

# BALTIMORE COUNTY PUBLIC SCHOOLS

S. Dallas Dance, Ph.D., Superintendent

6901 Charles Street Towson, MD • 21204-3711

## ADDENDUM NUMBER \_\_1\_\_

DATE: November 15, 2016  
BID NAME: REPLACEMENT OF VICTORY VILLA ELEMENTARY SCHOOL  
BID NUMBER: ARA-209-17  
DUE DATE: DECEMBER 8, 2016  
DUE TIME: 2:00 P.M.

TOTAL PAGES: 356

The following revisions and responses to questions are made to the original bid document. This addendum forms a part of the Contract Documents and modifies the Original Solicitation Documents accordingly and as noted below. Acknowledge receipt of this Addendum in the space provided on the "Addenda" form within the Form of Proposal.

### **SPECIFICATIONS**

**(1) ADD:** ADD the following specification sections were inadvertently left out of specification Volume Number I:

DIVISION 01 - GENERAL REQUIREMENTS  
01 10 00 SUMMARY  
01 21 00 ALLOWANCES  
01 22 00 UNIT PRICES  
01 23 00 ADD ALTERNATES  
01 26 00 CONTRACT MODIFICATION PROCEDURES  
01 29 00 PAYMENT PROCEDURES  
01 31 00 PROJECT MANAGEMENT AND COORDINATION  
01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION  
01 33 00 SUBMITTAL PROCEDURES  
01 40 00 QUALITY REQUIREMENTS  
01 42 00 REFERENCES  
01 50 00 TEMPORARY FACILITIES AND CONTROLS  
01 56 39 TREE PROTECTION & TRIMMING  
01 73 00 EXECUTION  
01 73 23 OPERATION AND MAINTENANCE MANUALS  
01 74 00 CLEANING PROCEDURES  
01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL  
01 77 00 CLOSEOUT PROCEDURES  
01 77 50 ASSET INFORMATION COLLECTION  
01 78 23 OPERATION & MAINTENANCE MANUALS  
01 78 39 RECORD DOCUMENTS  
01 79 00 DEMONSTRATION  
01 81 13 SUSTAINABLE DESIGN REQUIREMENTS  
01 91 13 GENERAL COMMISSIONING REQUIREMENTS

*Creating a Culture of Deliberate Excellence*

DIVISION 07 – THERMAL AND MOISTURE PROTECTION  
07 52 00 HOT APPLIED BUILT-UP ROOFING

DIVISION 08 – OPENINGS  
08 80 00 GLAZING

DIVISION 10 – SPECIALTIES  
10 21 13 TOILET COMPARTMENTS  
10 22 26 OPERABLE PARTITIONS  
10 26 60 CORNER GUARDS  
10 28 00 TOILET ACCESSORIES, SHOWER ENCLOSURES & RECYCLING RECEPTACLES  
10 44 16 FIRE EXTINGUISHERS AND FIRE EXTINGUISHER CABINETS  
10 50 50 METAL LOCKERS  
10 70 10 EXTERIOR SUN CONTROL DEVICES (ADD ALTERNATE)  
10 75 00 FLAGPOLES  
10 82 13 ROOF SCREENS (ADD ALTERNATE)

DIVISION 11 – EQUIPMENT  
11 06 10 STAGE CURTAINS  
11 40 00 FOODSERVICE EQUIPMENT  
11 52 13 FIXED REAR PROJECTION SCREENS  
11 54 13 KILNS  
11 68 00 PLAYGROUND EQUIPMENT  
11 90 00 WEATHER STATION (ADD ALTERNATE)

DIVISION 12 - FURNISHINGS  
12 21 13 HORIZONTAL LOUVER BLINDS  
12 35 00 LIBRARY FURNITURE  
12 93 00 SITE FURNISHINGS

DIVISION 14 – CONVEYING EQUIPMENT  
14 24 00 HOLELESS HYDRAULIC ELEVATORS  
14 21 50 ADA LIFT

**(2) REVISE** the specification Table of Contents. See attached updated Table of Contents with revisions shown in bold text and a corresponding (Addm. No.1).

All other specifications and terms remain as stated in original document. This addendum is hereby made a part of the Contract Documents, on which the contract is based and is intended to modify, explain, correct and/or add to the original Contract Documents.

### **END OF ADDENDUM NUMBER 1**

Anita Randall

Purchasing Agent  
Baltimore County Public Schools - Office of Purchasing

Katy Angstadt, Project Manager  
Bid file

*Creating a Culture of Deliberate Excellence*

**TABLE OF CONTENTS  
OF THE PROJECT MANUAL**

FOR

**Victory Villa Elementary School**  
500 Compass Road, Maryland 21220

**SPECIFICATIONS**

**BID SET**

November 10, 2016  
**(Rev. 11-15-2016 Addm.No.1)**

PSCP #03.057.17 LP  
ARA-209-17

The arrangement of the Project Manual has been established on the MASTERFORMAT (2009 version) of the CONSTRUCTION SPECIFICATIONS INSTITUTE. The following Table of Contents lists certain Bidding and Contract Documents which are made part of this Project Manual by reference.

No. of Pages  
Not Used

**VOLUME 1 (Div. 0-14; APPENDIX)**

**DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS**

BCPS	COVER PAGE PRE-BID INFORMATION SHEET
00100	NOTICE TO CONTRACTORS
PART 1	BCPS PART I GENERAL TERMS AND CONDITIONS
PART 2	BCPS PART II SPECIFICATIONS AND FORMS
00200	INSTRUCTIONS TO BIDDERS
00400	PROPOSAL FORM
00430	BID BOND
00450	MINORITY BUSINESS ENTERPRISE FORMS
00500	AGREEMENT BETWEEN THE OWNER AND CONTRACTOR
00510	APPLICATION FOR PAYMENT
00610	PERFORMANCE AND PAYMENT BONDS
00700	GENERAL CONDITIONS
00800	SUPPLEMENTAL CONDITIONS AND PROVISIONS
00850	STATE FUNDED (PREVAILING) WAGE RATES

**DIVISION 01 - GENERAL REQUIREMENTS**

01 10 00	SUMMARY
01 21 00	ALLOWANCES

01 22 00	UNIT PRICES
01 23 00	ADD ALTERNATES
01 26 00	CONTRACT MODIFICATION PROCEDURES
01 29 00	PAYMENT PROCEDURES
01 31 00	PROJECT MANAGEMENT AND COORDINATION
01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
01 33 00	SUBMITTAL PROCEDURES
01 40 00	QUALITY REQUIREMENTS
01 42 00	REFERENCES
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 56 39	TREE PROTECTION & TRIMMING
01 73 00	EXECUTION
<del>01 73 23</del>	<del>OPERATION AND MAINTENANCE MANUALS (Addm. No.1)</del>
01 74 00	CLEANING PROCEDURES
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 77 50	ASSET INFORMATION COLLECTION
01 78 23	OPERATION & MAINTENANCE DATA
01 78 39	RECORD DOCUMENTS
01 79 00	DEMONSTRATION
01 81 13	SUSTAINABLE DESIGN REQUIREMENTS
01 91 13	GENERAL COMMISSIONING REQUIREMENTS

**NON-CONTRACT PRE-CONSTRUCTION SURVEY DATA**

NOT USED

**DIVISION 02 – EXISTING CONDITIONS**

NOT USED

**DIVISION 03 – CONCRETE**

03 30 00 CAST-IN-PLACE CONCRETE

**DIVISION 04 – MASONRY**

04 20 00 UNIT MASONRY ASSEMBLIES  
04 21 13 BRICK AND STEEL STUD MASONRY  
04 72 00 CAST STONE MASONRY – WET CAST

**DIVISION 05 – METALS**

05 12 00 STRUCTURAL STEEL FRAMING  
05 12 10 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (Monumental Stair)  
05 21 00 STEEL JOIST FRAMING  
05 31 00 STEEL DECK  
05 40 00 COLD FORMED METAL FRAMING  
05 50 00 METAL FABRICATIONS AND STEEL STAIRS  
05 58 60 METAL COLUMN COVERS  
05 73 00 DECORATIVE METAL RAILING SYSTEMS

**DIVISION 06 – WOOD, PLASTICS, AND COMPONENTS**

06 10 00 ROUGH CARPENTRY  
06 16 00 SHEATHING  
06 40 23 INTERIOR ARCHITECTURAL WOODWORK

**DIVISION 07 – THERMAL AND MOISTURE PROTECTION**

07 13 26 SELF-ADHERING SHEET WATERPROOFING  
07 21 00 INSULATION

07 22 00	ROOF AND DECK INSULATION
07 27 20	FLUID-APPLIED MEMBRANE AIR AND VAPOR BARRIERS
07 33 63	VEGETATED ROOF ASSEMBLY: PRE-VEGETATED MODULAR (ADD ALTERNATE)
07 42 30	METAL COMPOSITE MATERIAL WALL PANELS
07 46 00	EXTERIOR ALUMINUM SOFFITTS
07 52 10	HYBRID HOT APPLIED BUILT-UP ROOFING
<b>07 52 00</b>	<b>HOT APPLIED BUILT-UP ROOFING (Addm. No.1)</b>
07 52 15	HOT APPLIED PVC/KEE ROOFING
07 62 00	SHEET METAL FLASHING AND COPINGS
07 72 10	ROOF HATCH
07 81 00	SPRAYED FIRE-RESISTIVE MATERIALS
07 84 13	PENETRATION FIRESTOPPING
07 92 00	JOINT SEALANTS
07 95 00	EXPANSION CONTROL

**DIVISION 08 – OPENINGS**

08 11 13	HOLLOW METAL DOORS AND FRAMES
08 14 16	FLUSH WOOD DOORS
08 31 13	ACCESS DOORS
08 33 22	OVERHEAD COILING SERVICE DOORS
08 41 13	ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
08 71 00	DOOR HARDWARE
08 80 00	GLAZING
08 90 00	LOUVERS AND VENTS
08 91 10	GLAZED ALUMINUM CURTAIN WALLS

**DIVISION 09 – FINISHES**

09 29 00	GYPSUM BOARD ASSEMBLIES
09 29 50	GYPSUM SHAFT WALL ASSEMBLIES
09 31 00	CERAMIC TILE
09 51 23	ACOUSTICAL CEILING TILE & CLOUDS
09 51 50	WOOD VENEER ACOUSTICAL WALL PANEL SYSTEM
09 65 19	RESILIENT TILE FLOORING
09 64 00	NEW WOOD FLOORING
09 65 30	RESILIENT WALL BASE AND ACCESSORIES
09 67 00	RESINOUS FLOORING
09 68 10	CARPET TILE WOM
09 84 33	SOUND-ABSORBING WALL UNITS
09 91 00	PAINTING

**DIVISION 10 – SPECIALTIES**

10 10 10	VISUAL DISPLAY BOARDS
<b>10 12 00</b>	<b>DISPLAY CABINETS (Addm. No. 1)</b>
10 14 00	SIGNAGE-EXTERIOR AND INTERIOR
10 21 13	TOILET COMPARTMENTS
10 22 26	OPERABLE PARTITIONS
10 26 60	CORNER GUARDS
10 28 00	TOILET ACCESSORIES, SHOWER ENCLOSURES & RECYCLING RECEPTACLES
10 44 16	FIRE EXTINGUISHERS AND FIRE EXTINGUISHER CABINETS
10 50 50	METAL LOCKERS
10 70 10	EXTERIOR SUN CONTROL DEVICES (ADD ALTERNATE)
10 75 00	FLAGPOLES
10 82 13	ROOF SCREENS (ADD ALTERNATE)

**DIVISION 11 – EQUIPMENT**

11 06 10	STAGE CURTAINS
----------	----------------

11 40 00	FOODSERVICE EQUIPMENT
11 52 13	FIXED REAR PROJECTION SCREENS
11 54 13	KILNS
11 68 00	PLAYGROUND EQUIPMENT
<b>11 68 20</b>	<b>GYMNASIUM EQUIPMENT (Addm. No.1)</b>
<b>11 90 20</b>	<b>WEATHER STATION (ADD ALTERNATE) (Addm. No.1)</b>

**DIVISION 12 - FURNISHINGS**

12 21 13	HORIZONTAL LOUVER BLINDS
12 35 00	LIBRARY FURNITURE
12 93 00	SITE FURNISHINGS

**DIVISION 14 – CONVEYING EQUIPMENT**

14 24 00	HOLELESS HYDRAULIC ELEVATORS
14 21 50	ADA LIFT

**APPENDIX**

	GEOTECHNICAL REPORT
	ADDENDUM #1 TO GEOTECHNICAL REPORT

## **VOLUME 2 (Div. 21-33)**

**DIVISION 21 – FIRE SUPPRESSION**

21 01 01	FIRE-SUPPRESSION GENERAL PROVISIONS
21 05 00	COMMON WORK RESULTS FOR FIRE SUPPRESSION
21 10 00	WATER-BASED FIRE-SUPPRESSION SYSTEM

**DIVISION 22 – PLUMBING**

22 01 01	PLUMBING GENERAL PROVISIONS
22 05 00	COMMON WORK RESULTS FOR PLUMBING
22 05 01	EXCAVATION AND FILL FOR PLUMBING WORK
22 05 02	SLEEVES AND PLATES FOR PLUMBING PIPING
22 05 03	ACCESS DOORS FOR PLUMBING PIPING AND EQUIPMENT
22 05 05	EQUIPMENT CONNECTIONS FOR PLUMBING
22 05 06	CURBS AND FLASHINGS FOR PLUMBING PIPING AND EQUIPMENT
22 05 07	FIRESTOPPING FOR PLUMBING WORK
22 05 09	PLUMBING EXPANSION SYSTEM
22 05 13	COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT
22 05 19	METERS AND GAGES FOR PLUMBING PIPING
22 05 23	GENERAL DUTY VALVES FOR PLUMBING PIPING
22 05 29	HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 05 48	VIBRATION CONTROL SUPPORTS FOR PLUMBING
22 07 00	PLUMBING INSULATION
22 07 19	PLUMBING PIPING INSULATION
22 08 00	COMMISSIONING OF PLUMBING SYSTEMS
22 11 16	DOMESTIC WATER PIPING
22 11 19	DOMESTIC WATER PIPING SPECIALTIES
22 11 23	DOMESTIC WATER PUMPS
<b>22 13 13</b>	<b>FACILITY SANITARY SEWERS (Addm. No.1)</b>
22 13 16	SANITARY WASTE AND VENT PIPING
22 13 19	SANITARY WASTE PIPING SPECILATIES
22 14 13	STORM DRAINAGE PIPING
22 14 23	STORM DRAINAGE PIPING SPECILATIES
22 14 29	SUMP PUMPS

22 34 00 FUEL-FIRED DOMESTIC WATER HEATERS  
22 42 00 INSTITUTIONAL PLUMBING FIXTURES

**DIVISION 23 – HVAC**

23 01 00 OPERATION AND MAINTENANCE OF HVAC SYSTEMS  
23 01 01 HVAC GENERAL PROVISIONS  
23 05 00 COMMON WORK RESULTS FOR HVAC  
23 05 01 EXCAVATION AND FILL FOR HVAC WORK  
23 05 02 SLEEVES AND PLATES FOR HVAC PIPING  
23 05 03 ACCESS DOORS FOR HVAC PIPING AND EQUIPMENT  
23 05 05 EQUIPMENT CONNECTIONS FOR HVAC  
23 05 06 CURBS AND FLASHINGS FOR HVAC PIPING AND EQUIPMENT  
23 05 07 FIRESTOPPING FOR HVAC WORK  
23 05 08 HVAC PIPING SPECIALTIES  
23 05 09 HVAC EXPANSION SYSTEM  
23 05 13 COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT  
23 05 19 METERS AND GAGES FOR HVAC PIPING  
23 05 23 GENERAL-DUTY VALVES FOR HVAC PIPING  
23 05 29 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT  
23 05 33 HEAT TRACING FOR HVAC PIPING  
23 05 48 VIBRATION CONTROL SUPPORTS FOR HVAC  
23 05 93 TESTING, ADJUSTING AND BALANCING  
23 07 00 HVAC INSULATION  
23 07 13 DUCT INSULATION  
23 07 16 HVAC EQUIPMENT INSULATION  
23 07 19 HVAC PIPING INSULATION  
23 08 00 COMMISSIONING OF MECHANICAL SYSTEMS  
23 09 01 AUTOMATIC TEMPERATURE CONTROL SYSTEM  
23 09 02 CONTROL SYSTEMS WIRING  
23 09 05 CONTROL PANELS  
23 09 07 CONTROL DAMPERS  
23 09 08 CONTROL VALVES  
23 09 13 INSTRUMENTATION AND CONTROL DEVICES FOR HVAC  
23 09 23 DIRECT DIGITAL BUILDING SYSTEMS CONTROL  
23 11 23 NATURAL-GAS PIPING  
23 21 13 HYDRONIC PIPING  
23 21 15 PREFABRICATED INSULATED PIPING  
23 21 23 HVAC PUMPS  
23 23 00 REFRIGERANT PIPING  
23 25 00 HVAC WATER TREATMENT  
23 31 13 METAL DUCTS  
23 33 00 DUCT ACCESSORIES  
23 34 00 HVAC FANS  
23 37 13 DIFFUSERS, REGISTERS, AND GRILLES  
23 37 14 LOUVERS  
23 41 00 PARTICULATE AIR FILTRATION  
23 51 00 BREECHINGS, CHIMNEYS, AND STACKS  
23 52 16 CONDENSING BOILERS  
23 63 13 AIR COOLED REFRIGERANT CONDENSING UNITS  
23 64 19 POSITIVE DISPLACEMENT CHILLERS  
23 72 00 ENERGY RECOVERY UNITS  
23 73 22 AIR-HANDLING UNITS WITH COILS  
23 74 13 PACKAGED ROOFTOP AIR-CONDITIONING UNITS  
23 81 27 DUCTLESS SPLIT-SYSTEM UNITS  
23 81 28 VARIABLE-REFRIGERANT-VOLUME MULTIZONE SYSTEM  
23 82 19 FAN-COIL UNITS

23 82 33	CONVECTORS
23 82 38	ELECTRIC RESISTANCE TERMINAL UNITS
23 82 39	UNIT HEATERS

#### **DIVISION 26 – ELECTRICAL**

26 01 01	ELECTRICAL GENERAL PROVISIONS
26 05 00	COMMON WORK RESULTS FOR ELECTRICAL
26 05 01	EXCAVATION AND FILL FOR ELECTRICAL WORK
26 05 03	ACCESS DOORS FOR ELECTRICAL WORK
26 05 07	FIRESTOPPING FOR ELECTRICAL WORK
26 05 19	WIRES AND CABLES
26 05 21	WIRING CONNECTIONS
26 05 26	GROUNDING & BONDING
26 05 28	EQUIPMENT FOUNDATIONS
26 05 33	CONDUITS
26 05 34	BOXES
26 05 36	CABLE TRAY
26 05 41	LOW-VOLTAGE SERVICE ENTRANCE
26 05 44	UNDERGROUND DUCTS AND UTILITY STRUCTURES
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 05 73	OVERCURRENT PROTECTIVE DEVICE STUDIES
26 08 00	COMMISSIONING OF ELECTRICAL SYSTEMS
26 09 23	STAND-ALONE LIGHTING CONTROL DEVICES
26 09 36	NETWORKED LIGHTING CONTROLS
26 22 00	LOW-VOLTAGE TRANSFORMERS
26 24 13	SWITCHBOARDS
26 24 16	PANELBOARDS
26 27 16	CABINETS AND ENCLOSURES
26 27 26	WIRING DEVICES
26 28 00	LOW-VOLTAGE CIRCUIT PROTECTIVE DEVICES
26 28 13	FUSES
26 29 14	ENCLOSED MOTOR CONTROLLERS
26 29 23	VARIABLE FREQUENCY DRIVES
26 32 13	GENERATORS, WEATHER-PROTECTED
26 36 00	TRANSFER SWITCHES
26 41 13	LIGHTNING PROTECTION FOR STRUCTURES
<b>26 43 13</b>	<b>SURGE PROTECTIVE DEVICES (Addm.No.1)</b>
26 51 00	INTERIOR LIGHTING
26 56 00	EXTERIOR LIGHTING

#### **DIVISION 27 – COMMUNICATIONS**

27 01 01	COMMUNICATIONS GENERAL PROVISIONS
27 05 00	COMMON WORK RESULTS FOR COMMUNICATIONS
27 10 00	LOW-VOLTAGE STRUCTURED CABLING SYSTEM
27 32 45	PUBLIC SAFETY-FIRST RESPONDER RADIO AMPLIFICATION SYSTEM
<del>27 41 25</del>	<del>CLASSROOM SOUND SYSTEM (Addm.No.1)</del>
27 51 16	INTERCOM/PUBLIC ADDRESS AND MASTER CLOCK

#### **DIVISION 28 – FIRE ALARM SYSTEM**

28 01 01	ELECTRONIC SAFETY AND SECURITY GENERAL PROVISIONS
28 05 00	COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY
28 16 00	INTRUSION DETECTION SYSTEM
28 31 00	FIRE DETECTION AND ALARM SYSTEMS

#### **DIVISION 31 – EARTHWORK**



31 10 00	SITE CLEARING
31 20 00	EARTHWORK
31 20 02	BIO-RETENTION SOIL
<del>31 23 19</del>	<del>DEWATERING (Addm. No.1)</del>
31 31 16	TERMITE CONTROL
31 37 00	SEDIMENT AND EROSION CONTROL
31 66 13	AGGREGATE PIER SOIL REINFORCEMENT

**DIVISION 32 – EXTERIOR IMPROVEMENTS**

32 12 16	HOT MIX ASPHALT PAVING
32 13 13	PORTLAND CEMENT CONCRETE PAVEMENT
32 13 73	PAVEMENT JOINTS
32 18 16.13	PLAYGROUND PROTECTIVE SURFACING
32 31 13	CHAIN LINK FENCES and GATES
32 31 19	ORNAMENTAL PICKET FENCES
32 92 00	LAWNS AND GRASSES
32 93 00	LANDSCAPING

**DIVISION 33 – UTILITIES**

33 41 00	STORM DRAINAGE SYSTEMS
33 46 00	SUBDRAINAGE

END OF TABLE OF CONTENTS

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Project information.
  - 2. Work covered by Contract Documents.
  - 3. Work by Owner.
  - 4. Work under separate contracts.
  - 5. Access to site.
  - 6. Coordination with occupants.
  - 7. Work restrictions.
  - 8. Specification and drawing conventions.

1.3 PROJECT INFORMATION

- A. Project Identification: New Victory Villa Elementary School
  - 1. Project Location: 500 Compass Road, Baltimore, Maryland 21220.
- B. Owner: Board of Education of Baltimore County, 6901 Charles Street, Towson, Maryland 21204. Tel: 410-887-4554
  - 1. Owner's Representative: Katherine Angstadt, Baltimore County Public Schools (hereafter BCPS) Senior Project Manager.
- C. Architect: Murphy & Dittenhafer Architects, Inc., 805 North Charles Street, Baltimore, Maryland. 21201. Tel: 410-785-7423
- D. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:
  - 1. Structural Engineer: Carroll Engineering, Inc., 215 Schilling Circle, Hunt Valley, MD 21031.Tel: 410-785-7423.
  - 2. Civil Engineer and Landscape Architect: Site Resources inc., 14315 Jarrettsville Pike, Phoenix, MD 21131.Tel: 410-683-3388.
  - 3. MEP Engineer: James Posey Associates, 3112 Lord Baltimore Drive, Baltimore, MD 21244.Tel: 410-265-6100.

4. Geotechnical Engineer: DW Kozera, Inc. 1408 Bare Hills Road, Suite 200, Baltimore, MD 21029. Tel: 410-823-1060.
5. Foodservice Design Consulting: Nyikos Associates, Inc., 18219-A Flower Hill Way, Gaithersburg, MD 20879. Tel: 240-683-9530.

#### 1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
  1. The scope of work consists of construction of a new 97,879 GSF elementary school building consisting of the following:
    - a. Classroom/Lobby building: A two-story building including but not limited to the following: kindergarten, pre-kindergarten, grades 1 (one) through 5 (five), and an administration/health suite, toilet rooms and a two-story lobby with a monumental connecting stair.
    - b. Gymnasium/Cafeteria/Food Service building: A one-story building including but not limited to the following: gymnasium, cafeteria, food service rooms, music rooms, toilet rooms and main mechanical room.
    - c. The two-story lobby is separated from the one-story gymnasium and cafeteria wing by a two-hour fire separation. The two-story lobby is separated from the two-story education wing by a smoke separation.
  2. Demolition of the existing one-story Victory Villa Elementary school constructed in 1942 will be completed prior to the beginning of new construction.
  3. New vehicular access drives for cars, buses and delivery trucks are provided as well as parking and walkways.
  4. The existing 12.45 acre site is located at 500 Compass Road which is on the north side of and contiguous to Compass Road and Honeycomb Road.
- B. Type of Contract:
  1. The work will be constructed under a single prime contract.
- C. Removal and disposal of materials:
  1. Non-hazardous materials shall be removed in accordance with Specification Section 017419 - Construction Waste Management and Disposal.
  2. Hazardous materials will be remediated and removed from the site prior to the beginning of construction. If additional hazardous materials are encountered the contractor shall stop work in that particular area and notify the Owner (BCPS) immediately.
- D. LEED Certification:
  1. LEED Silver Certification is required.

1.5 WORK UNDER SEPARATE CONTRACTS

- A. The existing Victory Villa Elementary School building constructed in 1942 will be demolished under a separate contract prior to the start of construction.

1.6 COORDINATION WITH BCPS AND NEIGHBORHOOD OCCUPANTS

- A. Adjacent Residential Occupancy: There are occupied residential homes located on the north south east and west sides of the site. Perform the Work so as not to interfere with day-to-day operations of the neighborhood.
  - 1. Maintain pedestrian access to existing roadside walkways.
  - 2. Maintain vehicular access for residential driveways, municipal trash pick-up, mail delivery, and other day-to-day functions of the neighborhood.
  - 3. Where necessary provide written request for permission from BCPS and authorities having jurisdiction.
  - 4. Schedule deliveries to minimize use of driveways and entrances by construction operations.
  - 5. Notify Owner not less than 72 hours in advance of activities that will affect neighborhood operations.
  - 6. Construction Entrance: Contractor shall install a separate construction entrance in accordance with the Civil drawings.

1.7 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 on site to normal business working hours of 7 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated.
  - 1. Weekend Hours: 8 a.m. to 5 p.m
  - 2. Early Morning Hours: Submit written request for permission to BCPS with 7 day min. notice.
  - 3. Hours for Utility Shutdowns: Submit written request for permission to BCPS with 7 day min. notice.
  - 4. Hours for noisy activity: 9 a.m. to 3 p.m
- 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 BCPS not less than seven days in advance of proposed utility interruptions.
  - 2. Obtain BCPS'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 BCPS not less than two days in advance of proposed disruptive operations.
2. Obtain BCPS's written permission before proceeding with disruptive operations.

E. Nonsmoking Site: Smoking is not permitted on site.

F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

H. Employee Screening: Comply with Owner's requirements for background screening of Contractor personnel working on Project site.

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

## 1.8 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 01 21 00 - ALLOWANCES

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 governing allowances.
  - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
  - 1. Quantity allowances.
- C. Related Requirements:
  - 1. Section 012200 "Unit Prices" for procedures for using unit prices.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
  - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
  - 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
  - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1 (Lump-Sum Allowance): Include the sum of \$20,000.00 for removal of unsatisfactory soil and replacement with satisfactory soil material.
  1. This allowance includes material cost, receiving, handling, installation and Contractor overhead and profit.

END OF SECTION 01 21 00



SECTION 01 22 00 - UNIT PRICES

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 unit prices.
- B. Related Requirements:
  - 1. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit, unless otherwise indicated.
- B. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- C. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.  
PRODUCTS (Not Used)

PART 2 - EXECUTION

2.1 SCHEDULE OF UNIT PRICES

- A. Unit Price 1: Removal of unsatisfactory soil and replacement with satisfactory soil material.

1. Description: Unsatisfactory soil excavation and disposal off site and replacement with satisfactory fill material or engineered fill from off site, as required, according to Section 31 20 00 "Earth Moving."
  2. Unit of Measurement: Cubic yard of soil excavated, based on survey of volume removed.
  3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 21 00 "Allowances."
- B. Unit Price No. 3: Heavy-Duty Concrete paving
1. Description: Heavy-Duty Concrete paving according to Section 32 13 13 "Concrete Paving" and Detail 4, Sheet C2.01, complete in place including excavation and stone base
  2. Unit of Measurement: Square feet.
- C. Unit Price No. 4: Full-Section Bituminous paving
1. Description: Full-section bituminous paving according to Section 32 12 16 "Hot-mix Asphalt Paving" and Detail 2, Sheet C2.01, complete in place including excavation and stone base
  2. Unit of Measurement: Square feet.
- D. Unit Price No. 6: Concrete Sidewalk
1. Description: Concrete sidewalk according to Section 32 13 13 "Concrete Paving" and Detail 1, Sheet C2.01, complete in place including excavation and stone base
  2. Unit of Measurement: Square feet.

END OF SECTION 01 22 00

SECTION 012 30 00 – ADD ALTERNATES

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 alternates.

1.3 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 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 alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 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. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. 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 ADD ALTERNATES

- A. Add Alternate #1 – PHOTOVOLTAIC INSTALLATION ON GREEN ROOF: Furnish and in install complete Photovoltaic Installation including steel structure, roof penetrations and fully operational bifacial photovoltaic panel system and all associated electrical work at location where shown on the drawings.
- B. Add Alternate #2 – WEATHER STATION: Furnish and in install complete fully operational weather station system as specified and provide electrical power and data at location where shown on the drawings.
- C. Add Alternate #3 – GREEN ROOF: Furnish and install green roof system over top of the built-up roofing system in lieu of standard roofing system as indicated on the drawings. Provide and install standard hot applied built-up roofing system in lieu hybrid hot applied built-up roofing system.
- D. Add Alternate #4 – AWNING VENT WINDOWS: Furnish and install Awning vent windows in all storefront as indicated on drawings.
- E. Add Alternate #5 – EXTERIOR SUN CONTROL DEVICES: Furnish and install fixed exterior sun control devices where shown in glazed aluminum storefront and curtain wall. Manufacturer shall be the same as the storefront and curtain wall manufacturer.
- F. Add Alternate #6 - MECHANICAL SCREEN WALL: Furnish and install “Mechanical Screen Wall” for the rooftop equipment as indicated on the drawings.
- G. Add Alternate #7 – ENTRANCE CANOPY: Furnish and install complete entrance canopy including structural system, roofing system, metal fascias and ceilings and lighting fixtures.
- H. Add Alternate #8 – LED SITE SIGN INSERT: Furnish and install complete two (2) sided LED sign panels and aluminum enclosure with power and data connections as shown on the drawings.
- I. Add Alternate #9 – QUARTZ TILE FLOORING: Furnish and install quartz tile flooring in lieu of VCT at all locations.
- J. Add Alternate #10 – INSTALL PLAYGROUND EQUIPMENT: Contractor shall remove existing playground equipment. Contractor shall accomplish all earthwork and grading and shall furnish and install all drainage, concrete mow strips and fence enclosures at Playground. The Owner shall furnish and install the New Playground Equipment.
- K. Add Alternate #11 – NEW FENCE FABRIC: Furnish and install new fence fabric for the existing multipurpose court.
- L. Add Alternate #12 – PLAYGROUND SURFACE: Furnish and install a complete unitary synthetic poured rubber seamless surface for the kindergarten playground instead of wood fiber mulch. Stabilization and preparation of subgrade shall be included.

- M. Add Alternate #13 – WOOD VENEER WALL PANELS IN CORRIDORS IN LIEU OF TILE: Furnish and install wood veneer on corridor walls.
- N. Add Alternate #14- TACKABLE SURFACE IN CORRIDORS: Furnish and install tackable surface in corridors.

END OF SECTION 01 23 00

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
  - 1. Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 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."

1.4 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. Work Change Proposal 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 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.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
  - 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 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.
  - 5. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
  - 6. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

#### 1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

#### 1.6 CHANGE ORDER PROCEDURES

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

#### 1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - 1. Construction 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 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 01 26 00



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 01 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. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the 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.
  - 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.
  - 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.
- 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. Architect's project number.
  - d. Contractor's name and address.
  - e. 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.
    - 1) Labor.
    - 2) Materials.
    - 3) Equipment.
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 where appropriate.
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. 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.
8. 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 Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect 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 of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- 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 Architect 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. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
  - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  - 2. When an application shows completion of an item, submit conditional final or full waivers.
  - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  - 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

- H. 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. Contractor's construction schedule (preliminary if not final).
  4. Products list (preliminary if not final).
  5. Schedule of unit prices.
  6. Submittal schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.
  10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
  13. Certificates of insurance and insurance policies.
  14. Performance and payment bonds.
  15. Data needed to acquire Owner's insurance.
- I. 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.
- J. 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. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.

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 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 provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. Coordination drawings.
  - 3. Requests for Information (RFIs).
  - 4. Project Web site.
  - 5. Project meetings.
- B. Related Requirements:
  - 1. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
  - 2. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 GENERAL COORDINATION PROCEDURES

- 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 (BCPS) 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. Preinstallation conferences.
  7. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner (BCPS)'s property.

#### 1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally 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. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    - f. Indicate required installation sequences.
    - g. Indicate dimensions shown on 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. Supplement plan drawings with section drawings where required to adequately represent the Work.
  2. Plenum Space: Indicate subframing 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. Indicate areas of conflict between light fixtures and other components.
  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. Mechanical and Plumbing Work: Show the following:
    - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    - c. Fire-rated enclosures around ductwork.
  7. Electrical Work: Show the following:
    - a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
    - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
  8. Fire-Protection System: Show the following:
    - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
  10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Division 01 Section "Submittal Procedures."
- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Preparation Format: DXF Version, operating in Microsoft Windows operating system.
3. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
4. BIM File Incorporation: Develop and incorporate coordination drawing files into Building Information Model established for Project.
  - a. Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect.
5. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
  - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
  - b. Digital Data Software Program: Drawings are available in BIM Revit or AutoCAD.
  - c. Contractor shall execute a data licensing agreement in the form of AIA Document C106 or in a form acceptable to Owner (BCPS) and Architect.

#### 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 in the form specified.
  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 and Contractor.
  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 suggested resolution 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.



- a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716, Form bound in Project Manual, or a software-generated form with substantially the same content as indicated above, acceptable to Owner (BCPS)/Architect.
- 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow ten (10) business days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
- 1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of Architect's actions on submittals.
    - g. 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 business working days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Use software log that is part of Project Web site. Include the following: 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 returned without action or withdrawn.
  - 5. RFI description.
  - 6. Date the RFI was submitted.
  - 7. Date Architect's response was received.
- F. 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 business working days if Contractor disagrees with response.
- 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT WEB SITE

- A. Provide, administer, and use Project Web site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web site shall include the following functions:
  - 1. Project directory.
  - 2. Project correspondence.
  - 3. Meeting minutes.
  - 4. Contract modifications forms and logs.
  - 5. RFI forms and logs.
  - 6. Task and issue management.
  - 7. Photo documentation.
  - 8. Schedule and calendar management.
  - 9. Submittals forms and logs.
  - 10. Payment application forms.
  - 11. Drawing and specification document hosting, viewing, and updating.
  - 12. Online document collaboration.
  - 13. Reminder and tracking functions.
  - 14. Archiving functions.
  
- B. Provide up to seven Project Web site user licenses for use of the Owner (BCPS), Owner (BCPS)'s Commissioning Authority, Architect, and Architect's consultants. Provide 4 hours of software training at Architect's office for Project Web site users.
  
- C. On completion of Project, provide one complete archive copy(ies) of Project Web site files to Owner (BCPS) and to Architect in a digital storage format acceptable to Architect.
  
- D. Provide [one of ]the following Project Web site software packages under their current published licensing agreements:
  - 1. AEC-Sync. (Newforma, Inc. Attoilst, LLC)
  - 2. Meridian Systems, Prolog
  - 3. Autodesk, Constructware.
  
- E. Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form of AIA Document C106 or an Agreement acceptable to Owner (BCPS) and Architect.

1.7 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 (BCPS) 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 (BCPS) (BCPS) 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 (BCPS) and Architect, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
  2. Attendees: Authorized representatives of Owner (BCPS) 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.
  3. 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. Lines of communications.
    - f. Procedures for processing field decisions and Change Orders.
    - g. Procedures for RFIs.
    - h. Procedures for testing and inspecting.
    - i. Procedures for processing Applications for Payment.
    - j. Distribution of the Contract Documents.
    - k. Submittal procedures.
    - l. Preparation of record documents.
    - m. Use of the premise and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner (BCPS)'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.
  4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Progress Meetings: Conduct progress meetings at biweekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
  2. Attendees: In addition to representatives of Owner (BCPS) 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.
  3. 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) Resolution of BIM component conflicts.
    - 4) Status of submittals.
    - 5) Deliveries.
    - 6) Off-site fabrication.
    - 7) Access.
    - 8) Site utilization.
    - 9) Temporary facilities and controls.
    - 10) Progress cleaning.
    - 11) Quality and work standards.
    - 12) Status of correction of deficient items.
    - 13) Field observations.
    - 14) Status of RFIs.
    - 15) Status of proposal requests.
    - 16) Pending changes.
    - 17) Status of Change Orders.
    - 18) Pending claims and disputes.
    - 19) Documentation of information for payment requests.
4. 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 013100

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes 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 CPM construction schedule.
  - 3. Construction schedule updating reports.
  - 4. Daily construction reports.
  - 5. Material location reports.
  - 6. Site condition reports.
  - 7. Special reports.
  - 8. Construction photographs and videos.
- B. Related Requirements:
  - 1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
  - 2. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time belongs to Owner.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

#### 1.4 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. Three 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 working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- E. CPM 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 the Notice to Proceed until most recent Application for Payment.

- F. Construction Schedule Updating Reports: Submit with Applications for Payment.
- G. Daily Construction Reports: Submit at weekly intervals.
- H. Material Location Reports: Submit at weekly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.
- J. Special Reports: Submit at time of unusual event.
- K. Qualification Data: For scheduling consultant.
- L. Construction Photograph and Video Documentation Plan and Submittals:
  - 1. Submit documentation plan for Project site and building with notation of vantage points marked for photographs and video recording.
  - 2. Submittals:
    - a. Qualifications: Indicate name and qualifications for photographer.
    - b. Construction Photographs: submit a complete set of digital image electronic files on CD-ROM. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

#### 1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.
- B. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
  - 1. Review software limitations and content and format for reports.
  - 2. Verify availability of qualified personnel needed to develop and update schedule.
  - 3. Discuss constraints, including phasing, work stages, area separations, interim milestones.
  - 4. Review delivery dates for Owner-furnished products.
  - 5. Review schedule for work of Owner's separate contracts.
  - 6. Review submittal requirements and procedures.
  - 7. Review time required for review of submittals and resubmittals.
  - 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
  - 9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
  - 10. Review and finalize list of construction activities to be included in schedule.
  - 11. Review procedures for updating schedule.

#### 1.6 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 STARTUP BASELINE CONSTRUCTION SCHEDULE

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

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

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 calendar days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 calendar days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. 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 60 calendar days after date established for the Notice to Proceed.
    - 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.
- D. CPM Schedule Updating:



1. Submit an updated CPM schedule at each bi-weekly construction meeting.
- E. 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. Purchase of materials.
    - d. Delivery.
    - e. Fabrication.
    - f. Utility interruptions.
    - g. Installation.
    - h. Work by Owner that may affect or be affected by Contractor's activities.
    - i. Testing and commissioning.
    - j. Punch list and final completion.
    - k. Activities occurring following 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. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
  5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, LEED documentation, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
    - a. Each activity cost shall reflect an appropriate value subject to approval by Architect.
    - b. Total cost assigned to activities shall equal the total Contract Sum.
- F. 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.
- G. 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).

H. 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.

I. 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.
  - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
  - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

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

A. General: Computerized C P M Schedule

1. The progress schedule to be prepared by the Contractor shall consist of a network analysis as described herein. The software shall be Primavera P3 or P6. A copy of the data file shall be provided with each submission. Preparation of the CPM Schedule is solely the responsibility of the Contractor. Senior management personnel shall actively participate in its development. The requirement for the CPM Schedule is included to assure adequate planning and execution of the Work by the Contractor and to assist the Architect and Owner in evaluating the progress of the Work.

