



**BEN STEELE MIDDLE SCHOOL**  
Billings, MT

100% Construction Document Specifications  
Volume 1 of 3

A&E Project #13048.20  
Integrus Project #21438.00



December 18, 2015





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## SECTION 011000 - SUMMARY

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

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

##### B. Related Requirements:

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

#### 1.2 PROJECT INFORMATION

##### A. Project Identification: Ben Steele Middle School.

1. Project Location: 5640 Grand Avenue, Billings, MT 59106.

##### B. Owner: School District 2.

1. Owner's Representative: Lew Anderson, Director of Facilities.
2. Owner's Representative: Shane Swandal, Hulteng CM, Inc.

##### C. Architect: A&E Architects, PC.

##### D. Construction Manager at Risk: Langlas & Associates.

1. CMAR Representative: Jason Hubbard

#### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

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

1. Construction of a new Middle School complete with associated site work and other Work indicated in the Contract Documents. The building will be approximately 81,000 sf on the main level and 40,000 sf on the second level for a total of 121,000 sf. Construction is slab on grade with structural steel framing for the columns, second level, and roof. Site work includes excavation, backfill, grading, drainage, utilities, parking, sidewalks, landscaping, and playing fields for football, track, baseball, and soccer.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.4 PHASED CONSTRUCTION

- A. The Work shall be conducted in a single phase of construction

1.5 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with 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 separate contracts.
- B. Concurrent Work: Owner has awarded a separate contract for the following construction operations at Project site. Those operations will be complete prior to start of this construction.
1. Langlas & Associates: To provide building pad preparation including scraping, scarifying, engineered fill and compaction, and installation of rammed aggregate piers to support the building foundation system.

1.6 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
  2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
  3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
  4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.7 COORDINATION WITH OCCUPANTS

- A. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to the Owner acceptance of the completed Work.
  2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.

3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

## 1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 8:00 p.m., Monday through Friday, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  1. Notify Owner not less than five (5) days in advance of proposed utility interruptions.
  2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  1. Notify Owner not less than two days in advance of proposed disruptive operations.
  2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Restricted Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

## 1.9 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

## SECTION 012300 - ALTERNATES

### PART 1 - GENERAL

#### 1.1 SUMMARY

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

#### 1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

#### 1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other work of the Contract.
- C. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1A: Provide LVT flooring in lieu of VCT flooring on the First Floor.
  - 1. Base Bid: Provide VCT flooring where shown on Room Finish Schedule.

2. Alternate: Provide LVT flooring in lieu of VCT flooring. See Section 099999 Color and Finishes Schedule.
- B. Alternate No. 1B: Provide LVT flooring in lieu of VCT flooring on the Second Floor.
1. Base Bid: Provide VCT flooring where shown on Room Finish Schedule.
  2. Alternate: Provide LVT flooring in lieu of VCT flooring. See Section 099999 Color and Finishes Schedule.
- C. Alternate No. 1C: Provide polished concrete floor finish in lieu of VCT flooring on the First Floor.
1. Base Bid: Provide VCT flooring where shown on Room Finish Schedule.
  2. Alternate: Provide polished concrete floor finish in lieu of VCT flooring. See Section 03 35 18 Polished Concrete.
- D. Alternate No. 2: Provide asphalt paved parking lot (94 spaces)
1. Base Bid: Grade this area of the site and provide native seed mix per Drawing C2.0.
  2. Alternate: Grade this area of the site, provide base material, compaction, asphalt paving, and striping per Drawing C2.0.
- E. Alternate No. 3: Provide gravel parking lot.
1. Base Bid: Grade this area of the site and provide native seed mix per Drawing C2.0.  
Alternate: Grade this area of the site, provide base material and compaction per Drawing C2.0.
- F. Alternate No. 4: Provide east soccer field.
1. Base Bid: Grade this area of the site and provide native seed mix per Drawing C2.0.
  2. Alternate: Grade this area of the site and provide soccer field improvements including landscaping and irrigation per Drawing C2.0.
- G. Alternate No. 5: Provide west soccer field.
1. Base Bid: Grade this area of the site and provide native seed mix per Drawing C2.0.
  2. Alternate: Grade this area of the site and provide soccer field improvements including landscaping and irrigation per Drawing C2.0.
- H. Alternate No. 6: Provide west softball field and improvements.
1. Base Bid: Grade this area of the site and provide native seed mix per Drawing C2.0.
  2. Alternate: Grade this area of the site and provide base material and compaction, fencing, sidewalks, dugouts, landscaping and irrigation, and related improvements per Drawing C2.0.
- I. Alternate No. 7: Provide north softball field and improvements.
1. Base Bid: Grade this area of the site and provide native seed mix per Drawing C2.0.
  2. Alternate: Grade this area of the site and provide base material and compaction, fencing, sidewalks, dugouts, landscaping and irrigation, and related improvements per Drawing C2.0.
- J. Alternate No. 8: Provide CMU veneer in lieu of Brick Veneer on exterior elevations.
1. Base Bid: Provide Brick Veneer per Section 04 26 13 where shown on exterior elevations.
  2. Alternate: Provide CMU Veneer per Section 04 26 13 in lieu of Brick Veneer.
- K. Alternate No. 9: Eliminate four (4) south-facing storefront windows in the Gymnasium.



A&E # 13048.20  
INTEGRUS # 21438.00  
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1. Base Bid: Provide four (4) south-facing windows as shown on the elevations.
2. Alternate: Eliminate the four (4) south-facing windows and masonry openings including headers, reinforcing steel, etc., and infill with 12" CMU backup with brick veneer, reinforced per the standard Gymnasium wall section.

END OF SECTION 012300



## SECTION 01 25 00 – SUBSTITUTION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
  - 1. Divisions 2 through 33 Sections for specific requirements and limitations for substitutions.

#### 1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
  - 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 in order to meet other Project requirements but may offer advantage to Contractor or Owner.

#### 1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use facsimile of 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 cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - 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 and 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 IBC.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - 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 three days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 5 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.5 QUALITY ASSURANCE

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

## 1.6 PROCEDURES

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

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Substitution request is fully documented and properly submitted.

- c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  - b. Requested substitution does not require extensive revisions to the Contract Documents.
  - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - d. Substitution request is fully documented and properly submitted.
  - e. Requested substitution will not adversely affect Contractor's construction schedule.
  - f. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00





# SUBSTITUTION REQUEST (After the Bidding Phase)

Project: \_\_\_\_\_ Substitution Request Number: \_\_\_\_\_  
 \_\_\_\_\_  
 From: \_\_\_\_\_  
 To: \_\_\_\_\_ Date: \_\_\_\_\_  
 \_\_\_\_\_  
 A/E Project Number: \_\_\_\_\_  
 Re: \_\_\_\_\_ Contract For: \_\_\_\_\_

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_  
 Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Proposed Substitution: \_\_\_\_\_  
 Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Trade Name: \_\_\_\_\_ Model No.: \_\_\_\_\_  
 Installer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_  
 History:  New product  2-5 years old  5-10 yrs old  More than 10 years old  
 Differences between proposed substitution and specified product: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Point-by-point comparative data attached - REQUIRED BY A/E

Reason for not providing specified item: \_\_\_\_\_  
 \_\_\_\_\_

Similar Installation:

Project: \_\_\_\_\_ Architect: \_\_\_\_\_  
 Address: \_\_\_\_\_ Owner: \_\_\_\_\_  
 \_\_\_\_\_ Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work:  No  Yes; explain \_\_\_\_\_  
 \_\_\_\_\_

Savings to Owner for accepting substitution: \_\_\_\_\_ (\$ \_\_\_\_\_).  
 Proposed substitution changes Contract Time:  No  Yes [Add] [Deduct] \_\_\_\_\_ days.

Supporting Data Attached:  Drawings  Product Data  Samples  Tests  Reports  \_\_\_\_\_

# SUBSTITUTION REQUEST (Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: \_\_\_\_\_

Signed by: \_\_\_\_\_

Firm: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone: \_\_\_\_\_

Attachments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

---

### A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by:

Date:

---

Additional Comments:     Contractor     Subcontractor     Supplier     Manufacturer     A/E     \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
  - 1. Division 1 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

#### 1.2 MINOR CHANGES IN THE WORK

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

#### 1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. AIA G709-2001 Work Changes Proposal Request: Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Requirements" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use AIA Document G709-2001 Work Changes Proposal Request.

#### 1.4 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: Refer to Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

#### 1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701-2001.

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Work Change Directive: Architect may issue a Construction Work Change Directive on AIA Document G714-2007. Construction Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  1. Construction Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Work Change Directive.
  1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

# DRAFT AIA<sup>®</sup> Document G701<sup>™</sup> - 2001

## Change Order

<b>PROJECT</b> <i>(Name and address):</i>	<b>CHANGE ORDER NUMBER:</b> 001	<b>OWNER:</b> <input type="checkbox"/>
	<b>DATE:</b>	<b>ARCHITECT:</b> <input type="checkbox"/>
<b>TO CONTRACTOR</b> <i>(Name and address):</i>	<b>ARCHITECT'S PROJECT NUMBER:</b>	<b>CONTRACTOR:</b> <input type="checkbox"/>
	<b>CONTRACT DATE:</b>	<b>FIELD:</b> <input type="checkbox"/>
	<b>CONTRACT FOR:</b> General Construction	<b>OTHER:</b> <input type="checkbox"/>

**THE CONTRACT IS CHANGED AS FOLLOWS:**

*(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)*

The original Contract Sum was  
 The net change by previously authorized Change Orders  
 The Contract Sum prior to this Change Order was  
 The Contract Sum will be increased by this Change Order in the amount of  
 The new Contract Sum including this Change Order will be

The Contract Time will be increased by Zero (0) days.  
 The date of Substantial Completion as of the date of this Change Order therefore is

\$		0.00
\$		0.00
\$		0.00
\$		0.00
\$		0.00

**NOTE:** This Change Order does not include changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

**NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.**

<u>A&amp;E Architects, P.C.</u>		
<b>ARCHITECT</b> <i>(Firm name)</i>	<b>CONTRACTOR</b> <i>(Firm name)</i>	<b>OWNER</b> <i>(Firm name)</i>
<u>608 North 29th Street, Billings, MT</u>		
<u>59101</u>		
<b>ADDRESS</b>	<b>ADDRESS</b>	<b>ADDRESS</b>
<u></u>	<u></u>	<u></u>
<b>BY</b> <i>(Signature)</i>	<b>BY</b> <i>(Signature)</i>	<b>BY</b> <i>(Signature)</i>
<u>Dusty Eaton, AIA</u>	<u></u>	<u></u>
<i>(Typed name)</i>	<i>(Typed name)</i>	<i>(Typed name)</i>
<u></u>	<u></u>	<u></u>
<b>DATE</b>	<b>DATE</b>	<b>DATE</b>



# DRAFT AIA® Document G709™ - 2001

## Work Changes Proposal Request

PROJECT (Name and address):

PROPOSAL REQUEST NUMBER: 001

DATE OF ISSUANCE:

OWNER (Name and address):

CONTRACT FOR: General Construction

CONTRACT DATE:

FROM ARCHITECT (Name and address):

A&E Architects, P.C.  
608 North 29th Street  
Billings, MT 59101

ARCHITECT'S PROJECT NUMBER:

TO CONTRACTOR (Name and address):

OWNER:

ARCHITECT:

CONSULTANT:

CONTRACTOR:

FIELD:

OTHER:

Please submit an itemized proposal for changes in the Contract Sum and Contract Time for proposed modifications to the Contract Documents described herein. Within Zero (0) days, the Contractor must submit this proposal or notify the Architect, in writing, of the date on which proposal submission is anticipated.

**THIS IS NOT A CHANGE ORDER, A CONSTRUCTION CHANGE DIRECTIVE OR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED IN THE PROPOSED MODIFICATIONS.**

DESCRIPTION (Insert a written description of the Work):

ATTACHMENTS (List attached documents that support description):

REQUESTED BY THE ARCHITECT:

\_\_\_\_\_  
(Signature)

Ric Heldt, AIA, Principal

\_\_\_\_\_  
(Printed name and title)



# DRAFT AIA® Document G710™ - 1992

## Architect's Supplemental Instructions

**PROJECT** *(Name and address):*

**ARCHITECT'S SUPPLEMENTAL  
INSTRUCTION NO:** 001

**OWNER** *(Name and address):*

**DATE OF ISSUANCE:**

**FROM ARCHITECT** *(Name and  
address):*

A&E Architects, P.C.  
608 North 29th Street  
Billings, MT 59101

**CONTRACT FOR:** General Construction

**CONTRACT DATE:**

**TO CONTRACTOR** *(Name and  
address):*

**ARCHITECT'S PROJECT NUMBER:**

OWNER:   
ARCHITECT:   
CONSULTANT:   
CONTRACTOR:   
FIELD:   
OTHER:

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.

**DESCRIPTION:**

**ATTACHMENTS:**

*(Here insert listing of documents that support description.)*

**ISSUED BY THE ARCHITECT:**

\_\_\_\_\_  
*(Signature)*

Dusty Eaton, AIA, Principal

\_\_\_\_\_  
*(Printed name and title)*





# DRAFT AIA® Document G714™ – 2007

## Construction Change Directive

PROJECT: (Name and address)

DIRECTIVE NUMBER: 001

DATE:

CONTRACT FOR: General Construction

OWNER:

ARCHITECT:

CONSULTANT:

CONTRACTOR:

FIELD:

OTHER:

TO CONTRACTOR: (Name and address)

CONTRACT DATED:

ARCHITECT'S PROJECT NUMBER:

You are hereby directed to make the following change(s) in this Contract:  
(Describe briefly any proposed changes or list any attached information in the alternative)

### PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum or Guaranteed Maximum Price is:

- Lump Sum decrease of \$0.00
- Unit Price of \$            per
- As provided in Section 7.3.3 of AIA Document A201-2007
- As follows:

2. The Contract Time is proposed to (remain unchanged). The proposed adjustment, if any, is 0 days.

When signed by the Owner and Architect and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive (CCD), and the Contractor shall proceed with the change(s) described above.

Contractor signature indicates agreement with the proposed adjustments in Contract Sum and Contract Time set forth in this CCD.

A&E Architects, P.C.

ARCHITECT (Firm name)

608 North 29th Street, Billings, MT  
59101

ADDRESS

BY (Signature)

Dusty Eaton, AIA

(Typed name)

DATE

OWNER (Firm name)

ADDRESS

BY (Signature)

(Typed name)

DATE

CONTRACTOR (Firm name)

ADDRESS

BY (Signature)

(Typed name)

DATE



## SECTION 01 29 00 - PAYMENT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Division 1 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of Contractor's construction schedule.

#### 1.3 DEFINITIONS

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

#### 1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.
  - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with continuation sheets.
    - b. Submittal schedule.
    - c. Items required to be indicated as separate activities in Contractor's construction schedule.
  - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 3. Sub-schedules for Phased Work: Where the Work is separated into phases requiring separately phased payments; provide sub-schedules showing values coordinated with each phase of payment.
  - 4. Sub-schedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work; provide sub-schedules showing values coordinated with each element.
  - 5. Sub-schedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide sub-schedules showing values coordinated with the scope of each design services contract as described in Division 1 Section "Summary of Work."

- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Contractor's name and address.
    - d. Date of submittal.
  2. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.
    - f. Change Orders (numbers) that affect value.
    - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
  3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
  4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
    - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
  6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
  7. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
  8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
  9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

- C. Application for Payment Forms: Use AIA Form G702/3 for Applications for Payment or Architect approved equivalent. Submit forms for approval with initial submittal of schedule of values.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Owner will return incomplete applications without action.
  - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
  - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  - 3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of values.
  - 3. Copies of building permits.
  - 4. Performance and payment bonds.
- H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  - 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

A&E # 13048.20  
INTEGRUS # 21438.00  
DECEMBER 18, 2015

BEN STEELE MIDDLE SCHOOL  
BILLINGS PUBLIC SCHOOLS  
100% CONSTRUCTION DOCUMENTS

- I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  1. Evidence of completion of Project closeout requirements.
  2. Updated final statement, accounting for final changes to the Contract Sum.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

## SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination drawings.
  - 2. Requests for Information (RFIs).
  - 3. Project Web site.
  - 4. Project meetings.
- B. Related Sections:
  - 1. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

#### 1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

#### 1.3 COORDINATION

- A. 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.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

#### 1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
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. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid.
  2. Plenum Space: Indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
  6. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility.

#### 1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI using AIA G716 - 2007.
1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:



1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: AIA G716 – 2007 bound in the Project Manual or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
  3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:
1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Architect.
  4. RFI number including RFIs that were dropped and not submitted.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Architect's response was received.
  8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

## 1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Sustainable design requirements.
    - l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.
    - v. Office, work, and storage areas.
    - w. Equipment deliveries and priorities.
    - x. First aid.
    - y. Security.
    - z. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:

- 1) Interface requirements.
  - 2) Sequence of operations.
  - 3) Status of submittals.
  - 4) Deliveries.
  - 5) Off-site fabrication.
  - 6) Access.
  - 7) Site utilization.
  - 8) Temporary facilities and controls.
  - 9) Progress cleaning.
  - 10) Quality and work standards.
  - 11) Status of correction of deficient items.
  - 12) Field observations.
  - 13) Status of RFIs.
  - 14) Status of proposal requests.
  - 15) Pending changes.
  - 16) Status of Change Orders.
  - 17) Pending claims and disputes.
  - 18) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

# DRAFT AIA® Document G716™ - 2004

## Request for Information ("RFI")

<b>TO:</b> Dusty Eaton, AIA A&E Architects, P.C. 608 North 29th Street Billings, MT 59101 <b>PROJECT:</b>	<b>FROM:</b>	RFI No. 001
<b>PROJECT NUMBERS:</b> /	<b>ISSUE DATE:</b>	
	<b>REQUESTED REPLY DATE:</b>	
	<b>COPIES TO:</b>	

**RFI DESCRIPTION:** *(Fully describe the question or type of information requested.)*

**REFERENCES/ATTACHMENTS:** *(List specific documents researched when seeking the information requested.)*  
**SPECIFICATIONS:**                      **DRAWINGS:**                      **OTHER:**

**SENDER'S RECOMMENDATION:** *(If RFI concerns a site or construction condition, the sender may provide a recommended solution, including cost and/or schedule considerations.)*

**RECEIVER'S REPLY:** *(Provide answer to RFI, including cost and/or schedule considerations.)*

\_\_\_\_\_  
**BY**                      **DATE**                      **COPIES TO**

**Note:** This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order, Construction Change Directive or a Minor Change in the work must be executed in accordance with the Contract Documents.



## 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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Construction schedule updating reports.
4. Site condition reports.

- B. Related Requirements:

1. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
2. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.
2. PDF electronic file.
3. Two paper copies.

- B. Startup construction schedule.

1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a paper copy of schedule, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

- E. CPM (Critical Path Method) Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from commencement of the Work until most recent Application for Payment.

F. Construction Schedule Updating Reports: Submit with Applications for Payment.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

#### 1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress 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.

### PART 2 - PRODUCTS

#### 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for commencement of the date of final completion.
  1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
  1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
  2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, 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 indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
  5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.



- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
  2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  3. Products Ordered in Advance: Include a separate activity and delivery dates for each product. Delivery dates indicated stipulate the earliest possible delivery date.
  4. Owner-Furnished Products: Include a separate activity and delivery dates for each product. Delivery dates indicated stipulate the earliest possible delivery date.
  5. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    - a. Structural completion.
    - b. Temporary enclosure and space conditioning.
    - c. Permanent space enclosure.
    - d. Substantial Completion.
  6. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- D. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Division 1 Section "Payment Procedures" for cost reporting and payment procedures.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
  2. Unanswered Requests for Information.
  3. Rejected or unreturned submittals.
  4. Notations on returned submittals.
  5. Pending modifications affecting the Work and Contract Time.
- F. Recovery Schedule: When periodic update indicates the Work is 14 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, and equipment required to achieve compliance, and date by which recovery will be accomplished.

## 2.2 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within **seven** days of date established for commencement of the Work.
- B. 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 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

## 2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. CPM Schedule: Prepare Contractor's construction schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for commencement of the Work.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
  3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Mobilization and demobilization.
    - c. Utility interruptions.
    - d. Installation.
    - e. Work by Owner that may affect or be affected by Contractor's activities.
    - f. Testing.
    - g. Punch list and final completion.
  2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
  3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    - a. Sub-networks on separate sheets are permissible for activities clearly off the critical path.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- E. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Main events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.

6. Early and late finish dates.
  7. Activity duration in workdays.
  8. Total float or slack time.
  9. Average size of workforce.
  10. Dollar value of activity (coordinated with the schedule of values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in total float or slack time.
  7. Changes in the Contract Time.
- G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
  2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
  3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
  4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

## 2.4 REPORTS

- A. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week 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. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect / Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.

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DECEMBER 18, 2015

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2. 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.

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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Division 1 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
  - 2. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
  - 3. Division 1 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

#### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

#### 1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to

submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
  - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
  - a. Scheduled date for first submittal.
  - b. Specification Section number and title.
  - c. Submittal category: Action; informational.
  - d. Name of subcontractor.
  - e. Description of the Work covered.
  - f. Scheduled date for Architect's final release or approval.
  - g. Scheduled date of fabrication.
  - h. Scheduled dates for purchasing.
  - i. Scheduled dates for installation.
  - j. Activity or event number.

#### 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
  1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD 2010.
    - c. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement, Agreement included in Project Manual.
    - d. The following digital data files will be furnished for each appropriate discipline:
      - 1) Floor plans.
      - 2) Wall Sections
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of complete submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
  4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- C. Options: Identify options requiring selection by Architect.
- D. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- E. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- F. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- G. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
- D. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
  5. Action Submittals: Submit three paper copies, Architect will return one copy.

6. Informational Submittals: Submit three paper copies. Architect will not return copies.
  7. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- E. 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 not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Testing by recognized testing agency.
    - d. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
    - b. Four (4) paper copies of Product Data unless otherwise indicated. Architect will return two copies.
- F. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of dimensions established by field measurement.
    - e. Relationship and attachment to adjoining construction clearly indicated.
    - f. Seal and signature of professional engineer if specified.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches .
  3. Submit Shop Drawings in the following format:
    - a. Electronically per Electronic Submittal Requirements



- G. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
    - e. Specification paragraph number and generic name of each item.
  3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit four (4) sets of Samples. Architect will return two (2) sets of samples.
- H. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."
- I. Application for Payment and Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."
- J. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 1 Section "Quality Requirements."
- K. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 1 Section "Closeout Procedures."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

### PART 3 - EXECUTION

#### 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 1 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

#### 3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

A&E # 13048.20  
INTEGRUS # 21438.00  
DECEMBER 18, 2015

BEN STEELE MIDDLE SCHOOL  
BILLINGS PUBLIC SCHOOLS  
100% CONSTRUCTION DOCUMENTS

- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 33 00



# DRAFT AIA® Document C106™ – 2013

## Digital Data Licensing Agreement

AGREEMENT made as of the « » day of « » in the year « »  
(In words, indicate day, month and year.)

BETWEEN the Party transmitting Digital Data (“Transmitting Party”):  
(Name, address and contact information, including electronic addresses)

« »  
« »  
« »  
« »  
« »

and the Party receiving the Digital Data (“Receiving Party”):  
(Name, address and contact information, including electronic addresses)

« »  
« »  
« »  
« »  
« »

for the following Project:  
(Name and location or address)

«Billings School District 2 Ben Steele Middle School»  
«65th and Grand Ave.»  
«Billings, MT»

The Transmitting Party and Receiving Party agree as follows.

### TABLE OF ARTICLES

- 1 GENERAL PROVISIONS
- 2 TRANSMISSION OF DIGITAL DATA
- 3 LICENSE CONDITIONS
- 4 LICENSING FEE OR OTHER COMPENSATION
- 5 DIGITAL DATA

### ARTICLE 1 GENERAL PROVISIONS

§ 1.1 The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party’s use of Digital Data on the Project, and to set forth the license terms.

§ 1.2 This Agreement is the entire and integrated agreement between the parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the parties.

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

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

§ 1.3 For purposes of this Agreement, the term Digital Data is defined to include only those items identified in Article 5 below.

§ 1.3.1 Confidential Digital Data is defined as Digital Data containing confidential or business proprietary information that the Transmitting Party designates and clearly marks as “confidential.”

## ARTICLE 2 TRANSMISSION OF DIGITAL DATA

§ 2.1 The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data identified in Article 5 solely and exclusively to perform services for, or construction of, the Project in accordance with the terms and conditions set forth in this Agreement.

§ 2.2 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data, or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.3 If the Transmitting Party transmits Confidential Digital Data, the transmission of such Confidential Digital Data constitutes a warranty to the Receiving Party that the Transmitting Party is authorized to transmit the Confidential Digital Data. If the Receiving Party receives Confidential Digital Data, the Receiving Party shall keep the Confidential Digital Data strictly confidential and shall not disclose it to any other person or entity except as set forth in Section 2.3.1.

§ 2.3.1 The Receiving Party may disclose the Confidential Digital Data as required by law or court order, including a subpoena or other form of compulsory legal process issued by a court or governmental entity. The Receiving Party may also disclose the Confidential Digital Data to its employees, consultants or contractors in order to perform services or work solely and exclusively for the Project, provided those employees, consultants and contractors are subject to the restrictions on the disclosure and use of Confidential Digital Data as set forth in this Agreement.

§ 2.4 The Transmitting Party retains its rights in the Digital Data. By transmitting the Digital Data, the Transmitting Party does not grant to the Receiving Party an assignment of those rights; nor does the Transmitting Party convey to the Receiving Party any right in the software used to generate the Digital Data.

§ 2.5 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party’s modification to, or unlicensed use of, the Digital Data.

## ARTICLE 3 LICENSE CONDITIONS

The parties agree to the following conditions on the limited license granted in Section 2.1:

*(State below rights or restrictions applicable to the Receiving Party’s use of the Digital Data, requirements for data format, transmission method or other conditions on data to be transmitted.)*

<< >>

## ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party’s use of the Digital Data:

*(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party’s use of the Digital Data.)*

<< >>

## ARTICLE 5 DIGITAL DATA

The Parties agree that the following items constitute the Digital Data subject to the license granted in Section 2.1: *(Identify below, in detail, the information created or stored in digital form the parties intend to be subject to this Agreement.)*

<< >>

This Agreement is entered into as of the day and year first written above and will terminate upon Substantial Completion of the Project, as that term is defined in AIA Document A201™-2007, General Conditions of the Contract for Construction, unless otherwise agreed by the parties and set forth below.  
(Indicate when this Agreement will terminate, if other than the date of Substantial Completion.)

<< >>

\_\_\_\_\_  
**TRANSMITTING PARTY** (Signature)

\_\_\_\_\_  
**RECEIVING PARTY** (Signature)

\_\_\_\_\_  
<< >><< >>  
(Printed name and title)

\_\_\_\_\_  
<< >><< >>  
(Printed name and title)









SUBMITTAL TRANSMITTAL

Project: \_\_\_\_\_ Date: \_\_\_\_\_
A/E Project Number: \_\_\_\_\_

TRANSMITTAL A To (Contractor): \_\_\_\_\_ Date: \_\_\_\_\_ Submittal No. \_\_\_\_\_
From (Subcontractor): \_\_\_\_\_ By: \_\_\_\_\_ [ ] Resubmission

Table with 4 columns: Qty., Reference / Number, Title / Description / Manufacturer, Spec. Section Title and Paragraph / Drawing Detail Reference

- [ ] Submitted for review and approval
[ ] Resubmitted for review and approval
[ ] Complies with contract requirements
[ ] Will be available to meet construction schedule
[ ] A/E review time included in construction schedule

- [ ] Substitution involved - Substitution request attached
[ ] If substitution involved, submission includes point-by-point comparative data or preliminary details
[ ] Items included in submission will be ordered immediately upon receipt of approval

Other remarks on above submission: [ ] One copy retained by sender

TRANSMITTAL B To (A/E): \_\_\_\_\_ Attn: \_\_\_\_\_ Date Rec'd by Contractor: \_\_\_\_\_
From (Contractor): \_\_\_\_\_ By: \_\_\_\_\_ Date Trnsmt'd by Contractor: \_\_\_\_\_

- [ ] Approved
[ ] Approved as noted

- [ ] Revise / Resubmit
[ ] Rejected / Resubmit

Other remarks on above submission: [ ] One copy retained by sender

TRANSMITTAL C To (Contractor): \_\_\_\_\_ Attn: \_\_\_\_\_ Date Rec'd by A/E: \_\_\_\_\_
From (A/E): \_\_\_\_\_ [ ] Other By: \_\_\_\_\_ Date Trnsmt'd by A/E: \_\_\_\_\_

- [ ] Approved
[ ] Approved as noted
[ ] Not subject to review
[ ] No action required
[ ] Revise / Resubmit
[ ] Rejected / Resubmit
[ ] Approved as noted / Resubmit

- [ ] Provide file copy with corrections identified
[ ] Sepia copies only returned
[ ] Point-by-point comparative data required to complete approval process
[ ] Submission Incomplete / Resubmit

Other remarks on above submission: [ ] One copy retained by sender

TRANSMITTAL D To (Subcontractor): \_\_\_\_\_ Attn: \_\_\_\_\_ Date Rec'd by Contractor: \_\_\_\_\_
From (Contractor): \_\_\_\_\_ By: \_\_\_\_\_ Date Trnsmt'd by Contractor: \_\_\_\_\_

Copies: [ ] Owner [ ] Consultants [ ] \_\_\_\_\_ [ ] \_\_\_\_\_ [ ] \_\_\_\_\_ [ ] One copy retained by sender



## 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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
  - 1. Divisions 2 through 50 Sections for specific test and inspection requirements.

#### 1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- D. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

- F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- H. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.

#### 1.6 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.

5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
- 1.7 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.

- 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, 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 qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. 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.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

## 1.8 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, 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 additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these 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 inspecting will be performed.

4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspecting 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. **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 1 Section "Submittal Procedures."
- D. **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.
- E. **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.
- F. **Testing Agency Responsibilities:** Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- G. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

#### 1.9 FIELD SAMPLES

- A. Install field samples at the site as required by individual Sections for review.
- B. Acceptable samples represent a quality level for the Work.
- C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Architect.

#### 1.10 MOCK-UP 1 – GENERAL MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be comparison standard for remaining Work.
- D. Where mock-up has been accepted by Architects and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so by Architect.

#### 1.11 MOCK-UP 2 – EXTERIOR WALL ENVELOPE

- A. Create multi-component exterior three dimensional wall corner mock-up as described in the drawings to include the following components:
  - 1. Aluminum Storefront and Glazing with flashing, per Section 08 41 13,
  - 2. Aluminum Curtainwall and Glazing with flashing, per Section 08 44 13,
  - 3. Air and Moisture Barrier as part of Section 07 27 00,
  - 4. Masonry veneer, mortar, joint profiles, masonry flashings, weeps, and accessories, per Section 04 26 13,
  - 5. Sealer/water repellent as part of Section 07 19 00,
  - 6. Fiber Cement Panels and accessories, per Section 07 42 00,
  - 7. Horizontal and Vertical Metal Panels, flashings, and accessories, per Section 07 42 13,
  - 8. Sheet Metal Flashing and Trim, per Section 07 62 00, and
  - 9. Joint Sealants, per Section 07 92 00.
- B. Configure as shown on mock-up drawings. Locate mock-up as directed.
- C. Assemble and erect other individual mock-ups as specified.
- D. Mock-ups not meeting the Architect's approval for minimum workmanship quality shall be redone until such approval has been received. Schedule with sufficient lead time to allow proper review time, and re-fabrication if required.
- E. When accepted, mock-ups will demonstrate minimum standard for the Work. Multi-component mock-up to remain until completion of all exterior work and then removed when directed.
- F. Where mock-up is specified in individual Sections to be removed, clear area after mock-up has been accepted by Architect.



#### 1.12 MOCK-UP 3 - CLASSROOM

- A. Complete Classroom Mock-up: Create a full classroom mock-up where directed. Mock-up to include all finishes, casework, including smart cabinet, marker boards, acoustical wall panels, lighting, air grilles, intercom speakers, clock, electrical outlets and switch boxes, and electronic device boxes such as fire alarm components.
- B. Mock-up to be provided in stages. First Stage: installation of studs, blocking, and j-boxes prior to installation of conduit and drywall. Second Stage: Installation of conduit, gypsum board and joint treatment to specified finish level, and all ceiling related work prior to installation of suspended ceiling panels. Third Stage: Installation of suspended ceiling panels, lighting, casework, marker boards, and acoustical wall panels. Mock-up may remain as part of finished project.

#### 1.13 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
  - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
  - 2. Notifying Architect, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
  - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  - 6. Retesting and reinspecting corrected work.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
  - 1. Date test or inspection was conducted.
  - 2. Description of the Work tested or inspected.
  - 3. Date test or inspection results were transmitted to Architect.
  - 4. Identification of testing agency or special inspector conducting test or inspection.

#### 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend

restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 1 Section "Execution."

- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

## SECTION 01 42 00 - REFERENCES

### PART 1 - GENERAL

#### 1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

#### 1.2 INDUSTRY STANDARDS

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

### 1.3 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" or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHAM	Association of Home Appliance Manufacturers
AHRI	Air-Conditioning, Heating, and Refrigeration Institute
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute

AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute (Now AHRI)
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers International)
ASSE	American Society of Safety Engineers
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
ATIS	Alliance for Telecommunications Industry Solutions
AWCI	Association of the Wall and Ceiling Industry
AWCMA	American Window Covering Manufacturers Association (Now WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	BICSI, Inc.
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee

BWF	Badminton World Federation (Formerly: IBF - International Badminton Federation)
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CEA	Consumer Electronics Association
CCFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRRC	Cool Roof Rating Council
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CRI	Carpet and Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
ECA	Electronic Components Association
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee

EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association (Electrostatic Discharge Association)
ETL SEMCO	Intertek ETL SEMCO
FIBA	Federation Internationale de Basketball (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FM Approvals	FM Approvals LLC
FM Global	FM Global (Formerly: FMG - FM Global)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Part of GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation (Now BWF)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission

IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IES	Illuminating Engineering Society
IESNA	Illuminating Engineering Society of North America (Now IES)
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization Available from ANSI
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Service NA (Now ETL SEMCO)
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association



NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWFA	National Wood Flooring Association
NWWDA	National Wood Window and Door Association (Now WDMA)

PCI	Precast/Prestressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
SAE	SAE International
SCTE	Society of Cable Telecommunications Engineers
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance
SPIB	Southern Pine Inspection Bureau
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute

SWRI	Sealant, Waterproofing, & Restoration Institute
TCNA	Tile Council of North America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society
TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCSC	Window Covering Safety Council
WDMA	Window & Door Manufacturers Association
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association
WSRCA	Western States Roofing Contractors Association
WWPA	Western Wood Products Association

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

DIN	Deutsches Institut f?r Normung e.V.
IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	ICC Evaluation Service, Inc.

UBC Uniform Building Code  
(See ICC)

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE Army Corps of Engineers  
CPSC Consumer Product Safety Commission  
DOC Department of Commerce  
DOD Department of Defense  
DOE Department of Energy  
EPA Environmental Protection Agency  
FAA Federal Aviation Administration  
FCC Federal Communications Commission  
FDA Food and Drug Administration  
GSA General Services Administration  
HUD Department of Housing and Urban Development  
LBL Lawrence Berkeley National Laboratory  
NCHRP National Cooperative Highway Research Program  
(See TRB)  
NIST National Institute of Standards and Technology  
OSHA Occupational Safety & Health Administration  
PBS Public Buildings Service  
(See GSA)  
PHS Office of Public Health and Science  
RUS Rural Utilities Service  
(See USDA)  
SD State Department  
TRB Transportation Research Board  
USDA Department of Agriculture  
USPS Postal Service

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the

following list. Names are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

- ADAAG Americans with Disabilities Act (ADA)  
Architectural Barriers Act (ABA)  
Accessibility Guidelines for Buildings and Facilities  
Available from U.S. Access Board
- CFR Code of Federal Regulations  
Available from Government Printing Office
- DOD Department of Defense Military Specifications and Standards  
Available from Department of Defense Single Stock Point
- DSCC Defense Supply Center Columbus  
(See FS)
- FED-STD Federal Standard  
(See FS)
- FS Federal Specification  
Available from Department of Defense Single Stock Point  
  
Available from Defense Standardization Program  
  
Available from General Services Administration  
  
Available from National Institute of Building Sciences
- FTMS Federal Test Method Standard  
(See FS)
- MIL (See MILSPEC)
- MIL-STD (See MILSPEC)
- MILSPEC Military Specification and Standards  
Available from Department of Defense Single Stock Point
- UFAS Uniform Federal Accessibility Standards  
Available from Access Board

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

- CBHF State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation
- CCR California Code of Regulations
- CDHS California Department of Health Services  
(See CDPH)
- CDPH California Department of Public Health, Indoor Air Quality Section

A&E # 13048.20  
INTEGRUS # 21438.00  
DECEMBER 18, 2015

BEN STEELE MIDDLE SCHOOL  
BILLINGS PUBLIC SCHOOLS  
100% CONSTRUCTION DOCUMENTS

CPUC California Public Utilities Commission

TFS Texas Forest Service  
Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

## SECTION 01 50 00 - 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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Division 1 Section "Summary" for limitations on work restrictions and utility interruptions.

#### 1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
  - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
  - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
  - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and floor grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

#### 1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
  1. Use Owner's services to greatest extent possible.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in 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. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 36 inches.
- B. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

#### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Locate facilities 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. Locate facilities to limit site disturbance as specified in Division 1 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
  1. Protect porous materials from water damage.
  2. Protect stored and installed material from flowing or standing water.
  3. Keep porous and organic materials from coming into prolonged contact with concrete.
  4. Remove standing water from decks.
  5. Keep deck openings covered or dammed.

### 3.3 OPERATION, TERMINATION, AND REMOVAL

- 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.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  1. Materials and facilities that constitute temporary facilities are property of Contractor.
  2. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
  3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section "Closeout Procedures."

END OF SECTION 01 50 00



## SECTION 01 60 00 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Section:
  - 1. Division 01 Section "Substitution Requirements" for requests for substitutions.

#### 1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process 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 specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

#### 1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
    - a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
    - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

#### 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.

#### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. 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 to determine that products are undamaged and properly protected.

- C. Storage:

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

#### 1.6 PRODUCT WARRANTIES

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

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  3. Refer to Divisions 02 through 50. Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, 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 not in conflict with 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.
- B. Product Selection Procedures:
1. 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.
  2. 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.
  3. Products:
    - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
    - b. Nonrestricted List: 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. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
  4. Manufacturers:
    - a. Restricted List: 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 will not be considered, unless otherwise indicated.
    - b. Nonrestricted List: 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. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. 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 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.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Requirements" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: 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 these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  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.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

## SECTION 01 70 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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

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

1. Installation of the Work.
2. Cutting and patching.
3. Progress cleaning.
4. Infection Control.
5. Noise Control.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

- B. Related Requirements:

1. Division 1 Section "Summary" for limits on use of Project site.
2. Division 2 Section "Selective Demolition" for demolition and removal of selected portions of the building.
3. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
4. Division 7 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

#### 1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

#### 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, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. 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. Mechanical systems piping and ducts.
    - f. Control systems.
    - g. Communication systems.
    - h. Fire-detection and -alarm systems.
    - i. Conveying systems.
    - j. Electrical wiring systems.
    - k. Operating systems of special construction.
  3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
    - a. Water, moisture, or vapor barriers.
    - b. Membranes and flashings.
    - c. Exterior curtain-wall construction.
    - d. Sprayed fire-resistive material.
    - e. Equipment supports.
    - f. Piping, ductwork, vessels, and equipment.
    - g. Noise- and vibration-control elements and 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. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
  1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 1 sustainable design requirements Section.
- 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.

## PART 3 - EXECUTION

### 3.1 ELIMINATION OF DUST & CONTAMINANTS

- A. Contractor responsible to eliminate and/or control dust and fumes (diesel, etc.) during the course of construction.
  1. Wet all exposed earth areas to eliminate dust exposure to public, patients and medical staff.
  2. Provide scrubbers for all machinery that will expose building ventilation intake system to fumes and exhaust particles. Provide pre-filters for building ventilation systems in areas where air currents force construction equipment exhaust into exterior ventilation intakes if exhaust contamination cannot be controlled with other preventative measures.
  3. Owner reserves the right to halt any construction, and contractor shall remedy such construction practices & processes, causing irritating or harmful exposure to patients of dust, debris, exhaust and other contaminants.
- B. See Infection Control Guidelines on Drawing A0.1.

### 3.2 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- 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. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.3 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 1 Section "Project Management and Coordination."
- E. Surface and Substrate Preparation: Comply with manufacturer's written recommendations for preparation of substrates to receive subsequent work.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 4. Maintain minimum headroom clearance as noted in drawings to attain noted height clearances.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  2. Allow for building movement, including thermal expansion and contraction.
  3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Division 1 Section "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. 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 minimize 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. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.6 PROGRESS CLEANING

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

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

### 3.7 INFECTION CONTROL

- A. General: Owner will coordinate weekly meetings to review Infection Control measures taken on the job and compliance with Infection Control Guidelines shown on Drawing A0.1.

### 3.8 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 1 Section "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- E. Manufacturer's Field Service: Comply with qualification requirements in Division 1 Section "Quality Requirements."

### 3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.10 NOISE CONTROL

- A. General: Refer to mechanical / electrical drawings for conformance with Noise Guidelines and hours of operations for certain noise intensive operations.

END OF SECTION 01 70 00

## SECTION 01 74 19 - 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 administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

#### 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous 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.

#### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

## PART 2 - EXECUTION

### 2.1 SALVAGING DEMOLITION WASTE

- A. Salvage items for reuse and handle as follows:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  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.
- C. Salvage items for Owner's use and handle as follows:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area on-site were designated by Owner.
  5. Protect items from damage during transport and storage.
- D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- F. Plumbing Fixtures: Separate by type and size.
- G. Lighting Fixtures: Separate lamps by type and protect from breakage.
- H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

### 2.2 RECYCLING 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 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 construction waste management plan.



1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
  - a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

### 2.3 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  1. Except as otherwise specified, do not allow waste materials that are to be disposed of 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.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 01 74 19



## 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 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Division 1 Section "Execution" for progress cleaning of Project site.
  - 2. Division 1 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 3. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 4. Divisions 2 through 50 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

#### 1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in 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. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Complete startup and testing of systems and equipment.
  2. Perform preventive maintenance on equipment used prior to Substantial Completion.
  3. Complete final cleaning requirements, including touchup painting.

#### 1.6 FINAL COMPLETION PROCEDURES

- A. 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, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

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

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, room by room.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. Three paper copies. Architect will return two copies.

#### 1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

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 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.
  4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

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

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - b. Sweep concrete floors broom clean in unoccupied spaces.
    - c. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - d. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - e. Remove labels that are not permanent.
    - f. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - g. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    - h. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - i. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

- 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
  - j. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
  - k. Leave Project clean and ready for occupancy.
- C. NBHH Environmental Services will conduct final pre-occupancy cleaning operations following final cleaning by Contractor.

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
    - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
  3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
  4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

## SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
1. Operation and maintenance documentation directory.
  2. Emergency manuals.
  3. Operation manuals for systems, subsystems, and equipment.
  4. Product maintenance manuals.
  5. Systems and equipment maintenance manuals.
- B. Related Sections:

#### 1.2 CLOSEOUT SUBMITTALS

- A. Format: Submit operations and maintenance manuals in the following format:
1. PDF electronic file. Assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to Architect.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked operation and maintenance directory.
    - b. Enable inserted reviewer comments on draft submittals.
  2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- B. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Agent will return copy with comments.
1. Correct or modify each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

### PART 2 - PRODUCTS

#### 2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

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

2. Table of contents.
  3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Construction Manager.
  7. Name and contact information for Architect.
  8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  9. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. 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: Enable bookmarking of individual documents based upon file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
  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. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
  4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.



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

## 2.2 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
  1. Type of emergency.
  2. Emergency instructions.
  3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
  1. Fire.
  2. Flood.
  3. Gas leak.
  4. Water leak.
  5. Power failure.
  6. Water outage.
  7. System, subsystem, or equipment failure.
  8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
  1. Instructions on stopping.
  2. Shutdown instructions for each type of emergency.
  3. Operating instructions for conditions outside normal operating limits.
  4. Required sequences for electric or electronic systems.
  5. Special operating instructions and procedures.

## 2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  2. Performance and design criteria if Contractor is delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Piped system diagrams.
  9. Precautions against improper use.

10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

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

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

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

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

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

## 2.4 PRODUCT MAINTENANCE MANUALS

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

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

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

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

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

1. Inspection procedures.

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

- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## 2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
  2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  3. Identification and nomenclature of parts and components.
  4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
  2. Troubleshooting guide.
  3. Precautions against improper maintenance.
  4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  5. Aligning, adjusting, and checking instructions.
  6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

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

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original project record documents as part of operation and maintenance manuals.
- F. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

## SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications
  - 3. Record Product Data
  - 4. Reports
- B. Related Requirements:
  - 1. Division 1 Section "Execution" for final property survey.
  - 2. Division 1 Section "Closeout Procedures" for general closeout procedures.
  - 3. Divisions 2 through 50 Sections for specific requirements for project record documents of the Work in those Sections.

#### 1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set of marked-up record prints.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.
  - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Reports: Submit written report indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

### PART 2 - PRODUCTS

#### 2.1 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 archive photographic documentation.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below first floor.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Duct size and routing.
    - h. Locations of concealed internal utilities.
    - i. Changes made by Change Order or Construction Change Directive.
    - j. Changes made following Architect's written orders.
    - k. Details not on the original Contract Drawings.
    - l. Field records for variable and concealed conditions.
  3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

### PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 10





## SECTION 01 79 00 - DEMONSTRATION AND TRAINING

### PART 1 - GENERAL

#### 1.1 SUMMARY

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

#### 1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. Indicate proposed training modules utilizing manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

#### 1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
  - 1. At completion of training, submit complete training manual(s) for Owner's use.

#### 1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training.

#### 1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

- B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

## PART 2 - PRODUCTS

### 2.1 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 Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project record documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.
  - 3. 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.
  - 4. Operations: Include the following, as applicable:
    - a. Startup procedures.
    - b. Equipment or system break-in procedures.
    - c. Routine and normal operating instructions.
    - d. Regulation and control procedures.
    - e. Control sequences.
    - f. Safety procedures.
    - g. Instructions on stopping.

- h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
  - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."

### 3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
  - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
  - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner with at least seven days' advance notice.
- D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral performance-based test.

END OF SECTION 01 79 00

## SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
  - 1. Section 31 20 00 Earth Moving for drainage fill under slabs-on-grade.
  - 2. Section 03 35 18 Polished Concrete.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material test reports.
- C. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
- D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

C. Pre-Installation Meeting

1. Convene minimum one week prior to commencing work of this section.
2. Include any contractors performing work per Section 03 35 18.

1.5 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.6 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1.

1. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

- B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M).

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301 (ACI 301M).
2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

## 2.4 CONCRETE MATERIALS

### A. Cementitious Materials:

1. Portland Cement: ASTM C 150/C 150M, Type I/II,.
2. Fly Ash: ASTM C 618, Class F or C, maximum 10% of cement content.
3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.

### B. Normal-Weight Aggregates: ASTM C 33/C 33M, graded.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

### C. Air-Entraining Admixture: ASTM C 260/C 260M.

### D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

### E. Water: ASTM C 94/C 94M and potable.

## 2.5 WATERSTOPS

### A. Flexible Rubber Waterstops: CE CRD-C 513, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

### B. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

## 2.6 VAPOR RETARDERS

### A. Acceptable Manufacturers:

1. Typical Concrete Slab Vapor Retarder (Type 1)
  - a. Stego Wrap, 15 mil, by Stego Industries, LLC (877-464-7834).
  - b. Perminator, 15 mil, by W.R. Meadows (847-214-2100).
  - c. Viper II Vapor Barrier 15 mil. by Insulation Solutions (866-698-6562).
  - d. "Vapor Block 15" by Raven Industries (800-635-3456).
  - e. Substitutions: See Section 01 25 00 - Substitution Procedures.
2. For Freezer/Cooler Areas (Type 2)
  - a. Griffolyn VAPORguard by Reef Industries (800-231-6074).

- b. Pre-moulded Membrane Vapor Seal with Plasmatic Core by W.R. Meadows (707-745-6666).
  - c. Substitutions: See Section 01 25 00 - Substitution Procedures.
- B. Provide minimum 15 mil thick Polyolefin geo membrane manufactured from prime, virgin resins. Water vapor retarder ASTM E1745, meets or exceeds Class A. Water transmission rate ASTM E96, 0.006 gr./ft<sup>2</sup>/hr. or lower permanence rating, ASTM E96, 0.01 perm or lower use manufacturers tapes, mastic and pipe boots.
- C. Accessories
1. Vapor Retarder Tape: High density polyethylene tape with pressure sensitive adhesive, by manufacturer of vapor barrier, 4 inches minimum width.
  2. Pipe Boots: Construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer's instruction.
  3. Vapor Proofing Mastic: Water transmission rate ASTM E96, 0.3 perms or lower. Recommended by vapor retarder manufacturer.

## 2.7 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. BASF Corporation-Construction Systems.
    - b. Dayton Superior.
    - c. Sika Corporation.
    - d. SpecChem, LLC.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dayton Superior.
    - b. SpecChem, LLC.

## 2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.



## 2.9 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to **ACI 301 (ACI 301M)**.
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.

## 2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Normal-Weight Concrete: Interior Slabs
  - 1. Minimum Compressive Strength: **3500 psi (24.1 MPa)** at 28 days.
  - 2. Maximum W/C Ratio: 0.45
  - 3. Slump Limit: **4 inches (100 mm)**, plus or minus **1 inch (25 mm)**.
  - 4. Air Content – Exterior footings, foundations, and slabs: 6-7 percent (+/- 1%), at point of delivery.
  - 5. Air Content – Interior slabs: 4 percent, (+/- 1%) at point of delivery.
- B. Normal-Weight Concrete: Exterior Slabs
  - 1. Minimum Compressive Strength: **4000 psi (24.1 MPa)** at 28 days.
  - 2. Maximum W/C Ratio: 0.45
  - 3. Slump Limit: **4 inches (100 mm)**, plus or minus **1 inch (25 mm)**.
  - 4. Air Content – Exterior footings, foundations, and slabs: 6-7 percent (+/- 1%), at point of delivery.
  - 5. Air Content – Interior slabs: 5 percent, (+/- 1%) at point of delivery.
- C. Normal-Weight Concrete: Foundations, Footings, and Grade Beams
  - 1. Minimum Compressive Strength: **3000 psi (24.1 MPa)** at 28 days.
  - 2. Maximum W/C Ratio: 0.45
  - 3. Slump Limit: **4 inches (100 mm)**, plus or minus **1 inch (25 mm)**.
  - 4. Air Content – Exterior footings, foundations, and slabs: 6-7 percent (+/- 1%), at point of delivery.
  - 5. Air Content – Interior slabs: 5 percent, (+/- 1%) at point of delivery.
- D. Normal-Weight Concrete: Interior slab on grade with polished concrete finish (Alternate)
  - 1. Minimum Compressive Strength: **3500 psi (24.1 MPa)** at 28 days.
  - 2. Maximum W/C Ratio: 0.45

3. Slump Limit: 4 inches (100mm), plus or minus 1 inch (25 mm).
4. Air Content – Interior slab: 6 percent, (+/- 1%) at point of delivery.
5. Maximum Aggregate size = 1" washed gravel
6. Admixtures
  - a. Masterpolyheed 997.....US-OZ/CWT = 7.00
  - b. Mastersure Z60.....US-OZ/CWT = 5.00
  - c. Masterglenium 3030.....US-OZ/CWT = 5.50

## 2.11 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
  1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## 2.13 CURING / SEALING COMPOUND

- A. Refer to Section 09 90 00.

## PART 3 - EXECUTION

### 3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).
- C. Chamfer exterior corners and edges of permanently exposed concrete.

### 3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

### 3.3 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
  - 1. Lap joints **6 inches (150 mm)** and seal with manufacturer's recommended tape.

### 3.4 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

### 3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of **1/8 inch (3.2 mm)**. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut **1/8-inch- (3.2-mm-)** wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

### 3.6 WATERSTOP INSTALLATION

- A. Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions.

### 3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of

weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to **ACI 301** (ACI 301M).

### 3.8 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  1. Apply to concrete surfaces exposed to public view.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.
- D. Sack and Rub Surface Finish: At exposed planter walls.

### 3.9 FINISHING FLOORS, STAIRS, AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
  2. Finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, **10-ft.- (3.05-m-)** long straightedge resting on two high spots and placed anywhere on the surface does not exceed **3/16"** for the slab on deck and **1/8"** for the slab on grade. The following standards apply to the slab on grade:
    - a. Flatness F (F) 50, min. local value F (F) 25.
    - b. Levelness F (L) 30, min. local value F (L) 20.
    - c. Provide flatness and levelness results to Architect prior to commencing work.

- C. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom.
  - 1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
  - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- E. Stair Tread Finish: Apply a trowel finish to interior stair treads, unless noted otherwise.

### 3.10 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and **ACI 301 (ACI 301M)** for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching **0.2 lb/sq. ft. x h (1 kg/sq. m x h)** before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least **12 inches (300 mm)**, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
  - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
  - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.12 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

END OF SECTION 03 30 00

## SECTION 03 35 18 – POLISHED CONCRETE - (ALTERNATE)

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Grinding of the slab surface to receive clear reactive, penetrating liquid hardener/densifier.
  - 2. Application of clear reactive liquid hardener.
  - 3. Progressive polishing of the slab surface to achieve Finish Requirements.
  - 4. Application of stain resistant surface treatment.
  - 5. Protection of the slab surface to be polished from slab pour to project completion.
  - 6. Bid as Alternate #1C in lieu of VCT on first floor.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-In-Place Concrete: Placement of slabs requiring integral color, grinding and polishing.
  - 2. Section 09 65 00 - Resilient Flooring: Transitions.

#### 1.2 REFERENCES

- A. American Concrete Institute (ACI):
  - 1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
  - 2. ACI 302.1R - Guide for Concrete Floor and Slab Construction.
- B. ASTM International (ASTM):
  - 1. ASTM C171 - Sheet Materials for Curing Concrete.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit data on hardener, sealer, and slip resistant treatment, compatibilities, and limitations.
- C. Manufacturer's Instructions: Submit application instructions, special procedures, and conditions requiring special attention.
- D. Project Phasing Schedule indicating work descriptions, locations/areas of each work phase, and duration of each phase.
- E. Certificate: Written certification, signed by manufacturer's representative, stating applicator as trained and qualified to perform work of this Section using manufacturer's products. Include qualification criteria.
- F. Closeout Submittals
  - 1. Extra Material: Provide 5 gallons of cleaning agent with hardener/densifier chemical content to prolong life of flooring finish.

2. Operation and Maintenance Data: Submit instructions on maintaining floor. Include methods and frequency recommended for maintaining optimum condition under anticipated use. Include precautions against cleaning products and methods which may be detrimental to finishes and performance.

#### 1.4 QUALITY ASSURANCE

##### A. Qualifications

1. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
2. Applicator/Installer: Company specializing in performing work of this section with minimum of 5 successful Public Works projects.
  - a. Certified by manufacturer's representative as qualified to perform work of this Section, prior to Bid date, and accepted by Architect.
  - b. Maintain competent supervisor who is at Project during times specified work is in progress.

##### B. Pre-Installation Meeting

1. Attendance: Contractor, Owner, Architect, concrete slab installer and finisher, polished floor installer, manufacturer's rep, and any others requested to attend.
2. Timing: At least 3 weeks prior to beginning work of Section 03 30 00 in area to be polished.
3. Establish project timeline and communicate necessity of quality assurance measures.

##### C. Mock-Up

1. Section 01 40 00 – Quality Control Services: Requirements for mockup.
2. Construct mock-up at Gymnasium prior to installation of gymnasium wood floor under conditions similar to those which will exist during actual placing, 24 feet long by 8 feet wide, with specified finishes and coatings applied, and specified joints. Finish various components to show maximum variation that will exist in work.
3. Use same personnel, including supervisors, which will perform work.
4. Use specular gloss meter as required to verify accepted gloss level.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Deliver materials in manufacturer's packaging including application instructions.

#### 1.6 PROJECT CONDITIONS

- A. Section 01 60 00 – Product Requirements: Environmental conditions affecting products on site.
- B. Temporary Lighting: Minimum 200 W light source, placed 8 feet above floor surface, for each 425 sq ft of floor being finished.
- C. Temporary Heat: Ambient temperature of 50 degrees F minimum. Maintain work area temperature, humidity, and ventilation within limits recommended by manufacturer of any products used for application.
- D. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.
- E. Concrete Slab Curing:



1. Moisture cure, using moisture-retaining cover, non-staining curing paper or film for minimum 7 days and as specified Section 03 30 00.
  2. Do not apply liquid curing compounds to concrete floors, except as instructed by manufacturer and accepted by Architect as part of work of this Section.
  3. Cure slab minimum 28 days, or as instructed by manufacturer, before beginning work of this Section.
- F. Protection of concrete floor surface:
1. Protect concrete floor slab to be polished throughout the entire construction process – from slab pour to project completion.
  2. 'Diaper' all hydraulic powered equipment to prevent floor surface abrasion and to prevent oils, hydraulic fluids, grease, etc., from contacting the floor surface.
  3. Inform all trades that the concrete floor shall be protected at all times. Protect floor surface from acids, acidic detergent, cutting oils, primers, solvents, dyes, etc. Protect floor surface from impact, abrasion, chips, gouges, etc.
  4. Do not permit vehicles or pipe cutting machinery on the concrete floor surface.
  5. Do not place steel on concrete floors.

## 1.7 COORDINATION

- A. Coordinate the Work with concrete floor placement and concrete floor curing.

## PART 2 PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Floor Flatness and Floor Levelness Tolerances: Conform to Section 03 30 00 and specified ACI 302.1R, and ACI 117 provisions.
- B. ADA Coefficient of Friction:
1. Minimum dry static coefficient of friction (SCOF) of 0.6 as measured per latest editions of ASTM C1028 or ASTM F-609.
  2. Slip Resistance Potential rating of Acceptable (not less than 0.40 for level surfaces or inclined surfaces) when tested by measuring the wet dynamic coefficient of friction using an approved tribometer according to ANSI B101.3 Test Method for Measuring Wet DCOF of Common Hard Surface Floor Materials.
- C. Degree of Reflectiveness: Medium to High Appearance: Not less than 60 units, as tested in accordance with ASTM E430.
- D. Degree of Hardness: Exceeding 5.5 tested in accordance with ASTM D3363.

### 2.2 ACCEPTABLE MANUFACTURERS

- A. Consolideck L/S by Prosoco, 3741 Greenway Circle, Lawrence, KS 66046.
- B. LM Scofield Formula One. Tel: 800.800.9900.
1. Performance Criteria:
    - a. System materials to be same types as specified for Consolideck.
- C. FGS PermaShine manufactured by L&M Construction Chemicals, 14851 Calhoun Road, Omaha, NE, 68152. Tel: 800-362-3331.

1. Performance Criteria:
  - a. System materials to be same types as specified for Consolideck.

D. Retroplate, manufactured by Advanced Floor Products, Inc., PO Box 50533, Provo Utah 84605. Tel: 801-812-3420.

1. Performance Criteria:
  - a. System materials to be same types as specified for Consolideck.

E. Substitutions: Under provisions of Section 01 25 00.

## 2.3 MATERIALS

A. Hardener/Densifier: Basis-of-Design - Consolideck LS.

1. Description: Premium hardener and sealer for concrete surfaces. A penetrating lithium silicate treatment reacting with the calcium hydroxide from concrete hydration to produce insoluble calcium silicate hydrates.

- a. Properties:
  - 1) Form: Clear, water like liquid.
  - 2) Specific Gravity: 1.10.
  - 3) pH: 11.
  - 4) Wt/Gal: 9.2 lbs.
  - 5) Active Content: 14.5%
  - 6) Total Solids: 14.5%.
  - 7) Freeze Point: 32 degrees F.
  - 8) VOC Content: VOC compliant.

B. Protective Finish Treatment: Basis-of-Design - Consolideck SLX100 Water and Oil Repellant.

1. Description: Combines water and oil repellency to prevent staining by waterborne and oily substances.

- a. Properties:
  - 1) Form: Clear liquid, slight solvent odor.
  - 2) Specific Gravity: .909.
  - 3) Wt/Gal: 7.56 lbs.
  - 4) Active Content: 93%
  - 5) Total Solids: 62%.
  - 6) VOC Content: VOC compliant.

- C. Maintenance Cleaning Product: Basis-of-Design - Consolideck Klean Super Concentrate
  - 1. A concentrated maintenance cleaner for concrete floors.
    - 1) Form: Clear liquid, soapy odor.
    - 2) Specific Gravity: 1.014.
    - 3) pH: 11.0.
    - 4) Wt/Gal: 8.45 lbs.
    - 5) Flash Point: ASTM D3278, more than 200 degrees F.
    - 6) VOC Content: VOC compliant.

## 2.4 ACCESSORIES

- A. Neutralizing Agent: Tri-sodium phosphate or baking soda.
- B. Water: Clear and potable.
- C. Kraft Curing Paper: Conforming to ASTM C171, Type 1.1.1, non-staining, moisture retentive, as specified by Section 03 30 00, or as instructed by manufacturer and accepted by Architect.
- D. Joint Filler:
  - 1. Manufacturers:
    - a. CSS Polymers Quick Joint.
    - b. Metzger/McGuire Spal-Pro RS 88 polyurea joint filler.
  - 2. Color: To be selected by Architect from manufacturer's complete range of color options.

## 2.5 EQUIPMENT

- A. Shot blasting and Grinding Equipment: Equipped with vacuum to capture and prevent concrete dust from escaping into interior spaces, and as instructed by manufacturer.

## 2.6 FINISHES

- A. Final Concrete Floor Finish: Conform to finish sheen and treatment as accepted by mock-up.
  - 1. Level 3 Sheen (Semi-Polished): 800 diamond grit. (CONC-1)
  - 2. Fine Aggregate (Salt and Pepper) Finish: Remove not more than 3/16 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with little or no medium aggregate exposure at random locations.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify the following conditions as satisfactory to receive work of this Section before beginning:
  - 1. Concrete Surface:
    - a. Clean, smooth and flat conforming to specified floor tolerances listed above.
    - b. Free of chemicals, acids, curing compounds and other substance that may inhibit application of products specified in this Section.
      - 1) Interior gypsum board and similar work capable of damaging work of this Section is completed.

### 3.2 PREPARATION

- A. Where concrete slabs do not conform to tolerances specified in this Section above and Section 03 30 00, make flat and level. Perform work as necessary to provide substrate within acceptable tolerances.
- B. Protect surfaces not receiving work of this Section.
  - 1. Seal off adjacent building areas and cover adjacent work to limit air-born dust migration from settling on surfaces and polluting other parts of the building.
- C. Clean concrete surfaces of dirt and other particulates and remove oil, stains, grease, adhesives, water repellants, and other substances that may be detrimental of this Section.
- D. Perform repair of isolated surface defects, irregularities and cracks prior to grinding floor to match adjacent floor finish.
- E. Installation of Joint Filler at formed construction joints:
  - 1. Clean joint of dirt, debris, coatings, etc. Joints must be free of all laitance and visible moisture. Joints shall have continuous, square edges without spalls or voids.
  - 2. Mask edges of joint as required and install backer rod. Install joint filler per manufacturer's recommendations until material crowns the floor surface without voids.

### 3.3 GRINDING

- A. Perform initial grinding to remove protective coverings from concrete floor slab using subsequent finer grits until floor is scratch pattern free.
- B. Commence grinding procedures in the 30 to 50 grit range with Metal Bonded Diamond tooling to remove construction debris and floor slab imperfections.
- C. Cross grind at 90 degree angles to achieve uniform scratch patterns at each grinding grit level.
- D. Mechanically grind floor surface with #100 grit resin bonded diamonds or Hybrid diamond tool removing all scratches from previous grinding.
- E. Vacuum the floor thoroughly after each grind.

### 3.4 DENSIFIER APPLICATION

- A. Apply hardener/densifier. Comply with manufacturer's current recommendations. Apply as required to seal and densify concrete surface without changing color of concrete surface except for sheen.

- B. Squeegee or AutoScrub excess material off of floor as recommended by manufacturer.
- C. Allow 1-2 hours to dry before proceeding if required by densifier manufacturer.

### 3.5 POLISHING

- A. Perform finish polishing of concrete floor slab using diamond polishing equipment to achieve uniform final finish, matching mock-up.
- B. Mechanically grind floor surface with #100 resin bonded diamonds to begin process of creating the initial shine. Clean floor surface with clean water and an AutoScrubber or a mop and a wet vacuum.
- C. Mechanically grind floor surface with #200 resin bonded diamonds to begin process of creating the initial shine. Clean floor surface with clean water and an AutoScrubber or a mop and a wet vacuum.
- D. Start the polishing process utilizing #400 grit resin bonded diamonds to improve the shine and remove swirls in the concrete. Clean floor surface with clean water and an AutoScrubber or a mop and a wet vacuum.
- E. Continue the polishing process utilizing #800 grit resin bonded diamonds to improve the shine and remove swirls in the concrete. Clean floor surface with clean water and an AutoScrubber or a mop and a wet vacuum.

### 3.6 PROTECTIVE FINISH APPLICATION

- A. Apply light coating of protective finish treatment using micro fiber mop. Allow to dry. Burnish using #1500 grit diamond pad and high speed burnisher per manufacturer's recommendations.

### 3.7 EDGES

- A. Where desired, polished edge work of all areas shall be done with a hand held or walk behind polishing tool. Match edge polishing process to desired gloss level.

### 3.8 FIELD QUALITY CONTROL

- A. Manufacturer's Representative:
  - 1. Attend pre-installation meeting.
  - 2. Perform initial inspection and subsequent inspections during and at completion of work to verify conformance with manufacturer's instructions.
  - 3. Make recommendations for remedial action where non-conforming work is discovered.
- B. Test Reports: Provide field quality control sheen gloss reading and static coefficient of friction test results confirming compliance with specified performance criteria.

### 3.9 CLEANING

- A. Leave area clean, free from spillage, overspray, tracking, and other residue resulting from work of this Section.
- B. Repair or replace any adjacent surfaces damaged by work of this Section, as directed by Architect.

- C. Clean polished concrete using maintenance cleaning product recommended by manufacturer prior to Substantial Completion of Project. Repair scratches, and other surface damage to show no evidence of repair.

### 3.10 PROTECTION

- A. Cover the polished floor after polishing process is complete with one of the following methods. Protection to remain in place until all interior finish work is complete except wall base installations.
  - 1. EZ Cover: <http://www.mctechgroup.com/ezcover.html>
  - 2. Ram Board: <http://www.ramboard.com/>
  - 3. Kraft paper and masonite.
- B. Do not lay non-permeable films, membranes, or covers, including polyethylene, over finished floor.

END OF SECTION 03 35 18

## SECTION 04 22 00 - CONCRETE UNIT MASONRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Concrete masonry units.
  - 2. Steel reinforcing bars.
  - 3. Mortar and grout.

#### 1.2 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.
- C. Samples: For each type and color of the following:
  - 1. Decorative CMUs.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of product. For masonry units, include data on material properties and material test reports substantiating compliance with requirements.
- B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
  - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
  - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

#### 1.5 QUALITY ASSURANCE

- A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Build sample panels for each type of exposed unit masonry construction in sizes approximately **48 inches (1200 mm)** long by **48 inches (1200 mm)** high by full thickness.

## 1.6 FIELD CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## PART 2 - PRODUCTS

### 2.1 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
  1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

### 2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
  1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of **2800 psi (19.3 MPa)**.
  2. Density Classification: Medium weight.
- C. CMU – Gymnasium Walls: 12"W x 8"H x 16"L, Basis of Design: Mutual Materials, Natural Color. Ground face finish on all interior walls and at exposed corners on openings in walls. Standard finish acceptable at hidden locations.
- D. CMU2 – Screen Walls around Service Yard and Dust Collector: 8"W x 8"H x 16"L, Basis of Design: Mutual Materials, Charcoal Color, Standard finish both sides.



- E. CMU3 – Baseball Dugouts: 8"W x 8"H x 16"L, Basis of Design: Mutual Materials, Charcoal Color. Split face finish on exterior sides and at exposed corners. Standard finish at interior sides.

## 2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. **Holcim (US) Inc.**
    - b. **Lafarge North America Inc.**
    - c. **Lehigh Hanson; HeidelbergCement Group.**
- E. Aggregate for Mortar: ASTM C 144.
  - 1. White-Mortar Aggregates: Natural white sand or crushed white stone.
- F. Aggregate for Grout: ASTM C 404.
- G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. **BASF Corporation-Construction Systems.**
    - b. **Euclid Chemical Company (The); an RPM company.**
    - c. **Grace Construction Products; W.R. Grace & Co. -- Conn.**
- H. Water: Potable.

## 2.4 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, **Grade 60 (Grade 420)**.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from **0.148-inch (3.77-mm)** steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:

- a. Dur-O-Wal; a Hohmann & Barnard company.
- b. Heckmann Building Products, Inc.
- c. Hohmann & Barnard, Inc.

C. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

1. Interior Walls: Mill- galvanized, carbon steel.
2. Exterior Walls: Hot-dip galvanized carbon steel.
3. Wire Size for Side Rods: 9 ga.
4. Wire Size for Cross Rods: 9 ga.
5. Spacing of Cross Rods: Not more than 16 inches (407 mm) o.c.
6. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

## 2.5 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- (6.35-mm-) diameter, hot-dip galvanized-steel wire.
2. Tie Section: Triangular-shaped wire tie made from 0.25-inch- (6.35-mm-) diameter, hot-dip galvanized-steel wire.

C. Partition Top Anchors: 0.105-inch- (2.66-mm-) thick metal plate with a 3/8-inch- (9.5-mm-) diameter metal rod 6 inches (152 mm) long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

D. Rigid Anchors: Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated.

1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.

## 2.6 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:

1. Fabricate metal drip edges from stainless steel. Extend at least 3 inches (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
2. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
3. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.

- B. Flexible Flashing: Use the following unless otherwise indicated:
1. Copper-Laminated Flashing: 7-oz./sq. ft. (2-kg/sq. m) copper sheet bonded between two layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
    - a. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
      - 1) **Advanced Building Products Inc.**
      - 2) **Hohmann & Barnard, Inc.**
      - 3) **York Manufacturing, Inc.**
- C. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.
1. **Manufacturers:** Subject to compliance with requirements, provide products by the following:
    - a. **Mortar Net USA, Ltd.**
- D. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
- E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

## 2.7 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

## 2.8 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  1. Do not use calcium chloride in mortar or grout.
  2. Use portland cement-lime or masonry cement mortar unless otherwise indicated.
  3. For exterior masonry, use portland cement-lime or masonry cement mortar.
  4. For reinforced masonry, use portland cement-lime or masonry cement mortar.
  5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
  - 1. For masonry below grade or in contact with earth, use Type M.
  - 2. For reinforced masonry, use Type S.
  - 3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
  - 4. For interior nonload-bearing partitions, Type O may be used instead of Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
  - 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than **2000 psi (14 MPa)**.
  - 3. Provide grout with a slump of **8 to 11 inches (200 to 280 mm)** as measured according to ASTM C 143/C 143M.
  - 4. Provide color grout at Charcoal color CMU, Color to be selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

### 3.2 TOLERANCES

#### A. Dimensions and Locations of Elements:

- 1. For dimensions in cross section or elevation, do not vary by more than plus **1/2 inch (12 mm)** or minus **1/4 inch (6 mm)**.
- 2. For location of elements in plan, do not vary from that indicated by more than plus or minus **1/2 inch (12 mm)**.
- 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus **1/4 inch (6 mm)** in a story height or **1/2 inch (12 mm)** total.

#### B. Lines and Levels:

- 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than **1/4 inch in 10 feet (6 mm in 3 m)**, or **1/2-inch (12-mm)** maximum.
- 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than **1/8 inch in 10 feet (3 mm in 3 m)**, **1/4 inch in 20 feet (6 mm in 6 m)**, or **1/2-inch (12-mm)** maximum.

3. For vertical lines and surfaces, do not vary from plumb by more than **1/4 inch in 10 feet (6 mm in 3 m)**, **3/8 inch in 20 feet (9 mm in 6 m)**, or **1/2-inch (12-mm)** maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than **1/8 inch in 10 feet (3 mm in 3 m)**, **1/4 inch in 20 feet (6 mm in 6 m)**, or **1/2-inch (12-mm)** maximum.
5. For lines and surfaces, do not vary from straight by more than **1/4 inch in 10 feet (6 mm in 3 m)**, **3/8 inch in 20 feet (9 mm in 6 m)**, or **1/2-inch (12-mm)** maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus **1/8 inch (3 mm)**, with a maximum thickness limited to **1/2 inch (12 mm)**.
2. For head and collar joints, do not vary from thickness indicated by more than plus **3/8 inch (9 mm)** or minus **1/4 inch (6 mm)**.
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus **1/8 inch (3 mm)**.

### 3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal **4-inch (100-mm)** horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- F. Fill cores in hollow CMUs with grout **24 inches (600 mm)** under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

### 3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
  1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  2. Bed webs in mortar in all courses of piers, columns, and pilasters.
  3. Bed webs in mortar in grouted masonry, including starting course on footings.
  4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

### 3.5 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of **5/8 inch (16 mm)** on exterior side of walls, **1/2 inch (13 mm)** elsewhere. Lap reinforcement a minimum of **6 inches (150 mm)**.
  - 1. Space reinforcement as shown on drawings.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

### 3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
  - 1. Provide an open space not less than **1 inch (25 mm)** wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
  - 3. Space anchors as indicated, but not more than **24 inches (610 mm)** o.c. vertically and **36 inches (915 mm)** o.c. horizontally.

### 3.7 FLASHING

- A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  - 2. At lintels, extend flashing a minimum of **6 inches (150 mm)** into masonry at each end. At heads and sills, extend flashing **6 inches (150 mm)** at ends and turn up not less than **2 inches (50 mm)** to form end dams.
  - 3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
  - 4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web

covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

### 3.8 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
  - 1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  - 2. Limit height of vertical grout pours to not more than **60 inches (1520 mm)**.

### 3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level B or C in TMS 402/ACI 530/ASCE 5.
  - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
  - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each **5000 sq. ft. (464 sq. m)** of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.
- G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- H. Prism Test: For each type of construction provided, according to ASTM C 1314 at seven days and at 28 days.

### 3.10 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  - 2. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

### 3.11 MASONRY WASTE DISPOSAL

- A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
  - 1. Do not dispose of masonry waste as fill within **18 inches (450 mm)** of finished grade.
- B. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 22 00



## SECTION 04 26 13 - MASONRY VENEER

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Face brick veneer (Base Bid)
2. Concrete masonry unit veneer (Alternate)

B. Products Installed but Not Furnished under This Section:

1. Steel lintels in masonry veneer.
2. Steel shelf angles for supporting masonry veneer.

#### 1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type and color of brick.

#### 1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of product.

#### 1.4 QUALITY ASSURANCE

A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Build sample panels for each type of exposed unit masonry construction in sizes approximately **48 inches (1200 mm)** long by **48 inches (1200 mm)** high by full thickness.

B. Preinstallation meeting: At project site.

#### 1.5 FIELD CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is **40 deg F (4 deg C)** and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## PART 2 - PRODUCTS

### 2.1 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects will be exposed in the completed Work.

### 2.2 BRICK VENEER - BASE BID)

- A. Integral Water Repellent: Provide units made with integral water repellent.
1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength.
    - a. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
      - 1) **ACM Chemistries.**
      - 2) **BASF Corporation-Construction Systems.**
      - 3) **Grace Construction Products; W.R. Grace & Co. -- Conn.**
- B. Face Brick: ASTM C216, Type FBX, Grade SW.
1. BMU:
    - a. Strength: 3000 psi minimum, average of 5 bricks; 2500 psi minimum individual brick.
    - b. Nominal size of 3- ½ x 11- ½ x 3- ½ inch. (Econ Stretcher)
    - c. Colors and Texture: Basis of Design – Mutual Materials, Limestone Color, Mission Texture.
  2. BMU2:
    - a. Strength: 3000 psi minimum, average of 5 bricks; 2500 psi minimum individual brick.
    - b. Nominal size of 3- ½ x 7- ½ x 3- ½ inch. (Stretcher)
    - c. Colors and Texture: Basis of Design – Mutual Materials, Ebony Color, Mission Texture.
- C. Efflorescence: Face brick shall show no signs of efflorescence when tested in accordance with ASTM C67, unless waiver is granted upon manufacturer's submittal of evidence stating that no efflorescence will become evident after brick surfaces are sealed.
- D. Special shapes: Contractor has the option of field cutting face brick above relieving angels or fabricating such brick notched to accept steel angels while maintaining the required mortar joint dimension. No overcutting is allowed.
- E. Furnish other special units as detailed.

## 2.3 CONCRETE MASONRY UNIT VENEER - (ALTERNATE )

- A. Integral Water Repellent: Provide units made with integral water repellent.
1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength.
    - a. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
      - 1) **ACM Chemistries.**
      - 2) **BASF Corporation-Construction Systems.**
      - 3) **Grace Construction Products; W.R. Grace & Co. -- Conn.**
- B. Concrete Masonry Unit: ASTM C 1634.
1. BMU:
    - a. Density Classification: Normal Weight.
    - b. Size (Actual Dimensions): **3-5/8 inches** wide by 7 5/8 inches high by **15-5/8 inches** long.
    - c. Texture: Ground face finish.
    - d. Color: Basis-of-Design - Mutual Materials, Castle White
  2. BMU2:
    - a. Density Classification: Normal Weight.
    - b. Size (Actual Dimensions): **3-5/8 inches** wide by 7 5/8 inches high by **15-5/8 inches** long.
    - c. Texture: Ground face finish.
    - d. Color: Basis-of-Design - Mutual Materials, Charcoal.

## 2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.
1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. **Holcim (US) Inc.**
    - b. **Lafarge North America Inc.**
    - c. **Lehigh Hanson; HeidelbergCement Group.**
- E. Aggregate for Mortar: ASTM C 144.
1. White-Mortar Aggregates: Natural white sand or crushed white stone.
- F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
  - a. **BASF Corporation-Construction Systems.**
  - b. **Euclid Chemical Company (The); an RPM company.**
  - c. **Grace Construction Products; W.R. Grace & Co. -- Conn.**

G. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete bricks containing integral water repellent from same manufacturer.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
  - a. **ACM Chemistries.**
  - b. **BASF Corporation - Admixture Systems.**
  - c. **Grace Construction Products; W.R. Grace & Co. -- Conn.**

H. Water: Potable.

## 2.5 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least **1-1/2 inches (38 mm)** into veneer but with at least a **5/8-inch (16-mm)** cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.

C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped **1/4-inch- (6.35-mm-)** diameter, hot-dip galvanized-steel wire.
2. Tie Section: Triangular-shaped wire tie made from **0.25-inch- (6.35-mm-)** diameter, hot-dip galvanized-steel wire.

D. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist a **100-lbf (445-N)** load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of **1/16 inch (1.5 mm)**.
2. Fabricate sheet metal anchor sections and other sheet metal parts from **0.105-inch- (2.66-mm-)** thick steel sheet, galvanized after fabrication.
3. Fabricate wire ties from **0.25-inch- (6.35-mm-)** diameter, hot-dip galvanized-steel wire unless otherwise indicated.
4. Fabricate wire connector sections from **0.25-inch- (6.35-mm-)** diameter, hot-dip galvanized, carbon-steel wire.
5. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.

6. Seismic Masonry-Veneer Anchors: Connector section and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with projecting tabs having slotted holes for inserting vertical leg of connector section. Connector section consists of a rib-stiffened, sheet metal bent plate with down-turned leg designed to fit in anchor section slot and with integral tabs designed to engage continuous wire.
  - a. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - 1) **Dur-O-Wal; a Hohmann & Barnard company.**
    - 2) **Hohmann & Barnard, Inc.**
    - 3) **Wire-Bond.**
  
7. Seismic Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with projecting tabs having holes for inserting vertical legs of wire tie. Wire tie has sheet metal clip welded to it with integral tabs designed to engage continuous wire.
  - a. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - 1) **Hohmann & Barnard, Inc.**
    - 2) **Wire-Bond.**
  
8. Seismic Masonry-Veneer Anchors: Connector section and a gasketed sheet metal anchor section, **1-1/4 inches (32 mm)** wide by **6 inches (152 mm)** long, with screw holes top and bottom; top and bottom ends bent to form pronged legs of length to match thickness of insulation or sheathing; and raised rib-stiffened strap, **5/8 inch (16 mm)** wide by **6 inches (152 mm)** long, stamped into center to provide a slot between strap and base for inserting connector section. Connector section consists of a triangular wire tie and rigid PVC extrusion with snap-in grooves for inserting continuous wire.
  - a. **Manufacturers:** Subject to compliance with requirements, provide products by the following:
    - 1) **Hohmann & Barnard, Inc.**

## 2.6 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:
  1. Fabricate metal drip edges from stainless steel. Extend at least **3 inches (76 mm)** into wall and **1/2 inch (13 mm)** out from wall, with outer edge bent down 30 degrees and hemmed.
  2. Fabricate metal sealant stops from stainless steel. Extend at least **3 inches (76 mm)** into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for **3/4 inch (19 mm)** and down into joint **1/4 inch (6 mm)** to form a stop for retaining sealant backer rod.
  
- B. Flexible Flashing: Use the following unless otherwise indicated:
  1. Copper-Laminated Flashing: **7-oz./sq. ft. (2-kg/sq. m)** copper sheet bonded between two layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
    - a. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
      - 1) **Advanced Building Products Inc.**

- 2) Hohmann & Barnard, Inc.
- 3) York Manufacturing, Inc.

- C. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

## 2.7 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Weep/Vent Products: Use one of the following unless otherwise indicated:
  1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth **1/8 inch (3 mm)** less than depth of outer wythe, in color selected from manufacturer's standard.
    - a. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
      - 1) **Advanced Building Products Inc.**
      - 2) **Heckmann Building Products, Inc.**
      - 3) **Hohmann & Barnard, Inc.**
      - 4) **Wire-Bond.**
- C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
  1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. **Advanced Building Products Inc.**
    - b. **Hohmann & Barnard, Inc.**
    - c. **Mortar Net USA, Ltd.**
    - d. **Wire-Bond.**
  2. Configuration: Provide one of the following:
    - a. Strips, full depth of cavity and **10 inches (250 mm)** high, with dovetail-shaped notches **7 inches (175 mm)** deep that prevent clogging with mortar droppings.
    - b. Strips, not less than **1-1/2 inches (38 mm)** thick and **10 inches (250 mm)** high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
    - c. Sheets or strips, full depth of cavity and installed to full height of cavity.

## 2.8 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without

discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
  - a. **Diedrich Technologies, Inc.; a division of Sandell Construction Solutions.**
  - b. **PROSOCO, Inc.**

## 2.9 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  1. Do not use calcium chloride in mortar or grout.
  2. Use portland cement-lime or masonry cement mortar unless otherwise indicated.
  3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Use Type N unless another type is indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- C. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds **30 g/30 sq. in. (30 g/194 sq. cm)** per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

### 3.2 TOLERANCES

- A. Dimensions and Locations of Elements:
  1. For dimensions in cross section or elevation, do not vary by more than plus **1/2 inch (12 mm)** or minus **1/4 inch (6 mm)**.
  2. For location of elements in plan, do not vary from that indicated by more than plus or minus **1/2 inch (12 mm)**.
  3. For location of elements in elevation, do not vary from that indicated by more than plus or minus **1/4 inch (6 mm)** in a story height or **1/2 inch (12 mm)** total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than **1/4 inch in 10 feet (6 mm in 3 m)**, or **1/2 inch (12 mm)** maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than **1/8 inch in 10 feet (3 mm in 3 m)**, **1/4 inch in 20 feet (6 mm in 6 m)**, or **1/2 inch (12 mm)** maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than **1/4 inch in 10 feet (6 mm in 3 m)**, **3/8 inch in 20 feet (9 mm in 6 m)**, or **1/2 inch (12 mm)** maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than **1/8 inch in 10 feet (3 mm in 3 m)**, **1/4 inch in 20 feet (6 mm in 6 m)**, or **1/2 inch (12 mm)** maximum.
5. For lines and surfaces, do not vary from straight by more than **1/4 inch in 10 feet (6 mm in 3 m)**, **3/8 inch in 20 feet (9 mm in 6 m)**, or **1/2 inch (12 mm)** maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus **1/8 inch (3 mm)**, with a maximum thickness limited to **1/2 inch (12 mm)**.
2. For exposed head joints, do not vary from thickness indicated by more than plus or minus **1/8 inch (3 mm)**. Do not vary from adjacent bed-joint and head-joint thicknesses by more than **1/8 inch (3 mm)**.

### 3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal **4-inch (100-mm)** horizontal face dimensions at corners or jambs.
- C. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

### 3.4 MORTAR BEDDING AND JOINTING

- A. Lay masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- C. Control And Expansion Joints:
  1. Install control and expansion joints at the following maximum spacing, unless otherwise indicated on Drawings:
    - a. Exterior Walls: 20 feet on center and within 24 inches on one side of each interior and exterior corner.
    - b. Interior Walls: 30 feet on center.
    - c. At changes in wall height.
  2. Do not continue horizontal joint reinforcement through control and expansion joints.
  3. Install preformed control joint device in continuous lengths. Seal butt and corner joints.
  4. Size control joint in accordance with Section 07 92 00 for sealant performance.



5. Form expansion joint by omitting mortar and cutting unit to form open space or as detailed.

### 3.5 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing and concrete and masonry backup with seismic masonry-veneer anchors to comply with the following requirements:
  1. Fasten seismic anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
  2. Embed tie sections connector sections and continuous wire in masonry joints.
  3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  4. Space anchors as indicated, but not more than **16 inches (406 mm)** o.c. vertically and **25 inches (635 mm)** o.c. horizontally, with not less than one anchor for each [**2.67 sq. ft. (0.25 sq. m)**] [**3.5 sq. ft. (0.33 sq. m)**] of wall area. Install additional anchors within **12 inches (305 mm)** of openings and at intervals, not exceeding **36 inches (914 mm)**, around perimeter.
  5. Space anchors as indicated, but not more than **18 inches (458 mm)** o.c. vertically and horizontally. Install additional anchors within **12 inches (305 mm)** of openings and at intervals, not exceeding **24 inches (610 mm)**, around perimeter.
- B. Provide not less than **2 inches (50 mm)** of airspace between back of masonry veneer and face of insulation.

### 3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete to comply with the following:
  1. Provide an open space not less than **1 inch (25 mm)** wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
  3. Space anchors as indicated, but not more than **24 inches (610 mm)** o.c. vertically and **36 inches (915 mm)** o.c. horizontally.

### 3.7 FLASHING, WEEP HOLES, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  2. At lintels and shelf angles, extend flashing a minimum of **6 inches (150 mm)** into masonry at each end. At heads and sills, extend flashing **6 inches (150 mm)** at ends and turn up not less than **2 inches (50 mm)** to form end dams.
  3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal drip edge.

4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
- C. Install weep holes in veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/vent products to form weep holes.
  2. Space weep holes **24 inches (600 mm)** o.c. unless otherwise indicated.
- D. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- E. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.
1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

### 3.8 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
- C. Testing Prior to Construction: One set of tests.
- D. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- E. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

### 3.9 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  2. Protect adjacent stone and nonmasonry surfaces from contact with cleaner.
  3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.10 MASONRY WASTE DISPOSAL

- A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
  - 1. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 26 13



## SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Structural steel.
  - 2. Grout.

#### 1.2 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

#### 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Mill test reports for structural steel, including chemical and physical properties.
- C. Source quality-control reports.
- D. Field quality-control and special inspection reports.

#### 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator shall have 15 years or more experience with projects of similar size, scope, and performance.
- B. Installer Qualifications: A qualified installer shall have 15 years or more experience with projects of similar size, scope, and performance.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

- D. Comply with applicable provisions of the following specifications and documents:
1. AISC 303.
  2. AISC 360.
  3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

## PART 2 - PRODUCTS

### 2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 572/A 572M, Grade 50 (345).
- B. Channels, Angles-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

### 2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.
1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.
- C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.
1. Finish: Mechanically deposited zinc coating.
- D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
1. Finish: Mechanically deposited zinc coating.
- E. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- F. Unheaded Anchor Rods: ASTM F 1554, Grade 36.

1. Configuration: Hooked.
2. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

G. Headed Anchor Rods: ASTM F 1554, Grade 55, weldable, straight.

1. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

H. Threaded Rods: ASTM A 36/A 36M.

1. Finish: Plain.

I. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

## 2.3 PRIMER

A. Primer: See Section 09 90 00 – Painting and Coating

## 2.4 GROUT

A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

B. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

## 2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

## 2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of **2 inches (50 mm)**.
  2. Surfaces to be field welded.
  3. Surfaces of high-strength bolted, slip-critical connections.
  4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  5. Galvanized surfaces.
  6. Surfaces enclosed in interior construction.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
1. SSPC-SP 2, "Hand Tool Cleaning."
  2. SSPC-SP 3, "Power Tool Cleaning."
  3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of **1.5 mils (0.038 mm)**. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

## 2.8 SOURCE QUALITY CONTROL

- A. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- B. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
1. Liquid Penetrant Inspection: ASTM E 165.
  2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
  3. Ultrasonic Inspection: ASTM E 164.
  4. Radiographic Inspection: ASTM E 94.
- C. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.



- B. Baseplates, Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

### 3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
  - 1. Verify structural-steel materials and inspect steel frame joint details.
  - 2. Verify weld materials and inspect welds.
  - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
  - 1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.

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- b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
- c. Ultrasonic Inspection: ASTM E 164.
- d. Radiographic Inspection: ASTM E 94.

END OF SECTION 05 12 00

## SECTION 05 21 00 - STEEL JOIST FRAMING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. K-series steel joists.
  2. K-series steel joist substitutes.
  3. LH- and DLH-series long-span steel joists.
  4. Joist girders.
  5. Joist accessories.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product.
- B. Shop Drawings:
1. Include layout, designation, number, type, location, and spacing of joists.
  2. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Manufacturer certificates.
- C. Mill Certificates: For each type of bolt.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."
1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

## PART 2 - PRODUCTS

### 2.1 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
- B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

### 2.2 LONG-SPAN STEEL JOISTS

- A. Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as indicated.

### 2.3 JOIST GIRDERS

- A. Manufacture joist girders according to "Standard Specifications for Joist Girders" in SJI's "Specifications," with steel-angle top- and bottom-chord members; with end and top-chord arrangements as indicated.

### 2.4 PRIMERS

- A. Primer: Provide shop primer that complies with Section 09 90 00 Painting and Coating.

### 2.5 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
- C. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within **1/2 inch (13 mm)** of finished wall surface unless otherwise indicated.
- D. Carbon-Steel Bolts and Threaded Fasteners: **ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6)**, carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.
  - 1. Finish: Plain, uncoated.
- E. High-Strength Bolts, Nuts, and Washers: **ASTM A 325 (ASTM A 325M)**, Type 1, heavy hex steel structural bolts; **ASTM A 563 (ASTM A 563M)** heavy hex carbon-steel nuts; and **ASTM F 436 (ASTM F 436M)** hardened carbon-steel washers.
  - 1. Finish: Plain.

- F. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

## 2.6 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories.
- B. Apply one coat of shop primer.
- C. Shop priming of joists and joist accessories is specified in Section 09 90 00 Painting and Coating.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
  - 1. Before installation, splice joists delivered to Project site in more than one piece.
  - 2. Space, adjust, and align joists accurately in location before permanently fastening.
  - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
- C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework using carbon-steel bolts.
- E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with Research Council on Structural Connection's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
- F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

### 3.2 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

END OF SECTION 05 21 00



## SECTION 05 31 00 - STEEL DECKING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Roof deck.
  - 2. Acoustic roof deck
  - 3. Noncomposite form deck.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
  - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product certificates.
- C. Evaluation reports.
- D. Field quality-control reports.

#### 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

### 2.2 ROOF DECK

- A. Size and depth: See Structural Drawings.
- B. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
1. **ASC Profiles, Inc.**
  2. **Nucor Corp.**
  3. **Verco Decking, Inc., a Nucor company.**
  4. Substitutions: See Section 01 25 00 Substitution Procedures.
- C. Roof Deck - Standard: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade **33 (230)**, zinc coating.
  2. Deck Profile: As indicated.
  3. Profile Depth: As indicated.
  4. Design Uncoated-Steel Thickness: As indicated.
- D. Roof Deck - Acoustic: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade **33 (230)**, zinc coating.
  2. Deck Profile: As indicated.
  3. Profile Depth: As indicated.
  4. Perforated flat sheet on underside welded to decking
  5. Manufacturer's standard insulation in flute spaces
  6. Design Uncoated-Steel Thickness: As indicated.

### 2.3 NONCOMPOSITE FORM DECK

- A. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
1. **ASC Profiles, Inc.**
  2. **Nucor Corp.**
  3. **Verco Decking, Inc., a Nucor company.**
  4. Substitutions: See Section 01 25 00 Substitution Procedures.
- B. Noncomposite Form Deck: Fabricate ribbed-steel-sheet noncomposite form-deck panels to comply with "SDI Specifications and Commentary for Noncomposite Steel Form Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:



1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), zinc coating.
2. Deck Profile: As indicated.
3. Profile Depth: As indicated.
4. Design Uncoated-Steel Thickness: As indicated.

## 2.4 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.
- G. Galvanizing Repair Paint: ASTM A 780.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

- G. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.
- H. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than **12 inches (305 mm)** apart with at least one fastener at each corner.
  - 1. Install reinforcing channels or zees in ribs to span between supports and mechanically fasten.
- I. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Mechanically fasten to substrate to provide a complete deck installation.
  - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- J. Pour Stops and Girder Fillers: Weld steel-sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- K. Floor-Deck Closures: Weld steel-sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

### 3.2 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

### 3.3 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 05 31 00

## SECTION 05 40 00 - COLD-FORMED METAL FRAMING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Load-bearing wall framing.
  2. Exterior non-load-bearing wall framing.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of cold-formed steel framing product and accessory.
- B. Shop Drawings:
1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
  2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Product test reports.
- D. Research reports.

#### 1.4 QUALITY ASSURANCE

- A. Product Tests: Mill certificates or data from a qualified independent testing agency.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- C. Comply with AISI S230 "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. [AllSteel & Gypsum Products, Inc.](#)
2. [ClarkDietrich Building Systems.](#)
3. [MBA Building Supplies.](#)
4. [MRI Steel Framing, LLC.](#)

## 2.2 PERFORMANCE REQUIREMENTS

- A. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
- B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency.
  1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

## 2.3 COLD-FORMED STEEL FRAMING, GENERAL

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
  1. Grade: As indicated.
  2. Coating: **G60 (Z180)**, **A60 (ZF180)**, **AZ50 (AZ150)**, or **GF30 (ZGF90)**.
- B. Steel Sheet for Vertical Deflection and Drift Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
  1. Grade: As indicated.
  2. Coating: **G60 (Z180)**.

## 2.4 LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  1. Minimum Base-Metal Thickness: **0.0428 inch (1.09 mm)**.
  2. Flange Width: **1-5/8 inches (41 mm) minimum**.
  3. Section Properties:  $S_x = .77 \text{ in}^3$ ,  $I_x + 2.32 \text{ in}^4$  (minimum).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and matching minimum base-metal thickness of steel studs.
- C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
  1. Minimum Base-Metal Thickness: **0.0428 inch (1.09 mm)**.
  2. Flange Width: **1-5/8 inches (41 mm)**.
  3. Section Properties:  $S_x = .77 \text{ in}^3$ ,  $I_x + 2.32 \text{ in}^4$  (minimum).

## 2.5 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: **0.0428 inch (1.09 mm)**.
  2. Flange Width: **1-5/8 inches (41 mm)**.
  3. Section Properties:  $S_x = .77 \text{ in}^3$ ,  $I_x + 2.32 \text{ in}^4$  (minimum).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. AllSteel & Gypsum Products, Inc.
    - b. ClarkDietrich Building Systems.
    - c. Simpson Strong-Tie Co., Inc.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

## 2.6 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration.

## 2.7 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel headless, hooked bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by mechanically deposition according to ASTM B 695, Class 50.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.

- D. 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 E 1190 conducted by a qualified testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
  - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

## 2.8 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B.
- B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, **1/4 inch (6.4 mm)** thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than **1/4 inch (6 mm)** to ensure a uniform bearing surface on supporting concrete or masonry construction.
- B. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

### 3.2 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
- D. Install framing members in one-piece lengths.

- E. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in Sections 07 21 13 and 07 21 16 in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- I. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of **1/8 inch in 10 feet (1:960)** and as follows:
  - 1. Space individual framing members no more than plus or minus **1/8 inch (3 mm)** from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.3 LOAD-BEARING WALL INSTALLATION

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
  - 1. Anchor Spacing: As shown on Shop Drawings.
- B. Squarely seat studs against top and bottom tracks with gap not exceeding of **1/8 inch (3 mm)** between the end of wall framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
  - 1. Stud Spacing: As indicated.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.
- D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- E. Align floor and roof framing over studs. Where framing cannot be aligned, continuously reinforce track to transfer loads.
- F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure as indicated.
- G. Install headers over wall openings wider than stud spacing. Locate headers above openings as indicated. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
  - 1. Frame wall openings with not less than a double stud at each jamb of frame as indicated on Shop Drawings. Fasten jamb members together to uniformly distribute loads.
  - 2. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.

- H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
  - 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- I. Install horizontal bridging in stud system, spaced vertically, minimum. Fasten at each stud intersection.
  - 1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches (150 mm) deep.
  - 2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
  - 3. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- J. Install steel sheet diagonal bracing straps to both stud flanges, terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.
- K. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

### 3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
  - 1. Stud Spacing: As indicated.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
  - 1. Install single deep-leg deflection tracks and anchor to building structure.
  - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
  - 3. Connect vertical deflection clips to bypassing or infill studs and anchor to building structure.
  - 4. Connect drift clips to cold-formed metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
  - 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within distance shown on drawings of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
    - a. Install solid blocking at centers indicated.