2. Within 15 days after Notice to Proceed, prepare and submit a preliminary schedule in time scale format indicating planned operations during the first 60 days and is to include procurement activities.

3. Within 30 days after Notice to Proceed, a complete network analysis shall be submitted and shall consist of complete CPM Schedule and associated computer files.

(a) The schedule diagram shall show the order and interdependence of activities and the sequence in which the work is to be accomplished as planned by the Contractor. The basic concept of a CPM Schedule will be followed to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of following activities. There shall be only one start and one finish activity.

(b) Activities contained in the construction schedule shall include:

- (1) Construction activities with a maximum of twenty work days for any on site activity. The description "start [activity]" or "finish [activity]" or the use of percentages to break up long duration activities are not acceptable and shall not be used.
- (2) Submittal, review and approval, and subsequent fabrication time of major materials are to be identified. A minimum of 10 working days shall be scheduled for approval of submittals to the Architect. Structural steel and submittals requiring color selection will be assigned a minimum of 15 working days for approval.
- (3) Activities by the Owner, Architect, or others that affect progress of the work.

(c) The CPM Schedule shall show the duration of each activity in working days.

(d) Related activities shall be grouped on the network. The activities on the critical path shall be identified in red. The schedule shall be time scaled. Weekends and holidays shall be indicated. Where float exists, the activities shall be shown at the earliest time they are scheduled to be accomplished.

(e) The following information shall be furnished, as a minimum, for each activity:

- (1) Activity number
- (2) Activity description
- (3) Predecessor and Successor activity numbers
- (4) Duration of activities in working days
- (5) Early start date (by calendar date)
- (6) Early finish date (by calendar date)
- (7) Actual start date (on started or completed activities)
- (8) Actual finish date (on completed activities)
- (9) Float (in work days)

(f) The completion date indicated on the construction schedule shall be the contract completion date. Schedules showing an early finish date are not acceptable.

(g) Weather sensitive activities will be assigned a separate calendar identifying the following anticipated lost weather days:

January– 7  
February - 5  
March - 6  
April - 6  
May - 8  
June - 6  
July - 6  
August - 7  
September - 5  
October - 5  
November - 5  
December - 6

Claims for lost time due to weather conditions will only be considered for losses exceeding the above anticipated lost weather chart.

(h) The following milestones will be identified (where appropriate) at a minimum:

- Building Pad to Grade
- Foundations Complete
- Structural Steel Complete
- Building Dried In
- Conditioned Air Available
- Permanent Power Available
- Substantial Completion
- Final Completion

4. Review of system shall be as follows:

Twenty days will be allowed for review of the proposed CPM schedule. Progress payments may be withheld pending attainment of a mutually acceptable schedule. The contractor, if requested, shall participate in a review and evaluation of the proposed schedule with the owner. Required revisions shall be resubmitted to the owner within ten days after the review. The mutually acceptable schedule shall then be the schedule used by the contractor for planning, organizing, directing and executing the work, and for reporting progress. If the contractor thereafter desires to make changes in his construction sequence, they shall notify the owner in writing stating the reasons for the proposed change. If the owner considers these changes to be of a major nature he may require the contractor to revise and resubmit the schedule, without additional cost to the owner. A change may be considered of a major nature if the time estimated to be required or actually used for an activity or the logic sequence of activities is varied from the approved schedule to a degree that there is reasonable doubt (in the sole judgment of the owner) as to the effect on the contract completion date. Changes which affect activities with adequate float time shall be considered as minor changes, except that an accumulation of minor changes may be considered as a major change when their cumulative effect might affect the contract completion date.

5. The schedule shall be updated monthly. A copy of the updated schedule, and associated data file, will be submitted for review in conjunction with each requisition. The percentage of work completed will be reviewed by the owner. If the contractor fails to submit the required monthly updates and files, the owner may withhold approval of progress payments until such time as the contractor submits the required schedule updates.

6. If the update shows the project to be more than two weeks (10 working days) behind schedule, the owner may require the submission of a recovery schedule, at no additional cost. The recovery schedule will show how the Contractor intends to bring the project back into compliance with the contract completion date.

7. Extensions of time for performance required under the contract documents will be granted only to the extent that equitable time and adjustments for the activity or activities affected exceed the total float along the path or sub paths involved. Float is defined as the difference between the early finish and the late finish date. Float is not for the exclusive use of the contractor or the owner.

- (a) Should a proposed Change Order include a request for extension of the Contract Time, it is incumbent upon the Contractor to demonstrate that such extension is valid and justified. The Contractor shall do this by submitting a "Time Impact Analysis" (TIA) demonstrating the impact of the proposed Change Order on the schedule.

8. Failure by the contractor to substantially comply with the requirements of this specification section at any time shall constitute a substantial breach of the contract documents.

## 2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Work Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

- B. **Material Location Reports:** At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
  - 1. Material stored prior to previous report and remaining in storage.
  - 2. Material stored prior to previous report and since removed from storage and installed.
  - 3. Material stored following previous report and remaining in storage.
  
- C. **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.

## 2.5 SPECIAL REPORTS

- A. **General:** Submit special reports directly to Owner within three day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
  
- B. **Reporting Unusual Events:** When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

## 2.6 CONSTRUCTION PHOTOGRAPHS AND VIDEOS

- A. **Photographic Documentation**
  - 1. Engage a qualified photographer to take construction photographs.
  - 2. **Photographic Media: Digital Images –** Provide images in uncompressed JPEG format, produced by a digital camera with a minimum sensor size of 6.0 megapixels, and at an image resolution of not less than 1600 x 1200 pixels.
  - 3. **General:** Take photographs using maximum range of depth of field, and that are in focus. Photographs with blurry or out of focus areas will not be accepted.
  - 4. **Maintain key plan** with each set of construction photographs that identify each photographic location. Key plan shall be submitted with CD.
  - 5. **Date and Time:** Include date of individual photo in filename for each image.
  - 6. **Upload images to the project website.** The images must include images spanning the entire month and capturing construction milestones and progress.
  - 7. **Select vantage points** to show status of construction and progress since last photographs were taken. Show progress from various angles, exterior viewpoints, and a sufficient number of interior viewpoints to show progress of construction.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
  - 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
  - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
  
- B. Contractor's Construction Schedule Updating: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at 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.
  
- C. Distribution: Distribute copies of approved schedule to Architect[, Contractor, 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.
  - 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 01 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. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
  - 2. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.

#### 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. 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.

#### 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. 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.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of 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.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
  4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
    - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
  5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
    - a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
      - 1) Project name.
      - 2) Date.
      - 3) Destination (To:).
      - 4) Source (From:).
      - 5) Name and address of Architect.
      - 6) Name of Construction Manager.
      - 7) Name of Contractor.

- 8) Name of firm or entity that prepared submittal.
- 9) Names of subcontractor, manufacturer, and supplier.
- 10) Category and type of submittal.
- 11) Submittal purpose and description.
- 12) Specification Section number and title.
- 13) Specification paragraph number or drawing designation and generic name for each of multiple items.
- 14) Drawing number and detail references, as appropriate.
- 15) Indication of full or partial submittal.
- 16) Transmittal number, numbered consecutively.
- 17) Submittal and transmittal distribution record.
- 18) Remarks.
- 19) Signature of transmitter.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
  - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
  - a. Project name.
  - b. Date.
  - c. Name and address of Architect.
  - d. Name of Construction Manager.
  - e. Name of Contractor.
  - f. Name of firm or entity that prepared submittal.
  - g. Names of subcontractor, manufacturer, and supplier.
  - h. Category and type of submittal.
  - i. Submittal purpose and description.
  - j. Specification Section number and title.
  - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
  - l. Drawing number and detail references, as appropriate.
  - m. Location(s) where product is to be installed, as appropriate.
  - n. Related physical samples submitted directly.
  - o. Indication of full or partial submittal.
  - p. Transmittal number, numbered consecutively.
  - q. Submittal and transmittal distribution record.
  - r. Other necessary identification.
  - s. Remarks.

F. Options: Identify options requiring selection by Architect.

- G. 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.
- H. 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.
- I. 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.
- J. 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.
  - 1. Submit electronic submittals via email as PDF electronic files.
    - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  - 2. Action & Informational Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
  - 3. 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. 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. Standard color charts.
  - d. Statement of compliance with specified referenced standards.
  - e. Testing by recognized testing agency.
  - f. Application of testing agency labels and seals.
  - g. Notation of coordination requirements.
  - h. 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. Printed performance curves.
  - c. Operational range diagrams.
  - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before or concurrent with Samples.
- C. 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 coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. 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. PDF electronic file.
    - b. Three opaque copies of each submittal. Architect will retain one copy; remainder will be returned.
- D. 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 that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  - 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  - 6. 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.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
- 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  - 2. Manufacturer and product name, and model number if applicable.
  - 3. Number and name of room or space.
  - 4. Location within room or space.
  - 5. Submit product schedule in the following format:
    - a. PDF electronic file.
    - b. Three paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 01 31 00 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 01 32 00 "Construction Progress Documentation."

- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 40 00 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 01 78 23 "Operation and Maintenance Data."
- 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.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.

- 6. Test procedures and results.
- 7. Limitations of use.
  
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
  
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
  
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
  
- X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

### 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 Section 01 77 00 "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.



- 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

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.

- B. CONSTRUCTION PHASE MATERIALS TESTING

1. The Owner will hire an independent inspection agency for structural steel testing, concrete testing, and soils testing, who shall perform field inspections, tests and prepare reports. Reports shall state whether tested Work complies with or deviates from requirements.
2. The Owner will hire Commissioning Agent (CxA). The CxA will perform "Fundamental Commissioning" Services Reports shall state whether tested Work complies with or deviates from requirements.
3. The Contractor is responsible for coordination and scheduling of the inspection agencies. Contractor shall be responsible for assuring continuous coordination of work with testing agencies and facilitating performance of their duties at desired time and schedule.
4. All other required material inspection and testing agencies identified in the Contract Documents will be hired by the Owner but the Contractor is responsible for coordination and scheduling of the inspection agencies. Such inspection and testing includes, but is not limited to, field inspection, laboratory testing and certification of mortar, masonry, structural steel, structural framing, and cast-in-place concrete. Refer to various sections of these specifications for requirements.
5. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements. 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.

- C. BALTIMORE COUNTY CODE INSPECTIONS

1. The General Contractor shall coordinate Schedule of Tests and Inspections by Baltimore County.
  - a. Building Inspector (and Fire)
  - b. Plumbing Inspector
  - c. Electrical Inspector.

- D. QUALITY-ASSURANCE AND CONTROL REQUIREMENTS - GENERAL CONTRACTOR

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. 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.

### 1.3 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than 5 days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
  1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- E. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.
- F. 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.
- G. 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.

#### 1.4 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. 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.
- C. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

#### 1.5 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 re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 2. Where 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.
- C. 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.
- D. 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.
- E. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "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.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with 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.

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
-------	---	----------------

ICC	International Code Council www.iccsafe.org	(888) 422-7233
-----	---	----------------

- C. 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, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

USAB	United States Access Board	(800) 872-2253
------	----------------------------	----------------

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 01 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. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Contractor shall furnish and install utility meters including (Water and electric). Utilities measured during the construction will be initially paid for by BCPS. During construction the Contractor will reimburse BCPS for all charges via a check made out to BCPS or a credit to contract (means of payment per the BCPS's discretion).
- B. Water and Sewer Service from Existing System: Provide connections and extensions of services as required for construction operations. The contractor will be response for paying for services and utilities during construction.
- C. Electric Power Service from Existing System: Provide connections and extensions of services as required for construction operations. The contractor will be response for paying for services and utilities during construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- B. 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.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

## 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 BCPS's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- C. 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 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading. It will be acceptable to keep use existing space inside the building to create a field office so long as it is kept organized and clean and meets the requirements specified below.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of BCPS, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
  1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
  2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.

3. Provide in construction trailer a separate room for the BCPS Inspector. The room should include a furnished desk, two chairs, drawing table, rack, file cabinet, marker board, and tack board.
  4. Drinking water and private toilet.
  5. Coffee machine and supplies.
  6. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
  7. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.

## 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless BCPS authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

## 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 Section 011000 "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 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
1. Arrange with utility company, BCPS, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Connect to existing utilities and utilize in a way to remove effluent lawfully.

- C. Retain one of two "Water Service" paragraphs below. Delete second paragraph if facilities are unavailable or if their use is not permitted even if available.
- D. Water Service: Connect to existing water service facilities. Clean and maintain water service facilities in a condition acceptable to BCPS. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- G. Dailey construction cleanup:
  - 1. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- H. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- I. Electric Power Service: Connect to existing electric power service. Maintain equipment in a condition acceptable to Owner.
- J. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. Install lighting for Project identification sign.
- K. Telephone Service: If construction site office is not provided with land-line telephone and internet service, the General Contractor's superintendent shall at a minimum carry a cell phone and have direct access to email.
  - 1. At construction site office, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.
    - f. Engineers' offices.
    - g. Owner's office.
    - h. Principal subcontractors' field and home offices.

- L. Dewatering:
  - 1. Provide and operate sufficient dewatering and pumping equipment to maintain the site and the work free of water
  - 2. Contractor shall maintain dewatering by temporary pumps or other means to drain excess water from site work/areas as needed during construction to maintain the project schedule.
  
- M. Snow and Ice Removal:
  - 1. Remove all snow and ice to protect work.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  - 1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
  
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
  
- C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
  - 1. Identification Signs: Provide Project identification signs as indicated in the BCPS front end of the specifications.
  - 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
  - 3. Maintain and touchup signs so they are legible at all times.
  
- D. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
  
- E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
  
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."
  - C. Security Enclosure and Lockup: Install temporary enclosure around all areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism theft and similar violations of security. Lock entrances at end of each work day. Provide (2) two keys to BCPS.
  - D. Site Limits Fence Enclosure:
    1. Provide construction fencing around the entire site limits. Fencing shall be chain link fencing with gates to prevent unauthorized persons from entering the site. Provide opaque mesh screening to be applied to the fence to obscure visual access. Maintain the fence and gates for the duration of construction and then remove from site after approval from the owner. See drawings for height.
  - E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
  - F. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
  - G. Temporary Partitions: Provide secure partitions to ensure security of building.
    1. Install doors and security locks where openings are required.
  - H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
    1. Prohibit smoking in construction areas and on site.
    2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
    3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
    4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
- 3.5 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. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

- D. 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. Owner reserves right to take possession of Project identification signs.
  2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 01 50 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 01 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. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Contractor shall furnish and install utility meters including (Water and electric). Utilities measured during the construction will be initially paid for by BCPS. During construction the Contractor will reimburse BCPS for all charges via a check made out to BCPS or a credit to contract (means of payment per the BCPS's discretion).
- B. Water and Sewer Service from Existing System: Provide connections and extensions of services as required for construction operations. The contractor will be response for paying for services and utilities during construction.
- C. Electric Power Service from Existing System: Provide connections and extensions of services as required for construction operations. The contractor will be response for paying for services and utilities during construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- B. 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.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

## 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 BCPS's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- C. 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 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading. It will be acceptable to keep use existing space inside the building to create a field office so long as it is kept organized and clean and meets the requirements specified below.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of BCPS, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
  1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
  2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.



3. Provide in construction trailer a separate room for the BCPS Inspector. The room should include a furnished desk, two chairs, drawing table, rack, file cabinet, marker board, and tack board.
  4. Drinking water and private toilet.
  5. Coffee machine and supplies.
  6. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
  7. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.

## 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless BCPS authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

## 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 Section 011000 "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 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
1. Arrange with utility company, BCPS, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Connect to existing utilities and utilize in a way to remove effluent lawfully.

- C. Retain one of two "Water Service" paragraphs below. Delete second paragraph if facilities are unavailable or if their use is not permitted even if available.
- D. Water Service: Connect to existing water service facilities. Clean and maintain water service facilities in a condition acceptable to BCPS. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- G. Dailey construction cleanup:
  - 1. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- H. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- I. Electric Power Service: Connect to existing electric power service. Maintain equipment in a condition acceptable to Owner.
- J. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. Install lighting for Project identification sign.
- K. Telephone Service: If construction site office is not provided with land-line telephone and internet service, the General Contractor's superintendent shall at a minimum carry a cell phone and have direct access to email.
  - 1. At construction site office, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.
    - f. Engineers' offices.
    - g. Owner's office.
    - h. Principal subcontractors' field and home offices.

- L. Dewatering:
  - 1. Provide and operate sufficient dewatering and pumping equipment to maintain the site and the work free of water
  - 2. Contractor shall maintain dewatering by temporary pumps or other means to drain excess water from site work/areas as needed during construction to maintain the project schedule.
  
- M. Snow and Ice Removal:
  - 1. Remove all snow and ice to protect work.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  - 1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
  
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
  
- C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
  - 1. Identification Signs: Provide Project identification signs as indicated in the BCPS front end of the specifications.
  - 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
  - 3. Maintain and touchup signs so they are legible at all times.
  
- D. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
  
- E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
  
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."
  - C. Security Enclosure and Lockup: Install temporary enclosure around all areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism theft and similar violations of security. Lock entrances at end of each work day. Provide (2) two keys to BCPS.
  - D. Site Limits Fence Enclosure:
    1. Provide construction fencing around the entire site limits. Fencing shall be 8'-0" high chain link fencing with gates to prevent unauthorized persons from entering the site. Provide opaque mesh screening to be applied to the fence to obscure visual access. Maintain the fence and gates for the duration of construction and then remove from site after approval from the owner.
  - E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
  - F. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
  - G. Temporary Partitions: Provide secure partitions to ensure security of building.
    1. Install doors and security locks where openings are required.
  - H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
    1. Prohibit smoking in construction areas and on site.
    2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
    3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
    4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
- 3.5 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. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

- D. 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. Owner reserves right to take possession of Project identification signs.
  2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 56 39 - TREE PROTECTION AND TRIMMING

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. This Section includes the protection and trimming of trees that interfere with, or are affected by, execution of the Work, whether temporary or new construction.
- B. Related Sections:
  - 1. Division 31 Section "Site Clearing" for removing existing trees and shrubs.

1.3 DEFINITIONS

- A. Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction, and defined by the drip line of individual trees or the perimeter drip line or groups of trees, unless otherwise indicated.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
- C. Qualification Data: For tree service firm and arborist.
- D. Certification: From qualified arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- E. Maintenance Recommendations: From arborist for care and protection of trees affected by construction during and after completing the Work.
- F. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
  - 1. Use sufficiently detailed photographs or video.
  - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

## 1.5 QUALITY ASSURANCE

- A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
- B. Arborist Qualifications: An arborist certified by the International Society of Arboriculture or licensed in the jurisdiction where Project is located.
- C. Tree Pruning Standards: Comply with ANSI A300 (Part 1), "Trees, Shrubs, and Other Woody Plant Maintenance--Standard Practices," (Pruning).
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
  - 1. Before starting tree protection and trimming, meet with representatives of authorities having jurisdiction, Owner, Architect, Construction Manager, consultants, and other concerned entities. Review tree protection and trimming procedures and responsibilities. Notify participants at least three working days before convening conference. Record discussions and agreements and furnish a copy to each participant.

## 1.6 PROJECT CONDITIONS

- A. The following practices are prohibited within protection zones:
  - 1. Storage of construction materials, debris, or excavated material.
  - 2. Parking vehicles or equipment.
  - 3. Erection of sheds or structures.
  - 4. Impoundment of water.
  - 5. Excavation or other digging unless otherwise indicated.
  - 6. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.
- B. Topsoil: Fertile, friable, surface soil, containing natural loam and complying with ASTM D 5268. Provide topsoil that is free of stones larger than 1 inch in any dimension and free of other extraneous or toxic matter harmful to plant growth. Obtain topsoil only from well-drained sites where soil occurs in depth of 4 inches or more; do not obtain from bogs or marshes.
- C. Filter Fabric: Manufacturer's standard, non-woven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Temporary Barriers: Install temporary barriers located as indicated or outside the drip line of trees to protect remaining vegetation from construction damage.
- B. Protect tree root systems from damage due to noxious materials caused by runoff or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations.
- C. Do not store construction materials, debris, or excavated material within the drip line of remaining trees. Do not permit vehicles or foot traffic within the drip line; prevent soil compaction over root systems.
- D. Do not allow fires under or adjacent to remaining trees or other plants.

### 3.2 EXCAVATION

- A. Install shoring or other protective support systems to minimize sloping or benching of excavations.
- B. Do not excavate within drip line of trees, except as specifically indicated on the plans.
- C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.
  - 1. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and relocate them without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots approximately 3 inches back from new construction.
  - 2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
- D. Where utility trenches are required within drip line of trees, tunnel under or around roots by drilling, auger boring, pipe jacking, digging by hand or vacuum excavation.
  - 1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

### 3.3 ROOT PRUNING

- A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as shown on Drawings and as follows:



1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instrument; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
  2. Cut ends: Do not paint cut root ends.
  3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
  4. Cover exposed roots with burlap and water regularly.
  5. Backfill as soon as possible according to requirements in Division 31 Section "Earthwork".
- B. Root pruning at Edge of Protection Zone: Prune tree roots 6 inches (150mm) outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.
- C. Root pruning within the Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

### 3.4 REGRADING

- A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond drip line of trees. Maintain existing grades within drip line of trees.
- B. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by qualified arborist, unless otherwise indicated.
1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.
- C. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.
- D. Moderate Fill: Where existing grade is more than 6 inches, but less than 12 inches, below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:
1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of finish grade and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches below elevation of grade.
  2. Place filter fabric with edges overlapping 6 inches minimum.
  3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

### 3.5 TREE PRUNING

- A. Prune remaining trees affected by temporary and new construction.

- B. Prune remaining trees to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by qualified arborist.
- C. Pruning Standards: Prune trees according to ANSI A300 as follows:
  - 1. Type of Pruning: Crown cleaning.
  - 2. Type of Pruning: Crown thinning.
  - 3. Type of Pruning: Crown raising.
  - 4. Type of Pruning: Crown reduction.
- D. Cut branches with sharp pruning instruments; do not break or chop.
- E. Chip branches removed from trees. Spread chips where indicated or as directed by Construction Manager.

### 3.6 TREE REPAIR AND REPLACEMENT

- A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to written instructions of the qualified arborist.
- B. Remove and replace dead and damaged trees that the qualified arborist determines to be incapable of restoring to a normal growth pattern.
  - 1. Provide new trees of the same size and species as those being replaced.
  - 2. Provide new trees of 6-inch caliper size and of a species selected by Construction Manager when trees more than 6 inches in caliper size, measured 12 inches above grade, are required to be replaced.
- C. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch- diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augured soil and sand.

### 3.7 DISPOSAL OF WASTE MATERIALS

- A. Burning is not permitted.
- B. Disposal: Remove excess excavated material, displaced trees, and excess chips from Owner's property.

END OF SECTION 01 56 39

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction and staging area layout.
  - 2. Field verification.
  - 3. Protection of existing structures to remain.
- B. Related Requirements:
  - 1. Section 01 10 00 "Summary" for limits on use of Project site.
  - 2. Section 01 77 00 "Closeout Procedures" for submitting Project Record Documents, recording.

1.3 QUALITY ASSURANCE / INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Certificates: Submit certificate signed by professional engineer certifying that earthwork and replacement fill comply with requirements specified for future building.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework and building demolition, investigate and verify the existence and location of underground utilities 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.

2.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner (BCPS) 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. 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 Section 013100 "Project Management and Coordination."
- C. Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

2.3 LAYOUT OF FENCING

- A. Layout: Layout the Super Silt Fence 34" ht and 72" Construction Fencing on site in accordance with the Sediment Control Plans and Demolition Grading Plans.

2.4 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.
- B. Public Roads: clean mud off public roads on an as needed basis as follows: If delivery or removal trucks leave mud on the public roads clean it off that same day.

END OF SECTION 01 73 00

SECTION 01 74 00 - CLEANING PROCEDURES

**Part I: General**

1. See Section 00200, Paragraph 7, for term of Contract. All new and major renovations projects are required to include a school-wide cleaning prior to the first duty day for teachers at the start of a new school year. The exact dates when cleaning must begin and be completed are included in other sections of this specification. See Section 00200, Paragraph 7. This summer cleaning is absolutely required for school opening and is significantly more comprehensive than a normal contractor's "broom" clean. This procedure is meant to supplement existing cleaning requirements that may appear elsewhere written in this specification.
2. The Bidder is responsible for the summer cleaning of the entire school prior to the first duty day for teachers at the start of a new school year.
  - 2.1. The Bidder must include in their price and scope of services the cost for cleaning all listed areas in accordance with the specifications below. The scope includes the entire school including the cleaning of all furniture.
  - 2.2. If the Bidder's work extends over more than one summer – similar cleaning is required for each summer worked, prior to the first duty day for teachers at the start of a new school year.
  - 2.3. Cleaning as described herein will be a part of the required contractor's construction schedule and phase plans as required in other specification sections.
3. Thorough cleaning, as outlined herein, will require the temporary movement of existing school furnishings, fixtures, and equipment. The Bidder is responsible for returning these furnishing, fixtures, and equipment to their original locations.
  - 3.1. Sensitive equipment including, but not limited to, computers, printers, facsimile machines, and multi-media equipment, various instruments, and other equipment must be thoroughly protected during the cleaning process. All such equipment is to be covered and moved to undisturbed locations during cleaning process. If construction is still in progress, equipment must be protected from the dirt and dust of the construction project.
  - 3.2. The Bidder will be held fully accountable for the **replacement cost** of any furniture, fixtures, and/or equipment that may be broken, structural damages, or otherwise made inoperable by, or during, the cleaning process.
4. If construction/renovation activities occur or continue during the cleaning process, the bidder shall be responsible for re-cleaning, to the satisfaction of BCPS, all disturbed areas which were previously cleaned.

**Part II: Products**

1. Cleaning Chemicals and Floor Care Products
  - 1.1. Baltimore County Public Schools has an established housekeeping and floor care programs based upon the use of specific cleaning chemicals and floor care products. Due to the green cleaning supplies law enacted by the State of Maryland, Baltimore County Public Schools has selecting environmentally preferred cleaning chemicals and floor care products for use under this contract.

- 1.2. The approved cleaning chemicals and floor care products are as follows:
  - 1.2.1. General Purpose Cleaner
    - 1.2.1.1. Sustainable Earth #64 Neutral Multi-Use Cleaner, manufactured by Coastwide Laboratories, a Division of Staples
  - 1.2.2. Heavy Duty Cleaner
    - 1.2.2.1. Sustainable Earth #65 Heavy-Duty General Purpose Cleaner, manufactured by Coastwide Laboratories, a Division of Staples
  - 1.2.3. Carpet Cleaner
    - 1.2.3.1. Sustainable Earth #62 Carpet Cleaner Concentrate, manufactured by Coastwide Laboratories, a Division of Staples
  - 1.2.4. Graffiti Remover
    - 1.2.4.1. Sustainable Earth #99 Graffiti Remover, manufactured by Coastwide Laboratories, a Division of Staples
  - 1.2.5. Disinfectant
    - 1.2.5.1. Sustainable Earth #66 Disinfectant, manufactured by Coastwide Laboratories, a Division of Staples
  - 1.2.6. Green Floor Finish
    - 1.2.6.1. Sanoverde E-Clean Floor Finish, manufactured by Bullen Chemical
  - 1.2.7. Green Floor Stripper
    - 1.2.7.1. Sanoverde E-Clean Floor Stripper, manufactured by Bullen Chemical
  - 1.2.8. Carpet Spotter
    - 1.2.8.1. Sustainable Earth #67 Carpet Spotter, manufactured by Coastwide laboratories, a Division of Staples
- 1.3. Only those products specifically approved by BCPS may be used under this contract.
- 1.4. The use of unauthorized products will be the sole and complete responsibility of the Bidder and may be cause of dismissal and contract termination.

### **Part III: Execution**

The Bidder is responsible for a complete cleaning using the approved cleaning chemicals and floor care products and the methods listed. Request cleaning instructions from BCPS for any other items or areas not listed below.

#### **1 Floor Cleaning Procedures for Floor Surfaces**

- 1.1 Vinyl Composition Tile Floors: Throughout the building, this procedure must be followed on all vinyl tile floors. Thoroughly sweep clean all floors. Remove all debris, chewing gum, candy, tape, adhesives, and other foreign materials from the floor tile. Scrub and strip all vinyl tile floors with a floor stripper using a stripping floor pad and 175-rpm scrubbing machine. After scrubbing, rinse floor with a neutral cleaner. Once dry, apply four (4) coats of floor finish. Let floor finish dry for 24 hours and burnish floor with a 1500-rpm floor burnishing machine. Follow all other manufacturer's recommendations for use and application of the approved floor care products. For newly installed vinyl tile floors, follow tile manufacturer's recommendations for cleaning and application of floor finish.
- 1.2 Wood Flooring: Throughout the building, this procedure must be followed on all wooden floors, to include, but not be limited to, gymnasium floors, stage floors, and wooden choral raisers. Remove all debris, chewing gum, candy, tape, adhesives, and other foreign materials from the wooden floors. Clean floor with a wet mop using a neutral cleaner. For all newly installed

wooden floors and specialty dance floors, see manufacturers recommendations for proper floor preparation and finishing.

- 1.3 Terrazzo Flooring: Throughout the building, this procedure must be followed on all terrazzo flooring. Follow the same procedures stated above for Vinyl Composition Tile Floors.
  - 1.4 Carpet Floors: Throughout the building, this procedure must be followed on all carpet flooring. Vacuum all carpeting and remove any spots and stains with a spray carpet stain remover. Clean carpeting using a steam cleaner, carpet extractor, or the rotary bonnet method. Ensure adequate ventilation for all carpeting cleaning to allow for carpeting to quickly and completely dry in order to prevent the mold and/or mildew.
  - 1.5 Concrete Flooring: Thoroughly sweep clean all floors. Remove all debris, chewing gum, candy, tape, adhesives, and other foreign materials from the floor. Concrete flooring found in Technical Education / Career Technology classrooms and gymnasium locker rooms should be scrubbed using a 175-rpm scrubbing machine and rinsed with neutral general purpose cleaner.
  - 1.6 Specialty Flooring: Contact the Office of Operations at 410 887-0430 for specific requirements.
- 2 Cleaning Procedures for Specific Building Elements (Throughout the Building)
- 2.1 Furniture: Entire room contents to include, but not limited to, desks, chairs, file cabinets, tables, and all other hard surface furnishings are to be cleaned with a damp cloth and general purpose cleaner along with spot cleaning with an abrasive cleaning pad. This cleaning shall include the removal of all trash, debris, graffiti, chewing gum, candy, tape, adhesives, and other foreign materials from interiors and exteriors of each piece of furniture. Fabric covered and stuffed furniture shall be vacuumed.
  - 2.2 Interior Walls: Remove any dirt smudges with a damp cloth and general purpose cleaner. Removal all pencil and pen markings, graffiti, tape, adhesives, and other foreign materials. Wash all ceramic wall tiles and glazed block tiles, up to the ceiling, with the # 64 Neutral Multi-Use Cleaner. Dust all concrete block walls, up to ceiling, with a chemically treated dust cloth.
  - 2.3 Lockers: Remove all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from interiors and exteriors of all lockers. Wipe clean the interior and exterior of all lockers with a damp cloth and general purpose cleaner. Remove any dirt smudges with a damp cloth and # 64 Neutral Multi-Use Cleaner along with an abrasive cleaning pad.
  - 2.4 Light Fixtures: Clean all light fixtures throughout the entire building. Lower the plastic lens cover and wipe inside and outside with a chemically treated dust cloth. Clean all light diffusers with a damp cloth and # 64 Neutral Multi-Use Cleaner. Lighting should be shut off before cleaning.
  - 2.5 Windows: Clean all interior and exterior windows, including gymnasium windows and all atrium windows throughout the building, with # 64 Neutral Multi-Use Cleaner. Windows must be free of any streaking. Clean all window ledges and frames with a damp cloth and general purpose cleaner.
  - 2.6 Blinds: All existing window blinds should be dusted and wiped clean with a damp cloth and #64 Neutral Multi-Use Cleaner.

- 2.7 Ceilings: Dust all ceilings. Expose bar joists, support beams, etc. must be dusted. Remove all debris and/or foreign material found on ceilings. Wipe clean all cleaning HVAC vents and diffusers with a damp cloth and # 64 Neutral Multi-Use Cleaner.

### 3 Cleaning Procedures for Specific Building Areas

- 3.1 Classrooms and Offices: Wipe clean all interior and exterior doorframes, door vents, and door glass with a damp cloth and # 64 Neutral Multi-Use Cleaner. Wipe clean all countertops, chalk ledges, cabinets, clocks, sinks, bookshelves, etc with a damp cloth and # 64 Neutral Multi-Use Cleaner. Clean and disinfect all sinks, water fountains, and countertops. Wipe clean all mirrors with # 64 Neutral Multi-Use cleaner. Wash and sanitize all waste receptacles with # 66 Disinfectant. Remove all debris, chewing gum, candy, tape, adhesives, graffiti, and other foreign materials from all surfaces. Follow the applicable Floor Cleaning Procedures listed above based on the floor surface. Entire room contents including, but not limited to, desks, chairs, file cabinets, and all other hard surface furnishings to be cleaned with a damp cloth and # 64 Neutral Multi-Use cleaner along with spot cleaning with an abrasive cleaning pad. Fabric covered and stuffed furniture to be vacuumed. Vacuum and clean all area carpets.
- 3.2 Toilet Rooms: Wipe clean all walls, toilet partitions, plumbing fixtures, interior/exterior doors, and doorframes with a damp cloth and # 64 Neutral Multi-Use cleaner. Wash and sanitize all waste receptacles with # 66 Disinfectant. This cleaning shall include the removal of all trash, debris, graffiti, pencil and pen markings, chewing gum, candy, tape, adhesives, and other foreign materials from all walls and partitions. Disinfect all toilets, sinks, and urinals with # 66 Disinfectant. Use # 64 neutral Multi-Use Cleaner on mirrors. Wash and sanitize all waste receptacles with # 66 Disinfectant. Clean and scrub ceramic floors with # 64 Neutral Multi-Use cleaner. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above.
- 3.3 Library: Dust all books, bookshelves, countertops, ledges, doors, and door frames with a dust control treated cloth. Wipe clean all interior and exterior doorframes, door vents, and door glass with a damp cloth and # 64 Neutral Multi-Use cleaner. Entire room contents including, but not limited to, desks, chairs, file cabinets, and other hard surfaces to be cleaned with a damp cloth and # 64 Neutral Multi-Use cleaner along with spot cleaning with an abrasive cleaning pad. Fabric covered and stuffed furniture to be vacuumed. Wash and sanitize all waste receptacles with # 66 Disinfectant. Follow applicable Floor Cleaning Procedures listed above based on the floor surface.
- 3.4 Gymnasium / Cafeteria / Recreation Area: Vacuum all soundproof boards. Wipe block walls with a dust control treated cloth and wipe clean all perforated-glazed tiles with a damp cloth and # 64 Neutral Multi-Use cleaner. Clean all basketball backboard with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove all dust from ceiling beams and exposed roof trusses. Wipe clean all gym mats hanging on walls with # 66 Disinfectant. Pull out bleachers; sweep and wet mop; sweep area behind bleachers; and wipe clean all handrails and seating area with a damp cloth and # 64 Neutral Multi-Use cleaner. Wipe clean all cafeteria tables and seating with a damp cloth and # 64 Neutral Multi-Use cleaner. This cleaning shall include the removal of all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from all gymnasium bleachers and all cafeteria tables. Follow applicable Floor Cleaning Procedures listed above based on the floor surface.
- 3.5 Auditoriums: Vacuum soundproof boards. Wipe clean block walls with a dust control treated cloth and wipe clean all perforated glazed tile with a damp cloth and # 64 Neutral Multi-Use cleaner. Wipe clean all seating with a damp cloth and # 64 Neutral Multi-Use cleaner. This cleaning shall include the removal of all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from auditorium seating. Remove dust from stage steps, and floors with a wet



mop. If stage flooring is wood, follow Floor Cleaning Procedures for Wooden Floors listed above. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above. Do not wax wooden floors.

3.6 Kitchens: Dust all block walls with a dust control treated cloth. Clean with # 64 Neutral Multi-Use Cleaner and disinfect with # 66 Disinfectant all glazed tile walls and partitions. Clean and scrub ceramic floors with general purpose cleaner. Clean and disinfect all sinks and countertops with # 66 Disinfectant. BCPS will be responsible for cleaning all kitchen equipment.

3.7 Locker Rooms: Wipe clean block walls and all glazed tile wall with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from interiors and exteriors of all lockers. Wipe clean the interior and exterior of all lockers with a damp cloth and # 64 neutral Multi-Use cleaner. Remove any dirt smudges with a damp

cloth and # 64 Neutral Multi-Use cleaner along with an abrasive-cleaning pad. Wipe clean all ceramic tile walls, partitions, plumbing fixtures, interior/exterior doors, and doorframes with a damp cloth and # 64 neutral Multi-Use cleaner. Disinfect with # 66 Disinfectant all toilets, sinks, and urinals. Use # 64 Neutral Multi-use cleaner on mirrors. Wash and sanitize with # 66 Disinfectant all waste receptacles. Clean and scrub ceramic floors with # 64 Neutral Multi-Use cleaner. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above.

3.8 Storage Rooms / Mechanical Rooms / Custodial Closets: Dust all walls, shelves and ledges with a dust control treated cloth. Wipe clean all doorframes, vents and doors with a damp cloth and # 64 Neutral Multi-Use cleaner. Sweep and wet mop floors. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above.

3.9 Stairwells: Dust walls with a chemically treated dust cloth. Sweep, damp mop steps with # 64 Neutral Multi-Use cleaner. Wipe handrails with a damp cloth and # 66 Disinfectant. Clean all window ledges with a damp cloth and # 64 Neutral Multi-Use cleaner. This cleaning shall include the removal of all trash, debris, graffiti, pencil and pen markings, chewing gum, candy, tape, adhesives, and other foreign materials from all walls and partitions. Follow applicable Floor Cleaning Procedures listed above based on floor surface type. Do not wax steps or non-skid floor strips.

3.10 Hallways: Dust ledges, fire extinguishers, wipe all water fountains with a damp cloth. Clean all interior glass partitions, windows and frames. Wipe clean all exterior doors and frames on inside with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from interiors and exteriors of all lockers. Wipe clean the interior and exterior of all lockers with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove any dirt smudges with a damp cloth and # 64 Neutral Multi-Use cleaner along with an abrasive-cleaning pad. Polish medal push-pads and kick plates. Clean all interior showcases with a damp cloth and # 64 neutral Multi Use cleaner. Clean showcase glass with # 64 Neutral Multi-Use cleaner. Remove all gum, candy, stickers, and other debris. Clean and disinfect with # 66 Disinfectant all water fountains. Follow applicable Floor Cleaning Procedures listed above based on the floor surface.

3.11 Technical Education / Career Technology classrooms: Contact the Office of Operations via BCPS project manager to determine specific school requirements.

#### 4 Inspections and Corrections

- 4.1 All cleaning is subject to inspection by the area supervisory staff (senior operations supervisor) of the Office of Operations to ensure all areas are cleaned to BCPS standards before final acceptance by the BCPS project manager.
  - 4.1.1 The Bidder will address any identified problem areas immediately.
  - 4.1.2 Cleaning not addressed in a satisfactory or timely manner may be performed by BCPS staff or their subcontractors. If required, the cost for this service will be the responsibility of the bidder and will be deducted from the contract.
  - 4.1.3 BCPS reserves the right to inspect and accept the cleaning of all floors prior to the application of any floor finish. BCPS may inspection and accept each coat of floor finish to ensure that proper finish coverage occurs and that the required number of finish coats is applied.

- END SECTION 01 74 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.
- B. Related Requirements:
  - 1. Section 01 35 20 "LEED Requirements" for Prerequisite 1: Construction Activity Pollution Prevention and for Credit MR 2.1 and Credit MR 2.2: Comply with Division 01 Section "Construction Waste Management and Disposal."
  - 2. Section 31 10 00 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

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.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of **75** 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 including the following:
  - 1. Demolition Waste:
    - a. Metals: Ferrous (Iron, steel, stainless steel, galvanized steel) and non-ferrous (copper, brass, bronze, aluminum) types and containers made from metals such as pails, buckets and beverage cans.

- b. Asphalt paving.
- c. Concrete.
- d. Concrete reinforcing steel.
- e. Electrical conduit.
- f. Copper wiring.
- g. Electrical devices.

2. Construction Waste:

- a. Concrete.
- b. Metals.
- c. Piping.
- d. Electrical conduit.
- e. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
  - 1) Paper.
  - 2) Cardboard.
  - 3) Boxes.
  - 4) Plastic sheet and film.
  - 5) Polystyrene packaging.
  - 6) Wood crates.
  - 7) Plastic pails.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within **7** days of date established for the Notice to Proceed.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
  - 1. Material category.
  - 2. Generation point of waste.
  - 3. Total quantity of waste in tons.
  - 4. Quantity of waste salvaged, both estimated and actual in tons.
  - 5. Quantity of waste recycled, both estimated and actual in tons.
  - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
  - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- H. LEED Submittal: LEED letter template for Credit MR 2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

#### 1.7 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
  - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
  - 2. Review requirements for documenting quantities of each type of waste and its disposition.
  - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - 5. Review waste management requirements for each trade.

#### 1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan. Plan shall comply with PHFA requirements.

- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
  
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
  
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
  - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
  - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
  
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### 3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. 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 Donation: Permitted on Project site.
- C. Salvaged Items for Owner's Use: 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 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.

### 3.3 RECYCLING DEMOLITION AND CONSTRUCTION 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 Owner.

- 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.

#### 3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Grind asphalt to maximum 4-inch size.
  - 1. Crush asphaltic concrete paving and screen to comply with requirements in Section 31 20 00 "Earthwork" for use as general fill.
- B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
  - 1. Pulverize concrete to maximum 4-inch size.
  - 2. Crush concrete and screen to comply with requirements in Section 312000 "Earth Moving" for use as satisfactory soil for fill or subbase.
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
  - 1. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.



- G. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- H. Conduit: Reduce conduit to straight lengths and store by type and size.

### 3.5 RECYCLING CONSTRUCTION WASTE

#### A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

#### B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
  - a. Comply with requirements in Section 32 93 00 "Plants" for use of clean sawdust as organic mulch.

#### C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
  - a. Comply with requirements in Section 32 93 00 "Plants" for use of clean ground gypsum board as inorganic soil amendment.

### 3.6 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. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

- D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.
- E. 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 01 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. Section 01 73 00 "Execution" for progress cleaning of Project site.
  - 2. Section 01 74 00 "Cleaning Procedures" for final cleaning of Project site
  - 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 4. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 5. Section 01 79 00 "Demonstration and Training" for requirements for instructing Owner's personnel.

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 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

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

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
  - 5. Submit test/adjust/balance records.
  - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. 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. Advise Owner of pending insurance changeover requirements.
  - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 3. Complete startup and testing of systems and equipment.
  - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
  - 6. Advise Owner of changeover in heat and other utilities.

7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion 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 the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

#### 1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, 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. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.8 CONTRACTOR'S LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. At least two (2) weeks prior to scheduling a combined Contractor/AE/BCPS review (Punch Out) of the project the Contractor shall complete their own review of the project and submit their punchlist to the BCPS.

- B. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
- C. Completion of Punchlist Items: Punchlist (including progress deficiencies, unsatisfactory or noted construction correction items, etc) are to be corrected no later than 10 days from observance from contractor, architect or owner (excludes instances where long lead item equipment, parts or materials are required and will take over 10 days to complete).

#### 1.9 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 (215-by-280-mm) paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  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. Contractor to provide electronic copy of warranty (3 CD's are required) which are to be labeled on the CD itself and on the sleeves. Note (3) three physical copies of warranty books are required.
- E. 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: Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Contractor to perform a final cleaning of the building following a formal request to BCPS and only after the BCPS has deemed the building ready to be turned over.
- C. Final Cleaning: Employ 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. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Remove snow and ice to provide safe access to building.
    - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- o. 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.
- p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
- q. Shampoo, wax, buff, etc. all floors.
- r. Clean elevators.
- s. Clean glass and mirrors.
- t. Clean furniture.
- u. Clean walls, stairs, partitions, and ceilings.
- v. Clean shafts, ducts, MEP rooms and equipment, etc.
- w. Leave Project clean and in a condition that allows BCPS to take occupancy without any BCPS cleaning needing to be done.

- D. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- E. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair of work shall be no more than 10 days after observance by Architect, Owner or Contractor.



- C. 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 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 77 50 – ASSET INFORMATION COLLECTION

PART I – GENERAL

1.1 DESCRIPTION

- A. Work included: To provide the operations and maintenance staff of Baltimore County Public Schools (BCPS) with the identification, information and tracking of large equipment incorporated into the Project. To provide an electronic source of the information furnished and deliver via Excel<sup>®</sup> spreadsheet in the format found in this Section of the Specifications (BCPS will provide the Contractor with the format in an electronic media).
- B. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

PART II – PRODUCTS

2.1 MAKE UP OF SPREADSHEET

- A. The attached Excel<sup>®</sup> spreadsheet is for the convenience of the Contractor and indicates the required information.

2.2 CONTENTS OF SPREADSHEET

- A. The Spreadsheet shall include:
  - 1. List of all large equipment including:
    - a. Air Conditioning Units;
    - b. Air Compressors;
    - c. Air Handling Units;
    - d. Automatic Temperature Controls;
    - e. Boilers;
    - f. Chair Lifts;
    - g. Chillers;
    - h. Cooling Tower;
    - i. DX Units;
      - 1) Self-contained;
      - 2) Split;
    - j. Electrical Switchgear;
    - k. Elevators;
    - l. Fan(s):
      - 1) Exhaust;
      - 2) Return Air;
    - m. Fire Alarm Annunciation Panel (lobby);
    - n. Generators;
    - o. Heating Units;
    - p. Individual Dampers;
    - q. Kilns;
    - r. Kitchen Hoods;
    - s. Laundry Equipment:
      - 1) Washer;
      - 2) Dryer;
    - t. Pumps;

- 1) Electric Pumps;
  - 2) Fire Pumps;
  - 3) Geothermal Pumps;
  - u. Switchgear;
  - v. Tanks:
    - 1) Air;
    - 2) Fuel;
    - 3) Storage;
    - 4) Water;
  - w. Unit Ventilators (*Unit Vents*);
  - x. Water Heater(s):
    - 1) Gas; and
    - 2) Electric;
  - y. Water Treatment Systems
    - 1) Boiler;
    - 2) Chiller.
2. The following information for each piece of equipment;
    - a. Asset Number from the Asset Barcode Tag,
    - b. Description
    - c. Location
    - d. Floor Number
    - e. Room Number
    - f. Manufacturer's Name
    - g. Model Number
    - h. Serial Number
  3. The following information for each piece of equipment that contains a filter(s);
    - a. Change Frequency (*the frequency for which the filter(s) must be changed*);
    - b. Type/Style (*the type or style of any and all filters for that piece of equipment*);
    - c. Quantity (*the quantity of filter(s) needed for that piece of equipment*); and
    - d. Size (*the size of all filter(s) needed for that piece of equipment*).

### PART III – EXECUTION

#### 3.1 PROCESS

- A. The Contractor shall, after the approval of equipment during the Submittal phase, submit a list of equipment, as outlined in Section 2.2.A.1 above, with a total number of equipment items to the Baltimore County Public School's Project Manager, who will obtain and provide to the Contractor, the appropriate number of Asset Barcode Tags for the equipment.
- B. The final spreadsheet shall be provided by the Contractor in both electronic and hard copy formats to the Baltimore County Public Schools Project Manager on or before Substantial Completion.

#### 3.2 PREPARATION

- A. Clean equipment surfaces of substances, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants, that could impair bond of Asset Barcode Tags.

#### 3.3 ASSET BARCODE TAG INSTALLATION

**Victory Villa Elementary School  
Replacement School  
PSCP #03.057.17 LP  
ARA-209-17**

- A. Permanently affix Asset Barcode Tags on each major item of equipment indicated on the spreadsheet.
- B. Locate Asset Barcode Tags where accessible and visible preferably adjacent to the permanently affixed equipment identification labels indicating the serial, model, or manufacturer's identification numbers.

Asset Number	Description	Location	Floor	Room #	Manufacturer	Model Number	Serial Number	Warranty Information			Filter Information		
								Start Date	End Date	Change Frequency	Type/Style	Quantity	Size
BCPS Barcode Asset Tag Number	Fan Coil Unit 3	Above Gym Office	1st Floor	123	Trane	M1234H5R67	KKKc1238u98	2/1/2010	1/31/2012	Quarterly	Disposable Polyscrub	8	24x24x2
BCPS Barcode Asset Tag Number	Klin	Art Room	2nd Floor	248	Masters	65029RB443	LKs238-09	3/8/2010	3/7/2012	N/A	N/A	N/A	N/A
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													
BCPS Barcode Asset Tag Number													

END OF SECTION 01 77 50

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

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 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 Requirements:
  - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. 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. Three (3) copies are required.

- 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.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 10 days before commencing demonstration and training. Architect will return copy with comments.
1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 10 days of receipt of Architect's comments and prior to commencing demonstration and training.

## PART 2 - PRODUCTS

### 2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
  2. List of systems.
  3. List of equipment.
  4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 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. Name and contact information for Commissioning Authority.
  9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  10. 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.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- 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 on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, 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 on 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, 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. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
  - b. 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. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. 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.

## 2.3 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.

## 2.4 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 has 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.

## 2.5 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 and drawing or schedule designation or identifier where applicable.
- 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.
  - 1. Include procedures to follow and required notifications for warranty claims.

## 2.6 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 and drawing or schedule designation or identifier where applicable.
- 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.
  - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- 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.
  - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. 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.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. 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.
  - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. 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.
  - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. 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.
  - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "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 01 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. Record Furniture and Equipment Log.
  - 5. Miscellaneous record submittals.
- B. Related Requirements:
  - 1. Section 01 73 00 "Execution" for final property survey.
  - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
  - 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit three (3) sets of marked-up record prints.
  - 2. Number of Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit three (3) paper-copy set(s) of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and number (TBD) of file prints.
      - 3) Submit record digital data files and three (3) sets of plots.
      - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit number three (3) paper-copy sets of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and number three (3) sets of prints.

- 3) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories 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. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report biweekly 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. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Construction Change Directive.

- k. Changes made following Architect's written orders.
  - l. Details not on the original Contract Drawings.
  - m. Field records for variable and concealed conditions.
  - n. Record information on the Work that is shown only schematically.
- 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.

## 2.2 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.
  - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

## 2.3 RECORD FURNITURE AND EQUIPMENT LOG

- A. Preparation: Prepare and submit a furniture and equipment log at substantial completion that lists all items that have been provided under the contract in the following format:
  - 1. Name of Piece of Equipment
  - 2. Short description of piece of equipment
  - 3. Qty of Respective Item
  - 4. Cost per Item
- B. Items that are required to be on the list included, but are not limited to:



1. Audio and video equipment & devices including lecterns and projection equipment.
2. Kitchen Equipment/Appliances.
3. Phones, Call box stations, print shop equipment, ticketing system, computer equipment, and other Technology/security equipment provided through the contract
4. Exterior furnishings including benches and bicycle racks.

#### 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
  1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

### 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 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 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 using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator and instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Documentation: Submit three (3) copies within seven days of end of each training module.
  - 1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project.
    - b. Name and address of videographer.
    - c. Name of Architect.
    - d. Name of Construction Manager.

- e. Name of Contractor.
  - f. Date of video recording.
2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
3. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

#### 1.5 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

#### 1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. 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 Section 01 78 23 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

#### 3.2 INSTRUCTION

- A. 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, through Architect, with at least seven days' advance notice.
- B. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- C. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 01 79 00

## SECTION 01 81 13 - SUSTAINABLE DESIGN REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes general requirements and procedures for compliance with certain USGBC LEED prerequisites and credits needed for Project to obtain LEED **Silver** certification based on LEED 2009 for Schools, New Construction and Major Renovations.
  - 1. Other LEED prerequisites and credits needed to obtain LEED certification depend on material selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
  - 2. Additional LEED prerequisites and credits needed to obtain the indicated LEED certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.
  - 3. A copy of the LEED Project checklist is attached at the end of this Section for information only.
- B. Related Sections:
  - 1. Divisions 01 through 33 Sections for LEED requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.

#### 1.3 DEFINITIONS

- A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
- B. LEED: Leadership in Energy & Environmental Design.
- C. Rapidly Renewable Materials: Materials made from plants that are typically harvested within a 10-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.
- D. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

- E. Regionally Manufactured Materials: Materials that are manufactured within a radius of 500 miles (800 km) from Project site. Manufacturing refers to the final assembly of components into the building product that is installed at Project site.
- F. Regionally Extracted and Manufactured Materials: Regionally manufactured materials made from raw materials that are extracted, harvested, or recovered within a radius of 500 miles (800 km) from Project site.
- G. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
  - 1. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
  - 2. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.
- H. Recycled Content: The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer).
  - 1. Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials.
  - 2. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.

#### 1.4 ACTION SUBMITTALS

- A. General: Submit additional LEED submittals required by other Specification Sections.
- B. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.
- C. LEED Documentation Submittals:
  - 1. Credit EA 5: Product data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy-consumption performance over a period of time of not less than one year of postconstruction occupancy.
  - 2. Credit MR 2.1 and Credit MR 2.2: Comply with Division 01 Section "Construction Waste Management and Disposal."
  - 3. Credit MR 3.1 and Credit MR 3.2: Receipts for salvaged and refurbished materials used for Project, indicating sources and costs for salvaged and refurbished materials.
  - 4. Credit MR 4.1 and Credit MR 4.2: Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.

5. Credit MR 5.1 and Credit MR 5.2: Product data for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
6. Credit MR 5.1 and Credit MR 5.2: Product data indicating location of material manufacturer for regionally manufactured materials. Include statement indicating cost for each regionally manufactured material[and for each regionally extracted and manufactured material.
  - a. Include statement indicating distance from manufacturer to Project for each regionally manufactured material.
  - b. Include statement indicating location of and distance from Project to point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials.
7. Credit MR 7: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
8. Credit EQ 3.1:
  - a. Construction indoor-air-quality management plan.
  - b. Product data for temporary filtration media.
  - c. Product data for filtration media used during occupancy.
  - d. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials.
9. Credit EQ 3.2:
  - a. Signed statement describing the building air flush-out procedures including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.
  - b. Product data for filtration media used during flush-out and during occupancy.
  - c. Report from testing and inspecting agency indicating results of indoor-air-quality testing and documentation showing compliance with indoor-air-quality testing procedures and requirements.
10. Credit EQ 4.1: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D (EPA Method 24).
11. Credit EQ 4.2: Product data for paints and coatings used inside the weatherproofing system indicating chemical composition and VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D (EPA Method 24).
12. Credit EQ 4.4: Product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Project Materials Cost Data: Provide statement indicating total cost for building materials used for Project, excluding mechanical, electrical, and plumbing components, and specialty items



such as elevators and equipment. Include statement indicating total cost for wood-based materials used for Project.

B. LEED Action Plans: Provide preliminary submittals within 30 days of date established for Notice to Proceed indicating how the following requirements will be met:

1. Credit MR 2.1 **and** Credit MR 2.2: Waste management plan complying with Division 01 Section "Construction Waste Management and Disposal."
2. Credit MR 3.1 and Credit MR 3.2: List of proposed salvaged and refurbished materials. Identify each material that will be salvaged or refurbished, including its source and cost.
3. Credit MR 4.1 and Credit MR 4.2: List of proposed materials with recycled content. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
4. Credit MR 5.1 and Credit MR 5.2: List of proposed regional materials. Identify each regional material, including its source, cost, and the fraction by weight that is considered regional.
5. Credit MR 5.1 and Credit MR 5.2: List of proposed regionally manufactured materials and regionally extracted and manufactured materials.
  - a. Identify each regionally manufactured material, including its source and cost.
  - b. Identify each regionally extracted and manufactured material, including its source and cost.
6. Credit MR 7: List of proposed certified wood products. Indicate each product containing certified wood, including its source and cost of certified wood products.
7. Credit EQ 3.1: Construction indoor-air-quality management plan.

C. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans for the following:

1. Credit MR 2.1 and Credit MR 2.2: Waste reduction progress reports complying with Division 01 Section "Construction Waste Management and Disposal."
2. Credit MR 3.1 and Credit MR 3.2: Salvaged and refurbished materials.
3. Credit MR 4.1 and Credit MR 4.2: Recycled content.
4. Credit MR 5.1 and Credit MR 5.2: Regional materials.
5. Credit MR 5.1 and Credit MR 5.2: Regionally manufactured materials and regionally extracted and manufactured materials.
6. Credit MR 7: Certified wood products.

1.6 QUALITY ASSURANCE

A. LEED Coordinator: Engage an experienced LEED-Accredited Professional to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator.

## PART 2 - PRODUCTS

### 2.1 SALVAGED AND REFURBISHED MATERIALS

- A. Credit MR 3.1 and Credit MR 3.2: Provide salvaged or refurbished materials for **5 and 10** percent of building materials (by cost). The following materials may be salvaged or refurbished materials:
1. Maple flooring.
  2. Wood Timber.

### 2.2 RECYCLED CONTENT OF MATERIALS

- A. Credit MR 4.1 **and** Credit MR 4.2: Provide building materials with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of **10 and 20** percent of cost of materials used for Project.
1. Cost of post-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
  2. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
  3. Do not include mechanical and electrical components in the calculation.

### 2.3 REGIONAL MATERIALS

- A. Credit MR 5.1 and Credit MR 5.2: Provide **10 and 20** percent of building materials (by cost) that are regional materials.
- B. Credit MR 5.1: Provide 20 percent of building materials (by cost) that are regionally manufactured materials.
- C. Credit MR 5.2: Provide 10 percent of building materials (by cost) that are regionally extracted and manufactured materials.

### 2.4 CERTIFIED WOOD

- A. Credit MR 7: Provide a minimum of 50 percent (by cost) of wood-based materials that are produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
1. Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:
    - a. Rough carpentry.
    - b. Miscellaneous carpentry.

- c. Heavy timber construction.
- d. Wood decking.
- e. Metal-plate-connected wood trusses.
- f. Structural glued-laminated timber.
- g. Finish carpentry.
- h. Architectural woodwork.
- i. Wood paneling.
- j. Wood veneer wall covering.
- k. Wood flooring.
- l. Wood lockers.
- m. Wood cabinets.
- n. Furniture.

## 2.5 LOW-EMITTING MATERIALS

- A. Credit EQ 4.1: For field applications that are inside the weatherproofing system, use adhesives and sealants that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

- 1. Wood Glues: 30 g/L.
- 2. Metal to Metal Adhesives: 30 g/L.
- 3. Adhesives for Porous Materials (Except Wood): 50 g/L.
- 4. Subfloor Adhesives: 50 g/L.
- 5. Plastic Foam Adhesives: 50 g/L.
- 6. Carpet Adhesives: 50 g/L.
- 7. Carpet Pad Adhesives: 50 g/L.
- 8. VCT and Asphalt Tile Adhesives: 50 g/L.
- 9. Cove Base Adhesives: 50 g/L.
- 10. Gypsum Board and Panel Adhesives: 50 g/L.
- 11. Rubber Floor Adhesives: 60 g/L.
- 12. Ceramic Tile Adhesives: 65 g/L.
- 13. Multipurpose Construction Adhesives: 70 g/L.
- 14. Fiberglass Adhesives: 80 g/L.
- 15. Contact Adhesive: 80 g/L.
- 16. Structural Glazing Adhesives: 100 g/L.
- 17. Wood Flooring Adhesive: 100 g/L.
- 18. Structural Wood Member Adhesive: 140 g/L.
- 19. Special Purpose Contact Adhesive (contact adhesive that is used to bond melamine covered board, metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber or wood veneer 1/16 inch or less in thickness to any surface): 250 g/L.
- 20. Top and Trim Adhesive: 250 g/L.
- 21. Plastic Cement Welding Compounds: 350 g/L.
- 22. ABS Welding Compounds: 400 g/L.
- 23. CPVC Welding Compounds: 490 g/L.
- 24. PVC Welding Compounds: 510 g/L.
- 25. Adhesive Primer for Plastic: 650 g/L.
- 26. Sheet Applied Rubber Lining Adhesive: 850 g/L.
- 27. Aerosol Adhesive, General Purpose Mist Spray: 65 percent by weight.
- 28. Aerosol Adhesive, General Purpose Web Spray: 55 percent by weight.
- 29. Special Purpose Aerosol Adhesive (All Types): 70 percent by weight.
- 30. Other Adhesives: 250 g/L.
- 31. Architectural Sealants: 250 g/L.

32. Nonmembrane Roof Sealants: 300 g/L.
  33. Single-Ply Roof Membrane Sealants: 450 g/L.
  34. Other Sealants: 420 g/L.
  35. Sealant Primers for Nonporous Substrates: 250 g/L.
  36. Sealant Primers for Porous Substrates: 775 g/L.
  37. Modified Bituminous Sealant Primers: 500 g/L.
  38. Other Sealant Primers: 750 g/L.
- B. Credit EQ 4.2: For field applications that are inside the weatherproofing system, use paints and coatings that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions.
1. Flat Paints, Coatings, and Primers: VOC not more than 50 g/L.
  2. Nonflat Paints, Coatings, and Primers: VOC not more than 150 g/L.
  3. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
  4. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
  5. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
  6. Floor Coatings: VOC not more than 100 g/L.
  7. Shellacs, Clear: VOC not more than 730 g/L.
  8. Shellacs, Pigmented: VOC not more than 550 g/L.
  9. Stains: VOC not more than 250 g/L.
  10. Flat Interior Topcoat Paints: VOC not more than 50 g/L.
  11. Nonflat Interior Topcoat Paints: VOC not more than 150 g/L.
  12. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
  13. Clear Wood Finishes, Varnishes and Sanding Sealers: VOC not more than 350 g/L.
  14. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
  15. Floor Coatings: VOC not more than 100 g/L.
  16. Shellacs, Clear: VOC not more than 730 g/L.
  17. Shellacs, Pigmented: VOC not more than 550 g/L.
  18. Stains: VOC not more than 250 g/L.
  19. Primers, Sealers, and Undercoaters: VOC not more than 200 g/L.
  20. Dry-Fog Coatings: VOC not more than 400 g/L.
  21. Zinc-Rich Industrial Maintenance Primers: VOC not more than 340 g/L.
  22. Pretreatment Wash Primers: VOC not more than 420 g/L.
  23. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
  24. Restricted Components: Paints and coatings shall not contain any of the following:
    - a. Acrolein.
    - b. Acrylonitrile.
    - c. Antimony.
    - d. Benzene.
    - e. Butyl benzyl phthalate.
    - f. Cadmium.
    - g. Di (2-ethylhexyl) phthalate.
    - h. Di-n-butyl phthalate.
    - i. Di-n-octyl phthalate.
    - j. 1,2-dichlorobenzene.
    - k. Diethyl phthalate.
    - l. Dimethyl phthalate.
    - m. Ethylbenzene.
    - n. Formaldehyde.
    - o. Hexavalent chromium.

- p. Isophorone.
- q. Lead.
- r. Mercury.
- s. Methyl ethyl ketone.
- t. Methyl isobutyl ketone.
- u. Methylene chloride.
- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride.

- C. Credit EQ 4.4: Do not use composite wood or agrifiber products or adhesives that contain urea-formaldehyde resin.

### PART 3 - EXECUTION

#### 3.1 REFRIGERANT AND CLEAN-AGENT FIRE-EXTINGUISHING-AGENT REMOVAL (BY BCPS UNDER SEPARATE DEMOILTION CONTRACT)

- A. Prerequisite EA 3: Remove CFC-based refrigerants from existing HVAC&R equipment indicated to remain and replace with refrigerants that are not CFC based. Replace or adjust existing equipment to accommodate new refrigerant as described in Division 23 Sections.
- B. Credit EA 4: Remove clean-agent fire-extinguishing agents that contain HCFCs or halons and replace with agent that does not contain HCFCs or halons. See Division 21 Section "Clean-Agent Fire Extinguishing Systems" for additional requirements.

#### 3.2 MEASUREMENT AND VERIFICATION

- A. Credit EA 5: Implement measurement and verification plan consistent with [**Option B: Energy Conservation Measure Isolation**] [**Option D: Calibrated Simulation, Savings Estimation Method 2**] in the EVO's "International Performance Measurement and Verification Protocol (IPMVP) Volume III: Concepts and Options for Determining Energy Savings in New Construction," and as further defined by the following:
  - 1. <Insert measurement and verification plan design team submitted for credit>.
- B. If not already in place, install metering equipment to measure energy usage. Monitor, record, and trend log measurements.
- C. Evaluate energy performance and efficiency by comparing actual to predicted performance.
- D. Measurement and verification period shall cover at least one year of postconstruction occupancy.

#### 3.3 CONSTRUCTION WASTE MANAGEMENT

- A. Credit MR 2.1 and Credit MR 2.2: Comply with Division 01 Section "Construction Waste Management and Disposal."

3.4 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

- A. Credit EQ 3.1: Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."
1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 01 Section "Temporary Facilities and Controls," install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
  2. Replace all air filters immediately prior to occupancy.
- B. Credit EQ 3.2: Comply with one of the following requirements:
1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of 14000 cu. ft. (4 300 000 L) of outdoor air per sq. ft. (sq. m) of floor area while maintaining an internal temperature of at least 60 deg F (16 deg C) and a relative humidity no higher than 60 percent.
  2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of 3500 cu. ft. (1 070 000 L) of outdoor air per sq. ft. (sq. m) of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm per sq. ft. (1.52 L/s per sq. m) of outside air or the design minimum outside air rate determined in EQ Prerequisite 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14000 cu. ft./sq. ft. (4 300 000 L/sq. m) of outside air has been delivered to the space.
  3. Air-Quality Testing:
    - a. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "LEED-NC: Reference Guide."
    - b. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
      - 1) Formaldehyde: 50 ppb.
      - 2) Particulates (PM10): 50 micrograms/cu. m.
      - 3) Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
      - 4) 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.
      - 5) Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
    - c. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting noncomplying building areas, take samples from same locations as in the first test.
    - d. Air-sample testing shall be conducted as follows:
      - 1) All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal

- daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
- 2) Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Nonfixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.
  - 3) Number of sampling locations will vary depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq. ft. (2300 sq. m) or for each contiguous floor area, whichever is larger, and shall include areas with the least ventilation and greatest presumed source strength.
  - 4) Air samples shall be collected between 3 and 6 feet (0.9 and 1.8 m) from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

END OF SECTION 018113

## SECTION 01 91 13 – GENERAL COMMISSIONING REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Commissioning (Cx) will verify that all building systems perform according to the construction documents and perform interactively according to the design intent, as well as the Owner's operational needs.
1. The Contractor will perform tests to verify system performance, and these tests shall be witnessed by the Commissioning Authority. BCPS is providing the Commissioning Agent.
  2. The commissioning scope includes:
    - a. Scheduling of commissioning,
    - b. System readiness,
    - c. Equipment startup,
    - d. Control system calibration,
    - e. Systems start-up,
    - f. Testing and balancing,
    - g. Performance testing,
    - h. Control system tuning
    - i. Operator training, and,
    - j. Systems documentation.
- B. This section includes requirements for the commissioning process including, but not limited to the following systems, assemblies and equipment:
1. HVAC&R
  2. Domestic Water Heating
  3. Lighting and Day Lighting Controls

#### 1.2 ABBREVIATIONS

- A. The following are abbreviations used in this Specification.
- |    |      |                                |
|----|------|--------------------------------|
| 1. | AABC | Associated Air Balance Council |
| 2. | ACG  | AABC Commissioning Group       |
| 3. | A/E  | Architect and Design Engineers |
| 4. | AHJ  | Authority Having Jurisdiction  |



5.	AHU	Air Handling Unit
6.	ASHRAE Engineers	American Society of Heating, Refrigerating and Air Conditioning Engineers
7.	AT	Acceptance Test
8.	ATC	Controls Contractor
9.	ATS	Automatic Transfer Switch
10.	BMS	Building Management System
11.	BOD	Basis of Design
12.	CD	Construction Documents
13.	CMP	Commissioning Master Plan
14.	Cx	Commissioning
15.	CxA	Commissioning Agent/Authority
16.	CxAR	CxA's designated on site representative
17.	CxLog	Cx Issues tracking to Resolution
18.	DDC	Direct Digital Control
19.	EC	Electrical Contractor
20.	E-Insp.	Electrical Inspector
21.	FAT	Factory Acceptance Test
22.	FPT	Functional Performance Test
23.	GBCI	Green Building Certification Institute
24.	GC	General Contractor
25.	HVAC&R	Heating Ventilation and Air conditioning & Refrigeration
26.	I-FPT	Integrated Functional Performance Test
27.	LEED AP Professional	Leadership in Energy and Environmental Design Accredited Professional
28.	MC	Mechanical Contractor
29.	MCC	Motor Control Center
30.	M-Insp.	Mechanical Inspector
31.	OPR	Owners Project Requirements
32.	PFC	Pre-functional Checklist
33.	PM	Project Manager (of the owner)
34.	QA/QC	Quality Assurance/Quality Control
35.	RE	Resident Engineer (BCPS Representative/Inspector)
36.	RFI	Request For Information
37.	SAT	Site Acceptance Test

- 38. SMACNA Sheet Metal and Air Conditioning Contractors National Association
- 39. Subs Subcontractors to General
- 40. TAB Test and Balance Contractor
- 41. USGBC US Green Building Council
- 42. UPS Uninterruptable Power Supply
- 43. VAV Variable Air Volume

**1.3 CONTRACTOR'S RESPONSIBILITIES**

- A. The commissioning process will not absolve the responsibility of the system designers, installing sub-contractors, GC to provide a finished and fully functional product/system.
- B. Provide calibrated and documented measuring instruments, logging devices and data acquisition equipment to record data for the complete range of testing for the required test period.
- C. Provided competent, certified and documented, labor to install and set-up these devices.
- D. Prepare and maintain an updated interactive commissioning schedule aligned with the CMP.
- E. Attend Cx meetings and work with the Cx Team to resolve issues on the Cx Issues Log.
- F. Attend construction phase coordination meetings for the Environmental DDC control system.
- G. Attend testing, adjusting and balancing (TAB) review and coordination meetings.
- H. Perform commissioning tests at the direction and approval of the RE in the presence of the CxA.
- I. Provide maintenance, orientation and inspection of commissioned systems, assemblies, equipment and components as directed by the CxA with the approval of the RE.
- J. Provide the O&M manual information for the commissioned products/systems.
- K. Provide information request by the CxA for final commissioning documentation.
- L. Prepare and conduct training for the BCPS personnel designated by the RE.
- M. All Checklists and test data forms required for the various phases of commissioning shall be similar to or based upon the applicable typical checklists and testing data included in Appendices to SMACNA's "HVAC Systems Commissioning Manual", Test and Balance Procedures Manual developed by the Associated Air Balance Council (AABC), ACG Commissioning Guideline (AABC Commissioning Group), ASHRAE Standard 111, ASHRAE Guideline 0, and in accordance with appropriate Specification Sections of the Contract Documents.

#### 1.4 CxA's RESPONSIBILITIES

- A. Coordinate and manage the Cx process as documented by the various phases described in PART 3 - EXECUTION.
- B. Provide project-specific construction checklists and commissioning process test procedures for commissioned systems, assemblies, equipment and components to be furnished and installed under the Contract.
- C. The test procedures, measuring instruments, accuracy of measurements, acceptance criteria, and all other requirements shall be in accordance with the above referenced manuals, standards, and Specifications. For equipment, devices, instruments, apparatus, systems and subsystems which are not covered in the above referenced manuals, standards and Contract Documents, the test procedures, checklists, and test data forms shall be developed based upon respective manufacturer's standard instructions for installation, checking, starting-up, testing, adjusting and balancing.
- D. Plan and Direct commissioning testing.
- E. Verify test data, inspection reports and certifications in the O&M manual for the commissioned products/systems.
- F. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry-accepted standards.
- G. Verify that the systems and equipment are started in a controlled process.
- H. Verify that the systems and equipment receive adequate operational checkout by installing contractors.
- I. Verify and document proper performance of equipment and systems.
- J. Verify that O&M documentation furnished by the contractor is complete.
- K. Oversee and verify that the training of BCPS personnel by contractor is adequate and satisfactory.

#### 1.5 COMMISSIONING DOCUMENTATION

- A. In addition to the requirements in PART 3 - EXECUTION, the Contractor shall provide the following information to the CxA for inclusion in the CMP.
- B. Detailed construction schedule & updates.
- C. Plans for delivery and review of submittals, system manuals, and other documents and reports.
- D. Identification of installed systems, assemblies, equipment and components, including changes that occurred during the construction phase.
- E. Certificate of readiness certifying that Mechanical systems, subsystems, equipment and associated controls are ready for testing.

- F. Process logic (flow-charts) and schedule for completing construction checklists and manufacturer's pre-start and start-up checklists for Mechanical systems, assemblies, equipment and components to be verified and tested.
- G. Certificate of completion certifying that installation, pre-start checks and start-up procedures have been completed.
- H. Test and inspection reports and certificates.
- I. Verify and furnish of testing, adjusting and balancing reports.

#### 1.6 SUBMITTALS

- A. Submittals from contractor for the commissioned systems are specified within this Section:
  - 1. Comments on the testing procedures/checklists
  - 2. Certificates of completion of installation, pre-start activities, and
  - 3. Certificates of start-up activities
  - 4. Lock-out Tag-out forms, Flushing/cleaning forms, Hydro& Air testing forms
  - 5. Physical complete forms, FAT forms, SAT forms, Start-up forms
  - 6. Certificates of readiness for FPT I-FPT & Acceptance test
  - 7. FPT commissioning reports
  - 8. Operation and Maintenance Documentation.
  - 9. Operation and Maintenance Training Program for review.
  - 10. Training agendas

#### 1.7 CODES AND STANDARDS

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
  - 1. "HVAC Systems Commissioning Manual"
- B. Associated Air Balancing Council (AABC)
  - 1. "Test and Balance Procedures"
  - 2. "ACG Commissioning Guideline" (AABC Commissioning Group)
- C. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

1. Standard 111 – “Practices for Measurement, Testing, Adjusting and Balancing Heating, Ventilation, Air Conditioning and Refrigeration Systems”
2. Guideline 0-2005, - “The Commissioning Process”

**1.8 COMMISSIONING TEAM (Cx Team)**

- A. The CM/GC will provide the CxA a list of the subcontractors responsible for the start-up and completion of the commissioning checklists prior to the first commissioning meeting.
- B. The contractors that will be members of the commissioning team include the:
  1. CM/GC’s PM,
  2. Mechanical Contractor (MC),
  3. Electrical Contractor (EC),
  4. Test & Balance contractor (TAB),
  5. Controls Contractor (ATC),
  6. Other installing sub-contractors (subs) of equipment to be commissioned,
  7. Other installing sub-contractors (subs) of systems to be commissioned,
  8. Manufacture representatives’ of systems or equipment to be commissioned.
- C. The RE will be a member of the Cx Team, along with the:
  1. Design engineers (particularly the mechanical & electrical engineers),
  2. CxA
  3. Designated representative of the Owner’s Construction Management firm (CM)
  4. An BCPS representative will also be a member of the commissioning team
- D. The BCPS’s building operator and system engineers are also members of the commissioning team.

PART 1 - PRODUCTS

1.9 EQUIPMENT AND SYSTEMS TO BE COMMISSIONED SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING

A. HVAC&R:

1. Roof-Top Units
2. Energy Recovery Units
3. Heat Exchangers
4. Humidifiers
5. Pumps
6. Testing, Adjusting and Balancing Work
7. Controls
8. Ductwork
9. Ductless Split Systems
10. VAV terminal units
11. Supply, Return, Relief and Exhaust Fans
12. Fan-Coil Units
13. Air Terminal Devices
14. Unit Heaters

B. Plumbing:

1. Domestic Hot Water System

C. Electrical:

1. Interior and Exterior Lighting
2. Lighting Controls

PART 2 - EXECUTION

1.10 GENERAL

- A. The Contractor shall perform commissioning tests for each equipment, subsystem, and system, as specified hereinafter to demonstrate that the work and equipment, as installed, complies with the Contract requirements. He shall provide all labor, calibrated instruments, and apparatus, including all recording devices, chart paper, videotapes, etc., required for such tests.
- B. The CxA may check the Contractor's instruments or furnish its own instruments for the contractor to use.

- C. If any of the work or equipment fails to meet the contract requirements or to function properly, the defects shall be rectified at no additional cost to the BCPS by re-adjusting or by removing and replacing the faulty work or equipment until, under test, the requirements are met.
- D. Start-up of major mechanical equipment listed shall be performed in accordance with manufacture's published procedures and instructions and shall be supervised by an authorized and trained manufacturer's representative. The manufacturer's representative shall certify in writing that the installed equipment has been checked for proper operation and the installation was found to be satisfactory. These certifications shall be included with the Operation and Maintenance Documentation.
- E. If factors, like the outside air temperature, or inappropriate seasons, or lack of full occupancy, or others, will prevent full performance testing, or testing of some functions, then the testing, verifying and documenting the performance of these functions shall be carried out at an appropriate and mutually agreed upon time after Substantial Completion, like during the first actual use, or appropriate seasonal use, or full occupancy.
- F. Commissioning tests shall be performed in the presences of the CxA and in accordance with the approved commissioning master plan (CMP), using approved test procedures and approved testing instruments.
- G. The Contractor shall review the procedures for commissioning tests contained in the CMP and submit any questions, comments and requested modifications to the CxA. All comments shall be submitted 60 days prior to the scheduled tests.
- H. The Contractor shall notify the CxA at least ten (10) days prior to the scheduled date of the commissioning tests.
- I. All pressure tests shall be performed on unenclosed and un-insulated pipes, with the piping in place. Tests shall be performed until all leaks are fixed. After pressure tests are completed and all defects are corrected, pipe insulation work may be performed.
- J. All piping tests shall be performed with the gauges removed. A separate test shall be performed with the gauges installed at the in-service pressure.

#### 1.11 TESTING PROTOCOLS:

- A. In general, start with singular components move to systems components then to integrated systems.
  - 1. The checkout and performance verification proceeds from simple to complex, from component level to equipment to systems and interdependent system levels, with pre-functional checklists being **completed** before functional testing.
  - 2. The Subs execute and document the initial checkout, perform startup and pre-functional checklist. The CxA documents that the checklists and startup were completed according to the approved plans. This may include the CxA witnessing startup of randomly selected equipment.

3. The CxA develops general equipment and system functional performance test procedures (checklists). The Subs review the procedures.
  4. The procedures are executed by the Subs, under the direction of Cx plan, and documented by subs. The CxA verifies this using a random sampling protocol.
  5. Items of non-compliance in material, installation or setup are corrected at the Sub's expense and the system retested.
- B. BCPS does not, typically, do sampling for systems; Systems are usually tested 100%. Should a certain Sampling Rate be carried out, percentage should be agreed upon with BCPS.
1. No sampling by Sub-contractors is allowed in readiness or pre-functional checklist execution.
- C. Bench top software testing
1. Point to Point testing is to be documented by the installing contractors and shall confirm that the wiring termination, addressing, monitoring, graphical display and control of intelligent equipment is programmed and terminated correctly.
  2. **Graphical Display testing** is part of the point to point check out stage. During this stage the DDC contractor will set up a workstation with the graphics for this project loaded and operating. This bench top testing and demonstration of the graphical displays will take place a minimum of two months prior to the start of the field roll out of the DDC system.
  3. It will be conducted in the DDC contractor office and a sample of the devices will be connected at least one of each type, so the CxA can visually see the actions as the software is verified.
  4. Test records shall be issued to the CxA by the contractor for inclusion in the final commissioning manual.
  5. The CxA will observe and witness a sample of the contractors Point to Point Tests.
- D. Repairing and correcting commissioning testing issues
1. All checks shall be documented on the relevant checklists as they are carried out. Deficiencies or incomplete work shall be corrected, and the checks repeated, until the installation is ready for operation, before proceeding to the next phase of the process.
  2. **Cost of Retesting:** The cost for the Sub-contractor to retest a pre-functional or functional test, if they are responsible for the deficiency, shall be theirs. If they are not responsible, any cost recovery for retesting costs shall be negotiated with the CM/GC.