2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
  3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
  4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

### 3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00



## SECTION 05 50 00 – METAL FABRICATIONS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Shop-fabricated metal items (as detailed).
  2. Shop fabricated ferrous metal items, not covered in Section 05 12 00 but required to complete the work.
  3. Metal items such as bearing plates and embedments furnished under this section but installed under other sections.
  4. Loose steel lintels.
  5. Elevator sill angles, hoist and divider beams.
  6. Ladders.
  7. Metal base.
  8. Bench.
  9. Counter.
  10. Structural supports for miscellaneous attachments.
  11. Fabricated architectural details.
- B. Related Requirements:
1. Section 03 30 00 - Cast in Place Concrete: Execution requirements for embedded anchors and attachments for metal fabrications specified by this Section in concrete.
  2. Section 05 12 00 - Structural Steel Framing: Structural steel anchor bolts.
  3. Section 05 21 00 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
  4. Section 05 31 23 - Steel Roof Decking: Bearing for metal deck bearing, including anchorage.
  5. Section 08 41 13 - Aluminum Framed Entrances and Storefronts.
  6. Section 09 90 00 - Painting and Coating: Field applied paint finish.

#### 1.2 REFERENCE STANDARDS

- A. Aluminum Association:
1. AA DAF-45 - Designation System for Aluminum Finishes.
- B. American Architectural Manufacturers Association:
1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
- C. American National Standards Institute:
1. ANSI A14.3 - Ladders - Fixed - Safety Requirements
- D. ASTM International:
1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  2. ASTM A53- Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  3. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  4. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  5. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
  6. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

7. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
8. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
9. ASTM A992 - Standard Specification for Structural Steel Shapes.
10. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
11. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
12. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
13. ASTM F436 - Standard Specification for Hardened Steel Washers.

E. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.

F. National Ornamental & Miscellaneous Metals Association:

1. NOMMA Guideline 1 - Joint Finishes.

G. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC SP 1 - Solvent Cleaning.
3. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.

### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Samples: Submit 2 samples of clear coat finished steel plate illustrating rolled edges and radius corners of steel plate counter and bench.
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

### 1.4 QUALITY ASSURANCE

- A. Finish joints according to NOMMA Guideline 1.
- B. Qualifications:
  1. Fabricator Qualifications: Company specializing in work of this Section with minimum 5 years documented experience.
  2. Welders Qualifications: AWS qualified, WABO Certified within last 12 months.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept metal fabrications on-Site in labeled shipments. Inspect for damage.

- C. Protect metal fabrications from damage by exposure to weather or by ground contact.

## 1.6 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

## PART 2 PRODUCTS

### 2.1 STEEL PIPE RAILINGS

- A. 1 ¼ inch outside diameter steel pipe; welded joints and 1 inch outside diameter steel pipe intermediate rails at guardrails as indicated on the drawings.

### 2.2 GUARD RAIL

- A. Plate and Flat Bar Railing Posts and Sections: Steel ASTM A36, thickness and fabricated as detailed on Drawings.

### 2.3 STEEL PLATE (STL-1)

- A. Hot rolled steel. Cleaned and consecutive plates.
- B. Thickness: 3/8 inch.
- C. Finish: Shop applied automotive clear coat lacquer. Comply with manufacturer's instructions to produce a satin finish.
  - 1. Basis of Design: Permalac Clearcoat, Peacock Laboratories, Inc.

### 2.4 STEEL TRANSITION AT RAMP

- A. Finish: Shop applied automotive clear coat lacquer. Comply with manufacturer's instructions to produce a satin finish.
  - 1. Basis of Design: Permalac Clearcoat, Peacock Laboratories, Inc.

### 2.5 METAL BASE

- A. Fabricated Steel Wall Base
  - 1. (MB-1): 20 gage. Countersunk steel fasteners.
- B. Finish: Shop applied automotive clear coat lacquer. Comply with manufacturer's instructions to produce a satin finish.
  - 1. Basis of Design: Permalac Clearcoat, Peacock Laboratories, Inc.

### 2.6 LINTELS

- A. Steel sections, size and configuration as indicated on Drawings, length to allow 8 in minimum bearing on both sides of opening.
  - 1. Exterior Locations: Prime paint, one coat.
  - 2. Interior Locations: Prime paint, one coat.
  - 3. Refer to Section 09 90 00.

## 2.7 ELEVATOR SILL ANGLES, AND HOIST AND DIVIDER BEAMS

- A. Sill Angles: Steel sections as indicated on Drawings for support of elevator sills; prime paint, one coat.
- B. Hoist and Divider Beams: Steel wide flange sections, shape and size required to support applied loads with maximum deflection of 1/240 of the span; prime paint, one coat (Section 09 90 00 – Painting and Coating).

## 2.8 BOLLARDS

- A. Bollards: Steel pipe, concrete filled, crowned cap, diameter and length as indicated on Drawings; (final finish see Section 09 90 00 Painting and Coating).
- B. Concrete Fill: 3,000 psi as specified in Section 03 30 00 - Cast-in-Place Concrete.
- C. Anchors: Concealed type as indicated on Drawings.

## 2.9 LADDERS

- A. Ladder: ANSI A14.3, steel-welded construction.
  - 1. Side Rails: 3/8 x 2 in side rails spaced at 24 in.
  - 2. Rungs: 1 in diameter solid rod, spaced 12 in o.c.
  - 3. Mounting: Space rungs 7 in from wall surface; with steel mounting brackets and attachments.
  - 4. Finish: Painted finish per 09 90 00.
  - 5. At each elevator pit, provide ladder with continuous rung handgrips 48 inches above bottom access landing.
  - 6. Provide steel bar cage where shown on plans constructed of flat bars and hoops as required by code.
- B. Roof Ladder: Aluminum heavy duty fixed ladder, ANSI A14.3 and OSHA 1920.27.
  - 1. Manufacturers:
    - a. O'Keeffe's Inc.
    - b. Precision Stair Corp.
    - c. Substitutions under provisions of Section 01 25 00.
  - 2. Aluminum: ASTM B209, 6063 alloy, T5 or T-6 temper, mill finish.
  - 3. Rungs: 1-1/4 inches square serrated extruded aluminum sections, 18-3/8 inches long, and at 12 inches on center. 1,000 lb design load capacity.
  - 4. Side Rails: 2-1/2 inch by 1 inch by 1/8 (0.125) inch thick aluminum channel.
  - 5. Wall Brackets: 2 inch by 3/16 inch aluminum flat bar. Locate maximum 4 feet on center and as instructed by manufacturer.
  - 6. Floor Brackets: 4 inch by 2 inch by 3/16 inch aluminum angle.
  - 7. Fasteners: Stainless steel, screws, bolts and anchors as suitable for installation and as instructed by manufacturer.
  - 8. Length: Extend to fullest possible height under hatches and floor doors. Extend to heights as detailed at parapet conditions, except not less than required to meet WISHA and OSHA Standards.
  - 9. Provide walk-thru where shown on drawings.

C. Ship's Ladder:

1. Manufacturers:
  - a. O'Keeffe's Inc.
  - b. Precision Stair Corp.
  - c. Substitutions under provisions of Section 01 25 00.
2. Performance Requirements:
  - a. Design for 60 degree to 75 degree slope as shown on Drawings.
  - b. Design and certify to meet WISHA and OSHA/ANSI A14.3 Standards.
  - c. Aluminum: ASTM B 209, 6063 alloy, T5 or T-6 temper, mill finish.
  - d. Hand Rails: 1-1/4 inch diameter, Schedule 40 aluminum pipe.
  - e. Wall Brackets: Manufacturer's standard to suit installation.
  - f. Tread: Serrated, aluminum plate.
  - g. Stringers: Aluminum channel.
  - h. Fasteners: Stainless steel, screws, bolts and anchors as instructed by manufacturer.
  - i. Length: Extend to fullest possible height to suit installation.

2.10 STRUCTURAL SUPPORTS

- A. Other Structural Supports: Steel sections, shape and size as indicated on Drawings or required to support applied loads with maximum deflection of 1/240 of the span.
1. Interior: Prime paint, one coat.
  2. Exterior: Paint if exposed. Refer to Section 09 90 00.

2.11 ANCHORS

- A. Refer to Section 03 30 00 - Cast-In-Place Concrete.

2.12 MATERIALS

A. Steel:

1. Structural W-Shapes: ASTM A992.
2. Structural Shapes: ASTM A36.
3. Channels and Angles: ASTM A36.
4. Steel Plate: ASTM A36; Grade 50.
5. Hollow Structural Sections: ASTM A500, Grade B.
6. Steel Pipe: ASTM A53, Grade B, Schedule 40 or as indicated.
7. Sheet Steel: ASTM A653, Grade 33 Structural Quality.
8. Bolts: ASTM A307; Grade A or B; Type 1.
9. Nuts: ASTM A563 heavy hex type.
10. Washers: ASTM F436; Type 1.
11. Welding Materials: AWS D1.1; type required for materials being welded.

B. Aluminum:

1. Extruded Aluminum: ASTM B221 Alloy 6063, Temper T5.
2. Sheet Aluminum: ASTM B209 Alloy.
3. Bolts, Nuts, and Washers: Stainless steel.
4. Welding Materials: AWS D1.1; type required for materials being welded.

C. Bolts, Nuts, and Washers for Equipment and Piping:

1. Carbon Steel:
  - a. Structural Connections: ASTM A307, Grade A or B, hot-dip galvanized.
  - b. Anchor Bolts: ASTM A36, hot-dip galvanized.
  - c. Pipe and Equipment Flange Bolts: ASTM A193, Grade B-7.

2. Stainless Steel: Type 316 stainless steel, class 2; ASTM A193 for bolts; ASTM A194 for nuts.

## 2.13 FABRICATION

- A. Fit and shop assemble items in largest practical sections for delivery to Site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small, uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- F. Fabrication Tolerances:
  1. Squareness: 1/8 inch maximum difference in diagonal measurements.
  2. Maximum Offset between Faces: 1/16 inch.
  3. Maximum Misalignment of Adjacent Members: 1/16 inch.
  4. Maximum Bow: 1/8 inch in 48 inches.
  5. Maximum Deviation from Plane: 1/16 inch in 48 inches.

## 2.14 FINISHES

- A. Steel:
  1. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
  2. Do not prime surfaces in direct contact with concrete or where field welding is required.
  3. Prime paint items with one coat.
  4. Structural Steel Members: Refer to Section 05 12 00.
  5. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.
  6. Galvanizing for Fasteners, Connectors, and Anchors:
    - a. Hot-Dip Galvanizing: ASTM A153.
    - b. Mechanical Galvanizing: ASTM B695; Class 50 minimum.
  7. Sheet Steel: Galvanized with G90 coating class.
  8. Bolts: Hot-dip galvanized.
  9. Nuts: Hot-dip galvanized.
  10. Washers: Hot-dip galvanized.
  11. Shop Primer: Refer to Section 05 12 00.
- B. Aluminum:
  1. Finish coatings to conform to AAMA 611. Comply with AA DAF-45.
  2. Exterior Aluminum Surfaces:
    - a. Exterior anodized to clear color, to 0.0007 in thickness.
  3. Interior Aluminum Surfaces:
    - a. Interior anodized to clear color, to 0.0007 in thickness.
  4. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.



## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Requirements for installation examination.
- B. Verify field conditions are acceptable and are ready to receive Work.

### 3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal and aluminum where field welding is required.
- B. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

### 3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, and free from distortion or defects.
- B. Install metal base on solid backing. Fit joints tightly and make vertical. Install in longest possible lengths. Miter internal corners.
- C. Make provisions for erection stresses. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed.
- D. Field weld components indicated on Drawings.
- E. Perform field welding according to AWS D1.1.
- F. Obtain approval of Architect/Engineer prior to Site cutting or making adjustments not scheduled.

### 3.4 TOLERANCES

- A. Maximum Variation from Plumb: 1/4 in per story or for every 12 ft. in height, whichever is greater, non-cumulative.
- B. Maximum Variation from Level: 1/16 inch in and 1/4 inch in 10 ft.
- C. Maximum Offset from Alignment: 1/4 in.
- D. Maximum Out-of-Position: 1/4 in.

### 3.5 FIELD QUALITY CONTROL

- A. Welding: Inspect welds according to AWS D1.1.
- B. Replace damaged or improperly functioning hardware.

- C. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.
- D. Touch up factory-applied finishes according to manufacturer-recommended procedures.

### 3.6 ADJUSTING

- A. Section 01 77 00 - Closeout Procedures: Requirements for starting and adjusting.
- B. Adjust operating hardware and lubricate as necessary for smooth operation.

END OF SECTION 05 50 00

## SECTION 05 51 13 - METAL PAN STAIRS

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Preassembled steel stairs with concrete-filled treads.
2. Steel tube or pipe railings attached to metal stairs.
3. Steel tube or pipe handrails attached to walls adjacent to metal stairs.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For metal pan stairs.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Delegated-Design Submittal: For stairs and railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs and railings.
- B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
  2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
  3. Uniform and concentrated loads need not be assumed to act concurrently.
  4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
- C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
    - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
  2. Infill of Guards:
    - a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).

b. Infill load and other loads need not be assumed to act concurrently.

D. Seismic Performance of Stairs: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Component Importance Factor: 1.5.

## 2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Tubing: ASTM A 500 (cold formed).

D. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, structural steel, **Grade 25 (Grade 170)**, unless another grade is required by design loads; exposed.

E. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, structural steel, **Grade 30 (Grade 205)**, unless another grade is required by design loads.

## 2.3 ABRASIVE NOSINGS

A. Extruded Units: Aluminum units with abrasive filler in an epoxy-resin binder.

B. Basis-of-Design – American Safety Tread Type 9511, 3" wide extruded aluminum with ribbed abrasive, full width of stair with  $\frac{3}{4}$ " integrally extruded anchor.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:

- a. **ACL Industries, Inc.**
- b. **American Safety Tread Co., Inc.**
- c. **Balco, Inc.**

2. Provide ribbed units, with abrasive filler strips projecting **1/16 inch (1.5 mm)** above aluminum extrusion.

C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

D. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.

E. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

## 2.4 FASTENERS

A. Provide zinc-plated fasteners with coating complying with ASTM B 633 or **ASTM F 1941 (ASTM F 1941M)**, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

## 2.5 MISCELLANEOUS MATERIALS

- A. Shop Primers: See Section 09 90 00 Painting and Coating.
- B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- C. Concrete Materials and Properties: Comply with requirements in Section 03 30 00 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of **3000 psi (20 MPa)** unless otherwise indicated.
- D. Welded Wire Reinforcement: ASTM A 185/A 185M, **6 by 6 inches (152 by 152 mm)**, W1.4 by W1.4, unless otherwise indicated.

## 2.6 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
  - 1. Join components by welding unless otherwise indicated.
  - 2. Use connections that maintain structural value of joined pieces.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. 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. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Weld connections 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 immediately.
  - 4. Weld exposed corners and seams continuously unless otherwise indicated.
  - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

## 2.7 STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Commercial Class, unless more stringent requirements are indicated.
- B. Stair Framing:

1. Fabricate stringers of steel channels.
    - a. Provide closures for exposed ends of channel stringers.
  2. Construct platforms of steel channel or tube headers and miscellaneous framing members as indicated.
  3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
- C. Metal Pan Stairs: Form risers, subread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch (1.7 mm).

## 2.8 STAIR RAILINGS

- A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
1. Rails and Posts: As indicated.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 2 welds: completely sanded joint, some undercutting and pinholes are okay as shown in NAAMM AMP 521.
- C. Form changes in direction of railings by bending or by inserting prefabricated elbow fittings.
- D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails.
- G. Connect posts to stair framing by direct welding.
- H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
- I. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses.

## 2.9 FINISHES

- A. Finish metal stairs after assembly.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

- C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

### PART 3 - EXECUTION

#### 3.1 INSTALLING METAL PAN STAIRS

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- B. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints.
- D. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- E. Place and finish concrete fill for treads and platforms to comply with Section 03 30 00 "Cast-in-Place Concrete."
  - 1. Install abrasive nosings with anchors fully embedded in concrete.

#### 3.2 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
  - 1. Anchor posts to steel by welding to steel supporting members.
  - 2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
- B. Attach handrails to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as required to comply with performance requirements.

#### 3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION 05 51 13





## SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking, cants, and nailers.
4. Wood furring and grounds.
5. Wood sleepers.
6. Utility shelving.
7. Plywood backing panels.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
1. Preservative-treated wood.
  2. Fire-retardant-treated wood.
  3. Power-driven fasteners.

### PART 2 - PRODUCTS

#### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

## 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all miscellaneous carpentry unless otherwise indicated.
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
  - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

## 2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, 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. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
  - 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
  - 3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841. For enclosed roof framing, framing in attic spaces, and where high-temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- D. Application: Treat all miscellaneous carpentry unless otherwise indicated.
  - 1. Framing for raised platforms.
  - 2. Concealed blocking.
  - 3. Roof framing and blocking.
  - 4. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.

5. Plywood backing panels.

## 2.4 DIMENSION LUMBER FRAMING

- A. Other Framing: Construction or No. 2 grade of species:

1. Hem-fir (north); NLGA.
2. Southern pine; SPIB.
3. Douglas fir-larch; WCLIB or WWPA.
4. Southern pine or mixed southern pine; SPIB.
5. Spruce-pine-fir; NLGA.
6. Douglas fir-south; WWPA.
7. Hem-fir; WCLIB or WWPA.
8. Douglas fir-larch (north); NLGA.
9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.

- C. Concealed Boards: 15 percent maximum moisture content of any of the following species and grades:

1. Mixed southern pine or southern pine, No. 2 grade; SPIB.
2. Eastern softwoods, No. 2 Common grade; NELMA.
3. Northern species, No. 2 Common grade; NLGA.
4. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

## 2.6 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fire-retardant treated, in thickness indicated or, if not indicated, not less than **3/4-inch (19-mm)** nominal thickness.

## 2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

- B. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

## 2.8 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

### 3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 53

## SECTION 06 16 00 - SHEATHING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Wall sheathing.
  2. Roof sheathing.
  3. Parapet sheathing.
  4. Composite nail base insulated roof sheathing.
  5. Sheathing joint and penetration treatment.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preserved-treated plywood.
  2. Fire-retardant-treated plywood.
  3. Foam-plastic sheathing.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

#### 2.2 WOOD PANEL PRODUCTS

- A. Emissions: Products shall meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

#### 2.3 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat all plywood unless otherwise indicated.

## 2.4 FIRE-RETARDANT-TREATED PLYWOOD

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, 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. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
  - 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201/D 3201M at 92 percent relative humidity. Use where exterior type is not indicated.
  - 3. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D 5516 and design value adjustment factors shall be calculated according to ASTM D 6305. Span ratings after treatment shall be not less than span ratings specified.
- C. Kiln-dry material after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.
- E. Application: Treat all plywood unless otherwise indicated.

## 2.5 WALL SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exterior, Structural I sheathing. Type and Thickness: As indicated.
- B. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. **CertainTeed Corporation.**
    - b. **Georgia-Pacific Building Products.**
    - c. **National Gypsum Company.**
    - d. **United States Gypsum Company.**
  - 2. Type and Thickness: As indicated.

## 2.6 PARAPET SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exterior, Structural I sheathing.

B. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
  - a. **CertainTeed Corporation.**
  - b. **Georgia-Pacific Building Products.**
  - c. **National Gypsum Company.**
  - d. **United States Gypsum Company.**
2. Type and Thickness: As indicated.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
1. For roof parapet and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

2.8 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Glass-Mat Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 07 92 00 "Joint Sealants."
- B. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
1. Sheathing Tape: Self-adhering glass-fiber tape, minimum **2 inches (50 mm)** wide, **10 by 10 or 10 by 20 threads/inch (390 by 390 or 390 by 780 threads/m)**, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.
- C. Sheathing Tape for Foam-Plastic Sheathing: Pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
  2. ICC-ES evaluation report for fastener.
- D. Coordinate wall parapet and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

### 3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
1. Wall Sheathing:
    - a. Screw to cold-formed metal framing.
    - b. Space panels **1/8 inch (3 mm)** apart at edges and ends.

### 3.3 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
1. Fasten gypsum sheathing to cold-formed metal framing with screws.
  2. Install panels with a **3/8-inch (9.5-mm)** gap where non-load-bearing construction abuts structural elements.
  3. Install panels with a **1/4-inch (6.4-mm)** gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Seal sheathing joints according to sheathing manufacturer's written instructions.
1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
  2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 06 16 00



## SECTION 06 20 00 – FINISH CARPENTRY

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. PLAM and wood veneer windowsills.
  - 2. Plywood wainscot.
  - 3. PLAM wainscot.
  - 4. PLAM whiteboard.
  - 5. Wood trim.
  - 6. Interior Benches.
- B. Related Sections:
  - 1. Section 06 41 16 - Architectural Decorative Laminate Casework.
  - 2. Section 09 21 16 - Gypsum Board Assemblies.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. Architectural Woodwork Institute/Architectural Woodwork Manufacturers Association of Canada/Woodwork Institute:
  - 1. AWS - Architectural Woodwork Standards.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details and accessories, to a minimum scale of 1½ inch to 1 ft.
- C. Samples:
  - 1. Submit two samples of each type of plastic laminate, veneer plywood, plywood & PVC edging specified.
  - 2. Submit two samples of tamperproof integral stainless steel washerhead screws to be used at wainscot.

#### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with AWS Sections 6 and 8, Custom Grade.
- B. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- C. Qualifications:
  - 1. Fabricator: Company specializing in fabricating the products specified in this section with minimum three years documented experience.

- D. Mockup:
  - 1. Provide wainscot mock-up under provisions of Section 01 40 00 - Quality Requirements.
  - 2. When accepted, mock-up will demonstrate minimum standard for the Work. Mock-up will not remain as part of the Work.
  - 3. Work of this section shall not proceed until approval of the mock-up.
- E. Pre-Installation Meetings:
  - 1. Convene minimum one week prior to commencing Work of this section.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Protect work from moisture damage.
- C. Maintain storage space relative humidity within ranges indicated in AWS Section 2.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. During and after installation of Work of this section, maintain same temperature and humidity conditions in building spaces as will occur after occupancy.
  - 1. Maintain relative humidity within ranges indicated in AWS Section 2.

#### 1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.8 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.

### PART 2 PRODUCTS

#### 2.1 COMPONENTS

- A. Softwood Lumber, concealed: DOC PS20 grade in accordance with requirements of AWS; maximum moisture content 6% for interior work.
- B. Typical Hardwood Lumber: AWS Grade Custom Grade; maximum moisture content of 6-8 percent; and the following:
  - 1. Species of Wood: Hard white birch. (WD-1)
    - a.  $\frac{3}{4}$  Ramp cap.
  - 2. Cut or Slicing of Wood: Rotary sliced.
  - 3. Finish: Factory finished as noted below.
- C. Wood Veneer Plywood (WVP-1):
  - 1. AWS Grade A veneer;
    - a. High Density Fiberboard Core Plywood Panels:

- b. Thickness: 1/4" or as shown on drawings. Provide panels of wood veneer and formaldehyde free particleboard meeting or exceeding Class C per ASTM E-84 or UL-723.
  - c. Exposed Surfaces: Hardwood Veneer: AWS Veneer Face Grade A.
    - 1) Species: Hard White Birch, rotary sliced.
    - 2) Book Match.
  - d. Concealed Surfaces: Manufacturer's standard balancing sheet.
  - e. Edges by woodwork contractor: Solid lumber to match face veneer, 1/4 inch thick by panel depth.
- D. Wood Panel Products: (PLWD-1)
- 1. APA Grade Stamp each panel. Conform to DOC PS 1 and DOC PS 2 for cross-laminated veneer panel.
  - 2. APA A-D Group 1, Exposure 1 plywood to be painted per Specification Section 09 90 00.
  - 3. Fire Retardant Treatment: Chemically treated and pressure impregnated, having flame spread of 25 or less when tested in accordance with ASTM E 84 and showing no evidence of significant progressive combustion when test is continued for an additional 20 minute period, Interior Type.
- E. Plastic Laminate: Refer to Color and Finish Schedule. (PLAM-3) (PLAM-6) and (PLAM-8)
- 1. NEMA LD3, 1/16 inch General Purpose type.
  - 2. Manufacturers: Nevamar, Pionite and Formica.
  - 3. Color: Refer to Color and Finish Schedule.
  - 4. Substitutions: Under provisions of Section 01 25 00.
- F. Plastic Laminate for Markerboard: Refer to Color and Finish Schedule. (PLAM-4) and (PLAM-7)
- 1. Manufacturer: Formica.
  - 2. Sheet Thickness: .048 inch.
  - 3. NEMA LD 3, Grade 10/HGS.
- G. Plastic Laminate for window sill: (PLAM-2)
- 1. NEMA LD3, 1/16 inch General Purpose type.
  - 2. Color: To be selected.
- H. Medium Density Fiberboard core and backer (MDF):
- 1. Thickness: 1/2 inch.
  - 2. ANSI A208.2 Grade 130.
  - 3. Moisture Content: 6 percent to 8 percent.
  - 4. Formaldehyde Content: Manufactured with formaldehyde free binders. Labeled by manufacturer as containing less than 0.005 parts per million found occurring naturally in wood.
  - 5. Flame Spread Rating Class C (3).
  - 6. Density: 48 lb/ft<sup>3</sup>.
  - 7. Internal Bond: 115 lb/in<sup>2</sup>.
  - 8. Modulus of Hardness 1000 lbs.
  - 9. Screw Holding, Face: 225 lbs.
  - 10. Screw Holding, Edge: 180 lbs.
  - 11. Acceptable Manufacturers:
    - a. Sierra Pine Ltd., Arreis.
    - b. West Fraser, EcoGold.
    - c. Plum Creek, GlacierGreen.
    - d. Substitutions under provisions of Section 01 25 00.
  - 12. Provide moisture resistant MDF where PLAM installed at drinking fountains.
  - 13. Provide black melamine (AWS approved product) at backer blocking where exposed.

## 2.2 ACCESSORIES

- A. Fasteners: to meet AWS standards, of size and type to suit application or as indicated.
- B. Adhesive for High Pressure Decorative Laminates: Type recommended by laminate manufacturer to suit application.
  - 1. Adhesives: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
  - 2. Aerosol Adhesives: Maximum volatile organic compound content in accordance with GS-36.
- C. Wainscot attachment: Exposed fasteners. Tamperproof screws with stainless steel washer.
- D. Aluminum trim for wainscot panels: Stylmark angle, part #110293 (<http://www.stylmark.com>)
- E. PVC edgebanding: 3mm, PVC by Charter Industries. Refer to Color and Finish Schedule. Radius edges 1/8". Self edge where indicated.
- F. Lumber for Shimming: Softwood lumber.

## 2.3 FABRICATION

- A. Fabricate work of this section to AWS Sections 6 and 8, Custom Grade.
- B. Shop assemble work for delivery to site, permitting passage through building openings.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

## 2.4 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.
- D. The following items are to be factory finished in accordance with AWS Section 5; Custom Grade; System 5; Conversion varnish.
  - 1. WVP-1, Clear Transparent.
  - 2. WD-1, Clear Transparent.
  - 3. Window sills, Clear Transparent.
  - 4. Misc. trims, Clear Transparent.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

#### 3.2 INSTALLATION

- A. Install work in accordance with AWS Sections 6, 7 and 8, Custom Grade and manufacturer's instructions.
- B. Set and secure materials and components in place, plumb and level.
- C. Use Biscuit Joint at Ramp WD-1.
- D. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- E. Set exposed fasteners and screws. Apply wood filler flush with surface in exposed fastener and screw indentations.
- F. Site Finishing: Refer to Section 099000 - Painting and Coating. Sand work smooth.

#### 3.3 ERECTION TOLERANCES

- A. Comply with AWS.

END OF SECTION 06 20 00



## SECTION 06 41 16 – ARCHITECTURAL DECORATIVE LAMINATE CASEWORK

### PART 1 GENERAL

#### 1.1 SUMMARY

##### A. General

1. This section includes casework specified to the Architectural Woodwork Standards (AWS) Casework Design Series (CDS) system. All casework numbering on the documents will reference Appendix A, located in the AWS standards. Refer to the AWS legend in the drawings or AWS manual for casework tag interpretation.
2. This section also includes custom casework as detailed. Custom build casework, which has a detail number in lieu of an AWS number, with materials and construction similar to the adjacent AWS casework.

##### B. Section Includes:

1. Plastic laminate faced cabinet units. TYPE A, FLUSH OVERLAY.
2. PLAM counter tops.
3. Interior display cases.
4. Music storage equipment.
5. Cabinet hardware.
6. Installation.
7. Preparation for installing utilities.

##### C. Related Sections:

1. Section 05 50 00 – Metal Fabrications: Steel countertop.
2. Section 06 10 53 - Miscellaneous Rough Carpentry: Grounds and support framing.
3. Section 06 20 00 - Finish Carpentry: Related trim not specified in this section.
4. Section 08 80 00 - Glazing.
5. Division 22 - Plumbing: Components for plumbing connections.
6. Division 26 - Electrical: Components for power connections.
7. Division 27 - Communications: Components for power connections.

#### 1.2 REFERENCES

##### A. American National Standards Institute:

1. ANSI A156.9 - Cabinet Hardware.
2. ANSI A208.1 - Particleboard.

##### B. Architectural Woodwork Institute/Architectural Woodwork Manufacturers Association of Canada/Woodwork Institute:

1. AWS Architectural Woodwork Standards.

##### C. IBC seismic requirements for cabinet restraint.

##### D. ASTM International:

1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

- E. Green Seal:
  - 1. GS-36 - Aerosol Adhesives.
- F. National Electric Manufacturers Association:
  - 1. LD3 - High Pressure Decorative Laminates.
- G. South Coast Air Quality Management District:
  - 1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location, and schedule of finishes.
- C. Samples:
  - 1. Submit two, 6x6 inch size samples, illustrating cabinet finish.
  - 2. Submit two 4x4 inch size samples, illustrating counter top finish.
  - 3. Submit two samples of drawer and door pulls hinges illustrating hardware finish
- D. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with AWS, Section 10 and Section 11; Custom grade.
- B. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- C. Provide plastic laminate in accordance with NEMA LD3.
- D. Definitions: Refer to the AWS.
- E. Qualifications:
  - 1. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five years' experience.
- F. Mockup:
  - 1. Provide mockup of full size base cabinet and upper cabinet under provisions of Section 01 40 00 - Quality Requirements.
  - 2. Provide units with specified counter top; with hardware installed.
  - 3. Units will be examined to ascertain quality and conformity to specification requirements.
  - 4. Approved mockup may remain as part of the Work.



G. Pre-Installation Meetings:

1. Convene one week prior to commencing work of this section, under provisions of Section 01 31 00.

1.5 QUALITY CONTROL

A. Contractor shall make the following items part of the Contractor's Quality Control Plan:

1. Contractor shall verify that all shop drawings, samples, and other submittals are complete and have been reviewed by the Architect prior to beginning installation of custom casework.
2. Conduct a Pre-Installation Conference to communicate the requirements for work of this Section. As a minimum, the Project Superintendent and foreman from the framing, painting, plumbing, electrical and other related trades shall be present. Coordination requirements of the various trades shall be discussed.
3. Prior to start of work, Contractor shall inspect preparatory work and ensure that it is acceptable for subsequent follow on installation.
4. Contractor shall inspect installation daily to ensure compliance with project requirements.
5. Contractor shall perform a final inspection of all installations, make all necessary corrections, and ensure completion prior to calling the Owner for finish inspection.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products to site under provisions of Section 01 60 00 - Product Requirements.
- B. Protect units from moisture damage.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. During and after installation of Work of this section, maintain same temperature and humidity conditions in building spaces as will occur after occupancy.
  1. Maintain relative humidity within ranges indicated in AWS Section 2.

1.8 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated and instructed by the manufacturer.

1.9 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00. Coordinate the work with electrical and plumbing rough-ins.

## PART 2 PRODUCTS

### 2.1 REGULATORY REQUIREMENTS

- A. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated according to IBC and ASCE 7.
- B. Accessibility: Conform to IBC Chapter 11 and ICC/ANSI 117.1 Accessible and Usable Buildings and Facilities.

### 2.2 WOOD MATERIALS

- A. Per AWS Section 3.

### 2.3 SHEET MATERIALS

- A. Per AWS Section 4.
- B. Provide particleboard core meeting the requirements of Architectural Woodwork Standards.
  - 1. Particleboard Panel: ANSI A208.1 Grade M-S; Moisture Content: 6 percent to 8 percent; no added urea-formaldehyde resins.
    - a. Acceptable Manufacturers:
      - 1) Sierra Pine Ltd., Arreis.
      - 2) West Fraser, EcoGold.
      - 3) Plum Creek, GlacierGreen.
      - 4) Substitutions: Under provisions of Section 01 25 00.
    - b. Thickness: Indicated on drawings.
- C. Glazing: As specified in Section 08 80 00 - Glazing.

### 2.4 CABINET TOPS AND FACING MATERIALS

- A. Per AWS Section 10.
- B. Plastic Laminate Manufacturers: (PLAM-1) (PLAM-2) (PLAM-2A)
  - 1. Wilsonart.
  - 2. Nevamar.
  - 3. Colors: As specified on Room Finish Schedule.
  - 4. Plam-2A: HPL with chemical resistance to be special order with chemical resistance added to HPL.
- C. Plastic Laminate: NEMA LD3.
- D. Laminate Backing Sheet: AWS approved backing grade, undecorated plastic laminate.
- E. Melamine Cabinet Liner: AWS approved product. Almond color.
- F. Plastic Laminate Cabinet Liner: AWS approved product. Color as selected from manufacturer's standard range.

### 2.5 ACCESSORIES

- A. Adhesive for High Pressure Decorative Laminates: Type recommended by laminate manufacturer to suit application.
  - 1. Interior Adhesives: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
  - 2. Interior Aerosol Adhesives: Maximum volatile organic compound content in accordance with GS-36.
- B. PVC Edge Band: 3 mm PVC by Charter Industries. Refer to Finish and Color Schedule. 0.02 inch thick not acceptable.
  - 1. Provide PVC edging to match adjacent PLAM at all trash receptacle openings.
- C. Fasteners and Anchors: Per AWS.

## 2.6 HARDWARE

- A. Hardware: ANSI A156.9.
- B. Drawer and Door Pulls: 4" solid brass with US26D finish, wire pulls.
- C. Countertop Support Bracket: 2 inch surface mount in hot milled finish.  
<http://rakks.com/products/counter-support-brackets/>
  - 1. Basis of Design:
    - a. Bench: Rakks, EH-1212.
    - b. Countertops:
      - 1) Rakks, EH-1818, typ.
      - 2) Rakks, EH-1825 – At North Commons Wall and North Library Wall only.
- D. Cabinet Locks: Olympus 777ICP-DR door lock and 888ICP-DW drawer lock, master keyed to accept Schlage style large format interchangeable cores. Schlage Cores 20-740 626.
  - 1. Provide locks and cores and install at all AV/Wardrobe casework and other door or drawer locations where indicated per interior elevations and details.
- E. Door Catches: K&V 918 Magnetic catch with 7 lbs. minimum pull strength, aluminum. Provide at all cabinet doors without self closing hinges.
- F. Drawer Slides: KV 6505 or equivalent zinc-plated cold rolled steel, ball bearing rollers, 125 lbs. capacity.
- G. Paper Storage Extra Heavy Duty drawer slides: K&V 8900 or equivalent zinc-plated cold rolled steel, full extension, ball bearing rollers with 500 lbs. capacity. Length to suit application.
- H. Shelf Clips: Polycarbonate, double 5 mm pegs, shelf securing clips designed to lock shelf in place, suitable for 3/4 inch and 1 inch thick shelves, min. 500 lb. load capacity. Clear color Lyman Associates, Allen Field, or Bainbridge Mfg.
- I. Shelf Support Brackets: Rakks EC-0808, 125 lbs weight capacity for shelves, clear anodized.
- J. Sliding Door and Display Case Hardware: Provide with lock cylinder to match building keying standard per Specification Section 08 71 00. Manufacturer: Stylmark Assembly Model 610190. Finish: Buffed Satin.
- K. Wall Bookshelf Standards and Rests: Adjustable extra heavy duty type; Knappe & Vogt Mfg. Co. Products 85-185, double slot type, 14 gauge steel, 72 inch long and shelf brackets 10 and 16 inches long.

- L. Hinges: 2 ¾ inch size, five knuckle, 270 degree swing hospital type, one pair per door except two pairs required on doors over 48 inches high. Exceed ANSI/BHMA 156.9 Grade 1 requirements. For student locations.
- M. Concealed Hinges: Blum #71B3580 (overlay); clip top Blumotion110° opening, self-closing, for office locations.
- N. Coat Rod and Shelf Brackets: KV #770-5 chrome rod with #766CHR end supports and KV #1194 shelf and rod support.
- O. Elbow Catch: (for inactive leaf of locking cabinets) Hafele 245.74.200 chrome plated, provide two per inactive leaf.
- P. Grommets: Rockler, black; 3 inch diameter. Provide 1 grommet at each knee space 4 feet wide or less and additional grommets for each knee space over 4 feet wide at maximum 48" on center. Coordinate exact locations with the Owner.

## 2.7 CUSTOM DISPLAY CASES

- A. Cable/Rod Suspended Glass Shelving Kit.
  - 1. Basis of Design: Nova Display, KSI-009.
    - a. Hardware
      - 1) Top/Bottom Fixings & Cables.
      - 2) Cable to be cut/adjusted in place.
      - 3) Shelf Supports Singles.
- B. Shelves: 3/8 inch tempered glass.
- C. Sliding Door and Display Case Hardware.
  - 1. Basis of Design: Stylmark Assembly Model #610007 with lock assembly.

## 2.8 MUSIC STORAGE EQUIPMENT

- A. Manufacturers:
  - 1. Basis of Design: Wenger Corporation, <http://www.wengercorp.com/>.
    - a. Contact: Jeffrey T. Kirkpatrick, 503.648.2463. [Jeff.kirkpatrick@wengercorp.com](mailto:Jeff.kirkpatrick@wengercorp.com)
  - 2. Westmark Products, 253.531.3470, [www.westmarkproducts.com](http://www.westmarkproducts.com) .
- B. Storage Cabinets: Wenger cabinet numbers are shown on the Drawings.
- C. Cabinet Construction:
  - 1. Panels: Manufacturer's standard 3/4 inch industrial composite wood with polyester laminate finish, or particleboard with plastic laminate finish as specified under this Section.
    - a. Laminate color: Oyster.
    - b. Edge Banding: Oyster, 3mm PVC.
  - 2. Shelves: Blow-molded polyethylene mounted with self-locking shelf supports.
  - 3. Doors:
    - a. Instrument Storage: Welded steel grilles with manufacturer's standard powdercoat finish. Oyster.
  - 4. Leveling Glides: Adjustable.
  - 5. Hinges: Manufacturer's standard heavy duty 5 knuckle type or as specified this Section.
  - 6. Locking slide bolt with padlock hasp. Padlock not included.
  - 7. Fasteners: Through-bolted.

## 2.9 FINISHING MATERIALS

- A. Cabinets:
  - 1. High pressure laminated plastic to AWS Section 10 requirements.
- B. Other standard accessories and equipment: As required for units as indicated; manufacturer's standard stock as approved.

## 2.10 FABRICATION

- A. General:
  - 1. Fabricate casework to AWS Section 10 Custom Grade.
  - 2. Fabricate counter tops to AWS Section 11 Custom Grade.
  - 3. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
  - 4. Provide cutouts for plumbing fixtures, inserts, outlet boxes, fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surfaces of cut edges.
  - 5. Door and Drawer Fronts; 3/4 inch thick; flush overlay style.
- B. Cabinet Panels and Shelves: To AWS requirements.
  - 1. Provide 3/4" finished backs on movable units.
- C. Cabinet Bodies:
  - 1. Fabricate, assemble and finish each cabinet to AWS requirements.
  - 2. Provide HPDL at exposed interior surfaces.
  - 3. Unless otherwise shown, provide toe-space on floor-mounted units.
  - 4. Adjustable Shelving: Support each shelf with four shelf clips permitting adjustment on 1-inch centers.
- D. Doors and Drawers: To AWS standards.
- E. Counter Tops and Splash: To AWS Section 11 standards.
  - 1. Edge: 3 MM PVC.
  - 2. Splash: Self edged with butt splash.
- F. Scribes and Fillers: Required at all surfaces adjoining walls of adjacent construction and equipment including bottoms of wall mounted uppers.
- G. Special Lock Requirement: Where locks are indicated, provide casework drawers and doors with locks; lock cylinders shall be masterkeyed in one or more systems and in addition, further keyed alike, keyed differently or separately as directed.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

### 3.2 INSTALLATION

- A. Install casework in accordance with AWS Section 10 Custom Grade.
- B. Install countertops in accordance with AWS Section 11 Custom Grade.
- C. Install, plumb, level, true and straight with no distortions. Shim as required, using concealed shims. Where casework abuts other finished work, scribe and apply scribe filler strips for accurate fit with fasteners concealed where practicable. Allow for 2-2 ½ inch scribe allowance. Include horizontal closure fillers at tops and bottoms of wall cabinets where cabinets meet at room corners.

### 3.3 TOLERANCES

- A. Tolerances per AWS standards.

### 3.4 ADJUSTING

- A. Adjust moving or operating parts to function smoothly and correctly.

### 3.5 PROTECTION, CLEANING/REPAIRING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Repair or remove and replace defective work.
- C. Clean shop finished casework, touch up as required, remove and refinish damaged or soiled areas.
- D. Cover casework for protection against soiling and deterioration during remainder of construction period.
- E. Clean counter tops with diluted dishwashing liquid and water leaving tops free of all grease and streaks. Use no wax or oils.
- F. Casework shall be protected before, during and after installation. Damaged materials due to improper protection shall be cause for rejection.

END OF SECTION 06 41 16

## SECTION 06 82 00 – GLASS-FIBER REINFORCED PLASTIC (FRP)

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Prefinished fiberglass wall panels.
- B. Related Sections:
  - 1. Section 07 92 00 - Joint Sealants: Panel joint filler.
  - 2. Section 09 21 16 - Gypsum Board Assemblies: Wall substrate.

#### 1.2 SUBMITTALS

- A. Submit shop drawings indicating panel layout and installation instructions.
- B. Submit product data and samples in accordance with Section 01 33 00.
- C. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.
- B. Accept panels on site in manufacturer's packaging. Inspect for damage.
- C. Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels in a dry indoor location at Project site. Remove any foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.

#### 1.4 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings and instructed by the manufacturer.

#### 1.5 COORDINATION

- A. Do not begin installation until building is enclosed, permanent heating and cooling equipment is in operations, and residual moisture from concrete has dissipated.
- B. During installation and within 48 hours prior to installation, maintain ambient temperature and relative humidity within limits required by adhesive used and recommendation of panel adhesive manufacturer.
- C. Condition panels by unpacking and placing in installation space no less than 24 hours before installation.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Varietex, Crane Composites, [www.cranecomposites.com](http://www.cranecomposites.com) (FRP-1).
- B. Marlite. [www.marlite.com](http://www.marlite.com)
- C. Substitutions accepted under provisions of Section 01 25 00.

### 2.2 MATERIALS

- A. Properties:
  - 1. ASTM E-84 Class C fire rated.
  - 2. Thickness: 0.09 inch.
  - 3. Flexural Strength -  $14 \times 10^3$  psi per ASTM D 790.
  - 4. Flexural Modulus -  $.4 \times 10^6$  psi per ASTM D 790.
  - 5. Tensile Strength -  $7 \times 10^3$  psi per ASTM D 638.
  - 6. Tensile Modulus -  $.7 \times 10^6$  psi per ASTM D 638.
  - 7. Barcol Hardness: 40 per ASTM D2583.
  - 8. Water Absorption: 0.16% per ASTM D570.
  - 9. Izod Impact Strength of 4 ft. lbs/in<sup>2</sup> per ASTM D256.
  - 10. Color and Texture: Refer to Color and Finish Schedule.
- B. Accessories
  - 1. Extruded aluminum trim. Heavy weight extruded aluminum 6063-T5 alloy prefinished at the factory.
    - a. Provide at all corner, panel edge and field edge conditions.
  - 2. Adhesive: Recommended by manufacturer.
  - 3. Sealant: Recommended by manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify existing conditions under provisions of Section 01 31 00 - Project Management and Coordination.
- B. Verify that joint preparation and affected dimensions are acceptable.

### 3.2 INSTALLATION

- A. Install components in accordance with manufacturer's instructions.
- B. Align work plumb and level.
- C. Cut and drill panels, finished face down, with carbide tipped saw blades or drill bits, or cut with snips.



- D. Install panels with manufacturer's recommended gap for panel field and corner joints.
  - 1. Pre-drill fastener holes in panels, 1/8 inch greater in diameter than fastener.
  - 2. Install panels in a full spread of adhesive. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.
- E. Install trim accessories with adhesive and nails. Do not fasten through panels.
- F. Rigidly anchor to substrate to prevent misalignment.
- G. Butt joints and fill joints with silicone sealant.

### 3.3 TOLERANCES

- A. Maximum Variation From True Dimension: 1/8 inch.
- B. Maximum Offset From True Position: 1/8 inch.

### 3.4 CLEANING

- A. Clean work under provisions of 01 73 00 - Execution.
- B. Clean surfaces in accordance with manufacturer's instructions.

### 3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Do not permit construction near unprotected surfaces.

END OF SECTION 06 82 00



## SECTION 07 11 13 - BITUMINOUS DAMPPROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes dampproofing applied to above-grade CMU cavity walls and below-grade concrete foundation walls & footings,

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS, GENERAL

- A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless otherwise required.

#### 2.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. BASF Corporation-Construction Systems; MasterSeal 610, 614, & 615 (Pre-2014: Hydrocide 600, 700, & 700B).
  - 2. Deco Products, Inc.; Deco 20.
    - a. Acrylic resin coating.
    - b. On masonry walls Deco 20 Clear Penetrating Concrete Sealer must be applied prior to the application of Deco 20 Dampproofing Coating
  - 3. Henry; HE789
    - b. Fibered asphalt emulsion coating made from selected asphalt, emulsified with bentonite clay, non-asbestos fibers and water.
    - c. Meets ASTM D1227, Type II Class I and ASTM D1187, Type 1.
  - 4. Substitutions: See Section 01 25 00 – Substitution Procedures.
- B. Trowel Coats: ASTM D 1227, Type II, Class 1.
- C. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.
- D. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

## 2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.
- B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
- C. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.
- D. Drainage Mat:
  - 1. American Hydrotech, Inc.; Hydrodrain 400.
    - a. Composite drainage mat consisting of three-dimensional "dimple" type polyethylene core with a non-woven, needle punched filter fabric.
  - 2. Carlisle; CCW MiraDRAIN 6200.
  - 3. Substitutions: See Section 01 25 00 – Substitution Procedures.

## PART 3 - EXECUTION

### 3.1 APPLICATION, GENERAL

- A. Comply with manufacturer's written instructions for substrate preparation, dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.
  - 1. Apply dampproofing to provide continuous plane of protection.
  - 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of **6 inches (150 mm)** over outside face of footing.
  - 1. Extend dampproofing **12 inches (300 mm)** onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
  - 2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an **8-inch- (200-mm-)** wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.
- C. Where dampproofing exterior face of inner wythe of exterior masonry cavity walls, lap dampproofing at least **1/4 inch (6 mm)** onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.
  - 1. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe.
  - 2. Lap dampproofing at least **1/4 inch (6 mm)** onto shelf angles supporting veneer.
- D. Where dampproofing interior face of above-grade, exterior single-wythe masonry walls, continue dampproofing through intersecting walls by keeping vertical mortar joints at intersection temporarily open or by dampproofing wall before constructing intersecting walls.

3.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Concrete Foundations: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. (0.6 L/sq. m) for first coat and 1 gal./100 sq. ft. (0.4 L/sq. m) for second coat, one fibered brush or spray coat at not less than 3 gal./100 sq. ft. (1.2 L/sq. m), or one trowel coat at not less than 4 gal./100 sq. ft. (1.6 L/sq. m).
- B. Masonry Backup for Exterior Cladding: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft. (0.4 L/sq. m).

3.3 INSTALLATION OF PROTECTION COURSE

- A. Where indicated, install drainage mat over completed-and-cured dampproofing. Comply with dampproofing-material and drainage mat manufacturers' written instructions for attaching protection course.

END OF SECTION 07 11 13



## SECTION 07 13 26 - SELF-ADHERING SHEET WATERPROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes self-adhering modified bituminous sheet waterproofing to be installed around the outside walls of the elevator pit, and at foundation walls above finish floor (Commons north wall)

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.
- B. Mock-up
  - 1. See Section 01 40 00 – Quality Requirements.
  - 2. Mock-up to incorporate 100 sf of vertical waterproofed panel; to represent finished work including internal and external corners, seam jointing, attachment method, counterflashing cover, drainage panel, base flashings, control and expansion joints, protective cover.
  - 3. If accepted, mock-up may be incorporated into finished work.

#### 1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Modified Bituminous Sheet: Minimum **60-mil (1.5-mm)** nominal thickness, self-adhering sheet consisting of **56 mils (1.4 mm)** of rubberized asphalt laminated on one side to a **4-mil- (0.10-mm-)** thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. **Carlisle Coatings & Waterproofing Inc.**
    - b. **Polyguard Products, Inc.**
    - c. **Soprema, Inc.**
    - d. **Henry Company, Blueskin WP200.**
    - e. Substitutions: See Section 01 25 00 – Substitution Procedures.
  2. Basis of Design: Carlisle CCW MiraDRI 860/861.
    - a. At Elevator Pit: MiraPly H and V.
  3. Physical Properties:
    - a. Tensile Strength, Membrane: **250 psi (1.7 MPa)** minimum; ASTM D 412, Die C, modified.
    - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
    - c. Low-Temperature Flexibility: Pass at **minus 20 deg F (minus 29 deg C)**; ASTM D 1970.
    - d. Crack Cycling: Unaffected after 100 cycles of **1/8-inch (3-mm)** movement; ASTM C 836.
    - e. Puncture Resistance: **40 lbf (180 N)** minimum; ASTM E 154.
    - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at **70 deg F (21 deg C)**; ASTM D 570.
    - g. Water Vapor Permeance: **0.05 perms (2.9 ng/Pa x s x sq.m)** maximum; ASTM E 96/E 96M, Water Method.
    - h. Hydrostatic-Head Resistance: **200 feet (60 m)** minimum; ASTM D 5385.
  4. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.
  5. Sheet Strips: Self-adhering, reinforced, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

### 2.2 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by sheet-waterproofing material manufacturer.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.



- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (229-mm) centers.
- G. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
  - 1. Thickness: 1/8 inch (3 mm), nominal, for vertical applications; 1/4 inch (6 mm), nominal, elsewhere.
  - 2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.
- H. Protection Course: Fan folded, with a core of extruded-polystyrene board insulation faced on one side with plastic film, nominal thickness 1/4 inch (6 mm), with compressive strength of not less than 8 psi (55 kPa) per ASTM D 1621, and maximum water absorption by volume of 0.6 percent per ASTM C 272.

### 2.3 INSULATION DRAINAGE PANELS

- A. Unfaced Wall-Insulation Drainage Panels: Extruded-polystyrene board insulation complying with ASTM C 578, Type IV, 25-psi (173-kPa) minimum compressive strength; unfaced; fabricated with shiplap or channel edges and with one side having grooved drainage channels.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by the following:
    - a. **Dow Chemical Company (The).**

## PART 3 - EXECUTION

### 3.1 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Prepare surfaces and install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
  - 1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).
- D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.

- E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- F. Seal edges of sheet-waterproofing terminations with mastic.
- G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- H. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.
- I. Immediately install protection course with butted joints over waterproofing membrane.
  - 1. Molded-sheet drainage panels or insulation drainage panels may be used in place of a separate protection course to vertical applications when approved by waterproofing manufacturer and installed immediately.

### 3.2 MOLDED-SHEET DRAINAGE-PANEL INSTALLATION

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesives or other methods that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
  - 1. For vertical applications, install protection course before installing drainage panels.

### 3.3 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 13 26

## SECTION 07 19 10 – WATER REPELLENTS/ANTI GRAFFITI COATINGS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes water repellent/anti-graffiti coating applied to interior and exterior masonry and concrete walls.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-In-Place Concrete: Concrete Surfaces.
  - 2. Section 04 22 00 - Concrete Unit Masonry.
  - 3. Section 07 92 00 - Joint Sealants.
  - 4. Section 09 90 00 – Painting and Coating.

#### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Product Data: Submit details of product description, tests performed, limitations to coating, and chemical properties including percentage of solids.
- C. Manufacturer's Installation Instructions: Submit special procedures and conditions requiring special attention, and cautionary procedures required during application.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- E. Closeout Submittals
  - 1. Section 01 77 00 - Closeout Procedures.
  - 2. Manual for Materials and Finishes: Indicate frequency of recoating.

#### 1.3 EXTRA MATERIALS

- A. At Substantial Completion, deliver to owner 1 gallon of graffiti remover compatible with anti-graffiti coating.

#### 1.4 QUALITY ASSURANCE

- A. Supply products from single manufacturer or under responsibility and Warranty of single manufacturer.
- B. Qualifications
  - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
  - 2. Applicator: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.
- C. Mock-Up
  - 1. Apply anti-graffiti coatings by manufacturer's representative to masonry mock up wall surfaces. Do not apply to new construction.

2. Prepare a minimum 4 foot by 4 foot in size area for each exterior wall substrate and each proposed product to be tested. Let test area protective treatment cure before inspection.
3. Remove graffiti, applied by Owner to determine graffiti removal methods and performance.
4. Final acceptance of product is based on successful removal of graffiti from mock up.

D. Pre-Installation Meetings

1. Convene minimum one week prior to commencing work of this section.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Protect coating liquid from freezing.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply coating when ambient temperature is lower than 50 degrees or higher than 100 degrees F.
- B. Do not apply coating when wind velocity exceeds manufacturer recommendations.

1.7 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Warranties.
- B. Furnish minimum five year manufacturer warranty that graffiti and other paint can be removed without harm to masonry and concrete substrates when following manufacturer's graffiti removal instructions.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Anti graffiti system will prevent penetration of unwanted markings into masonry and facilitate their removal.
  1. Allow for vapor transmission.
  2. UV resistant.
  3. Prevent water penetration.
  4. Sacrificial graffiti coatings are not accepted. Coating system must maintain an acceptable final appearance after each graffiti removal procedure.
  5. Ease of removal: Non abrasive chemical or detergent cleaning methods using low pressure rinsing that will not harm substrate.
  6. Leave no visible residue, surface film, color change, darkening, or sheen on treated surfaces.
  7. Meet Federal VOC standards for Architectural and Industrial Maintenance Coatings.

## 2.2 ACCEPTABLE MANUFACTURERS

- A. Evonik Industries, Protectosil Antigrffiti: Aqueous silane system; clear, penetrating, water vapor permeable water and graffiti repellent.
  - 1. Website: [www.salleeco.com](http://www.salleeco.com)
- B. Professional Products of Kansas, Inc. Professional Water Sealant, Super Strength: Clear silicone rubber based formulation; penetrates and fills pores to prevent water intrusion and paint adhesion.
  - 1. Website: <http://www.watersealant.com/>
- C. Prosoco, Inc. Blok-Guard Graffiti Control Ultra: Clear drying, water-based silicone emulsion.
  - 1. Website: <http://www.prosoco.com/>
- D. Substitutions: Under provisions of Section 01 25 00.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify joint sealants are installed and cured.
- C. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of coating.

### 3.2 PREPARATION

- A. Delay Work until masonry mortar, and concrete substrate is cured minimum of 60 days.
- B. Remove loose particles and foreign matter.
- C. Remove oil or foreign substance with chemical solvent which will not effect coating.
- D. Scrub and rinse surfaces with water and let dry.
- E. Notify Manufacturer's representative at least 48 hours before application. Do not begin application until manufacturer's representative has approved proposed application conditions and equipment.

### 3.3 APPLICATION

- A. Apply coating in accordance with manufacturer's instructions.
- B. Apply full height in two continuous, uniform coats, unless otherwise recommended by manufacturer.
- C. Refer to Section 09 90 00.

### 3.4 ADJUSTING

- A. Reapply additional coatings where testing, logs or invoices indicate insufficient coverage.

### 3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect adjacent surfaces not scheduled to receive coating.
- B. Protect landscaping, property, and vehicles.
- C. When applied to unscheduled surfaces, remove immediately by methods as instructed by coating manufacturer.

END OF SECTION 07 19 10

## SECTION 07 21 13 – BOARD INSULATION

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes board insulation at:
  - 1. Perimeter foundation walls.
  - 2. Under slab.
  - 3. Waterproofed or dampproofed foundation walls.
  - 4. Exterior CMU cavity walls.
  - 5. Continuous insulation on exterior frame walls
  - 6. Roofing.
  
- B. Related Sections:
  - 1. Section 04 26 13 – Masonry Veneer: Installation by the masonry contractor of wall insulation specified in this Section 07 21 13.
  - 2. Section 07 11 13 – Bituminous Dampproofing.
  - 3. Section 07 13 26 – Self - Adhered Sheet Waterproofing: Foundation wall insulation substrate and drainage panels.
  - 4. Section 07 26 00 - Vapor Retarders: Vapor retarder materials to adjacent insulation.
  - 5. Section 07 54 19 – Polyvinyl Chloride Roofing – Fully Adhered: Installation by the roofing contractor of roof insulation specified in this section.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM C165 - Standard Test Method for Measuring Compressive Properties of Thermal Insulations.
  - 2. ASTM C272 - Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
  - 3. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
  - 4. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  - 5. ASTM D1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
  - 6. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics.
  - 7. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  
- B. 2012 International Energy Conservation Code (IECC)
  - 1. C104.2.1.1 Wall Insulation Inspection
  - 2. C104.2.1.4 Slab/Floor Insulation Inspection

#### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
  
- B. Product Data: Provide data on product characteristics, performance criteria and limitations.
  
- C. Manufacturer's Installation Instructions: Indicate special environmental conditions required for installation and installation techniques.

#### 1.4 QUALITY ASSURANCE

- A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
  - 1. Foam Plastic Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
  - 2. Other Insulation: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- B. Insulation Installed in Exposed Locations Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- C. Mockup:
  - 1. Provide and install masonry cavity wall insulation for exterior wall mock-up under provisions of Section 01 40 00 - Quality Requirements. Coordinate installation with other trades involved in the mock-up.
  - 2. Locate where directed.
  - 3. When accepted, mock-up will demonstrate minimum standard for the Work. Accepted mockup may remain as part of the Work.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

#### 1.6 SEQUENCING

- A. Sequence work to ensure fireproofing materials are in place before beginning the Work of this section.

### PART 2 PRODUCTS

#### 2.1 EXTRUDED POLYSTYRENE INSULATION (XPS)

- A. Location
  - 1. Perimeter foundation walls and under slab
  - 2. CMU cavity wall
- B. Manufacturers:
  - 1. The Dow Chemical Company; ( <http://building.dow.com/na/en/> )
  - 2. Owens Corning; (<http://commercial.owenscorning.com/foam/> )
  - 3. Greenguard, (<http://www.trustgreenguard.com>)
  - 4. Substitutions: See Section 01 25 00 - Substitution Procedures.
- C. Extruded Polystyrene Insulation: ASTM C578, Type IV 1.35 lbs./s.f. min. density; extruded cellular type, conforming to the following:
  - 1. Thermal Resistance: R of 5.0 for 1 inch thickness.
  - 2. Thickness: As required to achieve the total R-Value of 10 at foundation walls and R-21 at walls or as shown on drawings.
  - 3. Compressive Strength: At slab and foundation, minimum 25 psi and at walls minimum 15 psi by ASTM D1621.
  - 5. Water Absorption: In accordance with ASTM C272, 0.3 percent by volume maximum.
  - 6. Water Vapor Permeance: ASTM E96, perm max, 1.5.
  - 7. Edges: Square.



## 2.2 POLYISOCYANURATE INSULATION

- A. Location
  - 1. Roof.
  
- B. Manufacturers: (Roofing)
  - 1. [Atlas Roofing Corporation.](#)
  - 2. [Carlisle SynTec Incorporated.](#)
  - 3. [GAF Materials Corporation.](#)
  - 4. [Insulfoam LLC; a Carlisle company.](#)
  - 5. [Johns Manville; a Berkshire Hathaway company.](#)
  - 6. [Rmax, Inc.](#)
  - 2. Substitutions: See Section 01 25 00 - Substitution Procedures.
  
- C. Cavity Wall and Roofing Insulation: ASTM C1289, Type II, Class 1; Closed-cell polyisocyanurate foam core bonded to non-asphaltic fiberglass facers for under roofing system.
  - 1. Thermal Resistance: Aged R of 5.6 for 1 inch thickness based on Advanced Method for Determining Long-Term Thermal Resistance (LTTR).
  - 2. Thickness: As required to achieve the total R-value of 30 at roofs or as shown on drawings.
  - 3. Compressive Strength: Minimum 20 psi ASTM C165.
  - 4. Water Absorption: 1% per ASTM D2842.
  - 5. Edges: Square.
  - 6. U.L. Fire Resistance: Flame spread – 60 max. (for 1 inch thick board).
  - 7. Smoke Developed – 170 max.
  - 8. Tapered Insulation – roof only: Provide in ¼ inch and ½ inch per foot taper to meet requirements of installation. Maintain average thickness not less than one half inch thickness to achieve stabilized R-values, except as otherwise accepted by Architect.

## 2.3 MINERAL WOOL BOARD INSULATION

- A. Location
  - 1. Exterior frame walls
  
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. [Industrial Insulation Group, LLC.](#)
  - 2. [Thermafiber, Inc.; an Owens Corning company.](#)
  - 3. Roxul Cavity Rock MD.
  - 4. Substitutions: See Section 01 25 00 – Substitution Procedures.
  
- C. Mineral-Wool Board, Type II: ASTM C 612, Type II; unfaced, with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Nominal density of **6 lb/cu. ft. (96 kg/cu. m)**.
  - 1. Thermal Resistance: R of 4.0 per 1 inch thickness.

## 2.4 ADHESIVES

- A. Adhesive: Type recommended by insulation manufacturer for application.

## 2.5 ACCESSORIES

- A. Provide miscellaneous and accessory materials, fasteners, adhesives, tools, and equipment as needed for completion of insulation work

- B. Spray Foam Sealant: Spray polyurethane foam sealant in a canister to fill gaps 1/8 inch or greater.
- C. Protective Boards for Perimeter Insulation Application Where Drainage Panel Not Used: Cementitious, 1/4 inch thick.
- D. Water Pervious Fabric: Black open weave polypropylene, 3 oz. per yd; Rufon P-38 manufactured by Phillips Fiber Corp.
- E. Insulation Perimeter Restraint: Metal edge device configured to restrain insulation boards in position and provide top flashing over ballast to system.
- F. Sheet metal "Z" furring at metal panel: 20 gage sheet metal typical with 16 gage at edges adjacent to storefront and curtain wall windows.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify site conditions.
- B. Verify that substrate, adjacent materials, and insulation boards are dry and ready to receive insulation and adhesive.
- C. Verify substrate surface is flat, free of honeycomb, fins, irregularities, and materials or substances that may impede adhesive bond.

#### 3.2 INSTALLATION - FOUNDATION PERIMETER

- A. Apply adhesive to substrate in three continuous beads per board length, unless otherwise recommended by manufacturer.
- B. Adhere boards to foundation wall perimeter on side shown on the drawings. Place boards in a method to maximize contact bedding. Stagger side and end joints. Butt edges and ends tight to adjacent board and to protrusions.
- C. Extend boards over control joints, unbonded 12 inches on one side of joint.
- D. Where boards are installed on exterior face of below grade walls, immediately following application of board insulation and prior to backfilling against insulation, adhere protective boards over exposed insulation surfaces or drainage panels as detailed. Apply adhesive in continuous beads per protective board length. Install boards from base of foundation to top of insulation. Butt board joints tight, stagger from insulation joints. IECC C104.2.1.4 Slab/Floor Insulation Inspection: To be made after the installation of the slab/floor insulation, but before concealment.

#### 3.3 INSTALLATION - MASONRY CAVITY WALL

- A. As specified in Section 04 26 13 – Masonry Veneer.

#### 3.4 INSTALLATION - ROOF INSULATION

- A. As specified in Section 07 54 19 – Polyvinyl-Chloride (PVC) Roofing.
- B. Do not permit work to be damaged prior to covering insulation.

### 3.5 SCHEDULE OF BOARD INSULATION APPLICATIONS

- A. Perimeter foundation walls – below grade: Extruded polystyrene.
- B. Foundation walls with sheet waterproofing – elevator pit and raised planters: Extruded polystyrene.
- C. Below slab: Extruded polystyrene.
- D. CMU cavity wall insulation: Extruded polystyrene.
- E. Roof Insulation: Polyisocyanurate.
- F. Continuous Insulation at Exterior Walls: Mineral Wool Board over sheathing.

END OF SECTION 07 21 13



## SECTION 07 21 16 – BLANKET INSULATION

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Blanket insulation in exterior wall construction.
  - 2. Insulation for filling perimeter window and door shim spaces.
  - 3. Insulation for filling voids at exterior wall and roof intersections.
  - 4. Sound attenuation blanket insulation for acoustical walls and construction.
- B. Related Sections:
  - 1. Section 05 40 00 - Cold-Formed Metal Framing: Load bearing steel stud wall framing and accessories.
  - 2. Section 07 21 13 - Board Insulation: Foundations, masonry and concrete walls and insulation under metal roofing.
  - 3. Section 07 26 00 - Vapor Retarders: Above and Below Grade Vapor Retarders.
  - 4. Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers: Air barrier materials.
  - 5. Section 09 21 16 - Gypsum Board Assemblies: Drywall board, trim and acoustical treatment.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - 2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. 2012 International Energy Conservation Code (IECC)
  - 1. C104.2.1.1 Wall Insulation Inspection

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on product characteristics, performance criteria, limitations, and installation instructions.

#### 1.4 QUALITY ASSURANCE

- A. Surface Burning Characteristics:
  - 1. Blanket Insulation: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

#### 1.5 COORDINATION

- A. Section 01 31 00 – Project Management and Coordination: Coordination and project conditions.
- B. Coordinate the Work with Section 07 26 00 - Vapor Retarders, for installation of vapor retarder and Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers, for air seal materials.

## PART 2 PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Materials of This Section: Provide continuity of thermal barrier at building enclosure elements.
- B. Materials of This Section: Provide thermal protection to vapor retarder in conjunction with vapor retarder materials in Section 07 26 00 - Vapor Retarders.

### 2.2 BLANKET INSULATION

- A. Manufacturers:
  - 1. CertainTeed Insulation, [www.certainteed.com](http://www.certainteed.com).
  - 2. Johns Manville, [www.jm.com](http://www.jm.com).
  - 3. Owens Corning Fiberglass, [www.owenscorning.com](http://www.owenscorning.com).
  - 4. Knauf Insulation, [www.knaufinsulation.us/](http://www.knaufinsulation.us/).
- B. Substitutions: See Section 01 25 00 - Substitution Procedures.

### 2.3 COMPONENTS

- A. Unfaced Blanket Insulation: ASTM C665, Type 1 and ASTM E 136; glass fiber blanket; friction fit, conforming to the following:
  - 1. Thermal Resistance: R value minimum 3.0 per inch.
  - 2. Blanket Size: Width to suit stud or joist spacing.
  - 3. Facing: Unfaced.
  - 4. Flame Spread/Smoke Developed: 25/50 or less when tested in accordance with ASTM E84.
- B. Glass Fiber Sound Attenuation Blankets (use in sound rated partitions, except where mineral fiber is required to meet fire ratings): Unfaced type conforming to ASTM C665, Type 1, and ASTM E136; provide 3.5 inch thick insulation batts, except where stud depths are less than 3.5 inches in which case provide insulation of thickness to fill entire stud cavity; widths as required for friction fit.
  - 1. Flame spread rating of 10 or less with a smoke developed of 10 when tested per ASTM E84.
  - 2. Owens-Corning "Sound Attenuation Batt Insulation", or approved equal.
- C. Mineral Wool Sound Attenuation Batts (use in fire rated partitions): ASTM C665, Type I mineral wool batts, non-combustible (ASTM E136), 0 flame spread and smoke developed (ASTM E84); moisture-resistant, non-corrosive and mildew-proof; 3 inches thick x stud spacing; nominal density 2.5 pounds per cubic foot; NRC of 1.05; unfaced; Thermafiber® SAFB™, or approved equal.
- D. Vapor Retarder for use with Blanket Insulation: As specified in Section 07 26 00 - Vapor Retarders.
- E. For all wall installations designated to be insulated, provide blanket insulation to achieve the R-value as shown on drawings, unless noted otherwise.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify substrate, adjacent materials, and insulation are dry and ready to receive insulation.

### 3.2 INSTALLATION

- A. Install in wall, roof, and ceiling spaces indicated, without gaps or voids according to manufacturer's instructions. Do not compress insulation.
- B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- C. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.
- D. Install vapor retarder membrane as specified in Section 07 26 00 - Vapor Retarders.
- E. Fit insulation into metal door and relite frames.

END OF SECTION 07 21 16





## SECTION 07 26 00 – VAPOR RETARDERS

### Part 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes sheet materials for controlling vapor diffusion through exterior walls.
- B. Related Sections:
  - 1. Section 07 21 16 - Blanket Insulation.
  - 2. Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers.
  - 3. Section 09 21 16 – Gypsum Board Assemblies.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data indicating material characteristics, performance criteria, and limitations.
- C. Manufacturer's Installation Instructions: Submit preparation and installation requirements, techniques.

#### 1.4 SEQUENCING

- A. Sequence Work to permit installation of materials in conjunction with insulation installation in Section 07 21 16.
- B. Do not install vapor retarder until items penetrating vapor retarder are in place.

## PART 2 PRODUCTS

### 2.1 ABOVE GRADE VAPOR RETARDERS

- A. Acceptable Manufacturers:
  - 1. MemBrain by CertainTeed.
  - 2. Substitutions under provision of Section 01 25 00 Substitution Procedures.
- B. Provide a 2 mil thick film of polyamide (nylon). Permeability changes with ambient humidity conditions.
- C. Properties:
  - 1. Water Vapor Transmission Rating (WVTR):
    - A. Less than 1.0 perms by ASTM E 96, Desiccant method.
    - B. More than 10 perms by ASTM E 96, Water method.
  - 2. Surface Burning Characteristics:
    - A. Maximum Flame Spread Index: 20.
    - B. Max Smoke Developed Index: 55.

3. Fungi Resistance: No growth; ASTM C1338.
4. Corrosivity: No unusual aspect of corrosion such as pitting, cracking and adhesive cure inhibition; ASTM C665.

D. Adhesives

1. Spray Adhesive: 3M Spray 90 or equal. Water-based adhesives are not acceptable.
2. Double-Sided Adhesive Tape: Asphaltic mastic strips compatible with sheet barrier and substrate, with factory applied release paper. Use for bonding adjacent sheets of retarder to each other at seams.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove loose or foreign matter capable of impairing adhesion.
- B. Clean and prime substrate surfaces to receive adhesive and sealants.

3.2 INSTALLATION

- A. Vapor Retarder For Stud Framed Walls: Secure sheet retarder to stud faces with adhesive. Lap edges over stud faces, lap ends onto adjacent construction.

3.3 INSTALLATION OF VAPOR RETARDERS ON FRAMING

- A. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives, vapor retarder fasteners, or other anchorage system as recommended by manufacturer. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs and sealing with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Locate all joints over framing members or other solid substrates.
- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

END OF SECTION 07 26 00

## SECTION 07 27 15 – NON-BITUMINOUS SELF-ADHERING SHEET AIR BARRIERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Self-adhering, vapor-permeable, nonbituminous sheet air barriers at exterior frame walls.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: For air-barrier assemblies.

1. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of nonbituminous self-adhering sheet air barrier.

- B. Product test reports.

- C. Field quality-control reports.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

- B. Mockups: Build mockups to set quality standards for materials and execution.

1. Build integrated mockups of exterior wall assembly as indicated on Drawings, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.

- a. Coordinate construction of mockups to permit inspection and testing of air barrier before external insulation and cladding are installed.
- b. Include junction with roofing membrane, building corner condition, and foundation wall intersection.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum **0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa)**, when tested according to ASTM E 2357.

### 2.2 NONBITUMINOUS SHEET AIR BARRIER

- A. Vapor-Permeable Nonbituminous Sheet: Minimum **20-mil- (0.5-mm-)** thick, self-adhering sheet consisting of a breathable carrier film or fabric and an adhesive with release liner on adhesive side and formulated for application with primer that complies with VOC limits.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. **Cosella-Dorken Products, Inc.**, Delta-Vent SA, 31 perms.
    - b. **Grace Construction Products; W.R. Grace & Co. -- Conn.**, Perma-Barrier VPS.
    - c. **VaproShield LLC.**, WrapShield SA, 50 perms,
    - d. Henry VP160 Blueskin, 29 perms.
  - 2. Physical and Performance Properties:
    - a. Air Permeance: Maximum **0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa)** pressure difference; ASTM E 2178.
    - b. Puncture Resistance: Minimum **40 lbf (180 N)**; ASTM E 154/E 154M.
    - c. Vapor Permeance: Minimum **27 perms (860 ng/Pa x s x sq. m)**; ASTM E 96/E 96M, Desiccant Method, Procedure A.
    - d. Adhesion to Substrate: Minimum **16 lbf/sq. in. (110 kPa)** when tested according to ASTM D 4541 as modified by ABAA.
    - e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
    - f. UV Resistance: Can be exposed to sunlight for 90 days according to manufacturer's written instructions.

### 2.3 ACCESSORY MATERIALS

- A. Requirement: Provide primers, transition strips, termination strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.

## PART 3 - EXECUTION

### 3.1 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- D. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- F. Bridge isolation joints, expansion joints, and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

### 3.2 INSTALLATION

- A. Install materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
  - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere air-barrier sheets over area to receive air barrier. Accurately align sheets and maintain uniform **2-1/2-inch- (64-mm-)** minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.
  - 1. Apply sheets in a shingled manner to shed water.
  - 2. Roll sheets firmly to enhance adhesion to substrate.
- D. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.
- E. Connect and seal exterior wall air-barrier sheet continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- F. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of **3 inches (75 mm)** of coverage is achieved over each substrate. Maintain **3 inches (75 mm)** of contact over firm bearing to perimeter frames, with not less than **1 inch (25 mm)** of full contact.

- G. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending **6 inches (150 mm)** beyond repaired areas in all directions.
- H. Do not cover air barrier until it has been tested and inspected by testing agency.
- I. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Tests: As determined by testing agency from among the following tests:
  - 1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
  - 2. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to ASTM E 783 or ASTM E 2357.
  - 3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each **600 sq. ft. (56 sq. m)** of installed air barrier or part thereof.
- C. Air barriers will be considered defective if they do not pass tests and inspections.
  - 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
  - 2. Remove and replace deficient air-barrier components for retesting as specified above.
- D. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- E. Prepare test and inspection reports.

### 3.4 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

END OF SECTION 07 27 15

## SECTION 07 42 10 – FIBER CEMENT PANELS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes integrally colored fiber-reinforced cementitious wall panel assembly and accessories.
- B. Related Sections:
  - 1. Section 06 16 00 - Sheathing.
  - 2. Section 07 21 13 - Board Insulation.
  - 3. Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers.
  - 4. Section 07 62 00 - Sheet Metal Flashing and Trim.

#### 1.2 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - 3. ASTM B370 Standard Specification for Copper Sheet and Strip for Building Construction.
  - 4. ASTM B882 Specification for Pre-Patinated Copper for Architectural Applications.
  - 5. ASTM C120 Standard Test Methods of Flexure Testing of Slate (Breaking Load, Modulus of Rupture, Modulus of Elasticity).
  - 6. ASTM C645 Standard Specification for Nonstructural Steel Framing Members.
  - 7. ASTM C1185 Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.
  - 8. ASTM C1186 Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.
  - 9. ASTM D1308 Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
  - 10. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 11. ASTM G155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

#### 1.3 SUBMITTALS

- A. Product Data: Include material descriptions, dimensions of individual components and profiles, and finishes for each type of fiber cement wall panel and accessory. Data confirming products meets specified requirements.
- B. Shop Drawings: Construction details, pattern and color location of panels, panels and sub framing including details and showing all panel fastening points.
- C. Samples for each type of exposed finish specified, provide:
  - 1. Fiber cement Wall Panels: 3" x 8". Two of each color specified. Include fasteners and other fiber cement wall panel accessories. Include a panel with anti graffiti coating.
  - 2. Furring: 12 inches long. Include fasteners and other concealed accessories.
  - 3. Accessories: 12 inch long samples for each type of accessory.

- D. Manufacturer's Instructions: Installation, special procedures, maintenance and conditions requiring special attention. Include:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods, including fastening patterns.
- E. Warranty: Standard 10 year warranty letter from panel manufacturer.

#### 1.4 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Manufacturer Qualifications: Company specializing in work of this Section with minimum 5 years documented experience in manufacturing products specified by this Section.
  - 2. Installer Qualifications: Company specializing in work of this Section with documented experience installing work of equivalent type and quality.
- B. Source Limitations: Obtain each type of fiber cement wall panel from single manufacturer.
- C. Mockup:
  - 1. Section 01 40 00 - Quality Requirements: Mockup requirements.
  - 2. When accepted, mock-up will demonstrate minimum standard for the Work. Mock-up will not remain as part of the Work.
  - 3. Work of this Section shall not proceed until approval of the mock-up.
- D. Preinstallation Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, Installer, manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects fiber cement wall panels including installers of doors, windows, and louvers.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Confirm to provisions of Section 01 60 00 - Product Requirements and manufacturer's instructions.
- B. Package panels for protection during transportation and handling.
- C. Store material in a dry, well ventilated area raised off the ground and on a dry level surface at all times. Stack panels horizontally covered with suitable weathertight, UV resistant and ventilated covering. Store panels to ensure dryness and protect from freezing. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Handling: Lift boards from stacks. Sheets must be carried by two people and by the edge.

#### 1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of panels to be performed according to manufacturer's written instructions and warranty requirements.
- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before panel fabrication and indicate measurements on Shop Drawings.



## 1.7 SEQUENCING

- A. Coordinate fiber cement wall panel assemblies with penetrations, rain drainage work, flashing, trim, and construction of studs, soffits, and other adjoining work to provide a secure and noncorrosive installation.

## 1.8 SCHEDULING

- A. Verify and confirm long lead times with manufacturer for 8 to 16 weeks for fiber cement panels.

## 1.9 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures, including spalling, rupturing, cracking, or puncturing.
  - 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Cracking, checking, peeling, or failure of paint to adhere to cementitious surface.
  - 2. Finish Warranty Period: 10 years from date of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Swisspearl (<http://www.swisspearl.com>)
  - 1. Local Representative: Steve Tucker, Tri-Jack Design, 406.652.2555.
- B. Substitutions: Under provisions of Section 01 25 00 – Substitution Procedures.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Provide wall cladding comprising panels, system components, accessories and supports such that the cladding complies with performance requirements indicated below and is capable of withstanding structural movement, thermally induced movement and exposure to weather without failure.
- B. Structural Performance: Provide fiber cement wall panel assemblies capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated:
  - 1. Wind Loads: Design and size components to withstand dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall, including building corners in accordance with 2012 IBC.
  - 2. Design pressure to be per General Structural Notes on drawings.
  - 3. Maximum allowable deflection ratio is 1/300 between panel support profiles.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, overstressing of components, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Resistance (Range): - 40 deg F (- 40 °C) up to 176 deg°F (80 °C).

## 2.3 FIBER CEMENT PANELS

- A. Panel Material: Portland cement, bonding material, additives, synthetic fibers, cellulose fibers and water with acrylic coating to panel face, rear side and edges.
  1. Dimensions
    - a. Panel Thickness: 5/16-inch.
    - b. Panel Weight: 3.1 lbs/sq.ft.
    - c. Panel Size: As indicated on drawings. Cut from 4 x 8 foot or 4 by 10 foot panels.
  2. Color: Black Opal.
  3. Physical and Mechanical Panel Properties
    - a. Density 1.8 g/cm<sup>3</sup> (ASTM C 1186)
    - b. Color Changes (ASTM G 155)
      - 1) 1000 hours: Change in E is less than or equal to 1.8.
    - c. 1 500 hours: Change in E is less than or equal to 2.2.
      - 1) 2000 hours: Change in E is less than or equal to 2.5.
    - d. Fire resistance (ASTM E84, E-136 and NFPA 285)
      - 1) Flame spread index: 0
      - 2) Smoke developed index: less than or equal to 15
      - 3) No flaming after 30 seconds weight loss less than or equal to 50%, final center temperature less than or equal to 30 degrees Celsius.
    - e. Fire classification: UBC Class I, NFPA A.
    - f. Frost resistance (ASTM C 1185): 2944 psi.
    - g. Minimum strength and bending characteristics (ASTM C120/C1185)
      - 1) Modulus of Rupture: 24 MPa (average cross/length).
      - 2) Modulus of elasticity: 16 GPa.
    - h. Moisture Properties (ASTM C1185):
      - 1) Moisture content normal 6% by mass.
      - 2) Moisture content maximum 20% by mass.
    - i. Water Tightness: No visible droplets or surface wetting. (ASTM C 1185)
    - j. Coefficient of Thermal Expansion:  $10 \times 10^{-6} \text{ K}^{-1}$  (ASTM E228)
    - k. Guaranteed to be free from efflorescence.

## 2.4 METAL FURRING

- A. Metal Furring, General: ASTM C 645, cold-formed metallic-coated steel sheet, ASTM A 653, G60 (Z180) hot-dip galvanized or coating with equivalent corrosion resistance unless otherwise indicated.
- B. Metal Z Furring: 20 gage galvanized metal "Z" furring, size and spacing as required by manufacturer for attaching metal siding to substrate.
- C. Fasteners for Metal Furring: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten metal furring members to substrates and to each other.
- D. Metal strapping, 16 ga.
- E. Shims: Allow for 50 year durable shims as required. Locate under the panel support profiles. Shims between support profile and panel are not allowed.

## 2.5 ACCESSORIES

- A. Provide components required for a complete wall panel assembly including escutcheons for pipe and conduit penetrating exterior walls and similar items. Match material and finish of fiber cement wall panels unless otherwise indicated.

- B. Panel Fasteners: Self-tapping screws, bolts, and nuts; self-locking rivets and bolts; end-welded studs; and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of fiber cement wall panels by means of factory-applied coating.
  - 1. Furnish manufacturer supplied stainless-steel rivets for exterior panels applied to galvanized steel furring.
- C. Field Applied Impregnation of panel edges: Impregnation material supplied by manufacturer of panels.
- D. Metal Closures: Partially perforated, as indicated. Open area perforation 50%. Finished to match adjacent panels.
- E. Air and Moisture Barrier: Refer to Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers.
- F. Board Insulation: Refer to Section 07 21 13.
- G. Anti-Graffiti Coating: Aliphatic Polyurethane Top Coat. GCP 100 or equivalent.

## 2.6 FABRICATION

- A. General: Fabricate and finish fiber cement wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated shapes and with dimensional and structural requirements. Handle finished panels to prevent damage to finished surfaces.
  - 1. Fabrication includes drilling holes for fasteners and other penetrations.
  - 2. Locate holes from edge of panel no less than distance recommended manufacturer.
- B. Factory cut and drill fiber cement panels. Trim and square edges of sheets.
  - 1. Fabricate panels with sharply cut edges.
  - 2. Locate holes for fasteners and penetrations where indicated on approved shop drawings.
- C. Fabricate panels to the following dimensional tolerances:
  - 1. Length and Width: Plus or minus 0.12 inch (3 mm) up to 48 inches; 0.19 inch (5 mm) more than 48 inches.
  - 2. Diagonal: Plus or minus 0.19 inch (5 mm).
  - 3. Squareness: 0.078 inch/39.4 inch (2 mm/m).
- D. Labeling: Apply identification label to back side of each fabricated panel.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, fiber cement wall panel supports, and other conditions affecting performance of the Work.
  - 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by fiber cement wall panel manufacturer.
  - 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by fiber cement wall panel manufacturer.

3. Verify that weather barrier membrane has been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating fiber cement wall panels to verify actual locations of penetrations relative to seam locations of panels before panel installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install fiber cement wall panel assembly according to manufacturer's written instructions and in orientation, shape, sizes, and locations indicated on approved shop drawings. Install panels perpendicular to cross furring unless otherwise indicated on shop drawings. Anchor furring, panels, and other components of the Work securely in place, with provisions for thermal and structural movement.
  1. Commence fiber cement wall panel assembly installation and install minimum of 300 sq. ft. in presence of fiber cement wall panel manufacturer factory-authorized representative.
  2. Do not begin furring installation until weather barrier, flashings, and sealants that will be concealed by panels are installed.
  3. Where weather barriers, flashings, and sealants are damaged during installation of wall panel assembly, repair and replace to match original installation.
  4. Shim or otherwise plumb substrates receiving direct furring.
  5. Provide escutcheons for pipe and conduit penetrating exterior walls.
  6. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action using dielectric coating or tape.
  7. Clean dirt, marks, stains and other surface blemishes from panel surfaces as they are installed according to manufacturer's instruction.
- B. Rear Ventilated Attachment System Installation: Install direct furring (on structural substrate), cross furring (on and perpendicular to direct furring), and other miscellaneous fiber cement wall panel support members according to fiber cement wall panel manufacturer's written instructions, and at locations, orientations, spacings, air cavity prescribed by the manufacturer depending of the height of the building and with fasteners indicated on approved shop drawings. Include components for a complete wall system, including shims.
  1. Air Space: As indicated on Drawings.
  2. Do not block air circulation.
- C. Fiber Cement Wall Panel Installation:
  1. Move panels by methods that will prevent damage to finished surfaces.
  2. Attach fiber cement wall panels to cross furring using fasteners indicated on approved shop drawings.
  3. Use stainless-steel fasteners for exterior panels applied to galvanized steel furring.
  4. Attach fasteners, through predrilled holes in fiber cement wall panels, into cross furring.
  5. Secure fasteners by means that will prevent damage to panels.
  6. Leave horizontal and vertical joints with open reveal.
  7. Nominal Joint Width: As indicated on Drawings.
  8. Install fiber cement wall panels to allow individual panels to "free float" and be installed and removed without disturbing adjacent panels.
  9. Field Fabrication: Where factory fabrication is not feasible, site fabricate panels in accordance with panel manufacturer's written recommendations.
    - a. Cut panels using equipment recommended by manufacturer. Cutting saws shall be only diamond coated cutting tools.

- b. Drill holes using only carbide masonry drill bits.
- c. Seal cut and drilled edges with coating supplied by manufacturer. Remove all fugitive dust prior to applying sealer.

### 3.3 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align fiber cement wall panel units within installed tolerance of 1/4 inch in 20 feet , non accumulative, on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

### 3.4 FIELD QUALITY CONTROL

- A. Final fiber cement wall panel inspection: Arrange for fiber cement wall panel system manufacturer's factory-authorized representative to inspect wall panel installation on completion and submit report to Architect.
  - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- B. Repair or remove and replace components of wall panel system where inspections indicate that they do not comply with specified requirements.
- C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare inspection reports.

### 3.5 CLEANING

- A. Clean finished surfaces as recommended by panel manufacturer. Maintain in a clean condition during construction.
- B. After fiber cement wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace fiber cement wall panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 42 10



## SECTION 07 42 13 – METAL SIDING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Preformed metal siding systems for exterior walls and soffit, with related flashings and accessory components.
- B. Related Sections:
  - 1. Section 05 40 00 - Cold Formed Metal Framing: Stud wall framing system.
  - 2. Section 06 16 00 – Sheathing.
  - 3. Section 07 21 13 - Board Insulation.
  - 4. Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers.
  - 5. Section 07 62 00 - Sheet Metal Flashing and Trim.
  - 6. Section 08 41 13 - Aluminum Framed Entrances and Storefronts.
  - 7. Section 08 44 13 – Glazed Aluminum Curtain Walls

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM A755 - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil Coating Process for Exterior Exposed Building Products.
  - 2. ASTM A924 - General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details and methods of anchorage.
- C. Samples: Submit two samples of each of siding, 12 x 12 inch in size illustrating finish color, sheen, and texture. Submit two samples of each type of trim piece, including coping, 12 inches long illustrating gage and shape. Submit two samples of typical bayonet type trim seams.
- D. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.
- C. Provide resume of foreman and project manager indicating work experience.

D. Mockup:

1. Provide metal siding portion of multi-component exterior wall mock-up under provisions of Section 01 40 00 - Quality Requirements.
2. When accepted, mock-up will demonstrate minimum standard for the Work. Mock-up will not remain as part of the Work.
3. Work of this section shall not proceed until approval of the mock-up.

1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01 60 00 - Product Requirements: Transport, handle, store, and protect products.
- B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- C. Store prefinished material off ground protected from weather, to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- D. Prevent contact with materials which may cause discoloration or staining.

1.6 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00 - Project Management and Coordination.
- B. Coordinate the Work for installation of vapor retarder.
- C. Coordinate the Work with installation of windows, louvers and doors components or materials.

1.7 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Warranties and Bonds.
- B. Correct defective Work within a five year period after Final Acceptance water tightness, integrity of seals, and degradation of panel finish including color fading caused by exposure to weather.
- C. Manufacturer Coating Performance Warranty: 45 year warranty against cracking, flaking, chipping or peeling. 35 year warranty against chalking and fading. AZ50 Galvalume-coated steel 25 year warranty against rupturing, perforating or failing structurally due to perforation.

PART 2 PRODUCTS

2.1 DESIGN REQUIREMENTS

- A. Components: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with applicable code and to a design pressure of 15 lb/sq ft.
- B. Maximum Allowable Deflection of Panel: 1/180 of span.
- C. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing.



## 2.2 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Metal Sales Manufacturing Corporation. <http://www.metalsales.us.com>.
  - 1. 2727 Trent Avenue, Spokane, WA 99202. Phone: 800-572-6565.
- B. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.3 COMPONENTS

- A. Exterior Wall Panels: Minimum 22 gage from finish grade level up to metal panel joints, 24 gage above. Refer to drawings for exact locations of metal panel gage transition joint lines. Minimum extent of 22 gage metal panel to be 10' above finish grade. ASTM A792, min yield 50,000 psi. Protective Coating: Conform to ASTM A792, AZ50 (Zincalume/Galvalume).
  - 1. MP-1: Metal Sales, T10-A. Vertical.
    - a. 28 inch panel coverage for T10-A.
    - b. 1 ½ inch rib height.
    - c. 90° vertical box ribs on 4 inch centers.
    - d. Exposed fastened.
  - 2. MP-2: Metal Sales, TLC-2. Vertical.
    - a. 12" panel coverage.
    - b. 1 ½ inch rib height.
    - c. Concealed fastened.
- B. Exterior Roof Panels (Dugouts): Minimum 24 gage. ASTM A792, min yield 50,000 psi. Protective Coating: Conform to ASTM A792, AZ50 (Zincalume/Galvalume).
  - 1. MP-3: Metal Sales, T3
    - a. 36 inch panel coverage.
    - b. 1 inch rib height.
    - c. Trapezoidal ribs on 6" centers.
    - d. Exposed fastened.
- C. Metal Z Furring: 20 gage galvanized metal "Z" furring, spacing as shown on the drawings and as required by manufacturer for attaching metal siding to substrate.
- D. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system as shown; shop cut and factory mitered to required angles. Mitered internal corners to be back braced with 24 gage thick precoated sheet stock to maintain continuity of profile.
- E. Expansion Joints: Same material, thickness and finish as exterior sheets; 24 gage thick; of profile to suit system as shown.
- F. Trim, Closure Pieces, Caps, Flashings, Facias and Infills: Same material, thickness and finish as exterior sheets, brake formed to required profiles and as shown.
- G. Anchors: Galvanized steel.

## 2.4 ACCESSORIES

- A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant; color as selected.
  - 1. Neoprene end closure gaskets: Formed to siding profile.

- B. Sealants: Specified in Section 07 92 00 - Joint Sealants, Manufacturer's standard type suitable for use with installation of system; non-staining, non-skinning, non-shrinking and non-sagging; ultra-violet and ozone resistant; color as selected.
- C. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized; fastener cap same color as exterior panel. Exposed fasteners same finish as panel system.
- D. Bituminous Paint: Asphalt base.
- E. Air and Moisture Barrier: Refer to Section 07 27 15.

## 2.5 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest practicable lengths.
- C. Fabricate trim to sections shown.
- D. Fabricate corners in one continuous piece with minimum 18 inch returns.
- E. Provide bayonet-type interlocking joints for continuous runs of trim.

## 2.6 FINISH

- A. Premium fluoropolymer (PVDF) coating system with 70 percent Kynar 500 or Hylar 5000 resin content, conforming to AAMA 621, over aluminum-zinc alloy finished sheet steel.
  - 1. Primer: UV resistant, .20 mil corrosion resistance.
  - 2. Color Coat: .70-.80 mil baked on finish coat.
    - a. Color:
      - 1) MP-1: Metal Sales, Terra Cotta (W72).
      - 2) MP-2: Metal Sales, Dark Bronze (50).
      - 3) MP-3: Metal Sales, Terra Cotta (W72).
  - 3. Prime and paint exposed back face of MP-2 panels at exposed exterior locations.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
  - 1. Verify substrate framing under provisions of Section 01 31 00 - Project Management and Coordination.
  - 2. Confirm exterior sheathing is plumb and level, with no deflection greater than ¼ inch in 20 feet.
  - 3. Verify discontinuities in WRB are properly flashed and sealed.
  - 4. Confirm taped joints at continuous insulation.
- B. Surfaces to receive panels shall be even, smooth, dry and free from defects detrimental to the installation of the panel system. Notify Architect in writing of conditions detrimental to proper and timely completion of the work.
  - 1. Verify that building framing members are ready to receive panel system.

- C. Beginning of installation means acceptance of existing substrate and site conditions.

### 3.2 INSTALLATION

- A. Fasten metal Z-furring where indicated to building substrate at spacing as recommended by manufacturer and around metal siding panel perimeters. Shim as required to achieve specified tolerances.
- B. Lay out work before beginning installation as necessary for true, plumb, and aligned panel installations. Verify locations of joints and panel lengths
- C. Install metal siding system on walls in accordance with manufacturer's instructions.
- D. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
- E. Fasten siding to structural supports; aligned, level, and plumb.
- F. Install exterior panels full length between vertical reveal joints. Lap panels horizontally minimum 1 corrugation.
- G. Provide expansion or control joints within panel system where required.
- H. Use fasteners approved by manufacturer and spaced as directed by manufacturer.
- I. Seal and place formed neoprene end gaskets to prevent weather penetration, set in mastic tape. Maintain neat appearance.
- J. Provide recesses for mechanical and electrical devices, as shown.

### 3.3 TOLERANCES

- A. Maximum offset from true alignment between adjacent members butting or in line: 1/16 inch.
- B. Maximum Variation from Plane or Location Indicated on Drawings: 1/8 inch.

### 3.4 CLEANING

- A. Clean work under provisions of Section 01 77 00 - Closeout Procedures.
- B. Remove site cuttings from finish surfaces.
- C. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.
- D. Panels with severe paint and/or substrate damage shall be replaced as directed.

END OF SECTION 07 42 13



## SECTION 07 54 19 - POLYVINYL-CHLORIDE (PVC) ROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Fully adhered polyvinyl-chloride (PVC) roofing system.
2. Optional: Fully adhered thermoplastic polyolefin (TPO) roofing system provided outside temperatures fall within the range required by the manufacturer – generally, 40 degrees and rising. See Section 075423 – Thermoplastic Polyolefin (TPO) Roofing
3. Roof insulation.

#### 1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

#### 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: For the following products:
1. Sheet roofing, of color required.
  2. Walkway pads or rolls, of color required.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- B. Sample Warranties: For manufacturer's special warranties.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.
- B. Roof Installer's Warranty: See end of this Section.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain components including roof insulation and fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- C. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:
  - 1. Fire Resistance: Roofing systems, including roof insulation, shall have been tested and approved as a UL-790 Class "A" roofing system over non-combustible substrates for application and slopes indicated.
  - 2. Wind Up-Lift: Roofing systems shall have an approval for wind up-lift classification as a complete system. Roof systems shall resist wind up-lift as required by IBC Section 1609.
- D. Energy Performance: Roofing system shall have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.
- E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

## 2.3 PVC ROOFING

- A. PVC Sheet: ASTM D 4434/D 4434M, Type III, fabric reinforced and fabric backed.
1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. Carlisle SynTec Incorporated.
    - b. GAF Materials Corporation.
    - c. GenFlex Roofing Systems.
    - d. Johns Manville; a Berkshire Hathaway company.
    - e. Sika Sarnafil.
    - f. Versico Incorporated.
  2. Thickness: 60 mils (1.5 mm), nominal.
  3. Exposed Face Color: White.

## 2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet.
- C. Bonding Adhesive: Manufacturer's standard, water based.
- D. Slip Sheet: Manufacturer's standard, of thickness required for application.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.
- F. Miscellaneous Accessories: Provide metal termination bars, metal battens, pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening substrate board to roof deck.

## 2.5 VAPOR RETARDER – PVC ROOFING

1. Low-density polyethylene roof vapor retarder, peel and stick application.
  - a. Tensile Strength = 3,300 PSI
  - b. Minimum thickness = 10 mil
  - c. Permeance = 0.019 perms
2. Substitutions: See Section 01 25 00 Substitution Procedures.

## 2.6 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. Atlas Roofing Corporation.
    - b. Carlisle SynTec Incorporated.
    - c. GAF Materials Corporation.
    - d. Insulfoam LLC; a Carlisle company.
    - e. Johns Manville; a Berkshire Hathaway company.
    - f. Rmax, Inc.
- B. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of **1/4 inch per 12 inches (1:48)** unless otherwise indicated.
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

## 2.7 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- C. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant primed gypsum substrate, **1/2 inch (6 mm)** thick, or ASTM C 1278, fiber-reinforced primed gypsum board panels for roofing systems.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation.
    - b. Georgia-Pacific Building Products.
    - c. National Gypsum Company.
    - d. United States Gypsum Company.