3. For a deficiency identified, not related to any pre-functional checklist or start-up fault, the CxA will direct the retesting of the equipment at no "charge" if it can be accomplished on same site trip, however, the CxA's time for a second retest will be back charged to the CM/GC who may choose to recover costs from the party responsible Sub-contractor.
  4. The effort for the CxA to direct any retesting required because a specific pre-functional checklist or startup test item reported to have been successfully completed but determined during testing to be faulty, will be back charged to the CM/GC who may choose to recover costs from the party responsible.
  5. The Contractor shall respond in writing to the CxA and PM at least as often as commissioning meetings are being scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreements and proposals for their resolution.
  6. The CM/GC shall not consider any required retesting by any party a justified reason for a claim of delay or for a time extension.
- E. Commissioning is to be completed before the Substantial Completion date.

#### 1.12 COMMISSIONING SCHEDULE

- A. The Commissioning Schedule may use logic-linked tasks that form a critical path linked to the master construction schedule to plan successful completion of all commissioning activities.
- B. Use a process similar to logic linked commissioning tasks in GANTT bar or PERT format.
- C. The CM/GC is responsible for monitoring and updating this schedule and reporting slippage and recovery actions to maintain program commissioning milestones.
- D. Commissioning progress reports are to be issued by the CM/GC monthly and then weekly after the first energization of equipment.
- E. The CxA will work with the CM /GC according to established protocols to schedule the commissioning activities.
- F. The CxA will provide to the CM /GC commissioning logic for scheduling commissioning activities. The CM /GC will integrate all commissioning activities into the master schedule, including specific time, logic and duration required.
- G. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.
- H. The CxA will provide the initial schedule of primary commissioning events at the commissioning scope meeting. The Commissioning Master Plan will provide a format for this schedule. As construction progresses, a more detailed and logical duration is developed by the CxA.

- I. The CM /GC will notify the CxA of any schedule changes and assist with updating the commissioning schedule accordingly.
- J. Scheduling updates shall be done in advance of reported system completion. All reasonable accommodations shall be made to avoid completed systems or equipment standing idle as this is detrimental to system components.
- K. Sample System Start-up template is attached

#### 1.13 COMMISSIONING ISSUES RESOLUTION LOG (CxLog)

- A. Review Cx issues from the design phase: At the commissioning kick-off meeting for the construction phase the contractor and all subs shall review all outstanding commissioning issues from the CxA's review of the OPR, and CD drawings. Potential cost, schedule and functional impacts noticed by the contractors will be raised and discussed.
- B. Maintenance of the CxLog: When an observation or issue is reported, the CM/GC shall notify the appropriate parties to initiate corrective action in an expeditious manner. The Commissioning Agent will keep an ongoing Log of Observations and Commissioning Issues. The Log will list and track identified items until the resolution of issues.
- C. An up to date copy of this CxLog will be kept on site in the 3-Ring Binder for the Field Commissioning documentation.
- D. Review monthly with ALL team members: The Owner, CM/GC, and CxA will monitor the resolution of identified deficiencies.

#### 1.14 SYSTEM READINESS

- A. General:
  - 1. Before starting any equipment or systems, the Contractor shall conduct the physical complete walk-through, system readiness review, pre-start checks and start-up checks of each equipment, subsystem and system and document the results. The following conditions and items shall be completed, as applicable.
  - 2. Electrical and Mechanical Systems:
    - a. All areas in which tests are to be conducted have been cleaned of all unwanted materials, etc., to the satisfaction of the CxA.
    - b. All electrical and mechanical measurements shall be recorded on approved test data forms.
    - c. Major equipment start-up has been carried out by manufacturer's representatives and start-up reports completed and submitted for approval.
    - d. All checks shall be documented on the relevant checklists as they are carried out. Deficiencies or incomplete work shall be corrected, and the

checks repeated, until the installation is ready for operation, before proceeding to the next phase of the process.

3. Mechanical Systems:

- a. Piping systems have been flushed and cleaned, as specified, any required reports submitted.
- b. System then filled or charged to required pressure, as applicable.
- c. Equipment has been lubricated to specifications.
- d. Air system cleaning is complete, and particulate filters have been installed.
- e. Vibration isolation and seismic restraints have been installed to Specifications and adjusted.
- f. Equipment drives have been aligned.
- g. Control point checkouts have been completed.
- h. Safety controls have been installed and operation checked.
- i. Sound tests, vibration tests, and all other tests, as recommended by the equipment manufacture or as specified in respective equipment Specification Sections have been completed and documented.

4. Electrical Systems:

- a. All Motors have been checked for insulation resistance and winding resistance and voltage, current, power factor, and kilowatt have been measured and recorded.
- b. Electrical services have been installed and checked and all electrical testing has been completed as specified herein.

B. Physical complete walk-throughs:

1. Before both sides of the walls are completed, CM/GC and the trade (subs) contractors will attend a review of the systems progress. This meeting may be attended by the RE, Design engineers, commissioning agent and others. The review may take place over a few days and comments and questions will be organized on the CxLog for resolution.
2. Before the ceilings are closed off and completed, the CM/GC and trade (subs) contractors will attend a review of the systems progress. This meeting may be attended by the RE, Design engineers, commissioning agent and others. The review may take place over a few days and comments and questions will be organized on the CxLog for resolution.
3. Before parts of commissioned systems are concealed by other work or general construction, the CM/GC and trade (subs) contractors will attend a review of the systems progress. This meeting may be attended by the RE, Design engineers, commissioning agent and others. The review may take place over a few days and comments and questions will be organized on the CxLog for resolution.
4. Maintenance of the CxLog will be the responsibility of the CxA, but it will be the contractor's responsibility to use the observation forms in the CMP for each walk-through and submit them to the CxA.
5. The issues from the walk-throughs may link to Design Intent issues. It will be the contractor's responsibility to create an RFI for submission to the design

team and to submit any appropriate Change order documentation in a timely manner.

6. The construction sequence will be tracked on the integrated commissioning and construction schedule so at least a two week notice can be given concerning the required timing for these Physical complete walk-throughs.

C. Lock-out & tag-out:

1. The contractor is responsible for lock-out & tag-out (LOTO), and as best practices and codes require, the Electrical and sub-contractor will be performing LOTO procedures.
2. Copies of the procedures and forms for the commissioned systems will be submitted to the CxA prior to the Flushing and Cleaning of the systems.
3. The Potential and Dynamic energies of each system must be addressed and neutralized as part of the LOTO process. This may include taking actions that included more than neutralizing the electrical risks. These actions will be formalized in a memo by the CM/GC for the commissioned systems and will submit to the CxA prior to the Flushing and Cleaning of the systems.

D. Hydro and air testing:

1. The contractor is responsible for Hydro and air testing, and as best practices and codes require the trade (subs) contractor will be performing these procedures.
2. Copies of the procedures and forms for the commissioned systems will submit to the CxA prior to the Flushing and Cleaning of the systems.
3. The contractor will prepare Colored (highlighted) diagrams of the systems or parts of the systems that are being tested and use the integrated schedule to track these dates.
4. Identify all the valves on the diagrams and note the position, (open or closed).
5. The design specifications will set the pass and fail criteria for these tests. The contractor will note the start and end times, and the actual gauge reading and the pass reading in the documentation.
6. Contractor generated forms for these tests will be used and submit copies of the pass documentation along with signatures to the CxA prior to the Flushing and Cleaning of the systems.

E. Flushing and Cleaning:

1. The contractor is responsible for flushing and cleaning the system, components and equipment, and as best practices and codes require the trade (subs) contractor will be performing these procedures.
2. Copies of the procedures and forms for the commissioned systems will submit to the CxA prior to the Flushing and Cleaning of the systems.

3. In the forms and procedures, the contractor will address the interaction of existing system, parts, and components and how these will be safeguarded.
4. Identify all the valves on the diagrams and note the position, (open or closed). Note how and where waste water will be collected, and disposed.
5. The design specifications will set the pass and fail criteria for these tests. The contractor will note the start and end times, and the actual reading and the pass reading in the documentation.
6. Contractor generated forms for these tests will be used and submit copies of the pass documentation along with signatures to the CxA prior to the Initial Operation phase begins.

### 1.15 INITIAL OPERATION

#### A. General:

1. The Contactor shall complete the testing, adjusting, balancing, and calibration of all components and systems. The contractor shall also operate all systems through all specified modes of operation, (specified, abnormal or emergency conditions) and test system responses.
2. All checks, tests, and data shall be documented on the relevant checklists and test data forms as they are carried out. Deficiencies or incomplete work shall be corrected and the checks or tests repeated until correct functions have been confirmed and the installation is ready for the CxA's verification.
3. All electrical and mechanical measurements shall be recorded on approved test data forms.
4. Pre-functional checks carried out during this phase of commissioning shall include the following, as applicable (note: that not all these activities are a direct part of the commissioning process, but they all need to be carried out during or prior to this phase of commissioning):
  - a. Air system balancing, including positioning of all balancing dampers, adjustments to diffusers, registers and grilles.
  - b. Hydronic systems balancing, including positioning of all balance valves.
  - c. Correction of all problems revealed during balancing, including belt tension, changes to all fans speeds or blade pitch, as necessary.
  - d. Setting up and calibrating all automatic temperature controls devices, including adjustments to control valves and damper actuators.
  - e. Setting up or programming controls for accurate response and precise sequencing to meet specified performance.
  - f. The Balancing contractor and Controls contractor shall work together to set up the air flows and calibrate the controls for variable volume terminal units and air valves, while the Mechanical contractor verifies the setting and work.
  - g. Ensure final adjustments to vibration isolation and seismic restraints are carried out.
  - h. Check operation of all fire dampers.

#### B. Pre-functional checks (PFC):

1. The contractor will use the forms daily/weekly as the systems progresses and will note the items that have been accomplished.
2. The contractor will accompany the CxA while he verifies a random sample of these checklists during site visits.
3. The pre-functional checklists have to be completed by the contractor and are Pre-requisite before the contractor can continue to the subsequent phases of Start-up, SAT or FAT.

C. Factory Acceptance tests (FATs):

1. Where specified these tests shall be coordinated by the contractor. Components, like fans, motors, coils, and dampers may be included in this testing.
2. The forms and procedures will be developed by the contractor or the manufacture. They will readiness testing before initial operation. For commissioned systems the contractor will submit these forms to the CxA for review and comment 60 days before the scheduled test date.
3. Copies of the completed forms will be submitted to the CxA so they can be included in the Cx documentation.
4. For commissioned systems the CxA shall witness this factory test.
5. The cost for travel, expenses and time will be included in this contract.

D. Site Acceptance tests (SATs):

1. These tests maybe specified, or recommend In lieu of the FAT, by the contractor.
2. Where specified/recommended these tests shall be coordinated by the contractor. Components, like fans, motors, coils, and dampers may be included in this testing.
3. The forms and procedures will be developed by the manufacture. They will include readiness testing before initial operation. For commissioned systems the contractor will submit these forms to the CxA for review and comment 60 days before the scheduled test date.
4. Copies of the completed forms will be submitted to the CxA so they can be included in the Cx documentation.
5. For commissioned systems the CxA shall witness this Site Acceptance test and the cost for travel, expenses and time will be included in this contract.

E. Start-up

1. When the contactor has performed FATs and SATs in accordance with this section, those tests can substitute for the pre-testing of components and subsystems.
2. The contactor will conduct and have witnessed Pre-functional checks before the start-up is performed.
3. During the Start-up of commissioned systems documented Manufacture's tests for components and subsystems maybe used.

22 of 32

4. The forms and procedures will be developed by the contractor or the manufacture. The contractor will submit these forms to the CxA for review and comment 60 days before the scheduled test date.
5. Copies of the completed forms will be submitted to the CxA prior to performing Function Performance Verifications so they can be included in the Cx documentation.

#### 1.16 FUNCTIONAL PERFORMANCE VERIFICATION

##### A. General:

1. All equipment and systems shall be operated through the entire sequence of operations as directed by the CMP and/or the CxA for witnessing and verifying acceptable operation.
2. Any or all of the following checks and tests may be required by the Design Engineer or Operation and maintenance Department's representative(s), the CMP and/or the CxA.
3. Operation of all control system devices, both sensors and actuators.
4. Proper physical response of all controlled devices and components to set point changes or other relevant adjustments.
5. Tune control systems and demonstrate with trending logs a stable control loop & diminishing feedback & diminishing control timing.
6. Operation of randomly selected fire or smoke dampers.
7. Demonstration of acceptable noise and vibration levels form any equipment under its full range of operational conditions.
8. Operation of equipment of systems under normal, abnormal, and emergency conditions.
9. Following completion of testing, all parts of the installation shall be thoroughly cleaned and inspected by the sub-contractor installing the system.

Thoroughly clean all soldering flux, grease, metal cuttings and sludge, which may be present on the outside of all equipment, piping, valves, fittings, etc. Any discoloration or other damage to parts of the building, its finish, or furnishings due to the Contractor's failure to properly clean the piping systems shall be repaired without additional cost to the Authority. Cleaning shall be performed in a manner not permitting debris to enter pumping or similar equipment. Painting or insulation shall be applied on all ductwork and piping only after thorough cleaning, as specified above.

10. Submit the Commissioning Report in three-ring binders with a title, cover sheet and table of contents. The commissioning report shall include, but not be limited to, all completed, signed and dated checklists and test data forms shall include acceptance criteria for each test result.

B. Functional Performance Test (FPT) plans:

1. The function testing of commissioned systems will start at the subsystems and move to systems, i.e., ductwork, VAVs, piping, AHUs, HVAC system.
2. 100% of these tests will be witnessed by the CxA and signed-off, unless otherwise indicated in the commissioning plan.
3. The contractor may use data loggers and trending from the BMS to document the performance over time.
4. The contractor should expect and host the RE for the test.
5. It is expected that the CM/GC will conduct the functional tests prior to time the CxA is schedule to witnessed the test, to minimize the risk of failure or avoid back-charges from the CxA for retesting.
6. Issues that are noted during functional testing will need to be resolved to the satisfaction of the BCPS and Engineers prior to starting Acceptance period.
7. During this period the contractor may conduct the prescribed training.

C. Integrated Functional Performance Test (I-FPT) plans:

1. Following the successful completion of Functional testing of the commissioned systems, System that are connected and/or integrate will be tested as they perform together.
2. 100% of these tests will be witnessed by the CxA and signed-off, unless otherwise indicated in the commissioning plan.
3. The contractor may use data loggers and trending from the BMS to document the performance over time.
4. The contractor should expect and host the RE for the test.
5. The contractor should expect and host the AHJ, who is usually present for Smoke Evacuation, Fire Alarm and other Integrated tests.



6. It is expected that the CM/GC will conduct the Integrated functional tests prior to time the CxA is schedule to witnessed the test, to minimize the risk of failure or avoid back-charges from the CxA for retesting.
7. Issues that are noted during functional testing will need to be resolved to the satisfaction of the BCPS and Engineers prior to starting Acceptance period.
8. During this period the contractor may conduct the prescribed training.

#### 1.17 ACCEPTANCE TESTING (ATs)

- A. After completion of Functional Performance Verification Testing, the entire system shall be operated continuously for seven (7) days, as directed by the Engineer. During the seven (7) day test, the motors shall show no signs of overheating and there shall be no leakage from any pipe, valve or bearing seal. During this seven-day operation, the system shall operate satisfactorily, without any malfunction, failure or adjustment. At any time during the seven-day operation, if a malfunction or failure occurs or an adjustment is required, stop the test, correct the problem, and start the seven-day operation from the beginning.
- B. Once acceptable performance has been verified, operate the system under specified interfaces to/from equipment and systems provided under other specifications sections.
- C. This is a test to be completed for 100% of the systems and equipment.
- D. The Acceptance period is 90 days. It will commence following a successful 7 day acceptance test. The 90 day period will include the successful 7day test duration.
- E. Issues that are noted during functional and integrated functional testing will need to be resolved to the satisfaction of the BCPS / RE and A/E prior to starting Acceptance period.
- F. During this period the contractor will conduct the prescribed training.

#### 1.18 TRAINING

- A. The contractor shall prepare and conduct the Training listed in this section for all three shifts of the operation and maintenance staff and shall video document the training with a video and audio recording.
- B. Training sessions for each shift and for each system shall be provided. At the direction of the BCPS and for their convenience groups of systems may be combined into a single session per shift.
- C. The training shall commence once the Functional Performance Verification is complete unless otherwise directed by the CxA. This training shall cover all equipment and systems, and their controls.
- D. Training in Start-up:
  1. Show this activity on Cx schedule,

2. Coordinate the on-site system familiarization of the Start-up activities & forms with the trade (subs) contractors so they will be present with the BCPS staff.
3. Start-up Cx forms shall include forms generation by the CxA and the contractors. These forms shall cover the area of LOTO, Flushing and Cleaning, and pre-functional testing.
4. Prepare and get approval of training agenda four (4) weeks prior to the scheduled date.
5. The trade (subs) contractor will conduct this training. The CxA will witness and coordinate the participation of the BCPS staff.
6. The CM/GC will make a Video recording, with sound of this training, and the presenters will use a handheld microphone, and questions will be re-iterated for the camera.
7. Sign-in sheets will be used for attendees, and certificates, will be given to those who will attend.

E. Training in operation:

1. Show this activity on Cx schedule,
2. Coordinate the on-site system familiarization of the Operation activities & forms with the trade (subs) contractors so they will be present with the BCPS staff.
3. The FPTs and I-FPTs Cx forms used during the functional testing and Integrated testing will be reviewed in detailed and the systems shall be exercised through the steps & sequences included in those forms.
4. The trade contractor will conduct this training. The CxA will witness and coordinate the participation of the BCPS staff.
5. The equipment Manufacture's rep shall be present and may conduct part of the training as appropriate.
6. Prepare and get approval of training agenda two weeks prior to the scheduled date.
7. The CM/GC will make a Video recording, with sound of this training, and the presenters will use a handheld microphone, and questions will be re-iterated for the camera.
8. Sign-in sheets will be used for attendees, and certificates, will be given to those who will attend.

F. Training in Maintenance:

1. Show this activity on Cx schedule,

2. Coordinate the on-site system familiarization of the Maintenance activities & forms with the trade (subs) contractors so they will be present with the BCPS staff.
3. The contractor will generate forms of the activities listed in the O&M manuals for schedule maintenance, for the periods of daily, weekly, monthly, semi-annually and yearly shall use them to conduct this training.
4. Manufacture's rep will conduct this training. The CxA will witness and coordinate the participation of the BCPS staff
5. Prepare and get approval of training agenda four (4) weeks prior to the scheduled date.
6. The CM/GC will make a Video recording, with sound of this training, and the presenters will use a handheld microphone, and questions will be re-iterated for the camera.
7. Sign-in sheets will be used for attendees, and certificates, will be given to those who will attend.

G. Training in Trouble-shooting:

1. Show this activity on Cx schedule,
2. Coordinate the on-site system familiarization of Trouble-shooting activities and forms with the trade (subs) contractors so they will be present with the BCPS staff.
3. The contractor will generate forms of trouble-shooting items listed in the O&M manuals for each type of equipment (organized by system) and shall use them to conduct this training.
4. The Pre-functional, Start-Up, Functional Testing, and Integrated Functional Testing forms shall also be used to conduct this training.
5. Manufacturer's representative will conduct this training. The CxA will witness and coordinate the participation of the BCPS staff.
6. Prepare and get approval of training agenda four (4) weeks prior to the scheduled date.
7. The CM/GC will make a Video recording, with sound of this training, and the presenters will use a handheld microphone, and questions will be re-iterated for the camera.
8. Sign-in sheets will be used for attendees, and certificates, will be given to those who will attend.

1.19 PROTOCOL FOR SYSTEM TURN-OVER

- A. Assemble Systems Manual - The contractor shall assemble the Systems Manual in accordance with the following:
1. The documentation for each system shall contain the following three (3) sections.
    - a. System information (see 3.10.A.8)
    - b. Equipment Maintenance Documentation
    - c. System Programming Documentation
  2. Each section shall be provided with a separate binder or binders, as necessary.
  3. This section contains the Operation and Maintenance Documentation required by the commissioning section.
  4. The requirements for Operation & Maintenance (O&M) documentation contained herein are intended to expand upon and supplement the requirements specified in other sections.
  5. The Operation and Maintenance (O&M) documentation shall include all necessary system information, and shall enable the reader to fully understand the procedures and all other requirements for the proper installation, start-up, testing, adjusting, balancing, operation, maintenance, trouble-shooting, and repair of a system and its components.
  6. The reader of the documentation shall be assumed to be technically competent but totally unfamiliar with the system and its components.
  7. Separate documentation shall be provided for each commissioned system, such as HVAC, fire protection, elevator, escalator, emergency generator, and emergency power. (Refer to PART 2- PRODUCTS, for list of the commissioned systems).
  8. System Information: This Section shall provide sufficient information and documentation for a thorough understanding of the system and all operating procedures. This shall include the following:
    - a. Table of Contents of Systems Section
    - b. Trouble-shooting Procedures
    - c. Operating Procedures
    - d. Spare parts
    - e. Sequence of operations
    - f. Record Drawings
    - g. System Intent & diagram
    - h. Step-by-step procedures for diagnosis and trouble-shooting of all possible system problems. This shall include procedures for collection and interpreting performance data.
    - i. Operation Procedures: This shall include step-by-step procedures for the following, with detailed explanations as necessary, for thorough understanding:

- 1) System start-up and shut-down, operation with occupied and unoccupied space, day and night operation and summer and winter operation.
- 2) Procedures for dealing with abnormal and emergency conditions for which there is a specified system response.
- 3) Acceptable tolerance for system adjustment in all operation modes.
- j. Commissioning Forms as used in the testing and blanks forms for future use as follows:
  - 1) LOTO Forms
  - 2) Flushing & Cleaning Forms
  - 3) Pre-functional forms
  - 4) Start-up forms
  - 5) Functional Testing forms
  - 6) Integrated Functional testing forms
  - 7) Acceptance certificate
- k. Spare Parts:
  - 1) Inventory data for all equipment accessories and appurtenances, and for all motors, pumps, lubricants, filters, belts, and bearings, shall be prepared in tabular form.
- l. The following data shall be placed in separate columns: identification number, relevant P&I diagram number, name, installed location, area served, manufacture's name, model number, serial number, all nameplate data , and other data necessary for ordering.
  - 1) Include name address and telephone numbers of local distributors and service stations for each equipment, accessory and appurtenance.
  - 2) Calibration charts for all instruments, control devices and input/output devices.
  - 3) An excel spread with all the Valve tags and location for this system and Valve charts showing the size, type and location of all the valves for this system.
  - 4) Sequence of operations for each equipment, subsystem and system.
  - 5) Operating parameters and control settings for all instruments, control devices and input/output devices.
- m. Record drawings (As-Built drawings): Refer to Paragraph 1.3 of this Specification Section regarding record drawings. Record drawings shall include the following:
  - 1) Area General Arrangement Drawings
  - 2) Equipment, piping and duct arrangement drawings
  - 3) P&I diagrams
  - 4) Submittals (Final)
  - 5) Control system diagrams including: interlock diagrams,
  - 6) ladder diagrams,
  - 7) terminal to terminal wiring (field wiring) diagrams,
  - 8) motor starter wiring diagrams,
  - 9) panel internal component layout diagrams and panel face layout diagrams.
- n. System intent & diagrams:
  - 1) System description will include a brief of the basic concepts,
  - 2) One-line diagram for an overview,
  - 3) Narrative of the theory of operation,

- 4) Capabilities and limitations of each system or subsystem and its components.
9. Equipment Maintenance Documentation: This Section shall include the following:
    - a. Equipment information: information for each type of equipment and its accessories shall include manufacturer's catalog information covering design parameters, materials of construction, all optional features or items supplied with the equipment, overall equipment dimensions and exploded view of equipment and accessories. The catalogs shall be clearly marked to indicate all applicable information. Information which is not applicable to the equipment being supplied shall be crossed out. Include wiring diagrams, catalog cuts and sequence of operation for controls and those controls supplied with equipment, (include the equipment manufacturer).
    - b. Inventory database as specified above shall be included in this Section as well.
    - c. Routine maintenance schedule including lubrication, parts replacement such as belt replacement, filter replacement, etc., and manufacturer's recommended preventive maintenance procedures.
    - d. Manufacturer's standard procedures or instructions for shipping, handling storage, installation, start-up, testing, adjusting, balancing, operation, service, maintenance, diagnosis and repair of equipment.
    - e. Parts list and recommended spare parts list for each equipment, accessory and appurtenance. The parts list shall include all parts, including controls devices, meters, gauges, valves, fitting, etc. Include in the list the part name, manufacturer's serial and model numbers, quantity installed and nameplate data.
    - f. All permits and approvals required for the system or its components from all authorities having jurisdiction.
    - g. Manufacturer's certification for installation, start-up, testing adjusting and balancing.
  10. System Programming Documentation: This Section shall serve as training and reference documents for all aspects of system programming and control system components and shall include the following, as a minimum:
    - a. Complete programming manuals and reference guides.
    - b. Details of any special software packages and compilers supplied with system.
    - c. Information required for systems programming.
    - d. Documentation for all application and DDC programs. Include flow charts, equations, and parameters, etc.
    - e. Point schedule: include all points, real and virtual.
    - f. Software trouble-shooting procedures.
    - g. Manufacturer's catalog cuts for all control system components, including information on installation, adjusting, operation, maintenance, trouble-shooting, design and operation parameters, wiring information, etc., for each control system component. Similar information for control components supplied by equipment manufacture may be included in the Equipment Maintenance section, or this section.

B. Turn-Over Certificates

1. The CxA will prepare a Turn-Over certificate for each commissioned system.
  2. Following the Functional tests and before the acceptance testing the responsible subcontractor, CM/GC and CxA shall sign and attach a list of any outstanding items that need to be addressed.
  3. The Turn-Over certificates with an attached list of items to be resolved for each system shall be presented to the BCPS at the training session for signature and change of custody.
- C. The certificates are not a Substantial Completion certificate for the contract.

END OF SECTION 01 91 13

SECTION 07 52 00  
HOT APPLIED BUILT-UP ROOFING

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes the materials and application procedures for the installation of gravel surfaced hot asphalt applied built-up roofing with cold adhesives applied aggregate.

1.2 RELATED DOCUMENTS

- A. Drawings and contract documents, including Section 01 01 00 – Summary of Work, apply to this section when students do not occupy building for extended period of time.
- B. Related Sections Include the Following:
1. Section 01 01 00 – Summary of Work
  2. Section 01 60 00 – Product Requirements
  3. Section 01 70 00 – Contract Closeout
  4. Section 02 06 00 – Demolition
  5. Section 02 08 02 – Hazardous Materials Abatement
  6. Section 03 51 10 – Cementitious Wood Fiber (Tectum) Deck
  7. Section 04 90 10 – Masonry Restoration
  8. Section 05 31 00 – Steel Deck
  9. Section 05 50 00 – Metal Fabrication
  10. Section 06 06 00 – Rough Carpentry
  11. Section 07 22 00 – Roof and Deck Insulation
  12. Section 07 41 00 – Metal Wall and Roof Panels
  13. Section 07 51 00 – Cold Applied Built Up Roofing
  14. Section 07 54 50 – Fluid-Applied Membrane Roof Flashing
  15. Section 07 62 00 – Sheet Metal Flashing and Trim
  16. Section 07 90 00 – Sealants
  17. Section 09 90 00 – Paints and Coatings
  18. Section 15 01 10 – Mechanical/Electrical General Requirements
  19. Section 15 16 00 – Roof Drains

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install a watertight, hot built-up roof and base flashing roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather.
- B. Roofing System must be tested by a third party testing agency and meet ASTM D 2523 for Load Strain Properties of Roof Membrane requirements of MD 586 lbf/in with 2.65% elongation and XMD 474 lbf/in with 2.67% elongation.
- C. Contractor must have a full time inspector on site for nine hours each day employed by the manufacturer during the actual installation of insulation, roof membrane, flashings, flood coat and gravel, and all sheet metal. Inspector must have been employed by the manufacturer for a five year period.

1.4 REFERENCES

- A. ASTM - American Society for Testing and Materials, West Conshohocken, PA.
- B. NRCA - National Roofing Contractors Association, Chicago, IL



C. UL - Underwriter's Laboratory, Northbrook, IL.

1.5 PROJECT CONDITIONS

A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed.

1.6 QUALITY ASSURANCE

A. Roofing system manufacturer shall provide on site inspector for the duration of the roof installation.

1.7 WARRANTY

A. Warranty:

1. Upon project completion and Owner acceptance, effective upon complete payment the Roofing Contractor shall issue a guarantee against defective workmanship and materials for a period of five (5) years.
2. Manufacturer's standard form, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
  - a. Warranty shall included roofing membrane, base flashings, roofing membrane accessories, roof insulation, insulation adhesive, cover boards, substrate board, metal edgings, metal copings, walkway products and other components of roofing system as well as metal roofing system. The same manufacturer will provide warranty for Built Up Roof and Metal Roofing System.
  - b. Warranty Period: Twenty-Five (25) years from date of Substantial Completion with a No-Dollar Limit.
  - c. Manufacturer will inspect the roofing system in years 2, 5, 10, 15, and 20 and shall perform any preventive maintenance and housekeeping as necessary. A written report with photographs will be provided for each inspection.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Tremco, Inc.
  2. Firestone
  3. Johns Manville
  4. Approved equal by Owner.

2.2 FASTENERS

- A. Roof membrane to wood nailers:
1. Simplex Cap Nails for attachment into wood; Length: 1-1/4 inch
  2. Approved equal by Owner.
- B. Membrane to cementitious wood fiber, gypsum:
1. ES Products Base Sheet Fastener - Twin Loc-Nail with 2.7-inch disc. Min 1.7 inch in length.
  2. Approved equal by Owner.

2.3 BASE SHEET & FIRST PLY FELTS:

- A. Non-perforated, SBS modified, asphalt-coated, polyester/fiberglass/polyester reinforced sheet, dusted with fine mineral surfacing on both sides and meets the requirements of ASTM

D 4601, Type II Trilaminare ply of polyester/fiberglass/polyester. Standard is Tremco Composite Ply Supreme or Approved Equal. Sheet must be a waterproof sheet.

1. One (1) ply
2. Tensile Strength, minimum, ASTM D 5147: machine direction, 300 lbf/in (52.5 kN/m); cross machine direction, 270 lbf/in (47.3 kN/m).
3. Tear Strength, minimum, ASTM D 5147: machine direction, 500 lbf (2.2 kN); cross machine direction, 500 lbf (2.2 kN).
4. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 5147: machine direction, 7.0 percent; cross machine direction, 7.0 percent.
5. Thickness, minimum, ASTM D 146: 0.05 inch (1.2 mm).

#### 2.4 ROOF MEMBRANE PLIES

- A. Type VI felts: Heavy Duty non-rotting glass ply sheet exceeding the requirements of ASTM D2178, Type VI. Three (3) plies.

#### 2.5 FLASHING MATERIALS

- A. Thermoplastic PVC-KEE Sheet: Basis of design product: Tremco, TPA Roof Membrane: ASTM D 4434, Type IV, internally fabric reinforced, uniform, flexible TPA sheet, CRRC listed and California Title 24 Energy Code compliant.
1. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 300 lbf/in (52 kN/m).
  2. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 6509: 100 lbf (0.44 kN).
  3. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D 6509: machine direction, 25 percent; cross machine direction, 25 percent.
  4. Thickness: 45 mils (1.1 mm), nominal.
  5. Exposed Face Color: White.
  6. Reflectance, ASTM C 1549: 86 percent.
  7. Thermal Emittance, ASTM C 1371: .86.
  8. Solar Reflectance Index (SRI), ASTM E 1980: 108
- B. Glass-Fiber Fabric for Stripping: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.
- C. Elastomeric Flashing Adhesive: Basis of Design: Tremco, Sheeting Bond White: One-part, asbestos-free, cold-applied, SEBS/SIS-based, elastomeric trowel-grade adhesive specially formulated for compatibility and use with specified roofing membranes and flashings, with the following properties:
1. Adhesion in Peel, minimum, ASTM D 1876: 3 lbf/in (0.5 N/mm).
  2. Lap Shear Adhesion, minimum, ASTM D 816: 18 psi (124 kPa).
  3. Asbestos Content: ASTM D 276: None.
  4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 250 g/L.
- D. Flashing Sheet Stripping Adhesive: Basis of design: Tremco, Rock-It Adhesive: One-part, white, highly reflective polymeric surfacing adhesive, CRRC listed and California Title 24 Energy Code compliant when combined with approved white gravel, with following physical properties:
1. Asbestos Content, EPA 600 R-93/116: None.
  2. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.
  3. Nonvolatile Matter, minimum ASTM D 6511: 50 percent.
  4. Flash Point, minimum, ASTM D 93: 120 deg. F (49 deg. C).
  5. Reflectance (adhesive plus aggregate), ASTM C 1549: 71 percent.
  6. Thermal emittance (adhesive plus aggregate), ASTM C 1371: 0.85.
  7. Solar Reflectance Index (SRI), adhesive plus gravel, ASTM E 1980: 86.

- E. Stripping ply for 2-ply stripping of metal flange flashings:
  - 1. Base layer of 2-ply stripping ply:
    - a. Roof membrane base sheet.
    - b. 6 inches minimum.
  - 2. Top layer of 2 ply stripping ply:
    - a. Roof membrane base sheet.
    - b. 3 inches beyond base layer (9 inches minimum).
  - 3. Stripping ply adhesive: Type III Hot Asphalt.
  - 4. Primer for metal flanges:
    - a. Water-based Primer.
    - b. Low volatile (VOC) primer.
- F. Flashing Sealant Tape:
  - 1. Teflon Tape - Flexible butyl based sealant tape.
  - 2. Dimensions: 1/8 inch by 1 inch.
- E. ASPHALT MATERIALS
- G. Membrane Adhesive:
  - 1. Type III Hot Asphalt.
    - a. Hot melt asphalt adhesive exceeding ASTM D 312-95a performance requirements.
    - b. Asphalt must have the "no smell" additive.
- H. Asphalt Primer:
  - 1. Water-Based Asphalt Primer: Water-based, polymer modified, asphalt primer
  - 2. Low volatile (VOC) primer - VOC Compliant Asphalt Primer: Solvent-based asphalt primer.
- I. Solvent-Free Elastomeric Roofing Mastic: One-part, solvent-free, asbestos-free, low-odor elastomeric roof mastic specially formulated for compatibility and use with specified roofing membranes and flashings.
- J. Asphalt Roofing Mastic: One-part, asbestos-free, cold-applied mastic specially formulated for compatibility and use with specified roofing membranes and flashings and meets the requirements of ASTM D 4586, Type II, Class 1.
- K. Temporary Tie-in Materials: G-2 base sheet - Non-perforated, asphalt-impregnated and coated glass-fiber sheet dusted with fine mineral surfacing on both sides and meets the requirements of ASTM D 4601, Type II.

## 2.6 WALK PADS

- A. Walkway Pads: Mineral-surfaced asphaltic composition panels, factory formed, non-porous, with a slip-resisting surface texture, manufactured specifically for adhering to built-up roofing as a protection course for foot traffic.

## 2.7 COATING MATERIALS

- A. Flashing Primer: Basis of design product: Tremco SP Primer or Approved Equal: Asbestos-free, acrylic-based primer formulated for use with acrylic latex coatings, with the following physical properties:
  - 1. Asbestos Content, EPA 600 R-93/116: None.
  - 2. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 80 g/L.
- B. Flashing Coating: Basis of Design: Tremco, ICE Coating or Approved Equal: Water-based, Energy Star qualified, CRRC listed and California Title 24 Energy Code compliant elastomeric roof coating formulated for use on bituminous roof surfaces, with the following physical properties:
  - 1. Asbestos Content, EPA/600/R-93/116: None.

2. Volatile Organic Compounds (VOC), ASTM D 3960: 39 g/L.
  3. Reflectance, minimum, ASTM C 1549: 86 percent.
  4. Emissivity, minimum, ASTM C 1370: 0.93.
  5. Solar Reflectance Index (SRI), ASTM E 1980: 103.
  6. Two (2) coats at 1 gallon a square
- C. White Cold Applied Flood Coat and Aggregate Surfacing:
1. Basis of design product: Rock-it Adhesive by Tremco or Approved Equal. A white cold applied, highly reflective low volatile surfacing adhesive.
  2. Provide aggregate surfacing that will withstand weather exposure without significant deterioration and will not contribute to membrane degradation, of the following type and size:
    - a. #1 White Highly Reflective Marble Roofing Chip Aggregate.
  3. Reflectance (adhesive plus aggregate), ASTM C 1549: 71 percent.
  4. Thermal emittance (adhesive plus aggregate), ASTM C 1371: 0.85.

## 2.8 MISCELLANEOUS ACCESSORIES

- A. Provide miscellaneous accessories recommended by roofing system manufacturer.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which roofing will be applied, with installer present, for compliance with requirements.
- B. Verify that roof openings and penetrations are set in place and braced.
- C. Verify that roof drains are properly clamped into position.
- D. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thickness of insulation required.

### 3.2 PREPARATION

- A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

### 3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install built-up roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA / NRCA's "Quality Control Guidelines for the Application of Built-Up Roofing".
- B. Install roofing system per manufacturer's published specifications manual.
- C. Wood fiber cants: Install and adhere preformed 45-degree fibered cants at all horizontal / vertical interfaces at projections and wall supported deck detail.
- D. Install and secure preformed 45-degree pressure-treated wood cants at horizontal / vertical interfaces of expansion joint and non-wall supported deck details.
- E. Coordinate installation of roofing system components so insulation and roofing plies are not exposed to precipitation or remain exposed at the end of the workday or when rain is forecast.

- F. Provide water cutoffs at end of each day's work to cover exposed ply sheets and insulation with a course of coated felt with joints and edges sealed.
- G. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
- H. Remove and discard temporary seals before beginning work on adjoining roofing.
- I. Asphalt heating:
  - 1. Maximum asphalt temperature: 25° F below the flash point.
  - 2. Avoid prolonged heating of asphalt at high temperatures. Reduce the asphalt temperature to below 500° F if asphalt is not being used for periods of 4 hours or more.
  - 3. Tanker: Free of contaminants.
  - 4. Application rates: Bitumen quantities for water stop/tie-offs, flashings, miscellaneous detail applications, and minimum kettle capacity are not included in application rates. Mopping rate - 25 pounds per 100 square feet plus or minus 20 percent.
  - 5. Heat and apply asphalt in accordance with equiviscous temperature (EVT) melted as recommended by NRCA. Temperature shall be EVT plus or minus 25° F at point of application. Discard bitumen that does not fall within this standard.
- J. Cold process adhesive heating:
  - 1. An in-line heat exchange unit may be used to facilitate application.
  - 2. Maximum adhesive temperature: 100° F. Do not exceed the flash point of the adhesive.
  - 3. Heat exchange unit: Filled with heat transfer oil approved by equipment manufacturer.
  - 4. Follow operation procedures as recommended by equipment manufacturer.
- K. Substrate-Joint Penetrations: Prevent adhesive from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

### 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. Comply with roofing system manufacturer's written instructions for installing roofing insulation.
- C. Refer to Section 07 22 00 - Roof and Deck Insulation for detailed requirements.

### 3.5 ROOF MEMBRANE INSTALLATION

- A. Install ply felts according to roofing system manufacturer's written instructions, starting at low point of roofing system. Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges. Shingle side laps of ply felts uniformly to achieve required number of membrane plies throughout. Shingle in direction to shed water. Extend adhesive past lap edges to ensure complete and uniform adhesion. Extend ply felts over cants.
- B. Four (4) Ply Application:
  - 1. Install one ply of tri-laminate base ply set in uniform and continuous application of type III hot asphalt
  - 2. Install three (3) plies of Type VI felts parallel to the roof slope. Overlap starter strips 28 inches with first ply, and then overlap each succeeding ply 26.5 inches. Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges.
  - 3. Install plies to roof in a uniform and continuous application of ply adhesive.
  - 4. Use 9, 18, 27, and 36-inch wide plies to start and finish roof membrane along roof edges and terminations.

5. Immediately after installation, broom and/or roll ply sheet. Ensure complete and continuous seal and contact between adhesive and felts, including ends, edges and laps without wrinkles, fish mouths, or blisters. Broom/roller width: 34 inches minimum.
6. Apply uniform and continuous pressure to exposed edge and end laps to ensure complete adhesion.
7. Avoid walking on plies until adhesive has set.
8. Overlap previous day's work 24 inches.
9. Lap ply membrane ends 4 inches. Stagger end laps three feet minimum.
10. Embed each ply in a uniform and continuous application of ply adhesive at a rate of 25 lbs. per 100 square feet at EVT.

### 3.6 GENERAL FLASHING REQUIREMENTS AND STRIPPING INSTALLATION

- A. Install PVC-KEE Flashing using flashing adhesive:
1. Adhere elastomeric sheeting completely to flashing surface, cant, and roofing with a ¼ inch notched trowel at 1 gallon per 20 sq. ft. of flashing adhesive, immediately embed elastomeric sheeting into the flashing adhesive.
  2. Apply consistent pressure to entire surface of elastomeric sheeting using a steel hand roller to achieve full adhesion of the sheeting to the flashing substrate. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 6 inches.
  3. Seal horizontal edges of sheeting to roof surface with reinforcing mesh embedded in a base course of adhesive and a top course of adhesive to fully cover the mesh.
  4. Seal vertical laps by heat welding the flashing sheet together. Probe the seam when complete to ensure complete weld
  5. Elastomeric sheeting width: sufficient to extend at least 6 inches beyond toe of cant onto new roof.
  6. Secure top edge of flashing membrane with metal termination bar and Teflon Tape. Fasten bar 6 to 8 inches o.c. Seal termination bar with three-course reinforcing mesh and asphaltic mastic as required.
- B. Two Ply striping for metal flanges:
1. Set flange in asphalt mastic. Seal flange with two striping plies embedded between alternate applications of striping adhesive/bitumen. Extend first ply 3 inches beyond flange; second ply 3 inches beyond first ply.

### 3.7 FLASHING SURFACING APPLICATION

- A. Surfacing Treatment for Flashings:
1. Prepare surface as required by roofing system manufacturer.
  2. Spot Apply White Coating over exposed flashing membrane surfaces where any black asphalt or mastics are on flashing.
    - a. Prime flashing with the flashing primer.
    - b. Apply two coats of flashing coating at one gallon per square.

### 3.8 COLD APPLIED ROOF SURFACING APPLICATION

- A. Prior to application of flood coat, Contractor shall inspect roof with manufacturer's technical representative and repair any deficiencies.
- B. Prior to application of flood coat, Contractor shall clean and prime roof surface areas that have become contaminated with dirt and/or debris. Prime contaminated areas with Low volatile primer at a rate of 200 to 400 square feet per gallon.
- C. Aggregate Surfacing:
1. Over entire cleaned, prepared roof surface apply uniform and continuous flood coat of white surfacing adhesive at a rate of 5 gallons per 100 sq. ft.
  2. Aggregate Weight: 250 lb/100 sq ft.

3. If flood coat and aggregate surface is delayed 6 months, promptly apply glaze coat of hot roofing asphalt at a rate of 20 lb/ 100 sq ft.

3.9 WALKWAY PAD APPLICATION

- A. Install walkway pads at roof access points, under wood sleepers, satellite dish, and to match existing walkway plan.
  1. Prime clean, smooth membrane ply surface with Low volatile (VOC) primer.
  2. Install walkway pads in spot adhesion using asphaltic mastic to ply surface.

3.10 DAILY WATERSTOP/TIE-INS

- A. Remove embedded gravel/debris from top ply of felt along termination; Width: 18 inches
- B. Adhere 12 and 18 inch wide ply sheets from exposed deck to existing roofing with a continuous 1/16 thick application of tie-off mastic. Glaze cut-off with surfacing mastic. Extend 18 inch wide felt 3 inches either side of 12-inch felt.
- C. Install 'deadman' insulation filler at insulation staggers.
- D. Extend roofing system at least 12 inches onto prepared area of adjacent roofing. Seal edge with 6 inches wide reinforcing membrane embedded between alternate courses of tie-off mastic.
- E. Remove temporary connection at beginning of next workday by cutting felts evenly along edge of existing roof system. Remove 'deadman' insulation fillers.

3.11 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

3.12 PROTECTING AND CLEANING

- A. Protect built-up roofing membrane from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to project superintendent.
- B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.
- C. Clean over spray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Contractor shall be responsible for vehicles and other property found to be contaminated by adhesive.

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
  - 1. Aluminum Framed Entrances and Storefronts.
  - 2. Interior borrowed lites.
- B. Related Sections:
  - 1. Division 8 Section "Aluminum Entrances and Storefront" for glass panels in exterior windows.

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Design glass, including comprehensive engineering analysis according to ICC's 2009 International Building Code by a qualified professional engineer, using the following design criteria:
  - 1. Design Wind Pressures: As indicated on Drawings.
  - 2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.



3. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

#### 1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of the following products; 12 inches (300 mm) square.
  1. Coated glass.
  2. Fire-resistive glazing products.
  3. Insulating glass.
- C. Glazing Accessory Samples: For gaskets and sealants in 12-inch (300-mm) lengths.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- F. Qualification Data: For installers manufacturers of insulating-glass units with sputter-coated, low-e coatings glass testing agency.
- G. Product Certificates: For glass and glazing products, from manufacturer.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for coated glass, insulating glass, glazing sealants, and glazing gaskets.
- I. Preconstruction adhesion and compatibility test report.
- J. Warranties: Sample of special warranties.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- E. Source Limitations for Glass: Obtain coated float glass and insulating glass from single source from single manufacturer for each glass type.
- F. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
- G. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: GANA's "Glazing Manual."
  - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
  - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
  - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- H. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- I. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

#### 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

#### 1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate 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.

1. Warranty Period: 10 years from date of Substantial Completion.

- B. **Manufacturer's Special Warranty on Laminated Glass:** Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

- C. **Manufacturer's Special Warranty on Insulating Glass:** Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 GLASS PRODUCTS, GENERAL

- A. **Thickness:** Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0mm.

- B. **Strength:** Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

- C. **Thermal and Optical Performance Properties:** Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick
2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).

4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

## 2.2 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
  1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
  2. For uncoated glass, comply with requirements for Condition A.
  3. For coated vision glass, comply with requirements for Condition C (other coated glass).

## 2.3 INSULATING GLASS

- 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. Basis of Design: PPG
    - a. Low-e coated: Solarban 60 except Solarban 70 XL on south facing building elevation.
    - b. Clear
  2. Guardian
    - a. SunGuard® SN68 on Clear
    - b. Clear
  3. Pilkington
  4. Old Castle
  5. Or equal as approved by Architect
- B. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
  1. Sealing System: Dual seal, with polyisobutylene and silicone primary and secondary.
  2. Spacer: Manufacturer's standard spacer material and construction
  3. Desiccant: Molecular sieve or silica gel, or blend of both.
- C. Glass: Comply with applicable requirements in "Glass Products" Article as indicated by designations in "Insulating-Glass Types"

## 2.4 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
  1. Neoprene complying with ASTM C 864.

2. EPDM complying with ASTM C 864.
3. Silicone complying with ASTM C 1115.
4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

C. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock-strips, complying with ASTM C 542, black.

## 2.5 GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
4. Sealants used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealants for Fire-Rated Glazing Products: Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire-protection ratings indicated.

## 2.6 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.7 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- G. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

## 2.8 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

## 2.9 INSULATING-GLASS TYPES

- A. Glass Type 1: Low-E coated Clear insulating glass (**All Locations other than Type 2 and Type 3 below**):
  - 1. Overall Unit Thickness: 1 inch (25 mm)
  - 2. Thickness of Each Glass Lite: 6.0 mm

3. Outdoor Lite: Fully tempered float glass
4. Interspace Content: Air
5. Indoor Lite: Fully tempered float glass
6. Low-E coating: (Solarban 70 XL) Sputtered on second surface
7. Visible Light Transmittance: 70 percent minimum
8. Visible Light Transmittance: 64 percent minimum
9. Winter Nighttime U-Factor: 0.28 maximum.
10. Summer Daytime U-Factor: 0.26 maximum.
11. Solar Heat Gain Coefficient: 0.27
12. Shading Coefficient: 0.32
13. Provide safety glazing labeling.

**B. Glass Type 2: Low-e coated (PPG Solarban 70XL) Clear insulating glass with Silk Screen applied ceramic frit dots White Dots Type D - #3. (Vestibule and Two Story Lobby on South Side of Building):**

1. Overall Unit Thickness: 1 inch (25 mm)
2. Thickness of Each Glass Lite: ¼", 6.0 mm
3. Outdoor Lite: Annealed glass
4. Interspace Content: Air
5. Indoor Lite: Fully tempered float glass
6. Low-e coating: Sputtered on second surface
7. Visible Light Transmittance: 47 percent minimum
8. Winter Nighttime U-Factor: 0.29 maximum.
9. Summer Daytime U-Factor: TBD.
10. Solar Heat Gain Coefficient: 0.23
11. Shading Coefficient: 0.26
12. Provide safety glazing labeling.
13. Outdoor Reflectance: 21%
14. Provide safety glazing labeling.

**C. Glass Type 3: Laminated and Clear insulating glass. (Clearstory at Gymnasium):**

1. Overall Unit Thickness: 1 inch (25 mm)
2. Thickness of Exterior Laminated Glass Lite: 3/8" 9.0 mm
3. Indoor Lite: 2 Layers laminated 3/16" Clear Float glass with .060 pvb interlayer between
4. Thickness of Interior Glass Lite: ¼", 6.0 mm
5. Interior Lite: Fully tempered float glass
6. Interspace Content: Air
7. .060 pvb interlayer: Translucent White
8. Indoor Lite: Fully tempered float glass
9. Low-E coating: (Solarban 70 XL) Sputtered on second surface
10. Visible Light Transmittance: 70 percent minimum
11. Visible Light Transmittance: 64 percent minimum
12. Winter Nighttime U-Factor: 0.28 maximum.
13. Summer Daytime U-Factor: 0.26 maximum.
14. Solar Heat Gain Coefficient: 0.27
15. Shading Coefficient: 0.32
16. Provide safety glazing labeling.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 2. Presence and functioning of weep systems.
  - 3. Minimum required face and edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).



1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape 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.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. 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.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks 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.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 088000

**SECTION 10 14 00 – SIGNAGE – EXTERIOR AND INTERIOR**

PART 1 - GENERAL

1.1 STIPULATIONS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Interior panel signs.
  - 2. Dimensional characters (letters and numbers) for exterior use on building.
  - 3. Exterior aluminum school pylon sign with two (2) LED displays.
  - 4. Plaques.
  - 5. Signage accessories.
  - 6. All signage shall be in accordance with Baltimore County Public Schools Signage standards.
- B. Related Sections include the following:
  - 1. Division 23 Section "Mechanical Identification" for labels, tags, and nameplates for
  - 2. Division 26 Section "Electrical Identification" for labels, tags, and nameplates for electrical equipment.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- B. LEED Submittals;
  - 1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
    - a. Fiberglass sheet materials that contain at least 60% post-industrial recycled content
  - 2. Regional Materials MR Credit 5.1 : Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- C. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and braille layout.
  - D. Samples for Initial Selection: For each type of sign material indicated that involves color selection.
  - E. Samples for Verification: For each type of sign, include the following Samples to verify color selected:
    1. Panel Signs: Full-size Samples of each type of sign required.
  - F. Qualification Data: For Installer.
  - G. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.
- 1.4 QUALITY ASSURANCE
- A. Installer Qualifications: An authorized representative of signage manufacturer for installation and maintenance of units required for this Project.
  - B. Source Limitations: Obtain each sign type through one source from a single manufacturer.
  - C. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.
    1. Interior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction.
- 1.5 PROJECT CONDITIONS
- A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.
- 1.6 COORDINATION
- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Basis-of-Design Product: The design for each sign is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

## 2.2 PANEL SIGNS

- A. General: Provide panel signs that comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
  1. Produce smooth panel sign surfaces constructed to remain flat under installed conditions within tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally.
- B. Manufacturers:
  1. Art Display Co., Capital Heights, MD, 401 Hampton Park Blvd, Capitol Heights, MD 20743. Tel: (240) 765-1400. Sales Rep: Dominic Young
  2. Apco Signs
  3. ASI Modulex, Architectural Signage Solutions 601 N Hammonds Ferry Rd, Linthicum Heights, MD 21090 410- 783-2741
  4. Best Sign Systems. Inc.
  5. InPro Corporation
  6. Mohawk Sign Systems, Inc.
  7. Signature Signs
- C. Cast-Acrylic Sheet: Manufacturer's standard and as follows:
  1. Color: As selected by Architect from manufacturer's full range.
- D. Perimeter: Fabricate edges to profile indicated; comply with the following requirements for materials and corner conditions:
  1. Material: Romark or Equivalent.
  2. Corner Condition: 1/2" Radius at top and bottom of sign.
- E. Graphic Content and Style: Provide sign copy that complies with requirements indicated in the Sign Schedule for size, style, spacing, content, mounting height and location, material, finishes, and colors of signage.
- F. Tactile and Braille Copy: Manufacturer's standard process for producing copy complying with ADA Accessibility Guidelines and ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square cut edges free from burrs and cut marks.
  1. Panel Material: Opaque acrylic sheet.
  2. Raised-Copy Thickness: Not less than 1/32 inch (0.8 mm).
- G. Accessories:
  1. Mounting Methods: Use concealed fasteners or double-sided vinyl tape fabricated from materials that are not corrosive to sign material and mounting surface.

2.3 INTERIOR PANEL SIGN TYPES (Types are as designated on the Drawings)

- A. Room Signs -Type 1A Permanent Rooms with Clear Acrylic Insert Window (sign center with Room #), 1B (no Room #).
  - 1. Text: As indicated in the Sign Schedule.
  - 2. Message: Fixed.
  - 3. Size: 6.5" x 6.5"
  - 4. Mounting: wall.
  
- B. Room Signs -Type 2, Permanent Rooms with Clear Acrylic Insert Window (sign top).
  - 1. Text: As indicated in the Sign Schedule. Provide laser printed inserts. Inserts shall be fixed with tamper-proof screws.
  - 2. Message: Changeable.
  - 3. Size: 5" x 5"
  - 4. Mounting: wall.
  
- C. Toilet Room Signs with ADA Pictogram – Type 8W, 8U, 8M
  - 1. Text: As indicated in the Sign Schedule.
  - 2. Message: Fixed.
  - 3. Size: 8" x 8"
  - 4. ADA Universal Symbol
  - 5. Mounting: wall.
  
- D. Type 3, Egress Stair Signs in accordance with NFPA.
  - 1. Text: As indicated in the Sign Schedule.
  - 2. Message: Fixed.
  - 3. Size: 7.5" x 9"
  - 4. Universal Pictogram Symbol and Stair Identification
  - 5. Mounting: wall.
  
- E. Type 4, Elevator Signs in accordance with NFPA.
  - 1. Text: As indicated in the Sign Schedule.
  - 2. Message: Fixed.
  - 3. Size: 6 ¾' x 8"
  - 4. Universal Pictogram Symbol and Instructional Text.
  - 5. Mounting: wall.
  
- F. Department Signs and Miscellaneous Others -Type 6.
  - 1. Text: As indicated in the Sign Schedule.
  - 2. Message: Fixed.
  - 3. Mounting: wall.
  
- G. No Smoking Sign -Type 7
  - 1. Universal Pictogram Symbol and Instructional Text.
  - 2. Mounting: wall.
  
- H. Evacuation Plan Signs -Type 5
  - 1. Building Plan Graphic with Exit Plan .
  - 2. Mounting: wall.
  
- I. LEED Education Signs – Sign Type 10
  - 1. Text: As indicated in the Sign Schedule.
  - 2. Message: Fixed.

3. Size: 8" x 10"
4. Photographic Overlay.
5. Mounting: wall.

#### 2.4 BRONZE PLAQUES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Corporation; Braille-Tac Division.
  2. A. R. K. Ramos.
  3. Gemini Incorporated.
  4. Matthews International Corporation; Bronze Division.
  5. Metal Arts; Div. of L&H Mfg. Co.
  6. Mills Manufacturing Company.
  7. Nelson-Harkins Industries.
  8. Southwell Company (The).
- C. Commemoration Plaques;
1. Bronze building commemoration plaque to be installed where shown on the drawings.
    - a. Provide 5 bronze plaques on interior at the front of the building (State, 2 BOE and 2 County Council).

#### 2.5 ETCHED GLASS LEED PLAQUE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advance Corporation; Braille-Tac Division.
  2. A. R. K. Ramos.
  3. Gemini Incorporated.
  4. Matthews International Corporation; Bronze Division.
  5. Metal Arts; Div. of L&H Mfg. Co.
  6. Mills Manufacturing Company.
  7. Nelson-Harkins Industries.
  8. Southwell Company (The).
- B. Type 16B
1. Etched glass with stainless steel button mounting to wall.

#### 2.6 EXTERIOR CHANNEL LETTERS

- A. Fabricated Channel Characters: Form exposed faces and sides of characters to produce surfaces free from warp and distortion. Include internal bracing for stability and attachment of mounting accessories. Comply with the following requirements:

1. Aluminum Sheet: Not less than 0.090 inch (2.29 mm) thick.
2. Mounting: Pin mounted.
3. Finish: Anodized metallic custom color.
4. Text: VICTORY VILLA ELEMENTARY SCHOOL
5. Locations: As shown on the drawings.
6. Size: As shown on the drawings.

## 2.7 EXTERIOR LED PANELS

- A. Fabricated Channel Characters: Form exposed faces and sides of characters to produce surfaces free from warp and distortion. Include internal bracing for stability and attachment of mounting accessories. Comply with the following requirements:
- B. Manufacturers:
  1. Golden Rule Signs, 13070 Middletown Ind. Blvd., Louisville, KY 40223. Toll Free 1-800-732-9886. Rep: Courtney Kern 502-416-0547.
  - 2.
  3. Daktronics:
    - a. Phone: 800-325-8766
    - b. Local Rep: Paul Kurtenbach, 410-365-0553; Paul.Kurtenbach@daktronics.com
- C. Description: A completely functioning turn key system with a back to back installation of two (2) LED signs within a formed 1/8" aluminum powder coated enclosure as shown on the drawings.
  1. Size of LED Signs: 2'-6" x 7'-9".
  2. Size of Aluminum Enclosure: As shown on the drawings.
  3. Color: Full Color / RGB Text, pictures & video.
  4. Matrix: 60x140.
  5. Pitch: 16 mm/0.6".
  6. Max# of lines: 8.
  7. Max Letter Per Line: 23

## 2.8 FINISHES, GENERAL

- A. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.
- C. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

## 2.9 ALUMINUM FINISHES

- A. Clear Anodic Finish: Manufacturer's standard clear anodic coating, 0.018 mm or thicker, over a satin directionally textured mechanical finish.



## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items provided under other sections of Work are sized and located to accommodate signs.
- C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
  - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
  - 2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Panel Signs: Attach panel signs to wall surfaces using methods indicated below:
  - 1. All room numbers, nameplates, and room identification signs will be adhered to 1/8" thick finish PVC material (Sintra, Celtec, Komacel, Komatex, or equivalent) with 3M VHB Very High Bond Joining Systems #9473 double-sided tape (or equivalent). All signs to be mounted on block wall shall have the entire perimeter of the sign taped with 3M double sided tape #4432 (or equivalent).
- C. Dimensional Characters: Attach individual characters to wall surfaces using methods indicated below:
  - 1. Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.

### 3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 10 14 00

## SECTION 10 21 13 - TOILET COMPARTMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Floor mounted and overhead braced Solid-polymer toilet compartments configured as toilet enclosures.
  - 2. Urinal Screens.
- B. Related Sections:
  - 1. Division 6 "Rough Carpentry" for blocking.
  - 2. Section 102800 "Toilet, Bath, and Laundry Accessories" for toilet tissue dispensers, grab bars, and similar accessories.

#### 1.3 SUBMITTALS ACTION

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Show locations of cutouts for compartment-mounted toilet accessories.
  - 2. Show locations of reinforcements for compartment-mounted grab bars.
  - 3. Show locations of centerlines of toilet fixtures.
- C. Samples for Initial Selection: For each type of unit indicated. Include Samples of hardware and accessories involving material and color selection.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of toilet compartment, from manufacturer.

#### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable provisions in "Americans with Disabilities Act (ADA) and ICC/ANSI A117.1 for toilet compartments designated as accessible.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M.
- B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M).
- C. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- D. Stainless-Steel Castings: ASTM A 743/A 743M.

2.2 SOLID-POLYMER UNITS

- 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. Accurate Partitions Corporation.
  - 2. Ampco, Inc.
  - 3. Bradley Corporation; Mills Partitions.
  - 4. Comtec Industries/Capitol Partitions.
  - 5. General Partitions Mfg. Corp.
  - 6. Global Steel Products Corp.
  - 7. Hadrian Manufacturing Inc.
  - 8. Knickerbocker Partition Corporation.
  - 9. Metpar Corp.
  - 10. Partition Systems Incorporated of South Carolina.
  - 11. Rockville Partitions Incorporated.
  - 12. Santana Products, Inc.
  - 13. Sanymetal; a Crane Plumbing company.
  - 14. Weis-Robart Partitions, Inc.
- B. Toilet-Enclosure Style: Overhead braced and Floor anchored.
- C. Urinal-Screen Style: Wall hung.
- D. Door, Panel and Pilaster Construction: Solid, high-density polyethylene (HDPE) and with homogenous color and pattern throughout thickness of material.
  - 1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
  - 2. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum or stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
  - 3. Color and Pattern: As selected by Architect from manufacturer's full range.

- E. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; or stainless steel.
- F. Brackets (Fittings):
  - 1. Stirrup Type: Ear or U-brackets, clear-anodized aluminum or stainless steel.
  - 2. Full-Height (Continuous) Type: Manufacturer's standard design; extruded aluminum or stainless steel.

## 2.3 ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

## 2.4 FABRICATION

- A. Overhead-Braced Units: 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.
- B. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
- C. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
  - 1. Maximum Clearances:
    - a. Pilasters and Panels: 1/2 inch (13 mm).
    - b. Panels and Walls: 1 inch (25 mm).

2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than two brackets attached near top and bottom of panel.
  - a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
  - b. Align brackets at pilasters with brackets at walls.
  
- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches (44 mm) into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
  
- C. Floor-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches (51 mm) into structural floor unless otherwise indicated in manufacturer's written instructions. Level, plumb, and tighten pilasters. Hang doors and adjust so tops of doors are level with tops of pilasters when doors are in closed position.
  
- D. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

### 3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation.

END OF SECTION 10 21 13

## SECTION 10 22 26 – OPERABLE PARTITIONS

### PART 1: GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Electric operated continuously hinged operable partitions (STC 52).
  - 2. Manually operated, paired panel operable partitions (STC 50).
- B. Related Sections include the following:
  - 1. Division 3 Sections for concrete tolerances required.
  - 2. Division 5 Sections for primary structural support, including pre-punching of support members by structural steel supplier per operable partition supplier's template.
  - 3. Division 6 Sections for wood framing and supports, and all blocking at head and jambs as required.
  - 4. Division 9 Sections for wall and ceiling framing at head and jambs.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified in writing by the operable partition manufacturer, as qualified to install the manufacturer's partition systems for work similar in material, design, and extent to that indicated for this Project.
- B. Acoustical Performance: Test operable partitions in an independent acoustical laboratory in accordance with ASTM E90 test procedure to attain no less than the STC rating specified. Provide a complete and unedited written test report by the testing laboratory upon request.
- C. Preparation of the opening shall conform to the criteria set forth per ASTM E557 "Standard Practice for Architectural Application and Installation of Operable Partitions."

#### 1.4 SUBMITTALS

- A. Product Data: Material descriptions, construction details, finishes, installation details, and operating instructions for each type of operable partition, component, and accessory specified.
- B. Shop Drawings: Show location and extent of operable partitions. Include plans, sections, details, attachments to other construction, and accessories. Indicate dimensions, weights, conditions at openings, and at storage areas, and required installation, storage, and operating clearances. Indicate location and installation requirements for hardware and track, including floor tolerances required and direction of travel. Indicate blocking to be provided by others.
- C. Setting Drawings: Show imbedded items and cutouts required in other work, including support beam punching template.
- D. Samples: Color samples demonstrating full range of finishes available by architect. Verification samples will be available in same thickness and material indicated for the work.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Clearly mark packages and panels with numbering systems used on Shop Drawings. Do not use permanent markings on panels.

- B. Protect panels during delivery, storage, and handling to comply with manufacturer's direction and as required to prevent damage.

## 1.6 WARRANTY

- A. Provide written warranty by manufacturer of operable partitions agreeing to repair or replace any components with manufacturing defects.
- B. Partition Warranty period: Two (2) years from date of shipment.
- C. Suspension System Warranty: Five (5) years from date of shipment.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS, PRODUCTS, AND OPERATIONS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Modernfold, Inc. A DORMA Group Company.  
215 West New Road. Greenfield, Indiana 46140. Phone: 800-869-9685.  
Local Dealer:  
Distributor Modern Door & Equipment Sales Inc. - Baltimore Div.  
Address 4301 Charles Crossing Drive, White Plains, MD 20695. Phone 301-843-5255  
Email bclements@moderndoor.com
  - 2. Hufcor  
P.O. Box 591 / 2101 Kennedy Road. Janesville, Wisconsin 53547. Toll Free: 1-800-542-2371  
Ext. 214.  
Local Dealer:  
HUFCOR/POTOMAC, 10820 Guilford Road Suite 210, Annapolis Junction, MD 20701-1105.  
Phone- 301.483.4515.
- B. Representative Products: Subject to compliance with the requirements, provide the following electric operated and manually operated operable partitions:
  - 1. OP-01: Electric operated continuously hinged operable partitions.
    - a. Acousti-Seal #933E by Modernfold, Inc.
    - b. Equal product.
  - 2. OP-01: Manually operated, paired panel operable partitions
    - a. Acousti-Seal #932 by Modernfold, Inc
    - b. Equal product.
- C. Sizes:
  - 1. OP-01: Electric operated continuously hinged operable partitions.
    - a. Height: 24'-5" +/- from bottom of track to floor.
    - b. Length: 58' +/-.
  - 2. OP-02: Manually operated, paired panel operable partitions.
    - c. Height: 9' +/- from bottom of track to floor.
    - d. Length: 27'-6" +/-.

### 2.2 MANUAL OPERATION

- A. Operation

1. OP-01: Acousti-Seal #932: Series of paired flat panels hinged together in pairs, manually operated, top supported with automatic operable floor seals.
- B. Final Closure:
  1. OP-01: Horizontally expanding panel edge with removable crank

## 2.3 ELECTRIC OPERATORS

- A. General: Provide factory-assembled electric operation system of size and capacity recommended and provided by operable panel partition manufacturer for partition specified; with electric motor and factory-rewired motor controls, speed reducer, chain drive, remote-control stations, control devices, and accessories required for proper operation. Include wiring from motor control to motor. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
  1. 1HP-208V-1-phase.
- B. Comply with NFPA 70.
- C. Control Equipment: Complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6.
- D. Remote-Control Stations: Two single-key-operated, constant-pressure control stations located remotely from each other on opposite sides and opposite ends of partition run. Wire in series to require simultaneous activation of both key stations to operate partition. Each three-position control station labeled "Open," "Close," and "Off." Provide two keys per station.
- E. Obstruction-Detection Devices: Provide each motorized operable panel partition with automatic safety sensor indicated, that causes operator to immediately **stop and reverse direction**.
  1. Sensor Edge: Contact-pressure-sensitive safety edge along partition's leading edge.
  2. Sensor Mat: Electrically operated, contact-weight-sensitive safety mat in storage pocket area.
  3. Infrared Sensor System: Designed to detect an obstruction in partition's path and sound an audible alarm, without obstruction contacting partition.
- F. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop operable panel partition at fully extended and fully stacked positions.
- G. Emergency Release Mechanism: Quick disconnect-release of electric-motor drive system, permitting manual operation in event of operating failure.

## 1.2 ACCESSORIES

- A. Pass Doors: Fabricated to comply with recommendations in ICC/ANSI A117.1
- B. Swinging door built into and matching panel materials, construction, acoustical qualities, finish, and thickness, complete with frames and operating hardware. Hinges finished to match other exposed hardware.
  1. Single Pass Door 36 by 84 inches with the following:
    - a. Door Seals: Mechanically operated floor seal on panels containing pass doors.



- b. Concealed door closer.
  - c. Latchset: Passage set.
  - d. Lock: Key-operated lock cylinder, keyed to master key system, operable from both sides of door. Include two keys per lock.
  - e. Lock: Deadlock to receive cylinder, operable from both sides of door. Refer to Division 08 door hardware Sections for lock cylinder and keying requirements.
- C. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same materials, finish, construction, thickness, and acoustical qualities as panels; complete with operating hardware and acoustical seals at soffit, floor, and jambs. Hinges in finish to match other exposed hardware.
- 1. Manufacturer's standard method to secure storage pocket door in closed position.
  - 2. Rim Lock: Key-operated lock cylinder[, keyed to master key system, to secure storage pocket door in closed position. Include two keys per lock.
  - 3. Rim Lock: Deadlock to receive cylinder, to secure storage pocket door in closed position. Refer to Division 08 door hardware Sections for lock cylinder and keying requirements.
- D. Electric Interlock: Provide each motorized operable panel partition with electric interlocks at locations indicated, to prevent operation of operable panel partition under the following conditions:
- 1. On storage pocket door, to prevent operation if door is not in fully open position.
  - 2. On partitions at location of convergence by another partition, to prevent operation if merging partitions are in place.

## 2.3 PANEL CONSTRUCTION

- A. Nominal 3-inch (76mm) thick panels in manufacturer's standard 48-inch (1220mm) widths. All panel horizontal and vertical framing members fabricated from minimum 16-gage formed steel with overlapped and welded corners for rigidity. Top channel is reinforced to support suspension system components. Frame is designed so that full vertical edges of panels are of formed steel and provide concealed protection of the edges of the panel skin.
- B. Panel skin shall be:
  - 1. OP-01: Roll-formed steel wrapping around panel edge. Panel skins shall be lock formed and welded directly to the frame for unitized construction. Acoustical ratings of panels with this construction:
    - a. 52 STC
  - 2. OP-01: Roll-formed steel wrapping around panel edge. Panel skins shall be lock formed and welded directly to the frame for unitized construction. Acoustical ratings of panels with this construction:
    - a. 50 STC
- C. Hinges for Panels, Closure Panels, Pass Doors, and Pocket Doors shall be:
  - 1. OP-01: SOSS invisible laminated hinge with antifriction segments mounted between each heat treated link. Welded internal hinge bracket shall support the hinge and allow for adjustment of hinge plates. Concealed hinges or hinges mounted into panel edge or vertical astragal are not acceptable.
- D. Panel Trim: No vertical trim required or allowed on edges of panels; minimal groove appearance at panel joints.
- E. Panel Weights:
  - 1. OP-01: 50 STC - 8 lbs./square foot

## 2.4 PANEL FINISH

- A. Panel finish shall be factory applied, Class "A" rated material. Finish shall be:
  - 1. OP-01: Carpet with surface treatment to resist stains.
    - a. As selected from manufacturer's full range.
- B. Panel Trim: Exposed panel trim of one consistent color:
  - 1. OP-01: As selected from manufacturer's full range.

## 2.5 SOUND SEALS

- A. Vertical Interlocking Sound Seals between panels: Roll-formed steel astragals, with reversible tongue and groove configuration in each panel edge for universal panel operation. Rigid plastic astragals or astragals in only one panel edge are not acceptable.
- B. Horizontal Top Seals: Continuous contact extruded vinyl bulb shape with pairs of non-contacting vinyl fingers to prevent distortion without the need for mechanically operated parts.
- C. Horizontal bottom floor seals shall be:
  - 1. OP-01: Modernfold 4" automatic floating seal. Automatic operable seals providing nominal 2-inch (51mm) operating clearance with an operating range of +0.50-inch (13mm) to -1.50-inch (38mm) which automatically drop as panels are positioned, without the need for tools or cranks.

## 2.6 SUSPENSION SYSTEM

- A. OP-01: #17 Suspension System
  - 1. Suspension Tracks: Minimum 11-gauge, 0.12-inch (3.04mm) roll-formed steel track, suitable for either direct mounting to a wood header or supported by adjustable steel hanger brackets, supporting the load-bearing surface of the track, connected to structural support by pairs of 0.38-inch (10mm) diameter threaded rods. Aluminum track is not acceptable.
    - a. Exposed track soffit: Steel, integral to track, and pre-painted off-white.
  - 2. Carriers: One all-steel trolley with steel tired ball bearing wheels per panel (except hinged panels). Non-steel tires are not acceptable.

## 2.7 OPTIONS (NONE SELECTED)

## PART 3: EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with ASTM E557, operable partition manufacturer's written installation instructions, Drawings and approved Shop Drawings.
- B. Install operable partitions and accessories after other finishing operations, including painting have been completed.
- C. Match operable partitions by installing panels from marked packages in numbered sequence indicated on Shop Drawings.
- D. Broken, cracked, chipped, deformed or unmatched panels are not acceptable.

### 3.2 CLEANING AND PROTECTION

- A. Clean partition surfaces upon completing installation of operable partitions to remove dust, dirt, adhesives, and other foreign materials according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions in a manner acceptable to the manufacturer and installer that insure operable partitions are without damage or deterioration at time of Substantial Completion.

### 3.3 ADJUSTING

- A. Adjust operable partitions to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts.

### 3.4 EXAMINATION

- A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable partitions. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.5 DEMONSTRATION

- A. Demonstrate proper operation and maintenance procedures to Owner's representative.
- B. Provide Operation and Maintenance Manual to Owner's representative.

END OF SECTION 10 22 26

SECTION 10 26 60 – CORNER GUARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Corner guards.
  - 2. Chair Rails.
  - 3. Rub Strips.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes for each impact-resistant wall-protection unit.
- B. Shop Drawings: For each impact-resistant wall-protection unit showing locations and extent. Include sections, details, and attachments to other work.
  - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated.
  - 1. Include similar Samples of accent strips and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
  - 1. Corner Guards: 12 inches long. Coordinate first paragraph below with qualification requirements in Division 1 Section "Quality Requirements" and as supplemented in "Quality Assurance" Article.
- E. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain impact-resistant wall-protection units through one source from a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls, columns, and other construction contiguous with impact-resistant wall-protection units by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall-protection units that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
    - a. Deterioration of corner guard stainless steel finishes.
  2. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
  2. Basis-of-Design Product: The design for each impact-resistant wall-protection unit is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 MATERIALS

- A. Corner Guards:
1. Stainless-Steel Sheet: ASTM A 240/A 240M.
  2. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

2.3 CORNER GUARDS

- A. Surface-Mounted, PETG Corner Guards on extruded aluminum retainers with formed edges; with 90- or 135-degree turn to match wall condition.
- B. Representative Product: Model SM-20N 90 degrees by Acrovyn (Construction Specialties).
1. Equal Manufacturers:
    - a. American Floor Products Co., Inc.
    - b. ARDEN Architectural Specialties, Inc.
    - c. Balco, Inc.

- d. Boston Retail Products.
- e. Construction Specialties, Inc.
- f. IPC Door and Wall Protection Systems; Division of InPro Corporation.
- g. Pawling Corporation.
- h. Koroseal Interior Products Group.

2. Material: PETG (OPVC Free)

- a. Thickness: Minimum 0.0781 inch.
- b. Color: From manufacturers full range.

2.4 FABRICATION

- A. Fabricate impact-resistant wall-protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
- B. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.5 METAL FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
  - 1. Remove tool and die marks and stretch lines or blend into finish.
  - 2. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- B. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- C. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
  - 1. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Complete finishing operations, including painting, before installing impact-resistant wall-protection system components.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

**3.3 INSTALLATION**

- A. General: Install impact-resistant wall-protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

**3.4 CLEANING**

- A. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 10 26 60

## SECTION 10 28 00 - TOILET ACCESSORIES AND SHOWER ENCLOSURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:

1. Public-use washroom accessories.
2. Baby Diaper Changing Stations.
3. Underlavatory guards.
4. Custodial Accessories.
5. Fiberglass Shower Enclosures.

- B. Related Sections include the following:

1. Division 10 Section "Toilet Compartments" for compartments and screens.

#### 1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.
- B. Setting Drawings: For cutouts required in other work; include templates, substrate preparation instructions, and directions for preparing cutouts and installing anchoring devices.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use designations indicated in the Toilet and Bath Accessory Schedule and room designations indicated on Drawings in product schedule.
- D. Maintenance Data: For accessories to include in maintenance manuals specified in Division 1. Provide lists of replacement parts and service recommendations.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise approved by Architect.

#### 1.5 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.



1.6 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Construction Manager under requirements of the Contract Documents.
- B. Manufacturer's Mirror Warranty: Written warranty, executed by mirror manufacturer agreeing to replace mirrors that develop visible silver spoilage defects within minimum warranty period indicated.
  - 1. Minimum Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers Names: Use of manufacturer's proprietary names to designate products is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers.
  - 1. Toilet Accessories:
    - a. Products of the Bobrick Washroom Equipment, Inc. have been used as the basis of design and shall be used for all applications unless a substitution is approved by the architect.
  - 2. Underlavatory Guards:
    - a. Brocar Products, Inc.
    - b. Truebro, Inc.
    - c. Approved equal

2.2 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.
- B. Plastic: High-impact ABS grey plastic.
- C. Sheet Steel: ASTM A 366/A 366M, cold rolled, commercial quality, 0.0359-inch (0.9-mm) minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180).
- E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.
- F. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- G. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

## 2.3 FABRICATION

- A. General: One, maximum 1-1/2-inch- (38-mm-) diameter, unobtrusive stamped manufacturer logo, as approved by Architect, is permitted on exposed face of accessories. On interior surface not exposed to view or back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.
- C. Recessed Toilet Accessories: Unless otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless-steel hinge. Provide anchorage that is fully concealed when unit is closed.
- D. Framed Glass-Mirror Units: : ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- F. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

## 2.4 FIBERGLASS SHOWER ENCLOSURES

- A. A.ADA Fiberglass Shower Enclosures:
  - 1. Manufacturer:
    - a. Accessible Environments, Inc., 493 McLaws Circle - Suite 2 Williamsburg, VA 23185. Tel: 1.800.643.5906 or 1.800.643.9860.
  - 2. Models:
    - b. Model No.: LSS4038A5TD, One piece 40" x 38" ADA shower with .5 inch threshold, center drain and factory installed shower dome. Fiberglass shower with "Smoothwall" look. Luxurious polyester gelcoat finish. Full plywood backing on all walls for outstanding strength and customized installation of accessories. No mud setting required. Shower stall complies with ADA inside dimensions of 36" x 36" for transfer showers. Seat and grab bars must be installed as shown to meet ADA requirements. "Reveal 90" front flange design allows for code required 48" clear floor space for transfer and clean drywall installation. Left reveal wall seat wall. 1/2" entry threshold design allows for installation on top of a floor, eliminating the need for recessing. W\*D\*H: 40" x 39" x 86".
    - c. Accessories: 16 in. x 32 in. corner grab bar - GST160320QCR , 24 inch grab bar - GSS240QCR, 2 inch brass body drain - SIOUX827, 34 in. x 22.5 in. LH L-shape seat with legs - SSL2-340225-NW, Alsons Handshower System, Flange Trim Kit, Shower Curtain, rod and hooks, Provide small shelf for shampoo and Small soap dish - ACC090, Symmons Valve ACX-SYM-1019, Water retainer - NWR 5.5 ft.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square at locations indicated, according to manufacturer's written instructions for substrate indicated.
- C. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

### 3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

### 3.3 PUBLIC-USE WASHROOM ACCESSORY SCHEDULE

- A. Toilet Tissue Dispenser (Single User Restrooms): Where this designation is indicated, provide toilet tissue dispenser complying with the following:
  - 1. Item: Single-roll dispenser with storage for second roll.
  - 2. Product: Model TT710, Stainless steel. Surface mounted with concealed anchorage.
  - 3. Manufacturer: Stanton Trading [skahn@stantontrading.com](mailto:skahn@stantontrading.com)
  - 4. Description: Heavy-gauge chrome-plated steel.
  - 5. Capacity: Designed for 4-1/2" diameter-core tissue rolls.
- B. Jumbo Toilet Tissue Dispenser (Multi-User Restrooms): Where this designation is indicated, provide toilet tissue dispenser complying with the following:
  - 1. Item: Siurface Mounted Single Jumbo Roll
  - 2. Product: Model R26.
  - 3. Manufacturer: Palmer Fixture Co. [www.palmerfixture.com](http://www.palmerfixture.com)
  - 4. Description: Holds single 9" roll, transparent plastic front.
  - 5. Dimensions: 11" x 11 3/4" x 5 3/8".
- C. Single Fold Paper Towel Dispenser (Single User Restrooms): Where this designation is indicated, provide unit complying with the following:
  - 1. Item: Single Fold Paper Towel Dispenser
  - 2. Product: Model 630, surface mounted.
  - 3. Manufacturer: Continental Manufacturing. [www.continentalcommercialproduts.com](http://www.continentalcommercialproduts.com)

4. Description: Self locking steel, with white enamel finish, dimensions 7 ½" x 12 3/16"x 6 ½".
- D. Jumbo Roll Towel Dispenser (Multi-User Restrooms): Where this designation is indicated, provide toilet tissue dispenser complying with the following:
1. Item: Surface Mounted Single Jumbo Roll
  2. Product: Model TD220BK.
  3. Manufacturer: Palmer Fixture Co. [www.palmerfixture.com](http://www.palmerfixture.com)
- E. Soap Dispenser (Single and Multi-User Restrooms): Where this designation is indicated, INSTALL soap dispenser provided by BCPS complying with the following:
1. Item: Soap Dispenser
  2. Product: GoJo 800 Series Bag-in-Box Dispenser.
  3. Manufacturer: GoJo Industries. [www.gojo.com](http://www.gojo.com)
  4. Description: Black.
- G. Sanitary Napkin Receptacle (Single and Multi-User Restrooms): Where this designation is indicated, receptacle complying with the following:
1. Item: Sanitary Napkin Receptacle.
  2. Product: Model 250W, white enamel finish.
  3. Manufacturer: Continental Manufacturing. [www.continentalcommercialproducts.com](http://www.continentalcommercialproducts.com)
  4. Description: White. Holds wax bag.
- D. Grab Bar: Where indicated, provide stainless-steel grab bar complying with the following:
1. Stainless-Steel Nominal Thickness: Minimum 0.05 inch (1.3 mm).
  2. Mounting: Concealed with manufacturer's standard flanges and anchors.
  3. Gripping Surfaces: Manufacturer's standard slip-resistant texture.
  4. Outside Diameter: 1-1/2 inches (38 mm) for heavy-duty applications.
- E. Underlavatory Guard: Where indicated, provide underlavatory guard complying with the following:
1. Insulating Piping Coverings: White, antimicrobial, molded-vinyl covering for supply and drain piping assemblies intended for use at accessible lavatories to prevent direct contact with and burns from piping. Provide components as required for applications indicated with flip tops at valves that allow service access without removing coverings.
- F. Mop and Broom Holder: Where indicated, provide mop and broom holder complying with the following:
1. Mop and Broom Holder with Utility Shelf: 36-inch- (914-mm-) long unit fabricated of minimum nominal 0.05-inch- (1.3-mm-) thick stainless steel with shelf; support brackets for wall mounting; three hooks for wiping rags; four spring-loaded, rubber hat, cam-type, mop/broom holders mounted on front of shelf; and approximately 1/4-inch- (6-mm-) diameter, stainless-steel rod suspended beneath shelf for drying rags.
- G. Mirror Unit

1. Basis-of-Design Product: Bobrick
2. Frame: Stainless-steel angle, 0.05 inch thick or channel
3. Stainless steel:
  - a. fixed
  - b. adjustable tilt.
4. Corners: Welded and ground smooth.