## 2.8 ASPHALT MATERIALS

- A. Roofing Asphalt: ASTM D 312, Type III or Type IV.
- B. Asphalt Primer: ASTM D 41/D 41M.

## 2.9 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately **3/16 inch (5 mm)** thick and acceptable to roofing system manufacturer.



## PART 3 - EXECUTION

### 3.1 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.2 VAPOR RETARDER INSTALLATION

- 1. Apply self-adhesive vapor retarder to metal deck.
- 2. Extend vapor retarder under cant strips and blocking to deck edge.
- 3. Lap flexible flashing over vapor retarder and air and moisture barrier of wall construction to provide continuity of vapor and air barrier seal.

### 3.3 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Install tapered insulation under area of roofing to conform to slopes indicated.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is **2.7 inches (68 mm)** or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of **6 inches (150 mm)** in each direction.
- D. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
  - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- E. Install protection boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of **6 inches (150 mm)** in each direction. Loosely butt protection boards together and fasten to roof deck.
  - 1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

### 3.4 ADHERED ROOFING INSTALLATION

- A. Prior to beginning the membrane installation, the outside temperatures must be within the recommended range according to the roofing manufacturer.
- B. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.
  - 1. Install sheet according to ASTM D 5036.
- C. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

- D. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.
- E. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.
- F. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
  - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
  - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
  - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- G. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

### 3.5 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### 3.6 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

### 3.7 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

A&E # 13048.20  
INTEGRUS # 21438.00  
DECEMBER 18, 2015

BEN STEELE MIDDLE SCHOOL  
BILLINGS PUBLIC SCHOOLS  
100% CONSTRUCTION DOCUMENTS

END OF SECTION 07 54 19

ROOFING INSTALLERS WARRANTY

A. WHEREAS \_\_\_\_\_ of \_\_\_\_\_,

herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

- a. Owner: \_\_\_\_\_
- b. Address: \_\_\_\_\_
- c. Building Name/Type: \_\_\_\_\_
- d. Address: \_\_\_\_\_
- e. Area of Work: \_\_\_\_\_
- f. Acceptance Date: \_\_\_\_\_
- g. Warranty Period: \_\_\_\_\_
- h. Expiration Date: \_\_\_\_\_

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or directly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

- a. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
  - i. Lightning;
  - ii. Peak gust wind speed exceeding 120 mph (3-second gust);
  - iii. Fire;
  - iv. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
  - v. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;

- vi. Vapor condensation on bottom of roofing; and
  - vii. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
- b. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  - c. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  - d. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonable justifying a limitation or termination of this Warranty.
  - e. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
  - f. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
  - g. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

- a. Authorized Signature: \_\_\_\_\_
- b. Name: \_\_\_\_\_
- c. Title: \_\_\_\_\_

END OF WARRANTY



## SECTION 075423 - THERMOPLASTIC POLYOLEFIN (TPO) ROOFING – (OPTIONAL)

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Adhered thermoplastic polyolefin (TPO) roofing system.
  - 2. Roof insulation.
  - 3. Vapor Retarder.

#### 1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

#### 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: For the following products:
  - 1. Sheet roofing, of color required.
  - 2. Walkway pads or rolls, of color required.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- B. Sample Warranties: For manufacturer's special warranties.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
  - 1. Carlisle SynTec Incorporated.
  - 2. Firestone Building Products.
  - 3. GAF Materials Corporation.
  - 4. GenFlex Roofing Systems.
  - 5. Johns Manville; a Berkshire Hathaway company.
  - 6. Versico Incorporated.
- B. Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- C. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:
  - 1. Fire Resistance: Roofing systems including roof insulation, shall have been tested and approved as a UL-790 Class A roofing system over non-combustible substrates for application and slopes indicated.
  - 2. Wind Up-Lift: Roofing systems shall have an approval for wind up-lift classification as a complete system. Roof systems shall resist wind up-lift as required by IBC Section 1609.
- D. Energy Performance: Roofing system shall have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.



- E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

## 2.3 TPO ROOFING

- A. Fabric-Reinforced TPO Sheet: ASTM D 6878, internally fabric- or scrim-reinforced, uniform, flexible fabric-backed TPO sheet.
  - 1. Thickness: 60 mils (1.5 mm), nominal.
  - 2. Exposed Face Color: White.

## 2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
  - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 55 mils (1.4 mm) thick, minimum, of same color as TPO sheet.
- C. Bonding Adhesive: Manufacturer's standard, water based.
- D. Slip Sheet: Manufacturer's standard, of thickness required for application.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.
- F. Miscellaneous Accessories: Provide metal termination bars, metal battens, pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

## 2.5 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch (13 mm) thick.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation.
    - b. Georgia-Pacific Building Products.
    - c. National Gypsum Company.
    - d. United States Gypsum Company.

- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening substrate board to roof deck.

## 2.6 VAPOR RETARDER

- A. Interwrap Titanium PSU-30 synthetic roofing underlayment, peel and stick application.
  - 1. Weight/square = 24 lbs.
  - 2. Minimum thickness = 45 mil.
  - 3. Permeability = .0336.
- B. Substitutions: See Section 01 25 00 Substitution Procedures.

## 2.7 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. Carlisle SynTec Incorporated.
    - b. Firestone Building Products.
    - c. GAF Materials Corporation.
    - d. Johns Manville; a Berkshire Hathaway company.
    - e. Rmax, Inc.
- B. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of **1/4 inch per 12 inches (1:48)** unless otherwise indicated.
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

## 2.8 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- C. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, **1/2 inch (13 mm)** thick, factory primed.
  - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation.
    - b. Georgia-Pacific Building Products.

- c. National Gypsum Company.
- d. United States Gypsum Company.

## 2.9 ASPHALT MATERIALS

- A. Roofing Asphalt: ASTM D 312, Type III or Type IV.
- B. Asphalt Primer: ASTM D 41/D 41M.

## 2.10 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch (5 mm) thick and acceptable to roofing system manufacturer.

## PART 3 - EXECUTION

### 3.1 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.2 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
  - 1. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturers' written instructions.

### 3.3 VAPOR RETARDER INSTALLATION

- 1. Apply self-adhesive vapor retarder to metal deck.
- 2. Extend vapor retarder under cant strips and blocking to deck edge.
- 3. Lap flexible flashing over vapor retarder and air and moisture barrier of wall construction to provide continuity of vapor and air barrier seal.

### 3.4 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Install tapered insulation under area of roofing to conform to slopes indicated.

- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is **2.7 inches (68 mm)** or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of **6 inches (150 mm)** in each direction.
- D. Loosely Laid Insulation: Loosely lay insulation units over substrate.
- E. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of **6 inches (150 mm)** in each direction. Loosely butt cover boards together and fasten to roof deck.
  - 1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
- F. Install slip sheet over cover board and immediately beneath roofing.

### 3.5 ADHERED ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.
- B. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.
- D. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.
- E. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
  - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
  - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
  - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- F. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

### 3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.

- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### 3.7 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

### 3.8 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 54 23

ROOFING INSTALLERS WARRANTY

A. WHEREAS \_\_\_\_\_ of \_\_\_\_\_,

herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

- a. Owner: \_\_\_\_\_
- b. Address: \_\_\_\_\_
- c. Building Name/Type: \_\_\_\_\_
- d. Address: \_\_\_\_\_
- e. Area of Work: \_\_\_\_\_
- f. Acceptance Date: \_\_\_\_\_
- g. Warranty Period: \_\_\_\_\_
- h. Expiration Date: \_\_\_\_\_

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or directly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

- a. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
  - i. Lightning;
  - ii. Peak gust wind speed exceeding 120 mph (3-second gust);
  - iii. Fire;
  - iv. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
  - v. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;

- vi. Vapor condensation on bottom of roofing; and
  - vii. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
- b. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  - c. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  - d. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonable justifying a limitation or termination of this Warranty.
  - e. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
  - f. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
  - g. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

- a. Authorized Signature: \_\_\_\_\_
- b. Name: \_\_\_\_\_
- c. Title: \_\_\_\_\_

END OF WARRANTY





## SECTION 07 62 00 – SHEET METAL FLASHING AND TRIM

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
1. Counterflashings at Roofing Terminations (as detailed):
  2. Counterflashings at Curb-Mounted Roof Items, including: skylights and roof hatches (as detailed).
  3. Roofing Penetration Flashings for: Pipes, Structural Steel and Equipment Supports.
  4. Gutters and Downspouts (as detailed).
  5. Scuppers (as detailed):
  6. Coping, Cap, Parapet, Sill and Ledge Flashings (as detailed).
  7. Flashings Associated with roofing including: Cricket, Gutter Edge, Gravel Stops (as detailed).
  8. Fabricated Sheet Metal Items (as detailed).
  9. Reglets and Accessories: Fry Reglet type.
- B. Related Sections:
1. Section 07 54 19– Polyvinyl-Chloride (PVC) Roofing.
  2. Section 07 72 33 - Roof Hatches: Metal curbs.
  3. Section 07 92 00 - Joint Sealants: Sealants.
  4. Section 09 90 00 - Painting and Coating: Field painting.
  5. Divisions 22 and 23 - Hangers and Supports for HVAC Piping and Equipment: Roof curbs for mechanical equipment.
  6. Division 26 - Hangers and Supports for Electrical Systems: Roof curbs for electrical equipment.

#### 1.2 REFERENCES

- A. American Architectural Manufacturers Association:
1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
  2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  3. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
  4. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International:
1. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  2. ASTM A625 - Standard Specification for Tin Mill Products, Black Plate, Single Reduced.
  3. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  4. ASTM A755 - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Pre-painted by the Coil-Coating Process for Exterior Exposed Building Products.
  5. ASTM B32 - Standard Specification for Solder Metal.
  6. ASTM B101 - Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction.
  7. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  8. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
  9. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
  10. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

11. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
12. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.

C. Federal Specification Unit:

1. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

D. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - Architectural Sheet Metal Manual.

### 1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Product Data: Submit data on manufactured components metal types, finishes, and characteristics.

D. Samples:

1. Submit two samples 3 x 3 inch in size illustrating metal finish color.

### 1.4 QUALITY ASSURANCE

A. Qualifications

1. Fabricator and Installer: Company specializing in sheet metal work with minimum three years documented experience.

B. Pre-Installation Meetings

1. Section 01 31 00 – Project Management and Coordination.
2. Convene minimum one week prior to commencing work of this section.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials causing discoloration or staining.

### 1.6 COORDINATION

A. Section 01 31 00 – Project Management and Coordination.

B. Coordinate with Work of Division 3 and 4 for installing recessed flashing reglets.

## PART 2 PRODUCTS

### 2.1 DESIGN REQUIREMENTS

A. Sheet Metal Flashings: Conform to the following criteria of SMACNA "Architectural Sheet Metal Manual."

## 2.2 SHEET METAL FLASHING AND TRIM

- A. Approved Manufacturers - Preformed (Manufactured) Reglets and Counterflashing:
  - 1. Cheney Flashing Co.
  - 2. Keystone Flashing Co.
  - 3. Fry Reglet Corporation.
  - 4. Substitutions: Section 01 25 00 – Substitution Procedures.
- A. Galvanized Steel: ASTM A653; structural steel sheet, G90 zinc coating; 0.024 inch thick steel.
- B. Pre-Finished Galvanized Steel Sheet: ASTM A755; structural steel sheet, G90 zinc coating; 0.024 inch thick core steel, shop pre-coated with PVDF (polyvinylidene fluoride) coating.
  - 1. Color: Unless otherwise noted, all exposed sheet metal flashing and trim to be the same color and selected from manufacturer's standard range of colors.

## 2.3 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal.
- B. Underlayment: W.R. Grace Ice and Water Shield or approved equal.
- C. Slip Sheet: Rosin sized building paper.
- D. Primer: Zinc molybdate, Galvanized iron, or Iron oxide linseed oil to suit metal type.
- E. Protective Backing Paint: Zinc molybdate alkyd.
- F. Sealant: Butyl sealant specified in Section 07 92 00.
- G. Plastic Cement: ASTM D4586, Type I.
- H. Reglets: Surface mounted or Recessed type as indicated, galvanized steel manufactured by Fry Reglet or approved equal.
- I. Downspout Shoes: Steel.

## 2.4 FABRICATION

- A. Form sections shape indicated on Drawings, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet metal, interlocking with sheet.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- H. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and brake edges.

- I. Fabricate gutters to profile and size indicated.
- J. Fabricate downspouts to profile and size indicated.
- K. Fabricate accessories in profile and size as detailed to suit gutters and downspouts.
  - 1. Anchorage Devices:
  - 2. Gutter Supports:
  - 3. Downspout Supports:
- L. Fabricate splash pans of same metal type as downspouts, formed to size as detailed.
- M. Seal metal joints.

## 2.5 FACTORY FINISHING

- A. Fluoropolymer Coating: Multiple coat as specified for sheet metal system, thermally cured, conforming to AAMA 2604
- B. Washcoat: Finish concealed side of metal sheets with washcoat compatible with finish system, as recommended by finish system manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 – Project Management and Coordination.
- B. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- C. Verify roofing termination and base flashings are in place, sealed and secure.

### 3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets to lines and levels indicated on Drawings. Seal top of reglets with sealant.
- C. Paint concealed metal surfaces with protective backing paint to minimum dry film thickness of 15 mils.

### 3.3 INSTALLATION

- A. See Division 3 and 4 for installation of concealed reglets.
- B. Insert flashings into reglets to form tight fit. Secure in place with plastic wedges. Seal flashings into reglets with sealant.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Seal metal joints watertight.

- F. Secure gutters and downspouts in place using concealed fasteners.
- G. Slope gutters minimum 1/4 inch per foot or as detailed.
- H. Connect downspouts to downspout boots.
- I. Set splash blocks under downspouts.
- J. Seal metal joints watertight.

### 3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspection will involve surveillance of Work during installation to ascertain compliance with specified requirements.

### 1.2 SCHEDULE

- A. Copings
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 24 gage.
  - 3. Detail: As shown.
- B. Gutter
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 22 gage, .031 inch nominal thickness.
  - 3. Detail: As shown.
- C. Downspouts
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 22 gage, .031 inch nominal thickness.
  - 3. Size: 4" unless noted otherwise.
  - 4. Downspout Detail: As indicated.
- D. Conductor Heads
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 22 gage, .031 inch nominal thickness.
  - 3. Detail: As indicated.
- E. Scuppers
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 22 gage, .031 inch nominal thickness.
  - 3. Detail: As indicated.
- F. Flashings at Sill Pan
  - 1. Material: Aluminum at storefront and curtain wall.
  - 2. Fabrication to include seal-welded joints for leak-free assembly.
  - 3. Thickness: 24 gage.
  - 4. Color: To match storefront.
- G. Counterflashings at roof to wall transitions:
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 24 gage.
  - 3. Detail: As indicated.

- H. Wall to Wall Saddle Flashing:
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 22 gage, .031 inch nominal thickness.
  - 3. Detail: As indicated.
  
- I. Parapet Saddle Flashing:
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 24 gage.
  - 3. Detail: As indicated.
  
- J. Miscellaneous trims and flashing.
  - 1. Material: Pre-Finished Galvanized Steel Sheet.
  - 2. Thickness: 24 gage.
  - 3. Detail: As indicated.

END OF SECTION 07 62 00

## SECTION 07 72 33 – ROOF HATCHES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes prefabricated roof hatches, with integral support curbs, operable hardware, and counterflashings, with release mechanism.
- B. Related Sections:
  - 1. Section 06 10 53 – Miscellaneous Rough Carpentry: Wood framing for rough opening.
  - 2. Section 07 54 19 – Polyvinyl Chloride (PVC) Roofing – Fully Adhered.
  - 3. Section 07 62 00 - Sheet Metal Flashing and Trim: Flashing to roof system.
  - 4. Section 09 90 00 - Painting and Coating: Field painting.

#### 1.2 REFERENCES

- A. U.S. Department of Labor Occupational Safety & Health Administration:
  - 1. OSHA 29 CFR 1910.23 - Guarding floor and wall openings and holes.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on unit construction, sizes, configuration, jointing methods and locations when applicable, and attachment method.
- C. Manufacturer's Installation Instructions: Indicate special installation criteria and interface with adjacent components.

### PART 2 PRODUCTS

#### 2.1 DESIGN REQUIREMENTS

- A. Hatches to withstand 40 psf external live load and negative (uplift) design pressure of 20 to 50 psf.

#### 2.2 ROOF HATCHES

- A. Manufacturers:
  - 1. Babcock-Davis Hatchways.
  - 2. The Bilco Company.
  - 3. Dur Red Products.
  - 4. O'Keeffe's Inc.
  - 5. J.L. Industries.
  - 6. Nystrom.
  - 7. Substitutions: See Section 01 25 00 - Substitution Procedures.
- B. Product Description: Manufacturer's standard zinc-coated steel, with nominal 12 inch high integral curb, double-wall insulated type.
  - 1. Roof Hatches:

- a. Single Leaf Personnel Access: Bilco Type NB, 2'-6" x 4'-6" opening with ships ladder access.

## 2.3 COMPONENTS

- A. Integral Steel Curb: Minimum 14 gage galvanized, prime painted steel with nominal 1 inch rigid glass fiber or foam insulation; integral cap flashing to receive roof flashing; extended flange for mounting.
- B. Flush Steel Cover: Minimum 14 gage galvanized, prime painted steel; nominal 1 inch glass fiber or foam insulation; minimum 22 gage steel interior liner; continuous neoprene or vinyl gasket to provide weatherproof seal.
- C. Hardware: Manufacturer's standard finish:
  - 1. Compression spring operator and shock absorbers;
  - 2. Steel manual pull handle for interior and exterior operation;
  - 3. Steel hold open arm with vinyl covered grip handle for easy release,
  - 4. Padlock hasp.
  - 5. Hinges: Manufacturer's recommended type for specific type of roof hatch.

## 2.4 ACCESSORIES

- A. Anchorage Devices: Type recommended by manufacturer.
- B. Counterflashings: Integral at curb.
- C. Protective Coating: Red oxide prime paint or manufacturer's standard corrosion resistant finish.
- D. Sealant: Manufacturer's recommended sealants integral with roof hatch installation, non-hardening, non-skinning, non-drying, non-migrating butyl based sealants.
- E. Ladder Safety Post: Telescoping, tubular steel with locking mechanism in full upright position; Model LU-1 Ladder Up® by Bilco, Model LP-4® by J.L. Industries, or approved equal.

## 2.5 FABRICATION

- A. Fabricate components free of visual distortion and free of defects. Weld corners and joints.
- B. Provide for condensation occurring within components and within assembly to drain to exterior above roofing.
- C. Fit components for weather tight assembly.
- D. Sloped Roofs: Fabricate roof hatch curbs tapered to maintain hatch top level.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify openings and substrate conditions are ready to receive Work of this section.



### 3.2 INSTALLATION

- A. Install curb assembly, fastening securely to roof decking. Flash curb assembly into roofing system.
- B. Place roof hatch and secure to curb assembly. Install integral setting sealant and counterflashing as required.
- C. Final installation to be watertight assembly.
- D. Coordinate with installation of roofing system and related flashings for weather tight installation.
- E. Lubricate hinges for smooth operation. Adjust cover to open and close properly.

### 3.3 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Wash down exposed surfaces; wipe surfaces clean.
- C. Remove excess sealant.

END OF SECTION 07 72 33



## SECTION 07 84 00 - FIRESTOPPING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes firestopping for through penetrations and top/bottom of fire rated wall, barrier and partitions.
- B. Related Sections:
  - 1. Section 07 26 00 - Vapor Retarders: Vapor retarder materials to adjacent insulation.
  - 2. Section 09 21 16 - Gypsum Board Assemblies: Gypsum board fireproofing.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
  - 4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.
- B. Firestop Contractors International Association (FCIA): MOP, Manual of Practice.
- C. Intertek Testing Services (Warnock Hersey Listed):
  - 1. WH - Certification Listings.
- D. National Fire Protection Association:
  - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- E. Underwriters Laboratories Inc.:
  - 1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
  - 2. UL 1479 - Fire Tests of Through-Penetration Firestops.
  - 3. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
  - 4. UL - Fire Resistance Directory.

#### 1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.
- B. Mortar and grout: Fill for firestopping permitted in masonry and concrete surfaces.
- C. UL: Underwriters Laboratories Inc.
- D. WH: Intertek's Warnock Hersey

#### 1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Product Data: Submit data on product characteristics, performance and limitation criteria.
- C. Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- D. Manufacturer's Installation Instructions: Submit preparation and installation instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements and applicable code requirements.
- F. Engineering Judgments: For conditions not covered by UL or WH listed designs, submit judgments by licensed professional firestop engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

#### 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain firestop systems for each kind of penetration and construction condition indicated from a single primary firestop systems manufacturer.
- B. Materials of different manufacture other than allowed by the tested and listed systems shall not be intermixed in the same firestop system or opening.
- C. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch water gage (24.9 Pa) minimum positive pressure differential to achieve fire F-Ratings as indicated on Drawings, but not less than 1-hour.
  - 1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
  - 2. Floor and Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
    - a. Floor Penetrations Within Wall Cavities: T-Rating is not required.
- D. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.
  - 1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
  - 2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.
- E. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.
- F. Fire Resistant Joints Between Floor Slabs and Exterior Walls: ASTM E119 with 0.10 inch water gage (24.9 Pa) minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.
- G. Surface Burning Characteristics: Maximum 15/60 flame spread/smoke developed index when tested in accordance with ASTM E84, NFPA 255, or UL 723.

H. Qualifications

1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
2. Installer: Company specializing in performing Work of this section with minimum five years documented experience, and accredited by manufacturer.
  - a. UL or FM 4991 Certified installers.

I. Mockup

1. Section 01 40 00 - Quality Requirements: Requirements for mockup.
2. Apply 3 linear ft of each type of linear firestopping material to representative substrate surface.
3. Apply one of each unit type of firestopping material, such as penetrations through fire rated assembly, to representative application.
4. Locate where directed by Architect.
5. Incorporate accepted mockup as part of Work.

J. Pre-Installation Meetings

1. Section 01 31 00 – Project Management and Coordination: Pre-installation meeting.
2. Convene minimum one week prior to commencing work of this section.
3. Attendance: Contractor, Installer, Owner, Architect, Manufacturer's Representative, Firestopping Installer and those requested to attend.
4. Agenda: Verify and adjust firestopping systems and construction of penetrations, construction joints, and perimeter fire containment systems of fire-resistive rated construction to meet and verify provision of this Section.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Do not apply materials when temperature of substrate material and ambient air is below 40 degrees F.
- C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of materials.
- D. Provide ventilation in areas to receive solvent cured materials.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Hilti Construction Chemicals, Inc.
- B. Grace Flamesafe.
- C. Specified Technologies, Inc. (STI).
- D. 3M Fire Protection Products.

- E. Tremco Tremstop.
- F. Substitutions: See Section 01 25 00 Substitution Procedures.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Conform to applicable UL and WH listings fire resistance ratings and surface burning characteristics.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

## 2.3 MATERIALS

- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- C. Use only firestop products that have been UL 1479, ASTM E814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- D. Product Description:
  - 1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound.
  - 2. Foam Firestopping Compounds: Two component foam compound.
  - 3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
  - 4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
  - 5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
  - 6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
  - 7. Firestop Bricks: Formed mineral fiber bricks.
- E. Pre-installed firestop devices for use with noncombustible and/or combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors, the following products are acceptable:
  - 1. Hilti CP 680P or CP 680M Cast-In Place Firestop Devices:
    - a. Add Aerator adapter when used in conjunction with an Aerator (Solvent system)
    - b. Add metal deck adapter kit if utilizing CP 680P or M on corrugated metal deck.
    - c. Add height extension if utilizing CP 680P or M in concrete slabs thicker than 8".
    - d. Add Hilti Water Module (2" up to 6") to achieve UL W-Rating
    - e. Add Hilti TOP SEAL (1/2" up to 2") to achieve UL W-Rating
  - 2. Hilti CP 681 Tub Box Kit for use with bath tub installations.
  - 3. Hilti Toilet Flange for use with floor outlet water closets.
  - 4. Hilti coupling sleeve for use with floor, shower or general purposes drains

- F. Telecommunications cabling shall be sealed with non-curing, re-penetrable intumescent putty or foam material, the following products are acceptable
  - 1. Hilti CP 618 Firestop Putty Stick
  - 2. Hilti CP 658 Firestop Plug
  
- G. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. Hilti CP 604 Self-leveling Firestop Sealant
  - 3. Hilti CP 620 Fire Foam
  - 4. Hilti CP 606 Flexible Firestop Sealant
  - 5. Hilti CP 601S Elastomeric Firestop Sealant
  
- H. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
  - 1. Hilti CP 601S Elastomeric Firestop Sealant
  - 2. Hilti CP 606 Flexible Firestop Sealant
  - 3. Hilti FS-ONE Intumescent Firestop Sealant
  
- I. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
  - 1. Hilti CP 672 Speed Spray
  - 2. Hilti CP 672 FC "FAST CURE" Speed Spray
  - 3. Hilti CP 601 S Elastomeric Firestop Sealant
  - 4. Hilti CP 606 Flexible Firestop Sealant
  - 5. Hilti CP 604 Self-leveling Firestop Sealant
  
- J. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.
  - 1. Hilti CP 777 Speed Plugs
  - 2. Hilti CP 767 Speed Strips
  
- K. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  
- L. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. Hilti CP 620 Fire Foam
  - 3. Hilti CP 601S Elastomeric Firestop Sealant
  - 4. Hilti CP 606 Flexible Firestop Sealant
  
- M. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti CP 618 Firestop Putty Stick
  - 2. Hilti CP 658 Firestop Plug
  
- N. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
  - 1. Hilti CP 617 Firestop Putty Pad
  - 2. Hilti Firestop Box Insert
  - 3. Hilti FS 657 FIRE BLOCK
  
- O. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

1. Hilti CP 643 N Firestop Collar
2. Hilti CP 644 Firestop Collar
3. Hilti CP 648E Endless Wrap Strips
4. Hilti CP 648S Single Wrap Strips

P. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti CP 637 Firestop Mortar
2. Hilti FS 657 FIRE BLOCK
3. Hilti CP 620 Fire Foam
4. Hilti CP 675T Firestop Board

Q. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti FS 657 FIRE BLOCK
2. Hilti CP 675T Firestop Board

R. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:

1. Hilti CP 672 Speed Spray
2. Hilti CP 601S Elastomeric Firestop Sealant
3. Hilti CP 606 Flexible Firestop Sealant
4. Hilti CP 604 Self-Leveling Firestop Sealant

S. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:

1. Hilti FS 657 FIRE BLOCK
2. Hilti CP 658T Firestop Plug

T. Color: As selected from manufacturer's entire range of colors.

## 2.4 ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Backing Material: Permanent:

1. Mineral fiberboard.
2. Mineral fiber matting.
3. Mineral Wool.

C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination: Coordination and project conditions.

B. Verify openings are ready to receive firestopping.



### 3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, water or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Install backing or damming materials to arrest liquid material leakage.

### 3.3 APPLICATION

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating to uniform density and texture.
- D. Compress fibered material per manufacturer's instructions.

### 3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements and Section 01 73 00 - Execution: Field inspecting, testing, adjusting, and balancing.
- B. Inspect installed firestopping for compliance with specifications and submitted schedule.
- C. Manufacturer: Provide letter stating representative has visited the site and confirms installation of products identified in this Section is complete.

### 3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Clean adjacent surfaces of firestopping materials.

### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 84 00



## SECTION 07 92 00 – JOINT SEALANTS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Sealants and joint backing.
  - 2. Pre-compressed foam sealers.
  - 3. Hollow gaskets.
  - 4. Accessories.
  
- B. Related Sections:
  - 1. Section 07 26 00 –Vapor Retarders: Sealants required in conjunction with vapor retarders.
  - 2. Section 07 27 15 – Non Bituminous Self-Adhering Sheet Air Barriers: Sealants required in conjunction with air barriers.
  - 3. Section 07 84 00 - Firestopping: Firestopping sealants.
  - 4. Section 08 80 00 - Glazing: Glazing sealants and accessories.
  - 5. Section 09 21 16 - Gypsum Board Assemblies: Acoustic sealant.
  - 6. Section 09 30 00 - Tiling: Sealant used as tile grout.

#### 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM C834 - Standard Specification for Latex Sealants.
  - 2. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.
  - 3. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
  - 4. ASTM C1193 - Standard Guide for Use of Joint Sealants.
  - 5. ASTM D1056 - Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
  - 6. ASTM D1667 - Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
  - 7. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
  
- B. South Coast Air Quality Management District:
  - 1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
  
- B. Products Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
  
- C. Samples: Submit two samples, 2 x 1/4 inch in size illustrating sealant colors for each product selection.

- D. Manufacturer's Installation Instructions: Submit special procedures, surface preparation, and perimeter conditions requiring special attention.
- E. Warranty: Include coverage for installed sealants and accessories failing to achieve airtight or watertight seal, exhibit loss of adhesion or cohesion, and sealants which do not cure.
- F. Section 01 77 00 - Closeout Procedures.
- G. Manual for Materials and Finishes: Submit locations, types and frequency for inspection and maintenance of sealants. Provide instructions for repairing and replacing failed sealant joints.

#### 1.4 QUALITY ASSURANCE

- A. Qualifications
  - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
  - 2. Applicator: Company specializing in performing Work of this section with minimum three years documented experience, and approved by manufacturer.
- B. Mockup
  - 1. Section 01 40 00 - Quality Requirements: Requirements for mockup.
  - 2. Construct mockup of sealant joints in conjunction with mockups specified in other sections.
  - 3. Construct mockup with specified sealant types and with other components noted.
    - a. Determine preparation and priming requirements based on manufacturers recommendations; take action necessary for correction of failure of sealant tests on mock-up.
    - b. Verify sealants, primers, and other components do not stain adjacent materials.
  - 4. Locate where directed by Architect/Engineer unless location is indicated on the Drawings.
  - 5. Incorporate accepted mockup as part of Work unless noted otherwise.
  - 6. Remove mockup when directed by Architect/Engineer.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

#### 1.6 COORDINATION

- A. Section 01 31 00 – Project Management and Coordination.
- B. Coordinate Work with sections referencing this section.

## PART 2 PRODUCTS

### 2.1 JOINT SEALERS

- A. Manufacturers:
1. Dow Corning Corp.
  2. GE Silicones
  3. Pecora Corp.
  4. Sika Corp.
  5. Tremco Sealants & Waterproofing
  6. BASF, Master Builders Solutions.
  7. Bostik.
  8. US Gypsum.
  9. Substitutions: See Section 01 25 00 - Product Requirements
- B. Products Description:
1. **Type A (Acoustical)** – Refer to Section 07 92 19.
  2. **Type B (Butyl)** Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, non-drying, non-skinning, non-curing.
    - a. Bostik, Chem-Calk 300.
    - b. Tremco, Butyl Sealant.
    - c. Applications: Use for concealed sealant bead in sheet metal work and concealed sealant bead in siding overlaps.
  3. **Type G (Gasket)** Exterior Compressible Gasket Expansion Joint Sealer Pre-compressed Joint sealant: Silicone coated polyurethane foam.
    - a. Construction Specialties, Type: VF.
    - b. Color: As selected from manufacturer's full line.
    - c. Size and Shape: As indicated on Drawings.
    - d. Applications: Use for exterior wall expansion joints.
  4. **Type GI (General Interior)** General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, single component, paintable.
    - a. Pecora, AC-20 + Silicone.
    - b. Tremco, Tremflex 834.
    - c. Color: Colors as selected from manufacturer's full line.
    - d. Applications: Use for interior wall and ceiling control joints, joints between door and window frames and wall surfaces, and other interior joints for which no other type of sealant is indicated.
      - a. Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
  5. **Type GP (General Polyurethane)** General purpose Polyurethane sealant: One component, nonpriming, elastomeric, gun-grade; ASTM C920, Type S, Grade NS, Class 35; Uses T, NT, M, A, G and O.
    - a. Masterseal NP1.
    - b. Exterior Applications: expansion joints, precast units, aluminum and wood curtain walls, roofing, Fascia, Parapets, structural components.
    - c. Color as selected from manufacturer's full line.
  6. **Type HP (Hybrid Polyurethane)** High Performance hybrid polyurethane sealant: One component, nonpriming, elastomeric, gun grade; ASTM C920, Type S, Grade NS, Class 50; Use NT,M, A, O.
    - a. BASF MasterSeal NP100
    - b. Exterior Applications: expansion joints, precast units, metal, coated metal (Kynar), curtain walls, vinyl, cement board & wood siding, window & door frames. Color as selected from manufacturer's full line.

7. **Type GS (General Silicone)** High Performance General Purpose Exterior (Non-traffic) Sealant: Silicone; ASTM C920, Grade NS, Type S, Class 100/50, Uses M, G, and A; single component.
  - a. Dow Corning 790.
  - b. Pecora 864 NST.
  - c. Tremco Spectrem 1.
  - d. Color: Colors as selected from manufacturer's full line.
  - e. Applications: Use for:
    - 1) Control, expansion, and soft joints in masonry.
    - 2) Joints between concrete and other materials.
    - 3) Joints between metal frames and other materials.
    - 4) Other exterior non-traffic joints for which no other sealant is indicated.
8. **Type T (Traffic)** General Purpose Traffic Bearing Sealant: Polyurethane; ASTM C920, Grade P, Class 25, Use T; single component.
  - a. Pecora, Urexpan NR-200.
  - b. Tremco, Vulkem 45 SSL.
  - c. Color: Colors as selected from manufacturer's full line.
  - d. Applications: Use for exterior and interior pedestrian and vehicular traffic bearing joints.
    - 1) Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
9. **Type W (Wet)** Bathtub/Tile Sealant: White silicone; ASTM C920, Type S, Grade NS, Class 50/25, Uses M and A; single component, mildew resistant.
  - a. Dow Corning 786 Silicone sealant.
  - b. Pecora 898.
  - c. Tremco Tremsil 200.
  - d. Color: Colors as selected from manufacturer's full line.
  - e. Applications: Use for joints between plumbing fixtures and floor and wall surfaces, and joints between kitchen and toilet room counter tops and wall surfaces.
    - 1) Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.

## 2.2 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
  1. Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant;
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Sand: Provide sand finish at Concrete and Masonry Joints: Apply sand of color, appearance, and texture matching mortar sand. Completely cover joint sealant.

## 2.3 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Unless otherwise specified, match color of adjacent material occurring in same plane. Where joints occur adjacent to two or more material colors in same plane, match color of lighter adjacent material, unless otherwise directed. Custom colors for exposed sealants may be required if standard colors are not acceptable to the Architect.
- C. Sealant for Face Brick: Sealant must have been tested by the manufacturer for staining of face brick, resulting in no discoloration or change in appearance of the joint substrate due to fluid migration.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 – Project Management and Coordination.
- B. Verify substrate surfaces and joint openings are ready to receive work.
- C. Verify joint backing and release tapes are compatible with sealant.

### 3.2 PREPARATION

- A. Remove loose materials and foreign matter impairing adhesion of sealant.
- B. Clean joints.
- C. Prime joints if required for a specific sealant or substrate as recommended by the sealant manufacturer.
- D. Perform preparation in accordance with ASTM C1193.
- E. Protect elements surrounding Work of this section from damage or disfiguration.

### 3.3 INSTALLATION

- A. Perform installation in accordance with ASTM C1193.
- B. Perform acoustical sealant application work in accordance with ASTM C919.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker where joint backing is not used.

- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.
- H. Pre-compressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.
- I. Compression Gaskets: Avoid joints except at ends, corners, and intersections; seal joints with adhesive; install with face 1/8 to 1/4 inch below adjoining surface.

### 3.4 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Clean adjacent soiled surfaces.

### 3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction.
- B. Protect sealants until cured.

### 3.6 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Perform field-test of joint-sealant in accordance with test recommended in ASTM C 1193, except as modified below. Method described is similar to method described in less detail in AAMA's "Aluminum Curtain Wall Series No. 13" and in SWRI's "Sealants: The Professionals' Guide."
  - 1. Extent of Testing: Perform 10 tests for the first 1000 feet of joint length for each type of elastomeric sealant and joint substrate.
- B. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### 3.7 SCHEDULE

- A. Exterior Joints for Which No Other Sealant Type is Indicated: Type GS.
- B. Control and Expansion Joints in Paving: Type T.
- C. Exterior Wall Seismic Movement Joints: Type G.
- D. Exterior Wall Expansion Joints: Type G
- E. Exterior Joints Between Wood and Wood: Type GP.



- F. Joints Between Concrete Panels and Between Panels and Adjacent Work: Type GS.
- G. Control, Expansion, and Soft Joints in Masonry, and Between Masonry and Adjacent Work: Type GS with Sand.
- H. Lap Joints in Exterior Sheet Metal Work: Type B.
- I. Butt Joints in Exterior Metal Work and Siding: Type B.
- J. Joints between Exterior Metal Frames and Adjacent Work (except masonry): Type GS.
- K. Under Exterior Door Thresholds: Type B.
- L. Interior Joints for Which No Other Sealant is Indicated: Type GI.
- M. Control and Expansion Joints in Concrete Slabs and Floors: Type T.
- N. Joints between Plumbing Fixtures and Walls and Floors, and Between Counter tops and Walls: Type W.
- O. In STC-Rated Walls, Between Metal Stud Track/Runner and Adjacent Construction. Between Outlet Boxes and Gypsum Board: Type A.

END OF SECTION 07 92 00



## SECTION 07 92 19 - ACOUSTICAL JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes acoustical joint sealants.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each acoustical joint sealant.
- B. Acoustical-Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranties.

#### 1.4 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace acoustical joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish acoustical joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Provide acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E 90.

## 2.2 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C 834.
1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. [GE Construction Sealants; Momenive Performance Materials Inc.](#)
    - b. [Hilti, Inc.](#)
    - c. [Pecora Corporation.](#)
    - d. [Tremco Incorporated.](#)
    - e. [United States Gypsum Company.](#)
    - f. Substitutions: See Section 01 25 00 – Substitution Procedures.
  2. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.
- B. Primer: Material recommended by acoustical-joint-sealant manufacturer where required for adhesion of sealant to joint substrates.
- C. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- D. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where recommended by acoustical-joint-sealant manufacturer.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

### 3.2 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

- A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.
- B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C 919, ASTM C 1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.
- C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

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END OF SECTION 07 92 19



## SECTION 07 95 00 - EXPANSION CONTROL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Interior expansion control systems.

#### 1.2 ACTION SUBMITTALS

- A. Shop Drawings: For each expansion control system specified. Include plans, elevations, sections, details, splices, blockout requirement, attachments to other work, and line diagrams.
- B. Samples: For each exposed expansion control system and for each color and texture specified.

### PART 2 - PRODUCTS

#### 2.1 SYSTEM DESCRIPTION

- A. General: Provide expansion control systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where expansion control systems change direction or abut other materials.
  2. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion control systems.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Where indicated, provide expansion control systems with fire barriers identical to those of systems tested for fire resistance per UL 2079 or ASTM E 1966 by a testing and inspecting agency acceptable to authorities having jurisdiction.
1. Hose Stream Test: Wall-to-wall and wall-to-ceiling systems shall be subjected to hose stream testing.

#### 2.3 INTERIOR EXPANSION CONTROL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
  2. Balco, Inc.
  3. Construction Specialties, Inc.
  4. Substitutions: See Section 01 25 00 Substitution Procedures.

- B. Source Limitations: Obtain expansion control systems from single source from single manufacturer.

C. Floor-to-Floor:

1. Basis-of-Design Product: Construction Specialties.
2. Design Criteria:
  - a. Nominal Joint Width: As indicated on Drawings.
  - b. Minimum Joint Width: As indicated on Drawings.
  - c. Maximum Joint Width: As indicated on Drawings.
  - d. Movement Capability: As indicated on Drawings.
  - e. Type of Movement: As indicated on Drawings.
  - f. Load Capacity:
    - 1) Uniform Load: 150 lb/sq. ft. (732 kg/sq. m).
    - 2) Concentrated Load: 2000 lb (907 kg).
    - 3) Maximum Deflection: 0.5 inch (13 mm).
  - g. Fire-Resistance Rating: Provide expansion control system and fire-barrier assembly with a rating not less than that of adjacent construction.
3. Type: As indicated on Drawings.
  - a. Cover-Plate Design: Plain.
  - b. Metal: Aluminum.
    - 1) Finish: Clear anodic, Class I Color anodic, Class I Color anodic, Class II Manufacturer's standard Insert finish.
  - c. Seal Material: Manufacturer's standard.
    - 1) Color: As selected by Architect from manufacturer's full range.

2.4 MATERIALS

- A. Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063-T5 for extrusions; ASTM B 209 (ASTM B 209M), Alloy 6061-T6 for sheet and plate.
  1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
- B. Elastomeric Seals: ASTM E 1783; preformed elastomeric membranes or extrusions to be installed in metal frames.
- C. Compression Seals: ASTM E 1612; preformed elastomeric extrusions having an internal baffle system and designed to function under compression.
- D. Cellular Foam Seals: Extruded, compressible foam designed to function under compression.
- E. Elastomeric Concrete: Modified epoxy or polyurethane extended into a prepackaged aggregate blend, specifically designed for bonding to concrete substrates.
- F. Fire Barriers: Any material or material combination to meet performance criteria for required fire-resistance rating.
- G. Moisture Barrier: Flexible elastomeric material.



- H. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M.
- I. Accessories: Manufacturer's standard anchors, clips, fasteners, and other accessories as indicated or required for complete installations.

## 2.5 ALUMINUM FINISHES

- A. Mill finish.
- B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prepare substrates according to expansion control system manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion control systems.
- C. Cast-In Frames: Coordinate and furnish frames to be cast into concrete.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion control systems and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion control systems.
  - 1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
  - 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper expansion control system installation and performance.
  - 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
  - 4. Repair or grout blockout as required for continuous frame support using nonmetallic, shrinkage-resistant grout.
  - 5. Install frames in continuous contact with adjacent surfaces.
    - a. Shimming is not permitted.
  - 6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches (75 mm) from each end and not more than 24 inches (600 mm) o.c.
- C. Seals in Metal Frames: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
  - 1. Provide in continuous lengths for straight sections.
  - 2. Seal transitions according to manufacturer's written instructions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.

3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Foam Seals: Install with adhesive recommended by manufacturer.
- E. Terminate exposed ends of expansion control systems with field- or factory-fabricated termination devices.
- F. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion control system materials and associated work so complete assemblies comply with assembly performance requirements.
1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

### 3.3 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete.
- B. Protect the installation from damage by work of other Sections.

END OF SECTION 07 95 00

## SECTION 08 12 14 – STANDARD STEEL FRAMES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes fire rated and non-rated steel frames.
  - 1. Provide frames for interior glazed lights.
  - 2. Provide frames for rated and non-rated interior and exterior doors.
  
- B. Related Sections:
  - 1. Section 04 22 00 - Concrete Unit Masonry: Installing anchors and grouting frames in masonry construction.
  - 2. Section 04 26 13 - Masonry Veneer: Installing anchors and grouting frames in masonry construction.
  - 3. Section 07 21 16 - Blanket Insulation: Sound insulation for metal frames.
  - 4. Section 08 13 14 - Standard Steel Doors: Metal doors manufactured according to the Hollow Metal Manufacturers Association's standards.
  - 5. Section 08 14 16 - Flush Wood Doors: Retaining applicable fabrication requirements for hollow and solid core wood doors installed in steel door frames.
  - 6. Section 08 71 00 - Door Hardware: Hardware, silencers and weatherstripping.
  - 7. Section 08 80 00 - Glazing: Glass in frames.
  - 8. Section 09 21 16 - Gypsum Board Assemblies: Steel framing in gypsum board partitions.
  - 9. Section 09 90 00 - Painting and Coating: Field painting factory-primed frames.

#### 1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI/BHMA A156.115 - Standard for Hardware Preparation in Steel Doors and Steel Frames.
  - 2. ANSI A 250.6- Hardware on Standard Steel Doors.
  - 3. ANSI A 250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
  
- B. American Society for Testing and Materials:
  - 1. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process.
  - 2. ASTM C518 - Standard for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
  - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  
- C. Door Hardware Institute:
  - 1. The Installation of Commercial Steel Doors and Steel Frames.
  
- D. National Fire Protection Association:
  - 1. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
  
- E. Steel Doors Institute:
  - 1. SDI-100 Rev. ANSI A250.8 Standard Steel Doors and Frames.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.

- B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.
- C. Section 01 77 00 – Closeout Procedures.
- D. Manual for Materials and Finishes: Include dent and scratch repair.

#### 1.4 QUALITY ASSURANCE

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

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Delivery Requirements: Storage and Handling.
- B. Accept frames on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on-site to permit ventilation.
- D. Maintain protected area on site for storage of frames to be installed. Door frames must be stored on pallets or wood sleepers. Do not store directly on earth or concrete.
- E. Handle frames in such a way as to avoid damage or scratches.
- F. Any rust discovered on door frames during construction will result in rejection and replacement of door frame.

### PART 2 PRODUCTS

#### 2.1 STANDARD STEEL FRAMES

- A. Manufacturers:
  - 1. Curries Assa Abloy.
  - 2. Republic Doors.
  - 3. Steelcraft.
  - 4. Stiles.
- B. Substitutions: See Section 01 25 00 - Substitution Procedures.
- C. Product Description: Standard shop fabricated primed or galvanized steel frames, rated and non-rated types.
  - 1. Exterior Frames:

- a. Level III, nominal 16 gage/0.053 inch thick material, base metal thickness. Galvanized.
2. Interior Frames:
  - a. Level III, nominal 16 gage/0.053 inch thick material, base metal thickness. Primed.

## 2.2 ACCESSORIES

- A. Removable Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.
- B. Primer: ANSI/SDI Standard A250.10 factory applied.
- C. Silencers: Specified in Section 08 71 00 - Door Hardware.
- D. Weatherstripping and Smoke Seals: Specified in Section 08 71 00 - Door Hardware.
- E. Interior Door Frames Sound Deadening Insulation: Fiberglass batt or mineral wool.
- F. Exterior Door Frames Thermal Insulation : Low expansion, foam-in-place insulation, similar to "Icynene" (Spray or Pour Formula) manufactured by The Icynene Insulation System (905) 890-7325, or approve equal meeting the following:
  1. Thermal Value (ASTM C518): R 3.6 hr/sq-ft./degrees F/BTU
  2. Corrosion: No significant corrosion when in contact with steel under 85% relative humidity.
  3. Bacterial or fungal Growth: No growth; no material deterioration.
  4. Fire Characteristics ASTM E84: Flame Spread <20; Smoke Developed <200.
  5. Water Absorption: Will not wick water.

## 2.3 PROVISION FOR HARDWARE

- A. Hardware Reinforcement: Conform to ANSI A156.115 and ANSI A250.6. Factory reinforce, drill, and tap frames to receive mortised hinges, continuous hinges (exterior doors only), locks, latches, flush bolts, and concealed door closers.
- B. Use hardware templates furnished by hardware manufacturer.
- C. Hardware Reinforcing: Steel, meet or exceed following:
  1. Hinges: 7 gauge.
  2. Surface Closers: 12 gauge plate reinforcements welded to frames according to type of door closer installation.
- D. Door Silencers: Drill door frame stops to receive silencers at each door swing. Insert plastic plugs to keep holes open during painting and construction activities.
- E. Plaster Guards: Provide at silencers, strike pockets, and hinge reinforcements.
- F. Finish Hardware Locations: Refer to Section 08 71 00 - Door Hardware.
- G. Field Tapping and Drilling: Accepted at surface-applied hardware.

## 2.4 FABRICATION

- A. Fabricate frames as full welded units. Knock down frames are not acceptable.
- B. Mullions for Double Doors: Removable type, of same profiles as jambs.
- C. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.

- D. Fabricate frames with hardware reinforcement plates welded in place. Provide. Provide mortar guard boxes. Provide heavy duty hinge plate reinforcements with a minimum of 1" continuous weld at top and bottom.
- E. Plaster Guards: Weld 16 gauge steel plaster guards or mortar boxes to frame at back of finish hardware cutouts where finish materials might obstruct hardware operation.
- F. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- G. Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.
- H. Do not provide silencers on frames to be provided with smoke seals or conflicting weatherstripping.
- I. Attach fire rated label to each fire rated frame.
- J. Fabricate frame profiles as detailed on the drawings.

## 2.5 SHOP FINISHING

- A. Thoroughly clean and chemically treat for maximum adhesion.
- B. Exterior Frames: Compatible with finish paint specified Section 09 90 00 - Painting and Coating.
  - 1. Galvanizing: ASTM A653, A60 galvanized. Wipe coat galvanized steel (WCGS) coating systems not accepted.
- C. Interior Frames: Compatible with finish paint specified of Section 09 90 00 - Painting and Coating.
  - 1. Baked-On Shop Primer: ANSI/SDI Standard A250.10 factory applied, baked-on rust inhibiting paint. Color: Light gray.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify opening sizes and tolerances are acceptable.

### 3.2 FRAMES INSTALLATION

- A. Install frames in accordance with SDI-100 and DHI. Countersink anchor screws, putty, prime and paint to provide concealed anchor finish.
- B. Coordinate with masonry, steel stud or concrete wall construction for anchor placement.
- C. Coordinate installation of glass and glazing specified in Section 08 80 00 - Glazing.
- D. Coordinate installation of frames with installation of hardware specified in Section 08 71 00 - Door Hardware, and doors in Section 08 13 14 - Standard Steel Doors.
- E. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
- F. Install fiberglass insulation in non-rated frames, and mineral wool in rated frames, for sound deadening.

### 3.3 ERECTION TOLERANCES

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

### 3.4 CLEANING

- A. Thoroughly clean surfaces. Sand scarred and rusty areas smooth and touch up with compatible primer to shop primer and finish paint as specified in Section 09 90 00 – Painting and Coating.

### 3.5 SCHEDULE

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

END OF SECTION 08 12 14





## SECTION 08 13 14 – STANDARD STEEL DOORS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes non-rated and rated interior and exterior steel doors.
- B. Related Sections:
  - 1. Section 08 12 14 - Standard Steel Frames: Metal frames manufactured according to the Hollow Metal Manufacturers Association's standards.
  - 2. Section 08 71 00 - Door Hardware: Hardware, silencers and weatherstripping.
  - 3. Section 09 90 00 - Paints and Coating: Field painting factory-primed doors.

#### 1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI/BHMA A156.115 - Standard for Hardware Preparation in Steel Doors and Steel Frames.
  - 2. ANSI 250.4 - Test Procedures for and Acceptance Criteria for Physical Evidence for Steel Doors and Reinforcement.
  - 3. ANSI A 250.6- Hardware on Standard Steel Doors.
  - 4. ANSI/SDI Standard A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- B. American Society for Testing and Materials:
  - 1. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process.
  - 2. ASTM C1363 – Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by means of a Hot Box Apparatus.
- C. Door Hardware Institute:
  - 1. The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- D. National Fire Protection Association:
  - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
  - 2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- E. Steel Door Institute:
  - 1. SDI 100 Rev. ANSI 250.8 - Standard Steel Doors and Frames.
  - 2. SDI 108 Recommended Selection and Usage Guide for Standard Steel Doors.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 – See Submittal Procedures.
- B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, cut-outs for glazing, and finishes.
- C. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement.
- D. Section 01 77 00 - Closeout Procedures.

- E. Manual for Materials and Finishes: Submit recommended areas to be inspected and inspection intervals. Include dent and scratch repair.

#### 1.4 QUALITY ASSURANCE

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

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements.
- B. Protect doors with resilient packaging sealed with heat shrunk plastic.
- C. Break seal on site to permit ventilation.
- D. Any rust discovered on doors during construction will result in the rejection of door and require replacement.

#### 1.6 COORDINATION

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

### PART 2 PRODUCTS

#### 2.1 STANDARD STEEL DOORS

- A. Manufacturers:
  - 1. Curries Assa Abloy.
  - 2. Republic Doors.
  - 3. Steelcraft.
  - 4. Stiles.
- B. Substitutions: See Section 01 25 00 - Substitution Procedures.
- C. Product Description:
  - 1. Exterior Doors (Thermally Insulated): SDI-100. 1-3/4" thick.

- a. Level 4 - Maximum Duty, Model 2, seamless design.
2. Interior Doors (Non-Rated): SDI-100, 1-3/4 inch thick.
  - a. Level 3 – Extra Heavy Duty, Model 2, seamless design.
3. Interior Doors (Fire Rated): SDI 108, 1-3/4 inch thick.
  - a. Level 3- Extra Heavy Duty, Model 2, seamless design.

## 2.2 PROVISION FOR HARDWARE

- A. Hardware Reinforcement: Conform to ANSI A156.115 and ANSI A250.6. Factory reinforce, drill, and tap doors to receive mortised hinges, continuous hinges (exterior doors only), locks, latches, flush bolts, and concealed door closers.
- B. Use hardware templates furnished by hardware manufacturer.
- C. Hardware Reinforcing: Steel, meet or exceed following:
  1. Hinges: 10 gauge or 12 gauge channel, full door height, with equivalent threads.
  2. Locks: 12 gauge or equivalent number of threads.
  3. Surface Closers: 12 gauge by 5-1/4 inch wide U-Channel reinforcement welded to door end channels. Flat reinforcements not accepted.
  4. Hold Open Arms: 12 gauge U-Channel.
  5. Panic Devices: 14 gauge U-Channels at fastening positions.
  6. Floor Check Hinges and Pivots: 7 gauge.
- D. Finish Hardware Locations: Refer to Section 08 71 00 - Door Hardware.
- E. Field Tapping and Drilling: Accepted at surface-applied hardware.

## 2.3 FABRICATION

- A. Exterior Doors: ANSI A250.8/SDI-100, Level 4, Model 2 (Seamless Design). Passing ANSI A250.4 Acceptance Criteria, Level A (1 million cycles).
  1. Face Sheets: 14 gauge steel.
  2. Core Design: Fiberglass; R-Value of 2.5 minimum, measured in accordance with ASTM C1363.
  3. Vertical Internal Stiffening: 20 gauge steel hat channels, space 6 inches on center, spot weld to skins.
  4. Vertical Edge Reinforcement: One piece, continuously arc welded full length to face sheets.
    - a. Lock Channel: 14 gauge steel, beveled 1/8 inch in 2 inch.
    - b. Hinge Channel: 12 gauge steel, formed and tapped for continuous hinges.
  5. Top and Bottom Channel Reinforcement: 16 gauge steel.
  6. Top Rail Closure Channel: 16 gauge steel with flush channel filler cap sealed against water penetration.
- B. Interior Steel Doors: ANSI A250.8/SDI-100, Level 3, Model 2 (Flush Seamless Design). Passing ANSI A250.4 Acceptance Criteria, Level A (1 million cycles).
  1. Face Sheets: 16 gauge steel.
  2. Core Design: Polystyrene foam core or phenolic impregnated honeycomb paper core, adhesive laminated to both face sheets, except honeycomb core not accepted at doors exposed to moisture.
  3. Vertical Edge Reinforcement: One piece, continuously arc welded full length to face sheets.
    - a. Lock Channel: 14 gauge steel, beveled 1/8 inch in 2 inch.
    - b. Hinge Channel: 12 gauge steel, formed and tapered for hinges.
  4. Top and Bottom Channel Reinforcement: 16 gauge steel.
- C. Vertical Door Edges: Bevel 1/8 inch in 2 inch at strike side vertical edges and square at hinge side.

- D. Hardware Reinforcement: Fabricate and weld into place. Include concealed stiffeners, reinforcement, edge channels, and moldings fabricated from either cold-rolled or hot-rolled 16 gauge steel.
- E. Exposed Joints: Arc weld continuously, full length. Grind, dress, and make smooth for flush, seamless appearance at edges and joinery.
- F. Welded Construction: Weld door skins to perimeter channels. Glued channels not accepted.

#### 2.4 SHOP FINISHING

- A. Thoroughly clean and chemically treat for maximum adhesion.
- B. Exterior Doors: Compatible with finish paint specified in Section 09 90 00 - Painting and Coating.
  - 1. Galvanizing: ASTM A 653, A60 galvanized. Wipe coat galvanized steel (WCGS) coating systems not accepted.
- C. Interior Doors: Compatible with finish paint specified in Section 09 90 00 - Painting and Coating.
  - 1. Primer: ANSI/SDI Standard A250.10 factory-applied, baked-on rust inhibiting paint. Color: Light gray.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify opening sizes and tolerances are acceptable.

#### 3.2 INSTALLATION

- A. Install doors in accordance with SDI-100/ANSI A250.8 and DHI.
- B. Coordinate installation of doors with installation of frames specified in Section 08 12 14 and hardware specified in Section 08 71 00 - Door Hardware.
- C. Touch-up factory finished doors.

#### 3.3 ERECTION TOLERANCES

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

#### 3.4 ADJUSTING

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

#### 3.5 SCHEDULE

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

END OF SECTION 08 13 14

## SECTION 08 14 16 – FLUSH WOOD DOORS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes rated and non-rated flush wood doors.
- B. Related Sections:
  - 1. Section 08 12 14 - Standard Steel Frames.
  - 2. Section 08 71 00 - Door Hardware.
  - 3. Section 08 80 00 - Glazing.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E413 - Standard Classification for Rating Sound Insulation.
- B. Architectural Woodwork Institute/Architectural Woodwork Manufacturers Association of Canada/Woodwork Institute:
  - 1. AWS - Architectural Woodwork Standards.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special blocking for hardware, factory finishing criteria, identify cutouts for glazing and louvers.
- C. Product Data: Submit information on door core materials and construction, and on veneer species, type and characteristics.
- D. Samples:
  - 1. Submit two samples of door veneer, illustrating wood grain and finish.
- E. Section 01 77 00 – Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AWS Section 9, Custom Grade.
- B. Finish doors in accordance with AWS Section 5, grades identified in section.
- C. Fire Rated Door and Transom Construction: Conform to one of the following:
  - 1. NFPA 252; with neutral pressure level at 40 inches maximum above sill at 5 minutes into test.
  - 2. UL 10C.
  - 3. 20-Minute Fire Rated Corridor Doors: Fire tested without hose stream test.
- D. Fire Rated Stair Doors: Rate of rise of 450 degrees F across door thickness.
- E. Installed Fire Rated Door and Transom Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.

F. Qualifications:

1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements.
- B. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer when stored more than one week.
- C. Accept doors on site in manufacturer's packaging. Inspect for damage.
  1. Break seal on site to permit ventilation.

1.6 COORDINATION

- A. Section 01 31 00 – Project Management and Coordination: Coordination and project conditions.
- B. Coordinate Work with door opening construction, door frame and door hardware installation.

1.7 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Warranties
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
- C. Furnish manufacturer's "Life of Installation" warranty for interior doors.
- D. Include coverage of refinishing and re-hanging of defective products.

PART 2 PRODUCTS

2.1 FLUSH WOOD DOORS

- A. Manufacturers:
  1. Algoma Hardwoods.
  2. Lynden Door.
  3. Marshfield Door Systems (Weyerhaeuser.)
  4. Vancouver Door.
  5. VT Industries.
  6. Substitutions: See Section 01 25 00 - Substitution Procedures.

2.2 DOOR TYPES

- A. Interior Doors: 1-3/4 inch thick, typical; solid core; 5-ply, or 7-ply construction, fire rated where scheduled.
  1. Performance Duty Level: Heavy Duty.

2.3 DOOR CONSTRUCTION

- A. Core (Solid, Non-Rated): AWS Section 9, Type SLC-Glued Block or PC-Particleboard.

- B. Core (Solid, Fire Rated): AWS Section 9, Type FD, fire resistive composite.

#### 2.4 DOOR FACING

- A. Veneer Facing (Interior Flush Doors): AWS Grade A, hard white birch, rotary sliced with book-matched grain for transparent finish.
- B. Minimum Width of Face Components: 5 inches.
- C. No sharp color contrasts at joints.

#### 2.5 ADHESIVE

- A. Facing Adhesive: Type I - waterproof.

#### 2.6 ACCESSORIES

- A. Glass: As specified in Section 08 80 00 - Glazing.
- B. Glazing Stops:
  - 1. Non-rated doors: Wood, of same species as door facing for non-rated doors. Face flush with door face, 1/16 inch reveal at joint, with mitered corners.
  - 2. Rated doors: Rolled steel channel shape, mitered corners.
- C. Acoustical Seals: Specified in Section 08 71 00 - Door Hardware.

#### 2.7 FABRICATION

- A. Fabricate non-rated doors in accordance with AWS Section 9 requirements.
- B. Fire rated doors shall be of the construction standard of the manufacturer and conform with the requirements of all applicable labeling agencies.
- C. Provide lock blocks at lock edge and top of door for closer for hardware reinforcement at all doors.
- D. Vertical Exposed Edge of Stiles: Of same or compatible species as veneer facing for transparent finish.
- E. Bond edge banding to cores.
- F. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through bolted hardware.
- G. Factory pre-fit doors for frame opening dimensions identified on shop drawings.

#### 2.8 FINISH

- A. Factory finish doors in accordance with AWS Section 5, Custom Grade.
- B. Transparent Finish System:
  - 1. System 9; UV curable epoxy, polyester, urethane.
- C. Seal door top edge with clear sealer to match door facing.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

#### 3.2 INSTALLATION

- A. Install doors in accordance with AWS Section 9 and manufacturer's instructions.
- B. Trim non-rated door width by cutting equally on both jamb edges if needed.
- C. Trim door height by cutting bottom edges to maximum of 3/4 inch if needed.
- D. Machine cut doors for hardware installation.
- E. Coordinate installation of doors with installation of frames specified in Section 08 12 14 - Standard Steel Frames, and hardware specified in Section 08 71 00 - Door Hardware.
- F. Coordinate installation of glass and glazing specified in Section 08 80 00 - Glazing.

#### 3.3 INSTALLATION TOLERANCES

- A. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taut string, corner to corner, over imaginary 36 x 84 inches surface area.
- B. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over imaginary 36 x 84 inches surface area.
- C. Maximum Width Distortion (Cup): 1/16 inch measured with straight edge or taut string, edge to edge, over imaginary 36 x 84 inches surface area.

#### 3.4 ADJUSTING

- A. Section 01 73 00 - Execution.
- B. Adjust door for smooth and balanced door movement.
- C. Adjust closer for full closure.

#### 3.5 SCHEDULE

- A. Refer to Door and Frame Schedule on the Drawings.

END OF SECTION 08 14 16



## SECTION 08 31 13 – ACCESS DOORS AND FRAMES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes
  - 1. Interior fire rated and non-rated access doors and panels with frames.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-In-Place Concrete: Casting openings in concrete floors and walls for access doors and floor doors.
  - 2. Section 04 22 00 – Concrete Unit Masonry: Leaving openings in masonry walls for access doors and for anchoring and grouting access door frames set in masonry construction.
  - 3. Section 05 50 00 – Metal Fabrications.
  - 4. Section 07 72 33 - Roof Hatches.
  - 5. Section 08 71 00 - Door Hardware: Mortise or rim cylinder locks and master keying.
  - 6. Section 09 21 16 - Gypsum Board Assemblies: Coordinating materials and framing that affect installation of access doors and frames in interior veneer plaster walls and ceilings.
  - 7. Section 09 51 23 - Acoustical Tile Ceilings: Acoustical tile and suspension systems that affect installation of access doors and frames and for access tile in suspended acoustical tile ceilings.
  - 8. Section 09 90 00 - Painting and Coating: Field paint finish.
  - 9. Division 22: coordination for access to plumbing valves and controls. Coordinate drain connection for floor door.
  - 10. Division 23: coordination with HVAC for access to hidden controls, dampers, etc.
  - 11. Division 26: coordination with electrical for required access panels.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- B. Intertek Testing Services (Warnock Hersey Listed):
  - 1. WH - Certification Listings.
- C. National Fire Protection Association:
  - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
- D. Underwriters Laboratories Inc.:
  - 1. UL - Building Materials Directory.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate exact position of access door units.
- C. Product Data: Submit literature indicating sizes, types, finishes, hardware, scheduled locations, fire resistance listings, and details of adjoining Work.
- D. Manufacturer's Installation Instructions: Submit installation requirements and rough-in dimensions.
- E. Section 01 73 00 - Execution: Project Record Documents- Record actual locations of access units.

#### 1.4 QUALITY ASSURANCE

- A. Fire Resistance Ratings: Where indicated as fire rated, provide assemblies from manufacturers listed in UL Directory or Intertek Testing Services (Warnock Hersey Listed) Directory.
- B. Fire Rated Horizontal Access Doors: Rating as indicated on Drawings.
  - 1. Tested Rating: Determined in accordance with ASTM E119.
- C. Attach label from agency approved by authority having jurisdiction to identify each fire rated access door.
- D. Qualifications:
  - 1. Manufacturer: Company specializing in manufacturing products specified with minimum three years documented experience.

#### 1.5 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Project Coordination.
- B. Coordinate Work with work requiring controls, valves, traps, dampers, cleanouts, and similar items requiring operation being located behind finished surfaces.

### PART 2 PRODUCTS

#### 2.1 ACCESS DOORS AND PANELS

- A. Manufacturers:
  - 1. J. L. Industries.
  - 2. Karp Associates, Inc.
  - 3. Nystrom Products Co.
  - 4. Milcor LTD, Partnership.
  - 5. Substitutions: See Section 01 25 00 - Substitution Procedures.
- B. Description: Provide for access to controls, valves, traps, dampers, cleanouts, and similar items requiring operation behind inaccessible finished surfaces.
  - 1. Coordinate exact locations with various trades to assure proper placement of access doors and panels.
  - 2. Conform to UL, Warnock Hersey (WHI), or other approved design, for fire rated wall and ceiling assemblies.
- C. Interior Fire Rated Flush Access Panels:
  - 1. Frame and Trim: 16 gage steel with a 1 inch flange.
  - 2. Door: 2 inch thick, insulated 20 gage steel.
  - 3. Hinge: Continuous hinge.
  - 4. Finish: Manufacturer's shop primer.
  - 5. Latch: Universal turn ring and key lock.
- D. Interior Non-Rated Flush Access Panels:
  - 1. Frame: 16 gage steel with a 1 inch wall flange.
  - 2. Door: Minimum 16 gage steel access door.
  - 3. Hinge: Minimum 90 degree continuous concealed hinge.
  - 4. Finish: Manufacturer's shop primer.
  - 5. Lock: Flush screwdriver-operated steel cam or cylinder lock keyed to district standard.

## 2.2 FABRICATION

- A. Fabricate units of continuous welded construction; weld, fill, and grind joints to assure flush and square unit.
- B. Provide attachment devices and fasteners of the type required to secure access doors to the types of support shown.
- C. Touch up shop primer and prepare for field paint finish coat.
- D. Size Variations: Obtain acceptance of manufacturer's standard size units which vary slightly from sizes shown or scheduled.

## 2.3 SHOP FINISHING

- A. Base Metal Protection: Galvanized finish. Prime coat units with baked on primer.
- B. Finish: Field paint to match wall or ceiling surfaces as specified Section 09 90 00.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions. Coordinate with individual Sections, including Division 22, Division 23, and Division 26 for access doors, as needed, for access to heating, ventilating, air conditioning, electrical and other equipment.
- B. Verify rough openings for access doors and panels are correctly sized and located.

### 3.2 INSTALLATION

- A. Install access doors per manufacturers' written instructions.
- B. Secure frames rigidly in place, plumb and level in opening, with plane of door and panel face aligned with adjacent finished surfaces.
  - 1. Set concealed frame type units flush with adjacent finished surfaces.
- C. Position unit to provide convenient access to concealed work requiring access.
- D. Install fire rated units in accordance with NFPA 80 and requirements for fire listing.

END OF SECTION 08 31 13



## SECTION 08 33 23 – OVERHEAD COILING DOORS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes the following:
  - 1. Non-rated insulated coiling steel door, operating hardware, electrical operation, for exterior exposure.
  - 2. Non-rated coiling aluminum door, operating hardware, electrical operation, for interior exposure.
  - 3. Wiring from electric circuit disconnect to door operator to control station.
- B. Related Sections:
  - 1. Section 05 50 00 - Metal Fabrications: Framing at door opening, steel angle, bent plate, corner guards and bollards.
  - 2. Section 07 92 00 - Joint Sealants: Weatherproof joints at hoods.
  - 3. Section 08 31 13 - Access Doors and Frames: Maintenance openings in ceiling and soffits.
  - 4. Section 08 71 00 - Door Hardware: Product Requirements for cylinder core and keys for placement by this section.
  - 5. Section 09 22 16 – Non Structural Metal Framing: Gage at framing for overhead coiling door openings.
  - 6. Division 26 - Electrical: Electrical conduit, wiring, and controls.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. A525 - Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
  - 2. National Electrical Manufacturers Association:
  - 3. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
  - 4. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
  - 5. NEMA MG 1 - Motors and Generators.
- B. Underwriters Laboratories:
  - 1. UL 325 - Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, control locations, installation details.
- C. Product Data: Submit general construction, component connections and details, wiring diagram and electrical equipment.
- D. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, and adjustment and alignment procedures.
- E. Samples: Manufacturer's standard colors for each product.

- F. Section 01 77 00 - Closeout Procedures.
- G. Maintenance and Operating Manual: Submit recommended areas to be inspected and inspection intervals. Submit lubrication requirements and frequency, and periodic adjustments required.

#### 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years experience.
- B. Installer: Company specializing in performing work of this section with minimum three years documented experience and approved by manufacturer.

### PART 2 PRODUCTS

#### 2.1 SYSTEM DESCRIPTION

- A. Electric Operation: Electric motor operated unit with manual override in case of power failure.

#### 2.2 MANUFACTURERS – STEEL DOORS - EXTERIOR

- A. Description: Insulated exterior overhead coiling door formed with curtain of interlocking steel slats.
- B. Performance:
  - 1. Design wind load: As indicated.
  - 2. Seismic Performance: Overhead coiling doors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  - 3. Operation Cycles: 20,000
  - 4. Testing: According to ASTM E330.
- C. Specified:
  - 1. Non-rated Insulated Service Door. Cookson Co., TempMaster Series – Motor Operated Insulated Service Door.
  - 2. ASHRAE 90.1 and IECC 2012.
- D. Manufacturers with Acceptable Equivalent Products:
  - 1. Cornell Iron Works.
  - 2. McKeon Door.
  - 3. Overhead Door Corp.
  - 4. Wayne Dalton.
  - 5. Substitutions: See Section 01 25 00 - Substitution Procedures.

#### 2.3 MANUFACTURERS – ALUMINUM DOORS - INTERIOR

- A. Description: Non-insulated interior overhead coiling door formed with curtain of interlocking aluminum slats.
- B. Performance
  - 1. Design wind load: NA.
  - 2. Seismic Performance: Overhead coiling doors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  - 3. Operation cycles: 20,000

4. Testing: According to ASTM E330.
- C. Specified:
1. Non-rated Insulated Service Door. Cookson Co., Type FMWI – Motor Operated Insulated Service Door.
- D. Manufacturers with Acceptable Equivalent Products:
1. Cornell Iron Works.
  2. McKeon Door.
  3. Overhead Door Corp.
  4. Wayne Dalton.
  5. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.4 MATERIALS

- A. Insulated Exterior Service Door. Face of wall mounted as detailed, non-rated:
1. Curtain and components: Conforming to the following:
    - a. Slats: Interlocking, steel slats conforming to ASTM A653. No. 5 (measuring 3 inch high by 7/8 inch deep). 22 gage exterior slat and 22 gage interior slat separated by 13/16 inch of rigid insulation for doors up to 24' wide. Galvanized and powder coated.
    - b. Bottom Bar: Two 1.5" x 1.5" x 1/8" steel angles mechanically joined together. Galvanized and powder coated.
    - c. Guides: Three steel angles bolted together with 3/8" fasteners. Extruded vinyl snap on weatherstripping continuously along exterior leg of guide. Galvanized and powder coated.
    - d. Brackets: Steel, not less than 1/4" thick. Bolted to wall angle with minimum 1/2". Galvanized and powder coated.
    - e. Hood: Match curtain material.
    - f. Locking device: Cremone style with cylinder lock both sides, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in both tracks.
  2. Barrel: Steel tubing pipe not less than 6" in diameter. Oil tempered torsion springs capable of correctly counter balancing weight of curtain. Limit maximum deflection to .03" per foot of opening width.
  3. Hardware: Keyed switch adaptable to cylinder specified in Section 08 71 00.
- B. Interior Service Door. Face of wall mounted as detailed, non-rated:
1. Curtain and components: Conforming to the following:
    - a. Slats: Interlocking, aluminum slats conforming to ASTM A653. No. 5 (measuring 3 inch high by 7/8 inch deep). 0.050" exterior slat and 0.050" interior slat separated by 13/16 inch of rigid insulation for doors up to 24' wide. Dark Bronze anodized.
    - b. Bottom Bar: Two 1.5" x 1.5" x 1/8" inch aluminum angles mechanically joined together. Dark Bronze anodized.
    - c. Guides: Three steel angles bolted together with 3/8" fasteners. Extruded vinyl snap on weatherstripping continuously along exterior leg of guide. Dark Bronze anodized.
    - d. Brackets: Steel, not less than 1/4" thick. Bolted to wall angle with minimum 1/2". Galvanized and powder coated.
    - e. Hood: Match curtain material.
    - f. Locking device: Cremone style with cylinder lock both sides, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in both tracks.
- C. Electric Operator:
1. Description: UL 325, side mounted, open dripproof motor.

2. Motor Enclosure: NEMA MG1 Type 1 enclosure.
3. Motor Rating: Continuous duty, hp as required for door.
4. Motor Voltage: 115 volt, single phase, 60 Hz. Or as indicated.
5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
6. Controller Enclosure: NEMA 250 Type 1.
7. Door Speed: 6 inches per second.
8. Brake: Adjustable friction clutch type, activated by motor controller.
9. Safety interlock switch: Equip all doors with safety interlock switch to disengage power supply when door is locked.
10. Operating controls, controllers, disconnect switches, wiring devices, and wiring: Manufacturer's standard unless otherwise indicated.

D. Control Stations:

1. Keyed switch operation.
2. Locations: As indicated.

E. Safety Edge: Manufacturer's standard cordless safety edge located at door bottom, full width, sensitized type, to reverse upon striking object.

## 2.5 SHOP FINISHING

A. Exterior Doors: Door Curtain, bottom bar, guides and brackets:

1. Hot dipped galvanized G-90 coating consistent with ASTM A-653.
2. Bonderized coating for prime coat adhesion.
3. Factory applied thermosetting powder coating applied with minimum thickness of 2 mils.
4. Color: As indicated.
5. Barrel: One coat of bronze rust-inhibiting prime paint.

B. Interior Doors: Door Curtain, bottom bar, guides and brackets:

1. Dark Bronze anodized

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.

### 3.2 INSTALLATION

- A. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- B. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- C. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- D. Coordinate installation of electrical service with Division 26. Complete wiring from disconnect to unit components and from fire alarm system to door operator.
- E. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 92 00 - Joint Sealants.



- F. Install perimeter trim and closures.

### 3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maintain dimensional tolerances and alignment with adjacent Work.
- C. Maximum Variation From Plumb: 1/16 inch.
- D. Maximum Variation From Level: 1/16 inch.
- E. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

### 3.4 ADJUSTING

- A. Section 01 73 00 - Execution: Testing, adjusting, and balancing.
- B. Adjust shutter, hardware and operating assemblies for smooth and noiseless operation.

### 3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Clean curtain and components.
- C. Remove labels and visible markings.

END OF SECTION 08 33 23



## SECTION 08 33 26 – OVERHEAD COILING GRILLES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Coiling metal grilles and operating hardware; electric operation.
- B. Related Sections:
  - 1. Section 05 50 00 - Metal Fabrications: Framing door opening, steel angle, bent plate, corner guards and bollards.
  - 2. Section 07 92 00 - Joint Sealants: Weatherproof joints at hoods.
  - 3. Section 08 31 13 - Access Doors and Frames: Maintenance openings in ceiling and soffits.
  - 4. Section 08 33 23 - Overhead Coiling Doors.
  - 5. Section 08 71 00 - Door Hardware: Product Requirements for cylinder core and keys for placement by this section.
  - 6. Division 26 - Electrical: Electrical conduit, wiring, and controls.

#### 1.2 REFERENCES

- A. National Electrical Manufacturers Association:
  - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
  - 2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
  - 3. NEMA MG 1 - Motors and Generators.
- B. Underwriters Laboratories:
  - 1. UL 325 - Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems.

#### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- C. Product Data: Provide general construction, details of grillage, component connections and details.
- D. Manufacturer's Installation Instructions: Indicate install sequence and procedures, adjustment and alignment procedures.
- E. Section 01 77 00 - Closeout Procedures.
- F. Maintenance and Operating Manual: Submit recommended areas to be inspected and inspection intervals. Submit lubrication requirements and frequency, and periodic adjustments required.

#### 1.4 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

## 1.5 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00 - Project Management and Coordination.

## PART 2 PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Electric Operation: Electric motor operation with manual override in case of power failure.
- B. Electric Unit: Face of wall mounted.
- C. Emergency Access: Grille to fail-safe.

### 2.2 MANUFACTURERS

- A. Specified:
  - 1. Cookson Company, Model ACE.
  - 2. Wayne Dalton, 600 EES series.
  - 3. Substitutions: See Section 01 25 00 - Substitution Procedures.

### 2.3 MATERIALS

- A. Grille: Conforming to the following:
  - 1. Material: Aluminum is to be 6063 alloy with T-5 temper.
  - 2. Sizes: Fabricated of 5/16 inch diameter horizontal members spaced at 2 inch O.C.; ½ inch diameter tube spacers for carrier rods spaced at 3-1/4 inch oc.
  - 3. Vertical Connecting Members: 5/16 inch diameter 5/8 x 1/8 inch flat bar; links spaced at 9 inch O.C.
  - 4. Ends: Members with nylon runners for quiet operation; bottom bar of back-to-back angles.
- B. Guides: Extruded aluminum or steel angles of profile to retain grille in place, mounting brackets of same metal.
- C. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to assure smooth operation of grille from any position; with adjustable spring tension.
- D. Brackets: Standard not less than 1/4" thick.
- E. Electric Operator
  - 1. Description: UL 325 side mounted, totally enclosed non-ventilated or fan-cooled motor.
  - 2. Motor Enclosure: NEMA MG1 Type 1 enclosure.
  - 3. Motor Rating: Continuous duty, hp as required for grille.
  - 4. Motor Voltage: 115 volt, single phase, 60 Hz. Or as indicated.
  - 5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
  - 6. Controller Enclosure: NEMA 250 Type 1.
  - 7. Grille Speed: 12 inches per second.
  - 8. Brake: Adjustable friction clutch type, activated by motor controller.
  - 9. Horsepower: ½ HP as verified by factory.
- F. Control Station: Keyed switch adaptable to Medeco cylinder specified in Section 08 71 00 - Door Hardware.

- G. Safety Edge: Manufacturer's safety edge located at grille bottom, full width, sensitized type, wired to reverse grille upon striking object. Cookson Phantom feather edge (or approved equal). No surface mounted cord will be acceptable.

## 2.4 FINISHES

- A. Grille Components: Clear anodized.
- B. Guides: Same as grille.
- C. Brackets: One coat aluminum primer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that opening sizes, tolerances and conditions are acceptable.

### 3.2 INSTALLATION

- A. Install grille unit assembly in accordance with manufacturer's instructions.
- B. Installation of grilles must be by a factory trained and approved installer.
- C. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- D. Securely brace components suspended from structure. Secure guides to structural members only.
- E. Coordinate installation of electrical service with Division 26 complete wiring from disconnect to unit.
- F. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- G. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 92 00.
- H. Install perimeter trim and closures.

### 3.3 ERECTION TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

### 3.4 ADJUSTING

- A. Adjust grille, hardware and operating assemblies.

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### 3.5 CLEANING

- A. Clean work under provisions of Section 01 73 00 - Execution.
- B. Clean grille and components.
- C. Remove labels and visible markings.

END OF SECTION 08 33 26

## SECTION 08 25 13 – FOLDING FIRE DOORS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes accordion folding fire doors, electrically operated, with track and operating system.
- B. Related Sections:
  - 1. Section 05 50 00 - Metal Fabrications: Door head supports.
  - 2. Section 06 20 00 – Finish Carpentry: Cover door.
  - 3. Section 09 21 16 - Gypsum Board Assemblies: Wall framing and finishing.
  - 4. Division 26 - Electrical: Power requirements for door operation.
  - 5. Division 28 - Fire Alarm System: Controls interface with fire alarm system.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E-2074 - Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
- B. National Fire Protection Association:
  - 1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives, Chapter 9
- C. Underwriters Laboratories Inc.
  - 1. UL 10B - Standard for Safety Fire Tests of Door Assemblies.
  - 2. UL 864 - Control Units and Accessories for Fire Alarm Systems.
  - 3. UL 1784 - Standard for Safety Air Leakage Tests of Door Assemblies.
  - 4. UL Fire Safety Ratings Guide.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop drawings: Indicate opening size, details of track and required supports, layout, electrical requirements, height of header above finished floor, track loads, adjacent construction and finish trim, and stacking sizes.
- C. Product Data: Submit data on door operation, hardware and accessories, colors and finishes and UL listing data.
- D. Section 01 77 00 - Closeout Procedures.
- E. Maintenance and Operating Manual: Provide manual describing operation, care, maintenance, testing, and trouble-shooting procedures.

#### 1.4 QUALITY ASSURANCE

- A. Fire doors shall be listed by Underwriters Laboratories for ratings as indicated, when tested in accordance with the requirements of UL 10B and ASTM E-2074.
- B. Automatic closing system shall be listed by Underwriters Laboratories in accordance with the requirements of UL 864.

- C. Fire doors shall meet the requirements of NFPA 80.
- D. Qualifications:
  - 1. Manufacturer: Company specializing in manufacturing products specified in this section with a minimum of 5 years experience.
  - 2. Installer: Company specializing in performing work of this section with a minimum of 5 years experience approved by manufacturer.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver to the job site in manufacturer's original, unopened package.

#### 1.6 WARRANTY

- A. Materials and installation shall be warranted against defects in workmanship for a period of two (2) year from the date of substantial completion.
- B. A comprehensive owner training seminar will be conducted by a factory trained, service technician. The owner training shall include door operation, care, maintenance, testing and trouble-shooting.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. FireGuard, Won-Door Corporation, Salt Lake City, UT.; [www.wondoors.com](http://www.wondoors.com).
- B. Substitutions: See Section 01 25 00 - Substitution Procedures.

#### 2.2 MATERIALS

- A. Accordion Folding Fire Door Construction:
  - 1. Construction: Two parallel, accordion-type walls of panels independently suspended, 6 to 8 inches apart, with no pantographs or interconnections except at the lead-post.
    - a. Panels: 24 gauge steel, V-grooved; connected by full height 24 gauge steel hinges.
    - b. Perimeter Seals: shall consist of continuous extruded vinyl sweeps attached to the top and bottom of the fire door to form a smoke and draft seal.
    - c. Hanging Weight: 5.5 pounds per sq ft, maximum.
    - d. Finish: All steel parts factory-applied enamel.
    - e. Color: Manufacturer's standard platinum.
  - 2. Suspension system: Two tracks, on 8 inch centers, attached to overhead structural support.
    - a. Tracks: 14 gauge cold rolled steel.
    - b. Panel Hangers: Each panel individually suspended from a steel hanger pin and a ¼ inch ball bearing roller.
    - c. Lead Post Hangers: 8 wheel ball bearing trolley.
  - 3. Automatic Closing System shall be listed to UL864, 9<sup>th</sup> edition, including capability to send and receive signals from the Fire Control Panel, and shall consist of the following:
    - a. Microprocessor based electronic control box with the ability to:
      - 1) Monitor dual power sources continually for peak performance, including
        - a) Detect a missing battery, bad battery, or a low battery condition.
        - b) Detect if the charging circuit is bad.
        - c) Detect fuse failures.
        - d) Detect high or low AC conditions.
      - 2) Monitor the health of the drive train.



- 3) Monitor inputs including:
    - a) Sticky door block, exit hardware, patron hardware and key switches.
    - b) Key switch mis-wires where key open and key close are on simultaneously.
  - 4) Run a "watch dog" monitoring circuit which will force a software restart in the event of software hangs, including tracking number of resets for diagnostic purposes.
  - 5) Record the number of door closes, opening, lost communication with external microprocessors, and manual resets.
  - 6) Monitor ambient temperature and lockout the operating devices when the environment at the door becomes untenable.
  - 7) Enter a security mode to help control access through the opening.
  - 8) Withstand voltages up to 120AC on the fire alarm input circuit without damage including the ability to indicate that the alarm circuit has not been wired as a dry contact, "no voltage" circuit when errant voltages are applied to the circuit.
  - 9) Communicate with other microprocessors in the assembly via an internal buss system.
  - 10) Indicate faults or supervised information both locally and at a remote station.
4. Motor Operator Assembly – including a DC gear motor, drive sprocket, clutch, and position sensors. The motor shall drive the fire door by means of a chain attached to a stabilizer bar trolley. The motor shall be rated for continuous use with unlimited cycle duty.
  5. A door control momentary rocker switch shall be mounted on one side of the door and shall function as follows:
    - a. Pressing the upper portion shall close the door and/or clear fault conditions.
    - b. Pressing the lower portion of the switch shall open the door and/or temporarily mute the local horn.
  6. Leading Edge Obstruction Detector shall be pressure sensitive such that contact with an obstruction shall cause the door to stop, pause for 3 seconds, then re-close when in alarm mode. The obstruction detection system shall be fully functional at all times.
  7. Exit Hardware shall be located on both sides of the fire door.
  8. Doors installed at the point of access to an elevator ("E" label) shall include the following extras: track seals, anti-sway brackets every five feet or less across the opening and foil tape between the panels and the smoke liner.
  9. Unitized track shall be furnished and installed under this section. No header required. Installation is contingent on the structural support being less than five (5) feet above the header assembly. Materials included are unitized track, threaded rods, and mechanical attachment hardware only. Drilling /placement of anchorage points into pre- or post-tensioned decks is by others. Welding/punching/drilling of steel members is by others. All drywall work is by others.
  10. A keyswitch module shall be provided, located as directed by the architect.
- B. Finishes:
1. Color: Manufacturer's standard platinum.
  2. Track: Field painted to match surrounding finishes.
  3. Perimeter Seals: Flat black.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify field measurements are as indicated on shop drawings.
- C. Verify that electrical utilities have been installed and are accessible.
- D. Verify that door opening is plumb and soffit is level and of correct dimensions.

### 3.2 INSTALLATION

- A. Fit and align door assemble level and plumb in accordance with manufacturer's written instructions and NFPA 80.
- B. Upon completion of the installation, general contractor shall protect fire doors from damage and shall replace or repair subsequent damage so that doors are acceptable to the architect at no additional cost to the owner.

### 3.3 ADJUSTING

- A. Section 01 73 00 - Execution.
- B. Adjust door assembly to provide smooth operation from stacked to full open position.
- C. Test door closing functions under all anticipated conditions.
- D. Verify that all operations are functional and meet the requirements of the authorities having jurisdiction.

END OF SECTION 08 35 13

## SECTION 08 41 13 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes aluminum-framed storefronts including aluminum and glass doors, frames and hardware.
- B. Related Sections:
  - 1. Section 05 12 00 - Structural Steel Framing: Steel support
  - 2. Section 05 50 00 - Metal Fabrications: Steel fabricated: attachment devices, framed openings.
  - 3. Section 07 21 16 - Blanket Insulation: Insulation materials field installed with aluminum-framed entrances and storefront.
  - 4. Section 07 26 00 - Vapor Retarders: Perimeter vapor seal between glazing system and adjacent construction.
  - 5. Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers: Perimeter air seal between glazing system and adjacent construction.
  - 6. Section 07 84 00 - Firestopping: Fire stop at system junction with structure.
  - 7. Section 07 92 00 - Joint Sealants: System perimeter sealant and back-up materials.
  - 8. Section 08 71 00 - Door Hardware: Mortised hardware reinforcement requirements affecting framing members, and door hardware items.
  - 9. Section 08 80 00 - Glazing: Glass and glazing requirements.
  - 10. Section 12 24 13 - Roller Shades: Roller Shade supports and attachments to framing members.

#### 1.2 REFERENCES

- A. The Aluminum Association:
  - 1. AA DAF-45 - Designation System for Aluminum Finishes.
  - 2. AA ADM - Aluminum Design Manual: Specifications and Guidelines for Aluminum Structures.
- B. American Architectural Manufacturers Association:
  - 1. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.
  - 2. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
  - 3. AAMA 503 - Voluntary Specification for Field Testing of Metal Storefronts. Curtain Wall and Sloped Glazing Systems.
  - 4. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
  - 5. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
  - 6. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  - 7. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
  - 8. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
  - 9. AAMA MCWM-1 - Metal Curtain Wall Manual.
  - 10. AAMA SFM-1 - Aluminum Store Front and Entrance Manual.
- C. American Society for Testing and Materials:
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 3. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

4. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
5. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
8. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
9. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
10. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.

D. National Fenestration Rating Council Incorporated:

1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.

E. National Fire Protection Association:

1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

F. The Society for Protective Coatings:

1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
2. SSPC Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.

G. Underwriters Laboratories Inc.:

1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.
- C. Product Data: Submit component dimensions; describe components within assembly, anchorage and fasteners and glass and infill.
- D. Samples: Submit two samples 12 x 12 inches in size illustrating finished aluminum surface, glass and glazing materials.
- E. Design Data: Indicate framing member structural and physical characteristics, calculations, dimensional limitations.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- G. Section 01 77 00 - Closeout Procedures.
- H. Manual for Materials and Finishes: Submit list of substances harmful to component materials.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

- B. Qualifications:
  - 1. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience.
  - 2. Design structural support framing components under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.
- C. Pre-Installation Meeting:
  - 1. Section 01 31 00 - Project Management and Coordination: Pre-installation meeting on site.

#### 1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Handle Products of this section in accordance with AAMA MCWM-1 - Curtain Wall Manual #10.
- C. Protect finished aluminum surfaces. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Do not install sealants or glazing materials when ambient temperature is less than 40 degrees F during and 48 hours after installation.

#### 1.7 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Coordinate the Work with installation of air and moisture barrier components or materials.

#### 1.8 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Product warranties and product bonds.
- B. Furnish five-year manufacturer warranty for glazed units.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: EFCO Corp, 433. [www.efcocorp.com](http://www.efcocorp.com)
- B. Kawneer North America. [www.kawneer.com](http://www.kawneer.com)
- C. Tubelite Company, Inc. [www.tubelite.com](http://www.tubelite.com)
- D. Pittco Architectural Metals, Inc. [www.pittcometals.com](http://www.pittcometals.com)
- E. Arcadia. [www.arcadiainc.com](http://www.arcadiainc.com)
- F. Oldcastle Glass. [www.oldcastlebe.com](http://www.oldcastlebe.com)
- G. Wausau Window and Wall Systems. [www.wausauwindow.com](http://www.wausauwindow.com)

H. Substitutions: See Section 01 25 00 - Substitution Procedures.

## 2.2 SYSTEM DESCRIPTION

### A. Product Description:

1. Aluminum Frame: Aluminum tubular aluminum sections with supplementary internal support framing as necessary to meet engineering loads. Complete thermal isolation between interior and exterior frames.
2. Face Width: 2 ¼".
3. Back Member Depth: 6 ½".
4. Glazing Infill: 1".
5. Mullions: Profile of extruded sheet aluminum with internal reinforcement of aluminum or shaped steel structural section.
6. Operable Windows: EFCO WV410 vents, Tubelite CVW 3900 or VW 3700.
  - a. Four bar stainless steel hinges – one pair per window.
  - b. Provide stainless steel handles. Two required when window width exceeds 4' 0".
  - c. Restrict opening of the windows to 4", or per Architect's requirements.
    - 1) Where the sill of an operable window is below 42", provide and locate a limiter to prevent a 4" diameter sphere from passing through the opening.
7. Heavy Duty Thermal Doors: Aluminum framed glass doors; EFCO D502 wide stile thermal doors. 5" head and jamb, 10" sill, 5" intermediate for mounting hardware.

### B. Performance Requirements:

1. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, including building corners, in accordance with ASTM E330 and IBC.
2. Deflection: Limit mullion deflection to 1/175 for spans under 13'-6" and 1/240 plus 1/4 inch for spans over 13'-6"; with full recovery of glazing materials.
3. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
4. Air Infiltration: Limit air leakage through assembly to 0.06 cfm/min/sq ft of wall area, measured at reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.
5. Air and Vapor Seal: Maintain continuous air and moisture barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
6. Water Leakage: None, when measured in accordance with ASTM E331 with test pressure difference of 20 percent of design pressure, with minimum differential of 2.86 lbf/sq ft and maximum of 12.00 lbf/sq ft.
7. Thermal Transmittance of Assembly (Excluding Entrances): Maximum U Value of 0.40 Btu/sq ft per hour per deg F when measured in accordance with AAMA 1503.
8. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over 12 hour period without causing detrimental effect to system components and anchorage.

### C. Regulatory Requirements

1. Safety Glazing: Conform to IBC for types and for locations within window and door opening.
2. Shading Coefficients and U-Factors: Conform to 2012 IECC State of Montana.
3. Framing Load Combinations Considerations: Include applicable seismic and wind loads, as specified by Structural General Notes.

## 2.3 COMPONENTS

- A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.

- B. Sheet Aluminum: ASTM B209, 5005 alloy, H15 or H34 temper.
- C. Sheet Steel: ASTM A653; galvanized to minimum G90.
- D. Steel Sections: ASTM A36; shaped to suit mullion sections, galvanized.
- E. Glass: Specified in Section 08 80 00 - Glazing.
- F. Glazing Materials: Storefront manufacturer's standard types to suit application and to achieve weather, moisture, and air infiltration requirements.
- G. Filler Plates: Manufacturer's standard aluminum and vinyl filler plates to close off back side of frame at jambs and heads.
- H. Hardware: Provide door hardware specified in Section 08 71 00 - Door Hardware.
- I. Flashings: Minimum thickness to match mullion sections where exposed.
- J. Firestopping: Specified in Section 07 84 00.
- K. Air and Moisture Barrier: Specified in Section 07 27 15.
- L. Sill Subframe: Aluminum with upturned leg at interior side and extended leg to form sloped sill with drip edge beyond face of wall. Make provision for watertight sealant and backer rod installation.
- M. Head Receptor with Reinforcement Clip: Aluminum compensation channel, designed to minimize head deflection and drain water to exterior of system. Make provision for watertight joint sealant and backer rod installation.
- N. Sealant and Backing Materials:
  - 1. Sealant Used within System (Not Used for Glazing): Manufacturer's standard materials to achieve weather, moisture, and air infiltration requirements.
  - 2. Perimeter Sealant: Specified in Section 07 92 00 - Joint Sealants.
- O. Fasteners: Stainless steel.
- P. Self – Adhered Underlayment: Provide where detailed.

#### 2.4 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.

- E. Prepare components with internal reinforcement for door hardware.
- F. Reinforce framing members for imposed loads.

## 2.5 SHOP FINISHING

- A. Color Anodized Aluminum Surfaces: AA-M12C22A44 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I 0.7 mils. Conform to AAMA 611.
  - 1. Standard dark bronze anodized coating.
- B. Concealed Steel Items: Galvanized to ASTM A123; minimum 2.0 oz/sq ft coating thickness; galvanize after fabrication.
- C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar metals.
- D. Shop and Touch-Up Primer for Steel Components: SSPC Paint 25 red oxide.
- E. Touch-Up Primer for Galvanized Steel Surfaces: SSPC Paint 20 zinc rich.
- F. Extent of Finish:
  - 1. Apply factory coating to surfaces exposed at completed assemblies.
  - 2. Apply finish to surfaces cut during fabrication so no natural aluminum is visible in completed assemblies, including joint edges.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify dimensions, tolerances, and method of attachment with other Work.
- C. Verify wall openings and adjoining air and vapor seal materials are sealed together and ready to receive Work of this Section.

### 3.2 INSTALLATION

- A. Install wall system in accordance with AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and aligning with adjacent Work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings per storefront manufacturer's details. Turn up ends and edges; seal to adjacent Work to form water tight dam.



- G. Coordinate attachment and seal of perimeter air and vapor retarder materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install integral flashings and integral joint sealers.
- J. Set thresholds in bed of mastic and secure.
- K. Install hardware using templates provided. Refer to Section 08 71 00 - Door Hardware, for installation requirements.
- L. Coordinate installation of glass with Section 08 80 00 - Glazing; separate glass from metal surfaces.
- M. Coordinate installation of perimeter sealants with Section 07 92 00 - Joint Sealants.

### 3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- C. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

### 3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements, Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Field inspecting, testing, adjusting, and balancing.
- B. Inspection to monitor quality of installation and glazing.
- C. Test to AAMA 502 and ASTM E1105.

### 3.5 ADJUSTING

- A. Section 01 73 00 - Execution: Testing, adjusting and balancing.
- B. Adjust operating hardware and sash for smooth operation.

### 3.6 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Remove protective material from pre-finished aluminum surfaces.
- C. Wash down surfaces with solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- D. Remove excess sealant by method acceptable to sealant manufacturer.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction.
- B. Protect finished Work from damage.
- C. Remove protections at substantial completion.

END OF SECTION 08 41 13

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Description of Work
1. The extent of finish hardware is shown on the drawings and in the schedules. Finish hardware is hereby defined to include all items known commercially as builders' hardware, as required for swing doors, except special types of hardware specified in the same section as the door and door frame.
  2. Hardware which is part of the following articles, as well as separate items of hardware listed below, is not included in this section of the specifications.
    - a. Cabinet Hardware: Refer to section 06 41 00 for locks for cabinets.
- B. Related Sections
1. Section 06 41 16 – Architectural Decorative Laminate Casework: Cabinet hardware.
  2. Section 08 12 14 - Standard Steel Frames: Frame preparation, reinforcement, and door silencers provided as part of hollow metal frames manufactured according to SDI standards. Astragals provided as part of fire-rated labeled assemblies.
  3. Section 08 13 14 - Standard Steel Doors: Door preparation, reinforcement, and door silencers provided as part of hollow metal door manufactured according to SDI standards.
  4. Section 08 14 16 - Flush Wood Doors: Factory pre-fitting and machining of wood doors for door hardware. Astragals provided as part of fire-rated labeled assemblies.
  5. Section 08 31 13 - Access Doors and Frames: Access door hardware, except cylinders.
  6. Section 08 33 26 - Overhead Coiling Grilles: Lockable coiling grilles.
  7. Section 08 41 13 - Aluminum-Framed Entrances and Storefronts: Entrance door hardware, except cylinders, provided as part of the door package.
  8. Section 10 14 00 - Signage.
  9. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Power supply to electric hardware devices.
  10. Section 28 13 00 - Access Control: Card access system.
  11. Section 28 16 00 - Intrusion Detection: Security system.
  12. Section 28 31 00 - Fire Detection and Alarm.