END OF SECTION 10 28 13

SECTION 10 44 16 – FIRE EXTINGUISHERS AND FIRE EXTINGUISHER CABINETS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Portable fire extinguishers.
  - 2. Fire-protection cabinets
  - 3. Brackets for wall hung units.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection specialties.
  - 1. Fire Extinguishers: Include rating and classification.
  - 2. Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of cabinet finish indicated.
- C. Samples for Verification: For each type of exposed cabinet finish required, prepared on Samples of size indicated below and of same thickness and material indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.
  - 1. Size: 6-by-6-inch-square Samples.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fire extinguishers and cabinets through one source from a single manufacturer.
- B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers."
- C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide extinguishers listed and labeled by FM.

## 1.5 COORDINATION

- A. Coordinate size of cabinets to ensure that type and capacity of fire extinguishers indicated and provided by Owner under separate Contract are accommodated.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Portable Fire Extinguishers:

- a. J.L. Industries, Inc.
- b. Larsen's Manufacturing Company.
- c. Potter-Roemer; Div. of Smith Industries, Inc.
- d. Watrous; Div. of American Specialties, Inc.

2. Fire-Protection Cabinets:

- a. J.L. Industries, Inc.
- b. Larsen's Manufacturing Company.
- c. Potter-Roemer; Div. of Smith Industries, Inc.
- d. Watrous; Div. of American Specialties, Inc.

### 2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A 366/A 366M, commercial quality, stretcher leveled, temper rolled.

### 2.3 PORTABLE FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers of type, size, and capacity for each cabinet and other locations indicated.
- B. Multipurpose Dry-Chemical Type I: UL-rated 2-A:10:B:C, 5-lb nominal capacity, in enameled-steel container.

### 2.4 FIRE-PROTECTION CABINETS

- A. Cabinet Construction: Provide manufacturer's standard semi-recessed box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld joints and grind smooth. Miter and weld perimeter door frames.
- B. Door Glazing: Manufacturer's standard, as follows:

1. Bubble: One-piece molded acrylic.

a. Color: Clear.

C. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam-action latch, or exposed or concealed door pull and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 degrees.

## 2.5 ACCESSORIES

A. Identification: Provide lettering to comply with authorities having jurisdiction for letter style, color, size, spacing, and location. Locate as indicated by Architect.

1. Identify fire extinguisher in cabinet with the words "FIRE EXTINGUISHER" applied to door.

a. Application Process: Silk-screened.

b. Lettering Color: Red.

c. Orientation: Vertical.

## 2.6 COLORS AND TEXTURES

A. Colors and Textures: As selected by Architect from manufacturer's full range for these characteristics.

## 2.7 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Cabinet and Door Finishes: Provide manufacturer's standard baked-enamel paint for the following:

1. Exterior of cabinets and doors, except for those surfaces indicated to receive another finish.

2. Interior of cabinets and doors.

## 2.8 STEEL FINISHES



- A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond using manufacturer's standard methods.
  - 1. Shop Primer: Manufacturer's or fabricator's standard, fast-curing, lead- and chromate-free, universal primer, selected for resistance to normal atmospheric corrosion, for compatibility with substrate and field-applied finish paint system indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
  
- C. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

## 2.9 MOUNTING BRACKETS

- A. Mounting Brackets: Provide manufacturer's standard steel, designed to secure fire extinguishers to wall or structure, of sizes required for types and capacities of extinguishers indicated, with plated or baked enamel finish.
  - 1. Color: Red.
  
- B. Identification: Lettering complying with authorities having jurisdiction for lettering style, size, spacing, and location. Locate as indicated.
  - 1. Identify bracket-mounted extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
  - 2. Orientation: Vertical.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine roughing-in for cabinets to verify actual locations of piping connections before cabinet installation.
  
- B. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets are to be installed.
  
- C. Examine fire extinguishers for proper charging and tagging.
  - 1. Remove and replace damaged, defective, or undercharged units.
  
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing fire-protection specialties.

- B. Install in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
    - 1. Prepare recesses for cabinets as required by type and size of cabinet and trim style.
- 3.3 ADJUSTING, CLEANING, AND PROTECTION
- A. Adjust cabinet doors that do not swing or operate freely.
  - B. Refinish or replace cabinets and doors damaged during installation.
  - C. Provide final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10 44 16

## SECTION 10 50 50 - METAL LOCKERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Single tier welded corridor lockers.
  - 2. Two tier welded corridor lockers.

#### 1.2 ACTION SUBMITTALS

- A. Product data.
- B. Shop Drawings: Include plans, elevations, sections, details, attachments to other work, and locker identification system and numbering sequence.
- C. Samples: For each color specified.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

#### 1.5 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
  - 1. Warranty Period for Welded Metal Lockers: 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in [the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

## 2.2 WELDED CORRIDOR LOCKERS

1. Basis-of-Design Product: Subject to compliance with requirements, provide Republic Storage Systems Company;
  - a. W. A. Hamilton Company, Inc. Beltsville Md. Tel: 301.937.6696.
  - b. Steel Products Inc. Rockville Md. Tel: 301.340.0770.

Standard Corridor Lockers. All-Welded Ventilated or comparable product by one of the following:

2. Art Metal Products; Bulldog Corridor; Champ Corridor; Champ Corridor Elite.
  3. DeBourgh Mfg. Co; Angle Iron Corridor.
  4. List Industries Inc; Booksafe III; Classmate; Classmate Premier; Graduate; Graduate Premier; Marquis Protector.
  5. Lyon Workspace Products, LLC; All-Welded; Integrated Frame.
  6. Olympus Lockers & Storage Products, Inc; Hercules.
  7. Penco Products, Inc; All-Welded; All-Welded Defiant.
- B. Locker Arrangement:
1. Single tier: 4-0" Nominal height with sloped top.
  2. Double tier: 5-0" Nominal height with sloped top Two (2) 30" compartments.
- C. Doors: One piece; fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.
1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
  2. Door Style:
  3. Vented panel as follows:
    - a. Louvered Vents: No fewer than six louver openings at top and bottom for single-tier
- D. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
1. Tops, Bottoms, and Sides: 0.060-inch (1.52-mm) nominal thickness.
  2. Backs: 0.048-inch (1.21-mm) nominal thickness.
  3. Shelves: 0.060-inch (1.52-mm) nominal thickness, with double bend at front and single bend at sides and back.
- E. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.
- F. Hinges:
1. Hinges: Manufacturer's standard, steel, continuous or knuckle type.
- G. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.

1. Multipoint Latching: Finger-lift latch control designed for use without locks; positive automatic latching.
- H. Door Handle and Latch for Box Lockers: Stainless-steel strike plate with integral pull.
- I. Locks: None.
- J. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.
- K. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.
- L. Coat Rods: Manufacturer's standard.
- M. Legs: No legs. Designed to sit on 4" concrete curb.
- N. Continuous Sloping Tops: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet, with a pitch of approximately 20 degrees.
  1. Closures: Vertical-end type.
- O. Recess Trim: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- P. Filler Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- Q. Boxed End Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- R. Materials:
  1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
  2. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with A60 (ZF180) zinc-iron, alloy (galvannealed) coating designation.
- S. Finish: Baked enamel or powder coat.
  1. Color: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.
  1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
  2. Anchor single rows of metal lockers to walls near top of lockers and to floor.
  3. Anchor back-to-back metal lockers to floor.

- B. Knocked-Down Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.
- C. Welded Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.
- D. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
  - 1. Attach recess trim to recessed metal lockers with concealed clips.
  - 2. Attach filler panels with concealed fasteners.
  - 3. Attach sloping-top units to metal lockers, with closures at exposed ends.
- E. Fixed Locker Benches: Provide no fewer than two pedestals for each bench, uniformly spaced

END OF SECTION 10 50 50

## SECTION 10 70 10 EXTERIOR SUN CONTROL DEVICES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Aluminum Sunshade Systems:
  - 1. Horizontal Outrigger Sunshade systems
- B. Compatible Systems: including accessories, mountings, and shims. Sunshades are anchored directly to the vertical curtain wall or storefront mullions.
  - 1. Compatible Systems:
    - a. Versoleil™ Sunshade Outrigger System: Compatible with Trifab® VersaGlaze® 451/451T/451UT Storefront System
- C. Related Sections:
  - 1. Division 079200 "Joint Sealants" for joint sealants installed as part of the glazed aluminum curtain walls system.
  - 2. Division 08 41 13 "Aluminum-Framed Entrances and Storefronts".
  - 3. Division 08 91 00 "Aluminum-Framed Entrances and Storefronts".

#### 1.3 DEFINITIONS

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance:
  - 1. Combined load on sunshade configurations to be determined in accordance with ASCE 7 or applicable code requirements. Combined load consists of wind, snow and ice loads.
  - 2. Design sunshade configurations to withstand stresses due to combined load. Stresses resulting from thermal expansion/contraction, shall not cause permanent deformation of sunshade assemblies or disengagement from the glazed system.
    - a. Trifab® VersaGlaze® 451/451T/451UT:
      - 1) 30" Outrigger.
      - 2) Mullion spacing as shown on the drawings.
    - b. 1600 Wall System®1,
  - 3. The assembled sunshade shall be capable of supporting the specified combined load without damage, permanent deformation, or disengagement from the glazed system mullion.
  - 4. Blade deflection shall not exceed L/120 of span length.

5. Submit test reports verifying compliance with each test requirement required by the project.
- B. Shading Performance:
1. Design of standard configurations will allow for negligible direct sunlight to show through the blades based on project location, latitude, altitude, building orientation, surrounding conditions, and aesthetic requirements, except for round, diamond and square louver styles.
- C. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
1. Temperature Change (Range): 120 deg F (49 deg C), ambient; material surfaces.
- 1.5 SUBMITTALS
- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. LEED Submittals:
1. 2. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
    - a. Aluminum extrusions that contain at least 60% post-industrial recycled content
  3. Regional Materials MR Credit 5.1: Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- C. Shop Drawings: For aluminum exterior sunshades. Include plans, elevations, sections, blade angles, blade spacing and attachments to compatible systems.
- D. Samples for Initial Selection: For units with factory-applied color finishes.
- E. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: Installer who has had successful experience with installation of the same or similar systems required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating exterior sunshades, and glazed aluminum curtain walls and storefront systems that meet or exceed performance requirements.
- C. Source Limitations: Obtain aluminum exterior sunshades and glazed aluminum curtain walls and storefront system through one source from a single manufacturer.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.



- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Build mockups for type(s) of sunshade elevation(s) indicated, in location(s) shown on Drawings.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

#### 1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for sunshades by field measurements before fabrication and indicate measurements on Shop Drawings.

#### 1.8 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
  - 1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis-of-Design Product:
  - 1. Versoleil™ Sunshade Outrigger System by Kawneer Company Inc.
- B. Equal products by:
  - 1. CS Group.

#### 2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall and storefront system manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6, 6105-T5, or 6061-T6 alloy and temper.
- B. Thermal Barrier: When applied on a thermally broken captured system, sunshade shall be thermally isolated from the interior aluminum mullions by a nominal 0.25" thick low conductance material.
- C. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
- D. Sealant: For sealants required within fabricated sunshade system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- E. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall and storefront members members are nominal and in compliance with AA Aluminum Standards and Data.

#### 2.3 SUNSHADES

- A. Sunshade Members: Manufacturer's standard extruded or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
- B. Fasteners and accessories: Nonmagnetic stainless steel to be non-corrosive and compatible with aluminum members, anchors, and other components.

- C. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- D. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- E. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle sunshade materials and components to avoid damage. Protect sunshade materials against damage from elements, construction activities, and other hazards before, during and after installation.

#### 2.4 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

#### 2.5 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
  - 1. Profiles that are straight, and free of defects or deformations.
  - 2. Accurately fitted joints with ends coped or mitered.
  - 3. Physical and thermal isolation of glazing from framing members.
  - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - 5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- C. Sunshade: Fabricate components for assembly following approved shop drawings and/or manufacturer's standard installation instructions.
- D. After fabrication, clearly mark components to identify their locations in Project according to approved shop drawings.

#### 2.6 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
  - 1. Kawneer Clear Anodized.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

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

#### 3.2 INSTALLATION

- A. General:
  - 1. Comply with manufacturer's written instructions. Refer to installation instructions of the compatible curtain wall or storefront system.

2. Please note that the installation instructions can differ from one compatible system to another one.
3. Do not install damaged components.
4. Fit joints to produce hairline joints free of burrs and distortion.
5. Rigidly secure non-movement joints.
6. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of
7. moving joints.
8. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
9. Seal joints watertight where shown on approved shop drawings and/or manufacturer's standard installation instructions.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components plumb and true in alignment with established lines and grades.

D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

E. Install glazing as specified in Division 08 Section "Glazing."

3.3 ADJUSTING, CLEANING AND PROTECTION

- A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum sunshade system from damage from grinding and polishing compounds, plaster, lime, cement, acid and/or acid wash, or other harmful contaminants.
- B. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 10 70 10

SECTION 10 75 00 - FLAGPOLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes ground-mounted aluminum flagpoles.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand the effects of gravity loads, and the following loads and stresses within limits and under conditions indicated according to the following design criteria:
  1. Wind Loads: 105 mph.
  2. Base flagpole design on polyester flags of maximum standard size suitable for use with flagpole.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
  1. 2. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
    - a. Aluminum extrusions that contain at least 60% post-industrial recycled content
  3. Regional Materials MR Credit 5.1: Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- C. Delegated-Design Submittal: For flagpole assemblies indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.
  1. Include loads, point reactions, and locations for attachment of flagpoles to building's structure.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Flagpole; a Kearney-National Inc. company.
  2. Atlantic Fiberglass Products, Inc.
  3. Baartol Company.
  4. Concord Industries, Inc.
  5. Eder Flag Manufacturing Company, Inc.
  6. Ewing Flagpoles.
  7. Lingo Inc.; Acme Flagpole Company Division.
  8. Millerbernd Manufacturing Company.
  9. Morgan-Francis; Division of Original Tractor Cab Co., Inc.
  10. PLP Composite Technologies, Inc.
  11. Pole-Tech Company Inc.
  12. U.S. Flag & Flagpole Supply, LP.
  13. USS Manufacturing Inc.

### 2.2 FLAGPOLES

- A. Exposed Height: 20 feet.
- B. Aluminum Flagpoles: Provide cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch (4.8 mm).
- C. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, not less than 0.064-inch- (1.6-mm-) nominal wall thickness. Provide with 3/16-inch (4.8-mm) steel bottom plate and support plate; 3/4-inch- (19-mm-) diameter, steel ground spike; and steel centering wedges welded together. Galvanize steel after assembly. Provide loose hardwood wedges at top of foundation tube for plumbing pole. Provide flashing collar of same material and finish as flagpole.
- D. Cast-Metal Shoe Base: For anchor-bolt mounting; provide with anchor bolts.
- E. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter. Fabricate from 0.063-inch (1.6-mm) spun aluminum, finished to match flagpole.
- F. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Provide flush access door secured with cylinder lock. Finish truck assembly to match flagpole.
- G. Halyard Flag Snaps: Provide two swivel snap hooks per halyard.

2.3 MISCELLANEOUS MATERIALS

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
- B. Sand: ASTM C 33, fine aggregate.
- C. Elastomeric Joint Sealant: Joint sealant complying with requirements in Section 079200 "Joint Sealants."

2.4 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611.

2.5 FLAGPOLE INSTALLATION

- A. General: Install flagpoles where shown and according to **Shop Drawings and** manufacturer's written instructions.
- B. Ground Set: Place foundation tube, center, and brace to prevent displacement during concreting. Install flagpole, plumb, in foundation tube. Place tube seated on bottom plate between steel centering wedges and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar.
- C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.
- D. Mounting Brackets and Bases: Anchor brackets and bases securely through to structural support with fasteners as indicated on Shop Drawings.

END OF SECTION 10 75 00

**SECTION 10 82 13 - ROOF SCREENS (ADD ALTERNATE)**

**PART 1 - GENERAL**

1.1 SECTION INCLUDES

- A. Roof Screens designed to attach to the steel structure as shown on the Structural Drawings.
- B. Roof Screen sheet material.
- C. Roof Screen accessories.

1.2 RELATED SECTIONS

- A. Section 05 12 00 - Structural Steel Framing.
- B. Section 05 21 10 - Steel Joist Framing.
- C. Section 05 31 10 - Steel Deck.
- D. Section 05 50 00 - Metal Fabrications and Stairs: Frames and supports.
- E. Section 07 52 10 - Hot Applied Built-Up Hybrid Roofing
- F. Section 099100 - Paints and Coatings: Field applied paint finish.
- G. Division 23 - Roof Top HVAC Equipment.

1.3 REFERENCES

- A. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- B. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- D. ASTM A 1008 - 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.
- E. ASTM B 749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
- F. ASTM D 4811 - Standard Specification for Nonvulcanized (Uncured) Rubber Sheet Used as Roof Flashing.
- G. ASTM D 6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.

- H. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- J. AWS D1.1 - Structural Welding Code - Steel.
- K. AWS D1.6 - Structural Welding Code - Stainless Steel.

#### 1.4 COORDINATION

- A. Coordinate Work with other operations and installation of roofing materials to avoid damage to installed insulation and membrane materials.

#### 1.5 ACTION SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Layout and erection drawings showing typical cross sections and dimensioned locations of all frames and base supports. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, shape, and patterns.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Design Calculations: 3 copies of structural design calculations for structural components and components resisting wind loads with seal and signature of professional engineer licensed in the State of Maryland.
- B. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
- D. Warranties: 3 signed copies.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with a minimum five years documented experience in producing pre-manufactured metal-framed equipment screens.
- B. Design Qualifications: Provide structural design calculations stamped by a professional engineer licensed in the state in which this project is located.
- C. Welders: AWS certified within previous 12 months.



- D. Pre-Installation Meeting:
  - 1. Convene at job site, at least seven calendar days prior to scheduled beginning of construction activities of this section, to review requirements of this section.
  - 2. Require attendance by representatives of the installing subcontractor (who will represent the system manufacturer), the mechanical subcontractors and other entities affected by construction activities of this section.
  - 3. Notify Architect four calendar days in advance of scheduled meeting date.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Locate in area designated by Architect.
  - 2. Construct mock-up, one full screen section wide, including two roof supports.
  - 3. Do not proceed with remaining work until workmanship, color, and location is approved by Architect.
  - 4. Remove mock-up if required by Architect.
  - 5. Accepted mock-up may remain in place.

## 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Field Measurements: Verify roof screen dimensions and conditions of the installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating equipment enclosure without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

## 1.9 WARRANTY

- A. Perforated Metal Panel Finish:
  - 1. Provide written warranty stating that the paint finish applied on all equipment enclosure panels will be warranted against chipping, peeling, cracking, fading, or blistering for the coverage period of twenty (20) years.
  - 2. Provide warranty signed by the panel manufacturer and paint finish applicator (if separate from manufacturer).
- B. The above warranties are in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

## **PART 2 - PRODUCTS**

### 2.1 PERFORMANCE REQUIREMENTS

- A. Design Loads: Comply with Building Code for site location and building height.
  - 1. Design to resist ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
  - 2. Design all materials, assembly and attachments to resist snow, wind, suction and uplift loading at any point without damage or permanent set.

- B. Structural Design: Refer to structural drawing S2.01 – General Notes under section “2.1 Performance Requirements”. for loads. Prepare structural design calculations for screen framing and attachment to structure including reactions at base supports for verification of roof structure by Architect.
- C. All welds to be performed by an AWS certified welder. Valid certification to be provided.

## 2.2 ROOF SCREEN SHEET METALS

- a. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- b. Stainless Steel Sheets: Through the use of a unique fabrication process, EcoScreen perforated screen walls combine an airy aesthetic with outstanding performance, blending industrial and other applications with their surroundings. In addition, EcoScreen panels may be installed horizontally or vertically.
  - 1) 20 gage stainless steel and 0.040" [1mm] painted aluminum.
  - 2) Perforation Pattern: Staggered
  - 3) Open/Free Area: 40%
  - 4) Diameter (in.) 3/8
  - 5) Spacing (in.) 9/16
- 6) Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a) Centria EcoScreen– Basis of Design. 1005 Beaver Grade Road, Moon Township, PA 15108. Tel: 1.800.759.7474.
  - b) Morin – A Kingspan Group Company. 685 Middle Street. Bristol, CT 06010 Tel: toll free: (800) 640-950.1
  - c) Hendrick Manufacturing. 1 Seventh Avenue, Carbondale PA 18407. Tel: 800-225-7373.

## 2.3 MATERIALS

- A. Structural Steel Members: See Structural Drawings.
- B. Roof Flashing: Refer to Division 07 section that specifies the roof membrane.
- C. Connector Fittings: Fabricated from AISI Type 304 stainless steel with mill finish.
- D. Steel Z section: Steel sheet conforming to ASTM A 653, Class SS, with a G90 hot-dip galvanized coating.
- E. Hardware: Bolts, nuts, washers and screws 18-8 stainless steel.
- F. Welding Materials: AWS D1.1; type required for materials being welded.

## 2.4 FABRICATION

- A. Fabricate ends of tubing with flat crimp for connections.

- B. Fit and shop assemble items in largest practical sections, for delivery to site.
- C. Fabricate items with joints tightly fitted and secured.
- D. 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.
- 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. Fabricate system components so that portions of screen can be dismantled for repairs to equipment being screened and for future roof replacement.
- G. Trim and Closures: Fabricated from 24 gauge metal and finished with the manufacturer's standard coating system.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine area where work will be installed to verify the installation can be performed in accordance with the Drawings and structural calculation requirements without interference from other equipment or trades.
- B. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Do not begin installation until conditions have been properly prepared.

#### **3.2 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.3 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects.
- C. Provide for erection loads, and for sufficient temporary bracing to maintain indicated alignment until completion of erection and installation of permanent attachments.
- D. Anchor fabrications to structure as indicated.
- E. Separate dissimilar metals and use gasketed fasteners, isolation shim, or isolation tape to eliminate possibility of corrosive or electrolytic action between metals.
- F. Exercise care when installing components so as not to damage finish surfaces. Touch up as required to repair damaged finishes.

- G. Install flashing boots at base supports as required to provide a watertight connection. Install as recommended by the roof membrane manufacturer.
- H. Remove all protective masking from material immediately after installation.

3.4 CLEANING AND PROTECTION

- A. Remove all protective masking from framing and trim material immediately after installation. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. Maintain in a clean condition during construction.
- B. Protect installed products until completion of project.
  - 1. Ensure that finishes and structure of installed systems are not damaged by subsequent construction activities.
  - 2. If minor damage to finishes occurs, repair damage in accordance with manufacturer's recommendations; provide replacement components if repaired finishes are unacceptable to Architect.
- C. Prior to Substantial Completion: Remove dust or other foreign matter from component surfaces; clean finishes in accordance with manufacturer's instructions.
- D. Replace metal wall panels and framing members that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

## SECTION 11 06 10 STAGE CURTAINS

### PART 1 GENERAL

#### 1.0 INSURANCE:

- A. Insurance under this section will be required in this bid. Proof of insurance should be supplied With the bid and will be required before purchase order is issued.
  - 1. Workman's compensation insurance.
  - 2. Public Liability / Property damage insurance.
  - 3. Motor Vehicles, licensed and non-licensed.

#### 1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the contract, including General and Supplementary conditions and Division 1 Specifications, apply to this Section.

#### 1.2 SUMMARY:

- A. Work under this section includes, but is not limited to the following components:
  - 1. Front curtains, Front Valance, Side curtains, Rear curtains.
  - 2. Curtain tracks, carriers, hangers, chain, pipe battens and any hardware for a complete installation.

#### 1.3 SUBMITTALS:

- A. Submit shop drawings for architect's approval and indicate layout of track system for **all** curtains.
- B. Submit schedule table showing all curtains and track sizes.
- C. Submit track product data on all hardware.

#### 1.4 PROJECT CONDITIONS:

- A. Field measurements: Verify all stage curtain openings and dimensions by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
- B. The stage equipment contractor must notify the contract holder of any site conditions or variations that effect the installation or completion of work and copy the Architect.
- C. Coordinate location and routing of sprinkler pipes and heads, conduit, HVAC ducting and any other trades installing in the areas of the stage equipment.

#### 1.5 QUALITY ASSURANCE:

- A. Fabricator/Installer Qualifications: Firm experienced in producing stage curtains similar to those indicated for this project, that has a record of successful installations.
- B. Flame Resistant Requirements; Provide stage curtains certified flame resistant by requirements of NFPA 701. Permanently attach label to each curtain.
- C. Provide two copies of flame resistant certificate from the fabric manufacture on the fabric used for this project.

1.6 DESCRIPTION OF WORK:

- A. Provide all labor, Material, equipment and services required for completion of all stage curtains indicated on Drawings and specifications herein.

**PART 2 PRODUCTS**

2.0 MANUFACTURER

A. Manufacturer's Products:

- 1. Subject to compliance with requirements, provide products by one of the following:
  - a. Kendall Stage Curtains
  - b. Dazian LLC; Symphony.
  - c. Frankel/Fabric One; 950.
  - d. JB Martin Company; #2703 Overture.
  - e. J. L. de Ball America, Inc.; Metro.
  - f. KM Fabrics, Inc.; Memorable.
  - g. Valley Forge Fabrics, Inc.; 2525 Velour.

2.01 CURTAIN FABRICS:

- A. General: Provide fabrics inherently and permanently flame resistant or chemically flame resistant by immersion treatment to comply with requirements indicated. Provide fabric from the same dye lot.
- B. Colors, Textures, and patterns: As selected by Architect/Customer with curtain contractor. A full range of fabric colors and fabrics to be shown to Architect/Customer, prior to manufacture of curtains.

2.02 FRONT SETTING CURTAIN FABRIC:

A. Materials:

- 1. Woven Cotton Velour: Napped fabric of 25 ounce, 100 percent cotton: 54-inch minimum width .
- 2. All curtains furnished with sewn 50 % fullness and box-pleated on 12-inch centers.
- 3. All top hems must have heavy-duty 3" black poly pro webbing , black grommets to be Installed in each pleat.
- 4. Floor length curtains shall have hems not less than 6 inches deep with a suspended inner canvas pocket containing #8 zinc plated chain weights.
- 5. For curtains that do not hang to the floor, provide hems not less than 3 inches.
- 6. 12 inch turn-back on leading edge and 6 inch on side hem.

B. Fabric Manufacturers:

- 1. KM Fabrics
- 2. JB Martin Fabrics

2.03 FRONT – SETTING CURTAIN TRACKS:

A. Track

1. Straight curtain tracks: Fabricate of not less than 14- gauge BLACK galvanized roll-formed steel, with each half of track in one continuous piece. Equip track with adjustable, heavy duty guarded pulley as required at track ends.
2. Carriers: Provide BLACK steel ball bearing 1 ¾" solid polyethylene two wheel curtain carriers for track spaced at 12 inch on center.
3. Floor pulley: Provide a BLACK adjustable floor pulley
4. Cord: #12 BLACK stretch-resistant braided polypropylene cord.
5. Bumpers: as required between each carrier.
6. End stops, hang clamps, rope guides, trim chain etc. as required to fully operate system.

B. Track Manufacturers:

1. Automatic Devices Company (ADC)

2.04 RIGGING:

A. Installation

1. Curtain battens: Fabricate battens from BLACK galvanized 1 ¼" steel pipe with a minimum number of joints. Connect pipe with drive -fit sleeve and pin.
2. Track installation: BLACK #2/0 double loop chain secured directly to structures. Crimp all "S" hook ends. Attach other end of chain to track with a turnbuckle. Mouse all turnbuckles to prevent loosening.
3. ALL hardware not factory painted, must be painted with EPOXY BLACK PAINT.

2.05 SIDE AND REAR-SETTING CURTAIN FABRIC:

A. Materials

1. Woven ATLAS REPP Cotton : Napped fabric , 100 percent cotton: 54-inch minimum width .
2. All curtains furnished with sewn 50 % fullness and box-pleated on 12-inch centers.
3. All top hems must have heavy-duty 3" black poly pro webbing, black grommets to be installed in each pleat.
4. Floor length curtains shall have hems not less than 6 inches deep with a suspended inner canvas pocket containing #8 zinc plated chain weights.
5. For curtains that do not hang to the floor, provide hems not less than 3 inches.
6. 6 inch turn-back on leading edge and 6 inch on side hem.

B. Fabric Manufacturer:

1. Fred Krieger & Company

2.06 SIDE AND REAR – SETTING CURTAIN TRACKS:

A. Track

1. Straight curtain tracks: Fabricate of not less than 14- gauge BLACK galvanized roll-formed steel, with each half of track in one continuous piece. Equip track with hardware, as required at track ends.
2. Carriers: Provide block constructed plate steel polyethylene two wheel curtain carriers for track spaced at 12 inch on center.
3. End stops, hang clamps, trim chain etc. as required to fully operate the system.

4. Fabricate sides and rear curtain tracks for walk-draw operation.

A. Track Manufacturers:

1. Automatic Devices Company (ADC)

2.07 RIGGING:

A. Rigging

1. Curtain battens: Fabricate battens from BLACK galvanized 1 ¼" steel pipe with a minimum number of joints. Connect pipe with drive-fit sleeve and pin.
2. Track installation: BLACK #2/0 double loop chain secured directly to structures. Crimp all "S" hook ends. Attach other end of chain to track with a turnbuckle. Mouse all turnbuckles to prevent loosening.
3. ALL hardware not factory painted, must be painted with EPOXY BLACK PAINT.

END OF SECTION



## SECTION 114000 - FOODSERVICE EQUIPMENT

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. Scope: Furnish all labor, materials, services, equipment and appliances required to provide and deliver all foodservice equipment hereinafter specified into the building, uncrate, assemble, hang, set-in-place, level, and completely install, exclusive of final utility connections.
- B. Related Work Specified Elsewhere:
  - 1. All plumbing, electrical and ventilating work required in conjunction with commercial foodservice equipment including rough-in to points indicated on mechanical drawings, and final connections from rough-in points, electrical service to points of connection and final connections shall be by Divisions 22, 23 and 26.
  - 2. Refrigeration work will be done by the Kitchen Equipment Contractor except for electrical and plumbing connections to and between compressors, blower coils, controls, etc. These final connections shall be by Divisions 22 and 26.
  - 3. All traps, steam traps, grease traps, line strainers, tail pieces, valves, stops, shut-offs, and fittings necessary for equipment specified will be furnished and installed under mechanical contract by Division 22 unless specifically called for otherwise under each item.
  - 4. All line and disconnect switches, safety cut-offs and fittings, convenience boxes or other electrical controls, fittings and connections will be furnished and installed under electrical contract by Division 26, unless specifically indicated otherwise in the item specifications. Starting switches for certain specified pieces of foodservice equipment are to be provided by Kitchen Equipment Contractor. Those starting switches, if furnished loose as standardized by Foodservice Manufacturers (other than fabricated items), shall be mounted and wired complete under Division 26.
  - 5. Any sleeves or conduit required for refrigeration, syrup tubing, or carbonation tubing will be furnished and installed under Division 22.
  - 6. Unless specifically called for in the Item Specifications, ventilating fans and all duct work between same and ceiling rough-in openings, and from same to discharge opening in building will be furnished and installed by Division 22.

#### 1.2 DEFINITIONS

- A. All references to the terms "Contractor", "Kitchen Equipment Contractor", or "K.E.C." in the specifications and/or on the drawings shall be defined to mean the Kitchen Equipment Contractor.
- B. All references to the term "Owner" in the specifications and/or on the drawings shall be defined to mean the Owner or Owner's designated representative and the Foodservice Equipment Consultant.
- C. All references to the term "Consultant" or "Foodservice Equipment Consultant" in the specifications and/or on the drawings shall be defined to mean **NYIKOS ASSOCIATES, INC.** its

employees, and authorized representatives and is referred to throughout the contract documents as if singular in number and masculine in gender.

- D. The phrase "The K.E.C. shall" or "by the K.E.C.", as applicable, is understood to be included as a part of each sentence, paragraph or article of these specifications unless otherwise indicated or specified.

### 1.3 QUALITY ASSURANCE

#### A. Qualification of Suppliers:

- 1. Commercial foodservice equipment suppliers shall submit satisfactory evidence of compliance with the following qualifications and conditions to be approved.
  - a. Successful completion of jobs of comparable scope.
  - b. Have manufacturer's authorization to distribute and install specified factory items of equipment.
  - c. Maintain a permanent staff experienced in the installation of foodservice equipment and preparation of professional style rough-in drawings and brochures.
  - d. Maintain or have access to fabrication shop meeting N.S.F. requirements. If other than foodservice equipment suppliers own fabrication shop, obtain Consultant approval of fabrication shop desired to be used.
  - e. Maintain or have access to a readily available stock of repair and replacement parts, together with authorized service personnel.

#### B. Qualification of Fabricators:

- 1. Fabricators shall be an N.S.F. approved organization with trained personnel and facilities to properly design, detail and fabricate equipment in accordance with the specifications and standard details contained herein.
- 2. Custom fabricated equipment shall bear the National Sanitation Foundation seal of approval and listed as such under N.S.F. Standards No. 2 and No. 33.
- 3. Only one (1) fabricator shall be used for this project, and all equipment will be fabricated at the same shop. When units cannot be fully shop-fabricated, complete fabrication at project site.
- 4. Acceptable fabricators are:
  - a. Pro Stainless, Inc.; Keyser, WV
  - b. Commercial Stainless, Inc.; Bloomsburg, PA
  - c. Keystone Custom Fabricators, Inc.; Elizabeth, PA
  - d. Southern Equipment Fabricators, Inc.; Columbia, SC
  - e. Stainless Unlimited, Inc., Waldorf, MD
  - f. Other fabricators, as approved by Consultant.

#### C. Qualification of Manufacturers:

- 1. Manufacturers shall be regularly engaged in the production of items furnished and shall have demonstrated the capability to furnish similar equipment that performs the functions specified or indicated herein.

#### D. Standard Products:

1. Materials, products, and equipment furnished under this contract shall be the standard items of manufacturers regularly engaged in the production of such materials, products, and equipment and shall be of the manufacturer's latest design that complies with the specifications which have been produced and used successfully on other projects and in similar applications.
2. Discrepancies within contract documents should immediately be brought to the attention of the Consultant in writing for clarification prior to fabrication or ordering of standard items.

#### 1.4 PLANS & SPECIFICATIONS

- A. Specifications and drawings have been prepared to form the basis for procurement, erection, start-up and adjustment of all equipment in this contract. Plans and specifications shall be considered as mutually explanatory and work required by one, but not the other, shall be performed as though required by both. Items required by one, but not by the other shall be provided as though required by both. Work shall be accomplished as called for in specifications and shown on drawings, so that all items of equipment shall be completely functional for purpose for which they were designed. When there is any discrepancy between drawings and specifications, drawings shall govern. Bidders should seek clarification of any discrepancies from the Consultant prior to bidding.

#### 1.5 SUBMITTALS

##### A. General Requirements

1. Within six (6) weeks or earlier, as required, assemble and submit all shop drawings, rough-in drawings, brochures, color samples, etc. as a complete package. There will be no review of partial submittals.
2. Any and all costs, to all trades and parties involved, arising from delay of project due to non-submittal of the complete package by the K.E.C. within a reasonable time period shall be borne solely by the K.E.C.
3. Identify each submittal by project name, date, contractor, submittal name, and any other necessary information to distinguish it from other submittals.

##### B. Shop Drawings:

1. Submit shop drawings electronically in PDF format, drawn on sheets equal in size to Contract Documents of equipment specified for custom fabrication including all accessories attached to each item.
2. Drawings shall be detailed and fully dimensioned to a minimum scale of 3/4"=1'-0" for plan and elevation views, and 1-1/2"=1'-0" for sections, based on the floor plan(s) and following item specifications. Drawings will be checked for thoroughness, accuracy, completeness, neatness, and returned for corrections, if necessary.

##### C. Rough-in Drawings:

1. Submit rough-in drawings electronically in PDF format, drawn on sheets equal in size to Contract Documents of detailed arrangement plans professionally prepared from architects dimensioned plans (not traced from Contract Documents) at a minimum scale of 1/4"=1'-0"

2. Equipment Layout Plan showing arrangement of all items specified and identified on schedule of equipment listing item number, description, quantity, manufacturer, model number, and remarks.
3. Ventilation Plan showing dimensioned locations of all duct openings for ventilators and dishmachines identifying size, c.f.m. required (exhaust and supply), static pressures, and connection heights.
4. Plumbing/Electrical Plans showing dimensioned locations, sizes, elevations and capacities of all utility services required for each item of equipment in relation to finished walls, columns, and heights above finished floor.
5. Special Conditions Plan showing exact dimensions and details of all masonry bases, floor depressions, critical partition locations/heights, wall openings, reinforcing for wall and/or ceiling mounted equipment, and conduit locations for soda and compressed gas lines.

D. Equipment Brochures:

1. Submit electronic files in PDF format of manufacturer's illustrations and technical data for approval prior to procurement. All items of Standard Manufacture shall be submitted, including items purchased to be built into fabricated equipment. Each illustration shall be marked to accurately describe the item to be furnished as specified. Include all deviations from standard information (i.e., voltage, phase, load, etc.).
2. Include a separate information sheet ahead of each illustration sheet showing all service connection sizes, electrical requirements, loads, consumptions, and all accessories specified.
3. Manufacturer's suggested schematic drawings for connection of mechanical and electrical services for such items as booster heaters, disposers, or any other item of equipment that may require the same.