### 1.2 REFERENCES

- A. American National Standards Institute:
1. ANSI A156.1 - Butts and Hinges.
  2. ANSI A156.2 - Bored and Preamsembled Locks and Latches.
  3. ANSI A156.3 - Exit Devices.
  4. ANSI A156.4 - Door Controls - Closures.
  5. ANSI A156.5 - Auxiliary Locks and Associated Products.
  6. ANSI A156.6 - Architectural Door Trim.
  7. ANSI A156.7 - Template Hinge Dimensions.
  8. ANSI A156.8 - Door Controls - Overhead Holders.
  9. ANSI A156.13 - Mortise Locks and Latches.
  10. ANSI A156.14 - Sliding and Folding Door Hardware.
  11. ANSI A156.15 - Closer Holder Release Devices.
  12. ANSI A156.16 - Auxiliary Hardware.
  13. ANSI A156.19 - Power Assist and Low Energy Power Operated Doors.
  14. ANSI A156 - Complete Set of 24 BHMA Standards (A156 Series) with Binder.
- B. Builders Hardware Manufacturers Association:
1. BHMA Directory of Certified Products.

- C. International Conference of Building Officials:
  - 1. ICBO AC84 - Acceptance Criteria for Testing of Fire Doors and Windows under Positive Pressure.
- D. Intertek Testing Services:
  - 1. Warnock Hersey (WHI) Mark
- E. National Fire Protection Association:
  - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
- F. International Building Code:
  - 1. IBC- Section 715.4 - Fire Door and Shutter Assemblies.

1.3 PERFORMANCE REQUIREMENTS - FIRE-RATED OPENINGS

- A. Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80. This requirement takes precedence over other requirements for such hardware. Provide only hardware which has been tested and listed by Underwriters' Laboratories (U.L.) for the types and sizes of doors required and which complies with the requirements of the door and door frame labels. If automatic self-latching bolts, coordinators, and astragals are required, they shall be furnished.
- B. Submit fire test data showing compliance with IBC 715.4 and supplemental "S" label requirements.
- C. Hardware: Coordinate products used during fire tests meeting UBC 7-2 and ICBO AC84, including component gasket system for "S" labeled openings. All hardware must provide an acceptable means of egress to the Building Official.

1.4 SUBMITTALS

- A. Hardware Schedule: Submit one set of 8½ x 11 reproducible copies of the final hardware schedule in the manner and format specified, complying with the actual construction progress schedule requirements (for each draft). Hardware schedules are intended for coordination of the work. Review and acceptance by the Architect or Owner does not relieve the Contractor of his exclusive responsibility to fulfill the requirements as shown and specified. Corrections or changes in the first submittal must be incorporated promptly and two copies of the revised schedule returned to the Architect.
- B. Format of Schedule: List hardware for each door opening separately and in numerical order. The following is an example of the required format of the final hardware schedule:

Heading 26  
 Sgl Door 4l. Corr. from Boiler Room 14  
 3070 x 134 - WD x HMF - LHR

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

- C. Hardware schedules prepared in a coded horizontal manner are not acceptable.

- D. Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.
- E. Section 01 77 00 - Closeout Procedures: Closeout procedures.
- F. Project Record Documents: Record actual locations of installed cylinders and their master key code.
- G. Operation and Maintenance Manual: Submit data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- H. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.
- I. Samples:
  - 1. To be furnished only upon request and prior to submittal of the last draft of the hardware schedule and prior to delivery of hardware. Submit one sample of each exposed hardware unit, finished as required and tagged with full description for coordination with the schedule. Sample will be reviewed by the Architect for design, color, and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.
  - 2. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review, and field comparison procedures may, after final check of operation, be used in the work.

#### 1.5 QUALITY ASSURANCE

- A. Subcontract the furnishing of hardware, as specified by these specifications, only to a recognized builders' hardware supplier who has been furnishing hardware in the same area as the project for a period of not less than two years and who has in his employment an experienced Architectural Hardware Consultant who is available at all reasonable times during the course of the work for project hardware consultation to the Owner, Architect, and Contractor.
- B. Pre-Installation Meeting:
  - 1. Section 01 31 19 - Project Meetings: Pre-installation meeting.
  - 2. Convene minimum one week prior to commencing work of this section.
  - 3. Include persons involved with installation of doors, frames, and hardware.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Package hardware items individually with necessary fasteners, instructions, and installation templates, when necessary; label and identify each package with door opening code to match hardware schedule.

#### 1.7 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
  - 1. Provide templates or actual hardware as required to ensure proper preparation of doors and frames.
- C. Sequence installation to accommodate required utility connections.

- D. Coordinate Owner's keying requirements during course of Work.

## 1.8 WARRANTIES

- A. Section 01 77 00 - Closeout Procedures: Product warranties and product bonds.
- B. Provide seven year manufacturer warranty for locksets.
- C. Provide thirty year manufacturer warranty for door closers.
- D. Provide three year manufacturer warranty for exit devices.
- E. Provide one year manufacturer warranty for electrified hardware items.

## 1.9 MAINTENANCE

- A. Section 01 77 00 - Closeout Procedures: Maintenance materials.
- B. Furnish special wrenches and tools applicable for each different and for each special hardware component.
- C. Extra Materials:
  - 1. Section 01 77 00 - Closeout Procedures: Spare parts and maintenance products.
  - 2. Furnish ten extra key lock cylinders for each master keyed group.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS AND SUBSTITUTIONS

- A. Architectural hardware of equivalent size, type, finish, and function to that specified, but produced by the manufacturers listed below, will be accepted by the Architect as equivalent to the respective items specified provided the design is approved by the Architect.

As Specified	Acceptable Substitutions
Hinges - Ives	Hager, McKinney, Stanley, Bommer
Continuous Hinges – Hager	None.
Locksets - Corbin Russwin CL3300 Series	None.
Cylinders - Corbin Russwin L4	None.
Door Closers – LCN 4040XP	Norton 7500 Unitrol Arm
Automatic Operators – LCN 4642	
Push Pulls - Ives	Trimco, Rockwood
Door Stops - Ives	Rockwood, Glynn-Johnson, Trimco
Thresholds - Pemko	Reese, National Guard
Door seals - Pemko	Reese, National Guard
Exit Devices - Von Duprin 99/99XP	Corbin Russwin 5200S

### 2.2 HARDWARE MATERIALS AND FABRICATION

- A. Furnish screws for installation with each hardware item. Provide Phillips head screws, except as otherwise indicated. Furnish exposed screws to match the hardware finish.
- B. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard manufactured units of the type specified are available with concealed

fasteners. Do not use through-bolts for installation where the bolt head or the nut on the opposite face is exposed under any condition, except where it is not possible to adequately reinforce the work. Use machine screws or concealed fasteners of another standard type to satisfactorily avoid the use of through-bolts.

- C. Provide fasteners which are compatible with both the unit fastened and substrate and which will not cause corrosion or deterioration of hardware, base material, or fastener.

## 2.3 HARDWARE FINISHES

- A. Unless specifically indicated otherwise, provide all architectural hardware in the following finishes:
  - 1. The finish of all hardware shall be satin chrome, US26D.
  - 2. The finish of all kickplates to be US32D.

## 2.4 COMPONENTS

- A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.
  - 1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
  - 2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
  - 3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.
    - a. Finish: Match hardware item being fastened.
  - 4. Fire Ratings: Provide hardware with UL or Intertek Testing Services (Warnock Hersey Listed) listings for type of application involved.
  - 5. Electrical Devices: Make provisions and coordinate requirements for electrical devices and connections for hardware.
- B. Hinges: ANSI A156.1, full mortise type, template type, ANSI A156.7, complying with following general requirements unless otherwise scheduled.
  - 1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
  - 2. Number: Furnish minimum three hinges to 90 inches high, four hinges to 120 inches high for each door leaf.
    - a. Fire Rated Doors To 86 inches High: Minimum three hinges.
  - 3. Size and Weight: 4-1/2 inch heavy weight typical for 1-3/4 inch doors.
    - a. Doors Over 40 inches Wide: Extra heavy weight ball bearing hinges.
    - b. Doors 1-3/8 inch Thick: 3-1/2 inch size.
    - c. Doors 2 inch Thick: 5 inch extra heavy weight ball bearing.
    - d. Doors Over 48 inches Wide: 5 inch extra heavy weight ball bearing.
  - 4. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior and locked outswinging doors, non-rising pins at interior doors.
  - 5. Tips: Flat button type unless noted otherwise.
- C. Continuous Hinges: ANSI A156.26
  - 1. Shall utilize a single gear section for the door leaf and a separate gear section for the frame side of the door. Provide full surface applied hinge as scheduled in each set. Geared hinges are to be UL 10C tested and approved for 90 minutes.
- D. Locksets: Furnish locksets compatible with specified cylinders. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.
  - 1. Mortise Locksets: ANSI A156.13, Series 1000, Grade 1 unless otherwise indicated.
  - 2. Bored (Cylindrical) Locksets: ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.

- E. Latch Sets: Match locksets. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.
  - 1. Mortise Latch Sets: ANSI A156.13, Series 1000, Grade 1 unless otherwise indicated.
  - 2. Bored (Cylindrical) Latch Sets: ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.
  
- F. Exit Devices: ANSI A156.3, Grade 1 concealed vertical rod type or rim type as scheduled, with push pad, unless otherwise indicated. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt, with dust-proof floor strikes for vertical rod units.
  - 1. Types: Suitable for doors requiring exit devices.
  - 2. Coordinators: Furnish overhead concealed in frame type at pairs of doors.
  
- G. Electric Strikes: ANSI A156.5 mortised electric strikes.
  
- H. Cylinders: ANSI A156.5, Grade 1. Incorporate new cylinders into existing L4 keyway as directed by the Owner.
  - 1. Keying: Schedule a minimum of two meetings with the Owner. The first meeting to discuss the Owner's keying requirements and assign key groups to every lockset. The second meeting is required to review/confirm keying prior to releasing hardware order. Attendance at each shall be Owner's representative or Owner and Contractor's AHC. Obtain Owner's written approval before proceeding. All discussions regarding keying are to be kept confidential, and copies of all keying schedules are to be limited to copies required by the Owner and hardware subcontractor.
  - 2. Provide construction keying.
  - 3. Keys: Nickel silver. Stamp keys with "DO NOT DUPLICATE."
  - 4. Supply keys in the following minimum quantities:
    - a. 10 master keys.
    - b. 5 grand master keys.
    - c. 5 great grand master keys.
    - d. 10 construction keys.
    - e. 3 control keys and 10 extra cylinder cores.
    - f. 3 change keys.
  
- I. Closers: ANSI A156.4, surface mounted or overhead concealed as scheduled; full rack and pinion type with steel spring and non-freezing hydraulic fluid; closers required for fire rated doors unless otherwise indicated.
  - 1. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
  - 2. Arms: Type to suit individual condition; parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees.
  - 3. Location: Mount closers on inside of exterior doors, room side of interior doors typical; mount on pull side of other doors.
  - 4. Operating Pressure: Maximum operating pressure as follows.
    - a. Interior Doors: Maximum 5 pounds.
    - b. Exterior Doors: Maximum 8.5 pound.
    - c. Fire Rated Doors: As required for fire rating, maximum 15 pounds.
  
- J. Automatic Operators: Provide low energy automatic operator units with hydraulic closer complying with ANSI A156.19.
  - 1. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door.
  - 2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
  - 3. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
  - 4. Provide drop plates, brackets, or adapters for arms as required for details.



5. Provide actuator switches for operation as specified. Provide weather-resistant actuators at exterior applications.
  6. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf.
  7. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.
- K. Door Controls and Overhead Holders: Furnish with accessories as required for complete operational installation.
1. Manual Door Holders and Overhead Stops: ANSI A156.8, Grade 1 types as specified.
  2. Electro-Magnetic Door Holder: ANSI A156.15 wall mounted type.
  3. Power Assist Door Operators: ANSI A156.19 power mechanism which reduces opening resistance of self-closing door.
  4. Low Energy Power Door Operators: ANSI A156.19 power mechanism which opens and closes door upon receipt of signal.
  5. Low Energy Power Open Door Operators: ANSI A156.19 power mechanism which opens self-closing door; closing of door independent of power operator.
- L. Sliding and Bi-Folding Door Hardware: ANSI A156.14; furnish complete hardware sets for operational installation.
- M. Push/Pulls, Manual and Automatic Bolts, Protection Plates, Gaskets, Thresholds, and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
1. Push/Pulls: ANSI A156.6; push plates minimum 0.050 inch thick. Furnish straight push-pull type pulls with bolts to secure from opposite door face; furnish with minimum 0.050 inch pull plates unless otherwise indicated.
  2. Manual and Automatic Bolts: ANSI A156.16 Grade 1 top and bottom flush bolts, with dust-proof floor strike, unless otherwise indicated.
  3. Kickplates: ANSI A156.6, metal; height indicated in Schedule by 1 inch less than door width; minimum 0.050 inch thick stainless steel.
  4. Weatherstripping: Furnish continuous weatherstripping at top and sides of all exterior doors.
  5. Fire Rated Gaskets: Furnish continuous fire rated gaskets at top and sides of all fire rated doors and where scheduled for smoke control doors.
  6. Thresholds: Maximum 1/2 inch height.
  7. Wall Stops: ANSI A156.1, Grade 1, 3 inch escutcheon with convex resilient insert with no visible screws.
  8. Floor Stops: ANSI A156.1 Grade 1 standard floor type with no visible anchors into floor slab.

## 2.5 ACCESSORIES

- A. Lock Trim: Furnish levers with rose as selected from manufacturer's full range of levers and roses.
1. Do not permit through bolts on solid wood core doors.
- B. Through Bolts: Do not permit through bolts and grommet nuts on door faces in occupied areas unless no alternative is possible.
1. Do not use through bolts on solid wood core doors.
- C. Key Cabinet:
1. Cabinet Construction: Sheet steel construction, piano hinged door with cylinder type lock master keyed to building system.
  2. Cabinet Size: Size for Project keys plus sufficient room to allow for 10 percent growth.
  3. Horizontal metal strips for key hook labeling with clear plastic strip cover over labels.
  4. Finish: Manufacturer's standard finish.

## 2.6 MISCELLANEOUS FINISHES

- A. Closers: Finish appearance to match door hardware on same face of door.
- B. Thresholds: Finish appearance to match door hardware on exterior face of door.
- C. Other Items: Furnish manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

## 2.7 DOOR SILENCERS

- A. Provide snap-in type rubber door silencers for all door frames at openings having single-acting doors in wood or pressed steel frames.
- B. Provide three silencers for single doors and four silencers for each pair of doors. Locate and install in accordance with manufacturer's printed instructions.

### C. ELECTRONIC ACCESSORIES

#### D. Power Supplies:

- 1. Provide power supplies, recommended and approved by the manufacturer of the electrified locking component, for the operation of electrified locks, electrified exit devices, magnetic locks, electric strikes, and other components requiring a power supply.
- 2. Provide the appropriate quantity of power supplies necessary for the proper operation of the electrified locking component and/or components as recommended by the manufacturer of the electrified locking components with consideration for each electrified component utilizing the power supply, the location of the power supply, and the approved wiring diagrams. Locate the power supplies as directed by the Architect.
- 3. Provide a power supply that is regulated and filtered 24 VDC, or as required, and UL class 2 listed.

#### E. Electric Strikes:

- 1. Provide electric strikes that are continuous duty rated without the use of external rectifiers.
- 2. Provide electric strikes with function (fail safe, fail secure) and power requirements as scheduled.

#### F. Electric Power Transfers:

- 1. Provide edge-mounted electric power transfer with either two 18 gauge wires or ten 24 gauge wires.

#### G. Push Buttons

- 1. Provide push buttons with color and text as indicated in the sets.

## PART 3 EXECUTION

### 3.1 MOUNTING HEIGHTS

- A. In the absence of a hardware installation requirement in another section of this specification, the following recommendations shall be used as a guide
  - 1. Top Hinge: 5-inch, header rabbet to top of hinge.
  - 2. Bottom Hinge: 10-inch, finish floor to bottom of hinge.
  - 3. Center Hinge: Centered between top and bottom hinges.
  - 4. Locksets: 40-5/16-inch, finish floor to center of lock case and strike.

5. Push Plates: 45-inch, finish floor to center of plate.
6. Door Pulls: 42-inch, finish floor to center of pull.
7. Exit Devices:
  - a. Push Pad Type: 42 inches floor to centerline.
  - b. Cross Bar Type: 38 inches floor to centerline.
8. Dead Locks: 48 inches floor to centerline.

### 3.2 INSTALLATION

- A. General: Install each hardware item in accordance with the manufacturer's instructions and recommendations. Install no hardware until substrate finishes are complete. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or otherwise finished, install each item completely then remove and store during application of finishes; reinstall upon completion of finishing operations. Set items level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for a secure installation. Drill and countersink items which are not factory prepared for anchorage fasteners. Space fasteners and anchorages as indicated or in accordance with industry standards. Notify Architect of doors which have been improperly templated; do not proceed with installation of hardware on such doors until direction has been received from the Architect. The installer shall advise the Contractor where blocking for wall-mounted hardware is missing and shall not install such items until blocking has been installed.
- B. Hardware and Specialties: In addition to installation requirements specified hereinbefore, install hardware as follows:
  1. Hinges: Where shimming is necessary for proper door/frame installation, use only metal shims.
  2. Closers: After installation, closers shall be adjusted to control the door swing and latch the door. After the air handling system has been balanced, arrange to have the closer manufacturer's representative make the final adjustment of all closers on the job.
    - a. Closer adjustment shall not exceed the following opening force:
      - 1) Interior doors: 5 pounds pressure.
      - 2) Exterior doors: 8.5 pounds pressure.
      - 3) Fire doors: 15 pounds pressure.
  3. Door Stops: Floor stops shall be installed to permit the maximum degree of door swing that job conditions permit and located so as not to create a tripping hazard. All stops should be located to catch the door at a point 6 inches in from the latch edge, but in no case any further than 1/3 the door width measured from the latch edge. Projecting wall stops shall be located 9 inches above the finished floor with sloped surface on top. Wall stops intended for knobs and levers shall be located on the centerline of the spindle.
  4. Thresholds: Cut and fit to profiles of door jambs with mitered corners and precision made joints. Join units with concealed welds or concealed mechanical devices. Cut smooth openings for spindles, bolts, and similar items. At exterior doors and elsewhere as indicated, set thresholds in bed of butyl rubber sealant; completely fill all voids to exclude moisture, taking care not to plug drainage holes or block weeps; remove all excess sealant. At exterior doors, the bevel of the threshold shall align with the exterior face of the door, unless indicated otherwise by detail or threshold manufacturer's instructions. Thresholds shall be installed level.
- C. Installation Clarification: All questions regarding the placement of hardware shall be directed to the Architect for clarification prior to installation of items under question.

### 3.3 ADJUSTMENT AND CLEANING

- A. Adjust and check each item of hardware and each door to insure proper operation and function of each unit. Lubricate all moving parts with graphite-type lubricant, unless otherwise recommended by manufacturer. Replace all hardware which cannot be lubricated and adjusted to operate freely and smoothly.

3.4 FINAL ADJUSTMENT

- A. Whenever the hardware installation is made more than 1 month prior to acceptance of the work, make final adjustment and check of hardware during the week immediately prior to acceptance, unless otherwise directed by the Architect. Clean and relubricate operating items as necessary to restore proper functioning and finish of hardware and doors. Make final adjustment of locksets and closers to compensate for operation of heating and ventilating systems under the supervision of manufacturer's representative.

3.5 PRODUCT HANDLING

- A. Provide secure storage for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items which are not immediately replaceable so that the completion of the work will not be delayed by hardware losses, both before and after installation.

3.6 DOOR/HARDWARE INDEX

Door #	HWSet #
1002	33
1003	33
1004	33
1005	14
1006.1	16
1006.2	17
1006.3	19
1007.1	14
1007.2	14
1008	14
1009	56
1010	56
1011	58
1012	14
1014	41
1015	33
1016	33
1017	33
1018	33
1019	33
1020	33
1021	33
1101.1	22
1102.1	21
1102.2	28
1102.3	27
1102.4	08
1103	66
1104.1	36
1104.2	21
1104.3	26
1104.4	08

Door #	HWSet #
1105.1	15
1105.2	28
1106.1	08
1106.2	61
1106A	41
1107	15
1108	15
1109	15
1110	15
1111	15
1112	15
1113	15
1114	41
1114A	42
1115A	41
1116	15
1117	15
1118	15
1118A	30
1119	15
1120	15
1121	15
1121A	52
1121B	52
1122	41
1122A	42
1123A	41
1124.1	24
1124.2	15
1125	15
1126.1	15
1300.A	05

Door #	HWSet #
1300.B	02
1300.C	06
1300.D	07
1301.A	04
1301.B	01
1302	48
1303.1	62
1303.2	09
1303A	54
1303B	54
1303C	54
1303D.1	35
1303D.2	35
1304.1	62
1304.2	09
1304A	54
1304B	54
1304C	54
1305.1	62
1305.2	09
1305A	33.01
1305B	53
1305C	53
1305D	55
1306.1	39
1306.3	66
1307.1	49
1307.2	31
1307.3	41
1307.4	49.01
1308.1	12
1308.2	66

Door #	HWSet #
1308.3	49
1308A	41
1308B	64
1309.1	66
1309.2	25
1309.3	66
1309.4	10
1309.5	45
1309.6	66
1309.7	25
1309A	14
1309B	14
1309C	33
1309D	18
1309E	56
1309F	52
1309G	18
1310	66
1313.1	65
1313.2	65
1313A	41
1315	38
1315A	57
1316.2	65
1316A	41
1316C	65
1318	38
1318A	57
1319	13
1320.1	32
1320.2	32
1321.1	11
1321.2	11
1321.3	63
1321.4	63
1321B	50
1322	51
1500	01

Door #	HWSet #
1501	01
1503A	59
1503B	43
1503C	46
1504	01
1506A	43
1507	01
1508A	23
1509.2	66
1509A	60
1509C	47
1509D	41
1509E	44
1510	34
1511A	14
1513.1	01
1513.2	01
1513.3	02.01
1514	03
2000.1	20
2000.2	20
2000A	37
2101	15
2102	15
2103.1	15
2103.2	24
2104.1	24
2104.2	24
2104.3	29
2105	15
2106.1	61
2106.2	61
2107	15
2108	15
2109	15
2110	15
2111	15
2112	15

Door #	HWSet #
2113	15
2114	41
2114A	42
2115A	41
2116	15
2117	15
2118	15
2119	15
2120	15
2121	15
2122	41
2122A	42
2123A	41
2124.1	24
2124.2	15
2125	15
2126.1	15
2127	40
2503A	46
2503B	43
2503C	59
2506A	43
2506B	46
2506C	59
2508A	23
2509.2	66
2509.4	66
2509.5	66
2509B	46
2509C	43
DUGOUT 4A	68
DUGOUT 4B	68
M103	67
M104	67

3.7 HARDWARE GROUPS

**Hardware Group No. 01**

For use on mark/door #(s):

1301.B            1500            1501            1504            1507            1513.1  
 1513.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
1 EA	KEYED REMOVABLE MULLION	KR4954XP	695	VON
1 EA	PANIC HARDWARE	XP-98-EO (PREP DOOR FOR VR914-DT TRIM)	710	VON
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD (PREP DOOR FOR VR914-NL TRIM)	710	VON
1 EA	MORTISE CYLINDER	10 X REQ'D KWY @ KR MULL	613	C-R
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	613	C-R
1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
2 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN
2 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
2 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	MEETING STILE	BY DOOR/FRAME MFG.		
2 EA	DOOR SWEEP	BY DOOR/FRAME MFG.		
1 EA	THRESHOLD	BY DOOR/FRAME MFG.		

**Hardware Group No. 02**

For use on mark/door #(s):

1300.B

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
2 EA	POWER TRANSFER	EPT10	695	VON
1 EA	KEYED REMOVABLE MULLION	KR4954XP	695	VON
1 EA	ELEC PANIC HARDWARE	LX-RX-QEL+-98-NL-OP-110MD (PREP DOOR FOR VR914-NL TRIM)	710	VON
1 EA	ELEC PANIC HARDWARE	RX-QEL+-XP-98-EO (PREP DOOR FOR VR914-DT TRIM)	710	VON
1 EA	MORTISE CYLINDER	10 X REQ'D KWY @ KR MULL	613	C-R
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	613	C-R
1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
1 EA	OH STOP	100SE ADJ	613	GLY
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN
1 EA	SURF. AUTO OPERATOR	4642 WMS (USE FLUSH CEILING MOUNT)	695	LCN

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1 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
1 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
1 EA	WEATHER RING	8310-801	PLA	LCN
2 EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1 EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	MEETING STILE	BY DOOR/FRAME MFG.		
2 EA	DOOR SWEEP	BY DOOR/FRAME MFG.		
1 EA	THRESHOLD	BY DOOR/FRAME MFG.		
1 EA	VIDEO DOOR STATION & ACCESS CONT KP	BY DIVISION 28		
1 EA	POWER SUPPLY	BY DIVISION 28		
1 EA	JUNCTION BOX	BY DIVISION 28		
1 EA	DESK MOUNT BUTTON	BY DIVISION 28		
1 SET	POINT TO POINT WIRING DIAGRAMS	PROVIDED BY HARDWARE SUPPLIER		

A) ARCHITECT TO COORDINATE WHERE ACTUATORS ARE TO BE LOCATED.

OPERATIONAL DESCRIPTION

1. FREE EGRESS AT ALL TIMES.
2. AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
3. SIGNAL FROM DESK MOUNT BUTTON, MOMENTARILY RETRACTS EXIT DEVICE LATCH, ALLOWING ENTRY.
4. KEY IN OUTSIDE TRIM RETRACTS LATCH FOR ENTRY ONLY. DOOR RE-SECURES WHEN KEY IS REMOVED.
5. OUTER ACTUATOR IS DISABLED BY LX SWITCH (INTEGRAL TO LOCKING HARDWARE). WHEN DOORS ARE LATCHED, ACTUATOR IS DISABLED.
6. INNER ACTUATOR IS ALWAYS ENABLED.
7. DEPRESSING ENABLED ACTUATOR SIGNALS OPERATOR TO OPEN DOOR.
8. TERMINATE ALL WIRES AT JUNCTION BOX LOCATED ABOVE CEILING. REF. SPECIAL SYSTEMS PLAN FOR LOCATION.

**Hardware Group No. 02.01**

For use on mark/door #(s):  
 1513.3

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
2 EA	POWER TRANSFER	EPT10	695	VON
1 EA	KEYED REMOVABLE MULLION	KR4954XP	695	VON
1 EA	ELEC PANIC HARDWARE	LX-RX-QEL+-98-NL-OP-110MD (PREP DOOR FOR VR914-NL TRIM)	710	VON
1 EA	ELEC PANIC HARDWARE	RX-QEL+-XP-98-EO (PREP DOOR FOR VR914-DT TRIM)	710	VON
1 EA	MORTISE CYLINDER	10 X REQ'D KWY @ KR MULL	613	C-R
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	613	C-R
1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE

DOOR HARDWARE

08 71 00-13

1 EA	OH STOP	100SE ADJ	613	GLY
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN
1 EA	SURF. AUTO OPERATOR	4642 WMS (USE FLUSH CEILING MOUNT)	695	LCN
1 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
1 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
1 EA	WEATHER RING	8310-801	PLA	LCN
2 EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1 EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	MEETING STILE	BY DOOR/FRAME MFG.		
2 EA	DOOR SWEEP	BY DOOR/FRAME MFG.		
1 EA	THRESHOLD	BY DOOR/FRAME MFG.		
1 EA	ACCESS CONTROL KEYPAD	BY DIVISION 28		
1 EA	POWER SUPPLY	BY DIVISION 28		
1 EA	JUNCTION BOX	BY DIVISION 28		
1 SET	POINT TO POINT WIRING DIAGRAMS	PROVIDED BY HARDWARE SUPPLIER		

A) ARCHITECT TO COORDINATE WHERE ACTUATORS ARE TO BE LOCATED.

OPERATIONAL DESCRIPTION

1. FREE EGRESS AT ALL TIMES.
2. AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
3. KEY IN OUTSIDE TRIM RETRACTS LATCH FOR ENTRY ONLY. DOOR RE-SECURES WHEN KEY IS REMOVED.
4. OUTER ACTUATOR IS DISABLED BY LX SWITCH (INTEGRAL TO LOCKING HARDWARE). WHEN DOORS ARE LATCHED, ACTUATOR IS DISABLED.
5. INNER ACTUATOR IS ALWAYS ENABLED.
6. DEPRESSING ENABLED ACTUATOR SIGNALS OPERATOR TO OPEN DOOR.
7. TERMINATE ALL WIRES AT JUNCTION BOX LOCATED ABOVE CEILING. REF. SPECIAL SYSTEMS PLAN FOR LOCATION.

**Hardware Group No. 03**

For use on mark/door #(s):  
 1514

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	626	HAG
2 EA	POWER TRANSFER	EPT10	689	VON
1 EA	KEYED REMOVABLE MULLION	KR4954XP	689	VON
1 EA	ELEC PANIC HARDWARE	LX-RX-QEL+-98-NL-OP-110MD (PREP DOOR FOR VR914-NL TRIM)	626	VON
1 EA	ELEC PANIC HARDWARE	RX-QEL+-XP-98-EO (PREP DOOR FOR VR914-DT TRIM)	626	VON
1 EA	MORTISE CYLINDER	10 X REQ'D KWY @ KR MULL	626	C-R
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL TRIM	626	C-R



1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
1 EA	OH STOP	100SE ADJ	630	GLY
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH ST-1595	689	LCN
1 EA	SURF. AUTO OPERATOR	4642 WMS (USE FLUSH CEILING MOUNT)	689	LCN
1 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	689	LCN
1 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	689	LCN
1 EA	WEATHER RING	8310-801	PLA	LCN
2 EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
2 EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1 EA	RAIN DRIP	346C	AL	PEM
1 SET	SEALS	2891APK @ HEAD	AL	PEM
1 SET	SEALS	290APK @ JAMBS	AL	PEM
1 EA	MULLION SEAL	5110BL	BLK	PEM
2 EA	DOOR SWEEP	3452CNB	AL	PEM
1 EA	THRESHOLD	1715A	AL	PEM
1 EA	MULTITECH READER	MTK15	BLK	SCE
1 EA	ACCESS CONTROL KEYPAD	BY DIVISION 28		
1 EA	POWER SUPPLY	BY DIVISION 28		
1 EA	JUNCTION BOX	BY DIVISION 28		
1 SET	POINT TO POINT WIRING DIAGRAMS	PROVIDED BY HARDWARE SUPPLIER		

**OPERATIONAL DESCRIPTION**

1. FREE EGRESS AT ALL TIMES.
2. AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
3. DURING OPEN HOURS, ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH RETRACTED, ALLOWING ENTRY.
4. KEY IN OUTSIDE TRIM RETRACTS LATCH FOR ENTRY ONLY. DOOR RE-SECURES WHEN KEY IS REMOVED.
5. OUTER ACTUATOR IS DISABLED BY LX SWITCH (INTEGRAL TO LOCKING HARDWARE). WHEN DOORS ARE LATCHED, ACTUATOR IS DISABLED.
6. INNER ACTUATOR IS ALWAYS ENABLED.
7. DEPRESSING ENABLED ACTUATOR SIGNALS OPERATOR TO OPEN DOOR.
8. TERMINATE ALL WIRES AT JUNCTION BOX LOCATED ABOVE OPENING.

**Hardware Group No. 04**

For use on mark/door #(s):  
 1301.A

**EACH TO HAVE:**

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
1 EA	REMOVABLE MULLION	4954XP	695	VON
2 EA	PANIC HARDWARE	XP-98-EO (PREP DOORS FOR VR914-DT TRIM)	710	VON
2 EA	DOOR PULL	VR914 DT	630	IVE
2 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN

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2 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
2 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	MEETING STILE	BY DOOR/FRAME MFG.		
2 EA	DOOR SWEEP	BY DOOR/FRAME MFG.		
1 EA	THRESHOLD	BY DOOR/FRAME MFG.		

**Hardware Group No. 05**

For use on mark/door #(s):  
 1300.A

**EACH TO HAVE:**

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
1 EA	REMOVABLE MULLION	4954XP	695	VON
1 EA	PANIC HARDWARE	XP-98-EO	710	VON
		(PREP DOOR FOR VR914-DT TRIM)		
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD	710	VON
		(PREP DOOR FOR VR914-NL TRIM)		
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	613	C-R
1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
2 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN
2 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
2 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	MEETING STILE	BY DOOR/FRAME MFG.		
2 EA	DOOR SWEEP	BY DOOR/FRAME MFG.		
1 EA	THRESHOLD	BY DOOR/FRAME MFG.		

**Hardware Group No. 06**

For use on mark/door #(s):  
 1300.C

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
1 EA	KEYED REMOVABLE MULLION	KR4954XP	695	VON
1 EA	PANIC HARDWARE	XP-98-EO (PREP DOOR FOR VR914-DT TRIM)	710	VON
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD (PREP DOOR FOR VR914-NL TRIM)	710	VON
1 EA	MORTISE CYLINDER	10 X REQ'D KWY @ KR MULL	613	C-R
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	613	C-R
1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
1 EA	OH STOP	100SE ADJ	613	GLY
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN
1 EA	SURF. AUTO OPERATOR	4642 WMS (USE FLUSH CEILING MOUNT)	695	LCN
1 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
1 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
2 EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
2 EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	MEETING STILE	BY DOOR/FRAME MFG.		
1 SET	POINT TO POINT WIRING DIAGRAMS	PROVIDED BY HARDWARE SUPPLIER		

A) ARCHITECT TO COORDINATE WHERE ACTUATORS ARE TO BE LOCATED.

OPERATIONAL DESCRIPTION

1. FREE EGRESS AT ALL TIMES.
2. KEY IN OUTSIDE TRIM RETRACTS LATCH FOR ENTRY ONLY. DOOR RE-SECURES WHEN KEY IS REMOVED.
3. DEVICE LATCH MAY BE MECHANICALLY HELD IN RETRACTED STATE BY MECHANICAL DOGGING FEATURE.
4. OPERATOR WILL ONLY OPEN DOOR IF PANIC DEVICES ARE DOGGED.
5. ALL WIRING AT THIS DOOR TO BE PROVIDED BY THE DOOR HARDWARE CONTRACTOR.

**Hardware Group No. 07**

For use on mark/door #(s):  
 1300.D

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
1 EA	REMOVABLE MULLION	4954XP	695	VON
1 EA	PANIC HARDWARE	XP-98-EO	710	VON
		(PREP DOOR FOR VR914-DT TRIM)		
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD	710	VON
		(PREP DOOR FOR VR914-NL TRIM)		
1 EA	RIM CYLINDER	30 X REQ'D KWY	613	C-R
1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
2 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN
2 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
2 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	MEETING STILE	BY DOOR/FRAME MFG.		

**Hardware Group No. 08**

For use on mark/door #(s):  
 1102.4            1104.4            1106.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
1 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD	710	VON
		(PREP DOOR FOR VR914-NL TRIM)		
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	613	C-R
1 EA	DOOR PULL	VR914 NL	630	IVE
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	695	LCN
1 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	695	LCN
1 EA	CUSH SHOE SUPPORT	4040-30 AS REQ'D	695	LCN
1 SET	SEALS	BY DOOR/FRAME MFG.		
1 EA	DOOR SWEEP	BY DOOR/FRAME MFG.		
1 EA	THRESHOLD	BY DOOR/FRAME MFG.		

**Hardware Group No. 09**

For use on mark/door #(s):  
 1303.2            1304.2            1305.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
1 EA	CONTINUOUS HINGE	780-157HD	626	HAG
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD	626	VON
		(PREP DOOR FOR VR914-NL TRIM)		
1 EA	RIM CYLINDER	30 X REQ'D KWY	626	C-R
1 EA	DOOR PULL	VR914 NL	630	IVE

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1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH ST-1595	689	LCN
1 EA	RAIN DRIP	346C	AL	PEM
1 SET	SEALS	2891APK @ HEAD	AL	PEM
1 SET	SEALS	290APK @ JAMBS	AL	PEM
1 EA	DOOR SWEEP	3452CNB	AL	PEM
1 EA	THRESHOLD	1715A	AL	PEM

A) ADD 1/4-INCH TO BACKSET OF PANIC DEVICE SO 429A WEATHERSTRIP DOES NOT HAVE TO BE CUT.

**Hardware Group No. 10**

For use on mark/door #(s):  
 1309.4

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	626	HAG
1 EA	KEYED REMOVABLE MULLION	KR4954XP	689	VON
1 EA	PANIC HARDWARE	XP-98-EO (PREP DOOR FOR VR914-DT TRIM)	626	VON
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD (PREP DOOR FOR VR914-NL TRIM)	626	VON
1 EA	MORTISE CYLINDER	10 X REQ'D KWY @ KR MULL	626	C-R
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	626	C-R
1 EA	DOOR PULL	VR914 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
2 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH ST-1595	689	LCN
2 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	RAIN DRIP	346C	AL	PEM
1 SET	SEALS	2891APK @ HEAD	AL	PEM
1 SET	SEALS	290APK @ JAMBS	AL	PEM
1 EA	MULLION SEAL	5110BL	BLK	PEM
2 EA	DOOR SWEEP	315CN	AL	PEM
1 EA	THRESHOLD	1715A	AL	PEM

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**Hardware Group No. 11**

For use on mark/door #(s):

1321.1            1321.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	626	HAG
1 EA	KEYED REMOVABLE MULLION	KR4954XP	689	VON
1 EA	PANIC HARDWARE	XP-98-EO (PREP DOOR FOR VR914-DT TRIM)	626	VON
1 EA	PANIC HARDWARE	XP-98-NL-OP-110MD (PREP DOOR FOR VR914-NL TRIM)	626	VON
1 EA	MORTISE CYLINDER	10 X REQ'D KWY @ KR MULL	626	C-R
1 EA	RIM CYLINDER	30 X REQ'D KWY @ NL	626	C-R
1 EA	DOOR PULL	VR910 DT	630	IVE
1 EA	DOOR PULL	VR914 NL	630	IVE
2 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH ST-1595	689	LCN
2 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	RAIN DRIP	346C	AL	PEM
1 SET	SEALS	2891APK @ HEAD	AL	PEM
1 SET	SEALS	290APK @ JAMBS	AL	PEM
1 EA	MULLION SEAL	5110BL	BLK	PEM
2 EA	DOOR SWEEP	3452CNB	AL	PEM
1 EA	THRESHOLD	1715A	AL	PEM

**Hardware Group No. 12**

For use on mark/door #(s):

1308.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
1 EA	CONTINUOUS HINGE	780-157HD	US10B	HAG
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	LOCK GUARD	LG12	630	IVE
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH ST-1595	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	RAIN DRIP	346C	AL	PEM
1 SET	SEALS	2891APK @ HEAD	AL	PEM
1 SET	SEALS	290APK @ JAMBS	AL	PEM
1 EA	DOOR SWEEP	3452CNB	AL	PEM
1 EA	THRESHOLD	1715A	AL	PEM

**Hardware Group No. 13**

For use on mark/door #(s):  
 1319

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
2 EA	CONTINUOUS HINGE	780-157HD	626	HAG
2 EA	MANUAL FLUSH BOLT	FB458/FB358 AS REQ'D BY DOOR MTL.	626	IVE
1 EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH ST-1595	689	LCN
2 EA	ARMOR PLATE	8400 36" X 1" LDW	630	IVE
1 EA	RAIN DRIP	346C	AL	PEM
1 SET	SEALS	2891APK @ HEAD	AL	PEM
1 SET	SEALS	290APK @ JAMBS	AL	PEM
1 EA	OVERLAPPING ASTRAGAL (INSTALL ON PULL SIDE OF ACTIVE LEAF)	355CS	AL	PEM
2 EA	DOOR SWEEP	3452CNB	AL	PEM
1 EA	THRESHOLD	1715A	AL	PEM

**Hardware Group No. 14**

For use on mark/door #(s):  
 1005            1007.1            1007.2            1008            1012            1309A  
 1309B            1511A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 15**

For use on mark/door #(s):  
 1105.1            1107            1108            1109            1110            1111  
 1112            1113            1116            1117            1118            1119  
 1120            1121            1124.2            1125            1126.1            2101  
 2102            2103.1            2105            2107            2108            2109  
 2110            2111            2112            2113            2116            2117  
 2118            2119            2120            2121            2124.2            2125  
 2126.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRY/OFFICE LOCK	CL3361 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	29326CNB	CLR	PEM

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**Hardware Group No. 16**

For use on mark/door #(s):  
1006.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 17**

For use on mark/door #(s):  
1006.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1 EA	PA MOUNTING PLATE	4040-18PA AS REQ'D	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 18**

For use on mark/door #(s):  
1309D                      1309G

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	OH STOP & HOLDER	90H	630	GLY
3 EA	SILENCER	SR64	GY	IVE



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**Hardware Group No. 19**

For use on mark/door #(s):  
1006.3

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PASSAGE LATCH	CL3310 NZD	626	C-R
1 EA	OH STOP & HOLDER	90H	630	GLY
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 20**

For use on mark/door #(s):  
2000.1                      2000.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRY/OFFICE LOCK	CL3361 NZD	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	29326CNB	CLR	PEM

**Hardware Group No. 21**

For use on mark/door #(s):  
1102.1                      1104.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRY/OFFICE LOCK	CL3361 NZD	626	C-R
1 EA	OH STOP	90S	630	GLY
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM

**Hardware Group No. 22**

For use on mark/door #(s):  
1101.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRY/OFFICE LOCK	CL3361 NZD	626	C-R
1 EA	OH STOP	90S	630	GLY
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	29326CNB	CLR	PEM

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**Hardware Group No. 23**

For use on mark/door #(s):

1508A                      2508A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	OH STOP	90S	630	GLY
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	29326CNB	CLR	PEM

**Hardware Group No. 24**

For use on mark/door #(s):

1124.1                      2103.2                      2104.1                      2104.2                      2124.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRY/OFFICE LOCK	CL3361 NZD	626	C-R
1 EA	OH STOP	90S	630	GLY
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	29326CNB	CLR	PEM

**Hardware Group No. 25**

For use on mark/door #(s):

1309.2                      1309.7

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP REG	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP/HOLDER	FS495	613	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 26**

For use on mark/door #(s):

1104.3

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
6 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 SET	CONST LATCHING BOLT	FB52	630	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	COORDINATOR	COR X FL X MB AS REQ'D	628	IVE
2 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1 SET	SEALS	S88D	BRN	PEM
1 EA	ASTRAGAL	356AV	AL	PEM
2 EA	DOOR SWEEP	18062CNB	CLR	PEM

**Hardware Group No. 27**

For use on mark/door #(s):  
1102.3

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
6 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2 EA	MANUAL FLUSH BOLT	FB458/FB358 AS REQ'D BY DOOR MTL.	626	IVE
1 EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
2 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH	689	LCN
1 SET	SEALS	S88D	BRN	PEM
1 EA	ASTRAGAL	356AV	AL	PEM
2 EA	DOOR SWEEP	18062CNB	CLR	PEM

**Hardware Group No. 28**

For use on mark/door #(s):  
1102.2            1105.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	COMMUNICATING LOCK	CL3362 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM

**Hardware Group No. 29**

For use on mark/door #(s):  
2104.3

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	COMMUNICATING LOCK	CL3362 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP PA	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	29326CNB	CLR	PEM

**Hardware Group No. 30**

For use on mark/door #(s):  
1118A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	COMMUNICATING LOCK	CL3362 AZD	626	C-R
1 EA	ELECTRIC STRIKE	6211 FS	630	VON
1 EA	SURFACE CLOSER (MOUNT ON PULL SIDE)	4040XPT	689	LCN
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE
1 EA	PUSHBUTTON	701BK L2	630	SCE
1 EA	POWER SUPPLY	PS902	LGR	VON
1 SET	POINT TO POINT WIRING DIAGRAMS	PROVIDED BY HARDWARE SUPPLIER		

A) OPENING REQUIRES AHJ APPROVAL.

OPERATIONAL DESCRIPTION

1. WHEN PUSH BUTTON IS HELD, ELECTRIC STRIKE BECOMES ENERGIZED AND SECURES THE LATCH.
2. WHEN PUSH BUTTON IS RELEASED, ELECTRIC STRIKE BECOMES DE-ENERGIZED ALLOWING PASSAGE IN BOTH DIRECTIONS.
3. ALL WIRING AT THIS DOOR TO BE PROVIDED BY THE DOOR HARDWARE CONTRACTOR.

**Hardware Group No. 31**

For use on mark/door #(s):  
1307.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP PA	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM

**Hardware Group No. 32**

For use on mark/door #(s):  
1320.1                    1320.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
8 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2 EA	MANUAL FLUSH BOLT	FB458/FB358 AS REQ'D BY DOOR MTL.	626	IVE
1 EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
2 EA	OH STOP & HOLDER	90H	630	GLY
2 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 33**

For use on mark/door #(s):

1002	1003	1004	1015	1016	1017
1018	1019	1020	1021	1309C	

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 33.01**

For use on mark/door #(s):

1305A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 34**

For use on mark/door #(s):

1510

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP REG	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM

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**Hardware Group No. 35**

For use on mark/door #(s):  
1303D.1            1303D.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP REG	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM

**Hardware Group No. 36**

For use on mark/door #(s):  
1104.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRY/OFFICE LOCK	CL3361 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP PA	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM

**Hardware Group No. 37**

For use on mark/door #(s):  
2000A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	OH STOP	90S	630	GLY
3 EA	SILENCER	SR64	GY	IVE

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**Hardware Group No. 38**

For use on mark/door #(s):  
 1315                    1318

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	OH STOP	90S	630	GLY
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 39**

For use on mark/door #(s):  
 1306.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	SURFACE CLOSER (W/ HOLD OPEN)	4040XP HEDA	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 40**

For use on mark/door #(s):  
 2127

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	ENTRANCE/OFFICE LOCK	CL3351 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP REG	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	29326CNB	CLR	PEM

**Hardware Group No. 41**

For use on mark/door #(s):

1014                    1106A                    1114                    1115A                    1122                    1123A  
 1307.3                    1308A                    1313A                    1316A                    1509D                    2114  
 2115A                    2122                    2123A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R

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1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 42**

For use on mark/door #(s):

1114A            1122A            2114A            2122A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	OH STOP	90S	630	GLY
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 43**

For use on mark/door #(s):

1503B            1506A            2503B            2506A            2509C

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 44**

For use on mark/door #(s):

1509E

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
1 EA	PANIC HARDWARE	98-L-NL-06	626	VON
1 EA	RIM CYLINDER	30 X REQ'D KWY	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM

**Hardware Group No. 45**

For use on mark/door #(s):

1309.5

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	CLASSROOM LOCK	CL3355 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP PA	689	LCN



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1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 46**

For use on mark/door #(s):

1503C            2503A            2506B            2509B

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	OH STOP	90S	630	GLY
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 47**

For use on mark/door #(s):

1509C

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	18062CNB	CLR	PEM

**Hardware Group No. 48**

For use on mark/door #(s):

1302

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
6 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2 EA	MANUAL FLUSH BOLT	FB458/FB358 AS REQ'D BY DOOR MTL.	626	IVE
1 EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
2 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH	689	LCN
2 EA	SILENCER	SR64	GY	IVE

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**Hardware Group No. 49**

For use on mark/door #(s):

1307.1            1308.3

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
8 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2 EA	MANUAL FLUSH BOLT	FB458/FB358 AS REQ'D BY DOOR MTL.	626	IVE
1 EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
2 EA	SURFACE CLOSER (W/ HOLD OPEN)	4040XP HEDA	689	LCN
2 EA	KICK PLATE	8400 10" X 1" LDW	630	IVE
2 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM

**Hardware Group No. 49.01**

For use on mark/door #(s):

1307.4

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 SET	SEALS	S88D	BRN	PEM

**Hardware Group No. 50**

For use on mark/door #(s):

1321B

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 51**

For use on mark/door #(s):

1322

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	SURFACE CLOSER	4040XP PA	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 52**

For use on mark/door #(s):

1121A            1121B            1309F

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PASSAGE LATCH	CL3310 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 53**

For use on mark/door #(s):

1305B            1305C

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PASSAGE LATCH	CL3310 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM

**Hardware Group No. 54**

For use on mark/door #(s):

1303A            1303B            1303C            1304A            1304B            1304C

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PASSAGE LATCH	CL3310 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM

**Hardware Group No. 55**

For use on mark/door #(s):

1305D

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	STOREROOM LOCK	CL3357	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM

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**Hardware Group No. 56**

For use on mark/door #(s):

1009                    1010                    1309E

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PRIVACY LATCH	CL3320 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP REG	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 57**

For use on mark/door #(s):

1315A                    1318A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PRIVACY LATCH	CL3320 NZD	626	C-R
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 58**

For use on mark/door #(s):

1011

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PRIVACY LATCH	CL3320 NZD	626	C-R
1 EA	OH STOP	90S	630	GLY
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 59**

For use on mark/door #(s):

1503A                    2503C                    2506C

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PRIVACY LATCH	CL3320 NZD	626	C-R
1 EA	SURFACE CLOSER	4040XP REG	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

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**Hardware Group No. 60**

For use on mark/door #(s):  
1509A

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PUBLIC RESTROOM LOCK	CL3359 NZD	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 61**

For use on mark/door #(s):  
1106.2            2106.1            2106.2

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
1 EA	PANIC HARDWARE	98-L-2SI-06	626	VON
2 EA	RIM CYLINDER	30 X REQ'D KWY	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 62**

For use on mark/door #(s):  
1303.1            1304.1            1305.1

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
1 EA	PANIC HARDWARE	98-L-2SI-06	626	VON
2 EA	RIM CYLINDER	30 X REQ'D KWY	626	C-R
1 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR BOTTOM	411ARL	AL	PEM
1 EA	CARPET THRESHOLD	V2325BL	BLK	PEM

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**Hardware Group No. 63**

For use on mark/door #(s):

1321.3                    1321.4

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
8 EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
1 EA	PANIC HARDWARE	9827-L-DT-LBR-06	626	VON
1 EA	PANIC HARDWARE	9827-L-LBR-06	626	VON
1 EA	RIM CYLINDER	30 X REQ'D KWY	626	C-R
2 EA	SURFACE CLOSER (W/ SPRING HOLD OPEN STOP)	4040XP SHCUSH	689	LCN
2 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
2 EA	SILENCER	SR64	GY	IVE

**Hardware Group No. 64**

For use on mark/door #(s):

1308B

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1 EA	PANIC HARDWARE	98-L-NL-06	626	VON
1 EA	RIM CYLINDER	30 X REQ'D KWY	613	C-R
1 EA	SURFACE CLOSER	4040XP PA	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
1 SET	SEALS	S88D	BRN	PEM
1 EA	DOOR SWEEP	18062CNB	CLR	PEM

**Hardware Group No. 65**

For use on mark/door #(s):

1313.1                    1313.2                    1316.2                    1316C

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
4 EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
1 EA	CLASSROOM DEADBOLT	DL3217	626	C-R
1 EA	PUSH PLATE	8200 4" X 16"	613	IVE
1 EA	PULL PLATE	8303 10" 4" X 16"	613	IVE
1 EA	SURFACE CLOSER	4040XP REG	689	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1 EA	WALL STOP	WS406/407CCV	626	IVE
3 EA	SILENCER	SR64	GY	IVE

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**Hardware Group No. 66**

For use on mark/door #(s):

1103	1306.3	1308.2	1309.1	1309.3	1309.6
1310	1509.2	2509.2	2509.4	2509.5	

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
1 SET	CYLINDER(S)	AS REQ'D BY LOCKING MECHANISM	626	C-R

A) BALANCE OF HARDWARE BY OVERHEAD DOOR MANUFACTURER.

**Hardware Group No. 67**

For use on mark/door #(s):

M103 M104

EACH TO HAVE:

- A) TRASH ENCLOSURE GATE.
- B) ALL HARDWARE BY GATE MANUFACTURER.

**Hardware Group No. 68**

For use on mark/door #(s):

DUGOUT 4A DUGOUT 4B

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>FIN</u>	<u>Mfr</u>
3 EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1 EA	PASSAGE LATCH	CL3310 NZD	626	C-R
1 EA	CLASSROOM DEADBOLT	DL3217	626	C-R
1 EA	OH STOP	90S	630	GLY
1 SET	SEALS	45041CNB	CLR	PEM
1 EA	DOOR SWEEP	18062CNB	CLR	PEM
1 EA	THRESHOLD	1715A	AL	PEM

END OF SECTION 08 71 00





## SECTION 08 80 00 - GLAZING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes glass for metal frames, doors, windows, curtainwall and storefronts.
  - 1. Glass glazing materials and installation requirements are included in this section for other sections referencing this section.
  
- B. Related Sections:
  - 1. Section 06 41 16 – Architectural Decorative Laminate Clad Casework.
  - 2. Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers.
  - 3. Section 07 92 00 - Joint Sealants: Sealant and back-up material other than glazing sealants.
  - 4. Section 08 12 14 - Standard Steel Frames.
  - 5. Section 08 14 16 - Flush Wood Doors: Glazed doors.
  - 6. Section 08 41 13 - Aluminum-Framed Storefronts.
  - 7. Section 08 44 13 – Glazed Aluminum Curtainwalls.

#### 1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings Safety.
  
- B. American Society of Civil Engineers:
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
  
- C. American Society for Testing and Materials:
  - 1. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
  - 2. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
  - 3. ASTM C1036 - Standard Specification for Flat Glass.
  - 4. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
  - 5. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass.
  - 6. ASTM C1193 - Standard Guide for Use of Joint Sealants.
  - 7. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
  - 8. ASTM E546 - Standard Test Method for Frost Point of Sealed Insulating Glass Units.
  - 9. ASTM E576 - Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position.
  - 10. ASTM E1300 - Standard Practice for Determining the Minimum Thickness of Annealed Glass to Resist a Specific Load
  - 11. ASTM E 2188 Standard Test Method for Insulating Glass Unit Performance
  - 12. ASTM E 2189 Standard Test Method for Testing Resistance to Fogging in Insulating Glass Units
  - 13. ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation
  
- D. Consumer Product Safety Commission:
  - 1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing Material.

- E. Glass Association of North America:
  - 1. GANA - Sealant Manual.
  - 2. GANA - Glazing Manual.
- F. International Building Code:
  - 1. IBC 2406 - Safety Glazing.

### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Product Data:
  - 1. Glass: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
  - 2. Glazing Sealants, Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors where exposed.
- C. Samples:
  - 1. Glass: Submit two samples 12 x 12 inch in size, illustrating each glass units, coloration and design.
  - 2. Glazing Materials: Submit 6 inch long bead of glazing sealant and gaskets, color as selected.
- D. Certificates: Certify products meet or exceed specified requirements.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual, GANA Sealant Manual, and GANA Laminated Glass Reference Manual for glazing installation methods.
- B. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
  - 1. Lites more than 9 square feet (sf) in area are required to be Category II materials.
  - 2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites, more than 9 sf. in area, provide glazing products that comply with Category II materials, and for lites 9 sf. or less in area, provide glazing products that comply with Category I or II materials.
- D. Qualifications
  - 1. Installer: Company specializing in performing Work of this section with minimum five years documented experience.
  - 2. Insulating Glass Manufacturer: A qualified insulating-glass manufacturer whose specific production location for this project is certified by the coated glass manufacturer.
- E. Mock up
  - 1. Provide under Quality Assurance provisions of Section 01 40 00.
  - 2. Provide glazing portion of multi component exterior wall mock-up as described in Section 01 40 00.

- F. Pre-Installation Meeting
  - 1. Section 01 31 00 – Project Management and Coordination: Pre-installation meeting.
  - 2. Convene minimum one week before starting Work of this section.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Do not install glazing when ambient temperature is less than 40 degrees F.
- C. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery:
  - 1. Deliver glass to site in accordance with manufacturer's instructions.
  - 2. Deliver glass in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage:
  - 1. Store glass in accordance with manufacturer's instructions.
  - 2. Store glass in clean, dry area indoors.
  - 3. Protect from exposure to direct sunlight and freezing temperatures.
  - 4. Apply temporary coverings loosely to allow adequate ventilation.
  - 5. Protect from contact with corrosive chemicals.
  - 6. Avoid placement of glass edge on concrete, metal, and other hard objects.
  - 7. Rest glass on clean, cushioned pads at ¼-points.
- C. Handling:
  - 1. Handle glass in accordance with manufacturer's instructions.
  - 2. Protect glass from damage during handling and installation.
  - 3. Do not slide one lite of glass against another.
  - 4. Do not use sharp objects near unprotected glass.

#### 1.7 WARRANTIES

- A. Special Warranty on Glass Breakage: Warrant glass units jointly and severally, on a single document, by the Installer and General Contractor, agreeing to replace all glass units broken by temperature changes, flaws in materials, environmental conditions (excluding fire and impact), and normal deflection up to specified limits for a period of five (5) years from date of Final Acceptance, excluding damage from misuse, impact or vandalism.
- B. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass that deteriorates within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

- C. Special Warranty on Insulating Glass: Provide written warranty signed by manufacturer of insulating glass, agreeing to furnish FOB project site replacements for insulating glass units which have deteriorated. Warranty shall be for a period of 10 years from date of Final Acceptance. "Deteriorated" shall be defined as having a failure in the seals of the glass units causing constant or intermittent appearance of condensation or other loss of visual clarity.

## PART 2 PRODUCTS

### 2.1 GLAZING

- A. Manufacturers:
1. Guardian ([www.guardian.com](http://www.guardian.com)).
  2. PPG ([www.ppg.com](http://www.ppg.com)).
  3. Viracon ([www.viracon.com](http://www.viracon.com)).
  4. Pilkington US & Canada ([www.pilkington.com](http://www.pilkington.com))
  5. Substitutions: See Section 01 25 00 - Substitution Procedures.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Provide glass and glazing materials for continuity of building enclosure weather resistive barrier:
1. In conjunction with materials described in Section 07 27 15 and 07 92 00.
  2. To utilize inner pane of multiple pane sealed units for continuity of weather resistive seal.
  3. To maintain continuous weather resistive barrier and vapor retarder throughout glazed assembly from glass pane to heel bead of glazing sealant.
- B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with applicable code, to design pressure as measured in accordance with ASTM E330, as calculated in accordance with ASCE 7 - Calculation of Wind Loads.
- C. Seismic Requirements: Determine in conformance to ASCE 7, Section 13.5.9.
- D. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer
- E. Limit glass center-of-glass deflection to the smallest of the following:
1. The displacement associated with the structural capacity of the glazing unit.
  2.  $L/100$ , where L is the shortest side dimension of the unit measured in inches.
  3.  $\frac{3}{4}$  inch.

### 2.3 COMPONENTS

- A. Flat Glass:
1. (GL-1) Clear Heat Strengthened Glass:  $\frac{1}{4}$ " , ASTM C1048, Type 1 transparent flat, Quality Q3, Kind HS, Condition A uncoated.
  2. (GL-2) Clear Laminated Glass:  $\frac{1}{4}$  inch, ASTM C1048, two 1/8 inch layers heat strengthened glass with .030 inch clear pvb interlayer.
  3. (GL-3) Clear Tempered Glass:  $\frac{1}{4}$  inch; ASTM C1048, Kind FT, heat strengthened, Condition A uncoated, Type 1 transparent flat, Class 1, q3.
  4. (GL-4) Tempered Glass: 3/8 inch, clear, flat polished at exposed edges.

- B. Low Emissivity Coating (Low E): Low-emissivity coated glass produced by sputter coating technology applied in a vacuum chamber. Low-emissivity coated glass shall meet the following performance values; values listed have been based on Guardian SN 68 on Clear. Approved equals also accepted. Substitutions refer to Section 01 25 00.
1. SN 68 on Clear
    - a. Visible light transmittance: 68% minimum.
    - b. U-Value: Winter (Argon Filled Cavity Space) - 0.25 maximum.
    - c. Solar Heat Gain Coefficient: .38 maximum.
    - d. Shading Coefficient: .43 maximum.
    - e. Outdoor Visible Light Reflectance: 11% maximum.
    - f. Stainless Steel Warm-Edge designed spacer.

## 2.4 INSULATED UNITS

- A. Double Panel Insulating Units: ASTM E2190, with glass elastomer edge seal.
1. (IG-1): Heat Strengthened; Exterior Insulating Unit
    - a. Total Thickness: 1 inch nominal.
    - b. Interior Pane: (GL-1)
    - c. Space: ½ inch, 90% argon/10% air fill.
    - d. Exterior Pane: (GL-1) with low e coating applied to the #2 side.
  2. (IG-2): Laminated/Tempered; Exterior Insulating Unit
    - a. Total Thickness: 1 inch nominal.
    - b. Interior Pane: (GL-2).
    - c. Space: ½ inch, 90% argon/10% air fill; with stainless steel warm edge designed spacer.
    - d. Exterior Pane: (GL-3) with low e coating applied to the #2 side.
  3. Insulated Units to be comparable to Guardian SN68 or better.

## 2.5 ACCESSORIES

- A. Glazing Materials: Select glazing sealants, tapes, stainless steel spacers, gaskets and additional glazing materials of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
- B. Silicone Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component; chemical solvent curing; capable of water immersion without loss of properties; non-bleeding, non-staining, cured Shore A hardness of 15 to 25 and as specified Section 07 92 00.
1. Structural Silicone Sealant: Conform to ASTM C1184 and provisions of Section 07 92 00.
  2. Color: As selected by Architect from manufacturer's complete range.
- C. Setting Blocks: Silicone compatible EPDM or silicone, 80 to 90 Shore A Durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- D. Spacer Shims: Silicone compatible EPDM or silicone, 50 to 60 Shore A durometer hardness, minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- E. Glazing Gaskets: ASTM C864 Option II, resilient Silicone compatible EPDM or silicone, extruded shapes to suit glazing channel retaining slot, 50 to 60 Shore A durometer hardness, one piece with molded corners, black color.

- F. Glazing Tapes:
  - 1. Preformed butyl compound with integral resilient tube spacing device, 10 to 15 Shore A durometer hardness, coiled on release paper, size and thickness as required for conditions of installation, black color.
  - 2. Expanded Cellular Glazing Tapes: Conform to AAMA 800.
  - 3. Spacer Tape In Continuous Contact with Silicone: Tested for compatibility and approved for intended purpose by sealant manufacturer.
- G. Temporary Glazing Clips: Manufacturer's standard type.

## 2.6 GLASS FABRICATION

- A. Insulating Glass Units: Comply with ASTM E2190; Class CBA per ASTM E773 and E774 through IGCC Program.
  - 1. Roll Wave: Orient roll wave in horizontal position whenever possible and ensure that all lites in an insulating unit are position with the same orientation.
    - a. Limit roll wave to a maximum of 0.005" from top to bottom of wave as measured by calibrated industry accepted equipment
  - 2. Sealing System: Dual seal with polyisobutylene (butyl) primary seal and silicone seals as appropriate for glazing application. Use silicone at structural silicone glazed systems as secondary seal.
  - 3. Air Space: For 1-inch insulated units, provide 1/2 inch air space. Provide 5/8 inch units with 3/8 inch air space at exterior entrance doors.
  - 4. Spacer Bar: Stainless steel; roll formed design filled with desiccant on two sides, minimum.

## 2.7 SOURCE QUALITY CONTROL AND TESTS

- A. Provide shop inspection and testing for safety and insulated glass.
- B. Test samples in accordance with ANSI Z97.1, ASTM E773, ASTM E546, and ASTM E576.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify openings for glazing are correctly sized and within acceptable tolerance.
- C. Verify surfaces of glazing channels or recesses are clean, free of obstructions impeding moisture movement; weeps are clear, and ready to receive glazing.

### 3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.

### 3.3 INSTALLATION

- A. Perform installation in accordance with GANA Glazing Manual and written recommendations of glazing manufacturer/fabricator and manufacturers of aluminum storefront, window, and curtain wall manufacturers.
1. Glazing Sealants: Comply with ASTM C1193.
- B. Exterior Wet/Dry Method (Preformed Tape and Sealant) Installation:
1. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with compatible butyl sealant.
  2. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of weather resistive seal.
  3. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
    - a. Ensure that setting blocks support both exterior and interior pane of glass in an insulating glass unit.
  4. Rest glazing on setting blocks and push against tape [and heel bead of sealant] with sufficient pressure to attain full contact at perimeter of pane or glass unit.
  5. Install removable stops, with spacer strips inserted between glazing and applied stops, 1/4 inch below sight line. Place glazing tape on glazing pane or unit with tape 1/4 inch below sight line.
  6. Fill gap between glazing and stop with elastomeric glazing sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
  7. Apply cap bead of elastomeric glazing sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.
- C. Exterior and Interior Gasket Glazed Method (Dry/Dry) Installation:
1. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
  2. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
  3. Center glass lites in openings on setting blocks that support both exterior and interior panes of glass in the insulating unit and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
  4. Install gaskets so they protrude past face of glazing stops.
- D. Exterior Wet Method (Sealant and Sealant) Installation:
1. Place setting blocks at 1/4 points and install glazing pane or unit.
    - a. Ensure that setting blocks support both exterior and interior pane of glass in an insulating glass unit.
  2. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.
  3. Fill gaps between glazing and stops with elastomeric glazing sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the weather resistive seal.
  4. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.
- E. Exterior and Interior Butt Glazed Method (Sealant Only) Installation:
1. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
  2. Temporarily secure small diameter non-adhering foamed rod on back side of joint.
  3. Apply sealant to open side of joint in continuous operation; thoroughly fill joint without displacing foam rod. Tool sealant surface smooth to concave profile.

4. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
5. Remove masking tape.

F. Interior Dry Method (Tape and Tape) Installation:

1. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
  - a. Ensure that setting blocks support both exterior and interior pane of glass in an insulating glass unit.
3. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
4. Place glazing tape on free perimeter of glazing in same manner described above.
5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
6. Knife trim protruding tape.

G. Interior Wet/Dry Method (Tape and Sealant) Installation:

1. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.
2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
  - a. Ensure that setting blocks support both exterior and interior pane of glass in an insulating glass unit.
3. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
4. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
5. Fill gaps between pane and applied stop with elastomeric glazing sealant to depth equal to bite on glazing, to uniform and level line.
6. Trim protruding tape edge.

H. Interior Wet Method (Compound and Compound) Installation:

1. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
  - a. Ensure that setting blocks support both exterior and interior pane of glass in an insulating glass unit.
2. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
3. Locate and secure glazing pane using glazers' clips.
4. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

### 3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements.
- B. Monitor quality of glazing and glazing installation.

### 3.5 MANUFACTURER'S FIELD SERVICES

- A. Section 01 40 00 - Quality Requirements: Manufacturers' field services.
- B. Monitor and report installation procedures, and unacceptable conditions.



### 3.6 CLEANING

- A. Section 01 77 00 – Closeout Procedures: Final cleaning.
- B. Remove glazing materials from finish surfaces.
- C. Remove labels after Work is complete.
- D. Clean glass and adjacent surfaces.

### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 – Execution: Protecting installed construction.
- B. After installation, mark pane with an 'X' by using removable plastic tape or paste.

### 3.8 SCHEDULE

- A. See Door Frame, Relite and Window types on the drawings.

END OF SECTION 08 80 00



## SECTION 09 21 16 – GYPSUM BOARD ASSEMBLIES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Interior gypsum board.
  2. Tile backing panels.
  3. Cement Board.
  4. Shaft wall assemblies.
  5. Drywall trim and finishing (joint tape and compound).
  6. Finishing Accessories.
- B. Related Sections:
1. Section 05 40 00 - Cold-Formed Metal Framing: For load bearing metal framing for gypsum board support.
  2. Section 06 10 53 - Miscellaneous Rough Carpentry: For wood framing and furring for gypsum board support.
  3. Section 07 21 16 - Blanket Insulation: For insulation and vapor retarders installed in assemblies that incorporate gypsum board and acoustical insulation.
  4. Section 07 84 00 - Firestopping: For fire resistive joint and penetration systems.
  5. Section 07 92 00 - Joint Sealants: Penetration and joint sealants.
  6. Section 0792 19 – Acoustical Joint Sealants.
  7. Section 08 12 14 - Standard Steel Frames: Coordination of frames and drywall details.
  8. Section 09 22 16 - Non-Structural Metal Framing: Wall framing, ceiling suspension systems, wall furring, including fire rated assemblies and shaft wall framing.
  9. Section 09 30 00 - Tiling: Coordination of tile backing panels with tiling installation.
  10. Section 09 90 00 - Painting and Coating: For finish paints and primers applied to gypsum board assemblies.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
1. ASTM C475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  2. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
  3. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. to 0.112 in in Thickness.
  4. ASTM C1002 - Standard Specification for Steel Self Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  5. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  6. ASTM C1178 - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
  7. ASTM C1396 - Standard Specification for Gypsum Board.
  8. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold Formed Steel Framing Connections.
  9. ASTM C1629 - Standard Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products and Fiber Reinforced Cement Panels.
  10. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
12. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

B. Gypsum Association:

1. GA-214 - Recommended Levels of Gypsum Board Finish.
2. GA-216 - Specifications for the Application and Finishing of Gypsum Panel Products.
3. GA-234 - Control Joints for Fire-Resistance Rated Systems.
4. GA-600 - Fire Resistance Design Manual Sound Control Gypsum Systems.

C. Underwriters Laboratories, Inc.:

1. Fire Resistance Directory.

### 1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data for each type of product indicated.

C. Shop Drawings:

1. Indicate special details associated with fireproofing and acoustic seals.
2. Indicate installation details required for seismic design loads.

### 1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards. Provide all components of each wall assembly from a single manufacturer.

B. Assembly Instructions: Keep at the site and make available to installers a copy of installation requirements for each STC and fire rated assembly.

C. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution. Install mockups representative of partition assemblies designated and as follows:

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Qualifications:

1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
2. Installer: Company specializing in performing Work of this section with minimum five years documented experience.

E. Pre-Installation Meeting:

1. Convene minimum one week prior to commencing Work of this section.

### 1.5 PROJECT CONDITIONS

A. Environmental Conditions: Comply with ASTM C840 requirements for gypsum board application or written recommendations of gypsum board manufacturer, whichever is more stringent, for environmental conditions before, during and after application of gypsum board.

- B. Cold Weather Protection: When ambient outdoor temperatures are below 55 degrees F., maintain continuous, uniform, comfortable building working temperatures of not less than 55 degrees F. for a minimum period of 48 hours prior to, during and following application of gypsum board and joint treatment materials. Do not install interior products until installation areas are enclosed and conditioned.
- C. Ventilation: Provide controlled ventilation during joint finishing operations to eliminate excessive moisture. Avoid drafts during hot, dry weather to prevent excessively fast drying of joint compound.
- D. Dehumidification: Refer USG Field Technical Information 303, dated 3/91, "Gypsum Wall board and Winter Weather" for required drying.

## PART 2 PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. General: Perform work in accordance with Gypsum Association publications:
  - 1. GA-214 - Recommended Levels of Gypsum Board Finish.
  - 2. GA-216 - Specifications for the Application and Finishing of Gypsum Panel Products.
- B. Fire Rated Construction: Wherever a fire resistance classification is indicated or scheduled for wall construction (1 hour or greater designation), provide materials and methods tested in accordance with ASTM E119 for the type of construction shown, and approved by local building authorities. Fire rated construction shall be continuous where required, whether or not specifically indicated. Provide assemblies as listed in the following:
  - 1. Fire Resistance Directory
  - 2. GA-600

### 2.2 DESIGN REQUIREMENTS

- A. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated according to ASCE 7 and applicable codes for Seismic Design Category indicated on Structural Drawings.

### 2.3 GYPSUM BOARD

- A. Acceptable Manufacturers
  - 1. CertainTeed Gypsum, Inc. (<http://www.certainteed.com>)
  - 2. Georgia-Pacific, (<http://www.gp.com>)
  - 3. USG, Chicago, IL, 312.436.4000. (<http://www.usg.com>).
  - 4. National Gypsum Company, Charlotte, NC. (<http://www.nationalgypsum.com>)
  - 5. Substitutions: Under provisions of Section 01 25 00.
- B. Gypsum Wallboard (GWB):
  - 1. USG Sheetrock; Georgia-Pacific ToughRock; Certainteed M2Tech; Gypsum Board; National Gypsum Gold Bond Type X or approved equal; ASTM C1396, Type "X", tapered edged, 5/8 inch thick (unless otherwise indicated); furnish boards in maximum lengths available to minimize end-to-end joints; 48-inches wide.

- C. Moisture Resistant Gypsum Wallboard (GWB-MR):
1. USG Mold Tough Gypsum Panels; Georgia Pacific DensArmor Plus High Performance Interior Panels, Certainteed Moisture and Mold Resistant with M2Tech; National Gypsum Gold Bond Mold Resistant eXP Interior Extreme or approved equal water and mold resistant panels; ASTM C1278, C1396, C1178, and rated 10 by independent test ASTM D3273 for mold resistance; tapered edged, 5/8 inch thick; furnish boards in maximum lengths available to minimize end-to-end joints; 48-inches wide. Scheduled framing at 16 inch span, maximum.
- D. Abuse Resistant Gypsum Wallboard (GWB-AR): Manufactured to produce greater resistance to surface abrasion (ASTM D 4977, Level 1), surface indentation (ASTM D5420, Level 1), Soft Body impact (ASTM E695, Level 1) than standard regular type and Type X gypsum board.
1. USG Sheetrock Brand Abuse-Resistant Panels, Georgia Pacific ToughRock Abuse Resistant, Certainteed AirRenew Extreme Abuse; National Gypsum XP Abuse Resistant or approved equal; ASTM C1396, Type X, tapered edged, 5/8 inch thick (unless otherwise indicated); furnish boards in maximum lengths available to minimize end-to – end joints; 48 inches wide.
    - a. Provide at all exposed locations 4' and below.
- E. Impact Resistant Gypsum Wallboard (GWB-IR): Manufactured with Type X core, with a fiberglass mesh imbedded in the core for greater resistance to through-penetration (impact resistance). In addition to ASTM D4977 (Level 1), ASTM D 5420 (Level 1) and ASTM E 659 (Level 1), tested in accordance with ASTM C1629 (Level 1) and a score of 10 when tested in accordance with ASTM D 3273.
1. USG Fiberock (Very High Impact), Georgia Pacific DensArmor Plus, Impact Resistant Gypsum Interior Panels, Certainteed AirRenew Extreme Impact; National Gypsum C eXP Interior Extreme IR or approved equal; ASTM 1278 or C1658, Flame Spread 5, Smoke Development 0; tapered edged, 5/8 inch thick; furnish boards in maximum lengths available to minimize end-to-end joints; 48 inches wide. Scheduled framing at 16 inch span, maximum.
    - a. Provide where indicated on Finish Schedule.
- F. Backer Gypsum Wallboard, Cementitious Tile Backer Board (GWB-TB, CTB):
1. USG Fiberock Aqua Tough Tile Backerboard, Georgia Pacific DensShield Tile Backer, CertainTeed GlasRoc; National Gypsum eXP Tile Backer or approved equal. ASTM C1178, Type X, square edged, 5/8 inch thick (unless otherwise indicated); furnish boards in maximum lengths available to minimize end to end joints; 48 inches wide.
    - a. Provide at all tiled wall locations.
    - b. Provide at all wet locations including sinks and water fountains.
- G. Liner Panels, Shaft Wall Assemblies: USG "Gypsum Liner Panels –Mold Tough or Glass-Mat", Georgia Pacific Gypsum DensGlass Shaftliner; National Gypsum eXP Shaftliner conforming to ASTM C 1685 or ASTM C 1396.or approved equal 1 inch thick, 24 inch wide, enhance with non-combustible and moisture-resistant core that is encased in a water-resistant, mold and mildew resistant (ASTM E2373), Glass mat facers or 100 % recycled blue face and back paper; UL Classified-Resistant (ASTM E136), flame spread 20 and smoke developed 0 (ASTM E84) with double beveled edges conforming to ASTM C1396, Type "SLX" and ASTM C1396. Furnish in maximum lengths available to eliminate or minimize end-to-end joints; for walls 12 feet or less in height, furnish panels in full length for height required.

## 2.4 CEMENT BOARD

- A. Acceptable Manufacturers:
  - 1. USG Durock Brand Cement Board.
  - 2. HardieBacker, James Hardie Industries.
  - 3. WonderBoard, Custom Building Products.
  - 4. Substitutions under provisions of Section 012500.
- B. Moisture and mold resistant comply with following requirements:
  - 1. Flexural Strength: >750 psi, ASTM C947.
  - 2. Indentation Strength: >1250 psi, ASTM D2394.
  - 3. Shear Bond Strength: >50 psi, ASTM A118.4.
  - 4. Water Absorption: 15% by weight 24 hours, ASTM C473.
  - 5. Surface burning characteristics: 0/0, flame/smoke, ASTM E84.
- C. Refer to Section 09 30 00 for waterproofing membrane.

## 2.5 PERFORATED ACOUSTIC GYPSUM BOARD (GWB -P):

- A. Acceptable Manufacturers:
  - 1. Basis of Design: Gyp-Sorb, Sonus Square, 8/18.
  - 2. Substitutions: Under provisions of Section 01 25 00.
- B. Components:
  - 1. Panel:
    - a. Perforation Type: 8mm/18mm.
    - b. Perforation Size: 1188 x 1998 mm, 1188 x 2394 mm.
    - c. Panel Thickness: 12.5 mm.
    - d. Open Rate: 19.8%.
  - 2. Non – woven fabric: Black.
- C. Accessories as needed to complete installation and recommended by manufacturer.

## 2.6 GYPSUM BOARD TRIM ACCESSORIES

- A. Standard Metal Trim: Unless otherwise noted, Beadex Manufacturing Co., Inc. trim is specified. Substitution of trim members by other manufacturers is acceptable conforming to ASTM C1047 and Section 01 25 00. Provide galvanized steel laminated with paper trim designed for concealed metal and for application without mechanical fastening, unless otherwise specified; sizes compatible with thickness of drywall.
  - 1. Outside Corners: Right angle trim with paper surface to receive cement; Beadex "No. B1."
  - 2. Exposed Edges: "L" shaped trim with paper surface to receive cement; size to suit wallboard thickness. Beadex "No. B4."
  - 3. Edges Abutting Dissimilar Materials: "L" shaped trim with paper surface to receive cement and factory applied masking; size to suit wallboard thickness. Beadex "Premask L."
  - 4. Control Joints: Roll-formed zinc trim with tape-protected 1/4-inch opening, 7/16 inch deep. US Gypsum "No. 093", or approved substitution.

## 2.7 GYPSUM BOARD JOINT TREATMENT MATERIALS

- A. General: Provide materials as hereinafter specified, complying with ASTM C475; use only compatible compounds from one manufacturer.

1. Joint Tape for Drywall: Manufacturer's standard high-strength fiber paper tape with feather (sanded) edges or 2" Fiberglass Mesh Tape and setting compound.
2. Joint Treatment for Standard Gypsum Wallboard Panels:
  - a. Joint compound for embedding paper tape and for first fill coat over metal trim and fasteners: Manufacturer's standard, except as otherwise indicated. Lightweight all-purpose types are acceptable for overhead and ceiling applications.
  - b. Joint compound for second and third coats, except for W/R Board: Manufacturer's standard.
3. Joint Treatment for Moisture Resistant - W/R Panels Under Tile and To Receive Painted Finish: Joint compound for embedding tape and for coating over metal trim and fasteners where W/R board is scheduled: Manufacturer's standard for high moisture areas.
4. Joint Treatment for Tile Backer Board: Use exterior rated tape and setting-type taping compound and setting-type, sandable topping compound as recommended by the cement board manufacturer. With Glass Mat gypsum Tile Backer, bed self adhesive 2" wide fiberglass mesh tape in all corners in a bed of flexible sealant. Bed tape on all joints and corners with material used to set tiles. Joint compound should not be used in wet areas.

## 2.8 FINISHING ACCESSORIES

- A. Partition Closures: Provide extruded aluminum adjustable partition closures at all junctures of partitions with other construction as indicated.
  1. Mullion Mate by Gordon Interior Specialties, [www.gordon-inc.com/interiors/ceilings/mullionmate.aspx](http://www.gordon-inc.com/interiors/ceilings/mullionmate.aspx) , or approved substitution.
    - a. Pre-assembled and spring loaded to provide a tight fit for vertical junctures and window walls, size to fit opening.
    - b. Finish to match mullions in spray applied water-borne cross-linked baked acrylic finish or Acrylic-Polyester hybrid powder coat to match storefront system at Commons.
    - c. STC Rating: 38
    - d. Materials: Provide metals free from surface blemishes where exposed to view in finished unit. Surfaces that exhibit pitting, seam marks, roller marks, stains, and discolorations or other imperfections on finished units are not acceptable. All metal shall be of the highest-grade commercial type.
      - 1) Aluminum Extrusions: 6063-T5, tensile strength 31 KSI (ASTM B221).
      - 2) Acoustical Blankets for sound attenuation factory installed.

## 2.9 GYPSUM BOARD MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board.
- B. Fasteners:
  1. Steel Drill Screws: ASTM C1002 and ASTM C1513, for fastening gypsum board to steel members, unless otherwise indicated.
    - a. Comply with ASTM C954, screws for fastening to 10 gauge or heavier steel studs.
    - b. For fastening tile backer board, use screws of type and size recommended by panel manufacturer.
- C. Fire Resistant Seal Compound: As specified in Section 07 84 00 - Firestopping.
- D. Sound Attenuation Blankets: As Specified in Section 07 21 16 - Blanket Insulation.



- E. Acoustical Sealant: As specified in Section 07 92 19 – Acoustical Joint Sealants.
  - 1. Sealant shall be a paintable, non-hardening, non-bleeding, non-drying, resilient caulk and meet ASTM C834.
- F. Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates, with installer present, and including welded hollow metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture, mold or otherwise damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Beginning of installation means acceptance of existing substrate and site conditions.

### 3.2 GENERAL INSTALLATION REQUIREMENTS

- A. General: Comply with applicable requirements of ASTM C840 and GA 216, fire rated assembly requirements and as specified herein, unless otherwise required by local building authorities.

### 3.3 FINISHING

- A. Installation: Tape and finish drywall in accordance with GA-214/ASTM C840, for Level of finish indicated below, unless detailed otherwise.
- B. Finishing Schedule:
  - 1. Level 2: Gypsum board above finished ceilings.
  - 2. Level 3: Gypsum board in utilitarian rooms as mechanical/electrical room, storerooms, custodial closets, and in restrooms at moisture resistant board behind finishes; except behind ceramic tile, blade second coat smooth.
  - 3. Level 4: Gypsum board in exposed to view (public) areas, except as otherwise indicated unless skim coat is required to create a smooth surface at abuse resistant and impact resistant panels and behind items that are mechanically attached including whiteboards, tackboards, casework, panel systems, etc.

### 3.4 GYPSUM BOARD INSTALLATION

- A. Install gypsum board units in accordance with ASTM C840 and manufacturer's instructions.
- B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing. Stagger joints on opposite sides of partitions.
- C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing. Stagger joints on opposite sides of partitions.
- D. When gypsum board is to be applied to both ceilings and walls, apply the gypsum board to the ceiling first and then to the walls, unless detailed otherwise.

- E. Use screws when fastening gypsum board to metal furring or framing.
- F. Multiple Layer Applications: Use gypsum backing board for first layer, placed over framing or furring members. Use fire rated gypsum backing board for fire rated partitions. Secure subsequent layers to substrate in manner required by code for indicated fire rating. Apply adhesive in accordance with manufacturer's instructions.
- G. Treat cut edges and holes in tile backer board with sealant.
- H. Place control joints consistent with lines of building spaces as indicated or directed.
- I. Place corner beads at all external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials and at exposed edges.

### 3.5 PERFORATED ACOUSTIC GYPSUM BOARD INSTALLATION

- A. Follow manufacturer's written instructions.
- B. Only seamless installation will be acceptable (No tape joints showing.)
- C. Any penetration that interferes/splits perforation, or at a termination edge/corner shall be filled, mudded, sanded and painted to create a seamless edge.

### 3.6 SHAFT WALL INSTALLATION

- A. Tape and finish inside of vertical shafts constructed with shaftwall studs if necessary to meet structural requirements and fire rating. Seal all joints between gypsum coreboard and dissimilar materials.
- B. Fill shaft wall stud space, if any, with approved blanket insulation as a sound deadening medium.

### 3.7 JOINT TREATMENT

- A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
- B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.
- C. Apply in accordance with manufacturer's instructions.

### 3.8 CONTROL AND EXPANSION JOINTS

- A. Position and install control and expansion joints.
- B. Coordinate with the framing installer to ensure that framing is installed immediately on either side of each control joint.
- C. Conform to GA-234.
- D. Space control joints as indicated or when not indicated, locate as follows (with Architect approval of locations):
  - 1. At maximum 30 foot intervals along continuous wall planes.
  - 2. At maximum 50 foot intervals at continuous ceilings with perimeter relief and each 2500 square foot of ceiling area.

3. At maximum 30 foot intervals at continuous ceilings without perimeter relief.
4. At locations where expansion or control joints occur in the building structure.
5. At transitions with other wall substrates install where gypsum board spans masonry, concrete, metal studs and other materials.
6. Locate control joints to form rectangular or square joints, in "L," "U," "T," or other irregularly shaped areas.
7. Position control joints to intersect light fixtures, air diffusers, door opening, and other areas of stress concentration as detailed or approved.

### 3.9 ACOUSTICAL ACCESSORY INSTALLATION

- A. Place acoustical insulation where indicated in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
- B. Place acoustical insulation under V.A.V. boxes over partitions above ceiling. Refer to mechanical drawings for V.A.V. box locations.
- C. Install acoustical sealant (in acoustically rated walls) at gypsum board perimeter for:
  1. Metal Stud Track Framing: Two beads.
  2. Base Layer.
  3. Face Layer.
  4. Caulk all penetrations of partitions by conduit, pipe, ductwork, rough-in boxes, etc.
- D. Method:
  1. Isolate all ductwork and pipe work over 2 inches in diameter (including sprinkler system) at penetrations as follows:
    - a. Provide a sheet metal (22 gauge) sleeve to cover the entire perimeter of a 1 inch to 1-1/2 inch (1/2 inch to 3/4 inch on each side) oversized penetration cut.
    - b. Plaster or caulk sleeve to the wall to ensure an airtight seal.
    - c. If ductwork or pipework penetrates a double wall, use a separate sleeve at each side of the wall (allow no sleeve connection between walls).
    - d. Pack the gap between the penetrating duct or pipe and the sleeve with Acoustical Insulation and seal airtight on both sides of the wall with an outer layer of Acoustical Sealant.
    - e. Do not use wall penetrations to support pipework or ductwork. Support pipe or duct just prior to and just after the penetration, so that the pipe or duct is centered in penetration.
    - f. Use the above penetration treatment regardless of the existence of external duct or pipe insulation. Size penetration large enough to pack additional Acoustical Insulation and apply Acoustical Sealant between the external insulation and the sheet metal sleeve.
  2. Isolate all pipe work 2 inches or less in diameter (including sprinkler system) at penetrations as follows:
    - a. Oversize penetration cut by 1/4 inch (1/8 inch each side).
    - b. Seal airtight on both sides of the wall with Acoustical Sealant.
    - c. Do not use wall penetrations to support pipe work. Support pipe just prior to and just after the penetration, so that pipe is centered in penetration.
    - d. Use the above penetration treatment regardless of the existence of external pipe insulation. Size penetration large enough to apply Acoustical Sealant between the external insulation and the pipes.

### 3.10 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

### 3.11 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in manner suitable to Installer, to ensure gypsum board assemblies are without damage or deterioration at time of Substantial Completion.

### 3.12 SCHEDULES

- A. Refer to finish schedule and details for types and locations.

END OF SECTION 09 21 16

## SECTION 09 22 16 – NON-STRUCTURAL METAL FRAMING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Metal studs for partition and ceiling framing as indicated for interior partitions.
  2. Suspension systems for gypsum board ceilings and soffits, and for exterior soffits.
  3. Wall furring.
  4. Backing plates for attaching wall hung items, toilet accessories, surface applied hardware, etc.
  5. Installation of access doors in metal framed walls and partitions.
  6. Firestop system at head of rated partitions and connecting floor or roof deck assemblies.
  7. Framing/furring for fiber cement walls and soffits.
- B. Related Sections:
1. Section 05 40 00 - Cold Formed Metal Framing: Exterior wall framing.
  2. Section 07 84 00 - Firestopping: Safing insulation for edge of slab applications.
  3. Section 07 92 00 – Joint Sealants.
  4. Section 08 31 13 - Access Doors and Frames: Coordination for installation.
  5. Section 09 21 16 - Gypsum Board Assemblies: Wallboard installation and finishing.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
1. ASTM A641 - Standard Specification for Zinc Coated (Galvanized) Carbon Steel Wire.
  2. ASTM A653 - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.
  3. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
  4. ASTM C635 - Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay In Panel Ceilings.
  5. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
  6. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products.
  7. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
  8. ASTM C1002 - Standard Specification for Steel Self Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  9. ASTM E84 - Standard Test Methods for Surface Burning Characteristics of Building Materials.
  10. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
  11. ASTM E814 - Standard Test Method for Fire Tests of Penetration Fire Stop Systems.
  12. ASTM E1966 - Standard Test Method for Fire Resistive Joint Systems.
- B. Underwriters Laboratories:
1. UL 2079 - Standard Test for Fire Resistance of Building Joint Systems.
- C. Warnock Hersey International, Inc.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings:
1. Indicate component details, framed openings, anchorage to structure, type and location of fasteners, and accessories or items required of other related work.

2. Describe method for securing studs to tracks, and for blocking and reinforcement to framing connections.
- C. Design Data: Published Load table and criteria indicating section properties, height of wall limitations, combined axial and lateral load limitations, load and deflection criteria, and allowable loads for fasteners and welds.
  1. For walls taller than 10 feet, provide stamped calculations for loadings and stresses of walls.
  2. For walls less than 10 feet, provide design data above or stamped calculations.
- D. Product Data: Submit data describing standard framing member materials and finish, product criteria, load charts, and limitations.
- E. Evaluation Reports: Submit evaluation reports certified under an independent third party inspection program administered by an agency accredited by International Accreditation Service (IAS).
- F. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions under provisions of Section 01 33 00 - Submittal Procedures.

#### 1.4 QUALITY ASSURANCE

- A. Allowable Tolerances: Provide framing to conform with the following allowable tolerances:
  1. Partition Framing: Plumb and located within plus or minus 1/4-inch of required locations.
  2. Ceiling Framing: Level within 1/8-inch in 12 feet and erected so that deflection of any component does not exceed deflection limits as indicated in design criteria after installation of all finish materials and equipment.
- B. Fire Assembly Certification: For each fire assembly, Installer shall certify in writing that installed metal support systems are in conformance with types of assemblies required at each location, including for coordination with specific assemblies of other components affecting each fire assembly.
  1. Fire-Test-Response Characteristics: Tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
  2. Firestopping System at Head-of Wall: Firestopping shall be tested in accordance with ASTM E1966 "Test Method for Fire Resistant Joint System" or UL 2079 "Standard Test for Fire Resistance of Building Joint Systems" Acceptance Criteria.
    - a. Coordinate adequate separation between head of wall joints and building systems required to allow installation of fire rated assembly and installation of gypsum board in Section 09 21 16 - Gypsum Board Assemblies.
- C. Qualifications:
  1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
    - a. Framing Manufacturer: Current member of Steel Stud Manufacturers Association or the Steel Framing Industry Association (SFIA)..
  2. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
- D. Pre-Installation Meeting:
  1. Section 01 31 00 - Project Management and Coordination: Pre-installation meeting on site.
  2. Convene minimum one week prior to commencing work of this section.

#### 1.5 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.

## PART 2 PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Installation Standard for Framing: ASTM C 754 for following assemblies:
  - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

### 2.2 DESIGN REQUIREMENTS

- A. Design Criteria for Metal Support Assemblies:
  - 1. Wall Support Framing: Resist lateral force of 5 pounds per square foot for full height partitions, and 200 pounds concentrated load applied anywhere over 10 sq. ft area for partial height partitions, and 100 pounds concentrated load for wall mounted light fixtures.
    - a. Deflection, Typical: Not exceed L/240 of the span; L/360 behind tile.
    - b. Stud Spacing, Typical: 16 inch O.C, unless otherwise indicated.
  - 2. Shaft Wall Framing: Maximum Deflection based on L/360:
  - 3. Ceiling Suspension Systems (Direct Hung): Comply with the minimum sizes and maximum spans for main runners and cross furring channels as indicated in ASTM C754.
    - a. Live Load: Meet Heavy-Duty Class per ASTM C635.
    - b. Deflection, Typical: Not to exceed L/360.
  - 4. Ceilings, GWB Framing: Design to support the following loading as indicated in ASTM C 754 guidelines:
    - a. Live Load: 10 psf plus weight of steel framing.
    - b. Deflection, Typical: Not to exceed L/360.

### 2.3 APPROVED MANUFACTURERS

- A. [AllSteel & Gypsum Products, Inc.](#)
- B. [ClarkDietrich Building Systems.](#)
- C. [MBA Building Supplies.](#)
- D. [MRI Steel Framing, LLC.](#)
- E. Substitutions: Refer to Section 01 25 00 - Substitution Procedures.

### 2.4 METAL SUPPORT MATERIALS

- A. Metal Studs (Typical Partition Studs)
  - 1. Fabricate from ASTM A653 steel sheet having a minimum yield strength of 33,000 psi; roll-formed "C" shaped with not less than 1-1/4 inch flange with 1/4 inch nominal return, and pre-punched webs for installation of mechanical and electrical items.
    - a. Size: Depth of studs as indicated on drawings and cross referenced with the appropriate height determination table to meet required performance.
    - b. Spacing: As indicated on drawings.
    - c. Gage: Comply with ASTM C645 and deflection criteria. 33mils (20 gage) unless noted otherwise. Cross reference with the appropriate height determination table to meet required performance.
    - d. Runners: Same gage as studs; size for friction fit to studs; type recommended by stud manufacturer for support of studs, and for vertical abutment of drywall work at other work. Provide top track with minimum 1-1/2 inch long legs, unless otherwise indicated.

- B. Cold Formed galvanized steel studs complying with Section 9.2 of ASTM C645.
1. Size: Depth of studs as indicated on drawings and cross referenced with the appropriate height determination table to meet required performance.
  2. Spacing: As indicated on drawings.
  3. Gage: Comply with ASTM C645 and deflection criteria. Cross reference with the appropriate height determination table to meet required performance.
  4. Runners: Same gage as studs; size for friction fit to studs; type recommended by stud manufacturer for support of studs, and for vertical abutment of drywall work at other work. Provide top track with minimum 1-1/2 inch long legs, unless otherwise indicated.
- C. Finish: Provide studs and runners with protective coating. Comply with ASTM C645. Coatings shall have a protective coating meeting the requirements of ASTM A653, G40, typical and G60 at high moisture locations (locker rooms, cafeteria, toilet rooms or shall have a protective coating with an equivalent corrosion resistance.
1. Coatings providing equivalent corrosion resistance to a G40 shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to the authority having jurisdiction.
- D. Direct Hung Suspension System: Chicago Metallic "640 Exposed System (640 Main Runner, 644 Cross Tee, 874 Cross Tee (for support of light fixtures), and 5111 Wall Tracks)", or approved equal double web suspension system bearing "Heavy-Duty" structural classification per ASTM C635.
1. Fabricate from commercial grade cold-rolled electro-galvanized steel. Required items standard with suspension system.
  2. Main runners (640) and cross tees (644) shall be 1-1/2 inches high with 1-3/8 inch wide knurled face for screw attachment of drywall. Cross tees (874) shall be 1-1/2 inches high with 15/16 inch face width; these members must be used for support of recessed light fixtures on four (4) sides.
  3. Design and construct main runners and cross tees and their splices and intersection connectors to carry a mean ultimate test load of not less than 180 pounds or twice the actual load, whichever is greater, in tension and compression. Provide mechanical interlocking connections at splices and intersections.
  4. Exterior Fiber Cement Soffit framing in accordance with manufacturer's recommendation.
- E. Wall Furring Members: ASTM C645; minimum 18 mils (25 gage), hat-shaped. Size 1-1/4 inch face width by 7/8 inch depth. Provide channels with manufacturer's standard zinc protective coating, except meeting ASTM A 653, G60 (Z180), hot-dip galvanized zinc coating for exterior locations.
- F. Shaft Wall Framing: Provide manufacturer's pre-engineered and tested systems constructed from components of gages required to meet the following criteria. Modify and supplement manufacturer's standard system to comply with performance criteria, including those of governing regulations. Provide runners, stiffeners, braces and similar framing members required to form a complete system; provide depth of support members indicated for wall types. Framing system shall meet the following performance criteria:
1. Maximum Deflection: L/360 for partitions constructed of 2-1/2, 3-1/2, 4 and 6 inch studs.
  2. Design Air Pressure: Coordinate with Division 14 or 15 subcontractor as appropriate.
  3. Fire Ratings: as indicated.
- G. Shaft Wall Studs: United States Gypsum "C-H Studs," or approved equal certified meeting fire rated assembly; all studs shall be minimum 20 gage; sizes of studs as indicated in partition types on drawings.