E. Miscellaneous Shop Drawings:

1. Submit electronic files in PDF format of manufactured equipment specified requiring clarification and approval such as, walk-in cooler/freezer drawings, ventilator drawings, utility raceway drawings, and refrigeration system drawings.

F. Operation and Maintenance Manuals:

1. Submit electronic files in PDF format for all mechanically operated equipment of standard manufacture. Include operating and cleaning/maintenance instructions, parts listing, recommended parts inventory listing and purchase source, copy of warranties, and similar applicable information.
2. Brochure covers shall bear the job name, date, and name of contractor.

G. Manufacturer's List:

1. The K.E.C. shall submit electronic files in PDF format a list of all manufacturer's representatives of the food service equipment such as convection ovens, ranges, etc., and their authorized service agencies' addresses and telephone numbers; to be presented after submission of manufacture data.

H. Samples:

1. Samples of materials, products, and fabrication methods, shall be submitted for approval upon request at no additional cost, before proceeding with work.

I. Re-submission Requirements:

1. Shop Drawings:

- a. Revise initial drawings as required and resubmit in accordance with submittal procedures.
- b. Indicate on drawings all changes which have been made in addition to those requested by Consultant.

2. Product Data and Samples:

- a. Submit new data and samples as required for initial submittal.
- b. Make all re-submittals within fourteen (14) working days from date of Consultants previous action.

J. Approvals:

1. After approval of the submittals listed above, furnish as many prints and copies as are required for the various trades, the Owner, the Architect, and the Consultant.
2. The approval of the shop drawings will be general and shall not relieve the K.E.C. of responsibility for proper fitting, finishing, quantities, and erection of work in strict accordance with the contract requirements, nor does it relieve him of the responsibility of furnishing material and workmanship not indicated on approved shop drawings but required for the completion of his work.
3. Approval by the Consultant and/or Owner of the manufacturer's data submitted by the K.E.C. does not waive the responsibility of K.E.C. to furnish each item of equipment in complete compliance with the specifications and drawings. Discrepancies between Contract Documents and furnished equipment shall be corrected even after approval and installation of this equipment at no additional cost to the Owner.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Equipment shall be delivered to the job site only after the building is weather-safe and vandal-safe.

B. Storage:

1. Store equipment in an area convenient to the point of installation in such a way that it is protected from the weather and job hazards.

C. Protection:

1. Wrapping and protective coatings shall remain on all items until ready for use and in the case of stainless steel items, until installation is complete and the job is ready for cleaning.

D. Damage:

1. All responsibility shall rest with the K.E.C. for any damage or loss incurred prior to final acceptance. Such items as may be lost or damaged shall immediately be replaced or

repaired to a new condition to the complete satisfaction of and at no additional cost to the Owner.

1.7 JURISDICTION TRADE AGREEMENTS AND RESTRICTIONS

- A. Include the work specified, shown or reasonably inferable as part of foodservice equipment. Portions of this work may be subcontracted to those qualified to do such work, as may be necessary because of jurisdictional trade agreements and restrictions.

1.8 REGULATIONS AND CODES:

- A. Except as otherwise indicated, each item of equipment shall comply with the latest current edition of the following standards as applicable to the manufacture, fabrication, and installation of the work in this section.

1. N.S.F. Standards: Comply with National Sanitation Foundation Standards and criteria, and provide N.S.F. "Seal of Approval" on each manufactured item and major items of custom-fabricated work.
2. U.L. Standards: For electrical components and assemblies, provide either U.L. labeled products or, where no labeling service is available, provide a complete index of the components used as selected from the U.L. "Recognized Component Index".
3. A.N.S.I. Standards: For gas-burning equipment, comply with A.N.S.I. Z21-Series standards. Comply with A.N.S.I. B57.1 for compressed gas cylinder connections and with applicable standards of the Compressed Gas Association for water connection air gaps and vacuum breakers.
4. A.G.A.: All gas-fired equipment shall be A.G.A. Approved, equipped to operate on the type gas available at the job site and shall contain 100% automatic safety shut-off devices.
5. N.F.P.A. Standards: Comply with N.F.P.A. Bulletin 96 for exhaust systems and with N.F.P.A. Bulletins 17 & 96, and U.L. 300 for fire extinguishing systems.
6. A.S.M.E. Code: Comply with A.S.M.E. boiler code requirements for steam generating and steam heated equipment. Provide A.S.M.E. inspection, stamps, and certification of registration with National Board.
7. National Electric Code: Comply with N.E.C. Volume 5 for electrical wiring and devices included with foodservice equipment.
8. All authorities having jurisdiction over this type of equipment and/or installation.
9. Where specifications and/or drawings require mechanical, electrical or refrigeration work to be performed, such work shall be done in strict conformance to other portions of the Base Building Specification which sets forth standards for this type of work.
10. Where there exists two standards or codes for one type of work, the stricter method shall govern.

1.9 WARRANTIES

- A. Warrantee in writing all equipment and fabrication against defects and workmanship for a period of two (2) year from date of acceptance.
1. Each piece of mechanical equipment shall be listed, together with the authorized service and repair agency whom the Owner will call should malfunctions occur within the two-year (2) guarantee period.

- B. Refrigeration system compressors shall be warranted for five (5) years by the manufacturer. Free refrigeration service, including parts and labor, shall be furnished for two (2) years from date of acceptance, unless otherwise specified.

#### 1.10 JOB CONDITIONS

- A. Visit the job site to field check actual wall dimensions and roughing-in and shall be responsible for fabricating and installing the equipment in accordance with the available space and utility services as they exist on the job site.
- B. Check all door openings, passageways, elevators, etc., to be sure that the equipment can be conveyed to its proper location within the building and if necessary, check the possibility of holding wall erection, placement of doorjambes, windows, etc. for the purpose of moving the equipment to its proper location with the Contractor. Any removal and rebuilding of walls, partitions, doorjambes, etc. necessary to place the equipment, or if caused by incorrect information on the Contractor's drawings, shall be done at the expense of the K.E.C., at no additional cost to the Owner.
- C. Notify the Consultant and Owner before fabrication of equipment of any discrepancies between plans and specifications and actual conditions on the job.
- D. Before finished floors, walls, and/or ceilings are in place, physically check the location of all "rough-ins" at the job site. Report discrepancies in writing.
- E. Any changes required after fabrication has been started to ensure equipment accurately fitting the space as it exists and conforming to actual field dimensions on the job shall be made at no additional cost to the Owner.
- F. If special hoisting equipment and operators are required, include such cost as part of the bid for this work.

#### 1.11 CHANGES IN THE WORK

- A. The Owner reserves the right to require reasonable modification to be made in the routing of work and relocation of equipment. This specifically refers to conditions where interference occurs or where more desirable accessibility can be obtained or whose materials cannot be installed because of structural or mechanical conditions encountered. Such changes shall be made at no additional cost to the Owner.

#### 1.12 PATENTS

- A. Hold harmless and save the Owner and its officers, consultants, servants and employees from liability of any nature or kind, including costs and expenses for or on account of any copyrighted, patented, or un-patented invention, process, trademark, design, device, material, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.
- B. If the Contractor has information that the process or article specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the

Owner in writing. The contract price shall include all royalties or costs arising from the use of any or all of the above which are, in any way, involved in the contract.

1.13 CONTRACTOR'S WARRANTY

A. The Contractor represents and warrants:

1. That he is financially solvent and that he is experienced in and competent to perform the types of work or to furnish the plans, materials, supplies or equipment, to be so performed or furnished by him.
2. That he is familiar with all Federal, State, municipal, and department laws, ordinances, orders, and regulations, which may, in any way, affect the work of those employed therein, including, but not limited to, any special acts relating to the work or to the project of which it is a part.
3. That such temporary and permanent work required by the contract as is to be done by him can be satisfactorily constructed and used for the purpose for which it is intended and that such construction will not injure any person or damage any property.
4. That he has carefully examined the plans, specifications, addenda, if any, and the site of the work and that, from his own investigations, he has satisfied himself as to the nature and location of the work, the character, quality, and quantity of materials likely to be encountered, the character of equipment and other facilities needed for the performance of the work, the general and local conditions, and all other materials which may, in any way, affect the work or its performance.
5. That he has satisfied himself as to the existing openings and accesses to the foodservice area through which his equipment shall be required to pass and that he is responsible for his equipment being delivered in as many sections as necessary to conform to the available space dictated by these existing limitations.

1.14 SUBSTITUTIONS

- A. Bids submitted shall be for the specific manufacturer and model, size, capacity, and accessories, as specified or shown on the drawings.
- B. The K.E.C. may quote upon brands and models of equipment other than those specified as a substitute, but he must also bid the primary item. In the event that it is desired to request approval of substitute material, product, article, process, or item of equipment in lieu of that which is specified, submit a written request at the time of submitting bid on a separate sheet attached to, but not part of, the base bid, setting forth the proposed substitution in detail, including an itemized analysis of the addition or deduction in the amount of the contract, if any, which will result if the substitution is approved. Each such request shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation.
- C. The Contractor shall be held responsible for additional costs to himself or any other prime contractor for changes required to install materials, devices, equipment, etc., which the Contractor has substituted for that specified.
- D. The Owner reserves the right to award a contract or contracts based upon the inclusion or exclusion of one or more of the alternate estimates. The description of all workmanship and materials under the various headings of the specifications shall have the same meaning and



force when applied to similar workmanship and materials in the alternate. If the descriptions are not specific, the workmanship shall be the best quality and the materials the best commercial grade.

- E. Whenever any product is specified in the Contract Documents by reference to the name, trade name, make, or catalog number of any manufacturer or supplier, the intent is not to limit competition but to establish a standard of quality which is necessary for the project. Products of other manufacturers meeting the established criteria will be considered. However, please take note that the plumbing, electrical, steam, heating, ventilating, and air-conditioning drawings prepared by the consulting engineers, have been engineered based on the first product named under each item number designation. Therefore, any other product which is submitted for approval in lieu of the primary item specified, shall conform to the rough-in requirements established for the first product named, as well as physical size and building construction requirements.
- F. Any equipment listed which is not in accordance with the provisions of these specifications will be rejected. If the Contractor fails to submit for approval within the specified time the list of equipment as required herein, the Consultant shall then have the right to make the final equipment selection. The selection made by the Consultant shall strictly conform to these specifications and will be final and binding, and the items shall be furnished and installed by the Contractor without change in the contract price at the time of completion.
- G. It shall be the responsibility of the K.E.C. to prove that substitutions are equal to specified items. **NYIKOS ASSOCIATES, INC.** as the Owner's representative, shall be the determining authority as to the acceptability or equality of the substitutions. No substitutions shall be approved after bids are received.

#### 1.15 DESIGN/MODEL CHANGE, DISCONTINUED ITEMS

- A. All equipment specified shall be of latest design. Any improvements made in design and construction of prefabricated items before equipment is actually delivered to the project site, shall be incorporated in equipment, at no additional cost, provided such incorporation does not delay delivery date of equipment.
- B. In the event of an item being discontinued after specified and prior to delivery to project site, the K.E.C. shall be responsible for notifying the Consultant in writing of the discontinued item and request an alternate of equal performance, including all accessories, at no additional cost to the Owner.

### PART 2 - PRODUCTS

#### 2.1 GENERAL:

- A. The equipment and its component parts shall be new and unused. All items of standard manufactured equipment shall be current models at the time of delivery. All parts subject to wear, breakage, or distortion shall be accessible for adjustment, replacement, and repair.
- B. Means shall be provided to ensure adequate lubrication for all moving parts. All oil holes, grease fittings, and filler caps shall be accessible without the use of tools.

- C. The design of the equipment shall be such as to provide for safe and convenient operation. Covers or other safety devices shall be provided for all items of equipment presenting safety hazards. Such guards or safety devices shall not present substantial interference to the operation of the equipment. All guards shall provide easy access to the guarded parts.
- D. Trim shall not be an acceptable substitute for accuracy and neatness. When trim is required and accepted by the Consultant and the Owner in lieu of rejection of items of equipment, it shall be the K.E.C.'s responsibility to provide same at no additional cost.
- E. Unless otherwise specified herein, no material lighter than #20 gauge shall be incorporated into the work. All gauges for sheet iron and sheet steel shall be U.S. Standard Gauges, and finished equipment gauge thickness shall not vary more than 5% plus or minus from the thickness indicated below.

<u>GAUGE</u>	<u>THICKNESS</u>	<u>GAUGE</u>	<u>THICKNESS</u>
#10	0.1406	#16	0.0625
#12	0.1094	#18	0.0500
#14	0.0781	#20	0.0375

- F. Materials or work described in words which have a well known and acceptable trade meaning shall be held to refer to such accepted meanings.

2.2 MATERIALS

A. Refrigeration Systems:

- 1. Self-contained:
  - a. Whether the units be top-mounted or cabinet-mounted, they shall be started by the K.E.C. and shall be tested for maintenance of temperature.
  - b. All units shall be furnished with condensate evaporators.
- 2. Remote: Provide and install complete refrigeration system(s), charged, started, and operating properly, according to the Item Specifications and the following.
  - a. Single stage compressors with air-cooled condensers operating within the recommended range of suction discharge pressure of economical operation and within the required capacity.
  - b. All units shall be new and factory assembled, to operate with the refrigerant specified. Refrigerant R-404 shall be used for all medium and low temperature applications. Due to the unsettled nature of refrigerants, no refrigerant shall be used with a phase-out date of less than ten (10) years from the date of installation.
  - c. Compressors shall be accessible hermetic type, Copeland or approved equal, and shall be equipped with high-low pressure control, liquid line drier, sight glass, suction and discharge vibration eliminator, and head pressure control.
  - d. The system shall have a factory mounted and pre-wired control panel complete with main fused disconnect, compressor circuit breakers, contactors, and time clocks wired for single point power connection.
  - e. The supporting frame shall be constructed of structural steel, fully welded, and protected against rust and corrosion with one (1) coat primer, and two (2) coats paint, unless otherwise specified.
  - f. Systems specified for outdoor installation shall be fully protected in a weather-proofed housing with louvered front panel and hinged top, constructed to resist rust

and corrosion, and furnished with low ambient controls. Crankcase heater shall be provided with every compressor.

3. Where specifications call for pre-piped lines (i.e., from a fixture to a valve compartment, etc.), provide such work in strict conformance with other sections of the specifications which set forth standards for this type of work or in conformity with the requirements of the Board of Fire Underwriters or ASHRAE Standards, whichever is greater.
4. Each refrigeration item specification is written to provide minimum specifications and scope of work. All refrigeration equipment shall be designed and installed to maintain the following general temperatures unless otherwise specified.

<u>TYPE</u>	<u>REFRIGERATORS</u>	<u>FREEZERS</u>
a. Walk-In	+35° F./1.7° C.	-10° F./-23.3° C.
b. Reach-In	+35° F./1.7° C.	-10° F./-23.3° C.
c. Undercounter	+35° F./1.7° C.	-10° F./-23.3° C.
d. Fabricated	+35° F./1.7° C.	-10° F./-23.3° C.
e. Cold Pans	+0° F./-17.8° C.	
f. Work Rooms	+50° F./10° C.	

5. Provide (including payment if subcontracted) all electrical and refrigeration components needed by the completed system and complete (or have completed by the respective trades) all connections of and to said components.
6. An evaporator coil defrost system shall be provided and installed by the K.E.C. on all refrigeration systems designed to operate at an evaporator coil temperature of less than +35° F. Evaporator coil units provided without electric defrost feature shall be installed with a solenoid valve in the liquid line, controlled by the time clock so as to shut off the flow of refrigerant and allow the compressor to pump down and shut off by activation of the pressure control switch.
7. Verify the requirements of and provide any or all additional refrigeration specialty(s) or component(s) required or recommended by the manufacturer for proper operation under the specific operating conditions and location of each system specified.
8. Verify and provide manufacturer's certification that the equipment selection hereinafter specified for each refrigeration system is properly sized and shall meet the operating requirements set forth for each system regarding maintaining specified operating temperature, hours of compressor running time, and system pressures and velocities as recommended by the equipment manufacturer(s).
9. All refrigeration systems shall be installed and wired in strict conformance with the manufacturer's instructions and recommendations.

**B. Motors and Heating Elements:**

1. Motors up to and including 1/2 HP shall be wired for 120 volt, single phase service. Motors larger than 1/2 HP shall be wired for 208 volt, single or three phase service as indicated. Motors shall be of the drip-proof, splash-proof, or totally enclosed type, having a continuous duty cycle and ball bearings, except small timing motors which may have sleeve bearings. All motors shall have windings impregnated to resist moisture. Motors located where subject to deposits of dust, lint, or other similar matter shall be of the totally enclosed type. Motors shall have ample power to operate the machines for which designated under full load operating conditions without exceeding their nameplate ratings. Insulation shall be N.E.M.A. Class B or better.
2. Heating elements having a connected load up to and including 1,000 watts shall be wired for 120 or 208 volt, single phase service, or as indicated on the drawings.

- a. Any heating element larger than 1,000 watts or any combination of elements in one fixture totaling more than 1,000 watts shall be wired for 208 volt single or three phase service, as indicated on the drawings.
- b. Fixtures having multiple heating elements may be wired for three phase service with the load balanced as equally as possible within the fixture.

C. Switches and Controls:

1. Provide recognized commercial grade signals, "on-off" pushbuttons or switches, and other speed and temperature controls as required for operation of each item, complete with pilot lights and permanent graphics, conspicuously labeled, to assist the user of each item.
2. Mount switches and controls directly adjacent the piece of equipment for which it involves, on operator's side of counter body apron, out of view to the public.
3. Provide on or for each motor-driven appliance or electrical heating or control unit, a suitable control switch or starter of the proper type and rating and in accordance with Underwriter's Code wherever such equipment is not built in. All other line switches, safety cut-outs, control panels, fuse boxes, other control fittings and connections, when not an integral part of the unit or furnished loose by the manufacturer will be furnished and installed by the Electrical Contractor, unless otherwise specified. All electrical controls, switches, or devices provided loose for field installation as a part of the item specified shall be installed in the field by the Contractor unless otherwise specified.
4. Appliances shall be furnished complete with motors, driving mechanisms, starters, and controllers, including master switches, timers, cut-outs, reversing mechanisms, and other electrical equipment if and as applicable.

D. Cover Plates:

1. All controls mounted on vertical surfaces of fixtures shall be set into recessed die stamped stainless steel cups, or mounted onto removable cover plates in such a fashion as to not protrude or interfere with the operation of each item.
2. Cover plates shall be furnished and installed for all electrical outlets, receptacles, switches and controls furnished by the K.E.C., and shall match the material and finish of the equipment to which they will be fastened.

E. Wiring and Conduit:

1. Wiring shall be properly protected in N.E.M.A. and U.L. approved metal enclosures. Only rigid steel conduit shall be used, zinc coated where unexposed and chrome plated where exposed. All wiring shall be run concealed wherever possible.
2. All equipment furnished under this contract shall be so wired, wound, or constructed so as to conform with the electrical characteristics at the job site.
3. Wiring and connection diagrams shall be furnished with electrically operated machines and for all electrically wired fabricated equipment.
4. Furnish all foodservice equipment completely wired internally using wire and conduit suitable for a wet location. Where an Electrician's services are required, the work shall be done in the K.E.C.'s factory or at his expense at the job site at no additional cost to the Owner. Provide all electrical outlets and receptacles required to be mounted on or in fabricated equipment and interconnect to a master circuit breaker panel with all wires neatly tagged showing item number, voltage characteristics, and load information. Final connection shall be made by the Electrical Contractor.

F. Cords, Plugs, and Receptacles:

1. The Electrical Contractor shall provide three- or four-wire, grounding-type receptacles for all wall and floor mounted outlets to be used for plug-in equipment with characteristics as noted on the drawings. Provide Hubbell three-wire or four-wire grounding-type connectors and neoprene cords installed on each item of plug-in equipment, as indicated on drawings and item specifications.
2. K.E.C. shall coordinate with the Electrical Contractor so that the receptacles provided will match the specific plugs provided as part of the plug-in equipment. Any changes in cords and plugs required in the field due to lack of coordination between the Electrical Contractor and the K.E.C. shall be the latter's responsibility.
3. Reduce the length of all cords furnished with the specified equipment to a suitable or appropriate length so they do not interfere with other equipment or operations.
4. Pedestal receptacles that are part of fabricated equipment exposed to view, shall be similar to T&S Model No. B-1508DD single face, single gang or Model No. B-1528DD single face, double gang.

G. Water Inlets:

1. Water inlets shall be located above the positive water level wherever possible to prevent siphoning of liquids into the water supply system. Wherever conditions shall require a submerged inlet, a suitable type of check valve (except in jurisdictions where check valves are prohibited) and vacuum breaker shall be placed on the fixture to form a part of same to prevent siphoning. Where exposed to view, piping and fittings shall be chrome-plated.

H. Drain Lines:

1. Plumbing Contractor shall provide and install indirect waste lines from equipment which will discharge into floor drains or safe wastes in accordance with Plumbing Rough-In Plans, chrome-plated where exposed. Extend to a point at least 1" (or as required by local codes) above the rim of the floor drain, cut bottom on 45° angle and secure in position.
2. All horizontal piping lines shall be run at the highest possible elevation and not less than 6" above finished floor, through equipment where possible.
3. No exposed piping in or around fixtures or in other conspicuous places shall show tool marks of more than one thread at the fitting.
4. All steam operating valves on or in fabricated and purchased foodservice equipment shall be provided with composition hand wheels, which shall remain reasonably cool in service.
5. Provide suitable pressure regulating valves for all equipment with such components that might reasonably be expected to be affected over a period of time by adverse pressure conditions.

I. Faucets, Valves and Fittings:

1. All sinks shall be fitted with chromium plated, swing spout faucets of same manufacturer throughout as follows, or otherwise specified in Item Specifications.
  - a. Prep and Utility Sinks:
    - 1.) Splash-Mounted:
      - a.) T&S Brass and Bronze Works, Inc., Model B-231.
      - b.) Fisher Manufacturing Company, Model 3253.
    - 2.) Deck-Mounted:
      - a.) T&S Brass and Bronze Works, Inc., Model B-221.
      - b.) Fisher Manufacturing Company, Model 3313.

- b. Pot Sinks:
    - 1.) Splash-Mounted:
      - a.) T&S Brass and Bronze Works, Inc., Model B-290.
      - b.) Fisher Manufacturing Company, Model 5214.
  - 2. Pre-Rinse Assemblies:
    - a. Splash-Mounted:
      - 1.) T&S Brass and Bronze Works, Inc., Model B-133 with B-109 wall bracket.
      - 2.) Fisher Manufacturing Company, Model 2210 with 2902-12 wall bracket.
    - b. Deck-Mounted:
      - 1.) T&S Brass and Bronze Works, Inc., Model B-143 with B-510 mixing valve and B-109 wall bracket.
      - 2.) Fisher Manufacturing Company, Model 2810 with 2805-CV mixing valve and 2902-12 wall bracket.
  - 3. Vacuum Breakers:
    - a. General Use:
      - 1.) Fisher Manufacturing Company, Model 3990-8000.
    - b. Disposers:
      - 1.) Splash-Mounted:
        - a.) T&S Brass and Bronze Works, Inc., Model B-455.
        - b.) Fisher Manufacturing Company, Model 3990.
      - 2.) Deck-Mounted:
        - a.) T&S Brass and Bronze Works, Inc., Model B-456.
        - b.) Fisher Manufacturing Company, Model 3991.
  - 4. Trough Inlets:
    - a. Fisher Manufacturing Company, Model No. 2905.
  - 5. Other specialty faucets, pre-rinse assemblies, vacuum breakers, and trough inlets, as specified under Item Specifications.
  - 6. All sink compartments shall be fitted with 2" NPT male, chrome-plated, brass rotary waste valves complete with overflow assemblies and stainless steel strainers.
    - a. Prep and General Utility Sinks:
      - 1.) Fisher Manufacturing Company, Model No. 6100.
    - b. Pot Sinks:
      - 1.) Fisher Manufacturing Company, Model No. 6102.
  - 7. Refer to Division 22 for all other fittings.
- J. Metals and Alloys:
- 1. Stainless steel sheets shall conform to ASTM 240, Type 302, Condition A, 18-8, of U.S. Standard Gauges as previously indicated under paragraph 2.1.E.

- a. All exposed surfaces shall have a No. 4 finish. A No. 2B finish shall be acceptable on surfaces of equipment not exposed to view.
  - b. All sheets shall be uniform throughout in color, finish, and appearance.
  - c. Rolled shapes shall be of cold rolled type conforming to ASTM A36.
2. Stainless steel tubing and pipe shall be Type 304, 18-8, having a No. 4 finish, and shall conform to either ASTM A213 if seamless or ASTM A249 if welded.
  3. Where galvanized metal is specified, it shall be copper-bearing galvanized iron, cold-rolled, stretcher leveled, bonderized, re-rolled to insure a smooth surface, and used in the largest possible sizes with as few joints as necessary.
  4. Galvanizing shall be applied to rolled shapes in conformance with ASTM A123, and to sheets in conformance with ASTM A526, coating designation G-90.
- K. Castings:
1. Castings shall consist of corrosion resisting metal (white metal) containing not less than 30% nickel. All castings shall be rough ground, polished, and buffed to bright lustre and free from pit marks, runs, checks, burrs, and other imperfections. In lieu of corrosion resisting metal castings, die-stamped or cast 18-8 stainless steel will be acceptable.
- L. Hardware and Casters:
1. All hardware shall be of heavy duty type, satin finished chromium plated brass, cast or forged or highlighted stainless steel of uniform design. All hardware shall be a well known brand, and shall be identified by the manufacturer's name and model number for easy replacement of broken or worn parts.
  2. Casters on custom built equipment shall be heavy duty type, ball bearing, solid or disc wheel, with grease-proof rubber, neoprene, or polyurethane tire. Wheel shall be 5" diameter, minimum width of tread 1-3/16", minimum capacity per caster 250 pounds, unless otherwise noted.
    - a. Solid material wheels are to be provided with stainless steel rotating wheel guard.
    - b. All casters shall have sealed wheel and swivel bearings, polished plated finish and be N.S.F. approved.
    - c. All equipment specified with casters shall have a minimum of two (2) with brakes installed on opposite corners, unless otherwise noted.
- M. Locks:
1. When specified, doors and drawers of all custom fabricated or manufactured equipment shall be provided with cylinder locks, disc tumbler type with stainless steel faceplate as manufactured by Standard-Keil Mfg. Co., or approved equal.
    - a. Provide two (2) sets of keys for each lock.
    - b. All locks shall be keyed alike, except at cashiers stations or unless otherwise specified.
- N. Thermometers:
1. All fabricated refrigerated compartments shall be fitted with exterior mounted, adjustable, dial or digital thermometers with flush bezels, and shall be calibrated after installation.

O. Sealants:

1. Sealant, wherever required, shall conform to ASTM C 920; Type S Grade NS, Class 25, Use Nt, with characteristics that when fully cured and washed meets requirements of Food and Drug Administration Regulation 21 CFR 177.2600 and N.S.F. RTV-732 for use in areas where it comes in contact with food.
2. Dow-Corning #780 or General Electric "Silastic", or approved equal, in either clear or approved color to match surrounding surfaces and applied in accordance with sealant manufacturers recommendations for a smooth, sealed finish.
3. Sealants applied within the building interior: VOC content not to exceed 250 g/L.

2.3 FABRICATION AND MANUFACTURE:

A. Materials and Workmanship:

1. Unless otherwise specified or shown on drawings, all materials shall be new, of best quality, perfect, and without flaws. Material shall be delivered and maintained on the job in an undamaged condition.
2. Fabrication shall be equal to the standards of manufacture used by all first class equipment manufacturers, performed by qualified, efficient, and skilled mechanics of the trades involved.
3. All items of standard equipment shall be the latest model at time of delivery.
4. All fabricated work shall be the product of one manufacturer of uniform design and finish.
5. Each fabricated item of equipment shall include all necessary reinforcing, bracing, and welding with the proper number and spacing of uprights and cross members for strength.
6. Wherever standard sheet sizes will permit, the tops of all tables, shelves, exterior panels of cabinet type fixtures, and all doors and drainboards shall be constructed of a single sheet of metal.
7. Except where required to be removable, all flat surfaces shall be secured to vertical and horizontal bracing members by welding or other approved means to eliminate all buckle, warp, rattle, and wobble. All equipment not braced in a rigid manner and which is subject to rattle and wobble shall be unacceptable, and the K.E.C. shall add additional bracing in an approved manner to achieve acceptance.

B. Sanitary Construction:

1. All fabricated equipment shall be constructed in strict compliance with the standards of the National Sanitation Foundation as outlined in their Bulletin on Food Service Equipment entitled "Standard No. 2" dated October 1952, and in compliance with the local and State Public Health Regulations in which the installation will occur.
2. All fabricated equipment shall bear the N.S.F. "Seal of Approval".

C. Construction Methods:

1. Welding:
  - a. All welding shall be the heliarc method with welding rod of the same composition as the sheets or parts welded. Welds shall be complete, strong, and ductile with excess metal ground off and joints finished smooth to match adjoining surfaces; free of mechanical imperfections such as gas holes, pits, cracks, etc., and shall be continuously welded so that the fixtures shall appear as one-piece construction. Butt welds made by spot solder and finished by grinding shall not be acceptable.



- b. Spot welds shall have a maximum spacing of 3". Tack welds shall be of at least 1/4" length, and spaced no greater than 4" from center to center. Weld spacing at the ends of the channel battens shall not exceed 2" centers.
  - c. In no case shall soldering be considered as a replacement for welding, nor shall any soldering operation be done where dependence is placed on stability and strength of the joint.
  - d. Fixtures shall be shop fabricated of one piece and shipped to the job completely assembled wherever possible. Equipment too large to transport or enter the building in one piece shall be constructed so that the field joints can be welded at the job site.
  - e. All exposed joints shall be ground flush with adjoining material and finished to harmonize therewith. Whenever material has been sunk or depressed by welding operation, depression shall be suitably hammered and peened flush with the adjoining surface and ground to eliminate low spots. In all cases the grain of rough grinding shall be removed by successive fine polishing operations.
  - f. All unexposed welded joints on undershelves of tables or counters of stainless steel shall be suitably coated at the factory with an approved metallic-based paint.
  - g. After galvanized steel members have been welded, all welds and areas where galvanizing has been damaged shall have a zinc dust coating applied in conformance with Military Specification Number MIL-P-26915.
2. Joints:
- a. Butt joints and contact joints, wherever they occur, shall be close fitting and shall not require a filler. Wherever break bends occur, they shall be free of undue extrudence and shall not be flaky, scaly, or cracked in appearance; where such breaks do mar the uniform surface appearance of the material, all such marks shall be removed by suitable grinding, polishing, and finishing. Wherever sheared edges occur, they shall be free of burrs, fins, and irregular projections and shall be finished to obviate all danger of laceration when the hand is drawn over them. In no case shall overlapping materials be acceptable where miters or bullnosed edges occur.
  - b. Field welded joints shall be ground smooth without dips and irregularities and finished to match original finish.
3. Bolt, Screw and Rivet Construction:
- a. All exposed surfaces shall be free from bolt and screw heads. When bolts are required, they shall be of the concealed type and be of similar composition as the metal to which they are applied.
  - b. Where bolt or screw threads on the interior of fixtures are visible or may come into contact with hands or wiping cloths, they shall be capped with a stainless steel or chrome acorn nut and stainless steel lock washer.
  - c. If rivets are used to fasten rear paneling to the body of the fixture, such rivets shall be stainless steel. In no case shall iron rivets be used.
4. Sound Deadening:
- a. Schnee Butyl-Sealant 1/2" wide rope continuously between all frame members and underside of stainless steel table tops, overshelves and undershelves.
  - b. Tighten stud bolts for maximum compression of sealant.
5. Hi-Lighting:

- a. All horizontal edges of stainless steel tops, splashes, tops of raised rolled rims, and edges of all exposed doors, handles and shelf edges shall be hi-lited, in uniform design by grinding with abrasive not coarser than #240 grit, then polishing with compound to a uniform mirror finish.

6. Polishing:

- a. The grain of polishing shall run in the same direction on all horizontal and on all vertical surfaces of each item of fabricated equipment except in the case where the finish of the horizontal sections of each shall terminate in a mitered edge.
- b. Where sinks and adjacent drainboards are equipped with backsplash, the grain of the polishing shall be consistent in direction throughout the length of the backsplash and sink compartment.

7. Finishes:

- a. Paint and coatings shall be of an N.S.F. approved type suitable for use in conjunction with foodservice equipment. Such paint or coating shall be durable, non-toxic, non-dusting, non-flaking and mildew resistant, shall comply with all governing regulations, and shall be applied in accordance with the manufacturers recommendations.
- b. All exterior, galvanized parts, exposed members of framework, and wrought steel pipe where specified to be painted shall be cleaned, primed with rust inhibiting primer, de-greased, and finished with two (2) coats of glossy enamel grey hammertone paint, unless otherwise noted.
- c. Where baked enamel finishes are specified, they shall be oven baked on the fixtures for a minimum of 1-1/2 hours at a minimum temperature of 300° Fahrenheit.
- d. Fabricated equipment shall be spray coated with plastic suitable for protecting the equipment during transport and installation. The coating shall be easily removable after the equipment installation is complete at the job site, and final clean-up has begun.

D. Construction:

1. Legs:

- a. All tubular stands for open base tables, sinks, or dishtables shall have legs constructed of 1-5/8" O.D. stainless steel tubing, with 1-1/4" O.D., #16 gauge stainless steel crossbracing running between legs at a point 10" above finished floor.
- b. All joints between legs and crossbracing shall be welded and ground smooth, full 360°.
- c. The top end of legs shall be closely fitted into fully-enclosed stainless steel conical gussets no less than 3" high, similar to Klein #481-58 or #483-58, or approved equal.
- d. Gussets shall be fully welded to framing reinforcing members, so that, set screw is not visible from front.
- e. Legs without crossrails will not be accepted.
- f. Legs shall be spaced at not more than 5'-6" on centers, unless otherwise specified.

2. Feet:

- a. All tubular legs will be swedged for appearance and close fit to United Show Case #BF-158, or approved equal, fully enclosed, stainless steel bullet-shaped foot.
  - 1.) The foot shall be threaded into a collar and completely welded inside the tubular leg to permit a maximum adjustment of 2" without any thread exposure.
  - 2.) Threads shall be National Course Series Class 2 fit or better, machined to prevent end play when foot is at maximum adjustment.
  - 3.) The bullet-shaped foot shall have slightly rounded bottom to protect the floor, and a minimum bearing surface of 3/4" diameter of stainless steel-to-floor contact.
  - 4.) Bottom of tubular leg shall be finished off smoothly to provide a sanitary fitting and prevent the accumulation of grease or other debris.
  
- b. Cabinet type fixtures shall be mounted on 8" high die-stamped, sanitary, two-piece stainless steel legs no less than 3" in diameter at the top, United Show Case #CM-68B, or approved equal.
  - 1.) The bottom fully enclosed, stainless steel, bullet-shaped foot threads up into the inside of the upper member, with a male threaded 5/8" bushing to permit maximum adjustment of 2" without thread exposure.
  - 2.) The upper section shall be stamped in a neat design with a flared inverted shoulder and fully welded to a base plate designed for anchoring to the channel underbracing.
  
3. Table Tops:
  - a. Tables shall be constructed of stainless steel, and of a thickness not less than #14 gauge with 1-3/4" by 120° rolled edges, or as otherwise specified and detailed.
  - b. All corners shall be bull-nosed and of the same radius as rolled edges.
  - c. Joints where required shall be butt-welded and ground smooth to present a uniform one-piece appearance.
  - d. All tops shall be reinforced on the underside with a fully welded framework of 1-1/2"x1-1/2"x1/8" galvanized steel angles with the framing extending around the top perimeter and crossbraced on 24" maximum centers.
  - e. 1"x4"x1" galvanized or stainless steel, fully welded, cross channel, closed end members placed at each pair of legs with one (1) channel running lengthwise will also be acceptable.
  - f. All tops shall be reinforced so that there will be no noticeable deflection.
  - g. Metal tops where adjacent to walls or other items of equipment, shall be constructed with integral, coved, back and/or endsplashes as required and specified in accordance with the standard details contained herein. Close all ends of splashes.
  
4. Enclosed Bases:
  - a. All enclosed bases or cabinet bodies shall be of seamless #18 gauge stainless steel construction, enclosed on the ends and sides as required and called for under each item.
  - b. Ends of body shall terminate at front or operator's side in a 2" wide mullion, vertical, and completely enclosed. All intermediate mullions shall be completely enclosed.
  - c. The bases shall be reinforced at the top with a framework of 1-1/2"x1-1/2"x1/8" galvanized angles, with all corners mitered and welded solid.

- d. Underside of top shall be reinforced with channels and gussets where necessary. Additional angles and cross members shall be provided to reinforce shelves and support tops under heavy tabletop equipment.
  - e. Where sinks or other drop-in equipment occur, provide additional reinforcing extending crosswise, both sides of opening.
  - f. In the case of fixtures fitting against or between walls, the bodies shall be set in 1" or 2" from the wall line, with the tops continuing to the wall line with integral, coved splashes as specified. Extend vertical face of body to the wall line only. This will permit adjustment to wall irregularities. Vertical trim strips will not be accepted.
  - g. Bodies shall be fitted with counter style stainless steel legs as hereinbefore specified.
5. Drawers:
- a. Drawers, where specified, shall have removable pan inserts of #18 gauge stainless steel, and shall be approximately 20"x20"x5" deep unless otherwise specified.
    - 1.) Perimeter top edge shall be flanged out 1/2".
    - 2.) All interior horizontal corners shall be rounded on a 1" radius, and all interior vertical corners shall be rounded on a 2" radius.
  - b. Fronts shall be double pan #16 gauge stainless steel construction, 1" thick, insulated with a semi-rigid, fiberglass board, un-faced, having a three-pound density.
    - 1.) The top of the drawer face shall be formed as an integral pull by breaking the front pan back on a 45° angle 1", then straight up 1", back to front 1", and then down at the front 3/4".
    - 2.) Drawer front shall have all edges and corners ground smooth with a radius edge pull.
    - 3.) Provide hard rubber button bumpers attached to rear of drawer face at each corner.
  - c. The drawer shall have an all welded frame of 1"x1", #16 gauge stainless steel angles sized to fit the removable pan insert.
  - d. Drawers shall operate on #14 gauge full-extension slides with stainless steel roller bearings with hardened and ground raceways, Component Hardware, S52 Series, or approved equal. Slides shall be pitched approximately 3/8" per foot to permit self closing action.
  - e. Drawers shall be adequately and neatly fitted to the guides to permit easy operation without rattle or binding.
  - f. Slides and frame shall be reinforced to support a dead weight of 150 pounds when drawer is fully extended.
  - g. Adjustable stops shall be provided for each drawer at the fully-opened position, and be readily liftable by hand for easy removal of drawer.
  - h. All drawers not mounted inside a cabinet body shall be completely enclosed in an #18 gauge stainless steel box-type enclosure and suspended from angle framing under the fixture top. The housing bottom shall be flanged and welded to an #18 gauge stainless steel reinforcing channel extending across the open end.
6. Sliding Doors:
- a. Sliding doors shall be of the double pan type, with the exterior pan constructed of #18 gauge stainless steel with all four sides channeled and corners welded. The interior pan shall be similarly constructed of #20 gauge stainless steel, set into the exterior pan, and welded in place.