1. Runners (tracks): Use stud manufacturer's standard "J-Runners," formed from same gage as wall studs; runners 1 inch by 2-1/4 inches by width of stud.
  2. Finish: Manufacturer's standard galvanized finish.
- H. Restraining Angles (Top of Fire Rated Partitions): ASTM C645, minimum 25 gage, 2½ x 2½ inches minimum. Provide angles with manufacturer's standard zinc protective coating, or be rolled formed from galvanized steel. Angles installed under Section 09 21 16.
- I. Steel Plate (Top of Rated Partitions Which Are Parallel to Deck Flutes): ASTM A653; minimum 16 gage. Provide steel plates in widths to span two or three metal deck ribs with at least 3 inch projection beyond runner track on either side; plates shall be continuous across top of partitions. Provide plates with galvanized protective coating.
- J. Carrying Channels: ASTM C754; 1-1/2 inches main runner channels, 3/4 inches cross furring channels, cold rolled steel channels, weighing 0.475 pounds per foot; provide channels with manufacturer's standard rust inhibitive prime finish for interior areas, and ASTM A 653, G90 (Z275) hot-dipped galvanized finish for exterior areas.
- K. Wire: ASTM A641, carbon steel wire, galvanized, soft annealed, with Class 1 coating; hanger wire minimum 12 gage; wire for tying channels minimum 16 and 18 gage as specified.
- L. Screws: Products of, or as recommended by stud manufacturer and meeting ASTM C1002.
- M. All other materials not specifically described but required for a complete installation of metal framing shall be in accordance with the recommendations of the manufacturer of framing materials used.

## 2.5 HEAD OF WALL AT FIRE RATED ASSEMBLIES

- A. Firestopping System: Provide firestop system between top of rated partitions and floor or roof assemblies that has been tested in accordance with ASTM E814, and listed by Underwriters Laboratories, Inc. or Warnock Hersey International, Inc. Firestopping system must meet criteria specified under 1.5 - Quality Assurance and as follows:
1. Deflection: Allow for 1-1/2 inch unrestrained vertical movement without causing failure, but not less than amount required to meet or UL Std 2079 acceptance testing.
  2. Metal Deck Assemblies: Approved for use with type and depth of fluted deck(s) indicated on drawings. Provide supplementary anchorage approved in the tested assembly.
  3. Concrete Deck Assemblies: Approved for use with deflection track directly attached to concrete substrate. Safing and fire resistant compound is not required as approved under the tested listing.
  4. Compatibility: Shall not impair the fire rating(s) of the metal deck assemblies.
- B. Firestopping Materials: The following materials have been approved, subject to meeting the requirements specified:
1. Safing Insulation: Semi-rigid, un-faced fiber insulation designed for use as a fire stop between top of walls and floor or roof assemblies; insulation shall conform to ASTM C612, Class 1 and 2, and pass ASTM E119 (melt at over 2,000 degrees F.); density four (4) pounds per cubic foot.
    - a. Fire Classification: Flame spread rating of 25 or less and a smoke development of 0 when tested per ASTM E84.
    - b. USG Interiors, Inc. "Thermafiber Safing Insulation", or approved equal.
  2. Fire Resistant Seal Compound: USG Interiors, Inc. "Firecode Compound", or approved equal fire resistant sealing compound which is listed as part of the fire and smoke system used at top of rated partitions. In all cases, sealing compound must be UL listed and approved by local authorities.

## 2.6 RELATED MATERIALS

- A. Acoustical Sealant Tape: Norton "Norseal Acoustical Sealant V-738", Nashua Corporation "Acoustical Tape", or approved equal; tape 1 inch wide by 1/4 inch thick. Provide tape for underside of floor runner tracks and where specified and at top tracks of ceiling height partitions.
- B. Acoustical Sealant: USG "Acoustical Sealant", Protective Treatments, Inc. "808 Acoustical Sealant", or approved equal resilient, non-staining, non-shrinking, non-hardening sealant for interior sealing of concealed construction joints.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify rough-in utilities are in proper location.

### 3.2 INSTALLATION OF STEEL FRAMING, GENERAL

- A. Steel Framing Installation Standard: Comply with ASTM C754.
- B. Install supplementary framing, blocking and bracing at terminations in work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, door bumpers, furnishings and similar construction to comply with details indicate.
- C. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at locations indicated below to comply with details shown on drawings.
  - 1. Where suspended ceiling assemblies abut building structure horizontally at ceiling perimeters or penetrations of ceiling.
  - 2. Where partition and wall framing abut overhead structure.
    - a. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
- D. Do not bridge building expansion and control joints with steel framing or furring members, independently frame both sides of joints with framing or furring members or as indicated.

### 3.3 INSTALLATION OF STEEL FRAMING FOR CEILINGS AND SOFFITS

- A. Suspend ceiling hangers from building structural members as follows:
  - 1. Install hangars plumb and free from contact with insulation or other objects within ceiling plenum not part of supporting structural or ceiling suspension system.
    - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter splaying or other equally effective means.
  - 2. Where widths of ducts and other construction within ceiling plenum produce hanger spacings that interfere with the location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers.
    - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards or manufacturers literature whichever is more stringent.

3. Secure wire hangers to structure, by looping or wire tying, directly to supporting structure, including intermediate framing members. Attach to inserts, eye screws, or other devices appropriate for structure to which hangers are attached as well as for type of hanger involved, in manner that will not cause deterioration or failure, due to age, corrosion or elevated temperatures.
  4. Do not attach hangers to metal roof deck or metal deck tabs.
  5. Do not connect or suspend steel framing from ducts, pipes or conduits.
- B. Keep hangers and braces 2 inches clear of ducts, pipes and conduits.
- C. Sway-brace suspended steel framing with hangers used for support.
- D. Install suspended steel framing components in sizes and at spacing indicated, but not less than required by referenced steel framing installation standard.
1. Wire Hangers: 0.1620 inch diameter (8 gauge), 4 ft. oc.
  2. Carrying Channels (Main Runners): 1 ½ inch, 4 ft. oc.
  3. Rigid Furring Channels (Furring Members): 16 inches oc.
- E. Installation Tolerances: Install steel framing components for suspended ceilings to cross furring members are level to within 1/8 inch in 12 ft. as measured both lengthwise in each member and transversely between parallel members.
- F. Wire-tie or clip furring members to main runners and to other structural supports as indicated.
- G. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension system abuts vertical surfaces. Mechanically join main beam and cross furring members to each other and butt cut to fit wall track.
- H. For exterior soffits, install cross-bracing and additional framing to resist wind uplift.

### 3.4 INSTALLATION OF STEEL FRAMING FOR WALLS AND PARTITIONS

- A. Install runners (tracks) at floors, ceilings and structural walls and columns where gypsum board stud system abuts other construction.
1. Use proprietary tracks for non-rated and fire rated walls and partitions.
  2. Install studs full height for all partitions unless noted otherwise.
- B. Installation Tolerances: Install each steel framing and furring member so that fastening surface does not vary more than 1/8 inch from plane of faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at or just above suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
1. Cut studs ½ inch short of full height to provide perimeter relief.
  2. For STC-rated or fire-resistance rated partitions that extend full height, install framing around structural members, as required to support gypsum board closures needed to make partitions continuous from floor to underside of structure above.
  3. Install bridging/spacing bar.
- D. Brace partition framing, not extending full height to structure above, with studs same size and thickness as partition framing. Provide bracing at:
1. 6'-0" oc. Intervals along length of partitions.
  2. Not less than 6'-0" from partition ends and corners.
  3. Door and window openings.

- E. Terminate partition framing at suspended ceilings where indicated.
- F. Install steel studs and furring in sizes and at spacings indicated.
  - 1. Space studs 16 inches oc., unless otherwise indicated.
- G. Double stud frame door openings not more than 2 inches from each side of opening and to comply with details indicated. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
  - 1. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
- H. Double stud frame openings other than door openings not more than 2 inches from each side of opening and to comply with details indicated or in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads.
- I. Install thermal insulation vertically and hold in place with Z-furring members spaced at 24 inches oc.
  - 1. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails or screws designed for masonry attachment, spaced at 24 inches oc.
  - 2. At exterior corners attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with standard width insulation and continue in regular manner.
  - 3. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
- J. Achieve air tight seal between runners and substrate with acoustic sealant in conjunction with Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers and Section 07 92 00 Joint Sealants.
- K. Achieve air tight seal between studs and adjacent vertical surfaces with acoustic sealant in conjunction with Section 07 27 15 – Non-Bituminous Self-Adhering Sheet Air Barriers and 07 92 00 Joint Sealants.

### 3.5 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation From Indicated Position: 1/8 inch in 10 feet.
- C. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION 09 22 16

## SECTION 09 30 00 - TILING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
1. Floor, wall tile and base.
  2. Quarry tile.
  3. Surface / Substrate Preparation Materials; Waterproofing & Crack Prevention Membranes; Cementitious Self-Leveling Underlayments; Uncoupling membrane for areas indicated.
  4. Setting Mortars for Ceramic Tile – Latex-Portland Cementitious Thin Set and Medium Set Mortars.
  5. Solids Epoxy Mortars
  6. Latex-Portland Cementitious Grouts.
  7. Solids Epoxy Grouts.
  8. Transitions.
- B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Coordination for wet curing of concrete to receive tile work.
  2. Section 06 10 53 – Miscellaneous Rough Carpentry.
  3. Section 07 92 00 - Joint Sealants: Joint sealant at wall penetrations.
  4. Section 09 21 16 - Gypsum Board Assemblies: tile backer board under wall tile.
  5. Section 09 22 16 - Non-Structural Metal Framing.
  6. Division 22 Sections: Coordination for shower pans, floor drain piping and fittings which form a component of uncoupling/waterproofing membrane.

#### 1.2 REFERENCES

- A. American National Standards Institute:
1. ANSI A118.4 - Latex-Portland Cement Mortar.
  2. ANSI A118.6 - Ceramic Tile Grouts.
  3. ANSI A118.10 - Standard for Load Bearing, Bonded, Waterproof Membranes.
  4. ANSI A137.1 - Ceramic Tile.
- B. American Society for Testing and Materials:
1. ASTM C1028 - Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
- C. Tile Council of North America:
1. TCNA - Handbook for Ceramic Tile Installation.
  2. TCNA System F111 (CT floor on unbonded mortar bed)
  3. TCNA System F125 (CT floor on crack isolation membrane on concrete)
  4. TCNA System W245 (CT wall on tile backer gypsum wallboard).
  5. TCNA (see manual for other conditions/substrates)

### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, and junctions with dissimilar materials, control and expansion joints, thresholds, accessories, and setting details.
- C. Product Data: Submit instructions for using grouts and adhesives.
- D. Samples: Submit standard size tile and grout samples illustrating color variations.
- E. Section 01 77 00 - Closeout Procedures: Closeout procedures.
- F. Materials and Finishes Manual: Submit instructions for routine care, stain removal methods and grout care.

### 1.4 QUALITY ASSURANCE

- A. Manufacturer/Installer Qualifications:
  - 1. Tile: Minimum 5 years experience in manufacture of tile products.
  - 2. Setting materials: Minimum 5 years experience in manufacture of setting and grout materials specified.
  - 3. Installer Qualifications: Specializing in tile work having minimum of 5 years successful documented experience with work comparable to that required for this Project.
- B. Mock-Up:
  - 1. Install under provisions of Section 01 40 00.
  - 2. Construct mock-up for Room 1123 – Girls Toilet.
  - 3. Size: Full room.
  - 4. Illustrate alignment of wall and floor patterns.
  - 5. Build-in specified components of construction.
  - 6. Architect accepted mock-up may remain as part of Work of this Contract.
  - 7. Protect accepted mock-up as standard of quality for work of this Section.
- C. Pre-Installation Conference: The Contractor shall conduct a pre- installation conference with tile installer, Owner's Representative and Architect, on site at least 7 days prior to the start of installation to review conditions and acceptance of substrates. The minimum requirements of Flatness (FF) and Levelness (FL) for concrete floors are as indicated. Repair and patching may be required. Other agenda topics may include requirements for mockups, installation and sequencing of components within assemblies, finish appearance requirements, transitions to adjacent finishes, joint spacing, and protection of substrates throughout period to Substantial Completion.
  - 1. Concrete Floor Substrate Acceptance Tolerances:
    - a. Slabs On Grade: FF 35; FL 25
    - b. Elevated Slabs: FF 20; FL 15
- D. Static Coefficient of Friction for Floor Tile: ASTM C1028.
  - 1. Dry: Minimum 0.60.
  - 2. Wet: Minimum 0.60.

- E. Dynamic Coefficient of Friction: DCOF AcuTest.
  - 1. Minimum .42 wet.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Protect adhesives and grouts from freezing or overheating.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Do not install adhesives and grouts in unventilated environment.
- C. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

#### 1.7 EXTRA MATERIALS

- A. Section 01 77 00 - Closeout Procedures: Spare parts and maintenance products.
- B. Supply 10 sq ft of each size, color, and surface finish of tile specified.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. DaTile. [www.daltile.com](http://www.daltile.com)
- B. United Tile, [www.unitedtile.com](http://www.unitedtile.com).
- C. Substitutions: As specified in Section 01 25 00.

#### 2.2 QUARRY TILE

- A. Quarry Tile (QT-1): United Tile/Crossville, Cross Colors Mingles.
  - 1. Color and finish: See Finish Schedule.
  - 2. Size: 8 x 8 inch.
  - 3. Tile Thickness: 5/16 inch.
  - 4. Joint Width: 3/8 inch.
  - 5. Coefficient of Friction:
    - a. Wet:  $\geq 0.6$ ; ASTM C1028.
    - b. Dry:  $\geq 0.7$ ; ASTM C1028.
  - 6. Moisture Absorption:  $< 0.10\%$ ; ASTM C373.
  - 7. Breaking Strength:  $> 350 - 420$  lbf; ASTM C648.
  - 8. Bond Strength:  $> 200$  psi; ASTM C482.
  - 9. MOH: 6.
  - 10. Installation: A118.4 Latex-Portland Cement Mortar with Medium Bed Characteristics, over A118.12 anti fracture membrane; refer to Installation Schedule, Paragraph 3.2.
  - 11. Installation Pattern: As shown.

- B. QTB-1: United Tile/Crossville, Cross Colors.
  - 1. Color and finish: See Finish Schedule.
  - 2. Size: 6 x 8 inch.

### 2.3 PORCELAIN TILE

- A. Porcelain Floor Tile (PT-1): Daltile, City View.
  - 1. Color, finish and Size: See Finish and Color Schedule.
  - 2. Tile Thickness: 3/8 inch.
  - 3. Joint Width: 1/8 inch.
  - 4. Static Coefficient of Friction:
    - a. Wet:  $\geq 0.60$ .
    - b. Dry:  $\geq 0.65$ .
  - 5. Moisture Absorption:  $< 3.0\%$ .
  - 6. Breaking Strength: 250 lbs.
  - 7. MOH: 8.0.
  - 8. Chemical Resistance: Resistant.

### 2.4 CERAMIC TILE

- A. Wall Tile (CT-1) (CT-2): Daltile, Matte.
  - 1. Color, finish and size: Refer to Finish and Color Schedule.
  - 2. Tile Thickness: 5/16 inch.
  - 3. Joint Width: 1/16 inch.
  - 4. Moisture Absorption:  $< 20\%$ .
  - 5. Breaking Strength: 120-230 lbs.
  - 6. MOH: 4.0 – 6.5.
  - 7. Chemical Resistance: Resistant.
  - 8. Installation: A118.4 Latex-Portland Polymer Modified Thin-Set Mortar (Non-Sag for Vertical Applications), over A118.10 Waterproofing Membrane in showers; refer to Installation Schedule, Paragraph 3.2.
  - 9. Installation Pattern: As shown on drawings.
- B. Wall Tile (CT-3) (CT-4): Daltile, Semi-Gloss/Matte.
  - 1. Color, finish and size: Refer to Finish and Color Schedule.
  - 2. Tile Thickness: 5/16 inch.
  - 3. Joint Width: 1/16 inch.
  - 4. Moisture Absorption:  $< 20\%$ .
  - 5. Breaking Strength: 120-230 lbs.
  - 6. MOH: 4.0 – 6.5.
  - 7. Chemical Resistance: Resistant.
  - 8. Installation: A118.4 Latex-Portland Polymer Modified Thin-Set Mortar (Non-Sag for Vertical Applications), over A118.10 Waterproofing Membrane in showers; refer to Installation Schedule, Paragraph 3.2.
  - 9. Installation Pattern: As shown on drawings.
- C. Special Shapes:
  - 1. Provide special shapes required by conditions of installation in each case.



## 2.5 WATERPROOFING/CRACK ISOLATION MEMBRANE

- A. Acceptable Manufacturers:
  - 1. Custom Building Products, RedGard Waterproofing and Crack Prevention Membrane.
  - 2. Laticrete, Hydro Ban.
  - 3. Mapei, Mapelastix, AquaDefense.
  - 4. Substitutions: Under provisions of Section 012500 - Substitution Procedures.
- B. Trowel, liquid or sheet applied. Single component, complying with ANSI A118.12.
- C. Substitutions: Under provisions of Section 01 25 00.

## 2.6 WATERPROOFING MEMBRANE

- A. Acceptable Manufacturers:
  - 1. Custom Building Products.
    - a. Single Component Waterproofing Membrane: RedGard Waterproofing and Crack Prevention Membrane. Combined dried coatings must be at least 30-35 mils thick.
    - b. Self-curing, Liquid Polymer: Custom 9240. Comply with 2-Part System for heavy duty and commercial applications.
  - 2. Laticrete.
    - a. Hydroban: Provide two coats.
    - b. 9235 Waterproofing Membrane: Provide two coats at walls and three coats at floors. Pretreat coves, corners, seams and board joints.
  - 3. Mapei, Mapelastix AquaDefense.
    - a. Provide two coats to a depth of 20 mils minimum. Recoat as needed where pinholes or areas not completely covered.
- B. Horizontal and vertical applications, able to bridge up to 1/8 inch shrinkage cracks and other non-structural joints, and meeting ANSI A118.10.
  - 1. Reinforcing Fabric: Manufacturer's standard, synthetic weave, in rolls 38 inch and 6 inch wide.
- C. VOC Content: 10 g/L maximum.

## 2.7 BED MATERIALS (F-111 LOCATIONS)

- A. Medium Bed Mortar: Portland Cement based, Single component, non-slump formula; ANSI A118.4.
  - 1. Custom Building Products; Medium Bed Mortar.
  - 2. Laticrete International; 255 Multimax.
  - 3. Mapei Corporation; Ultraflor.
  - 4. Substitutions: Under provisions of Section 012500 - Substitution Procedures.

## 2.8 CEMENTITIOUS BOND COAT MATERIALS (F125 LOCATIONS)

- A. Thin set Dryset and Polymer Additive: Single component, polymer modified thin set mortar; ANSI A118.4 and A118.11.
  - 1. Custom Building Products; Porcelain Tile Fortified Thin-Set Mortar.
  - 2. Laticrete International; 254 Platinum.
  - 3. Mapei Corporation; Ultraflex 2.
  - 4. Substitutions: Under provisions of Section 012500 - Substitution Procedures.

## 2.9 SETTING BED MATERIALS FOR WALL TILE

- A. Acceptable Manufacturers:
  - 1. Custom Building Products, ProLite Tile & Stone Mortar.
  - 2. Laticrete, 254 Platinum.
  - 3. Mapei Corporation, Ultraflex 3.
  - 4. Substitutions under provisions of Section 01 25 00.
- B. Thin Set Mortar:
  - 1. Single component system; factory prepared; polymer fortified; high bond strength; ANSI A118.4.

## 2.10 GROUTS

- A. Latex-Modified Grout for Wall Tile:
  - 1. Description: Latex-modified, factory blended, mildew resistant, sanded grout consisting of Portland cement and additives; comply with ANSI A118.6 or better.
  - 2. Latex Additive: Type as recommended by latex mortar manufacturer.
  - 3. Color: As specified in Room Finish Schedule.
  - 4. Joint Thickness: Approximately 1/8 inch.
  - 5. Acceptable Products: Type as recommended by tile manufacturer.
- B. Sanded Epoxy Grout for Floor Tile:
  - 1. Description: 100% solids epoxy emulsion grout meeting A 118.3.
  - 2. Color: As specified on Color and Finish Schedule.
  - 3. Joint Thickness: Approximately 1/8 inch.
  - 4. Acceptable Products: Type as recommended by tile manufacturer.

## 2.11 ACCESSORIES

- A. Joint Sealants: Provide in accordance with Section 07 92 00; color to match grout.
- B. Reinforcing Mesh (For F111-12 Installation): 6 oz. woven and treated glass fiber mesh
- C. Transitions: Size and Shape, as required for floor material heights.
  - 1. Basis of Design: Schlüter® -Schiene or approved equivalent, aluminum.
    - a. Locations:
      - 1) Ceramic tile to RF, floor tile or carpet tile.
      - 2) Ceramic tile to concrete.
  - 2. Adhesive For Setting: Manufacturer's recommendation.
- D. Top trim: L shaped profile with visible surface integrated trapezoid perforated anchoring leg, and integrated grout joint spacer, aluminum.
  - 1. Basis of Design: Schluter, Schiene or approved equivalent.
- E. Corner trim at toilet rooms:
  - 1. Outside Tile Corners: Basis of Design – Schuler, INDEC or approved equivalent.
    - a. Anodized Aluminum.
- F. Wall Base: Metal Trim Cove Base
  - 1. At wall tile and concrete floor and as shown on drawings: Single trapezoid-perforated anchoring leg secured in mortar bond coat and dove tailed channel.
    - a. Basis of Design: Schuler – Dilex – AHKA or approved equivalent. (MTB-1)
    - b. Material: Anodized aluminum, cove-shaped profile.
    - c. Height as required.

2. At wall tile and floor and as shown on drawings: Trapezoid-perforated anchoring legs secured in mortar bond coat and dove tailed channel.
    - a. Basis of Design: Schuler – Dilex-EHK/PHK. (MTB-2)
    - b. Material: Anodized aluminum, cove-shaped profile.
  3. Accessories: connector, end cap, outside corner, inside corner as needed.
  4. Comply with self-coved base requirement per IBC Section 1210.
- G. Penetrating sealer/grout release: Recommended by installation product manufacturer.

### PART 3 EXECUTION

#### 3.1 TILE INSTALLATION, GENERAL

- A. General: Install tile materials in accordance with ANSI A137.1, other referenced ANSI and TCA specifications, and TCA "Handbook for Ceramic Tile Installation," except for more stringent requirements of manufacturer or these Specifications.
- B. Quarry Tile Base:
  1. Cove Base: Install all cove base "flush" per TCNA 2011.
- C. Before grouting, for each type of grout used, test patch to determine if grout will contaminate surface of tile. If test patch shows a tendency for staining or difficulty of removal, apply penetrating sealer/grout release prior to grouting process.

#### 3.2 INSTALLATION SCHEDULE

- A. Floor Tile Installation Method: TCNA System F125.
  1. Description: Ceramic tile, over waterproofing/anti-fracture membrane, as indicated, including wall base.
  2. Bond Coat Mortars: Thin set Bed Dryset and polymer additive to set tile.
  3. Grout: Sanded, Latex-modified.
  4. Control Joints: 1/4" thick with backer rod and sealant. Location as shown on drawings but not exceeding 24 - feet in each direction for interior floor joints.
- B. Wall Tile Installation Method: TCNA System W245.
  1. Description: Ceramic tile, over waterproofing membrane, over tile backer gypsum wallboard.
  2. Mortar: Thin set Bed Dryset and polymer additive to set tile.
  3. Grout: Sanded, Latex-modified.
  4. Control Joints: 1/4" thick with backer rod and sealant. Location as shown on drawings but not exceeding 24 - feet in each direction for interior floor joints.
- C. Quarry Tile Installation Method: TCNA System F111.
  1. Description: Quarry tile, dry-set mortar with reinforcing mesh, over waterproofing/anti-fracture membrane, as indicated.
  2. Bond Coat Mortars: Thin set Bed Dryset and polymer additive to set tile.
  3. Grout: Sanded, Latex-modified.
  4. Reinforcing Mesh.
  5. Movement Joints: 1/4" thick with backer rod and sealant (EJ171C-09). Location as shown on drawings.

### 3.3 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Clean tile and grout surfaces.

### 3.4 PROTECTION OF INSTALLED CONSTRUCTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.
- B. Cover all tile flooring after installation is complete with ¼ inch plywood or hardboard sheets or masonite on undyed and untreated Kraft paper. Protection to remain in place until Substantial Completion.

END OF SECTION 09 30 00

## SECTION 09 51 13 – ACOUSTICAL TILE CEILINGS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Suspended metal exposed grid ceiling systems with acoustical lay-in tiles and filler panels.
  - 2. Glue-on acoustical tile.
  - 3. Spring Isolation hangers.
  - 4. Seismic restraint of suspended ceilings.
- B. Related Sections:
  - 1. Section 09 22 16 - Non-Structural Metal Framing: Ceiling and wall framing for gypsum wallboard systems, including lateral force bracing for ceiling height partitions above acoustical ceilings.
  - 2. Section 09 72 00 – Sound Absorbing and Diffusing Panels: Acoustical Metal Wall Panels.
  - 3. Divisions 21, 22 and 23 - Mechanical Sections: Coordinate supports and panel penetrations for HVAC, and fire suppression system penetrations.
  - 4. Divisions 26, 27 and 28 - Electrical Sections: Coordinate supports and panels penetrations for electrical fixtures and equipment.

#### 1.2 REFERENCES

- A. American Society of Civil Engineers:
  - 1. ASCE 7 - Minimum Design Loads for Building and Other Structures.
- B. American Society for Testing and Materials:
  - 1. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
  - 2. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
  - 3. ASTM E580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.
  - 4. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.
  - 5. ASTM E1477 - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- C. Ceilings and Interior Systems Construction Association:
  - 1. CISCA - Acoustical Ceilings: Use and Practice.
- D. International Code Council:
  - 1. ICC Section 803 - Test Specimens.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, interrelation of mechanical and electrical items related to system. Indicate method of suspension where interference exists.

- C. Product Data: Submit data on metal grid system components and acoustic units.
- D. Samples: Submit two samples illustrating material and finish of each acoustic unit specified.
- E. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner, trim and molding.
- F. Manufacturer's Installation Instructions: Submit special procedures, perimeter conditions requiring special attention.
- G. Section 01 77 00 – Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 QUALITY ASSURANCE

- A. Code Compliance Standards:
  - 1. ICC International Building Code, Edition 2012; Section 803.
  - 2. American Society for Testing and Materials (ASTM):
    - a. ASTM C635 –Manufacturing of Metal Suspension Systems.
    - b. ASTM C636 – Installation of Metal Suspension Systems in Non-Seismic Applications.
  - 3. American Society of Civil Engineers (ASCE): Std 7, "Minimum Design Loads for Buildings and Other Structures.
  - 4. Ceilings and Interior Systems Contractors Association (CISCA): Comply with "CISCA Ceilings Design Handbook" recommended installation requirements corresponding to the seismic design category(s) (SDC) as indicated.
- B. Allowable Tolerances/Clearances in Plane of Finished Surfaces:
  - 1. Install suspension system level within 1/8 inch in 12 feet, with cumulative tolerance not to exceed 1/4 inch. Gaps and levelness shall be installed within guidelines of ASTM C636.
  - 2. Comply with applicable tolerance requirements of ASTM C636 for exposed members in finished ceiling (ie. abutting sections, cross tees, intersections, etc.).
- C. Qualifications:
  - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
  - 2. Installer: Engage an Installer who has successfully completed acoustical ceiling work similar in material, design, and extent to that required for this Project, and who has a minimum of five (5) years experience.
- D. Mockup:
  - 1. Section 01 40 00 - Quality Requirements: Requirements for mockup.
  - 2. Construct mock-up, 12 feet x 12 feet, including typical field and edge conditions.
  - 3. Locate where directed by Architect.
  - 4. Incorporate accepted mockup as part of Work.

- E. Pre-Installation Meeting:
  - 1. Convene minimum one week prior to commencing work of this section.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustic unit installation.

#### 1.6 SEQUENCING

- A. Sequence Work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical tile after interior wet work is dry.

#### 1.7 EXTRA MATERIALS

- A. Furnish one full carton of each type, size, and color installed. Deliver to Owner, packaged for storage at project closeout.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Armstrong World Industries, Lancaster PA, 1.877.ARMSTRONG.
  - 1. Website: <http://www.armstrong.com/commceilingsna/>
- B. CertainTeed.
  - 1. <http://www.certainteed.com>
- C. USG Interiors, Inc.
  - 1. Website: <http://www.usg.com>
- D. Substitutions: Under provisions of Section 01 25 00.

#### 2.2 ACOUSTICAL LAY-IN TILE (MINERAL COMPOSITION)

- A. (ACT-1): CertainTeed, Performa Fine Fissured Customline, FFCL-224 or approved equivalent meeting the following:
  - 1. Size: 24 inches by 48 inches by  $\frac{3}{4}$  inch thick.
  - 2. Edges: Narrow Reveal for 9/16 "Type-1" inch wide suspension system.
  - 3. NRC: 0.50 per ASTM E1264.
  - 4. CAC: Minimum 40, (continuous ceiling) per ASTM E1264.
  - 5. Light Reflection: .84 minimum per ASTM E1477.
  - 6. Flame Spread: Fire-resistive ceiling when used in applicable UL assemblies.
  - 7. Color: White.

- B. (ACT -2): Armstrong "Clean Room VL Unperforated", Item No. 870 or approved equivalent meeting the following:
1. Size: 24 inches by 48 inches by 5/8 inch thick.
  2. Edges: Square for 15/16 "Type-2" inch wide suspension system.
  3. NRC: N/A.
  4. CAC: Minimum 40, (continuous ceiling) per ASTM E1264.
  5. Light Reflection: .80 minimum per ASTM E1477.
  6. Flame Spread: Fire resistive ceiling when used in applicable UL assemblies.
  7. Finish: Vinyl faced membrane with factory applied latex paint. Washable, scrubbable and soil-resistant.
  8. Color: White.
- C. (ACT-4): Armstrong "Colorations, Calla", Item No. 2824 or approved equivalent meeting the following:
1. Size: 24 inches by 24 inches by 7/8 inch thick.
  2. Edges: Beveled tegular for 9/16 "Type-1" inch wide suspension system.
  3. NRC: .85.
  4. CAC: Minimum 28.
  5. Flame Spread: Class A when tested per ASTM E1264.
  6. Color: Pecan.
- D. (ACT-5): Certainteed Performa Fine Fissured HHF-150, or approved equivalent meeting the following:
1. Size: 24 inches by 24 inches by 5/8 inch thick.
  2. Edges: Narrow reveal for 9/16 "Type-1" inch wide suspension system.
  3. NRC: 0.60 per ASTM E1264.
  4. CAC: Minimum 33, (continuous ceiling) per ASTM E1264.
  5. Light Reflection: .84 minimum per ASTM E1477.
  6. Flame Spread: Class A (UL).
  7. Color: White.
- E. (ACT-7): Armstrong Ceramaguard #605, or approved equivalent meeting the following:
1. Size: 24 inches by 48 inches by 5/8 inch thick.
  2. Edges: Square lay-in for 15/16 "Type-2" inch wide suspension system.
  3. NRC: N/A.
  4. CAC: Minimum 40, (continuous ceiling) per ASTM E1264.
  5. Light Reflection: .88 minimum per ASTM E1477.
  6. Flame Spread: Fire resistive ceiling when used in applicable UL assemblies.
  7. Color: White.

### 2.3 GLUE-ON ACOUSTIC TILE (MINERAL COMPOSITION)

- A. (ACT-6): Armstrong Fine Fissure 746, or approved equivalent meeting the following:
1. Size: 12 inch x 12 inch x 5/8 inch thick.
  2. Edges: Beveled K4C4.
  3. NRC: .55.
  4. CAC: 35.
  5. Light Reflectance: .85.
  6. Flame Spread: Class A.
  7. Finish: Manufacturer's standard white paint.



## 2.4 ACOUSTICAL METAL CEILINGS

- A. (ACT-3)(ACT-3A): Armstrong "MetalWorks Linear" Item No. 5571WH and 5570WH or approved equivalent meeting the following:
1. Material: Electrogalvanized Steel.
  2. Thickness: 5/8 inch.
  3. Size: 12 x 96 inch.
  4. Grid: Type 3.
  5. Flame Spread: Class A when tested per ASTM E1264.
  6. Color:
    - a. ACT-3: White.
    - b. ACT-3A: Item #550WH, White Exterior. Finish on both sides.
  7. Perforation:
    - a. ACT-3: Microperforated. NRC: 0.70.
    - b. ACT-3A: Non perforated.
  8. Acoustical fiberglass fleece for interior perforated panels. Black.
  9. Provide 8 inch end caps to match metal panels where required on cut panels to complete installation.
  10. Provide metal trim channel.
  11. Provide splice plate, carrier, carrier molding and pressure spring as needed to complete exterior installation.
- B. (ACT-8) Armstrong "MetalWorks Linear" Item No. 5492 or approved equivalent meeting the following:
1. Material: Electrogalvanized Steel.
  2. Thickness: 5/8 inch.
  3. Size: 4 x 96 inch.
  4. Grid: Type 3.
  5. Flame Spread: Class A when tested per ASTM E1264.
  6. Color: Custom Color. Refer to Color and Finish Schedule.
  7. Perforation: Microperforated. NRC: 0.70.
  8. Provide metal trim channel and linear and uplift clips.
    - a. Basis of Design: Armstrong, 4 inch Axiom Classic Straight, Item # AX4STR.
- C. (AP-6): Armstrong "MetalWorks Linear" Item No. 5492 or approved equivalent meeting the following:
1. Material: Electrogalvanized Steel.
  2. Thickness: 5/8 inch.
  3. Size: 4 x 96 inch.
  4. Grid: Type 3.
  5. NRC: 0.70 without fiberglass infill. .85 with fiberglass infill.
  6. Flame Spread: Class A when tested per ASTM E1264.
  7. Color: Custom Color. Refer to Color and Finish Schedule.
  8. Perforation: Microperforated.
  9. Provide metal trim. Basis of Design: Armstrong, 4 inch Axiom Classic.
  10. Provide uptight clips, linear carriers, blocking and #8 fasteners at each metal plank.

## 2.5 SUSPENSION SYSTEMS

- A. Seismic Design Categories (SDC): Support systems shall comply with ASCE 7, SDC AB; ASTM C636, and meet CISCA guidelines.
1. Load Limits Per CISCA: Loads include actual average weight of grid, panels. Light fixtures and air terminals.

- B. "Type 1" Heavy Duty Exposed Grid Suspension System with narrow exposed 'T' face (9/16 inch) suspension system bearing "heavy-duty" structural classification per ASTM C635 and in compliance with ASCE 7.
1. Cross tees shall be of same web height as main runners. Provide cross tees with off-set ends for a flush fit with main runners.
  2. Factory punch main runners to accept cross tees at the indicated module.
  3. Exposed members fabricated from commercial grade cold rolled steel. Provide suspension system complete with accessory items indicated or required for a complete installation.
  4. Design and construct main runners and cross tees and their splices and intersection connectors to carry a mean ultimate test load of not less than 180 pounds or twice the actual load, whichever is greater, in tension and in compression with a 5-degree misalignment of the members in any direction. Provide mechanical interlocking connections at splices and intersections.
  5. Provide manufacturer's standard hot-dipped galvanized or electro-galvanized finish; exposed bottom flange shall have manufacturer's standard low-gloss white baked-on enamel finish.
  6. Color, Typical: Match USG Interiors "#50 Flat White." At ACT-4, match panel color.
  7. Standard Edge Moldings and Trim: Comply with SDC, above.
- C. "Type 2" Heavy-Duty Exposed Grid Suspension System: 'Tee' suspension system with aluminum cap, double web suspension system with 15/16 inch wide bottom flange; suspension system shall have "heavy-duty" structural classification per ASTM C635 and in compliance with ASCE 7. For Kitchen/Sergeries/Food prep provide USDA/FSIS corrosion-resistant steel.
1. Cross tees shall be of same web height as main runners. Provide cross tees with off-set ends for a flush fit with main runners.
  2. Factory punch main runners to accept cross tees at the indicated module.
  3. Exposed members fabricated from commercial grade cold rolled steel. Provide suspension system complete with accessory items indicated or required for a complete installation.
  4. Design and construct main runners and cross tees and their splices and intersection connectors to carry a mean ultimate test load of not less than 180 pounds or twice the actual load, whichever is greater, in tension and in compression with a 5-degree misalignment of the members in any direction. Provide mechanical interlocking connections at splices and intersections.
  5. Provide manufacturer's standard hot-dipped galvanized or electro-galvanized finish; exposed bottom flange shall have manufacturer's standard low gloss baked-on enamel finish.
  6. Color, Typical: Match USG Interiors "#50 Flat White."
  7. Standard Edge Moldings and Trim: Comply with SDC, above.
- D. "Type 3" Standard Carrier: Basis of Design – Armstrong #5497.
1. Length: 144 inch.
  2. Width: 1-5/8 inch.
  3. Height: 1-5/8 inch.

## 2.6 MISCELLANEOUS MATERIALS

- A. Hanger Wires: Minimum 12 gage wire for 4-foot spacing and 10-gage wire for 5-foot spacing, carbon steel, galvanized, soft annealed, with Class 1 coating.
- B. Tie Wire: Not less than 16 gage galvanized, soft annealed mild steel wire.
- C. Fasteners: ICC approved; type and size to meet specified load requirements.
- D. Seismic Clips: As required by applicable code for seismic design category.
1. Basis of Design:
    - a. Armstrong BERC2 or USG ACM7 Seismic Clip –Used with 7/8 inch wall molding.

- b. Armstrong SJCG – Seismic Joint Clip or USG 4-Way Seismic Expansion Joint Clip. The clip is compatible with 15/16 and 9/ 16 inch grid systems.
- E. Filler Panels: Field cut to size and match specified product.
- F. Moldings: Wall molding for mounting to suspension system as indicated.
  - 1. Basis of Design:
    - a. Angle Molding: Armstrong Model #7804 or USG M7.
    - b. Channel Molding: Armstrong Model #7835 or USG US 28.
    - c. Finish: Match suspension system. At ACT-3 and ACT-3A, finish to match metal panel.
- G. Trim: As needed to complete installation.
  - 1. Basis of Design: Armstrong Axiom Transitions Assembly or USG Compasso Elite.
  - 2. Finish: To match suspension system.
  - 3. Height necessary for transition from acoustical ceiling to drywall suspension system.
- H. Reveal Trim: “F” reveal molding. Extruded aluminum 6063 T5. Color: Black.
- I. Spring Isolation Hanger at acoustic isolated ceilings:
  - 1. Acceptable Manufacturers:
    - a. Kinetics Noise Control, Model ICC Ceiling hanger. [www.kineticsnoise.com](http://www.kineticsnoise.com)
    - b. Kinetics Noise Control, Muta Hanger. . [www.kineticsnoise.com](http://www.kineticsnoise.com)
    - c. Mason Industries, Type 30N Ceiling Hanger. [www.mason-ind.com](http://www.mason-ind.com)
  - 2. Combination high-deflection steel spring in series with a resilient molded neoprene isolation element at top and coil steel spring seated in neoprene cup on bottom. Both element and cup shall be molded with a neoprene bushing that passes through the steel frame. Steel spring and neoprene pad shall be incorporated into a stamped steel hanger assembly that resiliently supports isolated ceiling.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify layout of hangers will not interfere with other work.

### 3.2 INSTALLATION

- A. Lay-In Grid Suspension System:
  - 1. Install suspension system in accordance with ASTM E580 and ASTM C636 and as supplemented in this section.
  - 2. Install system capable of supporting imposed loads to deflection of 1/360 maximum.
  - 3. Locate system on room axis according to reflected plan.
  - 4. Install after major above ceiling work is complete. Coordinate location of hangers with other work.
  - 5. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
  - 6. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
  - 7. Do not support components on main runners or cross runners when weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

8. Do not eccentrically load system, or produce rotation of runners.
  9. Perimeter Molding:
    - a. Install edge molding at intersection of ceiling and vertical surfaces into bed of acoustic sealant.
    - b. Use longest practical lengths.
    - c. Miter and rivet corners.
    - d. Install at junctions with other interruptions.
  10. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.
- B. Seismic Restraint: Ceiling areas of 1000 square feet or less surrounded by walls which connect directly to the structure do not require seismic bracing.
- C. Lay-In Acoustical Tile:
1. Fit acoustical tile in place, free from damaged edges or other defects detrimental to appearance and function.
  2. Fit border trim neatly against abutting surfaces.
  3. Install units after above ceiling work is complete.
  4. Install acoustical tiles level, in uniform plane, and free from twist, warp, and dents.
  5. Cutting Acoustic Units:
    - a. Cut to fit irregular grid and perimeter edge trim.
    - b. Cut square reveal edges to field cut units.
    - c. Double cut and field paint exposed edges of tegular units.
  6. Where round obstructions occur, install preformed closures to match perimeter molding.
- D. Glue-On Acoustical Tile:
1. Adhesively apply to suspended gypsum board ceiling in accordance with acoustic tile manufacturer's instructions.
  2. Center tile on room axis leaving equal border units.
  3. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
  4. Install acoustic units level in uniform plane.
- E. Metal Panel Installation:
1. Conform to manufacturer's installation instructions.
  2. Locate and space panels as shown across installation space.
  3. Securely attach to ceiling system using eyebolts and hanger wire.
- F. Spring Isolation Hanger:
1. All building components supported by isolation hangers shall be free from rigid contact with any part of non-isolated building structure.
  2. Attach isolation hangers to the structure in the spacing pattern recommended by the manufacturer.

### 3.3 ERECTION TOLERANCES

- A. Installation Tolerances: Not to exceed the following:
  - 1. Main Runners: Level within 1/8 in 12 feet.
  - 2. Main Runner to Cross Runner Deviation: 1/32 inch of the required center distance.
  - 3. Deviation Between Main Runner End Splices:
    - a. Vertical: 0.015 inch.
    - b. Horizontal: 0.015 inch.
  - 4. Visually Apparent Angular Displacement of Longitudinal Axis of One Runner to Another: None.
  - 5. Gaps Between Assembly Devices In Grid: 0.020 inch.

### 3.4 ADJUSTING

- A. Remove and replace damaged, soiled, and discolored materials and work not conforming to Contract Documents.

END OF SECTION 09 51 13



## SECTION 09 64 13 – WOOD FLOORING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes pre- finished wood flooring, glue down installation.
- B. Related Sections:
  - 1. Section 03 30 00 – Cast in Place Concrete.
  - 2. Section 09 65 00 – Resilient Flooring: Adjacent floor finish with transition strip edging abutting wood strip flooring.

#### 1.2 REFERENCES

- A. APA-The Engineered Wood Association:
  - 1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.
- B. ASTM International:
  - 1. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
- C. Green Seal:
  - 1. GS-11 - Product Specific Environmental Requirements.
- D. National Fire Protection Association:
  - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- E. National Wood Flooring Association.
  - 1. Installation Guidelines.
- F. South Coast Air Quality Management District:
  - 1. SCAQMD Rule 1113 - Architectural Coatings.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate floor joint pattern and termination details.
  - 1. Indicate provisions for expansion and contraction.
- C. Product Data: Submit data for floor finish materials
- D. Samples: Submit two samples 12 x 12 inch in size illustrating floor finish, color, and sheen.
- E. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, suggested schedule for cleaning, re-finishing, and stain removal methods.

#### 1.4 QUALITY ASSURANCE

- A. Qualifications
  - 1. Installer: Company specializing in performing work of this section.
- B. Maple Flooring: Comply with NWFA/NOFMA International Standards for Factory Finished Solid Wood Flooring.
- C. Floor Flatness: Tolerance should not exceed  $\frac{1}{4}$  inch on a 10 foot straight edge in any direction.
- D. Mock up
  - 1. Section 01 40 00 - Quality Requirements: Requirements for mockup.
  - 2. Construct mock-up, 10 x 10 feet, including typical field and edge conditions and finished as specified.
  - 3. Locate where directed by Architect/Engineer.
  - 4. Incorporate accepted mockup as part of Work.
- E. Pre-Installation Meetings
  - 1. Convene minimum one week prior to commencing work of this section.
  - 2. Review installation procedures including procedures for acclimation of flooring materials.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect wood from exposure to moisture. Do not deliver wood flooring until after concrete, ceramic tile and similar wet-work is completed and dry.
- B. Store wood wrapped on pallets in dry, warm, well-ventilated, weather-tight location.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Provide heat, light, and ventilation prior to installation.
- C. Acclimation: Comply with Manufacturer's written instructions after HVAC and humidity control facilities are in full operation and on long enough to ensure occupancy levels of temperature and humidity. Allow a minimum of 5-6 days for acclimation. Do not install under construction conditions where doors and windows are open and HVAC is intermittent.
- D. Ambient air humidity should read between 35% and 55%. Measure humidity using a reliable hygrometer or sling psychrometer. If humidity is not in this range, postpone acclimation and installation until conditions are normal.
- E. Concrete Slab: Cure minimum 50 days following enclosure of building by exterior building envelope. Test slab relative humidity using ASTM F1869. Maximum moisture content of slab must be less than 2 lb retention. Comply with ASTM F710 guideline for acceptance of hardwood flooring using relative humidity testing.



## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Oregon Lumber, Worthwood Solid End Grain. [www.oregonlumber.com](http://www.oregonlumber.com)
- B. Substitutions under provisions of Section 012500.

### 2.2 COMPONENTS

- A. Wood Flooring: (WDF-2)
  - 1. Species: Hemlock.
  - 2. Grade: C & BTR Flooring.
  - 3. Cut: Vertical grain.
  - 4. Kiln Dried (7-10%) solid wood blocks.
  - 5. Edges: Tongue and groove.
  - 6. Thickness: 1 inch.
  - 7. Width: 3 ¼ inch.
  - 8. Ends: Precision square cut. Solid End Grain.
  - 9. Backs: Beveled for flush fit on face.
  - 10. Length: Random, 12-34 inch strips.
- B. Concrete Sealer: Compatible with adhesive. Comply with VOC requirements.
  - 1. US Spec; Permasil.
  - 2. The Euclid Chemical Company; Eucosil.
  - 3. W.R. Meadows; Med-Cure. L&M Chemicals; L&M Seal Hard.
  - 4. Substitutions Section 012500 – Substitution Procedures.
- C. Adhesive: Recommended by flooring manufacturer.

### 2.3 ACCESSORIES

- A. Wood Plugs: Round shape, ¾ inch diameter x 1/8 inch thick, of same species as flooring.
- B. Transition Strip: Refer to Section 09 65 00.
- C. Adhesive: Recommended by manufacturer.

### 2.4 FINISH

- A. Prefinished Oil. Color: Hemlock TW 32-1.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 – Project Management and Coordination: Coordination and project conditions.
- B. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for maximum moisture content and installation tolerances.
- C. Seal concrete. Comply with manufacturer's written installation directions.

- D. Where concrete slabs do not conform to tolerances, specified in this section, make flat and level. Perform work as necessary to provide substrate within acceptable tolerances.
  - 1. Grind or remove concrete ridges and warps.
  - 2. Fill voids and swales using cementitious underlayment conforming to requirements of flooring manufacturer. Verify required floor mounted utilities are in proper location.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
- F. Verify wood flooring has been acclimated to ambient temperatures in accordance with manufacturer's instructions.

### 3.2 PREPARATION

- A. Broom clean substrate.

### 3.3 INSTALLATION

- A. Wood Flooring:
  - 1. Install in accordance with recommendations by the National Wood Flooring Association's Installation Guidelines and Methods and manufacturer's written instructions as applicable to flooring type.
  - 2. Expansion Space: Provide expansion space at walls and other obstructions and terminations of wood flooring of not less than ½ inch.
  - 3. Apply adhesive per Manufacturer's recommendations.
- B. Pattern: As directed by Architect.

### 3.4 CLEANING

- A. Section 01 77 00 – Closeout Procedures: Final cleaning.
- B. Vacuum and sweep clean.

### 3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Prohibit traffic on floor for 7 days after installation.
- B. Protect installed flooring with sheets of hardboard on kraft paper. Do not cover until finish reaches full-cure, but not less than 7 days after applying last coat.

END OF SECTION 09 64 13

## SECTION 09 64 66 – WOOD ATHLETIC FLOORING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Cushioned wood floors.
  - 2. Sheet vapor retarder on substrate surface.
  - 3. Plywood subflooring cushion pads.
  - 4. Surface finishing and game lines.
- B. Products Installed but Not Furnished under this Section
  - 1. Section 11 66 23 - Athletic Equipment: Volleyball equipment inserts.
- C. Related Sections
  - 1. Section 03 30 00 - Cast-In-Place Concrete: Concrete floor surface.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E84 - Surface Burning Characteristics of Building Materials.

#### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings:
  - 1. Indicate floor joint pattern, grain direction, and termination details.
  - 2. Indicate provisions for expansion and contraction, base, base corner details, and game insert or socket devices.
  - 3. Indicate location, size, design, and color of colored game lines.
  - 4. Game lines to be in strict accordance with MFMA and WIAA Standards for the following courts by shop drawing review:
    - a. Widths and colors of lines shall be:
      - 1) Main basketball court 2" color to be selected.
      - a) Infill: To be selected.
      - 2) Main volleyball court 2" color to be selected.
      - 3) Practice basketball courts 1" color to be selected.
      - 4) Practice volleyball courts 1" color to be selected.
      - 5) Badminton courts 1" color to be selected.
      - 6) Court logo and text 6 colors with image and text (color to be selected.)
- C. Product Data: Provide data for resilient blocks, floor materials, floor coating, and game insert socket devices.
- D. Samples: Submit two samples 12 x 12 inch in size illustrating floor finish, color, game line colors, and sheen.
- E. Manufacturer's MFMA Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

- F. Submit under provisions of Section 01 77 00 - Closeout Procedures.
- G. Manual for Materials and Finishes: Submit MFMA's Care Instructions. Include a suggested schedule for cleaning, stripping, and re-finishinG and stain removal methods,.

#### 1.4 QUALITY ASSURANCE

- A. Work: In accordance with the following
  - 1. Lumber Grading Agency: Certified by ALSC.
  - 2. Plywood Grading Agency: APA or other code approved quality control agency.
- B. Manufacturer's representative must be present throughout floor installation to verify acceptance of flooring system.
- C. Regulatory Requirements:
  - 1. Conform to applicable code for flame/smoke rating requirements in accordance with ASTM E84.
- D. Installer Qualifications: An experienced installer who has completed wood sports-floor assembly installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in installations with a record of successful in-service performance.
  - 1. Installer responsibilities include installation and field finishing of sports-floor assembly components and accessories, and application of game lines and markers.
- E. Maple Flooring: Comply with MFMA grading rules for species, grade, and cut.
  - 1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.
- F. Mockup:
  - 1. Provide mockup of floor system.
  - 2. Construct one mockup, 8 feet long by 8 feet wide, which includes accessories and finish.
  - 3. Locate where directed.
  - 4. Mockup may remain as part of the Work.
- G. Pre-Installation Meeting:
  - 1. Convene one week prior to beginning installation of work in this section.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver assembly materials in unopened cartons or bundles.
- B. Protect wood from exposure to moisture. Do not deliver wood components until after concrete, masonry, plaster, ceramic tile, and similar wet work is complete and dry.
- C. Store wood components in a dry, warm, well-ventilated, weather tight location and in a horizontal position.

#### 1.6 PROJECT CONDITIONS

- A. Concrete Slab: Cure minimum 60 days following enclosure of building by exterior building envelope. Test slab relative humidity using ASTM F2170. Acceptable level of relative humidity is 85% or lower.
- B. Conditioning period begins not less than seven days before sports-floor assembly installation, is continuous through installation, and continues not less than seven days after sports-floor installation.

1. Environmental Conditioning: Maintain an ambient temperature between 65 and 75 deg F (18 and 24 deg C)
2. Wood Conditioning: Move wood components into spaces where they will be installed, no later than beginning of the conditioning period and relative humidity planned for building occupants, but not less than 35 percent or more than 50 percent, in spaces to receive sports-floor assemblies during the conditioning period.
  - a. Do not install sports-floor assemblies until wood components adjust to relative humidity of, and are at same temperature as, spaces where they are to be installed.
  - b. Open sealed packages to allow wood components to acclimatize immediately on moving wood components into spaces in which they will be installed.
- C. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
- D. Install sports-floor assemblies after other finishing operations, including painting, overhead mechanical work, lighting, backstops, scoreboards and divider curtain have been completed.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Excel NR, Action Floor Systems, <http://www.actionfloors.com/> (WDF-1)
- B. Aacer Flooring, <http://aacerflooring.com/sports-flooring/> .
- C. Conner Sports Flooring, Inc. <http://www.connorfloor.com/>
- D. Horner Sports Flooring Company. <http://www.hornerflooring.com/>
- E. Robbins Sports Surfaces, <http://www.robbsinsfloor.com/>.
- F. Substitutions: Under provisions of Section 01 25 00.

### 2.2 WOOD MATERIALS

- A. Gym Flooring: Species and grade stamped on underside of each piece, conforming to the following: (WDF-1)
  1. Species: White Hard Maple.
  2. Grade: Second and better. For areas under stacked portion of telescoping bleachers that are normally concealed from view, provide Third and Better Grade.
  3. Treatment: Kiln dried.
  4. Cut: Flat Grain.
  5. Moisture Content: 7 to 9 percent.
  6. Actual Thickness: 25/32 inch.
  7. Actual Width: 2-1/4 inches.
  8. Edge: Tongue and Groove.
  9. 1/64 inch integral expansion at top of board.
  10. End: End matched.
  11. Length: Random, minimum of 9 inches.
  12. Backs: Channeled (kerfed) for stress relief.
- B. Factory fabricated subfloor panels: Two layers, 15/32 inch thick, APA Rated Sheathing, Span Rating of 32/16, Exposure 1 pre-assembled with 7/16 inch manufacturer's standard natural rubber pads.

- C. Provide structural support below flooring layers for bleachers in stacked position and open position as required in accordance with installer's recommendations.

## 2.3 BASE MATERIALS

- A. Ventilating Base (VRB-1): Molded rubber, 4 inch high with a 3 inch toe, ventilating type, with adhesives and accessories.
  - 1. ASTM F1861, Type TS, Group 1.
  - 2. Color: Refer to Finish and Color Schedule.

## 2.4 ACCESSORIES

- A. Vapor Retarder: Black polyethylene sheeting, 6 mil thick; 2 inch wide self adhesive, reinforced tape for joint sealing.
- B. Divider Strip: Mill finish aluminum, recommended by manufacturer.
- C. Threshold: Extruded, mill finish aluminum, profile recommended by floor manufacturer.
- D. Floor Cover Plate at Doors: 1/8" stainless steel diamond plate.
- E. Joint Cover: Fourteen (14) gauge stainless steel, or equivalent 0.125 inch aluminum.
- F. Fasteners: Type and size recommended by manufacturer, but not less than those recommended by MFMA for application indicated.
- G. Adhesives: Manufacturer's standard for application indicated.

## 2.5 FINISHES

- A. Floor Finish System:
  - 1. Basis of Design: Bona Sport.
    - a. Floor-Sealer Formulation: Bona Sport, Super Sport Seal.
      - 1) Ingredients: Water, acrylic resin, ipropylene glycol monomethyl ether, defoamers.
      - 2) Color: Milky, off white (wet).
      - 3) pH: 7.8.
      - 4) Solids: 35%.
      - 5) Density: 8.66 lbs/gallon.
      - 6) US Regulatory VOC: 100 g/L.
      - 7) Odor: Nonoffending.
    - b. Game Line and Marker Paint: Bona CourtLines Sport Floor Paint.
      - 1) Ingredients: Alkyd resins, odorless mineral spirits, pigments, driers, titanium dioxide.
      - 2) Solids: 47-51%; White: 66%.
      - 3) Density: Colors: 7.6-7.9 lbs/gallon; White: 11.1 lbs/gallon.
      - 4) US Regulatory VOC: Does not exceed 490 g/L.
      - 5) Odor: Nonoffending low odor.
    - c. Finish Coat Formulation: Bona Sport, Super Sport Finish.
      - 1) Ingredients: Water, polyurethane resin, N-Methyl-2-Pyrrolidone, Dipropylene Glycol Monomethyl Ether and Dipropylene Glycol n-Butyl Ether.
      - 2) Color: Milky, off white (wet).
      - 3) pH: 8.3.
      - 4) Solids: 28%.
      - 5) Viscosity: (#4 Ford cup @ 25 degrees C) approx. 16 seconds.

- 6) Density: 8.52 lbs/gallon.
- 7) US Regulatory VOC: 350 g/L.
- 8) Gloss Level: (60 degrees) 88+.
- 9) Odor: Nonoffending.

B. Substitutions: Under provisions of Section 01 25 00.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of sports-floor assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Where concrete slabs do not conform to tolerances, specified in this section, make flat and level. Perform work as necessary to provide substrate within acceptable tolerances.
  1. Grind or remove concrete ridges and warps.
  2. Fill voids and swales using cementitious underlayment conforming to requirements of flooring manufacturer.
- D. Verify wood subfloor is properly secured, is smooth and flat to plus or minus 1/8 inch.
- E. Verify that required floor mounted utilities are in proper location.

#### 3.2 PREPARATION

- A. Broom clean substrate surfaces.

#### 3.3 INSTALLATION - FLOORING

- A. General: Comply with sports-floor assembly manufacturer's written instructions, but not less than written recommendations of MFMA applicable to flooring type indicated.
- B. Place vapor retarder, lap edges and ends 6 inches, tape seal and spot glue in place.
- C. Install panels end to end in a brick pattern at right angles to the direction of the finish flooring leaving a ¼ inch gap between panel ends.
- D. Place solid blocking at all bleacher stack areas and doorways.
- E. Machine fasten strip flooring parallel with main playing court at 12 inches o.c. Provide 2 inch expansion voids at perimeter and all vertical obstruction.
- F. Arrange flooring with end matched grain set flush and tight.

#### 3.4 INSTALLATION - ACCESSORIES

- A. Provide threshold at centerline of door openings and where flooring terminates with other floor areas.

- B. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside corners and use premolded outside corners.
- C. Install floor sockets, inserts and cover plates to a depth sufficient to ensure flush top surface with sanded floor surface.
- D. Provide additional support for volleyball sleeves, bleachers, and doorways.

### 3.5 FINISHING

- A. Follow applicable recommendations in MFMA's "Industry Recommendations for Sanding, Sealing, Court Lining and Finishing of Maple Gym Floors."
- B. Allow installed flooring to acclimate to ambient conditions for at least 10 days before sanding.
- C. Machine sand with coarse, medium, and fine grades of sandpaper to achieve a level, smooth, uniform surface without ridges or cups. Remove sanding dust by tack or vacuum.
- D. Finish: Apply seal and finish coats of finish system according to finish manufacturer's written instructions. Provide not less than five coats total and not less than three finish coats.
  - 1. Water-Based Finishes: Use finishing methods recommended by finish manufacturer to reduce grain raise and side bonding effect.
  - 2. Lay out game lines in accordance with drawings provided. For game lines, use current rules of association having jurisdiction and install all lines recommended.
  - 3. Game Lines and Markers: Apply game-line and marker paint between final sealer coat and first finish coat according to paint manufacturer's written instructions.
    - a. Mask flooring at game lines and markers, and apply paint to produce lines and markers with straight and sharp edges.
    - b. Game line colors to be selected by Architect.
    - c. Where game lines cross, break minor game line at intersection; do not overlap lines.
    - d. Apply game lines and markers in widths according to requirements indicated on Drawings.
    - e. Apply finish coats after game-line and marker paint is fully cured.

### 3.6 CLEANING

- A. Clean work under provisions of 01 77 00 - Closeout Procedures.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage.
- C. Clean and polish floor surfaces in accordance with manufacturer's instructions.

### 3.7 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01 73 00 - Execution.
- B. Prohibit traffic on floor finish for 48 hours after installation.
- C. Protect sports floors during remainder of construction period to allow finish to cure and to ensure that flooring and finish are without damage or deterioration at time of Substantial Completion.
  - 1. Do not cover sports floors after finishing until finish reaches full cure, and not before seven days after applying last finish coat.
  - 2. Do not move heavy and sharp objects directly over sports floors.



A&E # 13048.02  
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- D. Cover all wood athletic flooring after installation is complete with  $\frac{1}{4}$  inch plywood or hardboard sheets or masonite on undyed and untreated Kraft paper. Protection to remain in place until Substantial Completion.

END OF SECTION 09 64 66



## SECTION 09 65 00 – RESILIENT FLOORING - VCT

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. VCT.
  - 2. Rubber base.
  - 3. Moisture and pH testing of concrete slab prior to installation.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-in-Place Concrete: Slab finishes in spaces to receive VCT floor coverings and for vapor retarder and granular base below slabs-on-grade. Moisture and pH testing of concrete.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
  - 2. ASTM F1861 - Standard Specification for Resilient Wall Base.
  - 3. ASTM F1869 - Standard Test Method for Measuring Vapor Emission Rate of concrete Subfloor Using Anhydrous Calcium Chloride.
  - 4. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes.
- B. National Fire Protection Association:
  - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.
- C. Environmental Protection Agency:
  - 1. 40 CFR 59, Subpart D (EPA Method 24) National Volatile Organic Compound Emission Standards for Architectural Coatings.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate seaming plan.
- C. Product Data: Submit data describing physical and performance characteristics; including sizes and installation instructions.

- D. Samples: Submit two samples, 12 x 12 inch in size illustrating color for each flooring product specified.
- E. Section 01 77 00 - Closeout Procedures.
- F. Manual for Materials and Finishes: Submit suggested schedule for daily and periodic maintenance, and application and removal of floor finish.

#### 1.4 QUALITY ASSURANCE

- A. Single Source: Obtain each type of product required, including adhesives and accessories from one manufacturer throughout the Project.
- B. Fire Resistance of Floor Coverings: Comply with IBC, Section 804 Interior Floor Finish; determined in accordance with NFPA 253 "Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Heat Source."
- C. Indoor Air Quality: Comply with 40 CFR 59, Subpart D (EPA Method 24) requirements for adhesives as indicated.
- D. Moisture/pH Testing: Verify concrete floors are dry so that maximum moisture emission from concrete shall not exceed 5 lbs. per 1,000 s.f. in 24 hours, unless otherwise specified by manufacturer. Test in accordance with ASTM F1869 (surface), F2170 (core) and ASTM F710. Floors should exhibit negative alkalinity, carbonization, and dusting. Perform one test of each type for each 1000 square feet of VCT flooring area. Refer to Section 03 30 00 - Cast-In-Place Concrete.

#### 1.5 DELIVERY STORAGE AND HANDLING

- A. Store cartons flat and squarely on top of one another at the center of installation area away from vents and direct sunlight.

#### 1.6 PROJECT CONDITIONS

- A. Install products of this section after other finishing operations, including painting have been completed and not until the work area can be temperature controlled. Permanent HVAC system must be operational and functional and set to a minimum of 65 degree F.
- B. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive flooring products during the following time periods:
  - 1. 7 days before, during and after installation.
  - 2. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Maintain ambient relative humidity between 40% and 60% during installation.

#### 1.7 WARRANTY

- A. Resilient: Provide manufacturer's standard 5 year warranty.
- B. Rubber Base: Provide Manufacturer's two (2) Year Commercial Warranty for Manufacturing Defects.

## 1.8 MAINTENANCE

- A. Extra Materials: After completion of work, deliver to project site at a location designated by the Owner's Representative, replacement materials from same manufactured lot as materials installed. Package extra materials in manufacturer's original unopened cartons with each carton clearly labeled. Provide the following quantities:
1. Tile: Furnish 1 box for each 100 boxes or fraction thereof of each color, pattern and size of tile installed.
  2. Base: Furnish 10 linear feet for each 1000 linear feet or fraction thereof of each color and size of base installed.

## PART 2 PRODUCTS

### 2.1 MATERIALS –VINYL COMPOSITION TILE

- A. Acceptable Manufacturers:
1. Mannington, Touchstone.
    - a. Construction: Through Pattern Vinyl Composition Tile
    - b. Color: Refer to Finish and Color Schedule.
    - c. Overall Thickness: 3 mm or nominal 1/8 inch.
    - d. Dimensions: 12 inch x 12 inch.
    - e. Performance Testing:
      - 1) ASTM Specification (F-1066) Class 2.
      - 2) Static Load Limit; 125 psi.
      - 3) Radiant Flux: ASTM E648; >0.45 watt/cm<sup>2</sup>, NFPA Class 1.
      - 4) Smoke Density: ASTM E662, < 450, Passes.
      - 5) Indoor Air Quality: FloorScore CDPH Standard Method v1.1-2010.
      - 6) NSF/ANSI-332 – Gold.

### 2.2 MATERIALS - RUBBER BASE

- A. Rubber Base:
1. Acceptable Manufacturers:
    - a. Basis of Design: Johnsonite. (RB-1)
      - 1) Website: <http://www.johnsonite.com>.
    - b. Burke, <http://www.burkeflooring.com>.
    - c. Flexco, <http://www.flexcofloors.com>.
    - d. Roppe, <http://roppe.com>.
    - e. Substitutions: Under provisions of Section 01 60 00.
  2. Construction: Extruded rubber base meeting requirements of ASTM F1861, Type TS (thermoset vulcanized extruded rubber); 1/8-inch thick; 4 inches high; coil stock; top set cove style.
    - a. At casework, match height installed on adjacent wall. Provide taller base if needed.
  3. Color: Refer to Finish and Color Schedule.

## 2.3 INSTALLATION MATERIALS

- A. Transitions: Size and Shape: As required for floor material heights.
  - 1. Basis of Design: Schlüter® - SCHIENE - (E) Series, pre-fabricated aluminum.
    - a. Locations:
      - 1) VCT to Carpet Tile.
      - 2) Concrete to Carpet Tile.
  - 2. Basis of Design: Schlüter®, Reno-U
    - a. Locations:
      - 1) VCT to Concrete.
      - 2) QT to Concrete.
  - 3. Substitutions: Under provisions of Section 01 60 00.
  - 4. Adhesive: Manufacturer's recommendation.
- B. Primers: Non-staining type as recommended by manufacturer.
- C. Adhesives: Water resistant types recommended by the manufacturer for the conditions of the installation; adhesives shall be low-odor and meet VOC's requirements; in all cases, adhesives shall not exhibit any long lasting noxious off-gassing. Provide white colored adhesives for all areas.
  - 1. Maximum VOC: 60 g/L.
  - 2. SCAQMD, Rule 1168.
- D. Underlayments (Forming Transitions and Patching Compounds): Recommended by flooring manufacturer.
- E. Other Materials: Provide incidental and accessory materials, tools for testing and installation required for completion of VCT floor installation. Provide cleaning solution and floor finish recommended by manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet and are ready to receive Work.
- B. Moisture/pH Testing: Verify concrete floors are dry as specified in Quality Assurance above.
- C. Beginning of installation means acceptance of existing substrate and site conditions.
- D. Sample test concrete for proper adhesive bond.

### 3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is cured.
- C. Clean substrate. Verify substrates are dry and free of curing compounds, sealers, and hardeners. Remove any substance incompatible with adhesives or containing soap, wax, oil, solvents or silicone using mechanical methods recommended by manufacturer.

- D. Prepare substrates according to ASTM F710.
- E. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances which cannot be removed.

### 3.3 INSTALLATION - TILE FLOORING

- A. Comply with manufacturer's written instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- D. Install tile as shown on drawings. Allow minimum 1/2 full size tile width at room or area perimeter.
- E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- F. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install flooring in recessed floor access covers. Maintain floor pattern.

### 3.4 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Install in longest possible lengths.
- B. Miter internal corners. At external corners gouge back of base including two stress relief gouges at the bottom of the base in accordance with manufacturer's instructions. Install external corners so base toe has a continuous flow/shape around the corner.
- C. Install base on solid backing. Bond tightly to wall surface. At returns 1 foot or shorter, apply continuous pressure until adhesive is fully cured.
- D. Scribe and fit to door frames and other interruptions.

### 3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage or flooding floor.
- C. Sweep or vacuum to remove all loose dirt and grit.
- D. Initial cleaning should not be performed until 72 hours after installation. Clean floor as recommended by manufacturer.

### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 70 00 - Execution: Protecting installed construction.
- B. Prohibit traffic on VCT flooring for 24 hours after installation. No heavy traffic, rolling loads or furniture placement for 72 hours after installation.
- C. Provide other approved protection, if finished flooring is to be exposed to construction traffic, and remove protection at substantial completion.

END OF SECTION 09 65 00



SECTION 09 65 10 – RESILIENT FLOORING – LVT – (ALTERNATE)

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Luxury vinyl tile bid as Alternate.
  - 2. Rubber base.
  - 3. Moisture and pH testing of concrete slab prior to installation.
  - 4. Bid as Alternate #1A in lieu of VCT on the first floor.
  - 5. Bid as Alternate #1B in lieu of VCT on the second floor.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-in-Place Concrete: Slab finishes in spaces to receive vinyl floor coverings and for vapor retarder and granular base below slabs-on-grade. Moisture and pH testing of concrete.

1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
  - 2. ASTM F970 - Standard Test Method for Static Load Limit.
  - 3. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile.
  - 4. ASTM F1861 - Standard Specification for Resilient Wall Base.
  - 5. ASTM F1869 - Standard Test Method for Measuring Vapor Emission Rate of concrete Subfloor Using Anhydrous Calcium Chloride.
  - 6. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes.
- B. National Fire Protection Association:
  - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.
- C. Environmental Protection Agency:
  - 1. 40 CFR 59, Subpart D (EPA Method 24) National Volatile Organic Compound Emission Standards for Architectural Coatings.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate seaming plan.
- C. Product Data: Submit data describing physical and performance characteristics; including sizes and installation instructions.
- D. Samples: Submit two samples, 12 x 12 inch in size illustrating color for each flooring product specified.
- E. Section 01 77 00 - Closeout Procedures.

- F. Manual for Materials and Finishes: Submit suggested schedule for daily and periodic maintenance, and application and removal of floor finish.

#### 1.4 QUALITY ASSURANCE

- A. Single Source: Obtain each type of product required, including adhesives and accessories from one manufacturer throughout the Project.
- B. Fire Resistance of Floor Coverings: Comply with IBC, Section 804 Interior Floor Finish; determined in accordance with NFPA 253 "Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Heat Source."
- C. Indoor Air Quality: Comply with 40 CFR 59, Subpart D (EPA Method 24) requirements for adhesives as indicated.
- D. Moisture/pH Testing: Verify concrete floors are dry so that maximum moisture emission from concrete shall not exceed 5 lbs. per 1,000 s.f. in 24 hours, unless otherwise specified by manufacturer. Test in accordance with ASTM F1869 (surface), F2170 (core) and ASTM F710. Floors should exhibit negative alkalinity, carbonization, and dusting. Perform one test of each type for each 1000 square feet of LVT flooring area. Refer to Section 03 30 00 - Cast-In-Place Concrete.

#### 1.5 DELIVERY STORAGE AND HANDLING

- A. Store cartons flat and squarely on top of one another at the center of installation area away from vents and direct sunlight.

#### 1.6 PROJECT CONDITIONS

- A. Install products of this section after other finishing operations, including painting have been completed and not until the work area can be temperature controlled. Permanent HVAC system must be operational and functional and set to a minimum of 65 degree F.
- B. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive flooring products during the following time periods:
  - 1. 7 days before, during and after installation.
  - 2. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Maintain ambient relative humidity between 40% and 60% during installation.

#### 1.7 WARRANTY

- A. Resilient: Provide manufacturer's standard 10 year commercial wear warranty.
- B. Adhesives: Provide manufacturer's standard 10 year warranty.
- C. Rubber Base: Provide Manufacturer's two (2) Year Commercial Warranty for Manufacturing Defects.

#### 1.8 MAINTENANCE

- A. Extra Materials: After completion of work, deliver to project site at a location designated by the Owner's Representative, replacement materials from same manufactured lot as materials installed. Package extra materials in manufacturer's original unopened cartons with each carton clearly labeled. Provide the following quantities:

1. Tile: Furnish 1 box for each 100 boxes or fraction thereof of each color, pattern and size of tile installed.
2. Base: Furnish 10 linear feet for each 1000 linear feet or fraction thereof of each color and size of base installed.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS (LVT-1)

- A. Basis of Design: Shaw, ([www.shawhardsurface.com](http://www.shawhardsurface.com))
- B. Patcraft, ([www.patcraft.com](http://www.patcraft.com))
- C. Tandus Centiva, ([www.tandus.com](http://www.tandus.com)).
- D. Mannington, ([www.mannington.com](http://www.mannington.com))

### 2.2 MATERIALS – LUXURY VINYL TILE

- A. Basis of Design: Shaw Hard Surface, Grain+Pigment, 0503V. (LVT-1)
  1. Color: Cinder 64557.
  2. Construction: Luxury Vinyl Plank.
  3. Meets ASTM F1700: Class III Printed Film Vinyl Tile, Type A (smooth).
  4. Wear Layer Thickness: 20 mil or 0.020 inch.
  5. Overall Thickness: 20 mil.
  6. Dimensions: 7 x 48 inch.
  7. Finish: ExoGuard Quartz-Enhanced Urethane.
  8. Backing Class: Commercial Grade.
  9. Performance Testing:
    - a. Slip Resistance/ASTM D2047; compliant.
    - b. Static Load Limit/(modified) ASTM F970; 1500 psi.
    - c. Flexibility/ASTM F137; Passes.
    - d. Resistance to Heat: ASTM F1514; Passes.
    - e. Resistance to Light: ASTM F1515; Passes.
    - f. Resistance to Chemicals: ASTM F925; Passes.
    - g. Radiant Flux: ASTM E648; >0.45 watt/cm<sup>2</sup>, NFPA Class 1.
    - h. Smoke Density: ASTM E662, < 450, Passes.
    - i. Indoor Air Quality: FloorScore certified.
- B. Patcraft, Design Catalyst.
  1. Color: Multiply – Style #1920V – Color #: Theorem 0500.
    - a. Description:
      - 1) Wear Layer: 20 mil.
      - 2) Wear Layer Thickness: .020 inch.
      - 3) Overall Thickness: .120 inch.
      - 4) Reference Specification: Class III Printed Film Vinyl Plank.
      - 5) Meets ASTM F1700: Type A (smooth).
      - 6) Finish: ExoGuard Quartz Enhanced Urethane.
      - 7) Tile Size: 18 x 18 inch.
    - b. Performance Testing:
      - 1) Slip Resistance: ASTM D2047; ADA Compliant.
      - 2) Residual Indentation: ASTM F970; 2000 psi (lbs/sq.in.) – 0.005 in.
      - 3) Flexibility/ASTM F137; Passes.

- 4) Resistance to Heat: ASTM F1514; Passes.
- 5) Resistance to Light: ASTM F1515; Passes.
- 6) Resistance to Chemicals: ASTM F925; Passes.
- 7) Resistance to Fungi: ASTM G21; Passes.
- 8) Antibacterial Activity: AATCC 147; Passes.
- 9) Radiant Flux: ASTM E648; >0.45 watt/cm<sup>2</sup>, NFPA Class 1.
- 10) Smoke Density: ASTM E662, < 450, Passes.
- 11) Dimensional Stability/Federal Standard #501A, Method 6211, <0.02 inch/ft, passes.
- 12) Indoor Air Quality: FloorScore Certified.

C. Tandus Centiva, C-Stamped CCD-0925-QU.

1. Color: Odyssey.
2. Classification: ASTM F1700 Class III Type B.
3. Total Thickness: 0.120 inch.
4. Wear Layer Thickness: 20 mil.
5. Edge Treatment: Square.
6. Emboss: Standard.
7. Performance Testing:
  - a. Slip Resistance/ASTM D2047; >0.5 ADA Compliant.
  - b. Static Load; ASTM F970; Passes.
  - c. Flexibility/ASTM F137; Passes.
  - d. Resistance to Heat: ASTM F1514; Excellent.
  - e. Resistance to Light: ASTM F1515; Excellent.
  - f. Resistance to Chemicals: ASTM F925; Excellent.
  - g. Resistance to Heat: ASTM F1514; Excellent.
  - h. Indoor Air Quality: FloorScore certified.
  - i. Third Party Certification: NSF/ANSI-332 Gold.

D. Mannington, Spacia Abstract.

1. Color: Metropolis Smoke.
2. Construction: Luxury Vinyl Tile with beveled edges. ASTM F1700, Class 3, Type B.
3. Overall thickness: 0.096 inch; wearlayer thickness: 20 mil.
4. Floorscore Certified.
5. Slip Resistance: R9, Class DS, 0.5 (DCOF), ADA compliant Residual.
6. Residual Indentation: ASTM F2199, passes.
7. Resistance to Heat: ASTM F1514; Passes.
8. Resistance to Chemicals: ASTM F925; Passes.
9. Smoke Density: ASTM E662, < 450, Passes.

## 2.3 MATERIALS - RUBBER BASE

A. Rubber Base:

1. Acceptable Manufacturers:
  - a. Basis of Design: Johnsonite. (RB-1)
    - 1) Website: <http://www.johnsonite.com>.
  - b. Burke, <http://www.burkeflooring.com>.
  - c. Flexco, <http://www.flexcofloors.com>.
  - d. Roppe, <http://roppe.com>.
  - e. Substitutions: Under provisions of Section 01 25 00.
2. Construction: Extruded rubber base meeting requirements of ASTM F1861, Type TS (thermoset vulcanized extruded rubber); 1/8-inch thick; 4 inches high; coil stock; top set cove style.
  - a. At casework, match height installed on adjacent wall. Provide taller base if needed.
3. Color: Refer to Finish and Color Schedule.

## 2.4 INSTALLATION MATERIALS

- A. Transitions: Size and Shape: As required for floor material heights.
  - 1. Basis of Design: Schlüter® - SCHIENE - (E) Series, pre-fabricated aluminum.
    - a. Locations:
      - 1) LVT to Carpet Tile.
      - 2) Concrete to Carpet Tile.
  - 2. Basis of Design: Schlüter®, Reno-U
    - a. Locations:
      - 1) LVT to Concrete.
      - 2) QT to Concrete.
  - 3. Substitutions: Under provisions of Section 01 25 00.
  - 4. Adhesive: Manufacturer's recommendation.
- B. Primers: Non-staining type as recommended by manufacturer.
- C. Adhesives: Water resistant types recommended by the manufacturer for the conditions of the installation; adhesives shall be low-odor and meet VOC's requirements; in all cases, adhesives shall not exhibit any long lasting noxious off-gassing. Provide white colored adhesives for all areas.
  - 1. Maximum VOC: 60 g/L.
  - 2. SCAQMD, Rule 1168.
- D. Underlayments (Forming Transitions and Patching Compounds): Recommended by flooring manufacturer.
- E. Other Materials: Provide incidental and accessory materials, tools for testing and installation required for completion of LVT floor installation. Provide cleaning solution and floor finish recommended by manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet and are ready to receive Work.
- B. Moisture/pH Testing: Verify concrete floors are dry as specified in Quality Assurance above.
- C. Beginning of installation means acceptance of existing substrate and site conditions.
- D. Sample test concrete for proper adhesive bond.

### 3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is cured.
- C. Clean substrate. Verify substrates are dry and free of curing compounds, sealers, and hardeners. Remove any substance incompatible with adhesives or containing soap, wax, oil, solvents or silicone using mechanical methods recommended by manufacturer.

- D. Prepare substrates according to ASTM F710.
- E. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances which cannot be removed.

### 3.3 INSTALLATION - TILE FLOORING

- A. Comply with manufacturer's written instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- D. Install tile as shown on drawings. Allow minimum 1/2 full size tile width at room or area perimeter.
- E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- F. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install flooring in recessed floor access covers. Maintain floor pattern.

### 3.4 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Install in longest possible lengths.
- B. Miter internal corners. At external corners gouge back of base including two stress relief gouges at the bottom of the base in accordance with manufacturer's instructions. Install external corners so base toe has a continuous flow/shape around the corner.
- C. Install base on solid backing. Bond tightly to wall surface. At returns 1 foot or shorter, apply continuous pressure until adhesive is fully cured.
- D. Scribe and fit to door frames and other interruptions.

### 3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage or flooding floor.
- C. Sweep or vacuum to remove all loose dirt and grit.
- D. Initial cleaning should not be performed until 72 hours after installation. Clean floor as recommended by manufacturer.

### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction.
- B. Prohibit traffic on LVT flooring for 24 hours after installation. No heavy traffic, rolling loads or furniture placement for 72 hours after installation.
- C. Provide other approved protection, if finished flooring is to be exposed to construction traffic, and remove protection at substantial completion.

END OF SECTION 09 65 10





## SECTION 09 68 13 – TILE CARPETING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Carpet tile, fully adhered.
  - 2. Modular walk off mat.
  - 3. Accessories.
  - 4. Transition strips.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-in-Place Concrete: Moisture and pH testing of concrete.
  - 2. Section 06 10 53 - Miscellaneous Rough Carpentry: Subflooring and underlayment.
  - 3. Section 09 65 00 - Resilient Flooring: Base finish and transition strips.

#### 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- B. Carpet and Rug Institute:
  - 1. CRI Carpet Installation Standard - Standard for Installation of Commercial Carpet.
  - 2. CRI Green Label Plus Testing Program.
  - 3. CRI Model Specifications for Commercial Carpets.
- C. Certified Floor covering Installers:
  - 1. CFI Certification Process.
- D. Consumer Products Safety Commission:
  - 1. CPSC 16 CFR 1630 - Standard for the Surface Flammability of Carpets and Rugs.
- E. National Fire Protection Association:
  - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate layout of joints, direction of carpet pile, location of edge moldings, and location of transitions with adjacent materials.
- C. Product Data: Submit data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- D. Samples:
  - 1. Submit two 24 x 24 inch carpet tiles illustrating color and pattern design for each carpet color selected.
  - 2. Submit two 36 inch long samples of transition strip material.

- E. Manufacturer's Instructions: Submit recommended procedures, for routine, periodic cleaning.
- F. Section 01 77 00 - Closeout Procedures.
- G. Manual for Materials and Finishes: Submit Preventative Maintenance Program.

#### 1.4 QUALITY ASSURANCE

- A. Surface Burning Characteristics:
  - 1. Floor Finishes: Comply with one of the following:
    - a. Class I, minimum 0.45 watts/sq cm, when tested in accordance with NFPA 253.
    - b. CPSC 16 CFR 1630.
- B. Qualifications:
  - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
  - 2. Installer: Company specializing in performing work of this section with minimum five years documented experience.
    - a. CFI Certified Carpet Installers.
- C. Pre-Installation Meeting:
  - 1. Convene minimum one week prior to commencing work of this section.
- D. Moisture/pH Testing: Verify concrete floors are dry so that maximum moisture emission from concrete shall not exceed 5 lbs. per 1,000 s.f. in 24 hours, unless otherwise specified by manufacturer. Test in accordance with ASTM F1869 (surface) and F2170 (core) and exhibit negative alkalinity, carbonization, or dusting. Perform one test of each type for each 1000 square feet of resilient flooring area. Refer to Section 03 30 00 - Cast-In-Place Concrete.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Store materials in area of installation for 48 hours prior to installation.

#### 1.6 EXTRA MATERIALS

- A. Section 01 77 00 - Closeout Procedures: Spare parts and maintenance products.
- B. Supply one box of carpet tiles of each color and pattern selected.

#### 1.7 WARRANTY

- A. Provide manufacturer's standard lifetime limited warranty, including face wear, moisture barrier, delamination, tuft bind, unraveling, and static protection.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Shaw, ([www.shawcontractgroup.com](http://www.shawcontractgroup.com))
- B. Patcraft, ([www.patcraft.com](http://www.patcraft.com))

- C. Tandus Centiva Modular, ([www.tandus.com](http://www.tandus.com)).
- D. Mannington, ([www.mannington.com](http://www.mannington.com))

## 2.2 CARPET TILE (CPT-1)

- A. Basis of Design – Shaw: Multi-level pattern loop.
  - 1. Product and Style: Refer to Color and Finish Schedule.
  - 2. Fiber Type: Eco Solution Q Nylon.
  - 3. Tile Size: To be selected.
  - 4. Dye Method: 100% Solution dyed.
  - 5. Tufted Weight: 18.
  - 6. Gauge: 1/12.
  - 7. Stiches per inch: 10.
  - 8. Finished Pile Thickness: 0.092.
  - 9. Total Thickness: 0.275.
  - 10. Average Density: 7743.
  - 11. Flammability Rating: Flooring Radiant Panel, ASTM E648 and/or NFPA 253. Class 1.
  - 12. Smoke Generation: Less than 450 (ASTM E662).
  - 13. Static Rating: Less than 3.5 kV.
  - 14. Primary Backing: Synthetic fiber.
  - 15. Secondary Backing: EcoWorx Tile.
  - 16. Protective Treatments: SSP Shaw Soil Protection.
  - 17. Sustainable Carpet Assessment Standard: NSF-140 Platinum.
- B. Patcraft: Multi-level Pattern Loop.
  - 1. Product and Color: Speak in Color – 10239. Color– Marble Moire 00517.
  - 2. Fiber Type: Eco Solution Q Nylon.
  - 3. Tile Size: 24 inch x 24 inch.
  - 4. Dye Method: 100% solution dyed.
  - 5. Gauge: 1/12.
  - 6. Stitches Per Inch: 10.0.
  - 7. Tufted Pile Height: 3/32 inch low – 7/32 inch high.
  - 8. Tufted Yarn Weight: 18.0.
  - 9. Finished Pile Thickness: .090.
  - 10. Density: 7200.
  - 11. Flammability Rating: Flooring Radiant Panel, ASTM E648 and/or NFPA 253. Class 1.
  - 12. Smoke Generation: Less than 450 (ASTM E662).
  - 13. Static Rating: Less than 3.5 kV.
  - 14. Primary Backing: Non woven synthetic fiber.
  - 15. Secondary Backing: EcoWorx Tile.
  - 16. Protective Treatments: SSP Shaw Soil Protection.
  - 17. Sustainable Carpet Assessment Standard: NSF-140 Platinum.
  - 18. Indoor Air Quality: Green Label Plus 9968.
- C. Tandus: Stratatec Patterned Loop.
  - 1. Product and Style: Grid Overlay II- 02969. Color: Clean Coal – 44030.
  - 2. Installation: As instructed by Architect.
  - 3. Fiber Content: Dynex SD Nylon.
  - 4. Face Weight: 18 oz/sq. yd.
  - 5. Tile Size: 24 inch x 24 inch.
  - 6. Dye Method: Solution dyed.
  - 7. Gauge: 5/64.
  - 8. Pile Height Average: .187 inch.

9. Flammability Rating: Flooring Radiant Panel, ASTM E648 and/or NFPA 253. Greater than 0.45 watts/ CM<sup>2</sup> Class 1.
10. Smoke Generation: Less than 450 (ASTM E662).
11. Static Rating: 1.9 kV.
12. Primary Backing: Non woven synthetic fiber.
13. Sustainable Carpet Assessment Standard: NSF-140 Gold.
14. Indoor Air Quality: Green Label Plus 9744.

D. Mannington: Textured Patterned Loop.

1. Product and Style: Urban Patina Collection, Elevation –Infinity Modular.
2. Color: Crosstown 11212.
3. Face Fiber: ECONYL (100% regenerated Type 6 Nylon).
4. Dye Method: Solution.
5. Gauge: 5/64.
6. Stiches per Inch: 9.16.
7. Pile Thickness: .091.
8. Tufted Yarn Weight: 14 ounces per square yard.
9. Density: Average Density = 5538; Weight Density = 77,538.
10. Primary Backing: 100% Synthetic.
11. Secondary Backing: Infinity Modular Reinforced Composite Closed Cell Polymer.
12. Standard Size: 18 x 36 inch modular tiles.
13. Installation Method: Vertical Ashlar.
14. NSF/ANSI – 140 Certification: Gold.
15. CRI Green Label Plus ID: GLP7616.
16. Radiant Panel, ASTM E648. Class 1. (Direct Glue).
17. Smoke Chamber, ASTM E662: Less than 450 (Flaming Mode).
18. Methenamine Pill Test, ASTM D2859: Passes.
19. Dimensional Stability AACHEN Test: Passes.
20. Electrostatic Propensity, AATCC 134: Less than 3.0 KV.

### 2.3 WALK OFF MAT (WOM-1)

A. Basis of Design - Shaw: Needlebond rib construction.

1. Collection and Style: Steppin out, Bon Jour II.
2. Color: To be selected by Architect.
3. Fiber: 100% P.E.T. Polyester.
4. Construction: Needlebond rib.
5. Dye method: 100% solution dyed.
6. Tufted Weight: 50.5.
7. Gauge: 1/12.
8. Stiches per inch: 11.0.
9. Finished pile thickness: .344.
10. Total thickness: .451 inches.
11. Average Density: 5284.
12. Primary Backing: Synthetic.
13. Secondary Backing: eco\*worx.
14. Electrostatic Propensity: Less than 3.5 kv.
15. Flammability: AASTM E648, Class 1; ASTM E662, less than 450.
16. NSF 140: Platinum.

B. Patcraft: Multi-Level Pattern Loop.

1. Product and Style: Beyond the Door, Prado.
2. Color and Size: Refer to Color and Finish Schedule.
3. Fiber Type: Eco Solution Q Nylon.
4. Dye Method: 100% solution dyed.

5. Gauge: 1/12.
  6. Tufted Pile Height: 3/32 inch low – 6/32 inch high.
  7. Tufted Yarn Weight: 32.0.
  8. Finished Pile Thickness: .144.
  9. Density: 8000.
  10. Weight Density: 256,000.
  11. Flammability Rating: Flooring Radiant Panel, ASTM E648 and/or NFPA 253. Greater than 0.45 watts/ CM<sup>2</sup> Class 1.
  12. Smoke Generation: Less than 450 (ASTM E662).
  13. Static Rating: Less than 3.5 kV.
  14. Primary Backing: Non woven synthetic fiber.
  15. Secondary Backing: EcoWorx Tile.
  16. Protective Treatments: SSP Shaw Soil Protection.
  17. Sustainable Carpet Assessment Standard: NSF-140 Platinum.
  18. Indoor Air Quality: Green Label Plus 9968.
- C. Tandas: Accuweave Patterned Loop manufactured in one color dye lot.
1. Style: Abrasive Action II.
  2. Color and Size: To be selected by Architect.
  3. Yarn type: TDX Nylon.
  4. Dye Method: 100% Solution Dyed.
  5. Face Weight: 24 oz/sq yd.
  6. Gauge: 1/12.
  7. Stitches per Inch: 8.0.
  8. Pile Height Average: 0.187 inch.
  9. Soil/Stain Protection: Ensure.
  10. Primary Tufting Substrate: Synthetic Non-Woven.
  11. Antimicrobial Chemicals: No antimicrobials (EPA registered pesticides) added to product.
  12. Electrostatic Propensity: 1.5 kV (AATCC 134); Permanent Conductive Fiber.
  13. Surface Flammability: Passes CPSC FF 1-70 (ASTM D2859).
  14. Floor Radiant Panel: Class 1 (mean average CRF: 0.45 w/sq cm or higher) (ASTM E 648).
  15. Smoke Generation: Less than 450 (ASTM E662).
  16. Backing: Powerbond Cushion.
  17. Third Party Environmental Certifications: NSF 140, Gold.
- D. Mannington: Tip-Sheared Loop.
1. Color and Size: To be selected by Architect.
  2. Face Fiber: Type 6,6 Nylon.
  3. Dye Method: Solution.
  4. Gauge: 5/32.
  5. Stiches per Inch: 9.
  6. Pile Thickness: .155.
  7. Finished Yarn Weight: 38 ounces per square yard.
  8. Density: Average Density = 8825; Weight Density = 335,380.
  9. Primary Backing: 100% Synthetic.
  10. Primary Precoat: 100% Non-Aqueous Closed Cell Polymer, Providing lifetime warranty against Stain Wick-Back.
  11. Secondary Backing: Infinity Modular Reinforced Composite Closed Cell Polymer.
  12. Standard Size: 24 x 24 inch modular tiles.
  13. Installation Method: Monolithic or Quarter Turned. Confirm with Architect.
  14. NSF/ANSI – 140 Certification: Platinum.
  15. CRI Green Label Plus ID: GLP7616.
  16. Radiant Panel, ASTM E648. Class 1. (Direct Glue).
  17. Smoke Chamber, ASTM E662: Less than 450 (Flaming Mode).
  18. Methenamine Pill Test, ASTM D2859: Passes.

19. Dimensional Stability AACHEN Test: Passes.
20. Electrostatic Propensity, AATCC 134: Less than 3.0 KV.

## 2.4 ACCESSORIES

- A. Sub-Floor Filler: Cementitious Type recommended in writing by flooring material manufacturer and as required to comply with warranty requirements.
- B. Primer: Recommended in writing by carpet manufacturer and as required to comply with warranty requirements.
- C. Adhesive: Compatible with carpet material and concrete subfloors with up to 5 lbs moisture vapor emissions as determined by Calcium Chloride Test (ASTM F 1869). Recommended in writing by carpet manufacturer and as required to comply with warranty requirements.
- D. Interior transitions/thresholds between dissimilar flooring materials: Schlüter® - Series, as selected and approved or specifically detailed, pre-fabricated stainless steel or approved equal.
  1. Size and Shape: As required for floor material heights.
  2. Center under door or as indicated.
  3. Adhesive: Manufacturer's recommendation.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify substrate conditions under provisions of Section 01 31 00 - Project Management and Coordination.
- B. Verify that substrate surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft.
- C. Moisture/pH Testing: Verify concrete floors are dry as specified in Quality Assurance above.
- D. PREPARATION
- E. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- F. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- G. Clean substrate.

### 3.2 INSTALLATION

- A. Do not mix carpet from different cartons unless from same dye lot.
- B. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- C. Install carpet tile in pattern approved by Architect, with pile direction aligned as indicated on shop drawings.
- D. Locate change of color or pattern between rooms under door centerline.
- E. Fully adhere carpet tile to substrate.

- F. Trim carpet tile neatly at walls and around interruptions.
- G. Complete installation of edge strips, concealing exposed edges.

### 3.3 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage.
- C. Clean and vacuum carpet surfaces.

### 3.4 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction.
- B. Prohibit traffic on flooring for 48 hours after installation.
- C. Provide other approved protection, if finished flooring is to be exposed to construction traffic, and remove protection at substantial completion.

END OF SECTION 09 68 13





## SECTION 09 72 00 – SOUND ABSORBING AND DIFFUSING WALL PANELS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Prefabricated sound absorbing and diffusing panels, anchoring devices and preparation of anchorages.
- B. Related Sections:
  - 1. Section 04 22 00 - Concrete Unit Masonry.
  - 2. Section 09 21 16 - Gypsum Board Assemblies: Wall substrate.
  - 3. Section 09 51 23 – Acoustical Tile Ceilings: Acoustical Metal Wall Panels.
  - 4. Section 09 90 00 - Painting and Coating: Priming of substrate surfaces.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittals: Submittal procedures.
- B. Product Data: Submit data for sound absorbing and diffusing panels, anchoring devices, and fabrics.
- C. Submit two samples of each type of panel specified, 12x12 inch in size illustrating color, finish, and texture.
- D. Manufacturer's Installation Instructions: Submit standard and special installation for encountered substrate conditions.
- E. Submit manufacturer's certificate that products meet or exceed specified requirements.
- F. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing acoustical panels with five years documented experience.
- B. Applicator: Company specializing in installing acoustical panels with five years documented experience.
- C. Regulatory Requirements:
  - 1. Conform to International Building Code requirements for flame spread ratings of 75 or less when tested to ASTM E84.
- D. Mock Ups
  - 1. For each type of panel specified, provide a two panel field sample, illustrating installed unit, joint and seaming technique.

2. Locate where directed.
3. Accepted sample may remain as part of the Work.

E. Do not mix material from different dye lots.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Delivery, Storage, and Handling - Storage and protection requirements.
- B. Protect packaged adhesive from temperature cycling and cold temperatures.
- C. Do not store roll goods on end.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain substrate surface and ambient temperatures above 60 degrees F, unless required otherwise by manufacturer's instructions.
- B. Maintain these conditions 24 hours before, during, and after installation of sound absorbing panels.
- C. Do not apply adhesive when substrate surface temperature or ambient temperature is below 60 degrees F or relative humidity is above 40 percent.
- D. Acclimate material to jobsite conditions for a minimum of 48 hour prior to installation.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Conwed Designscape / Wall Technology, Inc., Ladysmith WI. <http://www.conweddesignscape.com/>
  1. Contact: Ken Rowland, Creative Alternative, 303.534.0107, [creative@creativealternative.com](mailto:creative@creativealternative.com)
- B. Wenger Corporation, Owatonna, MN. <http://www.wengercorp.com/>
- C. Lamvin, Inc. Oceanside, CA. <http://www.lamvin.com/>
- D. Substitutions: Under provisions of Section 01 25 00.

## 2.2 MATERIALS – ABSOPTIVE PANELS

- A. Impact Resistant Co-Polymer Faced Absorptive Panel. (AP-1) (AP-2) (AP-5)
  - 1. Basis of Design: Conwed | Wall Technology Metro Rebound Acoustical Panels.
    - a. #A200 MET rigid medium density fiberglass core with perforated co-polymer face sheet.
    - b. Thickness: 2 inch.
    - c. Color: Refer to Finish and Color Schedule.
    - d. Panel Mounting: Z-clip with L bracket at perimeter panels, uno.
    - e. Edge Treatment: Resin-hardened.
    - f. See drawings for sizes and locations.
    - g. NRC: 0.75.
- B. High Impact Acoustic Tackable Panel. (AP-3) (AP-4)
  - 1. Basis of Design: Conwed | Wall Technology, Respond IR108 Series.
    - a. 6-7 PCF glass fiberboard laminated with a 1/16" or 1/8" 16-20 pcf molded glass fiber.
    - b. Panel Size: See drawings.
    - c. Thickness:
      - 1) 4 inch. (AP-3)
      - 2) 2 inch. (AP-4)
    - d. Panel Mounting: Z-clip with L bracket at perimeter panels, uno.
    - e. Edge Profile: Square.
    - f. Corner finish: Square.
    - g. Edge Treatment: Resin-hardened.
    - h. Fabric: Refer to Finish and Color Schedule.
    - i. NRC: 0.85 for 1 inch thick.
- C. Field verify all dimensions before production of panels.
- D. Provide cutouts with finished edges for electrical devices where they occur.

## 2.3 MATERIALS - DIFFUSING PANELS

- A. Basis of Design:
  - 1. Wall Technology, Barrel Diffuser Panel (DP-1)
    - a. Wall-mounted, impact resistant cylindrical section with two faceted ends, fabric-wrapped, sound absorbing material mounted on rear surface.
      - 1) Fabric: Refer to Finish and Color Schedule.
    - b. Size as shown on drawings.
  - 2. Wall Technology, Pyramidal Ceiling Diffuser Panel. (DP-2)
    - a. Ceiling mounted, impact resistant pyramid, gel coat finish.
    - b. Size: 2' x 2' x 8".
    - c. Provide pyramidal diffusers at Band, Choir and Orchestra rooms Refer to Reflected Ceiling Plans for extent of area.
- B. Manufacturer's standard construction of .125 inch thermoformed fire resistant plastic.
- C. NRC: .10.

- D. Anchors at Wall Mounting: As recommended by manufacturer.
- E. Sealant: Acoustical type as specified in Section 07 92 00.

#### 2.4 ACOUSTICAL METAL WALL PANELS

- A. (AP-6): Refer to Section 09 51 23 and Color and Finish Schedule.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Verify that substrate surfaces are ready to receive work, and conform to requirements of the panel manufacturer.
- B. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.
- C. Beginning of installation means acceptance of existing surfaces.

#### 3.2 INSTALLATION

- A. Install required anchor components on wall surfaces.
- B. Tie anchor frame to hanger wires and leave frame level and centered within coffer at proper elevation.
- C. Check pre-manufactured panels for proper dimension to fit openings/layout.
- D. Do not install panels which are not true to required dimension or not square and level.
- E. Repair damage to covering prior to panel installation.
- F. Installed panels on wall to be properly spaced and plumb on wall surface.

#### 3.3 CLEANING

- A. Clean off dirt, fingerprint smudges and excess sealant from exposed panel faces.

END OF SECTION 09 72 00

## SECTION 09 84 20 – TACKABLE WALL PANELS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Tackable wall panels, including outer facing, backing board, trim where noted, adhesives, and anchorages.
- B. Related Sections:
  - 1. Section 09 21 16 - Gypsum Board Assemblies: Wall substrate.
  - 2. Section 09 90 00 - Painting: Priming of substrate surfaces.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal procedures.
- B. Shop drawings: Indicate wall elevations with panel layout, attachment and anchorage methods.
- C. Product Data: Submit data for tackable wall panels, anchoring devices, and trims.
- D. Submit
  - 1. Two samples of each tackable wall panels specified, 12x12 inch in size illustrating color, finish, and texture, and edge details.
  - 2. Two samples of each metal trim to be used.
- E. Manufacturer's Installation Instructions: Submit standard and special installation for encountered substrate conditions.
- F. Submit manufacturer's certificate that products meet or exceed specified requirements.
- G. Submit test reports verifying flame/fuel/smoke ratings, when tested by an independent agency.
- H. Section 01 77 00 – Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing tackable wall surfaces with five years documented experience.
- B. Applicator: Specializing in installing tackable wall materials with five years documented experience.

- C. Regulatory Requirements:
  - 1. Conform to 2012 International Building Code requirements for flame/fuel/smoke ratings of Class B when tested to ASTM E84.
- D. Mockup:
  - 1. Provide a two panel field sample, illustrating installed unit, joint and seaming technique.
  - 2. Locate where directed.
  - 3. Accepted sample may remain as part of the Work.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect packaged adhesive from temperature cycling and cold temperatures.
- B. Do not store roll goods on end.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain substrate surface and ambient temperatures above 60 degrees F, unless required otherwise by manufacturer's instructions.
- B. Do not apply adhesive when substrate surface temperature or ambient temperature is below 60 degrees F or relative humidity is above 40 percent.
- C. Maintain these conditions seven days before, during, and after installation of tackable wall surface.
- D. Condition material including adhesive in same manner for a minimum of 48 hours prior to installation.

#### 1.7 EXTRA STOCK

- A. Provide 50 lineal feet of tackable outer surface material.
- B. Store where directed.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Forbo, Hazelton, PA 18202. 800.842.7839. (<http://www.forboflooringna.com/>)
- B. Koroseal Wall Talkers, tac wall. ([www.walltalkers.com](http://www.walltalkers.com))
- C. Substitutions under provisions of Section 01 25 00.

#### 2.2 MATERIALS

- A. Materials – Tackable Outer Surface. (TWP-1) (TWP-2)
  - 1. Basis of Design: Forbo Bulletin Board.
  - 2. Color: Refer to Color and Finish Schedule.
  - 3. Fire Resistance: Class B (ASTM E84)
  - 4. Gauge: 1/4".
  - 5. Width: 48" or as shown.
  - 6. Backing: Jute.

7. Accessories
  - a. Metal trim for tackable surface: L trim. Buffed/Brushed finish.
    - 1) Stylmark, Angles Part #110182. (<http://www.stylmark.com>)
  - b. Adhesive: Type recommended by tackable wall covering manufacturer to suit application to substrate, mildew and water resistant, strippable type.
  - c. Backing Board Product: Homosote or equal, 1/2" or 3/4" particle board depending on adjacent finish material.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the wall covering manufacturer.
- B. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.
- C. Beginning of installation means acceptance of existing substrate.

### 3.2 PREPARATION

- A. Protect adjacent work areas and finish surfaces from damage during product installation.
- B. Surface Preparation: Refer to Forbo Bulletin Board – Forbo Flooring Systems, <https://www.youtube.com/watch?v=AVcwF-I7-WA>
- C. Cut product to length and width shown on the drawings.
- D. If recommended by adhesive manufacturer, apply primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth. Vacuum clean.

### 3.3 INSTALLATION

- A. Repair damages and fill crevices in non-smooth walls and sand the surface. Clean walls free of dust.
- B. Match lot numbers of each roll.
- C. Apply adhesive to backing board face in accordance with manufacturer's instructions.
- D. Apply adhesive to board immediately prior to application of tackable outer layer. Let contact adhesive set tack free.
- E. Apply outer layer to backing board. Ensure full bond to boards. Direct scribe at molding/base. Pattern scribe where no base/molding. Heavily weight completed panels to eliminate bowing and twisting as adhesive dries.
- F. Install trim at perimeter of panels. Anchor to wall with concealed sheet metal angle clips behind installed panels, 24 inches o.c.
- G. Layout panels on walls to verify sizes and spacings. Install panels flush with adjacent finished material. Check approved shop layout drawings.

- H. Locate joints as shown on drawings.

#### 3.4 CLEANING

- A. Remove temporary coverings and protection of adjacent work areas.
- B. Repair or replace damaged installed products.
- C. Clean tackable surfaces of excess adhesive, dust, dirt, and other contaminants.

#### 3.5 PROTECTION

- A. Protect finished installation.

END OF SECTION 09 84 20



## SECTION 09 90 00 – PAINTING AND COATING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. In general, the principal items of work include, but are not limited to, the following:
1. Preparation of surfaces.
  2. Painting and finishing of all exposed-to-view interior and exterior surfaces, except as otherwise indicated or specified.
    - a. Paint all surfaces unless otherwise indicated, scheduled, factory finished or indicated to receive a finish in other Sections of the specifications.
    - b. Refer to the Finish Schedule, notes on the drawings and Part 2 - PRODUCTS in this Section for a general guide to the painting requirements.
  3. Field painting of all exposed-to-view mechanical and electrical items such as pipes, ducts, hangers, conduits, and like items in rooms or areas scheduled to be painted.
  4. Field painting of prime painted finished door hardware to match the door frame. Hardware includes, but is not limited to, coordinators' housing and associated door closer mounting brackets on door frames, astragals, and other items as required.
  5. Touch-up paint all blemished or otherwise disfigured paint on all surfaces which occur prior to acceptance of the building by the Owner.
  6. Touch-up paint for field-welded connections on materials that have a hot-dipped galvanized coating.
- B. Where items or surfaces are not scheduled or specifically mentioned, paint these items the same as adjacent similar materials or areas. If finish is not designated, the Architect will select these from the paint systems specified.
- C. The following items do not require field painting:
1. Exterior wall louvers.
  2. Toilet partitions.
- D. Related Sections:
1. Section 05 12 00 - Structural Steel Framing: Shop priming of exposed steel shapes.
  2. Section 05 50 00 - Metal Fabrications: Shop primed items.
  3. Section 07 72 33 - Roof Hatches: Field Finishing.
  4. Section 08 12 14 - Standard Steel Frames: Field finishing.
  5. Section 08 13 14 - Standard Steel Doors: Field finishing.
  6. Section 09 21 16 - Gypsum Board Assemblies: Finishing requirements for paints specified.

#### 1.2 REFERENCES

- A. Green Seal:
1. GS-11- Green Seal Environmental Standard for Paints and Coatings.
- B. Society for Protective Coatings:
1. Surface Preparation Standards and Specifications.
- C. South Coast Air Quality Management District (SCAQMD):
1. SCAQMD Rule 1113 - Architectural Coatings (Amended June 3, 2011)

1.3 DEFINITIONS

- A. Exposed Surfaces: The term “exposed surfaces” includes areas visible when permanent or built-in fixtures, covers, grilles, and similar components are in place. Extend painting in these areas as required to maintain the system integrity and provide desired protection.
- B. DFT (dry film thickness): Minimum thickness, measured in mils (0.001 inch) of a coat of paint in the cured state.
- C. Gloss Ratings: Determine in accordance with ASTM D 523, measured at 60 degree angle of incidence.

Gloss Level (GL)	Traditional Name	Gloss at 60 degrees	Sheen at 85 degrees
Gloss Level 1	Matte or Flat	maximum 5 units	maximum 10 units
Gloss Level 2	Low Sheen	maximum 10 units	10-35 units
Gloss Level 3	Egg Shell	10-25 units	10-35 units
Gloss Level 4	Satin	20-35 units	minimum 35 units
Gloss Level 5	Semi-Gloss	35-70 units	
Gloss Level 6	Gloss	70-85 units	
Gloss Level 7	High Gloss	more than 85 units	

1.4 SUBMITTALS

- A. General: Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- B. Product Data: Submit complete list of products proposed for use, including technical data on each product and paint label analysis to verify compliance; organize list to indicate painting systems to be used with each substrate.
  - 1. Organize the paint submittal to follow the format in 2.1, G and H of this Section in order to indicate painting systems to be used with each substrate.
  - 2. Submittal shall contain any proposed revisions to specifications (i.e. surface preparation, method of application, etc.) which contractor feels are necessary in their execution of the Contract.
  - 3. Any proposed revisions must be approved by the Architect prior to proceeding with the Work.
- C. Submit paint manufacturer’s product data sheets and Material Safety Data Sheets highlighting VOC limits for each paint or coating used in the building.
- D. Samples: Using approved materials, prepare and submit samples of each type of finish, gloss, and color for approval. Label samples with color number, name and date. Provide three (3) samples each.
  - 1. Prepare paint color samples on 8-1/2 inch by 11 inch heavy, durable non porous paper.
  - 2. Furnish additional samples as required until colors and finishes are approved.

- E. Section 01 77 00 - Closeout Procedures.
- F. Manual for Materials and Finishes: Submit maintenance and cleaning requirements for coatings, repair and patching techniques. Indicate frequency of recoating.

#### 1.5 QUALITY ASSURANCE

- A. Single Source:
  - 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
  - 2. For each individual system, provide primer and other undercoat paint produced by same manufacturer as finish coat. Use only thinners approved by paint manufacturer and use only within recommended limits.
- B. Visual Standards: Each distinct area of the finished Work shall be free of variations in color and sheen, runs, sags, holidays, blistering, checking, cracking, scratches and other signs of poor workmanship.
- C. Mockup:
  - 1. Provide and apply paint for classroom mock-up under provisions of Section 01 40 00 - Quality Requirements. Coordinate installation with other trades involved in the mock-up.
    - a. When accepted, mock-up will demonstrate minimum standard for the Work.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with requirements specified in Section 01 60 00 - Product Requirements.
- B. Deliver materials to building in sealed, original, labeled containers bearing manufacturer's name, type of material, brand name, color designation, and instructions for mixing and thinning.
- C. Store materials when not in actual use in a place specifically assigned for that purpose which is dry and out of direct sunlight. Store materials in a manner so as not to exceed the manufacturer's temperature limitations.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Air temperature and substrate temperature and relative humidity shall be within the manufacturer's established limits. Do not apply exterior paint when the following conditions exist, unless requirements of paint manufacturers are more restrictive.
  - 1. Temperature: If surface and ambient temperature is above 90 degrees F, or below 50-degrees F.
  - 2. Relative Humidity: If relative humidity is above 85 percent.
  - 3. Weather: During damp and inclement weather or during excessively windy weather.
- B. Lighting: Do not proceed with work under this section unless adequate lighting is available. Provide lighting level of at least 50 candlepower per square foot, measured mid-height at substrate surface.
- C. Ventilation: Provide adequate ventilation as required for the type of paint and cleaning materials used. If necessary, consult paint manufacturer for recommendations.
- D. Protection: Protect surrounding areas against damage due to painting operations. At a minimum, surrounding areas shall be covered with polyethylene sheeting and waterproof masking tape. The Owner shall not be responsible for Contractor's selection or method of protection.

1. Protective coverings shall be secured against wind and shall be vented to prevent collection of moisture on covered surfaces.
2. Provide "wet paint" signs as required to protect newly painted surfaces.

E. Precautions: Take all precautions to prevent fire; open containers of inflammable materials only when needed; keep rubbing cloths and oily rags in tightly closed containers and remove from site daily. Dispose of hazardous materials in accordance with all local, State and Federal regulations.

F. Coordination: Review other sections of this specification in which prime paints are to be provided to ensure compatibility of total coating system for various substrates. Notify Contractor in writing of any anticipated problems using specified coating systems with substrates primed by others.

## 1.8 TESTING FOR ADHESION

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

## 1.9 RIGHT OF REJECTION

A. Architect shall have the right to reject materials or work that does not comply with these specifications. Work so rejected shall be redone as directed. Work rejected and ordered to be redone shall be done at the Contractor's expense, and at no extra cost to the Owner.

## 1.10 MAINTENANCE

A. Extra Materials: Deliver to project site at a location designated by the Owner's Representative, extra paint materials in 5 gallon quantities for each color of finish coat material. Deliver paint materials in manufacturer's original unopened containers with each container clearly labeled.

## 1.11 WARRANTY

A. Contractor Warranty: The contractor shall fully warrant and guarantee the work of this section against failure or non-performance for one year from the date of completion and acceptance. Failure or non-performance shall be corrected promptly upon discovery by the owner. Correction work will follow project specifications.

B. Warranty not applicable for failure of substrates, or work by others.

## PART 2 PRODUCTS

### 2.1 PAINT MATERIALS

A. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

B. Specified Manufacturer:

1. Unless otherwise specified, the paint systems shown in this section are made up of products by Sherwin-Williams Co. trade names and numbers. Sherwin-Williams Company, Tel. 1-800-321-8194 (Technical Hotline), (NW Rep Brian Keil, CSI, CCPR), Email [brian.keil@sherwin.com](mailto:brian.keil@sherwin.com),

Voice Mail 425-427-1900, Cellular 425-417-1765, Tel/Fax 425-427-1911, Website  
<http://www.sherwin-williams.com>

2. It is not the intent to limit products to that manufacturer, but rather to establish a quality Basis of Design which is required for this project.
  3. Substitution Requests: Submit for acceptance under provisions of Section 01 25 00.
- C. VOC Compliance: Unless otherwise specified, comply with the current version of Green Seal GS-11, supplemented by the SCAQMD Rule 1113 for VOC limits.
- D. Exterior Surfaces:
1. Metal: Doors and frames, other trim and miscellaneous surfaces.
    - a. One Primer Coat: Water Based Corrosion Resistant Primer. S-W Pro Industrial Pro-Cryl Universal Acrylic Primer B66W00310 (<100 g/L VOC).
    - b. Two Finish Coats: S-W Pro Industrial H/P Acrylic, B66 Series (<50 g/L).  
Note: For new and unprimed galvanized metal, wash and etch according to manufacturer's written instructions with Sherwin Williams "Clean & Etch," or other approved material.
  2. Non Galvanized Shop primed Ferrous Metal: Including exposed to weather structural beams, columns and support members.
    - a. One Intermediate Coat: Surface tolerant, 2 part Polyamide Epoxy. S-W Macropoxy 646-100 B58W620 at 5.0-10.0 mils (<100 g/L VOC)
    - b. One Finish Coat: High Solids Polyurethane, Gloss. S-W Hi-Solids Polyurethane 100 B65W625 (<100 g/L VOC)
- E. Interior Surfaces
1. Concrete Floors: Refer to Section 03 30 00.
    - a. CONC-2:
      - 1) Curing/Sealing Compound. ASTM C1315 Type 1, Class A 30% solids, clear without fugitive dye, waterborne membrane-forming curing and sealing compound. Comply with Federal Air Quality Regulations of 40 CFR 52.254. Products by US Spec; Euclid, W.R. Meadows or L & M Chemicals.
    - b. CONC-3: Not using.
  2. Gypsum Wallboard: Typical walls and ceilings in class rooms, offices, living spaces, etc.
    - a. One Primer Coat: Top commercial grade zero VOC GWB primer. S-W ProMar 200 Zero VOC Primer B28 Series.
    - b. Two Finish Coats: Top commercial grade zero VOC latex, Eggshell. S-W ProMar 200 Zero VOC Eg-Shel, B20-2600.
  3. Gypsum Wallboard: Wet area walls and ceilings including toilet rooms, janitor closets, kitchens, locker rooms and other areas subject to increased moisture and/or cleaning. Excludes shower rooms.
    - a. Primer: Top commercial grade zero VOC GWB primer. S-W ProMar 200 Zero VOC Primer B28 Series.
      - 1) VOC's: 0 g/L.
      - 2) Coverage Rate: 300 to 400 square feet per gallon.
    - b. Two Finish Coats: Single component high performance water based epoxy modified acrylic, Semi-gloss. S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy Semi-Gloss K46 Series.
      - 1) VOC's: 150 g/L.
      - 2) Coverage Rate: 200 to 250 square feet per gallon per coat.
    - c. Dry Film Thickness: 2.5 to 3.0 mils per coat.
  4. Gypsum Wallboard: Shower rooms.
    - a. One Primer Coat: Top commercial grade zero VOC GWB primer. S-W ProMar 200 Zero VOC Primer B28 Series.
    - b. Two Finish Coats: Solvent based epoxy, Semi-Gloss. S-W Macropoxy 646-100 B58W620 at 5.0-10.0 mils (<100 g/L VOC).

5. DryFall, Multiple Substrates: Including exposed overhead structure, concrete, properly prepared metal, as well as pipes, ducts, hangers, conduits, and like items.
  - a. One Finish Coat: Water Based Dryfall, Eggshell. S-W Low VOC Waterborne Dryfall, B42 Series, (<50 g/L VOC)
    - 1) Additional coats may be required to achieve uniform color, hiding and appearance.
    - 2) Clean galvanized steel surfaces as specified above.
6. Ferrous Metal: Including factory primed Doors, Frames and Railings.
  - a. One Primer Coat: Prime unprimed, bare metal (only), with water based corrosion resistant primer. S-W Pro Industrial Pro-Cryl Universal Primer B66W00310 (<100 g/L VOC).
  - b. Two Finish Coats: Light industrial water based coating, Semi-Gloss, resistant to light abrasion and softening by constant hand contact. S-W Pro Industrial Pre-Catalyzed W/B Epoxy Semi-Gloss K46 Series (141 g/L VOC)
7. Structural Shop Primed Ferrous Metal: Including stairs.
  - a. One Primer Coat: S-W Macropoxy 646-100 Fast Cure Epoxy B58-620 (100 g/L VOC).
  - b. Two Finish Coats: Water based acrylic urethane. S-W Waterbased Acrolon 100 Urethane B65W700 Series (<100 g/L VOC).
8. Factory primed or unprimed miscellaneous metal: Including Mechanical and Electrical Equipment Items. Prep as appropriate for substrate.
  - a. Prime all bare metal as needed with water based corrosion resistant primer. S-W Pro Industrial Pro-Cryl Universal Primer B66W00310 (<100 g/L VOC).
  - b. Exposed Insulated Piping:
    - 1) Finish Coats: Match paint specified on adjacent walls or surfaces.
  - c. Exposed Galvanized Ducts, Piping, Conduits, etc.:
    - 1) Finish Coat: Match paint specified on closest adjacent walls or surfaces.
  - d. Exposed Ferrous Piping, Hangers (and like items):
    - 1) Finish Coat. Match paint specified on adjacent walls or surfaces.
  - e. Interior of all Ducts at Grilles, Registers and Diffusers:
    - 1) One Coat. SW ProMar 200 Zero VOC Black
  - f. Unprimed grilles and diffuser face plates, Match paint specified on adjacent walls or surfaces.
9. Plywood Backboards at Mechanical and Electrical Rooms – Fire Retardant Coating:
  - a. One Primer Coat: Water based wood primer. S-W Multi-Purpose Zero VOC Int/Ext Latex Primer Sealer B51 Series
  - b. Two Finish Coats: Fire Retardant. Flame Control 20-20, (55 g/L VOC)

10. Plywood Wainscot at Fabrication Lab:
    - a. One Primer Coat: Water based wood primer. S-W Premium Int Wall & Wood Primer, B28WO8111 (<50 g/L VOC).
    - b. Two Finish Coats: Water Based Catalyzed Epoxy, S-W Pro Industrial Waterborne Catalyzed Epoxy B73 Series (<50 g/L VOC).
  11. Interior Pre-primed Mechanical Wall Grilles and Diffusers
    - a. Two Finish Coats: Match paint specified on adjacent walls or surfaces.
- F. Colors: Each paint color must be accurately mixed to ensure color continuity. No allowance will be granted for mis-matched paint of the same color when viewed under normal lighting conditions. Refer to Finish and Color Schedule for color selections.
- G. Provide primer and finish coats which are compatible with each other and with prime coats provided under other Sections. Provide barrier coats over incompatible primers or remove and re-prime as required.
- H. Tint each undercoat a lighter shade than finish coat so that numbers of coats can be easily discerned. No color mixing will be allowed at the job-site.
- I. Thinner: Type as recommended by the paint manufacturer. Use thinner only when recommended by the paint manufacturer, and then only in a quantity as indicated on the label.
- J. Primers: Primers, except metal primers, shall be white in color for inspection purposes.
- K. Secondary Products: Secondary products not specified by name and required for the job such as shellac, oils, patching compounds, putty, etc., shall be "best grade" products.
- L. Provide the paint colors as indicated in the Finish Schedule.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

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

#### 3.2 SURFACE PREPARATION (GENERAL)

- A. General: Surface preparations and cleaning procedures shall be in strict accordance with the instructions and specifications of the paint manufacturer and with the requirements of this specification.

- B. Removal of Fixtures: Cooperate with other trades and coordinate removal of fixtures, hardware items, and equipment, as required for painting work. Items to be removed on surfaces to be painted include: switch and receptacle plates, escutcheons and like plates, surface-mounted equipment, free-standing equipment which blocks access to painting surfaces, grilles and louvers at duct openings into finished spaces, and other items as required and directed.
- C. Painting of Factory-Primed Door Hardware: Prior to painting, mask all operating parts so that item works freely after paint is dry. Remove any excess paint from operating parts and clean and free-up the operation of any parts which do not operate smoothly due to the painting operation.
- D. Pre-Cleaning: Remove oil and grease prior to mechanical cleaning as hereinafter specified by methods outlined in SSPC-SP 1 "Solvent Cleaning."

### 3.3 SURFACE PREPARATION

- A. Uncoated Ferrous Metal: For interior metals not requiring paint, surfaces are to remain as received from the factory.
- B. Shop-Coated Ferrous Metal: Thoroughly degrease surfaces and clean using solvent (SSPC-SP 1). Remove loose rust, blistered and peeling paint to bare metal by scraping, sanding, wire brushing, or other abrasion methods in accordance with SSPC-SP 2 or SP 3; feather edges of adjacent sound paint. Dull glossy surfaces by scuff-sanding and wipe down. Spot-prime all abraded portions, rust areas, and bare surfaces with specified primer on same day of surface preparation. Finish prime after spot priming has dried thoroughly.
- C. Galvanized Metal: Clean surfaces to remove factory films and oily residue as recommended by the paint manufacturer. Responsibility for insuring that the surface is properly prepared rests with the painting sub-contractor. Clean galvanized metal the same day to be painted.
- D. Gypsum Wallboard: Remove all dust and dirt with a brush; if necessary, clean surfaces using damp rags or sponges. Repair of surface defects is specified in Section 09 21 16.

### 3.4 CLEANING PRIOR TO PAINTING

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

### 3.5 APPLICATION OF PAINT

- A. Mixing: Mix paint materials in accordance with the manufacturer's instructions and directions. Mix often enough during application to keep the paint uniform and to ensure complete dispersion of pigment and a uniform composition.
  - 1. Prepare multiple component coatings using all of the contents of the container for each component as packaged by the manufacturer. Mixing of partial kits will not be permitted. Multiple component coatings that have been mixed shall not be used beyond their pot life. Only the components specified and furnished by the manufacturer, including thinner if required, shall be mixed.
- B. Application: Apply paint in accordance with the manufacturer's directions. Use techniques best suited for substrate and type of material being applied. Brushes and rollers shall be of a type best suited for the type of material being applied.



1. Apply intermediate and finish coats within the manufacturer's recommended top coating time periods.
  2. When applying paint to drywall, use a roller nap no greater than 3/8 inch so as to achieve a light stipple finish.
  3. Brush and level out paint applied to metal door frames to achieve a nearly sprayed-on appearance.
  4. If metal doors are not sprayed, finish may be applied with 1/4 inch nap roller.
- C. Apply each coat of paint as a continuous film of uniform thickness, free from holidays, sags, crawls, pinholes, blisters, unevenness in color, or other evidence of poor workmanship. Repaint thin spots or areas missed in the application and allow to dry before applying next coat of paint.
1. Give special attention to ensure that surfaces, such as edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  2. Each coat shall be free of dirt, dust, moisture, etc., prior to application of next coat.
- D. Allow each coat of paint to thoroughly dry, full thickness of the film, before application of the succeeding coat. Paint is considered dry for recoating when the next coat can be applied without the development of any detrimental film irregularities such as wrinkling, lifting, or loss of adhesion of the previous coat.
- E. Coverage for each paint material is specified as either the total minimum dry film thickness in mils, or the spreading rate in square feet per gallon over the surface designated. Actual coverage rate will vary depending upon the texture and porosity of the surface, climatic conditions, etc.
1. The number of coats specified is the minimum required, irrespective of the coating thickness.
  2. In the event the required paint thickness is not achieved, apply additional coats until the required thickness is obtained.
  3. Do not exceed manufacturer's recommended maximum film build-up per coat (wet mils).
- F. Recoat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat to ensure a finish coat with no burn-through or other defects.
- G. Sand lightly between coats of enamel to produce an even, smooth finish. Wipe to remove dust before recoating.
- H. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
- I. Do not paint over any code-required labels or any equipment identification or nomenclature plates.
- J. Tops and bottoms of metal doors shall be finished the same as the faces (primed and two finish coats of painted).

### 3.6 DAMAGED PAINT SURFACES

- A. General: Before final acceptance of the work by the Architect, repair or re-finish painted surfaces which have been damaged at no additional cost. Refinish whole wall where portion of finish is not acceptable.
- B. Painted Structural Steel: Areas of chipped, peeled, or abraded paint shall be hand or power sanded, feathering the edges. Prime and finish coat the areas using the same material as originally scheduled. Depending on the extent of repair and its appearance, an overall finish coat may be required by the Architect to achieve uniform appearance.

### 3.7 CLEAN-UP

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

### 3.8 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

END OF SECTION 09 90 00

## SECTION 10 11 00 – VISUAL DISPLAY SURFACES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes porcelain enamel white boards, tackboards and tackstrips, frames, and accessories.
- B. Related Sections:
  - 1. Section 06 10 53 - Miscellaneous Rough Carpentry.
  - 2. Section 09 21 16 - Gypsum Board Assemblies: Substrate construction.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM A424 - Standard Specification for Steel, Sheet, for Porcelain Enameling.
  - 2. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
- C. Product Data: Submit data on white boards, and trim and accessories.
- D. Closeout Submittals
  - 1. Section 01 77 00 - Closeout Procedures.
  - 2. Manual for Materials and Finishes: Include initial preparatory cleaning requirements, daily use suggestions, and permanent white removal techniques.

#### 1.4 QUALITY ASSURANCE

- A. Qualifications
  - 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Mockup:
  - 1. Provide and install marker boards and tack boards for classroom mock-up under provisions of Section 01 40 00 - Quality Requirements. Coordinate installation with other trades involved in the mock-up.
    - a. Locate where directed.
    - b. When accepted, mock-up will demonstrate minimum standard for the Work.

## 1.5 PRODUCT HANDLING AND STORAGE

- A. Store all materials in secure storage prior to installation and protected from accidental damage. Maintain a minimum room temperature of 60°F for a minimum of 48 hours prior to installation.
- B. Panel materials shall be stored in as close to a vertical position as possible. Do not lean materials at an angle against wall and do not lay panel materials on floor for any length of time.
- C. Panels shall always be carried in a vertical upright position.

## 1.6 PROJECT CONDITIONS

- A. Field measure prior to preparation of shop drawings and fabrication to ensure proper fit.

## 1.7 WARRANTY

- A. Section 01 77 00 - Closeout Procedures.
- B. Furnish Warranty stating that under normal usage and maintenance and when installed in accordance with manufacturer's instructions and recommendations, white boards are guaranteed for the life of the building.
  - 1. Include coverage of white board surface from discoloration due to cleaning, crazing, cracking, or staining.
- C. Furnish a standard warranty, stating that when installed in accordance with manufacturer's instructions and recommendations, tackboards are guaranteed for one year against defects in materials and workmanship.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Claridge Products & Equipment Inc., Series 5. (WB)
- B. Moore Co.
- C. Marsh Industries Inc.
- D. Aarco Products
- E. Substitutions: Section 01 25 00.

## 2.2 WHITE BOARD MATERIALS (WB)

- A. Steel Sheet ASTM A424, Type I, commercial quality. Pre clean and treat for application of architectural porcelain on a continuous coil process.
  - 1. Outer face sheet: 28 ga, magnetic.
  - 2. Provide ground and cover coats of ceramic frit by firing operation.
    - a. Firing Temperature: Enamel shall be fired at lowest possible temperatures to reduce steel and porcelain stresses and achieve superior enamel and hardness.
  - 3. Class 1 finish rating.
- B. Aluminum Extrusions: ASTM B221, 6061 alloy, temper selected by manufacturer as most appropriate for condition of use.
- C. Core material: 7/16" MDF.
- D. Foil Backing: Aluminum foil sheet.
- E. Adhesives: Type recommended by manufacturer.

## 2.3 TACKBOARD MATERIALS (TB) AND TACKSTRIPS (TKS-1) (TKS-2) MATERIALS

- A. Tackable outer surface:
  - 1. ¼ inch thick self-healing, burlap backed cork.
  - 2. Fire Resistance: Class B (ASTM E84)
  - 3. Color: Refer to Color and Finish Schedule.
- B. Core: ¼" thick, tempered hardboard.
- C. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate, mildew and water resistant, strippable type.
- D. Metal trim: Aluminum to match profile of white board frames.

## 2.4 ACCESSORIES

- A. Map Rail: Continuous 2 inch rails with cork insert. (TKS-1) (TKS-2)
  - 1. Map Hooks: One hook for each 3 ft. of rail.
  - 2. Flag holder.

## 2.5 FABRICATION

- A. Shop Assembly: White board and tackboard units.
- B. Frame: Extruded aluminum, concealed fasteners; 5/8 inch wide.
- C. Provide pen trough full length of each white board.
- D. Splice Joint: Concealed spline of sheet steel.

## 2.6 FINISHES

- A. Porcelain Enamel: Color: Low Gloss White. Provide music lines where indicated on drawings.
- B. Aluminum Frame and Pen Trough: Anodized with satin finish.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify internal wall blocking is ready to receive Work and positioning dimensions are as indicated on shop drawings.
- B. Verify that interior temperature and humidity approximate normal conditions of building occupancy. Do not install boards on damp walls or in damp and humid weather without heat in the building.
- C. Verify that wall surfaces are prepared and ready to receive boards.

### 3.2 INSTALLATION

- A. Comply with manufacturer's instructions for installing hangers.
- B. White boards:
  - 1. Establish bottom of perimeter frame as shown on drawings.
  - 2. Butt panels tight with concealed spline to hairline joint.
- C. White boards and Tack boards:
  - 1. Secure units level and plumb, with no bows at perimeter edges.
  - 2. Keep perimeter trim straight in accordance with manufacturer's recommendations.
  - 3. Layout panels on walls to verify sizes and spacings. Check approved shop layout drawings.
  - 4. Locate joints as shown on drawings.

### 3.3 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Clean installed products in accordance with manufacturer's instructions leaving all materials ready for use.
- C. Verify that all accessories are installed as required for each unit.
- D. Cover white board and tack board surfaces with protective cover, taped to frame.
- E. Remove temporary protective cover immediately prior to Architect's punch list.
- F. Repair or replace damaged installed products.

END OF SECTION 10 11 00

## SECTION 10 11 41 – SLAT PANEL SYSTEM

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes manufactured slat wall panels with horizontal slots for display.
- B. Related Sections:
  - 1. Section 05 40 00 - Cold Formed Metal Framing.
  - 2. Section 06 10 53 - Miscellaneous Rough Carpentry.
  - 3. Section 09 21 16 - Gypsum Board Assemblies: Substrate construction.
  - 4. Section 09 22 16 - Non-Structural Metal Framing.

#### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate locations, elevations, cross sections, joint details, dimensions, tolerances, clearances, fastening methods, accessories, and backing requirements.
- C. Product Data: Submit data on physical characteristics and limitations of components of construction. Include manufacturer's installation instruction and procedures.
- D. Product Samples: T-Lip channel inserts and maple veneer faces slot wall panel illustrating conformance to specifications.

#### 1.3 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver until building is closed in and work creating humidity, moisture, and dust are complete.
- B. Deliver in manufacturer's sealed protective packaging with manufacturer's identifying labels intact and legible.
- C. Store in areas meeting requirements for installation areas. Do not break packaging until ready for installation.
- D. Handle in manner to protect from moisture, soiling, and damage.
- E. Do not stack panels directly on floor.

#### 1.4 PROJECT CONDITIONS

- A. Condition panels to normal room temperature and low humidity prior to installation.

#### 1.5 COORDINATION

- A. Section 05 40 00 and Section 09 22 16 for backing support at stud framing required for work of this Section.

### PART 2 PRODUCTS

#### SLAT PANEL SYSTEM

## 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Marlite, Slatwall, 7000 series. [www.marlite.com](http://www.marlite.com)
- B. Spacewall International, [www.spacewall.com](http://www.spacewall.com) .
- C. Rich Ltd Pop Displays, <http://slatwall-display.com/> .
- D. Substitutions: Under provisions of Section 01 25 00.

## 2.2 MATERIALS

- A. Fiberboard Panels:  $\frac{3}{4}$  inch Premium grade medium density fiberboard (MDF) with an average 37 to 50 pounds per cubic foot density and moisture content of 8 percent to 12 percent.
- B. Panel Face: High Pressure Laminate: .030 inch thick high pressure laminate sheet bonded via cold press with PVA type II, water resistant adhesive. Color: PLAM-1.
- C. Channel Inserts: T-Lip extruded aluminum medium duty inserts for field installation into T-Lip channel slots in slot wall panels.
- D. Fasteners: 1-1/2 inch Type S screws for installation of panels into metal studs and backing through channel slots for concealed installation.

## 2.3 ACCESSORIES

- A. Straight hooks.
- B. Shelf brackets.
- C. Arms.
- D. Aluminum trim as needed.

## 2.4 FABRICATION

- A. Fabricate slat wall panels from  $\frac{3}{4}$  inch thick plastic laminate faced MDF.
- B. Space horizontal T-Lip Channel slots at 3 inches on center.
- C. Form continuous  $\frac{1}{2}$  inch wide slots between adjoining panels.
- D. Fabricate square cut edges at slat wall panel terminations to other construction.

## 2.5 FINISHES

- A. T-Lip Channel Inserts: Mill finished aluminum.



### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify conditions ready to receive work of this Section before beginning.

#### 3.2 INSTALLATION

- A. Conform to manufacturer's instructions.
- B. Field cut panels to suit installation.
- C. Install panels with channel slots running horizontally, continuously, and in alignment with adjoining panel joints.
- D. Position and secure installation level, plumb, and in alignment with adjacent work.
- E. Fasten panels to metal stud wall framing or backing using concealed screws into solid framing and backing between stud framing as necessary to accommodate loads.
- F. Install adjoining panels with inconspicuous joints and edges.

#### 3.3 ADJUSTMENT

- A. Repair or replace damaged panels and panels out of alignment as directed by Architect.

#### 3.4 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Leave installation clean and free from debris from work of this Section.

END OF SECTION 10 11 41



## SECTION 10 14 00 - SIGNAGE

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Panel Signage and Attachment Devices.
  - 2. Dimensional Letters and Numerals and Attachment Devices.
- B. Related Sections:
  - 1. Section 08 13 14 - Standard Steel Doors.
  - 2. Section 08 14 16 - Flush Wood Doors.
  - 3. Section 08 80 00 - Glazing.
  - 4. Section 09 21 16 - Gypsum Board Assemblies: Drywall substrate.
  - 5. Division 23 - Mechanical Identification.

#### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Submit complete shop drawings indicating all materials, sizes, configurations, applicable substrate mountings, sign styles, wording and lettering locations, anchorages and accessories and overall dimensions for each.
  - 1. Computerized Output: Furnish computerized samples of signs and graphics at a scale duplicating final appearance.
  - 2. Submit signage schedule complete with location of each sign and required copy; include floor plans if required.
  - 3. Furnish location template drawings for items supported or anchored to permanent construction.
- C. Product Data:
  - 1. Submit manufacturer's product literature indicating units and design selected.
  - 2. Submit manufacturer's technical data and installation instructions for each sign type required.
- D. Samples:
  - 1. Submit full size sample, finished, showing construction methods for sign types for Architect's approval prior to fabrication and delivery to jobsite.
  - 2. Submit two samples illustrating full size sample letters, of type, style, finish and color specified including method of attachment.
  - 3. Include installation template and hardware.
- E. Submit manufacturer's installation instruction. Submit installation template and attachment devices.
- F. Section 01 77 00 - Closeout Procedures.
- G. Manual for Materials and Finishes:
  - 1. Provide appropriate checklist for aiding in reordering after Date of Substantial Completion. Maintain schedule program for five years for ordering new signage as required by Owner.
  - 2. Submit maintenance data and cleaning requirements for all exterior surfaces.

#### 1.3 QUALITY ASSURANCE

- A. Uniformity of Manufacturer: For each sign form and graphic image process indicated, furnish products of a single manufacturer.
- B. Manufacturers: Company specializing in fabrication and installation of signs with at least two (2) years documented experience. Submit a list of installations and other substantiating data that demonstrates experience in sign work similar to that indicated on drawings and in these specifications.
- C. Sign finish shall be smooth, free of scratches, cutting marks or other imperfections. Sign material laminations shall be smooth, consistent and free of bubbles, bulging and foreign matter, and shall not delaminate or cause discoloration or deterioration of any materials used in fabrication.
- D. Comply with ADA Codes and Federal Regulations. Provide signs for assuring access for persons with disabilities in accordance with federal, state, and local regulations.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Package signs, labeled in name groups.
- C. Store adhesive attachment tape at ambient room temperatures.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install signs when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Cosco (507) 304-6408.
- B. Great Graphics and Signs, Inc. (253) 841-2678.
- C. Foley Signs (206) 324-3040.
- D. M3 Messengercorp (206) 342-1900.
- E. Substitutions: Under provisions of Section 01 25 00.

#### 2.2 WALL MOUNTED TACTILE SIGNAGE

- A. Interior Room Identification and Direction Signs and ADA Toilet Room Signs:
  - 1. Two layers of acrylic with sub-surface colors and face mounted tactile letters and braille. Face layer to be 1/8 inch non glare acrylic. Back layer to be 1/8" acrylic.
  - 2. Face and edges of plaques to be smooth, free of scratches, cut marks or other imperfections. Square corners.
  - 3. Sub-surface graphics and inks to be acrylic receptive.
  - 4. Provide sign lettering and graphics in the sizes and configurations as shown on the drawings and details.

5. Lettering: All lettering shall be executed in such a manner that all edges and corners of the letter forms are correctly spaced, true, clean, precise and must accurately reproduce the letter form. Letters adhered to field with UV curing plastic bonding adhesives. Letter height must conform to ADA keeping to a minimum of 5/8" and a maximum of 2".
  6. Text: Bold, Refer to drawings.
  7. Braille: Refer to drawings.
  8. Inserts: Provide space for inserts as detailed. Provide white card inserts for initial installation; copy on inserts by Owner.
- B. Rooms with Fire Sprinkler Riser/Fire Alarm Control Panels
1. ¼ inch acrylic sign permanent sign.
  2. 1 inch high tactile white letters on red background.
    - a. Fire Sprinkler Riser Room.
    - b. Fire Alarm Control Panel.
    - c. Fire Alarm Control Equipment.
- C. Mounting: Signs are to be installed using mechanical fasteners. Signs on glass are to be installed using industrial strength double sided tape and clear silicone adhesive.
1. Provide 1/8" acrylic layer for glass backup on opposite side of glass as shown in drawings. If no acrylic back layer, glass backups shall be of .015" vinyl backups furnished with peel-off pressure sensitive adhesive.
  2. Mount exterior signs with four tamperproof countersunk screws into drilled inserts into masonry veneer.

## 2.3 DIMENSIONAL LETTERS & SYMBOLS

- A. Aluminum Composite Material – Two thin aluminum sheets with a polyethylene core; total thickness 6 mm. Prepare panel to be pin mounted.
- B. Flat cutout letters of 1/8 inch thickness aluminum.
- C. Lettering and Sizes: As indicated on drawings.
- D. Projected Spacer Mounting:
1. Set studs in adhesive cement.
  2. Insert minimum 3 inch precut spacers between letter and mounting surface.

## 2.4 FINISHES

- A. Wall Mounted Tactile Signage
1. Color: Refer to drawings for colors (location), where not indicated custom color to be selected by architect.
- B. Dimensional Letters & Symbols
1. Finish: Gold with protective coating.

## 2.5 ACCESSORIES

- A. Mounting hardware for tactile signage: Chrome screws.
- B. Tape adhesive: Double sided tape, permanent adhesive.
- C. Provide concealed anchors appropriate for type substrate, with spacer sleeve projection as shown for dimensional letters and symbols.

- D. Mounting hardware for dimensional letters and symbols: Pre-cut 3 inch spacers.
- E. Adhesive: Type recommended by dimensional letter manufacturer.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Verification of existing conditions before starting Work.

#### 3.2 PREPARATION

- A. All signs shall be inspected and approved by Contractor prior to installation to site.
- B. Architect's review does not constitute approval of deviations, if any, from the approved sample unless their acceptance is specifically noted.
- C. Signs which are reviewed by Architect and which do not comply with contract requirements, will require another review by Architect after necessary corrections or repairs have been made.

#### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install signs after surfaces are finished, in locations indicated.
- C. Install signage in locations with mounting types indicated on drawings in accord with approved shop drawings. Square, plumb, and level units as required.
- D. Install inserts at date of Substantial Completion complete with all proper copy in place.
- E. Dimensional Letter Signage: Locate dimensional letters with spacing based on full size computer generated installation drawings secured to structure as required to resist anticipated loads.
  - 1. Final Location: As approved in field by Architect based on full size drawings.

#### 3.4 TOLERANCES

- A. Sign panels to remain flat under installed conditions with 1/16 inch tolerance, plus or minus, from corner to corner.

#### 3.5 CLEANING

- A. Clean and polish, remove excess adhesive.

END OF SECTION 10 14 00

## SECTION 10 14 63 – ELECTRONIC MESSAGE SIGNAGE

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes
  - 1. Exterior LED Message Board mounted on base.
- B. Related Sections
  - 1. Section 05 50 00 - Metal Fabrications: Structural steel supports.
  - 2. Division 26: Electrical.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit product data indicating material characteristics, dimensions and specifics for proper installation and maintenance.
- C. Section 01 77 00 – Closeout Procedures: Operations and Maintenance Manual.

#### 1.3 COORDINATION

- A. Coordinate the work under provisions of Section 01 31 00.

#### 1.4 WARRANTY

- A. Provide manufacturer's standard warranty on all equipment under provisions of Section 01 77 00.

### PART 2 PRODUCTS

#### 2.1 MESSAGE BOARD

- A. Acceptable Manufacturers:
  - 1. Basis of Design: Daktronics, Inc.
  - 2. Nevco.
  - 3. Substitutions: See Section 01 25 00 Substitution Procedures.
- B. Exterior LED Message Board:
  - 1. Daktronics, Galaxy 3500 Series.
    - a. Two View.
    - b. Power: 120 VAC Single phase. 390 watts/face (max); 780 watts total (max).
    - c. Matrix Size: 32 x 112.
    - d. Single face cabinet dimensions: 2'-9"H x 7'-10"W x 6"D.
    - e. LED Color: Monochrome Red or Monochrome Amber (64-shade capability).
    - f. Character height: 5.5 inches.
    - g. Line spacing: 20 mm.
    - h. Communication: Wireless Radio.

2. Support Structure
  - a. Provide steel support poles to support the electronic message board at 10' from bottom of the display to finished grade below the sign. (15'-2" overall height)
  - b. Provide 2'-6" wide pole cover over the steel support poles. Pole cover to be painted to match identification panel (color to be selected by architect/owner).
  - c. Include building address in white vinyl lettering on the pole cover.
3. Signage Header – 2'-0" x 7'-8" above the exterior LED Message Board for school name, text, and/or logo, TBD by Architect.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that installation locations are ready to receive equipment and anchorages are adequate to support loads.
- B. Beginning of installation means that the installer accepts the existing conditions.

#### 3.2 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions, drawings, and approved shop drawings.
- B. Install anchor fasteners, test anchors to verify that they will support equipment securely without unwanted movement or deflection.

#### 3.3 TOLERANCES

- A. Installation: Plumb, level, and true. Maximum to 1/8 inch variation between top and bottom of sign.

#### 3.4 ADJUSTING

- A. Repair damaged signs and finishes to conceal evidence of corrective work, or replace with new, as directed by Architect.
- B. Make repairs and adjustments for fabrication not conforming to specified requirements as directed by Architect.

#### 3.5 CLEANING

- A. Leave premises clean, free from residue due to work of this Section.
- B. Clean sign face and exposed components using water, soft cloth, mild detergent to prevent scratching and damage to finish.

#### 3.6 DEMONSTRATION

- A. Provide demonstration to Owner personnel as to the proper use and operation of electronic message signage.



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### 3.7 PROTECTION

- A. Protect signs from damage during Work of this Contract, prior to Owner occupancy.

END OF SECTION 10 14 63



## SECTION 10 21 13 – TOILET COMPARTMENTS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Plastic Toilet Compartments – High Density Polyethylene (HDPE); floor mounted, head rail braced and hardware.
- B. Related Sections:
  - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood blocking and curbing, in wall blocking for partition panel support.
  - 2. Section 09 22 16 - Non-Structural Metal Framing: Supports that attach ceiling-hung and floor-and-ceiling anchored units to the overhead structural system.
  - 3. Section 10 28 00 - Toilet, Bath and Custodial Room Accessories: Toilet tissue dispensers, grab bars, and similar accessories.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM A666 - Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

#### 1.3 SUBMITTALS

- A. Submit shop drawings, product data and manufacturer's installation instructions under provisions of Section 01 33 00 - Submittal Procedures.
- B. Indicate on shop drawings, partition plan and elevation views, dimensions, details of wall and floor supports, and door swings.
- C. Provide product data on panel construction, hardware, and accessories.
- D. Submit two samples 2 x 2 inch in size, illustrating panel finish, color and sheen.
- E. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 QUALITY ASSURANCE

- A. Single Source: Provide compartments and screens manufactured by nationally recognized manufacturer of compartments and screens of the types specified; only one manufacturer shall be used in the work.
- B. Handicapped Requirements: Comply with all national and local regulations regarding access by handicapped persons.
- C. Surface Burning Characteristics: Comply with Class B, ASTM E84 or NFPA 286.

#### 1.5 DELIVERY STORAGE AND HANDLING

- A. Do not deliver toilet compartment to site until building is enclosed and HVAC systems are in operation.
  - 1. Deliver toilet compartments in manufacturer's original packaging.
  - 2. Store in upright condition.

## 1.6 WARRANTY

- A. Special Warranty: 15 year limited warranty for panels, doors, and stiles against corrosion, warpage, breakage, delamination, and defects in factory workmanship.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Accurate Partitions. (<http://www.accuratepartitions.com/>)
- B. Ampco. (<http://www.ampco.com>)
- C. Bradley, Bradmar Solid Plastic. [www.bradleycorp.com](http://www.bradleycorp.com)
- D. Scranton Products, Hiny Hiders. [www.scrantonproducts.com](http://www.scrantonproducts.com) Substitutions: Under provisions of Section 01 25 00.
- E. Toilet Compartments: Water resistant and nonabsorbent HDPE polymer with heat sink attached as standard to bottom of all doors and panels. ASTM E84, Class B or pass NFPA 286.
  - 1. Product Description: Floor mounted overhead braced.
  - 2. Color: Folkstone Gray, 9400; Pebble Grained.
- F. Door and Panel Dimensions:
  - 1. Thickness: 1 inch.
  - 2. Door Width: 24 inch
  - 3. Accessible Door Width: 36 inch, out-swinging.
  - 4. Height: Top at 67 inches above finished floor.
  - 5. Bottom at 12 inches above finished floor.
  - 6. Thickness of Pilasters: 1 inch.

### 2.2 ACCESSORIES

- A. Pilaster Shoe: Formed, ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Hollow anodized aluminum tube, 1 x 1-5/8 inch size, with anti-grip profiles and cast socket wall brackets.
- C. Brackets: Full height, anodized aluminum, color as selected.
- D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
  - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- E. Hardware: Heavy duty polished stainless steel.
  - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
  - 2. Nylon bearings.

3. Thumb turn door latch with exterior emergency access feature.
4. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
5. Coat hook with rubber bumper; one per compartment, mounted on door panel.
6. Provide door pull for outswinging doors.

## 2.3 FABRICATION

- A. Mount hardware with tamper-resistant fasteners.
- B. Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and opening dimensions are as indicated and instructed by the manufacturer.
- B. Verify correct spacing of plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing, where required.
- D. Beginning of installation means acceptance of existing substrate.

### 3.2 INSTALLATION

- A. Install partitions secure, plumb, and level in accordance with manufacturers' instructions.
- B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Locate wall brackets so holes for wall anchorages occur in tile joints.
- E. Attach panels and pilasters to bracket with through sleeve tamperproof bolts and nuts. Locate headrail joints at pilaster center lines.
- F. Hang doors and adjust so tops of doors are level with tops of stiles when doors are in closed position.
- G. Conceal floor fastenings with pilaster shoes.
- H. Mount coat hook not more than 54 inches above floor.
- I. Install door strike and keeper with door bumper on each pilaster in alignment with door latch.
- J. Adjust hinges to locate in-swing doors in partial open position when unlatched. Returns outswing doors to closed position.

### 3.3 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16".

### 3.4 CLEANING

- A. Remove protective maskings. Clean surfaces.
- B. Field touch-up of scratches or damaged enamel finish will not be permitted.
- C. Replace damaged or scratched materials with new materials.

END OF SECTION 10 21 13

## SECTION 10 21 23 – CUBICLE CURTAINS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Overhead metal curtain track and guides.
  - 2. Curtains.
- B. Related Sections:
  - 1. Section 05 50 00 - Metal Fabrications: Above ceiling supports for track.
  - 2. Section 09 51 13 - Acoustical Tile Ceilings: Suspended ceiling system to support track.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association:
  - 1. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

#### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.
- C. Product Data: Provide data for curtain fabric characteristics.
- D. Samples:
  - 1. Submit two fabric samples, 12 x 12 inch in size illustrating fabric color.
  - 2. Submit 12 x 12 inch sample patch of curtain cloth with representative hem stitch detail, heading with reinforcement, and carrier attachment to curtain header.
  - 3. Submit 12 inch sample length of curtain track including typical splice and wall and ceiling hanger and escutcheon.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- F. Section 01 77 00 - Closeout Procedures.
- G. Manual for Materials and Finishes: Include stain removal methods.

#### 1.4 QUALITY ASSURANCE

- A. Conform to applicable IBC code and NFPA 701 for flame/smoke rating requirements in accordance with ASTM E84 for curtain fabric.
- B. Mockup:
  - 1. Provide mockup of curtain, track and accessories under provisions of Section 01 40 00.
  - 2. Provide one mockup, 12 feet long by 11 feet wide, with curtain track, curtain, cords and accessories.
  - 3. Locate where directed.
  - 4. Mockup may remain as part of the Work.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Accept curtain materials on site and inspect for damage.
- C. Store curtain materials on site and deliver to the Owner for installation when requested.

#### 1.6 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings and instructed by the manufacturer.

#### 1.7 MAINTENANCE

- A. Submit under provisions of Section 01 77 00 - Closeout Procedures.
- B. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.
- C. Extra Materials:
  - 1. Provide two of each curtain size.
  - 2. Provide ten extra carriers.

### PART 2 PRODUCTS

#### 2.1 SYSTEM DESCRIPTION

- A. Track: Surface mounted.
- B. Performance Requirements:
  - 1. Track: Support vertical test load of 50 lbs without visible deflection of track or damage to supports.
  - 2. Track Size: Safely support moving loads.
  - 3. Track and Mounting: Sufficiently rigid to resist visible deflection and without permanent set.



## 2.2 MANUFACTURERS

- A. C/S, Construction Specialties. ([www.c-sgroup.com](http://www.c-sgroup.com))
- B. InPro Corporation. ([www.inprocorp.com](http://www.inprocorp.com))
- C. Pryor Products, Oceanside CA. ([www.pryorproducts.com](http://www.pryorproducts.com))
- D. Substitutions: Under provisions of Section 01 25 00.

## 2.3 TRACK MATERIALS

- A. Track: Extruded aluminum sections; one piece per cubicle track run; channel profile.
- B. Track End Stop: To fit track section.
- C. Curtain Carriers: Nylon roller to accurately fit track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal.
- D. Wand: Fiberglass, attached to lead carrier, for pull-to-close action.

## 2.4 CURTAIN MATERIALS

- A. Acceptable Manufacturers:
  - 1. Knoll Textiles.
    - a. Website: <http://www.knoll.com/>.
  - 2. Substitutions: Under provisions of Section 01 25 00.
- B. Description:
  - 1. Color: Refer to Color and Finish Schedule. (CC-1)
  - 2. Width: 72 inch.
  - 3. Weight: 14.5 oz.
  - 4. Cutting Direction: NR- Non-railroaded.
  - 5. Average Bolt/Yard: 60.
  - 6. Finish: Flame Retardant.
  - 7. Testing:
    - a. Seam Slippage Weft: 56.
    - b. Seam Slippage Warp: 39.
    - c. NFPA 701 2010 TM1, as stocked: Pass.
    - d. Lightfastness 60 hrs: 4.5.
    - e. Colorfastness Wet: 5.
    - f. Colorfastness Dry: 5.
    - g. Greenguard Certification: Pass.
- C. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, same color as curtain.

## 2.5 FINISHING

- A. Exposed Surfaces: White enamel finish.

## 2.6 FABRICATION

- A. Manufacture curtains of one piece, sized 10 percent wider than track length. Terminate curtain 15 inches from floor.
- B. Curtain Heading: Double thickness 2 inches wide, with metal grommet holes for carriers 6 inches on center, double fold bottom hem 2 inches wide. Lock stitch seams in two rows. Turn seam edges and lock stitch.
- C. Fabricate track bend with minimum 12 inch radius, without deforming track section, or impeding movement of carriers.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces and above ceiling supports are ready to receive work.

### 3.2 INSTALLATION

- A. Install curtain track secure and rigid, true to ceiling line.
- B. Install end cap and stop device.
- C. Secure track to ceiling system.
- D. Install curtains on carriers ensuring smooth operation.

### 3.3 SCHEDULE

- A. Provide in room Nurse 1012.

END OF SECTION 10 21 23

## SECTION 10 26 00 – WALL PROTECTION

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Corner guards.
- B. Related Sections:
  - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Support blocking for corner guard anchors.
  - 2. Section 09 22 16 - Non-Structural Metal Framing: Supplementary framing, blocking, and bracing needed to attach and support impact-resistant wall protection products.

#### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit physical dimensions, features, mounted measurements, and anchorage details.
- C. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with ADA requirements.

#### 1.4 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.5 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Coordinate Work with wall or partition sections for installation of concealed blocking or anchor devices.

### PART 2 PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Corner Guards: Resist lateral impact force of 100 lbs at any point without damage or permanent set.

## 2.2 CORNER GUARDS

- A. Manufacturers:
  - 1. Babcock-Davis.
  - 2. Construction Specialties Inc. (C/S)
  - 3. InPro Corporation.
  - 4. Substitutions: Under provisions of Section 01 25 00.

## 2.3 COMPONENTS

- A. Corner Guards - Surface Mounted:
  - 1. Material: type 304 Stainless Steel.
  - 2. Length:
    - a. To match top height of adjacent finish (full height).
    - b. Where no wall finish, provide 4'-0" length.
  - 3. Width: 2 x 2 inch.
  - 4. Finish: Satin.
- B. Mounting: Manufacturer's standard screw attachment.

## 2.4 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify rough-in for components are correctly sized and located.

### 3.2 INSTALLATION

- A. Position bottom of corner guard at top of wall base.

### 3.3 SCHEDULES

- A. Refer to floor plans for locations.

END OF SECTION 10 26 00

## SECTION 10 28 00 – TOILET, BATH AND CUSTODIAL ACCESSORIES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Toilet accessories.
  - 2. Shower and tub accessories.
  - 3. Custodial accessories.
  - 4. Standard framed mirrors.
  
- B. Related Sections:
  - 1. Section 09 22 16 - Non-Structural Metal Framing: Placement of backing plate reinforcement for wall hung accessories.
  - 2. Section 09 30 00 - Tiling.
  - 3. Section 10 21 13 - Toilet Compartments.
  - 4. Section 10 26 00 - Wall Protection: Corner guards.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - 2. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 3. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
  
- B. Product Data: Submit data on accessories describing size, finish, details of function, attachment methods.
  
- C. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
  
- B. Coordinate the Work with placement of internal wall reinforcement to receive anchor attachments.

## PART 2 PRODUCTS

### 2.1 TOILET AND BATH ACCESSORIES

- A. Acceptable Manufacturers:
1. Basis of Design: Bobrick Washroom Accessories. <http://www.bobrick.com/Bobrick/> .
  2. American Specialties, Inc. <http://www.americanspecialties.com/> .
  3. Bradley Corp. <http://www.bradleycorp.com/> .
  4. Georgia Pacific. <http://www.gp.com/index.html>.
  5. Tubular Specialties Manufacturing (TSM). <http://www.tubularspecialties.com/contact.htm>.
  6. Substitutions: Section 01 25 00.

### 2.2 COMPONENTS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
1. Grind welded joints smooth.
  2. Fabricate units made of seamless metal sheets, with flat surfaces.
- B. Keys: Furnish keys for each lockable accessory to Owner.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269, stainless steel.
- E. Galvanized Sheet Steel: ASTM A653, G90 zinc coating.
- F. Framed Mirror Glass: Framed mirror manufacturer's standard.
- G. Adhesive: Contact type, waterproof.
- H. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof.
- I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

### 2.3 TOILET ROOM ACCESSORIES

- A. Toilet Paper Dispenser: Double roll, surface mounted vandal-resistant, bright-polished chrome-plated steel, self- locking mechanism.
1. Product: B265 manufactured by Bobrick.
- B. Paper Towel Dispenser: OFCI. (Hanson Chemical, 86801HC OptiServ Mechanical Hands Free Black.)
- C. Wall Mounted Soap Dispenser: OFCI. (Clario Dispenser by Betco.)
- D. Hand Sanitizer: OFCI. (Clario Dispenser by Betco.)

## TOILET, BATH AND CUSTODIAL ACCESSORIES

- E. Recessed Waste Receptacle: Stainless steel, seamless beveled flange. Removable 12—gallon receptacle locks into cabinet.
  - 1. Product: B-3644 manufactured by Bobrick.
  
- F. Framed Mirrors: Stainless steel framed, 6 mm thick tempered glass, abrasion-resistant coated mirror.
  - 1. Size: As indicated on Interior Elevation Drawings.
  - 2. Frame: 18-8 S, type 304,  $\frac{3}{4}$ " X  $\frac{3}{4}$ " inch angle, with mitered and welded and ground corners and tamperproof hanging system and vertical grain satin finish.
  - 3. Backing: Full-mirror sized, galvanized steel sheet.
  - 4. Product: Bobrick B-290 Series.
  
- G. Seat Cover Dispenser: Stainless steel, recessed, reloading by hinged access door, tumbler lock.
  - 1. Minimum capacity: 500 seat covers.
  - 2. Product: B301 manufactured by Bobrick.
  
- H. Grab Bars (GB): Stainless steel, 1-1/2 inches outside diameter, minimum 18 ga. wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
  - 1. Length and configuration: As indicated on Drawings.
  - 2. Product: B-6806 manufactured by Bobrick.
  
- I. Combination Sanitary Napkin/Tampon Dispenser: Stainless steel, recessed.
  - 1. Door: Seamless door with returned edges and tumbler lock.
  - 2. Cabinet: Fully welded, thick sheet.
  - 3. Operation: 25 cent coin required to operate dispenser. Provide locked coin box, separately keyed.
  - 4. Identify dispensers without using brand names.
  - 5. Minimum capacity: 20 napkins and 30 tampons.
  - 6. Product: B37063 50 ADA manufactured by Bobrick.
  
- J. Sanitary Napkin Disposal Unit: Stainless steel, recessed or back-to-back partition mounting with adjustable flanges, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
  - 1. Product:
    - a. B-354 manufactured by Bobrick (Toilet Partition Model).
    - b. B-35303 manufactured by Bobrick (Wall Recessed).
  
- K. Coat Hook: Heavy-duty stainless steel, surface mounted hat and coat hook with concealed mounting bracket and wall plate, satin nickel plate finish.
  - 1. Product: B-6827 manufactured by Bobrick.
  - 2. Mount on door of Staff Toilet rooms.
  - 3. Locate as directed by Architect at all offices and staff rooms, one per room.
  
- L. Baby Changing Station (BCS)
  - 1. Manufacturer: Koala Corporation, Model KB110-SSWM. Components:
    - a. Materials: 18 ga. stainless steel, Type 304, reinforced with steel-on-steel hinges and 11-gauge steel mounting supports; pneumatic cylinder mechanism designed to lift door from open position and brake to prevent the trapping of hands or fingers. High-density polyethelene molded concave changing platform.

2. Horizontal Surface Mounted Design:
  - a. Provide unit engineered to withstand loads of up to 300 pounds. Provide door that lowers to form concave changing platform, equipped with safety straps and snap-lock fasteners.
  - b. Provide integrated dispenser for 25 3-ply chemical-free, biodegradable sanitary bed liners.
  - c. Provide permanently engraved into plastic, graphic instructions and safety messages in English and five other languages.
    - 1) Provide factory-installed Best locks and two keys that are keyed alike to Bobrick Washroom accessories for each cavity liner dispenser.
3. Dimensions:
  - a. Height: 20 inches (outside of flange to outside of flange).
  - b. Width: 35 ¼ inches (outside of flange to outside of flange).
4. Depth: Closed 4 inches; Extension: 15 3/16 inches from face of wall when fully opened.

#### 2.4 SHOWER AND TUB ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1-1/4 inch outside diameter, 18 ga. inch wall thickness, satin-finished, with 2 9/16 inch square, minimum 20 ga. thick satin-finished stainless steel flanges, for concealed mounting.
  1. Product: Bobrick B-6047.
- B. Shower Curtain: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flame resistant and stain-resistant fabric.
  1. Size: 42 x 72 inches, hemmed edges.
  2. Grommets: Corrosion-resistant metal; pierced through top hem on 6 inch centers.
  3. Color: White.
  4. Product: Bobrick 204-2.
  5. Shower curtain hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
    - a. Bobrick 204-1.
- C. Reversible Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, hinges and mechanical fasteners of Type 304 stainless steel, L-shaped, seat, reversible.
  1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of color as selected.
  2. Product: Bobrick B-5181.
- D. Robe Hook: Heavy-duty stainless steel, single-prong circular bracket and backplate for concealed attachment, satin nickel plate finish.
  1. Product: Bobrick B-2116.

#### 2.5 CUSTODIAL ACCESSORIES

- A. Utility shelf with Mop and Broom Holder and rag hooks: Type 304, with satin finish.
  1. Shelf: 18 ga; 1 ½" return edge; 8" deep; 36" long.
  2. Drying rod: Stainless steel; 1/4" diameter.
  3. Mounting brackets: 18 ga; welded to shelf.
  4. Holders: 4 spring-loaded rubber cam holders.
  5. Hooks: 3 stainless steel; 16 ga.
  6. Length: 24 inches.
  7. Product: B-224 x 36 manufactured by Bobrick.



## 2.6 FACTORY FINISHING

- A. Per specified product manufacturer's standards.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify exact location of accessories for installation.
- C. Verify field measurements are as indicated on Drawings.
- D. Refer to Section 06 10 53 - Miscellaneous Rough Carpentry, for installation of fire-treated wood blocking or 6" by 20 gage metal strapping in walls.

### 3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

### 3.3 INSTALLATION

- A. Install plumb and level, securely and rigidly anchored to substrate.
- B. Mounting Heights and Locations: As indicated on Drawings and/or required by ADA.

END OF SECTION 10 28 00



## SECTION 10 44 00 – FIRE PROTECTION SPECIALTIES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Portable fire extinguishers.
  - 2. Fire extinguisher cabinets.
  - 3. Brackets for wall mounting.
  
- B. Related Sections:
  - 1. Section 06 10 53 – Miscellaneous Rough Carpentry: Wood blocking for wall-mounted mounting brackets and cabinets.
  - 2. Section 07 84 00 - Firestopping: Firestopping sealants at fire-rated cabinets.
  - 3. Section 09 21 16 - Gypsum Board Assemblies: rough opening framing.
  - 4. Section 10 14 00 - Signage: Directional signage to out-of-sight fire extinguishers and cabinets.

#### 1.2 REFERENCES

- A. National Fire Protection Association:
  - 1. NFPA 10 - Standard for Portable Fire Extinguishers.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements.
- B. Product Data: Submit extinguisher operational features, color and finish, and anchorage details.
- C. Manufacturer's Installation Instructions: Submit special criteria and wall opening coordination requirements.
- D. Section 01 77 00 - Closeout Procedures.
- E. Maintenance and Operating Manuals: Submit test, refill or recharge schedules and re-certification requirements.

#### 1.4 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not install extinguishers when ambient temperature is capable of freezing extinguisher components.

## PART 2 PRODUCTS

### 2.1 DESIGN REQUIREMENTS

- A. Conform to NFPA 10.
- B. Provide portable fire extinguishers and cabinets classified and labeled by Underwriters Laboratories Inc. for purpose specified and indicated.

### 2.2 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Larsen's Manufacturing Co.
- B. JL Industries.
- C. Potter Roemer.
- D. Substitutions: Section 01 25 00.

### 2.3 EXTINGUISHERS (FE)

- A. Dry Chemical Type: Red steel tank, Model MP-10 manufactured by Larsen's Manufacturing Co., with pressure gage. UL approved multipurpose type, 10 lb. capacity, UL rating 4A80BC.
- B. Wet Chemical Type: Silver tank, Model WC-6L, manufactured by Larsen's Manufacturing Co., with pressure gage. Meets 6L K class listing. UL approved.
  - 1. Locate as directed by Architect 30' maximum from cooking lines.

### 2.4 CABINETS (FEC)

- A. Cabinet: 304 Stainless steel, fire rated with same hourly rating as wall, semi-recessed, Larsen's Model FS SS 2409-6R Full .060 with letters door style and latch.
- B. Trim Type: Returned to wall surface, with 2½ inch projection.
- C. Door: 304 Stainless steel, reinforced for flatness and rigidity; latch with glass access.
- D. Door Glazing: Glass, clear, 1/8 inch thick float glass.
- E. Cabinet Mounting Hardware: Appropriate to cabinet.
- F. Fire Rating Construction: Double wall cabinet construction with 5/8" interstitial space filled with fire barrier material. Size depth of cabinet to match wall construction.
- G. Pre-drill for anchors.
- H. Hinge doors for 180 degree opening with continuous piano hinge.
- I. Glaze doors with resilient channel gasket glazing.

## 2.5 ACCESSORIES

- A. Extinguisher Brackets: Standard brackets by Larsen's Manufacturing Co.; size for specified extinguisher. Use brackets to hang extinguishers at specified locations. Provide manufacturer's standard designed wall bracket to prevent accidental dislodgement of extinguisher of sizes required for type and capacity of extinguisher required; furnish in manufacturer's standard plated finish.
- B. Graphic Identification: Die cut lettering, vertical, white.
  - 1. Wording: "Fire Extinguisher" on each cabinet door.

## 2.6 FINISH

- A. Cabinet Exterior Trim and Door: Stainless steel with #4 finish.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify rough openings for cabinet are correctly sized and located.

### 3.2 INSTALLATION

- A. Install cabinets plumb and level in wall openings, maximum 48 inches from finished floor to top of extinguisher handle.
- B. Install wall brackets, maximum 48 inches from finished floor to top of extinguisher handle.
- C. Secure rigidly in place.
- D. Place extinguishers in cabinets.

END OF SECTION 10 44 00



## SECTION 10 51 13 – METAL LOCKERS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Athletic fully framed all-welded locker units with hinged doors.
  - 2. Fully framed all welded corridor lockers.
  - 3. Locker benches.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-In-Place Concrete: Concrete base construction.
  - 2. Section 06 10 53 - Miscellaneous Rough Carpentry: In-wall blocking.

#### 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

#### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Procedures for submittals.
- B. Product Data: Provide data on locker types, sizes and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan and details; and benches layout and details.
- D. Samples: Two samples illustrating each locker finish.
- E. Manufacturer's Installation Instructions: Indicate component installation assembly.
- F. Closeout Submittals
  - 1. Section 01 77 00 - Closeout Procedures.
  - 2. Manual for Materials and Finishes: Submit information on adjusting, repairing, and replacing locker doors and latching mechanisms.

#### 1.4 QUALITY ASSURANCE

- A. Provide each type of metal locker as produced by a single manufacturer, including necessary mounting accessories, fittings, and fastenings.
- B. Installer: Company and employees specializing in work of this Section with minimum 5 years documented experience installing commercial quality work.

## 1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01 60 00 - Product Requirements: Transport, handle, store, and protect products.
- B. Protect locker finish and adjacent surfaces from damage.

## 1.6 WARRANTY

- A. Manufacturer: Warrant locker for lifetime of original purchaser against defects in material and workmanship, excluding finish.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Republic Lockers, <http://republicstorage.com/>.
- B. Substitutions: Under provisions of Section 01 25 00.

### 2.2 MATERIALS

- A. Sheet Steel: Mild cold-rolled and leveled furniture steel, free from buckle, scale, and surface imperfections. ASTM A1008.
- B. Fasteners: Cadmium, zinc, or nickel plated steel; exposed bolt heads, slotless type; self-locking nuts or lock washers for nuts on moving parts.
- C. Equipment: Hooks of cadmium-plated or zinc-plated steel.

### 2.3 COMPONENTS – ATHLETIC LOCKERS

- A. Heavy Duty Ventilated Lockers, Republic Storage Systems: Welded construction, galvanized steel.
  - 1. Door Frames: 16 gage formed into 1 inch wide face channel shapes with a continuous vertical door strike, integral with the frame on both sides of the door opening. Cross frame members of 16 gage channel shapes, including intermediate cross frame on double, triple or four tier lockers welded to vertical framing members.
  - 2. Doors: 14 gage with full channel shape on lock side of adequate depth to fully conceal lock bar, channel formation on the hinge side and right angle formations across the top and bottom. Diamond shaped perforation  $\frac{3}{4}$  inch wide by  $1\frac{1}{2}$  inch high.
  - 3. Pre-Locking Device: Positive automatic pre-locking device.
  - 4. Latching: One piece, pre lubricated spring steel latch completely contained within the lock bar under tension.
  - 5. Handles: Non-protruding 14 gage lifting trigger and slide plate. Exposed portion of lifting trigger encased in molded ABS thermoplastic cover and contained in a formed 20 gage stainless steel pocket.
  - 6. Built-in combination lock for each locker. Provide 5% ADA locks.
  - 7. Handles: Hinges: 2 inch high, 5 knuckle, full loop, tight pin style, securely welded to frame and double riveted to inside of door flanges. Attach hinges with two rivets.
  - 8. Body: 16 gage side uprights perforated with diamond shaped opening. Locker backs 18 gage with right angle flanges on each vertical side. Tops, bottoms, shelves and compartment dividers 16 gage, fully flanged on all sides.



## 2.4 COMPONENTS – CORRIDOR LOCKERS

- A. Republic Storage Lockers: Single Point II.
  - 1. Door Frames: 16 gage formed into 1 inch wide face channel shapes with a continuous vertical door strike integral with the frame on both sides of door opening.
  - 2. Doors: 14 gage outer door with double return flanges on both vertical edges and a single return flange on top and bottom edges.
  - 3. Latching: 11 gage frame hook with padlock hasp.
  - 4. Handles: One piece, deep drawn stainless steel cup securely riveted to door.
  - 5. Built-in combination lock for each locker. Provide 5% ADA locks.
  - 6. Hinges: 2 inch high, 5 knuckle, full loop, tight pin style securely welded to frame and double riveted to inside of door flange.
  - 7. Body: 24 gage upright sheets, backs, tops, bottoms and shelves. Tops, bottoms and shelves flanged on all four sides, backs flanged on two sides. Uprights offset at front and flanged at rear to provide a double lapped rear corner.

## 2.5 ACCESSORIES - ATHLETIC LOCKERS

- A. Provide minimum 18 gage continuous sloped tops at all lockers except 3 tier lockers in Gym Locker rooms or as shown on drawings.
- B. Hooks:
  - 1. One double prong ceiling hook and 2 single prong wall hooks, each compartment except at the following:
    - a. One double hook only for triple tier.
    - b. No hooks for openings 18 inch high and under.
- C. Plywood: APA Grade Stamp each panel. Conform to DOC PS 1 and DOC PS 2 for cross-laminated veneer panel
- D. Pressure treated wood framing: AWPA Treatment U1 using water borne preservative with 0.25percent retainage.
- E. Benches: 1 1/4" x 9" wide (typ) and 20" wide where shown on drawings ; bench top of laminated maple, corners radiused 1" and edges radiused 3/8", sanded smooth, sealed and varnished with two coats; heavy duty cast iron pedestal; support brackets as shown, fabricated in accordance with Section 05 50 00.

## 2.6 ACCESSORIES - CORRIDOR LOCKERS

- A. Provide minimum 18 gage continuous sloped tops.
- B. One double prong ceiling hook and 2 single prong wall hooks.

## 2.7 FABRICATION - ATHLETIC LOCKERS

- A. Construction: Lockers shall be welded at seams and joints, with all exposed welds sanded smooth. No bolts, screws, or rivets shall be used in the assembly of main locker unit. Make exposed metal edges safe to touch.
- B. Doors, General: When doors occur at ends of locker banks, position hinge so that door cannot swing beyond 180 degrees, around the corner of the locker body. If necessary reverse prevailing swing pattern of doors. Finish edges smooth.

- C. Locker Units:
  - 1. Type A: Six tier, 12 inch wide x 12 inch deep x 72 inch overall height. Sloped tops.
  - 2. Type B: Three tier, 12 inch wide x 12 inch deep x 40 inch overall height.
  - 3. Type D: Three tier, 18 inch wide x 18 inch deep x 40 inch overall height.
  - 4. Type E: Three tier, 18 inch wide x 18 inch deep x 32 inch overall height.

- D. Bodies: Formed welded to angle frame.
- E. Provide bright tread aluminum diamond plate, 1/8 inch thick at flat tops.
- F. Provide end panels, filler panels, and recess trim to close off all openings.
- G. Provide ventilation openings at top and bottom of each locker door.

## 2.8 FABRICATION - CORRIDOR LOCKERS

- A. Locker Units:
  - 1. Type C: Single tier, 12 inch wide x 12 inch deep by 72 inch overall height. Sloped tops.
- B. Provide end panels, filler panels, and recess trim to close off all openings.
- C. Finish edges smooth without burrs.
- D. Provide number plates.

## 2.9 FINISHES

- A. Clean, degrease, and neutralize metal; prime or galvanize and finish with baked polyester powder coat.
- B. Color: Provide locker units in color as selected by architect from manufacturer's standard line.
  - 1. Athletic:
    - a. Type A: Republic, #62 Shadow Grey.
    - b. Type B: Republic, #66 Green.
    - c. Type D: Republic, #53 Sun Yellow.
    - d. Type E: Republic, #53 Sun Yellow.
  - 2. Corridor:
    - a. Type C-1: Republic, #50 Grey.
    - b. Type C-2: Republic, #53 Sun Yellow.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that bases are in correct position and configuration.
- B. Verify bases and embedded anchors are properly sized.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install lockers plumb and square.

- C. Place and secure on prepared base.
- D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.
- E. Bolt adjoining locker units together to provide rigid installation.
- F. Install end panels, filler panels and recess trim.
- G. Test all combination locks to meet requirements.
- H. Replace components that do not operate smoothly.

### 3.3 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Cleaning installed work.
- B. Clean locker interiors and exterior surfaces.

END OF SECTION 10 51 13



## SECTION 10 67 20 – METAL STORAGE SHELVING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Metal storage shelving units, adjustable type, open configuration.
  - 2. Accessories: As indicated and as required for complete assembly.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate shelving plan layout, and configuration. Include schedule for distribution.
- C. Product Data: Provide data on types, sizes and accessories.
- D. Manufacturer's Installation Instructions: Indicate component installation.
- E. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00 - Product Requirements.
- B. Protect shelving finish from damage.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Western Pacific Storage Systems.
- B. Lyon Metal Products Inc.
- C. Penco Products.
- D. Republic Storage Systems.
- E. Substitutions: Under provisions of Section 01 25 00.

#### 2.2 SYSTEM DESCRIPTION

- A. Shelving Units:
  - 1. Width: 36 inches
  - 2. Depth: 12, 18, and 24 inches as shown on drawings.
  - 3. Height: 84 inches
  - 4. Mounting: Free standing, anchored to floor and wall.
  - 5. Base: Metal base

- B. Seismic Forces: Conform to IBC Chapter 16. Design shelving with seismic braces; anchors, and stiffeners as applicable for Seismic Category B. Include ICC approved anchors.

## 2.3 MATERIALS

- A. Sheet Steel: ASTM A446 Grade B, stretcher leveled; to the following minimum thicknesses:
  - 1. Shelving: 20 gage frame with 5/8" particle board decking.
  - 2. Shelf Clips: 12 gage.

## 2.4 FABRICATION

- A. Fabricate shelving units to clip together to form an adjustable rigid assembly.
- B. Posts: Offset steel angles, punched at 1½ inches o.c. to receive shelf clips and capable of supporting total specified shelf loading without deflection.
- C. Shelves: Formed and flanged welded corners, 800 lbs. capacity. Designed to be freestanding without sway bracing.
- D. Anchors and Fasteners: As required for a complete and assembled unit; enameled or chrome finish:
  - 1. Wall ties.
  - 2. Tie plates between units.
  - 3. Aisle ties (at peninsular units).
- E. Finish edges smooth without burrs.

## 2.5 FINISHES

- A. Clean, degrease, and neutralize metal; prime and finish with manufacturer's standard baked enamel.
- B. Color: Color as selected from manufacturer's standard range.

# PART 3 EXECUTION

## 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install shelving plumb and square.
- C. Bolt adjoining shelving units together to provide rigid installation.
- D. Install seismic foot plate & anchor to floor. Install wall ties for anchoring to wall.
- E. Install accessories.

### 3.2 CLEANING

- A. Clean work under provisions of 01 70 00 - Execution.
- B. Clean shelving surfaces.

### 3.3 SCHEDULES

- A. Kiln: 18 inch deep x 84 inch high, refer to plans for width.
- B. Custodial: 18 inch deep x 84 inch high, refer to plans for width.
- C. Storage Rooms: 18 inch deep x 84 inch high, refer to plans for width.

END OF SECTION 10 67 20





## SECTION 10 75 00 - FLAGPOLES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes flagpole, mounting and accessories.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-In-Place Concrete: Concrete footings for flagpoles.
  - 2. Section 07 92 00 - Joint Sealants: Elastomeric sealant filling the top of foundation tube.

#### 1.2 REFERENCES

- A. American Society for Testing and Materials:
  - 1. ASTM B241 - Standard Specification for Aluminum and Aluminum Alloy Seamless Pipe and Seamless Extruded Tube.
  - 2. ASTM C 150 - Standard Specification for Portland Cement.
- B. National Association of Architectural Metal Manufacturers:
  - 1. Metal Finishes Manual.

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of flagpole required.
- B. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturing Standards: Provide flagpole as a complete unit produced by a single manufacturer, including fittings accessories, bases, and anchorage devices.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Spiral wrap flagpoles with heavy Kraft paper or other protective wrapping and prepare for shipment in hard fiber tube or other protective container.
- B. Deliver flagpoles and accessories completely identified for installation procedure. Handle and store flagpoles to prevent damage or soiling.

### PART 2 PRODUCTS

#### 2.1 DESIGN REQUIREMENTS

- A. Design Criteria: Provide flagpoles and installations constructed to withstand a 90 mph wind velocity minimum when flying flag of appropriate size. Use heavy pipe sizes if required for flagpole type and height shown.

- B. Pole Construction: Construct pole and ship to site in one piece if possible. If more than one piece is necessary, provide snug-fitting, precision joints with self-aligning, internal splicing sleeve arrangement for weather-tight, hairline field joints.

## 2.2 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following.
  1. Morgan-Francis Co.
  2. Acme/Lingo Flagpoles, LLC
  3. American Flagpole
  4. Baartol Co. Inc.
  5. Concord Industries, Inc.
  6. Eder Flag Manufacturing Co.
  7. Pole-Tech Company, Inc.

## 2.3 FLAGPOLE TYPE

- A. Aluminum Flagpole: Fabricate aluminum flagpoles from seamless extruded tubing complying with ASTM B 241, alloy 6063-T6, having a minimum wall thickness of 3/16", tensile strength not less than 35,000 psi and a yield point of 30,000 psi. Heat-treat and age-harden flagpole after fabrication.
  1. Provide cone tapered aluminum flagpole, 30' height above ground.
  2. Ability to fly 3 flags.

## 2.4 FLAGPOLE MOUNTING

- A. Provide manufacturer's standard base system for the type of flagpole installation required.
- B. Foundation Tube: For ground-set flagpoles, provide 16 gage minimum galvanized corrugated steel tube, or 12 gage rolled steel tube, sized to suit flagpole and installation. Furnish complete with welded steel bottom base and support plate, lighting ground spike, and steel centering wedges, all welded construction. Provide loose hardwood wedges at top for plumbing pole after erection. Galvanize steel parts after assembly, including foundation tube.
  1. Provide manufacturer's standard flash collar, finished to match flagpole.

## 2.5 SHAFT FINISH

- A. Aluminum: Fine, directional, mechanical satin polish (NAAMM-32), finished as follows:
  1. Natural clear anodized finish complying with NAAMM-C22A41, Class I (0.7 mil).

## 2.6 FITTINGS

- A. Finial Ball: Manufacturer's standard flush seam ball, size to match pole butt diameter.
  1. 14 ga. spun aluminum, finished to match pole shaft.
- B. Internal Halyard System: Furnish poles with internal halyard system consisting of a manually operated, geared winch with control stop device and removable handle. Provide stainless steel braided aircraft-type cable and concealed revolving truck assembly with plastic coated counter balance and sling. Provide reinforced, flush access door, secured with cylinder lock.
- C. Flag:
  1. Provide 5' x 8' sewn fabric US flag.
  2. Provide 4' x 6' sewn fabric POW/MIA flag.
  3. Provide 4' x 6' sewn fabric Montana state flag.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Excavation: Excavate for foundation concrete to neat clean lines in undisturbed soil. Provide forms where required due to unstable soil conditions. Remove wood, loose soil, rubbish and other foreign matter from excavation, and moisten earth before placing concrete.
- B. Concrete: Provide concrete composed of portland cement, coarse aggregate, fine aggregate and water, mixed in proportions to attain 28-day compressive strength of not less than 3,000 psi. Use not less than 5 sacks of portland cement, complying with ASTM C 150, per cubic yard of wet concrete.
- C. Place concrete immediately after mixing. Perform chuting to avoid segregation of mix. Compact concrete in place by use of vibrators to consolidate. Moist-cure exposed concrete for not less than 7 days, or use a non-staining curing compound in freezing weather.
- D. Finish trowel exposed concrete surfaces to smooth, dense surface. Provide positive slope for water runoff to base perimeter.
- E. Flagpole Installation: Install flagpoles as shown and in compliance with final shop drawings and manufacturer's instructions.
- F. Provide positive lightning ground for each flagpole installation.

END OF SECTION 10 75 00



## SECTION 11 31 00 – RESIDENTIAL APPLIANCES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Dishwashers.
  - 2. Range/Oven.
  - 3. Range Hood.
  - 4. Washer and Dryer.
  - 5. Refrigerator/Freezers.
  - 6. Compact Refrigerator.
  - 7. Microwave.
  - 8. Double Wall Oven.
  - 9. Cooktop.
  
- B. Related Sections:
  - 1. Plumbing requirements are specified in Division 22.
  - 2. Electrical services and connections are specified in Division 26.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
  
- B. Product Data: Submit manufacturer's specifications and installation instructions for each type of residential equipment, including data indicating compliance with requirements. Submit operating and maintenance instructions for each item of residential equipment.
  
- C. Schedule: Submit schedule of residential equipment, using same room designations shown on drawings.
  
- D. Section 01 77 00 – Closeout Procedures: Operations and Maintenance Manual.

#### 1.3 QUALITY ASSURANCE

- A. Certification Labels: Provide residential equipment which complies with standards and bears certification labels as follows:
  - 1. Energy Ratings: Provide energy guide labels with energy cost analysis (annual operating costs) and efficiency information as required by Federal Trade Commission.
  - 2. UL Standards: Provide residential equipment with UL labels.
  
- B. Uniformity: Provide products of same manufacturer for each type of residential equipment required.
  - 1. To greatest extent possible, provide residential equipment by single manufacturer for entire project.

#### 1.4 DELIVERY AND STORAGE

- A. Deliver and handle equipment under provisions of Section 01 60 00 - Product Requirements.
- B. Deliver products to project site in manufacturer's undamaged protective containers, after spaces to receive them have been fully enclosed.

#### 1.5 WARRANTY

- A. Submit manufacturer's standard written warranty for each item of residential equipment under provisions of Section 01 77 00 - Closeout Procedures.

### PART 2 PRODUCTS

#### 2.1 PRODUCTS

- A. Range: GE Café # JS750DFSS. (OFCI)
  - 1. 30" free standing radiant range with Storage Drawer.
  - 2. ADA Compliant.
  - 3. Oven Capacity 4.4 Cu Ft.
  - 4. Cooktop Surface: Black Ceramic Glass.
  - 5. Oven Cleaning Type: Self – Clean.
- B. Range Hood: GE Profile Series JV566HSS. (OFCI)
  - 1. 36 inch High Performance Range Hood.
  - 2. Hidden Control Location.
  - 3. Dual Halogen Cooktop Lighting.
  - 4. Ducting: 4-Way.
  - 5. 120 volts/1.4 amp.
  - 6. Variable 2-speed fan control.
- C. Dishwasher: GE Tall Tub GLDA696FSS Stainless Steel. (OFCI)
  - 1. Energy Star Qualified.
  - 2. ADA Compliant.
  - 3. Place Settings: 12
  - 4. Dimensions: 32 7/20 H x 24 D inch x 24 W inch.
  - 5. Calrod HeaterWatts: 875 max.
  - 6. Current: 9.1 A.
  - 7. Volts: 120.
  - 8. 56 dBA.
- D. Washer: GE GTWS8650DWW (OFCI)
  - 1. Washer with 5.0 DOE cu ft capacity.
  - 2. Approximate Dimensions: 44 ½ x 28 x 29 in.
  - 3. Energy Star Qualified.
  - 4. Stainless steel basket and steam.
- E. Dryer: GE GTDP740EDWW (OFCI)
  - 1. 7.8 Cu. Ft. Electric Dryer.
  - 2. Approximate Dimensions: 44 ½ x 28 x 31 9/10 in.

- F. Refrigerator/Freezer: GE Energy Star Model # GTE18ISHSS. (OFCI)
  - 1. Energy Star Qualified.
  - 2. ADA Compliant.
  - 3. 18.2 Cubic Ft.
  - 4. Top freezer location.
  - 5. 66 5/8 x 29 1/2 x 34 1/4 inch.
  
- G. Compact Refrigerator: Haier, HNSE045. (OFCI)
  - 1. White, recessed handle. Flat door with reversible door swing.
  - 2. Dimensions: 20.3125 x 22.25 x 32.0625 inch.
  - 3. Total Capacity: 4.5 cu ft.
  - 4. Manual Defrost.
  - 5. Single-Knob Mechanical.
  
- H. Microwave: GE Profile PEB7226SFSS. (OFCI)
  - 1. 2.2 Cu. Ft. Countertop installation.
  - 2. 24 – 1/8 x 14 x 19-3/4 inch.
  - 3. 1100 watts.
  
- I. Double Wall Oven (Enterprise Lab): GE Profile Series PT9550SFSS. (OFCI)
  - 1. 30 inch.
  - 2. Built-In Double Convection Wall Oven.
  - 3. Self Clean.
  - 4. Capacity: 5.0 upper/5.0 lower.
  - 5. Stainless steel.
  - 6. Dimensions:
    - a. Lower: 25 x 17-3/8 x 20-1/4 inch.
    - b. Upper: 25 x 17-3/8 x 20-1/4 inch.
  
- J. Cooktop (Enterprise Lab): GE Café CP650STSS. (OFCI)
  - 1. 36 inch Built-in Electric Cooktop.
  - 2. Black Ceramic Glass with Stainless Steel Trim Cooking Surface.
  - 3. Cooktop Burner Type: 5 Ribbon Smoothtop.
  - 4. ADA Compliant.
  - 5. 21 x 3-1/4 x 36-1/8 inch.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations.
  
- B. Built-In Equipment: Securely anchor units to supporting cabinetry or countertops and concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
  
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate for proper operation of equipment.
  
- D. Utilities: Refer to Division 22 and 26 for plumbing and electrical requirements.

### 3.2 ADJUST AND CLEAN

- A. Testing: Test each item or residential equipment to verify proper operation. Make necessary adjustments.
- B. Accessories: Verify that accessory items required have been furnished.
- C. Cleaning: Remove packing material from residential equipment items and leave units in clean condition, ready for operation.

END OF SECTION 11 31 00



## SECTION 11 40 00 – FOODSERVICE EQUIPMENT

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. This section includes equipment for foodservice facilities indicated on the designated foodservice drawings (FS).
- B. NIC-Not in Kitchen Equipment Contractors (KEC) contract.
- C. Kitchen Equipment Contractor to coordinate/relocate owner provided and/or existing equipment when applicable.

#### 1.2 RELATED SECTIONS / DIVISIONS

- A. Refer to General Conditions, Supplementary Conditions, and applicable provisions of Division 1 for additional instructions.
- B. Refer to Divisions 5, 6, and 9 – Interior Design; for applicable provisions and sections regarding décor finishes, applications, details, and special instructions relating to items specified in this Section. Applicable to Projects with items specified in this Section, with décor finishes and/or constructions.
- C. Refer to Division 22 – Plumbing; for applicable sections regarding plumbing services and components necessary to complete final connections to individual items as specified in this Section. Not work of this Section.
- D. Refer to Division 23 – Heating Ventilating and Air Conditioning (HVAC); for applicable sections regarding HVAC services and components necessary to complete final connections to individual items as specified in this Section. Not work of this Section.
- E. Refer to Division 26 – Electrical; for applicable provisions and sections regarding electrical services and components necessary to complete final connections to individual items as specified in this Section. Not work of this Section.
- F. Work included in other Divisions – Provision of all wall, floor, and/or ceiling/roof openings, recesses, sleeves, and/or conduits; and equipment pads, and sealing thereof, as necessary for installation of items included in this section. Not work of this Section.
- G. Work included in other Divisions – Disconnection of existing equipment to be relocated and/or reused; and removal of existing equipment which will not be reused, as determined and designated by the Architect in other Divisions. Not work of this Section. (Applicable to projects with existing equipment.)

#### 1.3 DEFINITIONS

- A. Furnish – Supply and deliver to Project Site.
- B. Provide (set in place) – Operations at Project Site including unloading, assembly, placing, leveling and similar operations; ready for final utility connections by other Divisions as appropriate.
- C. Install – Furnish and install complete; ready for final utility connections by other Divisions as appropriate.

- D. KEC – Refers to the Kitchen Equipment (Sub) Contractor in this Section. References to any other Contractor or Division will be specific; such as General contractor, Plumbing (Sub) Contractor / Division, Electrical (Sub) Contractor / Division, Architect designated, etc.
- E. OSCI – Owner Supplied, Contractor (KEC) Installed - Equipment item that is currently installed at facility and will be removed and re-installed in new plan as shown/defined. Equipment is not in KEC contract, however coordinating, relocating and setting in place is required by the Kitchen Equipment Contractor. Modifications to existing equipment as defined or shown within the documents and/or for the current operational intent of the documents will be the responsibility of the KEC.

#### 1.4 QUALIFICATIONS

- A. Kitchen Equipment Contractor's requirements:
  - 1. Engaged in direct selling and installation to final user or user's agent of equipment specified in this section.
  - 2. Established in the foodservice/commercial kitchen equipment supply business for a minimum of five (5) years continuous operation under the same company name and ownership. Documentation supporting that experience must be provided upon request.
  - 3. Financially stable and have the ability to complete this project.
  - 4. Comparable size and scope projects completed in the last five (5) years.
  - 5. Have manufacturer's authorization to purchase, distribute, and install all items specified.
  - 6. Not engaged in conflicting installations at time of completion of this project. A complete list of projects and installation dates must be provided upon request.
- B. Any sub-contractor employed by Kitchen Equipment Contractor, is to comply with the same qualifications.
- C. Kitchen Equipment Contractor to disclose any discrepancies with qualifications on the initial bid document.

#### 1.5 SUBMITTALS

- A. Kitchen Equipment Contractor's use of any Design Teams' AutoCAD contract drawings for basis of producing their submittal drawings, is with the following conditions and understanding:
  - 1. Kitchen Equipment Contractor assumes total liability and responsibility for accuracy, and for conformance and verification with the latest Architectural and Engineering drawings, actual field conditions, and all equipment provided.
  - 2. Kitchen Equipment Contractor further assumes responsibility for coordination of their submittals with those of other Contractors and Sub-Contractors, as required.
  - 3. Submittals to have Kitchen Equipment Contractor's title block and information.
  - 4. A pdf copy of all associated submittal sheets can be substituted for hard copies when coordinated with architect and overall project written conditions.
- B. Product Data Manuals:
  - 1. Submit six (6) three ring bound sets with cover sheets and detailed information on every item included in this Section for review by the Design Team. After review process, Kitchen Equipment Contractor to reproduce and supply six (6) bound sets of distribution prints for record and construction purposes.
  - 2. The six (6) three ring bound sets with cover sheets and detailed information on every item included in this Section. Detailed information is to include, but not be limited to, item number, description, quantity, model numbers, options and accessories provided, N.E.M.A. plug and receptacle configuration for applicable items, clearance requirements for access and maintenance, exact utility requirements, manufacturer's cut-sheets, reference to specific shop drawings, and etc. General cut sheets with multiple model numbers are to have the specific specified item identified in an obvious manner. Distribute one additional copy of installation and start-up instructions to the Installer.

3. Every cover sheet and associated detailed submittal is to provide sufficient and complete information for the Design Team to verify that the Kitchen Equipment Contractor understands the Contract requirements, and is providing each item in compliance with the Contract documents. Cover sheets to also include associated items as listed on the Equipment Plan, but provided by others; and are to be noted as "Not in Contract -114000".
  4. Reproduction of any part of the Contract Specifications will not be acceptable as part or total of Kitchen Equipment Contractor's Product Data Submittal Manuals. These manuals are to be produced and assembled entirely by the Kitchen Equipment Contractor.
- C. Shop Drawings:
1. Submit six (6) sets in reproducible transparency form (24"x 36"min) for review by the Design Team. After review process, Kitchen Equipment Contractor to adjust, reproduce (if necessary) and supply six (6) sets for distribution prints of record and construction purposes.
  2. For any equipment requiring field assembly, including but not limited to, cooking suite assemblies, custom stainless steel products, pulper/extractor assemblies, remote refrigeration systems, walk-in coolers and/or freezers, exhaust hoods/ventilators, fire suppression system, utility distribution systems, pot/utility/ware washing assemblies/machines, and conveyors. Include plans, elevations, sections, roughing-in dimensions, fabrication details, utility service requirements, and attachments to other work.
  3. Before proceeding with the fabrication or manufacture of any item, Kitchen Equipment Contractor is responsible for verifying and coordinating all dimensions and details, with site dimensions, conditions, and adjacent equipment. The Kitchen Equipment Contractor is responsible for coordinating and reviewing all shop drawings with owner/owner's representative.
  4. Reproduction of any part of the Contract Drawings will not be acceptable as part or total of Kitchen Equipment Contractor's Shop Drawing Package. These drawings are to be prepared and assembled entirely by the Kitchen Equipment Contractor.
- D. Rough-In Drawings for Non-Altered Plans:
1. Rough-in locations have been prepared before the award of this contract; Kitchen Equipment Contractor is to examine the plans and facility.
  2. Indicate locations for additional wall backing for foodservice equipment.
  3. Key equipment using same designations as indicated on Drawings.
  4. Include plans and elevations; clearance requirements for equipment access and maintenance; details of support for equipment; and utility service characteristics.
- E. Equipment Plan & Rough-In Drawings for Altered Plans:
1. Submit six (6) sets in reproducible transparency form for review by the Design Team. After review process, Kitchen Equipment Contractor to adjust, reproduce (if necessary) and supply six (6) sets for distribution prints of record and construction purposes.
  2. Submit 1/4"=1' scale drawings. These drawings are to include complete information on the work included in the Contract, with references to equipment as provided by others; and are to provide sufficient information for associated trades, contractors, and/or sub-contractors to complete their division of work associated with food service equipment included in this Contract. They are to be dimensioned; showing locations of ducts, stubs, floor and wall sleeves, for ventilation, plumbing, stem, electrical, refrigeration lines, and concrete base and curb dimensions, as required for equipment so supported, and any additional information pertinent to the installation of this equipment.
  3. Drawings to also include equipment plan(s) with detailed equipment list, similar to Food Service Equipment Plans included in the Contract Drawings. Item numbers are to be the same as shown in the contract Documents, and are to include Spare Numbers and associated items as provided by others.
  4. In the event rough-ins have been accomplished before award of this contract, Kitchen Equipment Contractor is to examine the existing facility and make adjustments to their equipment to suit building conditions and utilities, where possible. If not possible, so state in

a letter, with reasons and an alternate method and pricing for their equipment, to the Architect.

F. Operation and Maintenance Data:

1. Two (2) bound sets of manuals are to be furnished for items of standard manufacture on/or before the date of the first event to occur of the following: demo/start-up, start-up for intended use by the Owner/Operator, completion of installation of kitchen equipment contract package, or final acceptance of installation by Owner. Manuals are to be in alphabetical order with tabbed dividers per manufacturer. Manufacturer's info is to include Tech Services telephone number, email, and web site address, where available.
2. Provide single index sheet with unit model and unit serial number for each item to be located at front of O&M book prior to local service agency sheet.
3. Two (2) pdf copies in CD/Compact Disk or DVD format to be furnished for items of standard manufacture in addition to the hard bound copies.
4. Provide a complete list of local service agencies for included manufacturers, complete with address and telephone numbers. Also provide email and web site addresses, where available.
5. All warranty cards for completion from owner/ Owners representative to be at front of O&M book and noted to be completed swiftly, when provided by manufacturer.
6. Provide DVD's for maintenance, training, operation, etc, where available.

G. Product samples that are required for examination to verify color or finish style are to be furnished at no expense to Owner.

H. Design Team's review of submittal drawings, shop details, product data brochures, and operation and maintenance manuals is for general conformance with the design concept and contract documents. Review markings or comments are not to be construed as relieving Kitchen Equipment Contractor from compliance with the contract documents, or departures there from. Kitchen Equipment Contractor remains responsible for details and accuracy, confirming and correlating all quantities and dimensions, selecting fabrication processes, techniques of assembly, and performing their work in a safe, satisfactory, and professional manner.

I. Cost for Re-Submissions:

1. The Kitchen Equipment Contractor is responsible for ensuring that all shop drawings, product data, samples, and submittals contain all information required by the Contract Documents to allow the Design Consultant to take action. The Kitchen Equipment Contractor shall pay the Design Consultant's cost for any re-submission of any rejected item. Such costs shall be deducted from the contract sum by Change Order. The Kitchen Equipment Contractor agrees that any action taken by the Design Consultant is solely in the Design Consultant's discretion and is non-negotiable for the purposes of the Design Consultant's cost recovery for multiple (i.e. more than one) review.

## 1.6 SCHEDULE

- A. Time management is critical and acceptance constitutes assurance that the Kitchen Equipment Contractor can and will obtain materials, equipment and manpower, to permit installation of the items included in this Section, on schedule. Kitchen Equipment Contractor is to coordinate their work with the progress schedules and updated periodically by the General Contractor or Construction Manager.
- B. Anticipated delays, not within the control of the Kitchen Equipment Contractor, are to be noted in a written notification to the Architect, immediately upon the Kitchen Equipment Contractor's realization that delays are imminent.
- C. Failure of manufacturers to meet promised delivery dates will not grant relief to the Kitchen Equipment Contractor for failure to meet schedules; unless the Kitchen Equipment Contractor can establish, in writing, that orders were received by the manufacturer, with reasonable lead times.

- D. Extra charges resulting from special handling or air shipment in order to meet the schedule will be paid by the Kitchen Equipment Contractor, if insufficient time was allowed in placing factory orders.

#### 1.7 QUALITY ASSURANCE

- A. Compliance with the following:
1. Air Conditioning and Refrigeration Institute (A.R.I.): applicable regulations and references of the latest edition of standards for remote refrigeration systems(s), components and installation.
  2. American Gas Association (A.G.A.): standards for gas heated equipment. Automatic safety pilots to be provided on all equipment, where available. (Canadian Gas Association or alternate testing lab's seals accepted if acceptable to local code jurisdictions.)
  3. American National Standards Institute (A.N.S.I.): Z21-Series for gas-burning equipment. Provide labels indicating name of testing agency.
  4. American National Standards Institute (A.N.S.I.): B57.1 for compressed gas cylinder connections, and with applicable standards of the Compressed Gas Association for compressed gas piping.
  5. American National Standards Institute (A.N.S.I.): A40.4 and A40.6 for water connection air gaps and vacuum breakers.
  6. American Society of Heating, Refrigeration and Air Conditioning Engineers (A.S.H.R.A.E.): applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation.
  7. American Society of Mechanical Engineers (A.S.M.E): Boiler Code requirements for steam generating and steam heated equipment.
  8. American Society of Testing and Materials (A.S.T.M.): C1036 for flat glass.
  9. American Society of Testing and Materials (A.S.T.M.): C1048 for heat-treated flat glass-Kind HS, Kind FT coated and uncoated glass.
  10. American Welding Society (A.W.S.): D1.1 structural welding code.
  11. National Electric Code (N.E.C.): N.F.P.A. Volume 5 for electrical wiring and devices included with foodservice equipment, A.N.S.I. C2 and C73, and applicable N.E.M.A. and N.E.C.A. standards.
  12. National Electrical Manufacturers Association (N.E.M.A.): LD3 for high-pressure decorative laminates.
  13. National Fire Protection Association (N.F.P.A.): applicable sections for exhaust hoods, ventilators, duct and fan materials, hoods fire suppression systems, construction and installation.
  14. National Sanitation Foundation (N.S.F.): latest Standards and Revisions. Provide N.S.F. Seal of Approval on each applicable item. (UL Sanitation approval and seal accepted if acceptable to local code jurisdictions.)
  15. U. S. Department of Health and Human Service Food Code: Latest Standards and Revisions.
  16. Sheet Metal and Air Conditioning Contractor's National Association (S.M.A.C.N.A.): latest edition of guidelines for seismic restraint of kitchen equipment, as applicable to project location.
  17. Underwriters Laboratories (U.L.): as applicable for electrical components and assemblies. (Canadian Standards Association or alternate testing lab's seals accepted if acceptable to local code jurisdictions.)
  18. Intertek ETL SEMKO (E.T.L.): as applicable for electrical components and assemblies. Listed Mark is an accepted alternative to UL. (Canadian Standards Association or alternate testing lab's seals accepted if acceptable to local code jurisdictions.)
  19. UL 300 Standard: for wet chemical fire suppression systems for exhaust hoods/ventilators.
  20. American with Disabilities Act (A.D.A.): as applicable to this Project.
  21. Refrigeration Service Engineers Society (R.S.E.S.): applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation.

22. All refrigerants used for any purpose is to comply with the 1995 requirements of the Montreal Protocol Agreement, and subsequent revisions and amendments. No DFC refrigerants will be permitted on this Project.
23. All refrigeration components installation, repairs, and/or associated work on any refrigeration system, is to be performed by a Certified Refrigeration Mechanic.
24. All Applicable local codes, standards and regulations.
25. For detention facilities projects: applicable Correctional Standards. Verify the level of security and construction required with the Architect, and provide all items in compliance.
26. Uniform Mechanical Code (UMC): Comply with requirements of the current UMC.

#### 1.8 MANUFACTURERS

- A. Basis-of-Design Product: The design for foodservice equipment item is based on the product named. Subject to compliance with requirements, provide either the named product or submit a substitution request for comparable equipment, see section 1.9. Manufacturers not approved as substitutions, or included as a Listed Alternates will not be permitted.
- B. Equipment models, accessories, utility requirements and dimensions are based on the latest manufacturer/fabricators data available at time of document preparation. It is possible that some or all the manufacturers' information could change between time of preparation of these documents and final construction. It is the responsibility of the Kitchen Equipment Contractor to verify that all revised equipment being provided meets the specification data, and if changed, notify appropriate trade contractors.
- C. Existing Equipment Coordination: It is the sole responsibility of the KEC to locate and verify existing equipment sizes, dimensions and loads prior to ordering any and/or all components intended for use with existing items.

#### 1.9 SUBSTITUTIONS

- A. The foodservice equipment for this project has been closely coordinated with the owner/operator. All requests for alternatives or substitutions will be coordinated through the architect. Comparable products to have prior approval and any substitution must meet or exceed the performance, style, materials, utility savings, manufacturing materials and/or operating techniques of the specified equipment. Owner reserves the right to approve or disapprove any items that are submitted for substitution, and is not required to give the reasons for the decision.
- B. Substitution request forms available upon request.
- C. Completed substitution request forms to be filed ten (10) business days prior to bid date. Substitution requests made after the project addendum closing date will not be accepted. Substitutions made after the bid closing date will not be accepted.
- D. Submit itemized bids with the primary manufacturers and models specified. Unless otherwise noted, substitutions may be submitted for consideration, but must be itemized at the end of the bid proposal.
- E. Substitutions must be approved in writing by the Architect and/or Owner, prior to utilization in this Contract. A copy of the approval must be included with any submittals by Kitchen Equipment Contractor.

#### 1.10 APPROVED SUBSTITUTIONS AND/OR LISTED ALTERNATES

- A. Substitutions approved as noted in article 1.9. and/or any Listed Alternate manufacturers included in the Itemized Specifications, or added by Addendum, may be utilized, in lieu of the primary specified manufacturer with the following conditions:
  1. These Contract Documents are designed and engineered using the primary specified manufacturer and model. Kitchen Equipment Contractor assumes total responsibility for any

deviations required, due to utilization of a substitution/alternate manufacturer or model; including, but not limited to, fitting alternates into available space, providing directions for required changes, and assuming any associated cost for utility, building, architectural, or engineering changes.

2. Kitchen Equipment Contractor is responsible for supplying the model, which is equal to the primary specified model in regards to general function, features, options, sizes, accessories, utility requirements, finish, operation, and listing approvals. If it is determined by the Owner or their appointed representative at any time during the construction and installation, and prior to the final acceptance of the Project, that the substitution/alternate model submitted is not equal to the primary specified model, the Kitchen Equipment Contractor will assume all associated cost and implications required to replace the model submitted, with the correct model.
3. The bid proposal is to clearly state any substitutions/alternates, which will be utilized including the manufacturer and model number. Also include product cut sheet for each substitution/alternate, with any and all deviations between the primary specified manufacturer and the substitution/alternate manufacturer. Complex alternates such as utility distribution systems, exhaust hoods, ventilators, etc. are to include a shop drawing specific to the Project.
4. Inclusion of an alternate manufacturer in Itemized Specifications article 2.1 is not intended to indicate that there is an equal alternate unit to match every primary specified unit. It is the responsibility of the Kitchen Equipment Contractor to insure that the alternate unit submitted matches the primary specified unit; and meets the conditions as stated above.
5. Manufacturers not approved as substitutions, or included as a Listed Alternates will not be permitted.

#### 1.11 DISCREPANCIES

- A. Where discrepancies are discovered between the drawings and the specifications, regarding quality or quantity, the higher quality or the greater quantity is to be included in the Bid Proposal.
- B. Kitchen Equipment Contractor is responsible for verifying and coordinating all items provided in this Section, with the drawings, specifications, manufacturer's requirements, submittals, actual site conditions, adjacent items, and associated (Sub-) Contractors; to assure that there are no discrepancies or conflicts. This is to include, but not be limited to, quantities, dimensions, clearances required, direction of operation, door swings, utilities, gas type, elevation calibration, fabrication details and methods, installation requirements, etc.
- C. Kitchen Equipment Contractor to notify the Architect, in writing, of any discrepancies discovered; await written clarification prior to proceeding with the items or areas in question.
- D. Kitchen Equipment Contractor will be solely responsible for any unauthorized foodservice related changes. All foodservice related changes/ alterations are to have written approval from H-C Design & Consulting prior to ordering, manufacture or implementation.

#### 1.12 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements to assure accurate fit of fabricated equipment. Do not fabricate equipment until site dimensions have been field verified by fabricator or Kitchen Equipment Contractor. Indicate measurements on Coordination Drawings for all custom fabricated or critical dimensioned equipment.
- B. Check electrical characteristic and water, steam, and gas pressure. Provide pressure regulating valves and appropriate orifices where required for proper operation of equipment. It is the sole responsibility of the Kitchen Equipment Contractor to coordinate with General Contractor, verify and adjust equipment gas type and elevation requirements (regulator and orifices) for optimal performance to site specifications regardless of original gas type/elevation provision. Extra charges

resulting from KEC not confirming gas type and elevation prior to foodservice equipment ordering will be paid by the Kitchen Equipment Contractor.

- C. Kitchen Equipment Contractor to coordinate size and location requirements with appropriate trade contractors who are responsible for outside wall and roof penetrations required to accommodate refrigeration lines, ventilation ducting, etc.

#### 1.13 COORDINATION

- A. Kitchen Equipment Contractor is responsible for obtaining any documents referenced in this Section and on any associated drawings, which contains information relative to the performance of this contract; and disseminating and coordinating the pertinent information contained in them, with the appropriate sub-contractors, manufacturers, fabricators, and/or installers.
- B. Coordinate foodservice equipment layout and installation with other work, including lighting fixtures, HVAC equipment, and fire-suppression system components.
- C. Coordinate location and requirements of utility service connections if deemed different than plan set.
- D. Coordinate size, location, and requirements of the following:
  - 1. Overhead equipment supports
  - 2. Equipment to be field welded
  - 3. Custom stainless steel tables
  - 4. Insulated floors and/or slab depressions
  - 5. Floor areas with positive slopes to drains
  - 6. Floor sinks and drains serving foodservice equipment
  - 7. Roof curbs, equipment supports, and penetrations
- E. Coordinate, relocate and install owner provided/existing equipment as applicable.
- F. Kitchen Equipment Contractor to attend any conference meetings at Project site, Architecture office, or General Contractor's office to comply with requirements in Division 1.

#### 1.14 WARRANTY

- A. Unless otherwise noted in Related Divisions / Sections 2.1, items furnished are to be fully guaranteed against defects in workmanship, materials and functionality for one (1) full year from the date of the first event to occur of the following: date of issue of Certificate of Occupancy (or the equivalent), start-up for intended use by the Owner/Operator, completion of installation of kitchen equipment contract package, or final acceptance of installation by Owner. Should a Temporary Certificate of Occupancy be issued for partial completion of work, the items furnished within that designated area are to be under warranty from the date of issue of the Certificate. Kitchen Equipment Contractor or their service agent will make necessary repairs and replacements without charge to the Owner, and within a reasonable time.
- B. Refrigeration Warranty: in addition to the one (1) year warranty requirements as stated above, provide start-up, and parts and labor for the first year; plus additional (4) four-year extended warranty on compressors. Extended warranty is for provision of replacement compressor, determined to be defective by a Certified Refrigeration Mechanic. However verification of defective compressor, installation of replacement compressor, recharging and repairs of system will be the responsibility of the Owner. This includes all items with built-in or remote refrigeration system.
- C. Periodic routine maintenance, servicing, adjustments, cleaning, etc., as required by the manufacturers included in this Project, are the responsibility of the Owner.
- D. Any and all parts or requirements for manufacturer's warranties to be in effect, whether or not noted in the itemized specifications, are to be provided or complied with by the Kitchen Equipment



- Contractor. This is to include, but not be limited to, particular parts, accessories, or installation; installation supervision, start-up, and/or follow-up inspections required by factory trained, Certified, and/or authorized personnel. Factory training, Certification, and/or authorization are to be in effect at the time of bidding, installation, start-up, and warranty period of Project.
- E. Manufacturer's warranties which comply with the requirements of this Warranty article 1.14 are to be provided in lieu of Kitchen Equipment Contractor's own warranties, where available. Copies of the written warranties are to be included in Section 1.5.F, the Operation & Maintenance manuals.
  - F. Kitchen Equipment Contractor to perform (11) eleven month warranty inspection. Correct items noted by reviewing agent, issue report for all equipment and areas pertaining to the foodservice equipment and design intent.

## PART 2 PRODUCTS

### 2.1 FOOD SERVICE EQUIPMENT

Refer to manufacturer's directions for additional information not shown on the drawing or specifications. Specified manufacturer establishes quality and function.

- A. Item 1 - HEATED CABINET, MOBILE (4 REQ'D)  
Food Warming Equip Model UHS-12  
Heated Cabinet, mobile, full-height, (1) door, insulated, humi-temp heat system with eye level controls, (12) pair universal tray slides 4-1/2" OC, for various size trays, pans & GN 2/1, removable slides & uprights, 20 gauge stainless steel exterior with 22 gauge stainless steel interior construction, heavy duty push bars, full bumper
  - 1. 4 ea Two year limited parts & one year labor warranty
  - 2. 4 ea 120v/50/60/1-ph, 11.3 amps, 1350w, NEMA 5-15P
  - 3. 4 ea Twist-lock plug
  - 4. 4 ea Cord winding brackets (pair)
  - 5. 4 ea Menu card holder (each)
  - 6. 8 ea Paddle latch (flush mount) (per door)
  - 7. 8 ea Tubular s/s handles, welded in place
  - 8. 4 ea Top corner bumpers, set of 4
  - 9. 4 ea 5" Caster standard: EZ Roll Heavy Duty Poly, 2-rigid, 2-swivel with brakes (set)
- B. Item 2 - HEATED CABINET, MOBILE (4 REQ'D)  
Food Warming Equip Model UHS-12  
Heated Cabinet, mobile, full-height, (1) door, insulated, humi-temp heat system with eye level controls, (12) pair universal tray slides 4-1/2" OC, for various size trays, pans & GN 2/1, removable slides & uprights, 20 gauge stainless steel exterior with 22 gauge stainless steel interior construction, heavy duty push bars, full bumper
  - 1. 4 ea Two year limited parts & one year labor warranty
  - 2. 4 ea 120v/50/60/1-ph, 11.3 amps, 1350w, NEMA 5-15P
  - 3. 4 ea Twist-lock plug
  - 4. 4 ea Cord winding brackets (pair)
  - 5. 4 ea Menu card holder (each)
  - 6. 8 ea Paddle latch (flush mount) (per door)
  - 7. 8 ea Tubular s/s handles, welded in place
  - 8. 4 ea Top corner bumpers, set of 4
  - 9. 4 ea 5" Caster standard: EZ Roll Heavy Duty Poly, 2-rigid, 2-swivel with brakes (set)
- C. Item 3 - CART, UTILITY (5 REQ'D)

Lakeside Manufacturing Model 953

Tough Transport® Utility Cart, 2-tier, 48"W x 25-3/4"D x 37-3/8"H, stainless steel construction, open base U-frame with angled stainless steel, 24" x 42" 14-gauge shelves with reinforced edges, 21" shelf clearance, 1" O.D. tube push handle with bumpers, (2) 6" bumpers riveted to front legs, 1000 lb. capacity, (2) 5" reinforced swivel plate casters & (2) 8" fixed casters with non-marking polyurethane wheels, NSF

1. 5 ea Wall-Saver perimeter bumpers

D. Item 4 - WALK IN COMBINATION COOLER FREEZER (1 LOT REQ'D)

American Panel Corporation Model WALK IN COMBO

22'-1.5" x 24'-0.5" x 8'-6" Walk in Cooler/ Freezer Combination Box, "L" shaped 23'-5" x 8'-0" x 17' - 7.5" x 9' - 7" x 7'-10.25" Cooler, 13'-1" x 9'-0" x 7'-10.25" Freezer, Diamond tread recessed floor application, white interiors, vertical beaded s/s where exposed exterior, 45 degree bumper rail, LED lighting, kick plates, 14 x 24 viewports, extra hinge on doors, closure panels and trim strips, stainless steel cove base, Weiss Instruments door monitor/ alarm with contacts for WebX connections, center mount low profile space saver evaporators, 5 year compressor warranty, remote condensing units, 208/3

1. See FS 6.1

E. Item 4.1 - DRAIN LINE COVER (2 REQ'D)

Custom drain line cover, stainless steel, of no less than 304 18 ga.,

1. Per FS6.1

F. Item 4.2 - 18" H ANGLE IRON COMPRESSOR RACK (2 REQ'D)

18" H Angle Iron Compressor Rack, coated with rust resistant finish

1. See Detail 1, FS6.1

G. Item 4.3 - CONTROLLING & MONITORING GATEWAY (1 LOT REQ'D)

Weiss Instruments Model WEB X

Web X temperature /control software and components, Temperature tracking software and temperature data loggers for walk in coolers & freezer, roll in coolers indicated

1. See FS3.0, Detail 1

H. Item 5 - WIRE SHELVING (1 LOT REQ'D)

Metro

1. 12 ea Model 2454NK3 Super Erecta® Shelf, wire, 54"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
2. 12 ea Model 2448NK3 Super Erecta® Shelf, wire, 48"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
3. 24 ea Model 74PK3 Super Erecta® SiteSelect™ Post, 74-5/8"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection

I. Item 6 - DUNNAGE RACK (1 REQ'D)

New Age Model 2016

Dunnage Rack, 60"W x 24"D x 8"H, all welded aluminum construction, 1-1/2" x 1-3/4" x 0.070 tubing, welded aluminum caps on feet, weight capacity 2000 lbs., NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

J. Item 7 - WIRE SHELVING (1 LOT REQ'D)

Metro

1. 15 ea Model 2472NK3 Super Erecta® Shelf, wire, 72"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF

2. 5 ea Model 2460NK3 Super Erecta® Shelf, wire, 60"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
  3. 35 ea Model 2448NK3 Super Erecta® Shelf, wire, 48"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
  4. 5 ea Model 2442NK3 Super Erecta® Shelf, wire, 42"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
  5. 5 ea Model 2436NK3 Super Erecta® Shelf, wire, 36"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
  6. 52 ea Model 74PK3 Super Erecta® SiteSelect™ Post, 74-5/8"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
  7. 110 ea Model 9995Z Super Erecta® "S" Hook, zinc
- K. Item 8 - PAN RACK, BUN (4 REQ'D)  
New Age Model 1331U  
"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF
1. 4 ea Lifetime warranty against rust & corrosion, 5 year construction warranty
- L. Item 9 - HAND SINK (1 REQ'D)  
Eagle Group Model HSA-10  
Hand Sink, wall mount, 13-1/2" Wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, requires splash mounted faucet, deep-drawn seamless design-positive drain, inverted "V" edge, NSF
1. 1 ea Model E44 Punching extra faucet holes or changing location of faucet holes from standard
  2. 1 ea Model -LRS Left & right side splashes
- M. Item 9.1 - ELECTRONIC FAUCET (1 REQ'D)  
T&S Brass Model EC-3101  
ChekPoint™ Electronic Faucet, wall mount, rigid gooseneck with vandal resistant aerator, AC/DC control module, mixing tee, 100-240 VAC adapter
- N. Item 10 - NOT USED
- O. Item 11 - SHELVING, WALL-MOUNTED (1 LOT REQ'D)  
Eagle Group
1. 1 ea Model WS1272-16/3 Wall Shelf, 12" x 72" 16/304 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, stainless steel mounting brackets stud welded to shelf, NSF
  2. 1 ea Model WSP1272 Wall Shelf, with removable hooks, 12" x 72" 16/430 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, 2" x 3/16" flat bar, furnished with double-prong stainless steel hooks, (1) per linear foot, NSF
- P. Item 12 - WORK COUNTER (1 REQ'D)  
Eagle Group Model SMPT30144  
Spec-Master® Marine Prep Table, 144"W x 30"D, 14/304 stainless steel top with box marine edge, (2) 24" x 18" x 12" sink bowls, 10" high backsplash, 1/2" thick poly cutting board with set of slides welded to outside of unit, NSF approved drawer, gusset with Uni-Lok® design, heavy gauge 304 undershelf, 1-5/8" dia. stainless steel feet with flanged adjustable feet, NSF
1. 1 ea Model E36 All welded construction, legs, undershelf & top
  2. 1 ea Model -TBOF Twist bracket with overflow for 2 comp FN sinks
  3. 2 ea Model 326270 Sink Cover, fits 24" x 18" sink bowl, stainless steel

4. 2 ea Model E47 Sink cover holders, sized for stainless steel or poly, includes upper and lower track
  5. 1 ea Model E41A Disposal provision package, includes weldment only for cone which are furnished by KEC (item 13), control panel bracket weldment, and holes for pre-rinse & anti-siphon vacuum breaker
  6. 1 ea Model E44 Punching extra faucet holes or changing location of faucet holes from standard
  7. Modify sink location and undershelf
  8. 1 ea Model 311772 Legs & Crossbrace Assembly, 304 stainless steel welded construction
  9. 1 ea Rack slide for cone
- Q. Item 12.1 - FAUCET & ACCESSORIES (1 LOT REQ'D)  
Fisher
1. 1 ea Model 13277 Faucet, backsplash mount, 8" C.C., 14" long swing spout, 1/2" inlets
  2. 1 ea Model 2260 Utility Spray, wall mount, 8" adjustable wall control valve, vacuum breaker, wall hook, 60" hose
  3. 1 ea Model 2907 Wall Hook
  4. 2 ea Model 22306 DrainKing Waste Valve, flat strainer, overflow body, 19 x 21 tube & elbow, 12 GPM drain rate, cast red brass body
- R. Item 13 - DISPOSER (1 REQ'D)  
InSinkErator Model SS-200-15A-CC202  
SS-200™ Complete Disposer Package, with 15" diameter bowl, 6-5/8" diameter inlet, with removable splash baffle & reversible bowl cover, 2 HP motor, stainless steel construction, includes syphon breaker, solenoid valve, flow control valve, CC-202 control center, auto reversing, adjustable leg kit
1. 1 ea Model SLEEVE GUARD Sleeve silver guard (less baffle)
  2. 1 ea Standard height disposer body
  3. 1 ea 208v/60/3-ph, 3.3 amps
  4. 1 ea Model DEJAMWRENCH Dejamming wrench, fits 6-5/8" opening only
- S. Item 13.1 - VACUUM BREAKER ASSEMBLY (1 REQ'D)  
Fisher Model 3990  
Atmospheric Vacuum Breaker, 45° ledge mount, 1/2" M inlet
- T. Item 14 - SHELVING, WALL-MOUNTED (1 LOT REQ'D)  
Eagle Group
1. 1 ea Model WS1272-16/3 Wall Shelf, 12" x 72" 16/304 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, stainless steel mounting brackets stud welded to shelf, NSF
  2. 1 ea Model WSP1272 Wall Shelf, with removable hooks, 12" x 72" 16/430 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, 2" x 3/16" flat bar, furnished with double-prong stainless steel hooks, (1) per linear foot, NSF
- U. Item 15 - HAND MIXER (1 REQ'D)  
Robot Coupe Model MP 350TURBOCOMBI  
Series B Commercial Power Mixer, hand held, 14" stainless steel shaft & 10" whisk attachment, removable stainless steel foot & blade, includes 1 stainless steel wall support & blade disassembly tool, 12.5 gal/50 qt., variable speed 3,000 - 10,000 RPM (mixer), 500 - 1,500 RPM (whisk), 120v/60/1-ph, 1 HP, 660 watt, ETL, cETL
- V. Item 16 - PROOFER HOLDING CABINET (1 REQ'D)  
Cres Cor Model 121-PH-UA-11D  
Proofer/Hot Cabinet, non-insulated, removable bottom heater, wire universal slides for 12" x 20" thru 18" x 26" pans, on 4-1/2" centers, adjustable on 1-1/2", capacity (11) 18" x 26" sheet pans or (22) 12" x 20" pans, aluminum construction, field reversible Lexan door, integral drip trough, (4) 5" swivel casters (2) braked, CSA

- W. Item 17 - WORK TABLE (1 REQ'D)  
Eagle Group Model T36120SE  
Spec-Master® Work Table, 120"W x 36"D, 14/304 stainless steel top with rolled edges front & back, square turndown ends, Uni-Lok® gusset system, 18 gauge stainless steel undershelf, (6) 1-5/8" diameter heavy gauge stainless steel legs with 1" adjustable stainless steel feet, NSF
1. 1 ea Model E36 All welded construction, legs, undershelf & top
  2. 1 ea Model SM-NTD3I Integrated Drawer Assembly, 3 tier, with extended cabinet and legs INTEGRATED into table and undershelf, consisting of (3) #502971 style drawers, 20" x 20" x 5" drawer assemblies, 304 style stainless steel, insulated drawer front, removable stainless steel drawer pan, self-closing drawer slides, hemmed safety pull handle. NSF
  3. 2 ea Model 502971 Spec-Master® Heavy Duty Drawer Assembly, 20" x 20" x 5", 304 type stainless steel, insulated drawer front, removable drawer pan, self-closing drawer slides, stackable, hemmed safety pull handle
  4. 1 ea Model UB-36 Utensil Bar, 36" long, 2" x 1/4" stainless steel bar welded to gussets to fit front to back between table legs, include (10) pot hooks
  5. 1 ea Model SUPPORT Stainless flat stock table end support for knife rack, item 17.1
- X. Item 17.1 - KNIFE SANITIZER (1 REQ'D)  
Edlund Model KSS-5050DT  
Knife Rack Sanitizing System, liquid sanitizing, air drying & storage, built in KR-50R, removable insert and tank, enclosed in stainless steel with draining tube, made in USA, NSF
- Y. Item 18 - WORK TABLE (1 REQ'D)  
Eagle Group Model T3672SE  
Spec-Master® Work Table, 72"W x 36"D, 14/304 stainless steel top with rolled edges front & back, square turndown ends, Uni-Lok® gusset system, 18 gauge stainless steel undershelf, (4) 1-5/8" diameter heavy gauge stainless steel legs with 1" adjustable stainless steel feet, NSF
1. 1 ea Model E36 All welded construction, legs, undershelf & top
  2. 1 ea Model SM-NTD3I Integrated Drawer Assembly, 3 tier, with extended cabinet and legs INTEGRATED into table and undershelf, consisting of (3) #502971 style drawers, 20" x 20" x 5" drawer assemblies, 304 style stainless steel, insulated drawer front, removable stainless steel drawer pan, self-closing drawer slides, hemmed safety pull handle. NSF
- Z. Item 19 - MEAT SLICER (1 REQ'D)  
Hobart Model HS7-1  
Heavy Duty Meat Slicer, automatic, 13" CleanCut™ removable knife with removal tool, burnished finish, (3) stroke lengths, & (4) stroke speeds, removable meat grip assembly, removable ring guard cover, single action top mounted sharpener with Borazon™ stones, manual lift lever, 1/2 hp motor, 5.6amps, 120v/60hz/1-ph, NSF cETLus
1. 1 ea Model TRAY-SLAW Container for catching sliced product
- AA. Item 20 - NOT USED
- BB. Item 21 - EXHAUST SYSTEM (1 LOT NIC) DIV 22/23
1. Not in KEC contract
  2. See Division 22/23
- CC. Item 22 - COVER, STAINLESS STEEL (1 LOT REQ'D)  
45 degree top gas line cover, stainless steel, 18/304
1. See detail 2, FS6.0
- DD. Item 23 - STAINLESS WALL FLASHING (1 LOT REQ'D)  
Wall flashing, stainless steel, of no less than 304 20 ga., pattern as noted, with an overhang of eighteen inches on all areas in contact with hood. Verify with all applicable codes and ordinances.
1. Per FS drawings and elevations

- EE. Item 24 - COMBI OVEN (2 REQ'D)  
Cleveland Range Model OGS 6.20  
Combi Oven-Steamer, gas, boilerless, (7) 18" x 26" full size sheet or (14) 12" x 20" full size hotel pan capacity, disappearing door, advanced closed system +3, digital controls for temperature, timer and core probe, 250 recipe storage capacity, cooking modes hot air, steam, combi, retherm, cook & hold, "Delta T" slow cooking and "Crisp & Tasty", includes (4) wire shelves, hand shower, stainless steel interior & exterior, EnerLogic™ Technology, 75,700 BTU, UL-gas, UL-Sanitation
1. 1 ea Model CWT-06 Claris Water Treatment System, includes (1) pre-filter, (1) Claris X-large steam system, (1) Claris flow meter and (1) water test kit (see water quality requirements in price list)
  2. 2 ea Natural Gas, 3200 ft Elevation
  3. 2 ea 120v/60/1-ph, 4.9 amp
  4. 2 ea Model ETCS easyToUCH control for new boilerless units, installed at the factory
  5. 10 ea Model CWB20 Frying Basket, Wire, 20" x 26", (full size) for 6.20, 10.20, 12.20 & 20.20 combi oven steamers
  6. 2 ea Model CUPR620 Pan Rack Adapter, 620 (P/N 111599)
  7. verify if pan rack is needed
  8. 1 ea Model CSTKG620CA Stacking Kit, for stacking two 6.20 gas models, with casters (P/N 111806)
  9. 2 ea Model CACK ConvoClean Hands Free Built-In Automatic Cleaning System: (1) 10 liter ConvoClean, (1) 1 liter ConvoCare and (1) empty 10 liter container with label for mixing
  10. 2 ea Model CSC Stainless steel Storage Container, for ConvoCARE and ConvoCLEAN containers (P/N 111875)
- FF. Item 24.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (2 REQ'D)  
Dormont Manufacturing Model 1675KITCF2S48  
Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Safety Quik® QDV, 2 Swivel MAX®, and coiled restraining cable with hardware, 160,000 BTU/hr minimum flow capacity, limited lifetime warranty
- GG. Item 25 - TILTING SKILLET, GAS (1 REQ'D)  
Cleveland Range Model SGL40T1  
PowerPan™ Tilting Skillet, gas, 40-gallon capacity, bead blasted cooking surface, 10° tilt cooking feature, with easy manual hand tilt, spring-assisted cover with vent, gallon & liter markings, food strainer, stainless steel construction with open leg frame, CE, NSF
1. 1 ea Natural Gas, 3200 ft Elevation
  2. 1 ea 120v/60/1-ph, 1.4 amp
  3. 1 ea Model PCS Pan Carrier, for floor models
  4. 1 ea Model DKFS Double Pantry Skillet Filler, with 60" hose
  5. 1 ea Mounting bracket required for faucet installation
- HH. Item 25.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)  
Dormont Manufacturing Model 1675KIT48  
Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 full port valve (2) 90° elbows, coiled restraining cable with hardware, 180,000 BTU/hr minimum flow capacity, limited lifetime warranty
- II. Item 26 - FLOOR TROUGH (1 LOT NIC) DIV 22
1. Equipment not in KEC contract
  2. See division 22
- JJ. Item 27 - TILTING SKILLET, GAS (1 REQ'D)  
Cleveland Range Model SGL40T1

- PowerPan™ Tilting Skillet, gas, 40-gallon capacity, bead blasted cooking surface, 10° tilt cooking feature, with easy manual hand tilt, spring-assisted cover with vent, gallon & liter markings, food strainer, stainless steel construction with open leg frame, CE, NSF
1. 1 ea Natural Gas, 3200 ft Elevation
  2. 1 ea 120v/60/1-ph, 1.4 amp
  3. 1 ea Model PCS Pan Carrier, for floor models
  4. 1 ea Model DKFS Double Pantry Skillet Filler, with 60" hose
  5. 1 ea Mounting bracket required for faucet installation
- KK. Item 27.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)  
Dormont Manufacturing Model 1675KIT48  
Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 full port valve (2) 90° elbows, coiled restraining cable with hardware, 180,000 BTU/hr minimum flow capacity, limited lifetime warranty
- LL. Item 28 - FLOOR TROUGH (1 EA NIC) DIV 22
1. Equipment not in KEC contract
  2. See division 22
- MM. Item 29 - KETTLE, ELECTRIC, COUNTERTOP (1 REQ'D)  
Cleveland Range Model TKET6T  
Kettle, electric, countertop, twin 6 gallon capacity, tilt type, center support console, two-thirds steam jacket, stainless steel construction
1. 1 ea Model HW1 High wattage option (6 & 12 gallon kettles only)
  2. 1 ea (VOK2) 440/480v/60/3-ph, 26.1kW, 31.4 amp
  3. 2 ea Model KM1 Kettle Markings, for countertop, 1 gallon increments
  4. 2 ea Model CL6 Lift-Off Cover, 6 gallon, per each kettle
  5. 2 ea Model LCH6 Kettle Lift-Off Cover Holder, for 6 gallon kettles, per each kettle
  6. 1 ea Model DPKT Double Pantry Faucet, with swing spout & mounting bracket for tilting kettles
  7. 1 ea Model ST42 Equipment Stand, open base with sliding drain drawer & splash screen, stainless steel top and legs
  8. 2 ea Model SG42 Retractable Splash Guard/Pan Shelf, for drain drawer, for ST42
  9. 1 ea Model KAK Kettle Accessory Kit, includes: clean up brush, paddle, stainless steel whip, brush, draw-off brush, ladle
- NN. Item 30 - NOT USED
- OO. Item 31 - PAN RACK, BUN (1 REQ'D)  
New Age Model 1331U  
"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF
1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty
- PP. Item 32 - WORK TABLE (1 REQ'D)  
Eagle Group Model T3684STE-BS  
Spec-Master® Work Table, 84"W x 36"D, 14/304 stainless steel top with 4-1/2" backsplash, rolled front edge, square turndown ends, heavy gauge stainless steel 1-1/4" O.D. side & rear crossrails, (4) 1-5/8" O.D. legs, 1" adjustable stainless steel feet, Uni-Lok® system, NSF
1. 1 ea Model TABLE BCKSPASH 6" high back splash, 45 degree top, turn down for z-clip application
  2. 1 ea Model E101A Turn down back of splash per table with Z clip
  3. 1 ea Model E36 All welded construction, legs, undershelf & top
- QQ. Item 33 - SHELVING, WALL-MOUNTED (1 LOT REQ'D)

Eagle Group

1. 1 ea Model WS1284-16/3 Wall Shelf, 12" x 84" 16/304 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, stainless steel mounting brackets stud welded to shelf, NSF
  2. 1 ea Model WSP1284 Wall Shelf, with removable hooks, 12" x 84" 16/430 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, 2" x 3/16" flat bar, furnished with double-prong stainless steel hooks, (1) per linear foot, NSF
- RR. Item 34 - INGREDIENT BIN (4 REQ'D)  
Piper Products/Servolift Eastern Model 47-150  
Ingredient Bin, mobile, stainless steel with sliding cover, 150-lb capacity, with full perimeter bumper, 4" casters
- SS. Item 35 - MIXER, PLANETARY (1 REQ'D)  
Hobart Model HL300-4STD  
Legacy Planetary Mixer, 3/4 hp, 200-240/50/60/1, 30-qt. capacity, three fixed speeds, gear-driven transmission, 15 min. timer, #12 taper attachment hub, manual bowl lift, bowl guard, stainless steel bowl, "B" beater & "D" whip, cord with plug
1. 1 ea Model EDDOUGH-HL30AL 30 QT ALUM ED DOUGH ARM
  2. 1 ea Model TRUCK-HL4030 BOWL TRUCK
- TT. Item 36 - MIXER, PLANETARY (1 REQ'D)  
Hobart Model HL120-1STDDEL  
Mixer, Planetary, Bench, 12-qt. capacity, three fixed speeds plus stir speed, gear-driven transmission, 15 min. SmartTimer, #12 taper attachment hub, manual bowl lift, s/s bowl, aluminum "B" beater, s/s "D" wire whip, bowl scraper, ingredient chute, s/s bowl guard, 100-120/50/60/1, 1/2 hp, cord/plug
1. 1 ea Model EDDOUGH-HL12 12 qt aluminum ED dough arm
- UU. Item 37 - EQUIPMENT STAND (1 REQ'D)  
Hobart Model TABLEHW-HL2012  
Mixer Table; 27"Wx32"Dx26"T, the top shelf is drilled for mounting an HL120 or HL200 mixer, includes 4 posts for storing attachments, a lower shelf for additional storage, and 5" diameter lockable wheels
- VV. Item 38 - OVERSHELF (1 REQ'D)  
Eagle Group Model WSP1272  
Wall Shelf, with removable hooks, 12" x 72" 16/430 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, 2" x 3/16" flat bar, furnished with double-prong stainless steel hooks, (1) per linear foot, NSF
- WW. Item 39 - MICROWAVE OVEN (1 REQ'D)  
ACP Model RCS10TS  
Amana® Commercial Microwave Oven, 1.2 cu. ft. capacity, 1000 watts, medium volume, 10 menu pads with capacity to program 100 menus, 5 power levels, 4-stage cooking, braille touch pads, non-removable air filter, side hinged door with glass window, stainless steel interior & exterior, 120v/60/1-ph, 15.0 amps, 15 MCA, 5' cord & NEMA 5-15P, UL, ETL
1. 1 ea 3-year limited warranty
  2. 1 bx Model SB10 Non-Stick Basket, 6" x 12" x 3/4", aids in crisping & browning food, (2 per box), suitable for all ACP Inc. ovens
- XX. Item 40 - NOT USED
- YY. Item 41 - MICROWAVE SHELF (1 REQ'D)  
Eagle Group Model MWS1824  
Microwave Shelf, 18" x 24" 18/430 stainless steel with marine edge on front, hole with black rubber grommet located toward the rear, NSF
- ZZ. Item 42 - WORK COUNTER (1 REQ'D)



- Eagle Group Model SMPT3096-C  
Spec-Master® Marine Prep Table, 96"W x 30"D, 14/304 stainless steel top with box marine edge, (1) 24" x 18" x 12" sink bowls, 10" high backsplash, 1/2" thick poly cutting board with set of slides welded to outside of unit, NSF approved drawer, gusset with Uni-Lok® design, heavy gauge 304 undershelf, 1-5/8" dia. stainless steel feet with flanged adjustable feet, NSF
1. 1 ea Model E36 All welded construction, legs, undershelf & top
  2. 1 ea Model MODIFY Single sink configuration
  3. 1 ea Model 326270 Sink Cover, fits 24" x 18" sink bowl, stainless steel
  4. 1 ea Model E47 Sink cover holders, sized for stainless steel or poly, includes upper & lower track, priced per slot
  5. 1 ea Model -TBOF Twist bracket with overflow for 1 comp FN sinks
- AAA. Item 42.1 - FAUCET & ACCESSORIES (1 LOT REQ'D)  
Fisher
1. 1 ea Model 13269 Faucet, backsplash mount, 8" C.C., 12" long swing spout, 1/2" inlets
  2. 1 ea Model 22306 DrainKing Waste Valve, flat strainer, overflow body, 19 x 21 tube & elbow, 12 GPM drain rate, cast red brass body
- BBB. Item 43 - SHELVING, WALL-MOUNTED (1 LOT REQ'D)  
Eagle Group
1. 1 ea Model WS1272-16/3 Wall Shelf, 12" x 72" 16/304 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, stainless steel mounting brackets stud welded to shelf, NSF
  2. 1 ea Model WSP1272 Wall Shelf, with removable hooks, 12" x 72" 16/430 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, 2" x 3/16" flat bar, furnished with double-prong stainless steel hooks, (1) per linear foot, NSF
- CCC. Item 44 - HAND SINK (1 REQ'D)  
Eagle Group Model HSA-10  
Hand Sink, wall mount, 13-1/2"Wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, requires splash mounted faucet, deep-drawn seamless design-positive drain, inverted "V" edge, NSF
1. 1 ea Model E44 Punching extra faucet holes or changing location of faucet holes from standard
  2. 1 ea Model -LRS Left & right side splashes
- DDD. Item 44.1 - ELECTRONIC FAUCET (1 REQ'D)  
T&S Brass Model EC-3101  
ChekPoint™ Electronic Faucet, wall mount, rigid gooseneck with vandal resistant aerator, AC/DC control module, mixing tee, 100-240 VAC adapter
- EEE. Item 45 - REACH-IN REFRIGERATOR (1 REQ'D)  
Traulsen Model RHT132WUT-HHS  
Spec-Line Refrigerator, Reach-in, one-section, self-contained refrigeration, stainless steel exterior and interior, standard depth, wide half-height door or doors with Santoprene® EZ-Clean Gaskets, INTELA-TRAUL™ microprocessor controls, 6" adjustable stainless steel legs, 1/3 HP, cULus, NSF, ENERGY STAR®
1. 1 ea 115v/60/1ph, 7.0 amps, with cord & NEMA 5-15P
  2. 1 ea 3 year service/labor, 5 year compressor warranty
  3. 1 ea Door field rehinging option, per door (MUST order for all doors)
  4. Left hand hinged from factory
  5. 5 ea EZ-change heavy duty universal trayslide - per pair, slides on top with 3 shelves on bottom
  6. 1 ea Model BT-SMALL Bare-tube coil, 132 models, priced per cabinet
  7. 1 ea Casters, 6" high (set of 4)
- FFF. Item 46 - PAN RACK, BUN (1 REQ'D)

New Age Model 1331U

"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

GGG. Item 47 - TRENCH DRAIN (1 EA NIC) DIV 22

1. Equipment not in KEC contract
2. See division 22

HHH. Item 48 - ICE CUBER (1 REQ'D)

Manitowoc Model IY-0454A

Indigo™ Series Ice Maker, cube-style, air-cooled, self-contained condenser, up to 450-lb approximately/24 hours, DuraTech™ exterior (stainless finish with innovative clear-coat resists fingerprints & dirt), half-dice size cubes, ENERGY STAR®

1. 1 ea 3 year parts & labor Commercial warranty
2. 1 ea 5 year parts & labor Commercial warranty on evaporator
3. 1 ea 5- year parts & 3- year labor Commercial warranty on compressor
4. 1 ea (-161) 115v/60/1ph, 13.2 amps
5. 1 ea (-161X) LuminIce Inhibitor model add suffix "X" to model when ordered with ice maker
6. 1 ea Model IAUCS AuCS Automatic cleaning system
  - a. 1 ea (-161) 115V/60/1-ph
7. 1 cs Model 000005163 AuCS Ice Machine Cleaning Solution, 16 oz. bottle
8. 1 cs Model 000005165 AuCS Ice Machine Sanitizing Solution, 16 oz. bottle
9. 1 ea Model AR-10000 Arctic Pure® Primary Water Filter Assembly

III. Item 49 - ICE BIN FOR ICE MACHINES (1 REQ'D)

Manitowoc Model B-400

Ice Bin, with top-hinged front-opening door, approximately 290 lb ice storage capacity, for top-mounted ice maker, stainless steel exterior

1. 1 ea 3 year parts & labor Commercial warranty
2. 1 ea 6" adjustable stainless steel legs

JJJ. Item 50 - WINDOW TRIM AND WALL CAP (1 LOT REQ'D)

Stainless window trim and wall cap, 18 gauge stainless steel, 6" high, length and width as specified, fully weld two lengths together, 1" full perimeter turn down sealed to wall, seal tightly length of wall cap, enclose ends

1. See FS detail 3, FS4.0

KKK. Item 51 - SHELVING, WALL-MOUNTED (1 LOT REQ'D)

Eagle Group

1. Model WS1236-16/3 Wall Shelf, 12" x 36" 16/304 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, stainless steel mounting brackets stud welded to shelf, NSF
2. 1 ea Model WSP1236 Wall Shelf, with removable hooks, 12" x 36" 16/430 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, 2" x 3/16" flat bar, furnished with double-prong stainless steel hooks, (1) per linear foot, NSF

LLL. Item 52 - WORK COUNTER (1 REQ'D)

Eagle Group Model SMPT30144

Spec-Master® Marine Prep Table, 144"W x 30"D, 14/304 stainless steel top with box marine edge, (2) 24" x 18" x 12" sink bowls, 10" high backsplash, 1/2" thick poly cutting board with set of slides welded to outside of unit, NSF approved drawer, gusset with Uni-Lok® design, heavy gauge 304 undershelf, 1-5/8" dia. stainless steel feet with flanged adjustable feet, NSF

1. 1 ea Model E36 All welded construction, legs, undershelf and top
2. 1 ea Model -TBOF Twist bracket with overflow for 2 comp FN sinks
3. 2 ea Model 326270 Sink Cover, fits 24" x 18" sink bowl, stainless steel

4. 2 ea Model E47 Sink cover holders, sized for stainless steel or poly, includes upper and lower track, priced per slot
  5. Modify sink location and undershelf
  6. 1 ea Model 311772 Legs and Crossbrace Assembly, 304 stainless steel welded construction
- MMM. Item 52.1 - FAUCET & ACCESSORIES (1 LOT REQ'D)  
Fisher
1. 1 ea Model 13277 Faucet, wall/backsplash mount, 8" C.C., 14" long swing spout, 1/2" inlets
  2. 1 ea Model 13390 Pre-Rinse Assembly, 8" c/c splash-mounted mixing valve, with spring action flexible gooseneck, with spray head (1.15 gallons per minute @ 60 PSI), with wall bracket
  3. 1 ea Model 2901-14 Add-On-Faucet, for rigid control valves, with 14" swing spout, 3/8" male inlet
  4. 2 ea Model 22306 DrainKing Waste Valve, flat strainer, overflow body, 19 x 21 tube & elbow, 12 GPM drain rate, cast red brass body
- NNN. Item 53 - SHELVING, WALL-MOUNTED (1 LOT REQ'D)  
Eagle Group
1. 1 ea Model WS1260-16/3 Wall Shelf, 12" x 60" 16/304 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, stainless steel mounting brackets stud welded to shelf, NSF
  2. 1 ea Model WSP1260 Wall Shelf, with removable hooks, 12" x 60" 16/430 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, 2" x 3/16" flat bar, furnished with double-prong stainless steel hooks, (1) per linear foot, NSF
- OOO. Item 54 - WIRE SHELVING (1 LOT REQ'D)  
Metro
1. 5 ea Model 2448NK3 Super Erecta® Shelf, wire, 48"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
  2. 4 ea Model 74UPK3 Super Erecta® SiteSelect™ Post, 74"H, for use with stem casters, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
  3. 2 ea Model 5MP Super Erecta® Stem Caster, swivel, 5" diameter, 1-1/4" face, polyurethane wheel tread, 300 lb. capacity
  4. 2 ea Model 5MPB Super Erecta® Stem Caster, brake (foot operated), 5" diameter, polyurethane wheel tread, 1-1/4" face, 300 lb. capacity, brakes are foot operated
- PPP. Item 55 - CART, UTILITY (6 REQ'D)  
Lakeside Manufacturing Model 947  
Tough Transport® Utility Cart, 2-tier, 42"W x 25-7/8"D x 37-3/8"H, stainless steel construction, open base U-frame with angled stainless steel, 24" x 36" 14-gauge shelves with reinforced edges, 21" shelf clearance, 1" O.D. tube push handle with bumpers, (2) 6" bumpers riveted to front legs, 1000 lb. capacity, (2) 5" reinforced swivel plate casters & (2) 8" fixed casters with non-marking polyurethane wheels, NSF
1. 6 ea Wall-Saver perimeter bumpers
- QQQ. Item 56 - WORK TABLE (1 REQ'D)  
Eagle Group Model T3672SE  
Spec-Master® Work Table, 72"W x 36"D, 14/304 stainless steel top with rolled edges front & back, square turnaround ends, Uni-Lok® gusset system, 18 gauge stainless steel undershelf, (4) 1-5/8" diameter heavy gauge stainless steel legs with 1" adjustable stainless steel feet, NSF
1. 1 ea Model E36 All welded construction, legs, undershelf & top
  2. 1 ea Model SM-NTD3I Integrated Drawer Assembly, 3 tier, with extended cabinet and legs INTEGRATED into table and undershelf, consisting of (3) #502971 style drawers, 20" x 20" x 5" drawer assemblies, 304 style stainless steel, insulated drawer front, removable stainless steel drawer pan, self-closing drawer slides, hemmed safety pull handle. NSF

RRR. Item 57 - WORK TABLE (1 REQ'D)

Eagle Group Model T36120SE

Spec-Master® Work Table, 120"W x 36"D, 14/304 stainless steel top with rolled edges front & back, square turndown ends, Uni-Lok® gusset system, 18 gauge stainless steel undershelf, (6) 1-5/8" diameter heavy gauge s/s legs with 1" adjustable stainless steel feet, NSF

1. 1 ea Model E30 End splash, per end, all heights
2. 1 ea Model TABLE ENDSPLASH 8" high table endsplash, 45 degree top, turn down for z-clip application
3. 1 ea Model E101A Turn down back of splash per table with Z clip
4. 1 ea Model E36 All welded construction, legs, undershelf and top
5. 6 ft Model E35 Apron in front of sink or cutout, 16 gauge stainless steel, per linear foot
6. 4 ea Model E18 Duplex receptacle & mounting plate (under table)
7. 4 ea Model ZZEAGLEGFI For GFI receptacle, add -GFI to model number
8. 1 ea Model 311772 Legs & Crossbrace Assembly, 304 stainless steel welded construction
9. 2 ea Model 502971 Spec-Master® Heavy Duty Drawer Assembly, 20" x 20" x 5", 304 type stainless steel, insulated drawer front, removable drawer pan, self-closing drawer slides, stackable, hemmed safety pull handle
10. 1 ea Model SM-NTD3I Integrated Drawer Assembly, 3 tier, with extended cabinet and legs INTEGRATED into table and undershelf, consisting of (3) #502971 style drawers, 20" x 20" x 5" drawer assemblies, 304 style stainless steel, insulated drawer front, removable stainless steel drawer pan, self-closing drawer slides, hemmed safety pull handle. NSF
11. 1 ea Model E24 Sink, 18" x 20" x 14" bowl, for 30"W tables, complete with faucet and basket drain
12. 1 ea Model -OF Hole for twist handle drain w/overflow drain
13. 1 ea Model -TB Twist brackets for 1 comp FN sinks
14. 1 ea Model SUPPORT Stainless flat stock table end support for knife rack, item 57.2

SSS. Item 57.1 - FAUCET & ACCESSORIES (1 LOT REQ'D)

Fisher

1. 1 ea Model 3315 Faucet, deck-mounted, 8" C.C. mixing valve, 12" swing gooseneck spout, with 1/2" inlets
2. 1 ea Model 22306 DrainKing Waste Valve, flat strainer, overflow body, 19 x 21 tube & elbow, 12 GPM drain rate, cast red brass body

TTT. Item 57.2 - KNIFE SANITIZER (1 REQ'D)

Edlund Model KSS-5050DT

Knife Rack Sanitizing System, liquid sanitizing, air drying & storage, built in KR-50R, removable insert and tank, enclosed in stainless steel with draining tube, made in USA, NSF

UUU. Item 58 - CAN OPENER (1 REQ'D)

Edlund Model 203/115V

Can Opener, electric, 2-speed (slower speed is ideal for opening smaller cans), recommended usage is up to 75 cans per day, 115v/60/1-ph

VVV. Item 59 - FOOD PROCESSOR (1 REQ'D)

Robot Coupe Model R2N ULTRA

Commercial Food Processor, 3 qt. stainless steel bowl with handle, kidney-shaped opening, vegetable prep attachment with external ejection, "S" blade, 27577 5/64" (2mm) grating disc & 27566 5/32" (4mm) slicing disc, continuous feed, bowl attachment designed for vertical cutting & mixing, on/off & pulse switch, single speed, 1725 RPM, 120v/60/1-ph, 7 amps, 1 HP, ETL electrical & sanitation, cETL

1. 1 ea 3 year motor warranty

WWW. Item 60 - NOT USED

XXX. Item 61 - TILTING KETTLE (1 REQ'D)

Cleveland Range Model KGL40TSH

Short Series™ Steam Jacketed Kettle, gas, tilting, 40-gallon capacity, full steam jacket design, 38" rim height, floor mounted control console supports, stainless steel exterior finish, standard with flanged feet, 50 psi rating, electronic spark ignition

1. 1 ea Natural Gas, 3200 ft Elevation
2. 1 ea 120v/60/1-ph, 10.0 amp, electronic spark ignition, cord & plug for controls
3. 1 ea Model TD2 2" tangent draw-off valve with strainer
4. 1 ea Model DS2 Perforated Drain Strainer, 2" draw-off, 3/16" strainer holes
5. 1 ea Model KM2 Kettle Markings, 5 gallon increments
6. 1 ea Gallon marks
7. 1 ea Model FS40SHG Food Strainer, 40 gallon, for gas short series kettles, stainless steel
8. 1 ea Model CHS40GTSH Spring-assisted cover (40 gallon)
9. 1 ea Model DPKT Double Pantry Faucet, with swing spout & mounting bracket for tilting kettles
10. 1 ea Model PCK Pan Carrier, for all floor model kettles 25 gal & larger except KDM-25-T
11. 1 ea Model KAK Kettle Accessory Kit, includes: clean up brush, paddle, stainless steel whip, brush, draw-off brush, ladle

YYY. Item 61.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)

Dormont Manufacturing Model 1675KIT48

Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 full port valve (2) 90° elbows, coiled restraining cable with hardware, 180,000 BTU/hr minimum flow capacity, limited lifetime warranty

ZZZ. Item 62 - FLOOR TROUGH (1 EA NIC) DIV 22

1. Equipment not in KEC contract
2. See division 22

AAAA. Item 63 - CONVECTION STEAMER (1 REQ'D)

Cleveland Range Model 24CGA10.2ES

Steamcraft® Gemini™ 10 Convection Steamer, pressureless, gas, 2 compartments with individual generators, (5) 12 x 20 x 2-1/2 pans/compartiment capacity, electro-mechanical 60 minute timers, 1 standard treated & tap water connection, stainless steel construction, 6" adjustable legs with flanged feet, twin 50,000 BTU, total 100,000 BTU, ENERGY STAR®

1. 1 ea Model CWT-06 Claris Water Treatment System, includes (1) pre-filter, (1) Claris X-large steam system, (1) Claris flow meter and (1) water test kit
2. 1 ea Natural Gas 3200ft Elevation
3. 1 ea (VOS115) 115v/60/1-ph, 2.0 amp, 2-wire (DO NOT connect to GFI outlet)

BBBB. Item 63.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)

Dormont Manufacturing Model 1675KIT48

Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 full port valve (2) 90° elbows, coiled restraining cable with hardware, 180,000 BTU/hr minimum flow capacity, limited lifetime warranty

CCCC. Item 64 - CONVECTION STEAMER (1 REQ'D)

Cleveland Range Model 24CGA10.2ES

Steamcraft® Gemini™ 10 Convection Steamer, pressureless, gas, 2 compartments with individual generators, (5) 12 x 20 x 2-1/2 pans/compartiment capacity, electro-mechanical 60 minute timers, 1 standard treated & tap water connection, stainless steel construction, 6" adjustable legs with flanged feet, twin 50,000 BTU, total 100,000 BTU, ENERGY STAR®

1. 1 ea Model CWT-06 Claris Water Treatment System, includes (1) pre-filter, (1) Claris X-large steam system, (1) Claris flow meter and (1) water test kit

2. 1 ea Natural Gas 3200ft Elevation
3. 1 ea (VOS115) 115v/60/1-ph, 2.0 amp, 2-wire (DO NOT connect to GFI outlet)

DDDD. Item 64.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)

Dormont Manufacturing Model 1675KIT48

Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 full port valve (2) 90° elbows, coiled restraining cable with hardware, 180,000 BTU/hr minimum flow capacity, limited lifetime warranty

EEEE. Item 65 - CONVECTION OVEN (1 REQ'D)

Blodgett Oven Model DFG100 DOUBLE

Convection Oven, gas, double-deck, standard depth, capacity (5) 18" x 26" pans per compartment, (SSD) solid state digital controls, 2-speed fans, , interior light, simultaneous operated doors with glass, porcelain crumb tray, stainless steel front, sides & top, 6" stainless steel legs, flue connector, 55,000 BTU each, cETL, NSF, CE

1. 1 ea (3) year parts, (2) year labor warranty and (5) additional year door warranty (parts only)
2. 1 ea Natural gas, 3200 ft Elevation
3. 2 ea 115v/60/1-ph, 6.0 amps, 3-wire with ground, 6' cord, NEMA 5-15P, 1/3 hp (per deck)
4. 1 ea Model SSD Top Oven: Solid State digital with Pulse Plus and Cook & Hold
5. 1 ea Top Oven: Controls on right side of oven
6. 1 ea Model SSD Bottom Oven: Solid State digital with Pulse Plus and Cook & Hold
7. 1 ea Bottom Oven: Controls on right side of oven
8. 1 ea Draft diverter
9. 2 ea Solid stainless steel back
10. 1 ea 6" casters (set), in lieu of legs
11. 2 ea Extra racks (each)
12. 1 ea Gas manifold

FFFF. Item 65.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)

Dormont Manufacturing Model 1675KITCF2S48

Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Safety Quik® QDV, 2 Swivel MAX®, and coiled restraining cable with hardware, 160,000 BTU/hr minimum flow capacity, limited lifetime warranty

GGGG. Item 66 - CONVECTION OVEN (1 REQ'D)

Blodgett Oven Model DFG100 DOUBLE

Convection Oven, gas, double-deck, standard depth, capacity (5) 18" x 26" pans per compartment, (SSD) solid state digital controls, 2-speed fans, , interior light, simultaneous operated doors with glass, porcelain crumb tray, stainless steel front, sides & top, 6" stainless steel legs, flue connector, 55,000 BTU each, cETL, NSF, CE

1. 1 ea (3) year parts, (2) year labor warranty and (2) additional year door warranty (parts only)
2. 1 ea Natural gas, 3200 ft Elevation
3. 2 ea 115v/60/1-ph, 6.0 amps, 3-wire with ground, 6' cord, NEMA 5-15P, 1/3 hp (per deck)
4. 1 ea Model SSD Top Oven: Solid State digital with Pulse Plus and Cook & Hold
5. 1 ea Top Oven: Controls on right side of oven
6. 1 ea Model SSD Bottom Oven: Solid State digital with Pulse Plus and Cook & Hold
7. 1 ea Bottom Oven: Controls on right side of oven
8. 1 ea Draft diverter
9. 2 ea Solid stainless steel back
10. 1 ea 6" casters (set), in lieu of legs
11. 2 ea Extra racks (each)
12. 1 ea Gas manifold

HHHH. Item 66.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)

- Dormont Manufacturing Model 1675KITCF2S48  
Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Safety Quik® QDV, 2 Swivel MAX®, and coiled restraining cable with hardware, 160,000 BTU/hr minimum flow capacity, limited lifetime warranty
- IIII. Item 67 - RANGE, 36", 5 OPEN BURNERS (1 REQ'D)  
Southbend Model 4365D  
Ultimate Restaurant Range, gas, 36", (3) non-clog burners front, (2) pyromax burners rear, standard grates, standing pilot, (1) standard oven with battery spark ignition, includes (1) rack, 22-1/2" flue riser with shelf, stainless steel front, sides, shelf & 6" adjustable legs, 224,000 BTU, CSA, NSF
1. 1 ea Natural Gas, 3200 ft Elevation
  2. 1 ea Battery spark ignition
  3. 1 ea Casters, 2 locking & 2 standard, in lieu of legs
- JJJJ. Item 67.1 - SAFETY SYSTEM MOVEABLE GAS CONNECTOR (1 REQ'D)  
Dormont Manufacturing Model 1675KITCF2S48  
Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Safety Quik® QDV, 2 Swivel MAX®, and coiled restraining cable with hardware, 160,000 BTU/hr minimum flow capacity, limited lifetime warranty
- KKKK. Item 68 - KETTLE / POT FILLER FAUCETS (1 REQ'D)  
Fisher Model 2240  
Pot Filler, wall mount, 8" adjustable wall control valve, vacuum breaker, wall hook, 60" hose
- LLLL. Item 69 - EXHAUST SYSTEM (1 LOT NIC) DIV 22/23
1. Not in KEC contract
  2. See Division 22/23
- MMMM. Item 70 - NOT USED
- NNNN. Item 71 - COVER, STAINLESS STEEL (1 LOT REQ'D)  
45 degree top gas line cover, stainless steel, 18/304
1. See Detail 2, FS6.0
- OOOO. Item 72 - STAINLESS WALL FLASHING (1 LOT REQ'D)  
Wall flashing, stainless steel, of no less than 304 20 ga., pattern as noted, with an overhang of eighteen inches on all areas in contact with hood. Verify with all applicable codes and ordinances.
1. Per FS drawings and elevations
- PPPP. Item 73 - THREE (3) COMPARTMENT SINK (1 REQ'D)  
Eagle Group Model FN2860-3-24-14/3  
Spec-Master® Sink, three compartment, stainless steel, with 24" left & right-hand drainboards, 28" front-to-back x 20"W compartment, 14"D, with 9-1/2"H splash, stainless steel open frame base, boxed crossrails, 2 set of faucet holes, 14/304 stainless steel, NSF
1. 1 ea Model E36 All welded construction, legs, undershelf & top
  2. 1 ea Model SINK BCKSPASH 10" high dishtable back splash, 45 degree top, turn down for z-clip application
  3. 1 ea Model E101A Turn down back of splash per table with Z clip
  4. 1 ea Model E49 stainless steel undershelf under drainboards, up to 24" (Right side only)
  5. 1 ea Model 311772 Legs & Crossbrace Assembly, 304 stainless steel welded construction (Right side only)
  6. 3 ea Model -OF Hole for twist handle drain with overflow drain (drain not included)
  7. 3 ea Model -TB Twist bracket, per drain
- QQQQ. Item 73.1 - FAUCET & ACCESSORIES (1 LOT REQ'D)  
Fisher
1. 1 ea Model 5414 Faucet, splash-mounted, 8" centers, 14" swing spout, 3/4" inlets

2. 1 ea Model 99449 Pre-Rinse Unit, 8" c/c backsplash mount control, with spring action flexible gooseneck, wall bracket, 3/4" faucet with 14" Add-On-Faucet
3. 3 ea Model 22306 DrainKing Waste Valve, flat strainer, overflow body, 19 x 21 tube & elbow, 12 GPM drain rate, cast red brass body

RRRR. Item 74 - SHELVING, WALL-MOUNTED (2 REQ'D)

Eagle Group Model WS1224-16/3

Wall Shelf, 12" x 24" 16/304 stainless steel, 1-1/2" roll on front, 1-1/2" upturn on rear & ends, stainless steel mounting brackets stud welded to shelf, NSF

SSSS. Item 75 - STAINLESS WALL FLASHING (1 LOT REQ'D)

Wall flashing, stainless steel, of no less than 304 20 ga., pattern as noted, with an overhang of eighteen inches on all areas in contact with hood. Verify with all applicable codes and ordinances.

1. Per FS drawings and elevations

TTTT. Item 76 - POT & PAN SHELVING RACK (1 REQ'D)

Metro Model PR48VX4

MetroMax i™ Mobile Drying Rack Unit, 26"W x 50"L x 68"H, 4-tier, includes: (4) cutting board/tray drying rack, built in Microban® antimicrobial product protection

UUUU. Item 77 - HAND SINK (1 REQ'D)

Eagle Group Model HSA-10

Hand Sink, wall mount, 13-1/2"Wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, requires splash mounted faucet, deep-drawn seamless design-positive drain, inverted "V" edge, NSF

1. 1 ea Model E44 Punching extra faucet holes or changing location of faucet holes from standard
2. 1 ea Model -LRS Left & right side splashes

VVVV. Item 77.1 - ELECTRONIC FAUCET (1 REQ'D)

T&S Brass Model EC-3101

ChekPoint™ Electronic Faucet, wall mount, rigid gooseneck with vandal resistant aerator, AC/DC control module, mixing tee, 100-240 VAC adapter

WWWW. Item 78 - SOILED DISHTABLE (1 REQ'D)

Eagle Group Model CUSTOM

Spec-Master® Soiled Dishtable, corner design, 130" x 72" L shape, for left-to-right operation, 14 gauge type 304 stainless steel top, stainless steel tubular legs, crossrails & gussets, adjustable feet, NSF

1. 1 ea Model E41A Disposal provision package, includes weldment only for cone which are furnished by KEC (item 79), control panel bracket weldment, and holes for pre-rinse & anti-siphon vacuum breaker
2. 1 ea Model DISHTB BCKSPASH 10" high dishtable back splash, 45 degree top, turn down for z-clip application
3. 1 ea Model E36 All welded construction, legs, undershelf and top
4. 1 ea Rack Slides, for 18" Cone
5. 1 ea Model E101A Turn down back of splash per table with Z clip
6. 1 ea Model E30 End splash, per end, all heights (left end)
7. 4 ft Model E100 Additional Top length, NSF construction, per linear foot
8. 2 ea Model 311772 Legs and Crossbrace Assembly, 304 stainless steel welded construction
9. 1 ea Model E102 Pass-thru maximum 12"W, up to 3 linear feet, 14/304 stainless steel
10. 1 ea Rack guide, curved, 2" x 1/4" flat bar, 14/304 stainless steel, removable
11. 1 ea Corner turn, 14/304 stainless steel
12. 1 ea Model E108 Field joint, ready for field welding by KEC, 14/304 stainless steel
13. 1 ea Model 606480 Dishtable Undershelf, 36"W x 24"D, 18 gauge 300 stainless steel
14. 1 ea Model E110 Sink, 24" x 26-1/2" x 14", 14/304 stainless steel



15. 1 ea Model -TBOF Twist bracket with overflow for 1 comp FN sinks
16. Per FS Drawings & Elevations
17. Field Measurements Required

XXXX. Item 78.1 - FAUCET & ACCESORIES (1 LOT REQ'D)

Fisher

1. 1 ea Model 13390 Pre-Rinse Assembly, 8" c/c splash-mounted mixing valve, with spring action flexible gooseneck, with spray head (1.15 gallons per minute @ 60 PSI), with wall bracket
2. 1 ea Model 34924 Faucet, 8" c/c backsplash mount, with 10" swing spout, with lever handles, includes EZ-Install adapter, POP packaging
3. 1 ea Model 22306 DrainKing Waste Valve, flat strainer, overflow body, 19 x 21 tube & elbow, 12 GPM drain rate, cast red brass body

YYYY. Item 79 - DISPOSER (1 REQ'D)

InSinkErator Model SS-200-18A-CC202

SS-200™ Complete Disposer Package, with 18" diameter bowl, 6-5/8" diameter inlet, with removable splash baffle & reversible bowl cover, 2 HP motor, stainless steel construction, includes syphon breaker, solenoid valve, flow control valve, CC-202 control center, auto reversing, adjustable leg kit

1. 1 ea Model SLEEVE GUARD Sleeve silver guard (less baffle)
2. 1 ea Standard height disposer body
3. 1 ea 208v/60/3-ph, 3.3 amps

ZZZZ. Item 79.1 - VACUUM BREAKER ASSEMBLY (1 REQ'D)

Fisher Model 3990

Atmospheric Vacuum Breaker, 45° ledge mount, 1/2" M inlet

AAAAA. Item 80 - NOT USED

BBBBB. Item 81 - DISHWASHER, CONVEYOR TYPE (1 REQ'D)

Hobart Model CL44E-16

L/R 15KW Tank Heat 480/60/3 30KW Booster Conveyor Dishwasher, single tank, 202 racks/hour, insulated hinged doors, .62 gallon/rack, stainless steel enclosure panels, Microprocessor controls with Low Temperature & Dirty Water Indicators, ENERGY STAR®

1. 2 ea Model VNTHD/E-DOM E-series vent hood domestic
2. 1 ea Model 1/2INSHK-ABSRBR Water hammer arrestor 1/2"
3. 1 ea Model CLE/TBL-SWITCH Table LMT switch CLE-Series
4. 1 ea Model CL44E-FETSTD \*Standard feet
5. 1 ea Model CL44E-FETSTD \*Standard feet

CCCCC. Item 81.1 - WATER FILTER ASSEMBLY (1 REQ'D)

Everpure Model EV979911

HTS-11 Kleenware™ System, Cartridge incorporates HydroBlend, a specially blended compound that inhibits limescale build-up and reduces corrosion

DDDDD. Item 82 - PANT LEG HOOD & VENT DUCT (2 REQ'D)

Eagle Group Model DVS-72

SpecAIR™ Condensate Vent, 16"W x 4"D x 72"H, continuously liquid tight, heavy gauge 304 stainless steel, mounts to dishwasher, NSF

EEEEE. Item 83 - CLASS 2 EXHAUST SYSTEM (1 LOT REQ'D) DIV 22/23

1. Equipment not in KEC contract
2. See division 22/23

FFFFF. Item 84 - CLEAN DISHTABLE (1 REQ'D)

Eagle Group Model CDTR-84-14/3

Spec-Master® Dishtable, clean, straight design, 84"L, for left-to-right operation, 14/304 stainless steel top, stainless steel tubular legs, crossrails, gussets & feet, NSF

1. 1 ea Model DISHTB BCKSPASH 10" high dishtable back splash, 45 degree top, turn down for z-clip application
2. 1 ea Model E101A Turn down back of splash per table with Z clip
3. 1 ea Model E36 All welded construction, legs, undershelf and top
4. 1 ea Model SCRAP TROUGH Scrap Trough, 5"W x 2"D, 1-1/2" center drain opening, removable basket with handles, stainless steel construction
5. 1 ea Model E120 Table limit switch provision (switch by KEC, item 81)
6. 1 ea Model 606481 Dishtable Undershelf, 48"W x 24"D, 18 gauge 300 stainless steel
7. 1 ea Model 311772 Legs and Crossbrace Assembly, 304 stainless steel welded construction
8. 1 ea Model 502972 Spec-Master® Heavy Duty Drawer Assembly, 20" x 15" x 5", 304 type stainless steel, insulated drawer front, removable drawer pan, self-closing drawer slides, stackable, hemmed safety pull handle (table must be field drilled for mounting)

GGGGG. Item 85 - SHELVING, WALL-MOUNTED (1 REQ'D)

Eagle Group Model WS1260-16/3

Wall Shelf, 12" x 60" 16 gauge type 304 stainless steel, 1 1/2" roll on front, 1 1/2" upturn on rear and ends, stainless steel mounting brackets stud welded to shelf, NSF

HHHHH. Item 86 - POT & PAN SHELVING RACK (1 REQ'D)

Metro Model PR48VX3

MetroMax i™ Mobile Drying Rack Unit, 26"W x 50"L x 68"H, 4-tier, includes: (2) drop-ins & (1) cutting board/tray drying rack, built in Microban® antimicrobial product protection

IIIII. Item 87 - DUNNAGE RACK (1 REQ'D)

New Age Model 2014

Dunnage Rack, 36"W x 24"D x 8"H, all welded aluminum construction, 1-1/2" x 1-3/4" x 0.070 tubing, welded aluminum caps on feet, weight capacity 2500 lbs., NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

JJJJJ. Item 88 - DUNNAGE RACK (1 REQ'D)

New Age Model 2016

Dunnage Rack, 60"W x 24"D x 8"H, all welded aluminum construction, 1-1/2" x 1-3/4" x 0.070 tubing, welded aluminum caps on feet, weight capacity 2000 lbs., NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

KKKKK. Item 89 - WIRE SHELVING (1 LOT REQ'D)

Metro

1. 20 ea Model 2472NK3 Super Erecta® Shelf, wire, 72"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
2. 5 ea Model 2454NK3 Super Erecta® Shelf, wire, 54"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
3. 10 ea Model 2448NK3 Super Erecta® Shelf, wire, 48"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3 epoxy coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
4. 28 ea Model 86PK3 Super Erecta® SiteSelect™ Post, 86-5/8"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
5. 20 ea Model 9995Z Super Erecta® "S" Hook, zinc

LLLLL. Item 90 - TRENCH DRAIN (3 EA NIC) DIV 22

1. Equipment not in KEC contract
2. See division 22

MMMMM. Item 91 - MOBILE ENCLOSED CABINET (4 REQ'D)

Food Warming Equip Model ETC-1826-16

Enclosed Transport Cabinet, full height, non-heated & non-insulated, (16) removable slides fixed 3" OC for 18" x 26" pans-trays, (1) insulated door, stainless steel interior & exterior, recessed hand grip

1. 4 ea Two year limited parts & one year labor warranty
2. 4 ea Top corner bumpers, set of (4)
3. 4 ea 5" Caster standard: EZ Roll Heavy Duty Poly, (2) rigid, (2) swivel with brakes

NNNNN. Item 92 - MOBILE ENCLOSED CABINET (4 REQ'D)

Food Warming Equip Model ETC-1826-16

Enclosed Transport Cabinet, full height, non-heated & non-insulated, (16) removable slides fixed 3" OC for 18" x 26" pans-trays, (1) insulated door, stainless steel interior & exterior, recessed hand grip

1. 4 ea Two year limited parts & one year labor warranty
2. 4 ea Top corner bumpers, set of (4)
3. 4 ea 5" Caster standard: EZ Roll Heavy Duty Poly, (2) rigid, (2) swivel with brakes

OOOOO. Item 93 - NOT USED

PPPPP. Item 94 - NOT USED

QQQQQ. Item 95 - NOT USED

RRRRR. Item 96 - NOT USED

SSSSS. Item 97 - LOCKERS (1 LOT NIC) NIC

1. *Equipment not in KEC contract*

TTTTT. Item 97.1 - COAT RACK (1 REQ'D)

CSL Foodservice & Hospitality Model TMKMB-3336

Traditional Coat Rack, 33" - 36" unit, 5/8" hanging rod, chrome

UUUUU. Item 98 - WIRE SHELVING (1 LOT REQ'D)

Metro

1. 4 ea Model 2424NK3 Super Erecta® Shelf, wire, 24"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
2. 4 ea Model 74UPK3 Super Erecta® SiteSelect™ Post, 74"H, for use with stem casters, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
3. 2 ea Model 5MP Super Erecta® Stem Caster, swivel, 5" diameter, 1-1/4" face, polyurethane wheel tread, 300 lb. capacity
4. 2 ea Model 5MPB Super Erecta® Stem Caster, brake (foot operated), 5" diameter, polyurethane wheel tread, 1-1/4" face, 300 lb. capacity, brakes are foot operated

VVVVV. Item 99 - WIRE SHELVING (1 LOT REQ'D)

Metro

1. 4 ea Model 2448NK3 Super Erecta® Shelf, wire, 48"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
2. 4 ea Model 2430NK3 Super Erecta® Shelf, wire, 30"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
3. 8 ea Model 74UPK3 Super Erecta® SiteSelect™ Post, 74"H, for use with stem casters, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
4. 4 ea Model 5MP Super Erecta® Stem Caster, swivel, 5" diameter, 1-1/4" face, polyurethane wheel tread, 300 lb. capacity
5. 4 ea Model 5MPB Super Erecta® Stem Caster, brake (foot operated), 5" diameter, polyurethane wheel tread, 1-1/4" face, 300 lb. capacity, brakes are foot operated

WWWWW. Item 100 - NOT USED

XXXXX. Item 101 - MOP BASIN (1 EA NIC) DIV 22

1. Equipment not in KEC contract
2. See division 22

YYYYY. Item 102 - SERVICE FAUCET (1 EA NIC) DIV 22

1. Equipment not in KEC contract
2. See division 22

ZZZZZ. Item 103 - HOSE BIB FAUCET (1 EA NIC) DIV 22

1. Equipment not in KEC contract
2. See division 22

AAAAA. Item 104 - MOP BROOM HOLDER (1 REQ'D)

Eagle Group Model US0836-16/3  
Utility Shelf with Mop Hanger, 8" x 36", 16/304 stainless steel

BBBBB. Item 105 - WIRE SHELVING (1 LOT REQ'D)

Metro

1. 25 ea Model 2460NK3 Super Erecta® Shelf, wire, 60"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
2. 10 ea Model 2448NK3 Super Erecta® Shelf, wire, 48"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
3. 28 ea Model 86PK3 Super Erecta® SiteSelect™ Post, 86-5/8"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
4. 30 ea Model 9995Z Super Erecta® "S" Hook, zinc

CCCCC. Item 106 - CART, UTILITY (2 REQ'D)

Lakeside Manufacturing Model 947

Tough Transport® Utility Cart, 2-tier, 42"W x 25-7/8"D x 37-3/8"H, stainless steel construction, open base U-frame with angled stainless steel, 24" x 36" 14-gauge shelves with reinforced edges, 21" shelf clearance, 1" O.D. tube push handle with bumpers, (2) 6" bumpers riveted to front legs, 1000 lb. capacity, (2) 5" reinforced swivel plate casters & (2) 8" fixed casters with non-marking polyurethane wheels, NSF

1. 2 ea Casters, 5" cushion tread
2. 2 ea Wall-Saver perimeter bumpers

DDDDD. Item 107 - HOSE REEL (1 LOT REQ'D)

Fisher

1. 1 ea Model 29262 Hose Reel Assembly, exposed reel rinse with spray gun, reel stainless steel construction, 50 feet of 5/8" ID, 3 ply, working pressure of 150 PSI, withstands 140° F water temperature, 1/2" NPT female or 3/4" F garden hose inlet
2. 1 ea Model 1801 Reel Rinse Control Unit, valves, gauges and connections are completely enclosed within a stainless steel cabinet, dual check backflow preventer, water hammer silencer, 90° panel lock, padlock hasp & finger latch, 1/2" NPT female inlets & outlets

EEEEEE. Item 108 - TRENCH DRAIN (1 EA NIC) DIV 22

1. Equipment not in KEC contract
2. See division 22

FFFFFF. Item 109 - CART, UTILITY (5 REQ'D)

Lakeside Manufacturing Model 953

Tough Transport® Utility Cart, 2-tier, 48"W x 25-3/4"D x 37-3/8"H, stainless steel construction, open base U-frame with angled stainless steel, 24" x 42" 14-gauge shelves with reinforced edges, 21" shelf clearance, 1" O.D. tube push handle with bumpers, (2) 6" bumpers riveted to front legs, 1000 lb. capacity, (2) 5" reinforced swivel plate casters & (2) 8" fixed casters with non-marking polyurethane wheels, NSF

1. 5 ea Wall-Saver perimeter bumpers

GGGGGG. Item 110 - NOT USED

HHHHHH. Item 111 - DOLLY (2 REQ'D)

New Age Model 1194

Sheet Pan Dolly, (2) tier, fame with sides & handle, 21" Wx 30"D x 44-1/2"H, 1200 lbs. capacity, welded aluminum construction, 5" platform swivel casters, NSF

1. 2 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

IIIIII. Item 112 - AIR CURTAIN (1 REQ'D)

Berner Model SHC07-2072A

Sanitation Certified Series High Performance Air Curtain, 72" long, unheated, (2) 3/4 hp motor, for doors up to 7-feet high, aluminum housing with white finish, indoor/outdoor, UL listed

1. 1 ea Five year parts warranty (unheated units)
2. 1 ea Model A 120v/60/1-ph, 15.0 amps
3. 2 ea Model 91STR120-DA-P Deluxe Control Package, includes: plunger style door switch & factory installed time delay relay, 120V
4. 1 ea Model 33A020W-SS-WHT-K Wall On/Off Switch & Cover Plate, single speed, unheated models only
5. 2 ea Model 66ADS000DMB Mounting Bracket, for plunger door switch used with manual swing doors
6. 1 ea White powder coat exterior finish standard

JJJJJJ. Item 113 - CORNER GUARD (1 LOT REQ'D)

Eagle Group

1. 9 ea Model CORNER GUARD Stainless Steel Corner Guard-2-1/8" x 2-1/8"x 48" -16/304 stainless steel
2. 2 ea Model END CAP End Cap, outside channel type, 2" edges, 43" high, verify wall width required, stainless steel, adhesive tape included

KKKKKK. Item Q01 - WIRE SHELVING (1 LOT REQ'D)

Metro

1. 5 ea Model 2460NK3 Super Erecta® Shelf, wire, 60"W x 24"D, plastic split sleeves are included in each carton, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
2. 4 ea Model 74UPK3 Super Erecta® SiteSelect™ Post, 74"H, for use with stem casters, Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
3. 2 ea Model 5MP Super Erecta® Stem Caster, swivel, 5" diameter, 1-1/4" face, polyurethane wheel tread, 300 lb. capacity
4. 2 ea Model 5MPB Super Erecta® Stem Caster, brake (foot operated), 5" diameter, polyurethane wheel tread, 1-1/4" face, 300 lb. capacity, brakes are foot operated

LLLLLL. Item Q02 - HEATED CABINET, MOBILE (1 REQ'D)

Food Warming Equip Model UHS-12

Heated Cabinet, mobile, full-height, (1) door, insulated, humi-temp heat system with eye level controls, (12) pair universal tray slides 4-1/2" OC, for various size trays, pans & GN 2/1, removable slides & uprights, 20 gauge stainless steel exterior with 22 gauge stainless steel interior construction, heavy duty push bars, full bumper

1. 1 ea Two year limited parts & one year labor warranty
2. 1 ea 120v/50/60/1-ph, 11.3 amps, 1350w, NEMA 5-15P

3. 1 ea Twist-lock plug
4. 1 ea Cord winding brackets (pair)
5. 1 ea Menu card holder (each)
6. 2 ea Paddle latch (flush mount) (per door)
7. 1 ea Tubular s/s handles, welded in place
8. 1 ea Top corner bumpers, set of 4
9. 1 ea 5" Caster standard: EZ Roll Heavy Duty Poly, 2-rigid, 2-swivel with brakes (set)

MMMMMM. Item Q03 - WORK COUNTER (1 REQ'D)

Eagle Group Model CBH3060SE-BS

Spec-Master® Work Table, cabinet base with hinged doors, 60"W x 30"D, 14/304 stainless steel top with 4-1/2" backsplash, rolled front edge, square turndown ends, stainless steel wrapper, hinged doors, stainless steel legs, adjustable feet, NSF

1. 1 ea Model TABLE BACKSPLASH 6" high table back splash, 45 degree top, turn down for z-clip application
2. 1 ea Model E101A Turn down back of splash per table with Z clip
3. 1 ea Model E20 Sink, 10" x 14" x 5" bowl, for 30"W tables, complete with faucet and basket drain
4. 1 ea Model 300722 Lever Handle Drain, with overflow, 2" IPS connection
5. 1 ea Model E33 Sink splashes, single thickness 4" tall, each
6. 1 ea Model BASE Stainless steel curb base, provide floor template

NNNNNN. Item Q03.1 - ELECTRONIC FAUCET (1 REQ'D)

T&S Brass Model EC-3100

ChekPoint™ Electronic Faucet, deck mount, rigid gooseneck, vandal resistant aerator, AC/DC control module, mixing tee, 100-240 VAC adapter

OOOOOO. Item Q04 - PAN RACK, BUN (1 REQ'D)

New Age Model 1331U

"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

PPPPPP. Item Q05 - REACH-IN REFRIGERATOR (1 REQ'D)

Traulsen Model RHT132WUT-FHS

Spec-Line Refrigerator, Reach-in, one-section, self-contained refrigeration, stainless steel exterior and interior, standard depth, wide full-height door or doors with Santoprene® EZ-Clean Gaskets, INTELA-TRAUL™ microprocessor controls, 6" adjustable stainless steel legs, 1/3 HP, cULus, NSF, ENERGY STAR®

1. 1 ea 115v/60/1ph, 7.0 amps, with cord & NEMA 5-15P
2. 1 ea 3 year service/labor, 5 year compressor warranty
3. 1 ea Door field rehinging option, per door
4. 1 ea Model BT-SMALL Bare-tube coil, 132 models, priced per cabinet
5. Shipped with left hand hinge from factory, with re-hinge option

QQQQQQ. Item Q06 - REFRIGERATED DISPLAY CASE (1 REQ'D)

Federal Industries Model LPRSS4

Specialty Display Low Profile Self-Serve Refrigerated Merchandiser, 48"W x 34"D x 46"H, self contained refrigeration with condensate evaporator, adjustable temperature control, energy saving night curtain, horizontal top light, (2) tiers of solid black metal shelves, stainless steel display deck & black interior, black trim, tempered glass ends, cord & plug, choice of laminate, 120v/60hz/1ph electrical, UL safety & UL sanitation approved, 1/3 HP

1. 1 ea Self-contained refrigeration
2. 1 ea 120v/60/1, 1/3 hp, 16.0 amps, cord & plug (NEMA 5-20P), R404A refrigerant, with condensate pan

3. 1 ea Laminate standard color – Black, KEC to coordinate with interior design
4. 1 ea Rear access doors

RRRRRR. Item Q07 - REFRIGERATED SANDWICH UNIT (1 REQ'D)

Randell Model 9030K-7

Refrigerated Counter/Salad Top, 48" L, 33" D, two section, (2) 18" doors, (3) 12" x 20" or (18) 1/6 pan capacity, stainless steel exterior, aluminum interior, 6" casters, side-mounted self-contained refrigeration system, 1/3 HP

1. 1 ea Self-contained refrigeration
2. 1 ea 115v/60/1-ph, 9.0amps, 8' cord, NEMA 5-15P
3. 1 ea Model SMBOR50R48 Cutting Board, 1/2", richlite
4. 1 ea Model SMCVRHGCP48 Hinged glass cover and counter protector
5. 1 ea Model RSKCKPLT48 Kick/Toe Plate, for 48" RanServe units, laminate or stainless. KEC to coordinate with interior design

SSSSSS. Item Q08 - UTILITY SERVING COUNTER (1 REQ'D)

Randell Model 14G ST-4S

RanServe Utility Unit, 48" L, 30" D, 35" H, mobile modular, open cabinet base with 2 shelves, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking)

1. 1 ea Model 9550A Drop-In Freezer/Plate Chiller, 6 gallon, top opening with 2 insulated hinged covers, stainless steel interior & top, corrosion resistant steel exterior, self-contained refrigeration system, bottom mount 1/3 HP
2. 1 ea 115v/60/1-ph, 6.3 amps, 8' cord, NEMA 5-15P
3. 1 ea Model DICVRHPL9550 Hinged plexiglass covers for 9550
4. 1 ea Model RSEXTLAM-48 Laminate Exterior, for 48" units
5. 1 ea Model RAN FLT48 Flat Top Tray Slide, customer side
6. 1 lot 6" Casters
7. 1 ea Model RSCUTTOP Cutout in Top
8. 1 ea Model RSEQPINS Equipment Installation
9. 2 ea Model 6ELEOUT Cabinet face mounted Electric Outlet
10. 1 ea Model RSKCKPLT48 Kick/Toe Plate, for 48" RanServe units, laminate or stainless. KEC to coordinate with interior design
11. Cabinet work-height to be 35" AFF
12. 10" trayslide work-height to be 34" AFF

TTTTTT. Item Q09 - DISPLAY MERCHANDISER, HEATED, FOR MULTI-PRODUCT (1 REQ'D)

Hatco Model GR3SDS-27

Glo-Ray® Designer Slant Display Warmer, (10) rods, free-standing, (1) shelf, adjustable thermostat, hardcoated heated base, heated glass shelf, stainless steel or designer colors, 997 watts

1. 1 ea 120v/60/1-ph, NEMA 5-15P
2. 1 ea Warm Red, designer color, body & shelf
3. 1 st 4-inch adjustable legs, set of 4

UUUUUU. Item Q10 - NOT USED

VVVVVV. Item Q11 - NOT USED

WWWWWW. Item Q12 - CASH REGISTER STAND (1 REQ'D)

Randell Model 14G CA

RanServe Cash Register Stand, 30" L, 30" D, 35" H, portable with locking cash drawer, foot rest & cash register cord hole, 14 gauge stainless steel top with interchangeable laminate body panels, swivel casters (2 locking)

1. 1 ea Model RSEXTLAM-CA Laminate Exterior
2. 1 ea Model RAN FLT30 Flat Top Tray Slide, customer side
3. 1 lot 6" Casters
4. 1 ea Model RSELMOUT Electrical Outlet, mounted in unit

5. 1 ea Model RSKCKPLT30 Kick/Toe Plate, for 30" RanServe units, laminate or stainless
6. Cabinet work-height to be 35" AFF
7. 10" trayslide work-height to be 34" AFF

XXXXXX. Item Q13 - STANCHION (4 REQ'D)

Lavi Industries Model 26-20400WB/BK

Basic Retractable Post includes a 4-way connection, black slow-retract belt, and rubberized base. Wrinkle Black finish with wrinkle charcoal base

YYYYYY. Item S01 - WORK COUNTER (1 REQ'D)

Eagle Group Model CBH2448SE-BS

Spec-Master® Work Table, cabinet base with hinged doors, 48"W x 24"D, 14/304 stainless steel top with 4-1/2" backsplash, rolled front edge, square turndown ends, stainless steel wrapper, hinged doors, stainless steel legs, adjustable feet, NSF

1. 1 ea Model TABLE BACKSPLASH 6" high table back splash, 45 degree top, turn down for z-clip application
2. 1 ea Model E101A Turn down back of splash per table with Z clip
3. 1 ea Model E30 End splash, per end, all heights (right end)
4. 3 ea Model E39A Enclosed endsplash per linear foot
5. 1 ea Model BASE Stainless steel curb base, provide paper template

ZZZZZ. Item S02 - HEATED CABINET, ROLL-THRU (1 REQ'D)

Traulsen Model RIH132HP-FHS

Spec-Line Heated Cabinet, Roll-Thru, One-Section, stainless steel exterior and interior, standard depth cabinet, full-height doors, accepts 72" high racks, with INTELA-TRAUL™

1. 1 ea 208/115v/60/1ph, 7.8 amps, 1500 watts, NEMA L14-20P
2. 1 ea Thermometer side door: field rehinging option, per door. Ship left hinge
3. 1 ea Rear door: field rehinging option, per door. Ship right hinge

AAAAAAA. Item S02.1 - PAN RACK, BUN (1 REQ'D)

New Age Model 1331U

"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

BBBBBBB. Item S03 - REFRIGERATOR, ROLL-THRU (1 REQ'D)

Traulsen Model RRI132HPUT-FHS

Spec-Line Refrigerator, Roll-Thru, One-Section, self-contained refrigeration, s/s exterior and interior, standard depth cabinet, full-height doors, accepts 72" high racks, with INTELA-TRAUL™

1. 1 ea 115v/60/1ph, 11.6 amps, NEMA 5-15P
2. 1 ea Thermometer side door: field rehinging option, per door. Ship right hinge
3. 1 ea Rear door: field rehinging option, per door. Ship left hinge
4. 2 ea S/S banking strip, each

CCCCCCC. Item S03.1 - PAN RACK, BUN (1 REQ'D)

New Age Model 1331U

"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

DDDDDDD. Item S04 - WORK COUNTER (1 REQ'D)

Eagle Group Model CBH2448SE-BS

Spec-Master® Work Table, cabinet base with hinged doors, 48"W x 24"D, 14/304 stainless steel top with 4-1/2" backsplash, rolled front edge, square turndown ends, stainless steel wrapper, hinged doors, stainless steel legs, adjustable feet, NSF



1. 1 ea Model TABLE BACKSPLASH 6" high table back splash, 45 degree top, turn down for z-clip application
2. 1 ea Model E101A Turn down back of splash per table with Z clip
3. 2 ea Model E30 End splash, per end, all heights
4. 1 ea Model E20 Sink, 10" x 14" x 5" bowl, for 30"W tables
5. 1 ea Model 300722 Lever Handle Drain, with overflow, 2" IPS connection
6. 1 ea Model E33 Sink splashes, single thickness 4" tall, each
7. 1 ea Model BASE Stainless steel curb base, provide paper template

EEEEEEE. Item S04.1 - ELECTRONIC FAUCET (1 REQ'D)

T&S Brass Model EC-3100

ChekPoint™ Electronic Faucet, deck mount, rigid gooseneck, vandal resistant aerator, AC/DC control module, mixing tee, 100-240 VAC adapter

FFFFFFF. Item S05 - REFRIGERATOR, ROLL-THRU (1 REQ'D)

Traulsen Model RRI132HPUT-FHS

Spec-Line Refrigerator, Roll-Thru, One-Section, self-contained refrigeration, s/s exterior and interior, standard depth cabinet, full-height doors, accepts 72" high racks, with INTELA-TRAUL™

1. 1 ea 115v/60/1ph, 11.6 amps, NEMA 5-15P
2. 1 ea Thermometer side door: field rehinging option, per door. Ship left hinge
3. 1 ea Rear door: field rehinging option, per door. Ship right hinge
4. 2 ea S/S banking strip, each

GGGGGGG. Item S05.1 - PAN RACK, BUN (1 REQ'D)

New Age Model 1331U

"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

HHHHHHH. Item S06 - HEATED CABINET, ROLL-THRU (1 REQ'D)

Traulsen Model RIH132HP-FHS

Spec-Line Heated Cabinet, Roll-Thru, One-Section, stainless steel exterior and interior, standard depth cabinet, full-height doors, accepts 72" high racks, with INTELA-TRAUL™

1. 1 ea 208/115v/60/1ph, 7.8 amps, 1500 watts, NEMA L14-20P
2. 1 ea Thermometer side door: field rehinging option, per door. Ship right hinge
3. 1 ea Rear door: field rehinging option, per door. Ship left hinge

IIIIIII. Item S06.1 - PAN RACK, BUN (1 REQ'D)

New Age Model 1331U

"U" Type Nesting Bun Pan Rack, mobile, full height, front loading, open sides, accommodates (20) 18" x 26" or 13" x 18" pans, slides on 3" centers, (4) 5" platform casters, NSF

1. 1 ea Lifetime warranty against rust & corrosion, 5 year construction warranty

JJJJJJJ. Item S07 - WORK COUNTER (1 REQ'D)

Eagle Group Model CBH2436SE-BS

Spec-Master® Work Table, cabinet base with hinged doors, 36"W x 24"D, 14/304 stainless steel top with 4-1/2" backsplash, rolled front edge, square turndown ends, stainless steel wrapper, hinged doors, stainless steel legs, adjustable feet, NSF

1. 1 ea Model TABLE BACKSPLASH 6" high table back splash, 45 degree top, turn down for z-clip application
2. 1 ea Model E101A Turn down back of splash per table with Z clip
3. 1 ea Model E30 End splash, per end, all heights (right end)
4. 1 ea Model BASE Stainless steel curb base

KKKKKKK. Item S08 - TRAY RACK DISPENSER (2 REQ'D)

Delfield Model CT-1422

Dispenser, Tray, cantilever style, mobile design, single self-leveling tray platform, for 14" x 22" trays, stainless steel construction, 4" casters

1. 2 ea Push handle
2. KEC to verify with trays provided, adjust if needed

LLLLLLL. Item S09 - HOT FOOD SERVING COUNTER (1 REQ'D)

Randell Model 14G HTD-5S

RanServe Hot Food Table, electric, 72" L, 30" D, 35" H, mobile modular, (5) 12" x 20" hot food wells, open cabinet base with sliding doors, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking)

1. 1 ea 208v/60/1-ph, 27.4amps, NEMA 6-50P
2. 1 ea Model RSEXTLAM-72 Laminate Exterior (specify color), for 72" units
3. 1 ea Model RAN FLT72 Flat Top Tray Slide, server side
4. 36 ea Model SPACER Stainless Steel Spacer, includes top, interlocks and legs, per linear inch
5. 1 lot 6" Casters
6. 1 ea Model RSKCKPLT72 Kick/Toe Plate, for 72" RanServe units, laminate or stainless
7. Cabinet work-height to be 35" AFF
8. 10" trayslide work-height to be 34" AFF

MMMMMMM. Item S09.1 - STATIONARY FOOD GUARD (1 REQ'D)

Premier Brass Model FMT2S

FMT2S - 1" od two tier full/self service food shield with slanted front; 3/8" clear tempered glass with polished edges; both end panels included; 644b-3/1 narrow surface mount flange with optional flange cover; no heat/light included; brushed stainless finish; approx 72" cl length; approx 328 lbs ea (2 end and 1 center supports)

1. Second tier shelf
2. Sized to item S09
3. KEC to ship to Randell for dry fit

NNNNNNN. Item S10 - NOT USED

OOOOOOO. Item S11 - UTILITY SERVING COUNTER (1 REQ'D)

Randell Model 14G ST-3S

RanServe Utility Unit, 36" L, 30" D, 35" H, mobile modular, open cabinet base with 2 shelves, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking)

1. 1 ea Model RSEXTLAM-36 Laminate Exterior (coordinate with architect and interior design), for 36" units
2. 1 ea Model RSBORSWB-36 Flat Work Board, 36", stainless steel server side
3. 1 ea 6" Casters
4. 1 ea Model RSKCKPLT36 Kick/Toe Plate, for 36" RanServe units, laminate or stainless
5. Cabinet work-height to be 34" AFF
6. 10" trayslide work-height to be 34" AFF
- 7.

PPPPPPP. Item S11.1 - STATIONARY FOOD GUARD (1 REQ'D)

Premier Brass Model CUSTOM FM2R

CUSTOM FM2R - 1" od two tier self service food shield with top shelf; 3/8" clear tempered glass with polished edges; both end panels included; 644b-3/1 narrow surface mount flange with optional flange cover; no heat/light included; brushed stainless finish; approx 36" cl length; approx 192 lbs ea (2 end supports)

1. Second tier shelf
2. Size unit to item S11
3. KEC to ship to Randell for dry fit

QQQQQQQ. Item S12 - UTILITY SERVING COUNTER (1 REQ'D)

Randell Model 14G ST-5S

RanServe Utility Unit, 60" L, 30" D, 35" H, mobile modular, open cabinet base with 2 shelves, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking)

1. 1 ea Model RSEXTLAM-60 Laminate Exterior (coordinate with architect and interior design), for 60" units
2. 1 ea Model RSBORSWB-60 Flat Work Board, 60", stainless steel server side
3. 1 ea 6" Casters
4. 1 ea Model RSKCKPLT60 Kick/Toe Plate, for 60" RanServe units, laminate or stainless
5. Cabinet work-height to be 34" AFF
6. 10" trayslide work-height to be 34" AFF

RRRRRRR. Item S13 - UTILITY SERVING COUNTER (1 REQ'D)

Randell Model 14G ST-3S

RanServe Utility Unit, 36" L, 30" D, 35" H, mobile modular, open cabinet base with 2 shelves, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking)

1. 1 ea Model RSEXTLAM-36 Laminate Exterior (coordinate with architect and interior design), for 36" units
2. 1 ea Model RSBORSWB-36 Flat Work Board, 36", stainless steel server side
3. 1 ea 6" Casters
4. 1 ea Model RSKCKPLT36 Kick/Toe Plate, for 36" RanServe units, laminate or stainless
5. Cabinet work-height to be 34" AFF
6. 10" trayslide work-height to be 34" AFF

SSSSSSS. Item S13.1 - STATIONARY FOOD GUARD (1 REQ'D)

Premier Brass Model CUSTOM FM2R

CUSTOM FM2R - 1" od two tier self service food shield with top shelf; 3/8" clear tempered glass with polished edges; both end panels included; 644b-3/1 narrow surface mount flange with optional flange cover; no heat/light included; brushed stainless finish; approx 36" cl length; approx 192 lbs ea (2 end supports)

1. Second tier shelf
2. Size unit to item S13
3. KEC to ship to Randell for dry fit

TTTTTTT. Item S14 - HOT FOOD SERVING COUNTER (1 REQ'D)

Randell Model 14G HTD-5S

RanServe Hot Food Table, electric, 72" L, 30" D, 35" H, mobile modular, (5) 12" x 20" hot food wells, open cabinet base with sliding doors, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking)

1. 1 ea 208v/60/1-ph, 27.4amps, NEMA 6-50P
2. 1 ea Model RSEXTLAM-72 Laminate Exterior (coordinate with architect and interior design), for 72" units
3. 36 ea Model SPACER Stainless Steel Spacer, includes top, interlocks and legs, per linear inch
4. 1 ea Model RAN FLT72 Flat Top Tray Slide, server side
5. 1 ea 6" Casters
6. 1 ea Model RSKCKPLT72 Kick/Toe Plate, for 72" RanServe units, laminate or stainless
7. Cabinet work-height to be 35" AFF
8. 10" trayslide work-height to be 34" AFF

UUUUUUU. Item S14.1 - STATIONARY FOOD GUARD (1 REQ'D)

Premier Brass Model FMT2S

FMT2S - 1" od two tier full/self service food shield with slanted front; 3/8" clear tempered glass with polished edges; both end panels included; 644b-3/1 narrow surface mount flange with optional flange cover; no heat/light included; brushed stainless finish; approx 72" cl length; approx 328 lbs ea (2 end and 1 center supports)

1. Second tier shelf
2. Sized to item S14
3. KEC to ship to Randell for dry fit

VVVVVVV. Item S15 - TRAY RACK DISPENSER (2 REQ'D)

Delfield Model CT-1422

Dispenser, Tray, cantilever style, mobile design, single self-leveling tray platform, for 14" x 22" trays, stainless steel construction, 4" casters

1. 2 ea Push handle
2. KEC to verify with trays provided, adjust if needed

WWWWWWW. Item S16 - MILK COOLER (1 REQ'D)

Traulsen Model RMC58D4

Forced-Air Double Access Milk Cooler, sliding door, holds (16) 13"x13" crates or (10) 13"x19" milk crates, stainless steel interior and exterior, reinforced floor, sliding caster rails, (4) heavy-duty stainless steel dunnage racks, top-mount refrigeration system, Santoprene® E-Z clean gaskets, floor drain, 4" casters, 1/3 hp, UL, NSF.

1. 1 ea 3 year service/labor, 5 year compressor warranty

XXXXXXX. Item S17 - OPEN MERCHANDISER (1 REQ'D)

Federal Industries Model RSSM-460SC

Specialty Display High Profile Self-Serve Refrigerated Merchandiser, 46"W x 35"D x 60"H, self contained refrigeration with condensate evaporator, energy saving night curtain, top light, (2) tiers of adjustable black metal shelves, stainless steel display deck, black interior, tempered glass ends, choice of laminate, designed for continuous lineups, DOE 2012 compliant, UL safety & UL sanitation approved, 3/4 HP

1. 1 ea Self-contained refrigeration standard
2. 1 ea 120/208-240v/60/1, 3/4 hp, 13.0 amps, NEMA L14-20P
3. 1 ea Five year compressor warranty (for self-contained units only)
4. 1 ea Laminate standard color – Black, coordinate with architect and interior design
5. 1 ea Rear access doors or sliding rear doors
6. 1 ea Wire shelves (per tier)
7. 1 ea Cord & plug (6 ft.) (for self-contained units only)

YYYYYYY. Item S18 - COLD PAN SERVING COUNTER (1 REQ'D)

Randell Model 14G SCA-4

RanServe Cold Food Table, refrigerated cold pan, 60" L, 30" D, 35" H, mobile modular, 4-pan size, enclosed base, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking), 1/4 HP

1. 1 ea 115v/60/1-ph, 5.0 amps, NEMA 5-15P
2. 1 ea Model RSEXTLAM-60 Laminate Exterior (coordinate with architect and interior design), for 60" units
3. 1 ea Model RSBORSWB-60 Flat Work Board, 60", stainless steel server side
4. 1 ea Model RAN FLT60 Flat Top Tray Slide, customer side
5. 1 lot 6" Casters
6. 2 ea Model RSKCKPLT60 Kick/Toe Plate, for 60" RanServe units, laminate or stainless
7. 1 ea Model cabinet Cabinet base with locking doors
8. Cabinet work-height to be 35" AFF
9. 10" trayslide work-height to be 34" AFF

ZZZZZZZ. Item S19 - STATIONARY FOOD GUARD (1 REQ'D)

Premier Brass Model CUSTOM TMIR

CUSTOM TMIR - 1" od two tier double sided self service food shield with top shelf; 3/8" clear tempered glass with polished edges; both end panels included; 644b-3/1 narrow surface mount

flange with optional flange cover;; no heat/light included; brushed stainless finish; approx 60" cl length; approx 476 lbs ea (2 end supports)

1. Second tier shelf
2. Sized to item S18
3. KEC to ship to Randell for dry fit

AAAAAAA. Item S20 - NOT USED

BBBBBBBB. Item S21 - UTILITY SERVING COUNTER (1 REQ'D)

Randell Model 14G ST-3

RanServe Utility Unit, 36" L, 30" D, 35" H, mobile modular, enclosed base, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking)

1. 1 ea Model RSEXTLAM-36 Laminate Exterior (specify color), for 36" units
2. 1 ea Model RSBORSWB-36 Flat Work Board, 36", stainless steel server side
3. 1 ea Model RAN FLT36 Flat Top Tray Slide, customer side
4. 1 ea 6" Casters
5. 2 ea Model RSKCKPLT36 Kick/Toe Plate, for 36" RanServe units, laminate or stainless
6. Cabinet base with locking doors
7. Cabinet work-height to be 35" AFF
8. 10" trayslide work-height to be 34" AFF

CCCCCCCC. Item S22 - CASH REGISTER STAND (1 REQ'D)

Randell Model 14G CA

RanServe Cash Register Stand, 30" L, 30" D, 35" H, portable with locking cash drawer, foot rest & cash register cord hole, 14 gauge stainless steel top with interchangeable laminate body panels, swivel casters (2 locking)

1. 1 ea Model RSEXTLAM-CA Laminate Exterior (coordinate with architect and interior design)
2. 1 ea Model RSBORSWB-30 Flat Work Board, 30", stainless steel server side
3. 1 ea Model RAN FLT30 Flat Top Tray Slide, customer side
4. 1 ea 6" Casters
5. 1 ea Model RSELMOUT Electrical Outlet, mounted in unit
6. 2 ea Model RSKCKPLT30 Kick/Toe Plate, for 30" RanServe units, laminate or stainless
7. 1 It Model MITERED Mitered ends on trayslides
8. Cabinet work-height to be 35" AFF
9. 10" trayslide work-height to be 34" AFF

DDDDDDDD. Item S23 - OPEN MERCHANDISER (1 REQ'D)

Federal Industries Model RSSM-460SC

Specialty Display High Profile Self-Serve Refrigerated Merchandiser, 46"W x 35"D x 60"H, self contained refrigeration with condensate evaporator, energy saving night curtain, top light, (2) tiers of adjustable black metal shelves, stainless steel display deck, black interior, tempered glass ends, choice of laminate, designed for continuous lineups, DOE 2012 compliant, UL safety & UL sanitation approved, 3/4 HP

1. 1 ea Self-contained refrigeration standard
2. 1 ea 120/208-240v/60/1, 3/4 hp, 13.0 amps, NEMA L14-20P
3. 1 ea Five year compressor warranty (for self-contained units only)
4. 1 ea Laminate standard color – Black, coordinate with architect and interior design
5. 1 ea Rear access doors or sliding rear doors
6. 1 ea Wire shelves (per tier)
7. 1 ea Cord & plug (6 ft.) (for self-contained units only)

EEEEEEEE. Item S24 - MILK COOLER (1 REQ'D)

Traulsen Model RMC58D4

Dealer's Choice Forced-Air Double Access Milk Cooler, sliding door, holds (16) 13"x13" crates or (10) 13"x19" milk crates, stainless steel interior and exterior, reinforced floor, sliding caster rails , (4)

heavy-duty stainless steel dunnage racks, top-mount refrigeration system, Santoprene® E-Z clean gaskets, floor drain, 4" casters, 1/3 hp, UL, NSF.

1. 1 ea 3 year service/labor, 5 year compressor warranty

FFFFFFFF. Item S25 - STANCHION (4 REQ'D)

Lavi Industries Model 26-20400WB/BK

Basic Retractable Post includes a 4-way connection, black slow-retract belt, and rubberized base. Wrinkle Black finish with wrinkle charcoal base

GGGGGGGG. Item S26 - STANCHION (4 REQ'D)

Lavi Industries Model 26-20400WB/BK

Basic Retractable Post includes a 4-way connection, black slow-retract belt, and rubberized base. Wrinkle Black finish with wrinkle charcoal base

HHHHHHHH. Item S27 - CART, CONDIMENT (1 REQ'D)

Lakeside Manufacturing Model 70310

Condi Express™, 36-1/2" counter height, includes: (2) 7 qt. poly round pump dispensers, (3) 3 qt. poly rectangular pump dispensers & (2) disposable cup dispensers, stainless steel with laminate exterior, laminate top, 5" casters ( (2) swivel with brakes, (2) fixed)

1. 1 ea Group 2 laminate finish: coordinate with architect and interior design

IIIIIIII. Item S28 - CART, CONDIMENT (1 REQ'D)

Lakeside Manufacturing Model 70310

Condi Express™, 36-1/2" counter height, includes: (2) 7 qt. poly round pump dispensers, (3) 3 qt. poly rectangular pump dispensers & (2) disposable cup dispensers, stainless steel with laminate exterior, laminate top, 5" casters ( (2) swivel with brakes, (2) fixed)

1. 1 ea Group 2 laminate finish: coordinate with architect and interior design

## 2.2 FABRICATION, GENERAL

- A. Fabricate food service equipment according to NSF 2 requirements. Fabricate equipment to greatest extent possible.
- B. Plastic-Laminate and Wood Casework: Fabricate according to requirements specified in Division 6 Section "Interior Architectural Woodwork."
- C. Welding: Use welding rod of same composition as metal being welded. Use methods that minimize distortion and develop strength and corrosion resistance of base metal. Provide ductile welds free of mechanical imperfections such as gas holes, pits, or cracks.
- D. Welded Butt Joints: Provide full-penetration welds for full-joint length. Make joints flat, continuous, and homogenous with sheet metal without relying on straps under seams, filling in with solder, or spot welding.
- E. Grind exposed welded joints flush with adjoining material and polish to match adjoining surfaces.
- F. Where fasteners are welded to underside of equipment, finish reverse side of weld smooth and not depressed.
- G. Coat unexposed stainless-steel welded joints with suitable metallic-based paint to prevent corrosion.
- H. After zinc-coated steel is welded, clean welds and abraded areas and apply SSPC-Paint 20, high-zinc-dust-content, galvanizing repair paint to comply with ASTM A 780.
- I. Fabricate field-assembled equipment prepared for field-joining methods indicated. For metal butt joints, comply with referenced SMACNA standard, unless otherwise indicated.

- J. Where stainless steel is joined to a dissimilar metal, use stainless steel welding material or fastening devices.
- K. Form metal with break bends that are not flaky, scaly, or cracked in appearance; where breaks mar uniform surface appearance of material, remove marks by grinding, polishing, and finishing.
- L. Sheared Metal Edges: Finish free of burrs, fins, and irregular projections.
- M. Provide surfaces in food zone, as defined in NSF 2, free from exposed fasteners.
- N. Cap exposed fastener threads, including those inside cabinets, with stainless-steel lock washers and stainless-steel cap (acorn) nuts.
- O. Provide pipe slots on equipment with turned-up edges and sized to accommodate service and utility lines and mechanical connections.
- P. Provide enclosures, including panels, housings, and skirts, to conceal service lines, operating components, and mechanical and electrical devices including those inside cabinets, unless otherwise indicated.
- Q. Seismic Restraints: Fabricate to comply with referenced SMACNA standard, unless otherwise indicated.

## 2.3 MATERIALS

- A. Stainless-Steel Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 304, stretcher leveled, and in finish specified in "Stainless-Steel Finishes" Article.
- B. Stainless-Steel Tube: ASTM A 554, Grade MT-304, and in finish specified in "Stainless-Steel Finishes" Article.
- C. Zinc-Coated Steel Sheet: ASTM A 653, G115 (ASTM A 653M, Z350) coating designation; commercial quality; cold rolled; stretcher leveled; and chemically treated.
- D. Zinc-Coated Steel Shapes: ASTM A 36 (ASTM A 36M), zinc-coated according to ASTM A 123 requirements.
- E. Plastic Laminate: Complying with NEMA LD 3 and NSF 35 requirements; NSF certified for end-use application indicated; 0.050 inch (1.27mm) thick for horizontal and vertical surfaces and 0.042 inch (1.07mm) thick for post-formed surfaces; smooth texture; and easily cleanable.
- F. Color: As selected by Architect from manufacturer's full range of colors.
- G. Plywood and Lumber: Provide plywood and lumber as specified in Division 6 Section "Interior Architectural Woodwork."
- H. Sealant: ASTM C 920; Type S, Grade NS, Class 25, Use NT. Provide elastomeric sealant NSF certified for end-use application indicated. Provide sealant that, when cured and washed, meets requirements of Food and Drug Administration's 21 CFR, Section 177.2600 for use in areas that come in contact with food.
- I. Color: As selected by Architect from manufacturer's full range of colors.
- J. Backer Rod: Close-cell polyethylene, in diameter larger than joint width.
- K. Tempered Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated surfaces), Type I (transparent), Class 1 (clear), Quality q3 (glazing select). Provide products complying with ANSI

Z97.1, manufactured by horizontal (roller-hearth) process, and 6mm thick, unless otherwise indicated. Provide exposed safety edges, if any, seamed before tempering.

- L. Plastic: Except for plastic laminate, provide plastic materials and components complying with NSF 51.
- M. Sound Dampening: NSF-certified, nonabsorbent, hard drying, sound-deadening coating. Provide coating compounded for permanent adhesions to metal in 1/8-inch (3mm) thickness that does not chip, flake, or blister.
- N. Gaskets: NSF certified for end-use application indicated, of resilient rubber, neoprene, or PVC that is nontoxic, stable, odorless, nonabsorbent, and unaffected by exposure to foods and cleaning compounds.
- O. Installation Accessories, General: NSF certified for end-use application indicated.
- P. Public Health and Safety Requirements:
  - 1. Sealant is certified for compliance with NSF standards for end-use application indicated.
  - 2. Washed and cured sealant complies with the FDA's regulations for use in areas that come in contact with food.
- Q. Cylindrical Sealant Backing: ASTM C 1330, Type C, closed-cell polyethylene, in diameter larger than joint width

## 2.4 ACCESSORIES

- A. Cabinet Hardware: Provide NSF-certified, stainless steel hardware for equipment items as indicated.
- B. Casters: NSF-certified, standard-duty, stainless-steel, swivel stem casters with 5-inch (125mm) diameter wheels, polyurethane tires with 1-inch (25mm) tread width, and 200-lb (90kg) load capacity per caster. Provide brakes on 2 casters per unit unless otherwise stated.

## PART 3 EXECUTION

### 3.1 PRODUCT HANDLING

- A. Kitchen Equipment Contractor is responsible for receiving and warehousing equipment and fixtures, until ready for installation. Store materials, equipment and fixtures in sealed containers, where possible. Store off the ground and under cover, protected from damage.
- B. Receive all equipment, inspect and warehouse until scheduled installation. If any damage is noted; return to manufacturer, and replace with new undamaged equipment. All equipment replacements to not affect the final delivery and installation schedule.
- C. Do not install equipment that has been damaged either in manufacture, shipment or storage.

### 3.2 INSTALLATION

- A. Kitchen Equipment Contractor to verify and coordinate conditions at the building site, particularly door and/or wall openings, and passages, to assure access for all equipment. Pieces too bulky for existing facilities are to be hoisted or otherwise handles with apparatus as required. All special handling equipment charges will be arranged for and paid for by Kitchen Equipment Contractor.
- B. The Kitchen Equipment Contractor to coordinate, relocate and install owner provided/existing equipment, if applicable.
- C. The Kitchen Equipment Contractor will provide and install all refrigeration lines for remote refrigeration.



- D. A photocopy of drain line routing details for walk in coolers/ freezer as detailed on General Construction Details page FS5.0, detail 1 & 2 to route outside of box and utilize drain line cover to be posted in an obvious location at walk ins. KEC to verbally notify General Contractor and Plumbing Contractor of detail.
- E. Install foodservice equipment level and plumb, according to manufacturer's written instructions.
  - 1. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.
- F. Complete equipment assembly where field assembly is required.
  - 1. Provide closed butt and contact joints that do not require filler.
  - 2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish.
  - 3. Metal tops to be one-piece welded construction, including field joints.
  - 4. Field joints that are required because of size of fixture: butt joint, reinforce on underside with angles of same material, bolt together with non-corrosive bolts and nuts, field weld, grind and polish to same finish as top surface.
- G. Verify equipment access and maintenance clearance requirements of authorities having jurisdiction and of local sanitation and health codes; reflect minimum clearances on drawings.
- H. Install closure-trim strips and similar items requiring fasteners in a bed of sealant.
- I. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.
- J. Equipment to be left ready for final electrical and plumbing connection by others.
- K. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and requirements of authorities having jurisdiction.
- L. Uni-strut not to be utilized or fastened to flooring surface in any instance. Galvanized uni-strut to be used and secured to underside of fixed equipment or walls to help in routing of water connections or drains. Routing to not impede the access, functionality or maintenance of equipment.
- M. Remove all packaging, pallets, cardboard and trashes related to the foodservice equipment and properly dispose.
- N. All work to be done in a neat workman like manner.

### 3.3 REFRIGERATION INSTALLATION

- A. Provide and install refrigerant piping, hard drawn, Type K or L, ASTM B88. Fittings for copper tubing shall be wrought copper. Piping to run from compressor to evaporator coil. Provide and install fittings, control devices, line insulation, sight glass and other components required for a complete and operational system. Charge with refrigerant.
- B. Provide and install s/s trim without gaps or buckles. Silicone in place in lieu of metal fasteners when applicable. Silicone seams of trim of walk in with like colored silicone.
- C. Provide and install s/s trim as shown on drawings and as needed at walls and coordinate with ceiling.
- D. Fasten drain line cover per detail on FS5.0 to conceal drain lines.

### 3.4 CLEANING AND PROTECTING

- A. After completing installation of equipment, repair any/all damaged finishes. Alert General Contractor of any observed damage.
- B. Clean and adjust equipment as required to produce ready-for-use condition.

- C. Use all means reasonable to protect the materials of this Section before, during, and after installation; and to protect the associated work and materials of the other trades.
- D. Protect equipment from theft or damage during remainder of the construction period and final acceptance by the Owner.

### 3.5 TESTING, START-UP, AND DEMONSTRATION

- A. Prior to testing/start up, inform Architect/ Design Consultant of intent to proceed with start up. Subsequent to testing/start up, provided a report of results to Architect and H-C Design and Consulting.
- B. Engage a qualified technician to test each item of operational equipment to demonstrate that it is operating properly, and the controls and safety devices are functioning. Repair or replace equipment which is found to be defective in its operation, including units which are below capacity or operating with excessive noise or vibration.
- C. Appoint a factory-authorized service representative or a qualified technician to instruct Owner's operating personnel in proper operation and maintenance procedures for each item of operational foodservice equipment. This instruction to be coordinated with the owner at least five (5) working days ahead of the demonstration.

END OF SECTION 11 40 00

## SECTION 11 47 50 – SCIENCE EQUIPMENT

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Safety Storage Cabinets.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Submit product data indicating material characteristics, dimensions and specifics for proper installation and maintenance.
- C. Section 01 77 00 - Closeout Procedures: Operations and Maintenance Manual.

#### 1.3 COORDINATION

- A. Coordinate the work under provisions of Section 01 31 00 - Project Management and Coordination.

### PART 2 PRODUCTS

#### 2.1 SAFETY STORAGE CABINETS

- A. Manufacturers:
  - 1. Basis of Design: SciMatCo.
  - 2. Acceptable Manufacturers:
    - a. Flinn Scientific, Inc.
    - b. Justrite Manufacturing
    - c. Sheldon Laboratory Systems.
  - 3. Substitutions accepted under Section 01 25 00.
- B. Acid/Flammable Cabinet: 1" thick, high density plywood, with lock and flame arrestor. Cabinets meet all applicable OSHA and NFPA standards.
  - 1. Capacity:
    - a. Acid: 4 x 2.5 Liter.
    - b. Flammable: 4 x 1 Gallon.
  - 2. Exterior Dimensions: 31 inch wide x 17 inch height x 14 ½ inch deep.
  - 3. Color: Gray.
  - 4. Self closing door on flammables side.
  - 5. 2" liquid-tight trough at cabinet floor.
  - 6. Locks:
    - a. Internal metal lock on flammable side.
    - b. Plastic hasp and padlock on corrosive side.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that installation locations are ready to receive equipment, substrate surfaces are finished and mechanical and electrical services are in place.
- B. Beginning of installation means that the installer accepts the existing conditions.

#### 3.2 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.

#### 3.3 CLEANING

- A. Prior to Final Acceptance, clean equipment items thoroughly in accordance with Section 01 77 00 - Closeout Procedures.

END OF SECTION 11 47 50

## SECTION 11 51 23 – LIBRARY SHELVING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Cantilever metal shelving.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate shelving plan layout, and configuration.
- C. Product Data: Provide data on types, sizes and accessories.
- D. Manufacturer's Installation Instructions: Indicate component installation.
- E. Section 01 77 00 - Closeout Procedures: Manual for Materials and Finishes.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Protect shelving finish from damage.

#### 1.4 REGULATORY REQUIREMENTS

- A. Comply with IBC for fastening and bracing of shelving.

### PART 2 PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Borroughs, Wilsonstak, [www.borroughs.com](http://www.borroughs.com).
- B. Tenssco, Estey, [www.tenssco.com](http://www.tenssco.com).
- C. Spacesaver, <http://education.spacesaver.com>.
- D. Substitutions: Under provisions of Section 01 25 00.

#### 2.2 DESCRIPTION

- A. Double Face Book Shelving:
  - 1. Double Face Units: 36" W x 12" D each side x 42" H. (Type A1)
  - 2. Mounting: Mobile.
  - 3. Base: Metal.
  - 4. Shelves: 2 plus base shelf.

- B. Single Face Book Shelving:
  - 1. Single Face Units:
    - a. 36" W x 12" D x 86" H. (Type B1)
    - b. 36"W x 12" D x 42" H at tack panels. (Type B2)
    - c. 36"W x 12" S x 36" H at whiteboards. (Type B3)
  - 2. Mounting: Wall anchored.
  - 3. Base: Metal.
  - 4. Shelves:
    - a. 5 plus base shelf.
    - b. 2 plus base shelf.

## 2.3 MATERIALS

- A. Sheet metal: Cold rolled, Class 1 steel.
- B. PLAM: NEMA LD3.

## 2.4 COMPONENTS

- A. Type: Weld Frame (WF) closed base shelf, 16 gage.
- B. Base Shelves: 18 gage steel, with backstop and raised end panels.
- C. Shelf End Brackets: 16 gauge steel.
- D. Adjustable Standard Shelves: Support book loads of 50 pounds per square foot. 18 gage.
- E. Accessories: As need to complete installation.
  - 1. Upright Filler Channels: 24 gage.
  - 2. Reinforcing gussets: 16 gage.
  - 3. Provide 18 gage 6 inch high dividers; 4 per shelf.
  - 4. Corner and intermediate fillers: 18 gage steel, 2 panels with tightly fitting top. Same height as abutting frames. Same depth as bases.
  - 5. Hinged Periodical Shelves: Provide (6) 12 inch sloping shelves installable in typical single face units. 18 gage display and storage shelve. 16 gage pivots and shelf brackets.
- F. End Panels and Canopies Tops: Plastic laminate over particle board core with 3mm PVC edging to match PLAM. Mill edging to 1/8" radius.
- G. Wheels: Manufacturer's standard locking type, number and size as required for size of units.
- H. Include the necessary modifications to floor anchor the shelving system and meet seismic zone requirements without the use of top bracing.

## 2.5 FINISH

- A. Frame: Clean, neutralize and etch. Electrostatic powder coated. Color: To be selected by Architect.
- B. PLAM: PLAM - 1.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install shelving plumb and square.
- C. Bolt adjoining shelving units together to provide rigid installation.

#### 3.2 CLEANING

- A. Clean work under provisions of 01 70 00 - Execution.
- B. Clean shelving surfaces.

#### 3.3 SCHEDULES

- A. Refer to drawings for number and location of units.

END OF SECTION 11 51 23





## SECTION 11 52 13 – PROJECTION SCREENS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Electrically operated exposed mounted projection screens.
  - 2. Related accessories.
- B. Related Sections:
  - 1. Section 06 10 53 - Miscellaneous Rough Carpentry.
  - 2. Section 09 21 16 - Gypsum Board Assemblies.
  - 3. Section 09 51 13 - Acoustical Tile Ceilings.
  - 4. Division 26 - Electrical: Conduit and electrical service.

#### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Submit manufacturer's wiring diagram for electrically operated controls. Also detailed drawings concealed mounting.
- C. Product Data: Submit manufacturer's product data on materials, finishes, operation of unit, and electrical requirements.
- D. Manufacturer's Installation Instructions: Submit detailed installation instructions including rough-in measurements.
- E. Section 01 77 00 - Closeout Procedures: Operation and Maintenance Manual.
  - 1. Submit parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
  - 2. Submit technical information for servicing operating equipment.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Deliver projection screens after building is enclosed, other work within spaces where screens are to be installed is substantially complete, and installation of screens is ready to take place.
- C. Protect projection screens from damage before, during and after installation.

#### 1.4 COORDINATION

- A. Section 01 31 00 – Project Management and Coordination: Requirements for coordination.
- B. Coordinate installation of ceilings, walls, electric service power characteristics, and location.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Da-Lite Screen Co., Professional Electrol, Model # 38701E, [www.da-lite.com](http://www.da-lite.com).
- B. Draper Shade and Screen Co., Paragon/Series E, [www.draperinc.com](http://www.draperinc.com).
- C. Substitutions: Refer to Section 01 25 00.

### 2.2 FRONT PROTECTION SCREENS, ELECTRICALLY OPERATED

- A. General: Provide manufacture's standard UL-listed and -marked units consisting of case, screen, motor, controls, mounting accessories and other components as required for a complete installation and complying with requirements indicated for screen surface, controls and for case, motor and screen under description of operating and type.
- B. Viewing Surface of Screen: Comply with the following requirements for type of viewing surface:
  - 1. Matte white, washable surface, flame and mildew resistant. For use with and type projector where light can be controlled.
- C. Motor-In-Roller-Operated Screens: Units designed and fabricated for recessed or surface installation and complying with the following requirements:
  - 1. Screen Case: Designed to receive mounting hardware and sized to suit projection screen.
    - a. Material: Extruded aluminum.
    - b. Finish: Black.
  - 2. Motor: Instant reversing motor of size and capacity recommended by screen manufacturer, with permanently lubricated ball bearings, automatic thermal overload protection, preset limit switches to automatically stop screen in "up" and "down" position, and positive stop action to prevent coasting; mounted inside roller with vibration insulators to reduce noise transmission and remotely controlled as indicated.
  - 3. Screen: Mildew- and flame-resistant vinyl-coated glass fiber or polyvinyl fabric with viewing surface complying with requirements indicated, with top edge mounted on, and securely anchored to 3" diameter rigid metal roller supported by vibration- and noise-absorbing supports and bottom edge formed into a pocket holding a 3/8" diameter metal rod, with ends of rod protected by plastic caps.
    - a. Aspect ratio: 16:9.
    - b. Size of viewing surface: 160 inch high x 284 inch w.
    - c. Provide 5 foot extra drop length of dimension.
    - d. Provide 2 inch wide black border.

### 2.3 ACCESSORIES

- A. Projector Lift: Scissor lift to lower projector from ceiling storage position for use or service and then retract projector, electrically operated, white finish. UL listed.
  - 1. Basis of Design: Draper, Scissor Lift, Part No. SL8 or approved equivalent.
  - 2. Provide housing, scissor operating mechanism, motor, controls, limit switches, mounting hardware, support cables, ceiling finish trim kit, universal projector mount and other components required for complete installation.
  - 3. Suspend projector from 3 ¼ inch x 24 inch x 26 inch, 11 gage steel operating pan with white powder coat finish.

4. Operating pan shall be lowered and raised by 3 sets of stabilizing scissors positioned on sides and rear of pan and two 3/16 inch cables with 4200 foot-pounds, tensile strength per cable. Mechanism operated by 110 VAC, 60 HZ, instantly reversible, thermally protected, lifetime lubricated, right angle gear motor and chain drive system. Provide lift with fail-safe inertial safety belt system.
5. Provide projector security cage and mounting hardware. Attach to operating pan. Color: white.
  - a. Basis of Design: Da-Lite, Projector Cage, Part No. CPMSC20 or approved equivalent.
6. Provide set limit switches to automatically stop travel at store, show and service positions. Single station control, standard, shall consist of one 12V toggle switch to lower lift from stored to show positions, and one 12V momentary key switch to lower lift from show to service position.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Verification of existing conditions before starting work.
- B. Verify rough-in opening and conditions are acceptable.
- C. Verify electrical power is available and of correct characteristics.

#### 3.2 INSTALLATION

- A. Install projection screens at location indicated on Drawings.
- B. Coordinate with electrical connection.
- C. Coordinate installation with ceiling finishes for application of ceiling finish to screen case bottom panels.
- D. Securely anchor to supporting substrate.
- E. Install to produce smoothly operating screen with plumb and straight vertical edges and plumb and flat viewing surfaces when lowered.
- F. Test electrically-operated units to verify screen controls, limit switches, closure and other operating components are in optimum functioning conditions.

#### 3.3 ADJUSTING

- A. Section 01 73 00 - Execution: Requirements for balancing and adjusting.
- B. Adjust installed unit for smooth and balanced operation.

#### 3.4 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final Cleaning.
- B. Remove protective coverings from finished surfaces. Clean surfaces and components ready for inspection.

### 3.5 DEMONSTRATION

- A. Section 01 77 00 - Closeout Procedures: Requirements for demonstration and training.
- B. Demonstrate electrically operated projection screens to Owner. Allow one hour duration for demonstration.

### 3.6 PROTECTION OF FINISHED WORK

- A. Section 01 73 00 – Execution.
- B. Do not permit use of projection screens after installation.

END OF SECTION 11 52 13

## SECTION 11 52 16 – VIDEO PROJECTORS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Video projector at Gymnasium 1321, lens and accessories.
  - 2. All short throw projectors OFCI.
- B. Related Sections:
  - 1. Section 11 52 13 - Projection Screens.
  - 2. Electrical services and connections are specified in Division 26.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's specifications and installation instructions for each type of equipment, including data indicating compliance with requirements. Submit operating and maintenance instructions for each item of equipment.
- C. Section 01 77 00 – Closeout Procedures: Operations and Maintenance Manual.

#### 1.3 DELIVERY AND STORAGE

- A. Deliver and handle equipment under provisions of Section 01 60 00 - Product Requirements.
- B. Deliver products to project site in manufacturer's undamaged protective containers, after spaces to receive them have been fully enclosed.

#### 1.4 WARRANTY

- A. Submit manufacturer's standard written warranty for each item of equipment under provisions of Section 01 77 00 - Closeout Procedures.

### PART 2 PRODUCTS

#### 2.1 VIDEO PROJECTOR

- A. Acceptable Manufacturer:
  - 1. Basis of Design: Hitachi, CP-X10000 Professional Series.
  - 2. Substitutions: Under provisions of Section 01 25 00.

- B. Optical
  1. Panel: 1.3 inch LCD panel.
  2. Resolution: XGA (1024x768).
  3. Brightness: Normal Mode: 7500 ANSI Lumens.
  4. Contrast Ratio: 2500:1.
  5. Lamp: Single Lamp System. 350W UHB
  6. Lamp Life: 3000 hours.
  7. Number of Colors: 10-bit signal processor, digital gamma 12-bit.
  
- C. Power
  1. Voltage: 110V~120V, 220V-240V.
  2. Power Consumption: 540W.
  
- D. Compatibility
  1. Computer: up to UXGA (1600 x 1200) compressed.
  2. Video: NTSC / PAL / SECAM / PAL-M,N / NTSC4.43  
SDTV: 525i(480i), 525p(480p), 625i(576i)  
HDTV: 750p (720p@60Hz), 1125i(1080i@50 / 60Hz), 1125p(1080p@50 / 60).
  3. Plug & Play: DDC2B.
  
- E. Physical
  1. Dimensions (W x D x H): 18.7 x 18.5 10.7 inch.
  2. Weight: 28.9 lbs without lens.
  3. Noise Level: Normal: 39dB.
  4. Air Filter: Super Hybrid.

## 2.2 LENS

- A. Ultra Short Throw Lens, Hitachi, USL-801.
  1. F=2.4-2.5.
  2. F=14-17mm.
  3. Throw Distance Ratio= 0.5-0.6
  4. 8.8 lbs.

## 2.3 ACCESSORIES

- A. Remote control with batteries.
- B. Computer cable.
- C. Power cord.
- D. Multiple language operator/Safety Manual.
- E. Security Label.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Determine conditions are acceptable for installation.

#### 3.2 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations.
- B. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate for proper operation of equipment.
- C. Utilities: Refer to Division 26 for electrical requirements.

#### 3.3 ADJUST AND CLEAN

- A. Testing: Test each item or equipment to verify proper operation. Make necessary adjustments.
- B. Accessories: Verify that accessory items required have been furnished.
- C. Cleaning: Remove packing material from equipment items and leave units in clean condition, ready for operation.

#### 3.4 DEMONSTRATION AND TRAINING

- A. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair procedures that end user personnel would normally perform.

END OF SECTION 11 52 16





## SECTION 11 66 23 – ATHLETIC EQUIPMENT

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes
  - 1. Basketball backstops, backboards and goals.
  - 2. Padded wall pads.
  - 3. Gym divider curtain.
  - 4. Gymnasium Control Center.
  - 5. Volleyball Equipment.
  - 6. Badminton Equipment.
  - 7. Climbing Rope.
  - 8. Chinning Bar.
  - 9. Wrestling Mat Storage System.
- B. Related Sections
  - 1. Section 05 50 00 - Metal Fabrications: Structural steel supports.
  - 2. Section 09 64 66 - Wood Athletic Flooring.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Show layout, sizes, dimensions, installation details, fasteners, finishes, and colors. Include mounting details to structural framing and masonry walls.
- C. Submit product data indicating material characteristics, dimensions and specifics for proper installation and maintenance.
- D. Section 01 77 00 – Closeout Procedures: Operations and Maintenance Manual.
- E. Certification: Installer as certified by manufacturer as authorized and qualified to perform work of this Section.

#### 1.3 COORDINATION

- A. Coordinate the work under provisions of Section 01 31 00.
- B. Section 05 12 00 for installation and mounting to structural framing.
- C. Coordinate with cushioned wood flooring installer for location of floor sleeves and flooring construction at these locations.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in work of this Section. Able to furnish references for 5 successful installations, upon request by Architect.

- B. Installer Qualifications:
  - 1. Company specializing in work of this Section.
  - 2. Able to document minimum 5 years experience conforming to work of this Section.
  - 3. Certified as manufacturer's authorized installer prior to Bid, or accepted by Architect.
- C. Pre-Installation Conference: Arrange, in accordance with Section 01 31 00.
  - 1. Attendance: Contractor, installer, Owner, Architect, manufacturer's representative, and those requested to attend.
  - 2. Meeting Time: Minimum 3 weeks prior to prior to beginning work of this Section and work of related Sections affecting work of this Section.

## 1.5 WARRANTY

- A. Provide manufacturer's standard warranty on all athletic equipment under provisions of Section 01 77 00.
- B. Special Warranties:
  - 1. Electric backstop winches: 5 year replacement warranty.
  - 2. Glass backboard: Limited Lifetime warranty.

## PART 2 PRODUCTS

### 2.1 GENERAL

- A. Supplier shall be responsible for furnishing all components required for complete installation of products including additional supports, framing, anchors, other necessary accessories/fasteners for anchorage as required for particular conditions of installation in each case.

### 2.2 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Porter Athletic Equipment Co, Local Representative: Cliff Schantz, Red Rock Sport Goods, 406.232.2716. ([reps@redrocksportinggoods.com](mailto:reps@redrocksportinggoods.com)) (<http://www.porterathletic.com/>) (<http://www.porterathletic.com/>)
- B. Draper, Inc., Local Representative, Montana School Equipment, Aaron Johnson, <http://www.mtschoolequipment.com/> . (<http://www.draperinc.com>)
- C. Performance Sports Systems, [www.perfsports.com](http://www.perfsports.com)
- D. Substitutions accepted under Section 01 25 00.

### 2.3 BASKETBALL BACKSTOPS

- A. Components, ceiling mounted backstop assemblies:
  - 1. Main courts: No. 950 electric operated cambered forward folding backstop with No. 10797 "SAF-Strap" backstop safety lock.
  - 2. Side courts: No. 949 electric operated forward folding backstop with No. 10797 "SAF Strap" backstop safety lock.
  - 3. No. 208-000 center strut-mount 72" x 42" x 1/2" rectangular fully tempered glass backboard with unitized steel or aluminum frame and prostyle center strut. Fiberglass at end court.
  - 4. No. 326 Pro Pad Bolton backboard padding. Color: Black.
  - 5. No. 234156 Ultra-Flex 2 Goal with mounting hardware and anti-whip net.

6. No. 707 remote control UL listed electric winches with No. 791 Key Switch and 3/4 hp. motors.
  7. Provide manufacturer's custom superstructure provided to avoid conflict in ceilings.
- B. All units to use saddle cut die welds. Pinch welds not permitted.
- C. Provide cross framing members to attach backstop assemblies to roof trusses.
- D. All metal parts are to be powdercoated white.

## 2.4 WALL PADS

- A. Materials:
1. Wall Padding: Porter, 00560-00 – Meets the requirements of ASTM F2440 Standard Specification.
    - a. Foam: 2 ¼ inch thick polyethylene foam bonded to a 7/16 inch oriented strand wood board.
    - b. Cover: 15 ounce fire-retardant, high tensile, vinyl-coated polyester fabric material designated as flame resistant in accordance with NFPA 701.
    - c. Color: Grey 09.
    - d. Size: Custom size, one piece pads to fit location, see drawings.
    - e. Attach with 00347-100 and 00347-300 "Z" clips.
    - f. Provide molded inserts at all outlets.

## 2.5 GYM DIVIDER CURTAIN

- A. Roll Fold-Up Curtain: Porter, 90670-100 - Ceiling suspended, power operated with system for storage at ceiling. Include welded frame assembly, cable hoist system, and accessories for complete system.
1. Provide solid vinyl, polyester reinforced 19 oz vinyl coated fabric. Color: Black. ASTM E-84 Class A Rating and NFPA-701 large scale, ULC S-109 large and small scale.
  2. Begin upper section of open polyester type interlocking grid weave coated polyvinyl chloride with an approximate 45 to 50% open area at 4'-0" above floor. Color: Gray. Flame resistant.
  3. Seams: Electronically welded.
  4. Hoist Mechanism: ¾ H.P dual output, 60 cycle, 115 volt single phase electric motor with automatic thermal overload protection manufactured to NEMA specifications. Center mount.
  5. Provide cross framing members to attach curtain assemblies to roof trusses.

## 2.6 GYMNASIUM CONTROL CENTER

- A. Total Gymnasium Control Center, No. 2550 Power-Touch II Control System.
1. Wall mounted TouchPad control system.
  2. Operator with separate keys for forward and reverse direction.
  3. Appropriate gang assembly for operating identified equipment.
  4. Custom Equipment Legend.

## 2.7 VOLLEYBALL EQUIPMENT

- A. Model 01991-000 Power-line System.
1. Standards: 3 1/2" diameter extruded aluminum with winch, clear anodized finish, No. 01991-000 pair. 3 pair.
  2. Net with pulley tensioner, international style with antenna, No. 02295-640, one per pair of standards.
  3. Safety Padding: Polyethylene foam padding covered with nylon-reinforced vinyl. Color: Black.

- B. Floor Sleeves with brass floor plate: No. 00872-200.

## 2.8 BADMINTON EQUIPMENT

- A. Portable Badminton Standards: 2 3/8 inch diameter international competition portable badminton standards (pair) with steel bases. No. 779000.
- B. Badminton Net: No. 02236-110.

## 2.9 CLIMBING ROPE

- A. Climbing Rope Construction: 1-1/2 inch diameter construction, hemp climbing rope with turk's head knot stitched in at bottom end and intermediate rubber knots, 3 inch diameter, secured on rope on 12 inch centers.
  - 1. Height: Custom length, as indicated to underside of structural framing.
- B. Accessories
  - 1. Tambourine: 24 inch diameter, 1/2 inch thick plywood.
  - 2. Safety Guard And Attachment Hardware: As required for mounting to steel trusses under work of Section 05 12 00.
  - 3. Rubber Balls: Attached to climbing rope.
  - 4. Safety Cable Attachment:
  - 5. Climbing Rope Hoist:

## 2.10 ADJUSTABLE WALL-MOUNTED CHINNING BAR

- A. Mounting Height: Bottom bar at 66 inch above finish flooring.
- B. Porter, 00197-100.
  - 1. Bar Height Adjustment: 18 inch in 6 inch increments.
  - 2. Steel Bar Assembly: Removable 42 inch long by 1-1/16 inch diameter.

## 2.11 WRESTLING MAT STORAGE SYSTEM

- A. Basis of Design: Anthem Sports, Winch-Loaded Wrestling Mat Rack.
  - 1. Holds 3 mat sections.
  - 2. Heavy duty winch with air craft cable, 7000 lb test.
  - 3. 5 inch diameter caster wheels.
  - 4. Can be rolled by 2-3 people in any direction.
  - 5. Constructed of 14 gage, zinc plated steel.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that installation locations are ready to receive equipment, substrate surfaces are finished and anchorages are adequate to support loads.
- B. Beginning of installation means that the installer accepts the existing conditions.

### 3.2 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions, drawings, and approved shop drawings.
- B. Install anchor fasteners, test anchors to verify that they will support equipment securely without unwanted movement or deflection.
- C. Mount basketball backstops and other hanging athletic equipment to structural steel framing or to masonry walls into solid grouted cavities.
- D. Provide steel tube framing system matching finish of backstop struts, designed for purpose.
- E. Make attachments into concrete masonry walls with removable expansion fasteners. Conceal fasteners where possible.
- F. Adjust and lubricate moving parts to operate smoothly, quietly, without binding.

### 3.3 ADJUSTING

- A. Verify operation of movable parts and adjust for smooth operation, free from defects.
- B. Repair or replace damaged installations as directed by Owner and Architect.
- C. Field touch-up primer and re-paint damaged factory finishes to match color and gloss level of original finishes.

### 3.4 CLEANING

- A. Prior to Final Acceptance, clean equipment items thoroughly.
- B. Install goal nets on basketball backstops.

### 3.5 DEMONSTRATION

- A. Provide demonstration to Owner personnel as to the proper use and operation of athletic equipment.

END OF SECTION 11 66 23



## SECTION 11 66 43 – LED SCOREBOARDS AND SHOT TIME CLOCK

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes
  - 1. Scorekeeper and timer system.
- B. Related Sections
  - 1. Section 05 50 00 - Metal Fabrications: Structural steel supports.
  - 2. Division 26: Electrical.

#### 1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit product data indicating material characteristics, dimensions and specifics for proper installation and maintenance.
- C. Section 01 77 00 – Closeout Procedures: Operations and Maintenance Manual.

#### 1.3 COORDINATION

- A. Coordinate the work under provisions of Section 01 31 00.

#### 1.4 WARRANTY

- A. Provide manufacturer's standard warranty on all equipment under provisions of Section 01 77 00.

### PART 2 PRODUCTS

#### 2.1 GENERAL

- A. Supplier shall be responsible for furnishing all components required for complete installation of products including additional supports, framing, anchors, and other necessary accessories/fasteners for anchorage as required for particular conditions of installation in each case.

#### 2.2 SCOREBOARDS AND TIMER SYSTEM

- A. Acceptable Manufacturers:
  - 1. Basis of Design: Daktronics, Inc.
  - 2. Nevco.
  - 3. Substitutions accepted under Section 01 25 00.

- B. Electronic Basketball Scoreboard:
  - 1. Daktronics, Inc. Tuff Sport Model BB-3101-05
  - 2. Dimensions: 4'-0"H x 8'-0"W x 6" deep.
  - 3. Construction: All aluminum.
  - 4. Home and Guest Captions: 6" high all others 4" high.
  - 5. Digits: 13" high & 10" high, 7 bar segments using LED illumination.
  - 6. Maximum Power Demand: 200 watts at 120v.
  
- C. Shot Timer:
  - 1. Daktronics, Inc. No. BB-2122-13.
  - 2. Dimensions: 1'-7"H x 1'-10"W x 6"D.
  - 3. Construction: All aluminum.
  - 4. Digits: 13" high with 7 bar segments.
  - 5. Control Console: Operate from scoreboard control console (see paragraph 2.2.D).
  - 6. Quantity: 2.
  
- D. Accessories: (Scoreboard)
  - 1. Controllers: Daktronics, All Sport 5500 Scoreboard Controller.
    - a. Provide hand-held start/stop switch for game clock control.
    - b. Provide hand-held reset switch for shot clock control to support two independent reset times.
    - c. Provide 2.4GHz Radio transmitters and receivers for scoreboard and shot timer communication.
    - d. Provide one control console for each scoreboard.
    - e. Provide hard sided carry cases.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that installation locations are ready to receive equipment, substrate surfaces are finished and anchorages are adequate to support loads.
  
- B. Beginning of installation means that the installer accepts the existing conditions.

#### 3.2 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions, drawings, and approved shop drawings.
  
- B. Install anchor fasteners, test anchors to verify that they will support equipment securely without unwanted movement or deflection.



3.3 CLEANING

- A. Prior to Final Acceptance, clean equipment items thoroughly.

3.4 DEMONSTRATION

- A. Provide demonstration to Owner personnel as to the proper use and operation of scoreboard equipment.

END OF SECTION 11 66 43



## SECTION 12 21 00 – WINDOW BLINDS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Horizontal metal slat louver blinds and operating hardware.
- B. Related Sections:
  - 1. Section 06 10 53 - Miscellaneous Rough Carpentry.
  - 2. Division 8: Door and window frames.

#### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.
- C. Product Data: Submit data indicating physical and dimensional characteristics, and operating features.
- D. Samples: Submit two samples, 4 inches long, illustrating slat materials and finish, color, head rail housing type and color.
- E. Manufacturer's Installation Instructions: Submit special procedures and perimeter conditions requiring special attention.
- F. Section 01 77 00 – Closeout Procedures:
- G. Materials and Finishes Manual: Submit information on adjusting, repairing, and replacing blinds, wand tilter and cording.

#### 1.3 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

#### 1.4 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.5 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination.
- B. Coordinate the Work with window installation and placement of concealed blocking to support blinds.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design: Levolor, Inc. - 1" Riviera Classic Dust Guard Blinds.
- B. Graber Window Treatments.
- C. Hunter Douglas Model, CD 80.
- D. Springs Windows Fashions Model Bali S3000 Mini Blinds.
- E. Substitutions: Under provisions of Section 01 25 00.

### 2.2 COMPONENTS

- A. Blinds: Horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by control wand.
- B. Metal Slats: Spring tempered pre-finished aluminum; square slat corners, with manufacturing burrs removed.
  - 1. Width: 1 inch.
  - 2. Thickness: .0085 inch.
  - 3. Color: Dark Bronze.
- C. Slat Support: Woven polypropylene cord, ladder configuration.
- D. Headrail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operations; same depth as width of slats.
  - 1. Color: Dark Bronze.
- E. Bottom Rail: Pre-finished, formed aluminum with top side shaped to match slat curvature; with end caps.
  - 1. Color: Dark Bronze.
- F. Lift Cord: Braided polypropylene; continuous loop.
  - 1. Free end weighted.
  - 2. Color: Dark Bronze.
- G. Control Wand: Extruded hollow plastic.
  - 1. Non-removable type.
  - 2. Length of window opening height less 3 inches.
  - 3. Color: Clear.
- H. Headrail Attachment: Wall brackets.
- I. Accessory Hardware: Type recommended by blind manufacturer.

## 2.3 FABRICATION

- A. Fabricate blinds to fit within openings with uniform edge clearance.
- B. At openings requiring multiple blind units, provide separate blind assemblies with space between assemblies, occurring at window mullion centers.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify openings are ready to receive work.
- B. Verify structural blocking and supports are correctly placed.

### 3.2 INSTALLATION

- A. Install blinds.
- B. Secure in place with concealed fasteners.
- C. Place intermediate head supports as recommended by manufacturer.

### 3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.
- C. Maximum Offset From Level: 1/8 inch.

### 3.4 ADJUSTING

- A. Section 01 73 00 - Execution: Testing, adjusting, and balancing.
- B. Adjust blinds for smooth operation.

### 3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Clean blind surfaces just prior to occupancy.

### 3.6 SCHEDULE

- A. Exterior aluminum window (Storefront Types W and Curtain Wall Types CW, as indicated on A9.1 Window Types), without motorized roller shades are to receive blinds, as specified. Reference Interior Elevation (A6) sheets for motorized roller shade locations.
- B. Exterior hollow metal frames: No blinds.
- C. Interior Doors @ Relites and side lites.

END OF SECTION 12 21 00

## SECTION 12 24 13 – ROLLER SHADES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Room darkening roller shades for windows, motor operated.
  - 2. Deductive Alternate #9 – Eliminate four (4) south-facing gym windows and shades.
- B. Related Sections:
  - 1. Section 06 10 53 - Miscellaneous Rough Carpentry.

#### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures.
- B. Drawings: Submit fabrication details and erection drawings including field measured dimensions.
- C. Product Data: Submit data indicating physical and dimensional characteristics and operating features.
- D. Samples: Submit two samples, 3 inch x 5 inch illustrating shade materials and colors.
- E. Manufacturer's Installation Instructions: Submit special procedures, perimeter conditions requiring special attention.
- F. Section 01 77 00 - Closeout Procedures.
- G. Materials and Finishes Manual: Submit methods for maintaining roller shades, precautions regarding cleaning materials and methods, and instructions for operating hardware and controls.

#### 1.3 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Minimum 3 years documented experience, approved by window shade manufacturer.

#### 1.4 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.5 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination.
- B. Coordinate the Work with window installation and placement of concealed blocking to support blinds.
- C. Coordinate wiring requirements with Electrical Contractor. Shade Contractor shall be responsible for providing site and product-specific wiring diagrams as well as supply-only of switches, taps and other

shade-related electrical components. All wiring, wire runs and termination of wiring to be by Electrical Contractor.

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver prefabricated shades to site in manufacturer's original, labeled and unopened protective packaging. Labels to be intact and legible; identifying manufacturer and contents; uniquely identified for each intended location.
- B. Store products off ground, under cover, protected from elements and construction activities. Schedule delivery to prevent delays, but minimize on-site storage.

## 1.7 WARRANTY

- A. Operating Components: Provide warranty under provisions of Division 1 - General Requirements. Warranty period shall be 10 years from Date of Final Acceptance. Warranty shall contain provisions that installation shall remain operational, without fault, for the warranty period. Warranty shall contain provisions that installation shall remain operational, without fault, for the warranty period. Warranty shall include all operating parts.
- B. Motor and Electrical Components: Provide warranty under provisions of Division 1 - General Requirements. Warranty period shall be 2 years from Date of Final Acceptance. Warranty shall contain provisions that installation shall remain operational, without fault, for the warranty period; including coverage of motor, electrical controls and override circuits.
- C. Shadecloth: Provide warranty under provisions of Division 1 - General Requirements. Warranty shall be for a minimum period of 10 years from Date of Final Acceptance. Warranty shall contain provisions that the shadecloth will not deteriorate, sag or warp and will not be unfit for the use intended for the warranty period.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Draper, [www.draperinc.com](http://www.draperinc.com)
  - 1. Contact: Leo Nickels, 800.238.7999x3111, [lnickel@draperinc.com](mailto:lnickel@draperinc.com).
- B. MechoShade Systems Inc., Long Island City, NY. (718) 729-2020. Fax (800) 899-8081. [www.mechoshade.com](http://www.mechoshade.com)
- C. Springs Window Fashions (SWF), Middleton, WI. [www.swfcontract.com](http://www.swfcontract.com)
- D. Sun or Shade, Manufactured by Inside Outfitters, Inc., Dublin OH.
- E. Solarfactive Products Limited, Toronto, Ontario, Canada (800) 421-5578. Fax: (416)421- 8424. <http://www.solarfactive.com>
- F. Substitutions: Under provisions of Section 01 25 00.



## 2.2 MOTORIZED ROLLER SHADES

- A. Motorized vertical roll-up, fabric, window shade with motors, controls, mounting brackets, and other components necessary for complete installation.
  - 1. Endcaps and headbox.
- B. Shade Motor and Control System
  - 1. Intelligent Technology Motor - 110 VAC motor with built-in low voltage controller with 3-wire pig tail and data cable. No external motor controls are required. Available with optional three prong plug. Tubular motor concealed inside each shade roller tube.
    - a. Individual Control, Group Control & Individual and Group Control:
  - 2. 6 button RS 485 switch- for 2 groups up/stop/down or 1 group up/stop/down and 3 presets.
- C. Roller: Fabricated from extruded aluminium or steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade size. Provide with roller idler assembly of molded nylon and zinc-plated steel pin. Sliding pin to allow easy installation and removal of roller. Fabric connected to roller tube with low surface energy double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.
- D. Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.
- E. Endcap covers to match fascia/headbox finish.
- F. Shade slat: Slat encased in heat seamed hem

## 2.3 SHADECLOTH

- A. Single Fabric Shadecloth: 36% PVC coated fiberglass and 64 % vinyl blend woven into 2 x 2 basketweave. Flame retardant per NFPA 701 Bacteria and Fungi Resistant per ASTM G21.
  - 1. Fabric Selection: Thickness: 0.020.
    - a. Shadecloth: E Screen, 3% openness factor. Color: Charcoal.

## 2.4 FABRICATION

- A. Prior to fabrication, verify actual opening dimensions by accurate site measurements. Adjust shade sizes for proper fit at each window.
- B. Shade bands shall be configured to avoid 'railroading' fabrics, which will not be permitted without prior approval from the Architect.
- C. Cut shadecloth to suit window size by means of edge sealing hot knife system. Top of shadecloth to be attached to SnapLoc spline. Bottom of shadecloth to include smooth, concealed hembar; hotsealed on all four sides.
- D. Furnish shadecloth in lengths not less than 12 inches longer than actual window dimensions permit shade to be operated full length without tearing from roller.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Examine conditions under which shades are to be installed.
- B. Report unsatisfactory conditions to architect in writing.
- C. Do not proceed with installation until unsatisfactory condition have been corrected.

### 3.2 INSTALLATION

- A. Install shades in accordance with recommended manufacturer's installation instructions.

### 3.3 ADJUST AND CLEAN

- A. Adjust shade operating assemblies for smooth and proper operation.
- B. Clean soiled shade surfaces and components with a mild soap and water solution only. Do not use steam, hot water, bleach or any abrasive or solvent-based cleaners for cleaning.

### 3.4 SCHEDULE

Note: All dimensions nominal. Verify in field.

- A. Gym: Surface mounted within CMU jambs in front (to the room side) of aluminum window system. One (1) switch per elevation. 12 motors/12 shades.
  - 1. Deductive Alternate #9: Eliminate roller shades at south-facing gym windows. 4 motors/4 shades.
- B. Library: Surface mounted within frame. Two (2) control zones. One switch per elevation. 7 motors/7 shades.
- C. Band: Surface mounted within frame. One (1) switch per elevation.
  - 1. North – 4 motors/4 shades; wall mount.
  - 2. West: 2 motors/2 shades; wall mount.
- D. Orchestra: 4 motors/4 shades, surface mounted within frame. One (1) switch.
- E. Choir: 4 motors/4 shades, surface mounted within frame. One (1) switch.
- F. For all fascia: Provide positive screw attachment through front of fascia into sub-bracket. Color/finish of fastener to be approved by Architect.
- G. For all switch settings: Provide all up or all down.

END OF SECTION 12 24 13

## SECTION 12 31 00 – MANUFACTURED METAL SHELVING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Stainless steel shelf.
- B. Related Sections:
  - 1. Section 05 50 00 - Metal Fabrications.
  - 2. Section 06 20 00 - Finish Carpentry.
  - 3. Section 06 41 16 - Architectural Casework.

#### 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM A666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

#### 1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Indicate shelving plan layout, and configuration.
- C. Product Data: Submit component dimensions, configurations, construction details, joint details, and attachments.

#### 1.4 DELIVERY AND STORAGE

- A. Deliver and handle equipment under provisions of Section 01 60 00 - Materials and Equipment.
- B. Deliver products to project site in manufacturer's undamaged protective containers, after spaces to receive them have been fully enclosed.

### PART 2 PRODUCTS

#### 2.1 STAINLESS STEEL SHELVING

- A. Stainless Steel: ASTM A666, Type 304.
- B. Dimension: 10 inches deep x 4 foot wide.
- C. Shelf bracket: Vertical L bracket steel standard.
- D. Fasteners: Provide tamperproof of type and size recommended by manufacturer for specific applications. Finish exposed to view fasteners to match bracket and other components.

## 2.2 FABRICATION

- A. Fabricate corners and joints without gaps or areas where dirt or moisture could accumulate.
- B. Form each unit rigid with smooth edges and seams.

## 2.3 FINISH

- A. Stainless Steel: No 4 finish.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Determine conditions are acceptable for installation.

### 3.2 INSTALLATION

- A. Use anchoring devices to suit conditions and substrate materials encountered.
- B. Set shelving plumb and square, securely anchored to wall.

### 3.3 ADJUST AND CLEAN

- A. Accessories: Verify that accessory items required have been furnished.
- B. Clean shelves and hardware.
- C. Do not permit finished shelving to be exposed to continued construction activity.

### 3.4 SCHEDULE

- A. Stainless Steel Shelf at Sinks: As located in drawings.

END OF SECTION 12 31 00

## SECTION 12 66 13 – TELESCOPING BLEACHERS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Telescoping Bleachers: Operable systems of multiple-tiered benches on interconnected, folding supports which permit closing, without requiring dismantlement, into nested relationship for purposes of storing or moving.
    - a. Wall attached units.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-in-Place Concrete: Floor levelness.
  - 2. Section 09 64 66 - Wood Athletic Flooring.
  - 3. Division 26: Electrical wiring and connections for power operation of bleachers.

#### 1.2 REFERENCES

- A. Americans with Disability Act (ADA)
  - 1. ADA - Standards for Accessible Design.
- B. American Society for Testing and Materials:
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
  - 3. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 4. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
  - 5. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
  - 6. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
- C. American Welding Society:
  - 1. AWS D1.1 - Structural Welding Code- Steel.
- D. National Fire Protection Association:
  - 1. NFPA Standards for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures.

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of telescoping bleacher and accessory indicated.

- B. Shop Drawings: Submit in accordance with Section 01 33 00 indicating layout of telescoping bleacher units coordinated with field measurements and including seat heights, row spacing and rise, aisle widths and locations, overall dimensions in closed and open position, connections and relationships to adjoining work, accessories, types of materials, and finishes.
  - 1. Wiring Diagrams: Indicate electrical wiring and connections.
  - 2. Graphics Layout Drawings: Indicate pattern of contrasting seat colors.
- C. Samples: Submit samples of seat materials, colors and finishes as selected by Architect from manufacturer's standard lines.
- D. Closeout Submittals
  - 1. Section 01 77 00 - Closeout Procedures.
  - 2. Operation and Maintenance Manual: Submit detailed instructions for operation and maintenance of each type of bleacher unit specified.

#### 1.4 QUALITY ASSURANCE

- A. NFPA Standard: Comply with applicable requirements of NFPA 102, "Standard for Assembly Seating, Tents, and Air-Supported Structures" and specifically with Chapter 9, "Folding and Telescopic Seating," except where more stringent requirements are indicated or imposed by authorities having jurisdiction.
- B. Welding Standards & Qualification: Comply with AWS D1.1 Structural Welding Code- Steel and AWS D1.3 Structural Welding Code- Sheet Steel.
- C. Installer Qualifications: Engage experienced installer to perform work of this section who has specialized in installation of types of telescoping bleachers similar to that required for this project and who is acceptable to, or certified by, manufacturer of telescoping bleachers.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver telescopic gym seats in manufacturers packaging clearly labeled with manufacturer name and content.
- B. Deliver the seating at a scheduled time for installation that will not interfere with other trades operating in the building.

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Coordinate actual dimensions of construction affecting telescoping bleachers installation by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid delay of Work.

#### 1.7 WARRANTY

- A. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for telescoping bleachers. This warranty is in addition to, and not a limitation of other rights Owner may have under Contract Documents.
  - 1. Warranty Period: Five years from Date of Acceptance.

## 1.8 MAINTENANCE

- A. Extra Materials: 5 extra seat modules.
- B. Maintenance Service: Full inspection and maintenance call-back service by Installer for a period of 24 months following Substantial Completion.
  - 1. Provide repairs, adjustments, lubrication, equipment, and supplies as necessary to keep equipment in working operation under normal conditions of use.
  - 2. Perform maintenance work by installer using fully trained employees.
  - 3. Arrange with Owner and perform work during hours convenient to Owner.

## PART 2 PRODUCTS

### 2.1 SYSTEM PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design, engineer, fabricate, and install telescoping bleachers to withstand structural design loads specified in NFPA 102, Chapter 5, except where more stringent requirements are indicated or imposed by authorities having jurisdiction without exceeding allowable design working stresses of materials involved, including anchors and connections. Apply each load to produce maximum stress in each respective component of each bleacher unit.
  - 1. Gymnasium seat assembly: Design to support and resist, in addition to its own weight the following forces:
    - a. Live load of 120 lbs per linear foot on seats and decking.
    - b. Uniformly distributed live load of not less than 100 lbs per sq. ft. of gross horizontal projection.
    - c. Parallel sway load of 24 lbs per linear foot of row combined with (b.) above.
    - d. Perpendicular sway load of 10 lbs per linear foot of row combined with (b.) above.
  - 2. Hand Railings, Posts and Supports: Engineered to withstand the following forces applied separately:
    - a. Concentrated load of 200 lbs applied at any point and in any direction.
    - b. Uniform load of 50 lbs per foot applied in any direction.
  - 3. Guard Railings, Post and Supports: Engineered to withstand the following forces applied separately:
    - a. Concentrated load of 200 lbs applied at any point and in any direction along top rail.
    - b. Uniform load of 50 lbs per foot applied horizontally at top rail and a simultaneous uniform load of 100 lbs per foot applied vertically downward.
- B. Operation: Provide telescoping bleacher units incorporating manufacturer's standard telescoping system of seating and understructure members that permit opening and closing with respect to adjacent rows, that allow any or all rows to be locked open for use, and that close with vertical faces of upper skirts in same vertical plane.

## 2.2 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Hussey Telescoping Gym Seat System, Maxam series.
  - 1. Contact: Tutt Construction, Jared Tutt, 406.698.4538, [jared@tuttconstruction.com](mailto:jared@tuttconstruction.com)
- B. Interkal Telescopic Bleachers.
  - 1. Contact: Aaron Johnson, Montana School Equipment. <http://www.mtschoolequipment.com/>
- C. Substitutions under provisions of Section 01 25 00.

## 2.3 COMPONENTS

- A. Telescopic Gym Seats, forward folding, wall attached, rise to be 9 5/8".
  - 1. Seating capacity: Maximum 800.
- B. Aisle Type: Foot level aisles as indicated.
- C. Seat Types: High density, 100% recyclable HDPE (high density polyethylene) modules in monochromatic colors providing, dual textured scuff resistant 10" wide seat surface with ½ inch minimum interlock on seat and face. Unit structural tested to 600 lbs occupant load..
- D. Rail Type: Self-storing rails as required per bank. 42" high above seat, end rail with tubular supports and intermediate members designed with 4" sphere passage requirements. Black.
- E. Operation: Electrical power.
  - 1. Electrical Power System: Integral power with pendant control, limit switches on open and closed positions.
- F. Product Description:
  - 1. Bank Length: 19' -6".
  - 2. Overall Length: 76' -6".
  - 3. Aisle Widths: 4' - 6".
  - 4. Number of Tiers: 20.
  - 5. Row Spacing(s): 24 inch.
  - 6. Open Dimension: 40' - 3".
  - 7. Closed Dimension: 4' - 0".
  - 8. Overall Unit Height: 16' - 7 and 15/16 inch.

## 2.4 MATERIALS

- A. Lumber: ANSI/Voluntary Product 20 B & B Southern Pine.
- B. Plywood: ANSI/Voluntary Product PSI, APA A-C Exterior Grade.
- C. Structural Steel Shapes, Plates and Bars: ASTM A36.
- D. Uncoated Steel Sheet: ASTM A1008, Class 1, Commercial quality, cold rolled sheet.
- E. Uncoated Steel sheet: ASTM A1011, Structural quality, hot rolled steel.
- F. Galvanized Steel Sheet: ASTM A653 Zinc Coated by the hot dipped process.
- G. Structural Tubing: ASTM A501, hot rolled.



- H. Polyethylene Plastic: ASTM D1248, Type III, Class B; molded, color-pigmented, textured, impact resistant, structural formulation; in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard color.
- I. Fasteners: Vibration-proof, of size and material standard with manufacturer.

## 2.5 FABRICATION

- A. General: Provide manufacturer's standard telescopic bleacher system fabricated to comply with requirements indicated. Smoothly round corners, edges and exposed fasteners, if any, to eliminate snagging and pinching hazards. Form exposed sheet metal with flat, flush surfaces, true to line and level, and without cracking and grain separation. Perform welding by operators and processes complying with AWS requirements.
- B. Bench Seats and Upper Risers: Fabricate from following materials to form seats with uniform heights per bleacher unit of not less than 16 inches nor more than 18 inches, as standard with manufacturer. Provide integrally molded end caps at aisle end locations.
  - 1. Material: Polyethylene plastic contoured to form individual seats with recesses for number plates.
  - 2. Integrally molded recess pockets to accept seat number and row letters.
  - 3. Integrally molded rear closure panel at back of seat.
  - 4. Seat Attachment: 12 ga steel clamp bracket with through bolted attachment to front nose beam of bleacher.
  - 5. Colors:
    - a. Color A: Hussey, 050 Grey.
    - b. Color B: Hussey, 125 Gold.
    - c. Color C: Hussey, 627 Legend.
    - d. Location per drawings.
- C. Lower Risers and Foot Rests: Provide recessed lower riser and fully closed foot rest construction. Fabricate riser from steel sheet with baked enamel, vinyl-cladding or galvanized finish as standard with manufacturer. Fabricate foot rest from plywood as standard with manufacturer.
- D. Understructure: Fabricate understructure from structural steel members of size, spacing and form required to support design loads with cantilevered bench seat supports to produce toe space uninterrupted by vertical bracing.
- E. Decking: 5/8 inch, AC grade clear top coated tongue and groove Southern Yellow Pine or BC grade polyethylene top coated tongue and groove Douglas Fir plywood; both of interior type with exterior glue, 5 ply, all plies with plugged cross-bands, produced in accordance with National Bureau of Standards PS-1. Plywood shall be cut and installed with top, center and bottom ply grain-oriented from front of deck to rear of deck (nose beam to riser beam).
- F. Support Column Wheels: Provide manufacturer's standard wheel assembly under each support column. Include wheels of size, number and design required to support bleacher units and to achieve smooth operation without damage to flooring surface, but not less than 4 per column nor less than 3½ inches in diameter and 1 inch wide.
- G. Aisles: Fabricate bleacher units with aisles and seating as indicated in the drawings. Provide intermediate aisle steps and center aisle handrails as required. Aisle sizes handrails, guardrails and handicap seating to meet all applicable codes.
  - 1. Footrest Level Type: Interrupt bench seats to provide aisle walking surfaces at foot rest level.
    - a. Provide manufacturer's standard metal nosing for aisles with wood walking surfaces.

- H. Type of Bleacher Units: Provide assemblies of following type fabricated in lengths and number of rows as indicated.
  - 1. Wall-Attached Type: Provide units with rear of understructure permanently attached to wall/floor construction.
- I. Accessories: Provide following accessories of manufacturer's standard design and construction, at locations indicated or required:
  - 1. Rear fillers including supports for closing openings between top row and rear wall of adjoining construction.
  - 2. Vinyl End Closure Curtains permanently attached to wall or rear closure panel and secured to individual rows of seating. Curtain to open with seating unit into taught secure configuration and fold automatically as seating unit closes.
    - a. Color: Black.
  - 3. End railings of telescoping, self-storing type and required perimeter guardrails.
  - 4. Intermediate Aisle Handrails: Provide single pedestal mount handrails 34" high with terminating mid rail. Handrails shall be attached to the socket and shall lift and rotate 90° for easy storage in socket. Aisle handrails that are not fully looped that could catch loose clothing or handbags are not acceptable.
  - 5. Provide a minimum of one removable 8 x 15" scorer's table, and required mounting hardware, on each side of the gymnasium. Coordinate power, telephone, and scoreboard controls with a flexible wiring system.
- J. Handicap Seating Provisions: Provide first tier recoverable truncations on wall attached bleachers to provide for seating per requirements of the Americans with Disability Act (ADA) located as indicated.
- K. Fastenings:
  - 1. Welds: Performed by welders certified by AWS standards for process employed.
  - 2. Structural Connections: Secured by structural bolts with prevailing torque lock nuts, free-spinning nuts in combination with lock washers, or Riv-nuts in combination with lock washers.

## 2.6 FINISHES

- A. Wood and Transparent Finish: Prepare surfaces by machine sanding, supplemented by hand sanding where required, followed by application of sealer coats and transparent top coats of type, in number, and by process standard with manufacturer. Apply to wood surfaces except where otherwise indicated.
- B. Painted Ferrous Metal Surfaces: Apply manufacturer's standard baked enamel finish over shop-cleaned ferrous metal surfaces. Apply to exposed and concealed metal surfaces including understructure, except where other types of finishes are indicated.
- C. Vinyl-Clad Steel Finish: Apply manufacturer's standard flow-coated vinyl plastisol finish over shop-cleaned steel sheet to produce vinyl-coating with cured thickness of not less than 8 mils and in manufacturer's standard, uniform color.
- D. Galvanized Finish: Manufacturer's standard G60 galvanized finish with matte finish, complying with ASTM A653.
- E. Railings: Finish steel railings with powder coated semi-gloss black.
- F. Clear Anodized Aluminum Finish: AA-CC33A42 (medium matte etched finish with 0.7 mil min. thick anodic coating).

## 2.7 OPERATION

- A. General: Provide bleacher units incorporating manufacturer's standard telescoping system of seating and understructure members which permit opening and closing with respect to adjacent rows, which allow any rows to be locked open for use, and which close with vertical faces of upper skirts in same vertical plane.
- B. Tractive Electric Operation: Provide manufacturer's standard powered operation of bleacher units which apply tractive force to floor. Use units with non-marking rubber rollers or tracks which will not mar or damage type of floor over which bleacher units move.
- C. Coordinate wiring requirements and current characteristics of motors and control stations with building electrical system.
- D. Provide parts and instructions for installing a key-operated controller on fixed structure of facility.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Install telescoping bleacher units to comply with manufacturer's instructions and final shop drawings. Provide accessories indicated and anchors, inserts, and other items required for installation of units and attachment of adjoining construction.

#### 3.2 ADJUSTMENT AND CLEANING

- A. Upon completion of installation, including work of other trades, lubricate, test and adjust telescoping bleachers to operate easily and in compliance with manufacturer's specifications.
- B. Clean installed bleacher units on exposed and semi-exposed surfaces. Touch-up shop applied finishes to restore damaged or soiled areas.

#### 3.3 DEMONSTRATION

- A. Provide demonstration to Owner personnel as to the proper use and operation of bleacher equipment.

END OF SECTION 12 66 13



## SECTION 14 24 00 – HYDRAULIC ELEVATORS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Holeless hydraulic elevator with machine-room less application.
  - 2. Passenger cab with door and frame; hoistway entrance door and frame.
  - 3. Automatic key controlled push button operation with keyed manual firefighter's operation.
  
- B. Work Furnished But Installed Under Other Sections:
  - 1. Furnish elevator motor and pump anchors to Section 03 30 00 for placement in concrete.
  - 2. Furnish guide rail support brackets and anchors to Contractor for placement.
  
- C. Related Work:
  - 1. Section 05 12 00 - Structural Steel: Structural steel hoistway framing, divider beams, overhead hoist beams.
  - 2. Section 05 50 00 - Metal Fabrications: Pit ladder and sill supports.
  - 3. Section 07 13 26 – Self Adhered Sheet Waterproofing: Waterproofing of elevator pit walls and floor.
  - 4. Section 08 31 13 - Access Doors and Frames: Fire rated access doors into hoistway.
  - 5. Section 08 71 00 - Finish Hardware.
  - 6. Section 09 21 16 - Gypsum Board Assemblies: Gypsum shaft walls.
  - 7. Section 09 65 00 - Resilient Flooring: Elevator floor.
  - 8. Division 23 - Mechanical: Fire and smoke detectors in hoistway, shaft venting.
  - 9. Division 26 - Electrical: Electrical service to main disconnect including emergency power transfer cabinet. Fire alarm signal lines to elevator controller cabinet. Empty conduit to elevator equipment devices remote from hoistways.

#### 1.2 REFERENCES

- A. Americans with Disabilities Act (ADA) Compliance Code.
  
- B. American National Standards Institute:
  - 1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
  - 2. ANSI/AWS D1.1 - Structural Welding Code, Steel.
  - 3. ANSI/IEEE C2 - National Electrical Safety Code.
  - 4. ANSI/NFPA 80 - Fire Doors and Windows.
  - 5. ANSI/UL 10B - Fire Tests of Door Assemblies.
  
- C. American Society of Mechanical Engineers:
  - 1. ASME A17.1 - Safety Code for Elevators and Escalators.
  - 2. ASME A17.2.2 - Inspector's Manual for Hydraulic Elevators.
  
- D. American Society for Testing and Materials:
  - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A139 - Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (Sizes 4 in. and Over).

3. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
4. ASTM B221 - Aluminum and Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.

- E. National Electrical Manufacturers Association:
1. NEMA LD 3 - High Pressure Decorative Laminates.
  2. NEMA MG 1 - Motors and Generators.

### 1.3 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Indicate the following minimum information on shop drawings:
1. Section view, floor heights, location of pit equipment, location and means for disconnect.
  2. Motor and hydraulic pump, valves, controller, motor generator, selector, governor, and other component locations.
  3. Car, guide rails, buffers, and other components in hoistway.
  4. Rail bracket spacing and maximum loads on guide rails.
  5. Reactions at points of support.
  6. Weights of principal components.
  7. Top and bottom clearance and overtravel of car and counterweight.
  8. Location of circuit breaker, switchboard panel or disconnect switch, light switch, and feeder extension points.
  9. Locations in hoistway of traveling cables and connections for car light and telephone.
  10. Location and sizes of access doors, doors, and frames.
  11. Loads on hoisting beams.
  12. Elevator control functions and operational description.
  13. Applicable seismic design data; certified by registered Professional Engineer.
  14. Interface with building security system.
- C. Provide product data on the following items:
1. Signal and operating fixtures, operating panels, indicators.
  2. Cab design and components.
  3. Door and frame details.
- D. Samples: Submit two samples, 12 x 12 inch in size illustrating cab floor material, cab interior finishes, cab and hoistway door and frame finishes, and handrail material and finish.
- E. Operation And Maintenance Data
1. Submit operation and maintenance data under provisions of Section 01 77 00.
  2. Include description of elevator system's method of operation and control including motor and pump unit, door operation, signals, firefighter's service, emergency power operation, and special or non-standard features provided.
  3. Provide parts catalogs with complete list of equipment replacement parts with equipment description and identifying numbers .
  4. Provide legible schematic of hydraulic piping and wiring diagrams covering electrical equipment installed, including changes made in final work, with symbols listed corresponding to identify or markings on hoistway apparatus.
  5. Provide one copy of master electric and hydraulic schematic, behind plastic or glass glazing, in metal frame. Locate where directed.
  6. Provide one copy of lubrication chart, behind plastic or glass glazing, in metal frame. Locate where directed.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing elevator equipment with ten years minimum documented experience.
- B. Installer: Employees and supervisor on payroll of elevator equipment manufacturer.
- C. Perform welding in accordance with AWS D1.1.
- D. Regulatory Requirements
  - 1. Conform to ASME A17.1 Safety Code for Elevators and Escalators.
  - 2. Conform to ANSI A117.1 and the Americans with Disabilities Act (ADA) for provisions for the disabled.
  - 3. Conform to Chapter 296-81 of the Washington Administrative Code.
  - 4. Where differences exist between these authorities, the most stringent shall govern.
  - 5. Fire Rated Door Construction: Conform to one of the following:
    - a. NFPA 252.
    - b. UL 10B.
  - 6. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.
  - 7. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.
  - 8. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- E. Tests
  - 1. Provide inspection and testing of each elevator under provisions of Section 01 40 00.
  - 2. Obtain required permits to perform tests.
  - 3. Perform tests required by regulatory agencies and report results to Owner and Architect.
- F. Pre-installation Conference:
  - 1. Convene a pre-installation conference one week prior to commencing work of this Section, under provisions of Section 01 31 00.
  - 2. Require attendance of persons directly involved with the work of this Section.
  - 3. Review schedule of installation, installation procedures and conditions, and coordination with related work.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.

#### 1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

## 1.7 WARRANTY

- A. Provide (1) one year warranty then a (1) one year maintenance period for a total of (2) year of coverage under this contract to commence at the school acceptance under provisions of Section 01 77 00.
- B. Warranty: Include coverage of elevator system controller, operating equipment and devices.

## 1.8 MAINTENANCE SERVICE

- A. Contractor shall furnish semi-monthly maintenance service concurrent with the warranty period. Warranty period shall be for 12 months. This maintenance shall include cleaning, lubrication, adjustment, all repairs and parts to keep the elevator in operating condition. Call-backs will be reimbursed for damage caused by vandalism or call-backs which are found to be due to a power outage in the electrical service to the elevator control. Damage caused by vandalism will be repaired on an equitable basis at the time it is found and a determination of the extent of damage can be made.
- B. Maintenance hydraulic fluid levels. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment.
- C. Perform work without removing cars from service during peak traffic periods.
- D. Provide emergency call back service at all house for this maintenance period.
- E. Maintain locally, near the place of the work, an adequate stock of parts for replacement or emergency purposes, and have qualified installation personnel available to ensure the fulfillment of this maintenance service without unreasonable loss of time.
- F. Perform maintenance work using competent personnel, under the supervision of the elevator manufacturer.
- G. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Otis, Hydrofit 2100.
- B. Acceptable Manufacturers:
  - 1. Otis Elevator Co.
  - 2. ThyssenKrupp Elevator Americas.
- C. Substitutions: See Section 01 25 00 Substitution Procedures.

### 2.2 SYSTEM DESCRIPTION

- A. Characteristics of elevators are as follows:
  - 1. Rated Net Capacity: 2100.
  - 2. Rated Speed: 100 FPM.



3. Travel Distance: Refer to drawings.
  4. Hoistway Size: Refer to drawings.
  5. Platform Size: Manufacturer's standard, coordinate with drawings.
  6. Clear Inside Cab Dimensions: Refer to drawings.
  7. Cab Interior Height: Refer to drawings.
  8. No. of Stops: 2.
  9. No. of Openings: Front.
  10. Door Type: Single Panel.
  11. Door Operation: Side opening.
- B. Program doors to open automatically when car arrives at floor.
- C. Include door protective devices consisting of movable, retractable safety edges, noiseless in operation and proximity detector device. Also provide light beam reopening device at 5 inch and 29 inch levels which do not require contact to operate. Doors shall remain open at least 20 seconds.
- D. Program door operating sequence to minimize car and hall door open and close times. Provide independently adjustable door open times.
- E. Program controls to minimize delays and the return of car to service, should doors be prevented from closing for a predetermined time.
- F. If doors are prevented from closing for approximately twenty seconds because of an activated obstruction safety device, automatically disconnect door control device, allow doors to close more slowly, and recycle until obstruction is cleared. Sound alarm.
- G. Render "Door Close" signal inoperative when car is standing at dispatching terminal with doors open unless that elevator is operating on independent service.
- H. Special Operational Features:
1. Independent operation with key operated fire fighter's controls.
  2. Provide key switch to allow service to be shut off. Provide fire department service override and furnish three keys for switch cylinder to Owner.
- I. Firefighter's Operation
1. Provide manual firefighter's operation in accordance with ANSI A17.1.
  2. Do not permit sensing devices to restore normal service.
- J. System Power Requirements
1. Controller: The elevator control system shall be microprocessor based and software oriented and be linked together for purposes of communication by a serial communications link. Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops, and by "up-down" push buttons at each intermediate landing and "call" push buttons at terminal landings.
    - a. Momentary pressing of one or more buttons shall dispatch the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed. Each landing call shall be canceled when answered.
    - b. When the car is traveling in the up direction, it shall stop at all floors for which car buttons for "up" hall buttons have been pressed. The car shall not stop at floors where "down" buttons have been pressed, unless the stop for that floor has been registered by a car button or unless the down call is at the highest floor for which any buttons have been pressed. Pressing the "up" button when the car is traveling in the down direction shall not intercept the travel unless the stop for that floor has been registered by a car button or unless the up call is the lowest for which any button has been pressed.

- c. When the car has responded to its highest or lowest stop, and stops are registered for the opposite direction, its direction of travel shall reverse automatically and it shall then answer the calls registered for that direction. If both up and down calls are registered at an intermediate floor, only the call corresponding to the direction of car travel shall be canceled upon the stopping of the car at the landing.
2. Microprocessor: Locate the main microprocessor and car controller in the control space or hoistway.
  - a. Microprocessor for door operator shall reside in the door operator and control all functions of the elevator door(s). Communication to the car controller shall be serial.
  - b. Electronic selector shall reside on the car top and contain hall effect transducers that detect magnetic fields. Magnets, corresponding to floor positions and top/bottom of hoistway are mounted on a perforated metal tape that runs the length of the hoistway.
3. Provide Simplex Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the call shall park at the last landing served.
4. Provide a key operated switch in the elevator for the purpose of removing the car from normal operation. When the switch is in the "independent service" position, the elevator will bypass all landing calls and answer only car calls. The operator will have complete control over the operation of the car.
5. Emergency Power Operation: (Battery Lowering 10-DOC) When the loss of normal power is detected, a battery lowering feature is to be activated. The elevator shall automatically return to the bottom floor and provide a door operation. After passengers have exited the car, the doors will close and the car will shut down with its doors closed but subject to door operation from within the car. When normal power becomes available, the elevator will automatically resume operation.
  - a. The battery lowering feature is included in the elevator contract and does not utilize a building-supplied standby power source.
  - b. Will be powered by suitable batteries that are automatically maintained at full charge with the charging voltage regulated. Also provide manual oil bypass valve for lowering platform.
6. Limited Access Features: Hall controls to be key operated. Keyed switch adapted to the school's Schlage Primus Everest keying system specified in Section 08 71 00.

## 2.3 MATERIALS

- A. Rolled Steel Sections, Shapes, Rods: ASTM A36.
- B. Casing: ASTM A139, Grade A steel.
- C. Sheet Steel: ASTM A1008; Class 1, with commercial bright finish.
- D. Stainless Steel: ASTM A167; Type 304; No. 4 finish.
- E. Aluminum: ASTM B221, extruded 6063 alloy with T6 temper; satin finish.
- F. Plywood: APA rated sheathing, span rating 32/16, Exposure 1, sanded.
- G. Plastic Laminate: NEMA LD-3.

## 2.4 COMPONENTS

- A. Provide compact design suitable for operation under the required pressure. Mount the power component in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a low-pressure switch and a shut-off valve.
- B. Locate the entire hydraulic system with hydraulic-fluid storage tank, power component and valves in the hoistway pit. Provide maintenance access through an access door in the hoistway wall.
- C. Provide a microprocessor-based controller, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.
- D. Locate the controllers together with the hydraulic system in the hoistway pit and be easily accessible for maintenance through the same access door that is also used for the hydraulic system.
- E. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
- F. Pressure Switch.
- G. Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
- H. Guide Rails: Provide rolled steel section or composite section size and weight as required to adequately span a minimum distance of 15'-0" while carrying lateral load required by ANSI A17.1.

## 2.5 CAR FABRICATION

- A. Frame: Rigid rolled steel sections, braced; mounted on resilient isolators.
- B. Enclosure: Sheet steel panels attached to steel frame; sheet plywood inner liner.

## 2.6 CAB FABRICATION

- A. Provide manufacturer's standard car enclosure or units fabricated by firm specializing in elevator car enclosures; including fire rated plywood walls with plastic laminate interior finish; emergency lighting, ceiling lighting, with two speed fan, doors, emergency access, hardware, accessories, ceiling and floor; prepared to receive signal equipment and elevator devices and equipment. Interior cab minimum dimension to meet Montana State handicapped requirements.
- B. Floor, Walls and Ceiling: 3/4 inch plywood, fire retardant treated surfaces and edges. Attach with flush mechanical fasteners. Provide double thickness floor sheathing.

- C. Flooring: Refer to Room Finish Schedule and Section 09 65 00.
- D. Walls:
  - 1. Plastic Laminate: Refer to Room Finish Schedule.
- E. Trim, Including Base: Stainless steel.
- F. Handrails (On Walls without Doors): Stainless steel, round, height per applicable accessibility codes.
- G. Ceiling: Fluorescent lighting with luminous panels mounted in a metal frame.
- H. Back up Lighting: Provide DC lighting operated by emergency battery pack under power failure conditions.
- I. Control Panel and Face Plate: Stainless steel with illuminating call buttons, including Braille characters. Panel is to be a custom central panel with Best switches to be used for master key system.
- J. Indicator Panel: Above control panel with illuminating position indicators.
- K. One Set pads and ceiling hooks provided per elevator.
- L. License Frame and Glass: Attached with tamper proof screws.
- M. Cab Doors: Stainless steel; 16 gage, of insulated sandwich panel construction, flush design rolled profiles, rigid construction. Fascia panels constructed same as doors.
- N. Cab Door Frames and Transom: Stainless steel; 16 gage, of rolled profiles.
- O. Thresholds: Mill finished aluminum.
- P. Emergency Return: Refer to System Description above.
- Q. Emergency telephone mounted with highest operable part no more than 48 inches above the floor. Identify with raised lettering and Braille numerals. Provide hands-free type telephone. Provide in compartment with hinged door and simple, accessible latch.

## 2.7 HOISTWAY ENTRANCES

- A. Hoistway Doors: Stainless steel; 16 gage, of insulated sandwich panel construction, flush design, rolled profiles, rigid construction. Fascia panels constructed same as doors.
- B. Hoistway Door Frames: Stainless steel; 16 gage; of rolled profiles. Bolted corner with smooth invisible joints.
- C. Door and Frame Construction: UL rated, with 1-hour fire rating; insulated sandwich panel construction, 1-1/4 inch thick.
- D. Weatherstrip hoistway door and frames to minimize audible noise caused by car movement imposed air pressure differential between hoistway and landing floors.

## 2.8 FACTORY FINISHING

- A. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
  - 1. FS TT-P-645.
- B. Galvanized Surfaces: Clean with neutralizing solvent; prime one coat.
  - 1. FS TT-P-641.
- C. Aluminum: Clear anodized finish.
- D. Wood Surfaces not Exposed to Public View: One coat primer; two coats enamel.
- E. Stainless Steel: #4 Satin Polished.

## 2.9 SIGNAL EQUIPMENT

- A. Provide manufacturer's standard signal equipment and graphics system, except as otherwise indicated, for the required type and operation of elevator. Provide stainless steel exposed metal surfaces, with acrylic plastic translucent signals.
  - 1. Provide one car-control station at front entrance in car; mounted for handicap use with tactile letters.
  - 2. Provide Commercial Grade Heavy duty Vandal proof hall and car mechanical call buttons, hall and car.
  - 3. Provide emergency alarm bell, located as directed, with button in car.
  - 4. Provide audible and visible car direction indicator.
  - 5. Provide telephone box with instrument and automatic dialer for connection to local exchange by others.
  - 6. Provide a separate Locknetics 650 Series key switch with I/C core at each floor in the hallway, next to the call buttons that lock out operation of the elevator for Keyed Elevator Operation Cylinder to be keyed to building Master Key System, to lockout the operation of the elevator and have the door closed.

## 2.10 SEISMIC CRITERIA

- A. Design and assemble elevator equipment and components to withstand earthquake forces in accordance with applicable code.
- B. Include adjustable seismic trigger switches to operate elevators, wherever predetermined level of seismic acceleration is detected as follows:
  - 1. Prevent idle elevators from starting.
  - 2. Stop elevators at next available stop.

## 2.11 DESIGN FOR THE DISABLED

- A. Comply with ANSI A117.1 and applicable Montana state requirements. It is also the intent of this specification to incorporate applicable provisions of the Americans with Disabilities Act (ADA). The more restrictive requirements shall govern.
- B. Include stainless steel handrails with ends returned on three sides of car.

- C. Sound audible signal in car when car is stopping or stopped at a floor. Audible signal shall be no less than 20 decibels and less than 1500 hertz. Provide visual indicator with numerals at least ½ inch high.
- D. All floor buttons shall be installed no higher than 48 inches above finish floor. Emergency controls shall have centerlines no less than 35 inches above finish floor.
- E. In each cab provide Arabic numerals 5/8 inch in height raised a minimum of 0.03 inch and Braille numerals immediately to left of floor buttons to identify floor.
- F. At each floor landing provide 2 inch floor numerals raised a minimum of 0.03 inch on both jambs. Place floor numerals at 60 inches above finish floor. Provide a raised star adjacent to the main floor (ground floor) button.
- G. Locate control panel on front wall of car adjacent to doorway.
- H. Provide emergency two-way communication systems between the elevator and a point outside the hoistway to comply with ANSI A17.1 and ADA 4.10.14.

### PART 3 EXECUTION

#### 3.1 INSPECTION

- A. Verify that hoistway and pit are ready for work of this Section.
- B. Verify shaft and openings are of correct size and within tolerances.
- C. Verify location and size of machine foundation and position of machine foundation bolts.
- D. Confirm electrical power is available and of correct characteristics.
- E. Report defects or deficiencies in writing.
- F. Beginning of installation means acceptance of conditions.

#### 3.2 PREPARATION

- A. Arrange for temporary electrical power to be available for installation work and testing of elevator components.

#### 3.3 INSTALLATION

- A. Install in accordance with ANSI/ASME A17.1.
- B. Install hoistway. Connect equipment to building utilities. Install piping between hoistway plunger and pump unit.
- C. Provide conduit, boxes, wiring, and accessories within hoistway and signal outlets.
- D. Mount motor and pump unit on vibration and acoustic isolators, on bed plate, and concrete pad. Place units on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.

- E. Install guide rails using threaded bolts with metal shims and lockwashers under nuts. Compensate for expansion and contraction movement of guide rails.
- F. Accurately machine and align guide rails. Form smooth joints with machined splice plates.
- G. Bolt or weld brackets directly to hoistway framing.
- H. Field Welds: Chip and clean away oxidation and residue; wire brush weld; prime two coats.
- I. Coordinate installation of hoistway wall construction.
- J. Install hoistway door sills, frames and headers in hoistway walls. Grout sills in place with non-staining, non-shrink grout. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.
- K. Adjust equipment for smooth and quiet operation.

### 3.4 TOLERANCES

- A. Guide Rail Alignment: Plumb and parallel to each other within 1/8 inch.
- B. Cab Movement on Aligned Guide Rails: Smooth movement, with no perceptible lateral or oscillating movement or vibration.

### 3.5 FIELD QUALITY CONTROL

- A. Perform and meet tests required by ANSI/ASME A17.1.
- B. Supply instruments and execute specific tests.
- C. Furnish test and approval certificates issued by jurisdictional authorities.
- D. Provide two weeks written notice of date and time of tests.

### 3.6 INSTRUCTION AND MAINTENANCE

- A. Instruct Owner's personnel in proper use, operations and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program.

### 3.7 CLEANING

- A. Remove protective coverings from finished surfaces.
- B. Clean surfaces and components ready for inspection.

### 3.8 ADJUSTING

- A. Adjust for smooth acceleration and deceleration of car provide passenger comfort.

- B. Adjust doors to open only at the landing where the car is at rest. The opening sequence may begin only when the car is at rest. The car must be substantially level with the landing before the hoistway door is fully open.
- C. Adjust automatic floor leveling feature at each floor to achieve a maximum of 1/4 inch from flush.

### 3.9 PROTECTION

- A. Protect finished installation under provisions of Section 01 73 00.

END OF SECTION 14 24 00