- b. All doors shall be insulated with semi-rigid fiberglass board, un-faced, having a three-pound density. Styrofoam shall not be acceptable.
  - c. Doors 18" wide or greater, shall have internally welded 4" wide reinforcing channels to prevent warpage.
  - d. Each door shall be fitted with a positive flush-type stainless steel pull, Standard-Kiel #1262-1014-1283 recessed handle, or approved equal.
  - e. In the back of each door install a 1"x1", #16 gauge stainless steel angle stop welded in a suitable location to prevent the doors from overpassing the flush pulls.
  - f. Doors in the closed position shall overlap each other by no more than 2".
  - g. Each door shall be fitted with two (2), 1-3/8" ball bearing sheaves fastened to 1"x1/8" stainless steel bar stock welded to the top corners of each door for suspending on an overhead #16 gauge stainless steel channel track. The hangers shall be tapped for 1/4"-20 thumb screw vertical locks which prevent the doors from jumping the track in operation while permitting easy removal for cleaning without tools.
  - h. Insure that the bottom of the doors are positively and continuously guided to assure proper alignment and passing regardless of the position of each door.
  - i. Provide hard rubber bumpers for doors to close against to insure quiet operation.
7. Hinged Doors:
- a. Hinged doors shall be of the same materials and construction as sliding doors previously specified.
  - b. Hinges shall be heavy duty, stainless steel, removable type, and fastened by tapping into 1/4"x3/4" stainless steel bar stock inside the door pan and behind the door jamb.
  - c. The door face shall be flush with the cabinet body when fully closed.
  - d. Size widths of doors equally when installed in pairs, or in series with other pairs, with no door being greater than 36" in width.
  - e. Doors shall be held closed by permanent magnetic closure devices of an approved type and of sufficient strength to hold the doors shut. Install two (2) per door (minimum), mounted to the door jamb, top and bottom, with opposing chrome-plated steel plates securely fastened to the inner panel of the doors.
8. Undershelves:
- a. All open base tables shall be provided with full-length undershelves of #16 gauge stainless steel fully welded to legs with all joints ground smooth and polished.
  - b. Front edge shall turn down 1-1/2" and under 1/2".
  - c. Turn up rear and ends 2", with integral coved radius, when specified.
  - d. If required by width, provide 1-1/2"x1-1/2"x1/8" galvanized angle bracing mounted to underside, full length.
9. Interior Shelves:
- a. All interior shelves within cabinet bodies, enclosed bases and overhead cabinets, shall be of #16 gauge stainless steel.
  - b. Removable shelves shall be constructed in equal sections, and rest in 1-1/2"x1-1/2"x1/8" stainless steel angle frame. Cove all horizontal corners in accordance with N.S.F. requirements.
  - c. Stationary shelves shall have 2" turn-up on back and ends, and continuously welded to cabinet body, polished and ground smooth to form a one-piece interior free of any crevices.

- d. Front edge shall turn down 1-1/2" and under 1/2", and finished with "z" bar forming completely enclosed edge for maximum strength and sanitation.
- e. Provide 1-1/2"x1-1/2"x1/8" angle bracing mounted to underside, full length.

10. Elevated Shelves:

- a. Shelves over equipment not adjacent to a wall shall be mounted on 1" diameter #16 gauge stainless steel tubular standards neatly fitted with stainless steel base flanges, unless otherwise specified.
- b. The top of the tubular standards shall be completely welded to #14 gauge stainless steel support channels, full width of overshef.
- c. Inside the tubular standard, and welded to same, provide 1/2" diameter steel tension rod extended through countertop and securely anchored to lower framework reinforcing with nuts and lock washers in such a manner as to assure a stable, sway-free structure.
- d. If required by width, provide 1-1/2"x1-1/2"x1/8" stainless steel angle bracing mounted to underside, full length.
- e. Cantilevered shelves, when called for, shall be #16 gauge stainless steel supported on #14 gauge stainless steel brackets welded to 1-5/8" O.D. stainless steel tubular standards extending through the backsplash, and fully welded to the table framework. Provide Klein #481-SH welded sleeves where standards penetrate backsplash.

11. Wall Shelves:

- a. Open wall shelves shall be constructed of #16 gauge stainless steel with back and ends turned up 2", positioned 2" out from face of wall, with all corners welded, and supported on #14 gauge stainless steel brackets.
- b. Brackets shall be flanged inward beneath the shelf and at the wall 1-1/2" with intersecting flanges completely welded, and attached to shelf with studs welded to the underside and bolted with stainless steel lock washers and chrome-plated cap nuts.
- c. Each bracket shall be fastened to the wall with a minimum of two (2) 1/4"-20 stainless steel bolts anchored securely by means of toggles or expansion shields.

12. Sinks:

- a. All sinks shall be the size and shape as shown on drawings, and constructed of #14 gauge stainless steel with backs, bottoms and fronts formed of one continuous sheet and the ends welded in place.
- b. Sinks shall have all corners, both vertical and horizontal, coved on a 3/4" radius electrically welded, ground smooth and polished. Solder in filleted corners will not be acceptable.
- c. Multiple compartment sinks shall be divided with double wall, #14 gauge stainless steel partitions with a 1/2" radius on top and all corners rounded as other corners, continuously welded, ground smooth and polished.
- d. The bottom of each compartment shall be creased to a die stamped recess, tapered and shaped to receive a lever type waste without the use of solder, rivets, or welding.
- e. Provide #14 gauge stainless steel waste lever angle bracket mounted to underside of compartment at front.
- f. The front and exposed ends of sinks shall be fabricated with a 1-1/2", 180° rolled edge. The back and ends adjacent to walls or other fixtures shall be turned up with

integral coved edge 12" high and returned 2-1/2" at the top on a 45° angle. Cap ends of all exposed splashes.

- g. Unless otherwise specified, two (2) faucet holes on 8" centers shall be provided, located over the center line of partitions between compartments, 2-1/2" down from splash break.
- h. Gussets for legs shall be fully welded all around to #12 gauge stainless steel triangular plates fully welded to underside of sink.
- i. Sinks fabricated into working surfaces shall be constructed of the same material and in like manner to sinks specified above, except rolled edge and backsplash shall be omitted and the bowl shall be completely welded integral and flush with the working surface. Where basket type wastes are called for, they shall be fitted with removable seats.
- j. Where sink bowls are exposed, the exterior shall also be polished to a #4 finish.

13. Sink Drainboards:

- a. Drainboards shall be constructed of the same material as the sinks and shall be welded integral to same.
- b. The front portion of drainboards shall continue the 1-1/2", 180° rolled edge of sink bowls on a continuous and level horizontal plane.
- c. The surface of the drainboard shall pitch from 2-1/2" at the end furthest from the sink, to 3" at the bowl; or 1/8" per foot. In addition, the bottom surface shall be dished toward the center for complete drainage.
- d. The backsplash of the drainboard shall match the rear of the sink contour and shall be welded integral thereto, running parallel to the floor.
- e. Drainboards shall be reinforced on the underside with a framework of 1"x4"x1" stainless steel channel underbracing placed at each pair of legs, with exposed ends capped, and one (1) channel running lengthwise.
- f. Where disposer cones are fabricated into drainboards, additional 1"x4"x1" stainless steel channels shall be welded into the top framing, spanning the drainboard from front-to-back on both sides of the cone and located not more than 3" to either side.
- g. Disposer control panels or switches shall be supported beneath drainboards, when specified, by means of a #12 gauge stainless steel mounting bracket.

14. Dishtable Tops:

- a. Dishtables shall be constructed of #14 gauge stainless steel with all corners, both vertical and horizontal, coved on a 3/4" radius electrically welded, ground smooth and polished. Solder in filleted corners will not be acceptable.
- b. Fronts and exposed ends shall be fabricated with a 3" high, 1-1/2", 180° rolled edge with rounded corners. The back and ends adjacent to walls or other fixtures shall be turned up with integral coved edge 12" high and returned 2-1/2" at the top on a 45° angle. Cap ends of all exposed splashes.
- c. All tops shall slope 1/8" per foot (minimum).
- d. Dishtables shall be reinforced on the underside with a framework of 1"x4"x1" stainless steel channel underbracing placed at each pair of legs, with exposed ends capped, and one (1) channel running lengthwise fully welded between front-to-back channels.
- e. Where tops fit into dishmachines, they shall turn down and into, forming a sealed watertight fit, and attached according to dishmachine manufacturers instructions.
- f. On each side of dishmachine, tables shall be provided with integral splash shields as part of the backsplash.
- g. Silicon filling of gaps caused by poor fit will not be acceptable.

- h. On corner-type door machines, provide #14 gauge stainless steel wall-mounted, splash panel to protect adjacent wall, full width of door opening.

15. Cafeteria Style Counters:

- a. All counters shall be constructed as previously specified under Enclosed Bases.
- b. Provide top and bottom framing for each counter food pan, cold pan, coffee urn, ice cream unit, ice bin, dish dispenser, etc., whether a drop-in unit or a cutout for a portable unit.
- c. Where plate shelves occur, frame horizontally 8-1/2" back from counter edge or as design dictates, and at bottom of shelf at counteredge.
- d. The countertop shall be constructed of #14 gauge stainless steel, as previously specified, with all joints welded, ground and polished.
- e. Fronts and exposed ends shall be stainless steel, plastic laminate or other material as noted in the Item Specifications.
- f. All display glass shelving shall be 1/4" polished plate glass and fully trimmed with #18 gauge stainless steel formed channels. Top shelves shall be the same width as the shelf below. Shelves shall be supported on 5/8" square, #16 gauge stainless steel perimeter tubing fully welded to 1-1/4" square, #16 gauge stainless steel tubing uprights.
- g. Provide appropriate adjustable glass sneeze or breath guards trimmed in stainless steel along front, entire length, mounted in Klein 4465-A brackets.
- h. Protector shelf over hot food wells shall be #16 gauge stainless steel supported on 1-1/4" square, #16 gauge stainless steel tubing uprights, with 1/4" polished plate glass front and end panels trimmed in #18 gauge stainless steel channels. When specified for self-service, mount bottom edge of front panel 8" above countertop.
- i. All display and protector shelves shall be furnished with full-length fluorescent lights wired to on/off switch in counter apron, with lamps and protective shields. Conceal all wiring in tubular uprights.
- j. Refer to Item Specification for changes, as required.
- k. Counter shall be internally wired complete by the K.E.C., and in such a way as to meet the requirements of the Electrical Code of the job location.

2.4 EQUIPMENT:

- A. All items listed on the Contract Documents under the heading "Equipment Schedule" shall be furnished in strict accordance with the foregoing specifications and with the following detailed Itemized Specifications.
- B. Manufacturer's names and model numbers are shown establishing quality, size, and finish required, representing the Owner's and Consultant's requirements and basis for bid. Equipment is listed hereinafter with same item numbers as shown on Contract Documents.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before beginning the installation of foodservice equipment, the spaces and existing conditions shall be examined by the K.E.C. and any deficiencies, discrepancies, or unsatisfactory



conditions for proper installation of foodservice equipment shall be reported to the Architect in writing.

1. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner satisfactory to the installer.
2. Beginning installation shall constitute acceptance of the area.

### 3.2 PREPARATION

- A. Foodservice equipment drawings are diagrammatic and intended to show layout, arrangement, mechanical and electrical requirements.
- B. Field verify all measurements at the building prior to fabrication of custom equipment. Coordinate measurements and dimensions with rough-in and space requirements.

### 3.3 INSTALLATION

- A. The K.E.C. shall coordinate his delivery schedule with the Contractor to ensure adequate openings in the building to receive the equipment.
- B. Equipment shall be uncrated, fully assembled and set level in position for final connections. Parts shipped loose but required for connection shall be properly tagged and shall be accompanied by the necessary installation instructions.
- C. Provide a competent, experienced foreman to supervise installation and final connections with other trades.
- D. Remote Refrigeration Systems:
  1. All refrigeration work where applicable to this contract shall be accomplished in an approved manner, using finest quality fittings, controls, valves, etc.
  2. Refrigeration items shall be started up, tested, adjusted, and turned over to the Owner in first class condition and left running in accordance with the manufacturer's instructions.
  3. Refrigeration lines and hook-ups shall be completed by the K.E.C. with the exception of electric, water, and drain line final connections unless otherwise specified.
  4. All copper tubing shall be refrigerant grade A.C.R. or type "L".
  5. Silver solder and/or Sole-Phase shall be used for all refrigerant piping. Soft solder is not acceptable.
  6. All refrigerant lines in pipe sleeves or conduit shall be effectively caulked at ends to prevent entrance of water or vermin and at penetrations through walls or floors.
  7. All tubing shall be securely anchored with clamps, and suspended lines shall be supported with adjustable hangers at 6'-0" o.c. maximum.
  8. Wrap drain line in freezer compartment(s) with approved heat-tape for final connection by Electrical Contractor.
- E. Sealing and Caulking:
  1. Prior to the application of sealant, all surfaces shall be thoroughly cleaned and degreased.
  2. Apply around each unit of permanent installation at all intersections with walls, floors, curbs or other permanent items of equipment.

3. Joints shall be air-tight, water-tight, vermin-proof, and sanitary for cleaning purposes.
4. In general, joints shall be not less than 1/8" wide, with backer rod to shape sealant bead properly at 1/4" depth. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint.
5. At internal corner joints, apply sealant or gaskets to form a sanitary cove, of not less than 3/8" radius.
6. Provide sealant-filled joints up to 3/4" in joint width. Trim strips for wider joints shall be set in a bed of sealant and attached with stainless steel fasteners, 48" o.c., or less, to insure suitable fastening and prevent buckling of the metals fastened.

F. Cutting:

1. All cutting, fitting, or patching required during installation shall be accomplished by the K.E.C., at his own expense, so as to make the work conform to the plans and specifications.
2. The K.E.C. shall not cut or otherwise alter, except with the consent of the Owner, the work of any other Contractor.
3. Provide cut-outs in foodservice equipment where required to run plumbing, electric, or steam lines through equipment items for final connections.

3.4 FIELD QUALITY CONTROL

A. Inspection:

1. Provide access to shop fabrication areas during normal working hours to facilitate inspection of the equipment, during construction, by the Architect or his authorized representative.
2. Errors found during these inspections shall be corrected to the extent required within the scope of the plans, specifications, and approved drawings.

B. Start-Up and Testing:

1. Delay start-up of foodservice equipment until service lines have been tested, balanced, and adjusted for pressure, voltage, and similar considerations; and until water and steam lines have been cleaned and treated for sanitation.
2. Before testing, lubricate each equipment item in accordance with manufacturer's recommendations.
3. Supply a trained person or persons who shall start up all equipment, test and make adjustments as necessary, resulting in each item of equipment, including controls and safety devices, performing in accordance with the manufacturer's specifications.
4. All gas-fired equipment shall be checked by the local gas company as to calibration, air adjustments, etc., and adjustments made as required.
5. Repair or replace any equipment found to be defective in its operation, including items which are below capacity or operating with excessive noise or vibration.

C. Demonstration:

1. Provide an operating demonstration of all equipment at a time of Owner's convenience, to be held in the presence of authorized representatives of the Architect and Owner.
2. Demonstration shall be performed by manufacturer's representative knowledgeable in all aspects of his equipment.

3. During the demonstration, instruct the Owner's operating personnel in the proper operation and maintenance of the equipment.
4. Furnish complete, bound, operation/maintenance manuals and certificates of warranty for all items of equipment provided, in accordance with Article 1.5 Submittals, Paragraph F, at this demonstration time.

### 3.5 ADJUST AND CLEAN

- A. Upon completion of installation and tests, clean and sanitize foodservice equipment, and leave in condition ready for use in food service.
- B. Remove all protective coverings, and thoroughly clean equipment both internally and externally.
- C. Make and check final adjustments required for proper operation of the equipment.
- D. Restore finishes marred during installation to remove abrasions, dents, and other damages. Polish stainless steel surfaces, and touch-up painted surfaces with original paint.
- E. Clean up all refuse, rubbish, scrap materials, and debris caused by the work of this Section, and put the site in a neat, orderly, and broom-clean condition.

### 3.6 EQUIPMENT SCHEDULE

#### **ITEM #1: FLY FAN**

---

QUANTITY: One (1)  
MANUFACTURER: Mars Air Doors  
MODEL NO.: N242-1UA-SS (N058)  
PERTINENT DATA: 42" Long, Wall-Mounted, Stainless Steel  
UTILITIES REQ'D: 1/2HP, 120V, 1PH  
ALTERNATE MFRS.: Berner

Furnish and install per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

1. Accessories:
  - Plunger-type micro-switch.
2. Attach to wall with expansion bolts centered over door opening.

#### **ITEM #2: SHELVING**

---

QUANTITY: One (1)  
MANUFACTURER: InterMetro Industries Corporation  
MODEL NO.: MetroMaxQ (N058)  
PERTINENT DATA: Free-Standing, Open-Grid Polymer Shelf Mat  
UTILITIES REQ'D: ---  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

**ITEM #2: (Continued)**

---

Soap Storage:

1. One (1) #MQ1842G section; 18" W x 42" L x 4-tier high.
2. Four (4) #MQ74PE polymer posts; 74" high.
3. Plastic wedge lock connectors, quantity as required.
4. Locate bottom shelf @ 12" A.F.F.; space remaining shelves equally.

**ITEM #3: MOP SINK & RACK**

---

QUANTITY: One (1)  
MANUFACTURER: IMC/Teddy  
MODEL NO.: FS (N058)  
PERTINENT DATA: Floor Mounted, Stainless Steel  
UTILITIES REQ'D: 1/2" HW, 1/2" CW, 4" W  
ALTERNATE MFR: Eagle Group

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Accessories:
  - One (1) #SSF service sink wall faucet.
  - Two (2) #MH3 mop holders, six (6) total.
  - One (1) #HA hose and bracket assembly.
2. K.E.C. to furnish #16 gauge stainless steel wall flashing along two (2) walls adjacent sink, 36" high. Attach to wall with non-exposed fasteners and seal to wall and sink.

**ITEM #4: WALK-IN COOLER/FREEZER**

---

QUANTITY: One (1)  
MANUFACTURER: Bally  
MODEL NO.: Indoor Installation (N058)  
PERTINENT DATA: 4" Thick Urethane Panel - Class I, NSF Construction  
UTILITIES REQ'D: 1,300W, 120V, 1PH; (2) 3/4" IW  
ALTERNATE MFRS.: ThermalRite; American Panel; Thermo-Kool

Furnish and install per Equipment Plan, Sheet K1.01; Building Conditions Plan, Sheet K1.02; Manufacturer's Shop Drawing and the following:

1. Two-Section Unit, 14'-5½" L x 11'-7" D x 8'-6" H. Size width of interior compartments equally.
2. Exterior Finish:
  - 26 GA stucco embossed galvanized steel where unexposed.
  - 22 GA stucco embossed stainless steel where exposed.
3. Interior Finish:
  - White .040 stucco embossed aluminum walls.

**ITEM #4: (Continued)**

---

- White acrylic enamel baked on 26 GA smooth galvanized steel ceiling.
- 4. Interior Floor:
  - 4" prefabricated floor panels installed in 6" deep floor recess over hot asphalt paper or 6 MIL polyethylene sheets on building floor slab.
  - 2" setting bed with two (2) layers of wire reinforcing mesh fabric and quarry tile floor material with 6" high integral coved base, both interior and exterior of box, installed over prefabricated floor panel by Flooring Contractor.
- 5. Entrance Door:
  - Two (2) flush-mounted, self-closing right-hand hinged doors with 34" x 76" net opening.
  - Polished chrome camlift hinges with lift off capability. Provide one (1) extra hinge per door, three (3) total.
  - Kason #1236 polished chrome lever-action handle with knob turn release and cylinder lock.
  - Kason #09440004 polished chrome dead-bolt lock, factory mounted.
  - Hydraulic door closer.
  - Mount Kason #1806 LED light fixture centered over door opening to avoid conflict with shelving, each compartment. Extend conduit up in door frame header to junction box mounted on top.
  - Foot treadle door opener.
  - Standard 2" diameter dial indicating thermometer factory mounted, each compartment.
  - Pilot light and switch assembly factory mounted in door frame with stainless steel coverplate.
  - 36" high aluminum diamond tread kickplates, interior and exterior of door, frame and jamb.
  - 14" x 24" heated observation windows, both entrance doors.
  - Undercut doors for quarry tile floor.
  - Kason #907 interior door handle, factory mounted, with concealed metal backing plate.
  - Round vinyl door bumper mounted to front exterior face to protect handle from puncturing wall when door in full open position.
  - Heavy-duty stainless steel heated threshold, both compartments.
  - Engraved phenolic plastic compartment signs - 12" long x 2" high; white in color with 1" high blue CAPITAL letters mounted on each door above observation window; (1) - COOLER, (1) - FREEZER.
- 6. One (1) heated pressure relief port in freezer.
- 7. Four (4) Kason #1810L21248LB 48" long twin-tube LED light fixtures with shatter-proof high impact plastic covers centrally-mounted to walk-in ceiling per Detail, Sheet K1.04, two (2) for the cooler, two (2) for the freezer. Provide low-temperature ballast (-20°F) in freezer lights. Fixtures shipped loose and mounted by K.E.C.; final connection by Electrical Contractor.
- 8. Modularm Corporation Model 75LC recessed digital thermometer with audio-visual temperature alarm factory mounted in door panel and inter-wired with building monitoring system, as required by Electrical Contractor.
- 9. Provide and install trim strips of matching exterior finish between ends of walk-in panels and building walls from finish floor to 6" above finish ceiling; K.E.C. to verify ceiling height.
- 10. Provide and install closure panels of matching exterior finish between top of walk-in and finish ceiling. K.E.C. to verify finished ceiling height.
- 11. All electrical conduit shall be run concealed above walk-in ceiling, per Detail Sheet K1.04.

**ITEM #4: (Continued)**

---

12. Evaporator coil drain lines shall be run to floor drain with "P"-trap on exterior of box by Plumbing Contractor.
13. Black flexible "Armaflex" insulation applied to exposed drain lines and fittings within interior of box by Refrigeration Contractor.
14. Spiral heat tape applied to drain line within interior of freezer compartment prior to application of insulation by Electrical Contractor. Drain line heating cable shall be installed for continuous 24-hour operation.
15. Coordinate location of sprinkler system drops and provide penetrations, where necessary.
16. K.E.C. to seal and insulate all openings to prevent infiltration of warm air into cooler/freezer compartments.
17. Accessories:
  - Two (2) Mars Air LoPro #LPN36-IU air door curtains with optional on/off microswitch. Electrical Contractor to provide power receptacle and final connection. Center fan over each entrance door opening and attach to wall panel with thru-bolts.
18. Quality Inspection Requirement:
  - Walk-In shall be completely erected at the manufacturer's facility prior to shipment and a quality control inspection performed on the assembled structure. Digital photographs of the assembled walk-in shall be provided for the K.E.C. permanent records and included in the operation and maintenance manuals.

**ITEM #5: COOLER REFRIGERATION SYSTEM**

---

QUANTITY: One (1)  
MANUFACTURER: Bally Refrigerated Boxes, Inc.  
MODEL NO.: BEHA009E6-HS2B (N058)  
PERTINENT DATA: BEH-Line Series, Air Cooled, Outdoor Installation, Remote, With KE2 Therm Demand Defrost Controller  
UTILITIES REQ'D: 9.2A, 208V, 1PH  
ALTERNATE MFRS.: RDT; Omni-Temp; ColdZone

Furnish and install per Equipment Plan, Sheet K1.01; Manufacturer's Shop Drawing and the following:

1. Condensing Unit: Factory Pre-Assembled, Hermetic, Medium Temperature, R-404A.
2. System located outdoors on roof. Curb with pitch-pocket furnished and installed by General Contractor.
3. Complete winterization package and condensing unit weatherproof cover.
4. Factory installed air defrost timer with contactors and relays.
5. Overall size: 24 $\frac{7}{8}$ " L x 30 $\frac{3}{8}$ " W x 16 $\frac{7}{8}$ " H.
6. Weight: 152 lbs.

**ITEM #5: (Continued)**

---

7. Evaporator Coil with High-Efficiency EC Motors: Low-Profile, End-Mount Type, Model BLP209MA-S1B\_ECM; 2.3A, 120V, 1PH
  - System to operate at +35°F.
  - Furnished complete with solid-state temperature sensors, electric expansion valve, transformer, coil compressor contactor, low-pressure time-delay switch and pressure transducer ready for final connection by Refrigeration Contractor.
  - KE2 Therm Demand Defrost Electronic Controller with remote monitoring and diagnostics consisting of a microprocessor driven controller, sensors and an optional Electronic Expansion Valve (EEV) factory-installed.
  - Furnish Cat5 cable and interwire to building monitoring system by Electrical Contractor.
8. Factory certified installers to provide complete refrigeration system warrantee: five (5) years for the compressor, two (2) years for the condensing unit, and two (2) years for all parts of the evaporator coil.
9. Factory installed main-fused disconnect switch.

**ITEM #6: FREEZER REFRIGERATION SYSTEM**

---

QUANTITY: One (1)  
MANUFACTURER: Bally Refrigerated Boxes, Inc.  
MODEL NO.: BEHA025L6-HT3B (N058)  
PERTINENT DATA: BEH-Line Series, Air Cooled, Outdoor Installation, Remote, With KE2 Therm Demand Defrost Controller  
UTILITIES REQ'D: 12.6A, 208V, 3PH  
ALTERNATE MFRS.: RDT; Omni-Temp; ColdZone

Furnish and install per Equipment Plan, Sheet K1.01; Manufacturer's Shop Drawing and the following:

1. Condensing Unit: Factory Pre-Assembled, Hermetic, Low Temperature, R-404A.
2. System located outdoors on roof. Curb with pitch-pocket furnished and installed by General Contractor.
3. Complete winterization package and condensing unit weatherproof cover.
4. Factory installed electric defrost timer with contactors and relays.
5. Overall size: 36<sup>3</sup>/<sub>8</sub>" L x 30<sup>3</sup>/<sub>8</sub>" W x 19<sup>7</sup>/<sub>8</sub>" H.
6. Weight: 281 lbs.
7. Evaporator Coil with High-Efficiency EC Motors: Low-Profile, End-Mount Type, Model BLP209LE-S2B\_ECM, 1.4A, 208V, 1PH (Fan); 10.3A, 208V, 1PH (Defrost Heater)
  - System to operate at -10°F.
  - Furnished complete with solid-state temperature sensors, electric expansion valve, transformer, coil compressor contactor, low-pressure time-delay switch and pressure transducer ready for final connection by Refrigeration Contractor.
  - KE2 Therm Demand Defrost Electronic Controller with remote monitoring and diagnostics consisting of a microprocessor driven controller, sensors and an optional Electronic Expansion Valve (EEV) factory-installed.

**ITEM #6: (Continued)**

---

- Furnish Cat5 cable and interwire to building monitoring system by Electrical Contractor.
- 9. Complete refrigeration system warrantee: five (5) years for the compressor, Two (2) years for the condensing unit, and Two (2) years for all parts of the evaporator coil.
- 10. Factory installed main-fused disconnect switch.

**ITEM #7: DUNNAGE RACK, MOBILE**

---

QUANTITY: Four (4)  
MANUFACTURER: InterMetro Industries Corporation  
MODEL NO.: Super Erecta (N058)  
PERTINENT DATA: With Wire Mat, Metroseal 3™ Epoxy-Coated  
UTILITIES REQ'D: ---  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

Cooler:

1. Two (2) #MHP33K3 units; 18" W x 36" L.

Freezer:

1. Two (2) #MHP33K3 units; 18" W x 36" L.

**ITEM #8: SHELVING, MOBILE**

---

QUANTITY: Ten (10)  
MANUFACTURER: InterMetro Industries Corporation  
MODEL NO.: MetroMax i (N058)  
PERTINENT DATA: Open-Grid Shelf Mat, Polymer  
UTILITIES REQ'D: ---  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

Cooler:

1. One (1) #MX1836G section; 18" W x 36" L x 4-tier high.
2. Four (4) #MX1842G sections; 18" W x 42" L x 4-tier high.
3. Twenty (20) #MX63UP polymer posts for stem casters, 63" high.
4. Ten (10) #5MPX polyurethane swivel casters with bumpers.
5. Ten (10) #5MPBX polyurethane swivel casters with brakes and bumpers.



**ITEM #8: (Continued)**

---

6. Plastic wedge lock connectors, quantity as required.
7. Locate bottom shelf @ 10" A.F.F.; space remaining shelves equally.

Freezer:

1. One (1) #MX1836G section; 18" W x 36" L x 4-tier high.
2. Four (4) #MX1842G sections; 18" W x 42" L x 4-tier high.
3. Twenty (20) #MX63UP polymer posts for stem casters, 63" high.
4. Ten (10) #5MPX polyurethane swivel casters with bumpers.
5. Ten (10) #5MPBX polyurethane swivel casters with brakes and bumpers.
6. Plastic wedge lock connectors, quantity as required.
7. Locate bottom shelf @ 10" A.F.F.; space remaining shelves equally.

**ITEM #9: SHELVING**

---

QUANTITY: Fourteen (14)  
MANUFACTURER: InterMetro Industries Corporation  
MODEL NO.: MetroMaxQ (N058)  
PERTINENT DATA: Free-Standing, Open-Grid Polymer Shelf Mat, Adjustable Epoxy-Coated Wire Shelves  
UTILITIES REQ'D: ----  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

Dry Storage:

1. Three (3) #MQ1842G sections; 18" W x 42" L x 5-tier high.
2. Three (3) #MQ1848G sections; 18" W x 48" L x 5-tier high.
3. Two (2) #MQ1854G sections; 18" W x 54" L x 5-tier high.
4. Thirty-two (32) #MQ74PE polymer posts; 74" high.
5. Plastic wedge lock connectors, quantity as required.
6. Locate bottom shelf @ 12" A.F.F.; space remaining shelves equally.

Non-Food Storage:

1. Two (2) #MQ1836G sections; 18" W x 36" L x 5-tier high.
2. Four (4) #MQ1848G sections; 18" W x 48" L x 5-tier high.

**ITEM #9: (Continued)**

---

3. Twenty-four (24) #MQ74PE polymer posts; 74" high.
4. Plastic wedge lock connectors, quantity as required.
5. Locate bottom shelf @ 12" A.F.F.; space remaining shelves equally.

**ITEM #10: SPARE NUMBER**

---

**ITEM #11: DUNNAGE RACK**

---

QUANTITY: One (1)  
MANUFACTURER: InterMetro Industries Corporation  
MODEL NO.: MetroMax (N058)  
PERTINENT DATA: Stationary, With Open-Grid Shelf, Polymer  
UTILITIES REQ'D: ---  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

Dry Storage:

1. One (1) #MHP2460G polymer shelf unit; 24" W x 60" L.
2. One (1) #M3TF2460E three-sided frame.
3. Four (4) #MX13P polymer posts, 13" high.

**ITEM #12: PREP SINK**

---

QUANTITY: One (1)  
MANUFACTURER: Custom Fabricated  
MODEL NO: #14 GA Stainless Steel  
PERTINENT DATA: 7'-0" Long x 2'-6" Wide x 2'-10" High  
UTILITIES REQ'D: 1/2" HW, 1/2" CW, (2) 1-1/2" IW  
ALTERNATE MFRS None

Fabricate and set-in-place per Equipment Plan, Sheet K1.01; Fabrication Detail, Sheet K5.01; and the following:

1. Front and end edge rolls per Detail 1.02B.
2. 13" high back, right and partial left end splash per Detail 1.04A.
3. Framework per Detail 1.05.
4. Legs per Detail 1.07.
5. Stainless steel undershelf on left end per Detail 1.11.

**ITEM #12: (Continued)**

---

6. Full-length table-mounted stainless steel overshef per Detail 1.12A.
7. Sound-deaden underside of sinks and drainboards with NSF-approved sound dampening material.
8. Accessories:
  - One (1) T&S #B-231 backsplash-mounted swing spout faucet with #B-199-1 aerator.
  - Two (2) T&S #B-3950-01 twist waste valves with overflow assemblies and #010387-45 basket strainers.
9. Item will remain shrink-wrapped until ready for final connection by Plumbing Contractor. Immediately following completion of final connections, K.E.C. shall re-shrink-wrap tubs or provide removable panel to avoid use by construction trades. Post sign on wall above sink tubs in English and Spanish stating: **WARNING! NOT TO BE USED BY CONSTRUCTION TRADES. FAILURE TO COMPLY WILL RESULT IN \$500.00 FINE AND ALL COSTS TO REPLACE ITEM WITH NEW.**

**ITEM #13: HAND SINK**

---

QUANTITY: Three (3)  
MANUFACTURER: Eagle Foodservice Equipment, Inc.  
MODEL NO.: HSA-10-FAW-LRS (N058)  
PERTINENT DATA: Wall Mounted Assembly, With Wrist Handles  
UTILITIES REQ'D: 1/2" CW, 1/2" HW, 1-1/2" W  
ALTERNATE MFRS.: Advance/Tabco; Krowne

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

1. Complete sink assembly consisting of gooseneck faucet, p-trap, wrist handles, tailpiece and basket drain.
2. Accessories:
  - #606215 skirt assembly.
  - Left and right end splashes.

**ITEM #14: SOAP & TOWEL DISPENSER -- (N.I.K.E.C. – SPECIFIED BY ARCHITECT)**

---

QUANTITY: Three (3)

**ITEM #15: EYE WASH STATION**

---

QUANTITY: One (1)  
MANUFACTURER: Speakman Company  
MODEL NO.: SE-582-ADA (N058)  
PERTINENT DATA: Wall-Mounted, Dual Aerated Spray Heads with Automatic Flow Control, Stainless Steel Bowl  
UTILITIES REQ'D: 1/2"HW, 1/2" CW, 1-1/2" W  
ALTERNATE MFRS.: T&S Brass

Furnish and install per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

**ITEM #15: (Continued)**

---

1. Accessories:
  - P-trap.
  - Flow switch.
  - Eye wash station emergency signage.
  - Thermostatic mixing valve.
  - Scald protection valve.

**ITEM #16: PAN RACK CART, MOBILE**

---

QUANTITY: Two (2)  
MANUFACTURER: CresCor  
MODEL NO.: 207-UA-13A (N058)  
PERTINENT DATA: Universal Angles, Channel Posts, (18) 22x20 Pan Capacity  
UTILITIES REQ'D: ----  
ALTERNATE MFR: InterMetro; Lakeside

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Accessories:
  - Full perimeter non-marking wrap-around vinyl bumper.

**ITEM #17: WORKTABLE**

---

QUANTITY: Two (2)  
MANUFACTURER: Custom Fabricated  
MODEL NO.: #14 GA Stainless Steel  
PERTINENT DATA: 9'-0" Long x 2'-6" Wide x 3'-0" High  
UTILITIES REQ'D: ----  
ALTERNATE MFRS.: None

Fabricate and set-in-place per Equipment Plan, Sheet K1.01; Fabrication Detail, Sheet K5.01; and the following:

1. Perimeter edge roll per Detail 1.02M.
2. Framework per Detail 1.05.
3. Legs per Detail 1.07.
4. Stainless steel undershelf per Detail 1.11.
5. Two (2) stainless steel drawer assemblies per Detail 1.14, Type I with locks.
6. Worktable per Detail 2.01.
7. Sound-deaden underside of tabletop with NSF-approved sound dampening material.
8. Accessories:
  - One (1) Edlund #S-11C manual can opener mounted on table adjacent prep sink.

**ITEM #18: POT & PAN SHELVING, MOBILE**

---

QUANTITY: One (1)  
MANUFACTURER: InterMetro Industries Corporation  
MODEL NO.: MetroMax i (N058)  
PERTINENT DATA: Open-Grid Shelf Mat, Polymer  
UTILITIES REQ'D: ----  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. One (1) #MX2448G shelf section; 24" W x 48" L x 4-tier high.
2. Four (4) #MX63UP polymer posts for stem casters, 63" high.
3. Two (2) #5MPX polyurethane swivel casters with donut bumpers.
4. Two (2) #5MPBX polyurethane swivel casters with brakes and donut bumpers.
5. Plastic wedge lock connectors, quantity as required.
6. Locate bottom shelf @ 12" A.F.F., space remaining shelves equally.
7. Accessories:
  - One (1) #MTR2448XE tray drying rack.
  - Five (5) #MXD24-8 shelf dividers.

**ITEM #19: POT WASHING SINK**

---

QUANTITY: One (1)  
MANUFACTURER: Custom Fabricated  
MODEL NO.: #14 GA Stainless Steel  
PERTINENT DATA: 12'-0" Long x 2'-6" Wide x 3'-0" High  
UTILITIES REQ'D: (2) 3/4" HW, (2) 3/4" CW, (3) 2" IW  
ALTERNATE MFR.: None

Fabricate and set-in-place per Equipment Plan, Sheet K1.01; Fabrication Detail, Sheet K5.01; and the following:

1. Front edge roll per Detail 1.02B.
2. 13" high backsplash per Detail 1.04A.
3. Framework per Detail 1.05
4. Legs per Detail 1.07.
5. Stainless steel undershelf on left end per Detail 1.11.
6. 8'-0" long table-mounted stainless steel overshelf per Detail 1.12A.
7. Pot sink and drainboards per Detail 3.01.

**ITEM #19: (Continued)**

---

8. Sound-deaden underside of sinks and drainboards with NSF-approved sound dampening material.
9. Accessories:
  - Two (2) T&S #B-290 backsplash mounted swing spout faucets.
  - Three (3) T&S #B-3950-01 twist waste valves with overflow assemblies and #010387-45 basket strainers.
10. Item will remain shrink-wrapped until ready for final connection by Plumbing Contractor. Immediately following completion of final connections, K.E.C. shall re-shrink-wrap tubs or provide removable panel to avoid use by construction trades. Post sign on wall above sink tubs in English and Spanish stating: WARNING! NOT TO BE USED BY CONSTRUCTION TRADES. FAILURE TO COMPLY WILL RESULT IN \$500.00 FINE AND ALL COSTS TO REPLACE ITEM WITH NEW.

**ITEM #20: SPARE NUMBER**

---

**ITEM #21: BULK MILK COOLER, MOBILE**

---

QUANTITY: Two (2)  
MANUFACTURER: Norlake, Inc.  
MODEL NO.: GR422WVW/0 (N058)  
PERTINENT DATA: Self-Contained, 28-Crate Capacity  
UTILITIES REQ'D: 6.4A, 120V, 1PH  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Instructions and the following:

1. Cylinder door locks.
2. Cord and plug set.
3. Accessories:
  - Warrantee: five (5) year compressor, one (1) year service.
  - Four (4) heavy duty 4" diameter swivel casters, front two (2) with brakes.
  - Four (4) standard wire shelves with clips.
  - Condensate vaporizer with drain line kit.

**ITEM #22: WORKTABLE**

---

QUANTITY: One (1)  
MANUFACTURER: Custom Fabricated  
MODEL NO.: #14 GA Stainless Steel  
PERTINENT DATA: 5'-0" Long x 2'-6" Wide x 3'-0" High  
UTILITIES REQ'D: ---  
ALTERNATE MFRS.: None

Fabricate and set-in-place per Equipment Plan, Sheet K1.01; Fabrication Detail, Sheet K5.01; and the following:

**ITEM #22: (Continued)**

---

1. Front and end edge roll per Detail 1.02M.
2. 6" high backsplash per Detail 1.04A.
3. Framework per Detail 1.05.
3. Legs per Detail 1.07.
4. Stainless steel undershelf per Detail 1.11.
5. One (1) stainless steel drawer assembly per Detail 1.14, Type I with lock.
6. Worktable per Detail 2.01.
7. Sound-deaden underside of tabletop with NSF-approved sound dampening material.

**ITEM #23: CONVECTION OVEN**

---

QUANTITY: One (1)  
MANUFACTURER: Blodgett Oven Company, Inc.  
MODEL NO.: MARK V DOUBLE (N058)  
PERTINENT DATA: Double Section, Standard Depth  
UTILITIES REQ'D: (2)11.0KW, 208V, 3PH  
ALTERNATE MFRS: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Stainless steel front, sides, top and back panels.
2. Standard compliment of wire racks, five (5) per section.
3. Doors with dual pane thermal windows and interior light package.
4. 6" high stainless steel legs with adjustable bullet feet.
5. Accessories:  
-- Blower fan guard.

**ITEM #24: EXHAUST CANOPY**

---

QUANTITY: One (1)  
MANUFACTURER: Captive-Aire Systems, Inc.  
MODEL NO: 6630VHB-G (N058)  
PERTINENT DATA: Stainless Steel, Exhaust Only Canopy  
UTILITIES REQ'D: 750 CFM Exhaust; 350W, 120V, 1PH (Lights)  
ALTERNATE MFRS.: Avtec; Gaylord

Furnish and install per Equipment Plan, Sheet K1.01; Exhaust Canopy Details, Sheet K5.02; Manufacturer's Shop Drawing and the following:

**ITEM #24: (Continued)**

---

1. 5'-0" long x 5'-6" wide x 2'-6" high, with bottom edge mounted at 6'-8" A.F.F.
2. Length comprised of one (1) 5'-0" long section.
3. Entire unit constructed of 18 GA stainless steel type 304 with #4 finish on all exposed surfaces with liquid tight all welded external continuous seams and joints.
4. Two (2) U.L. Listed, NSF-Approved, 12" x 12" recessed LED light fixtures, centrally mounted, pre-wired to common junction box. Bulbs furnished and installed by K.E.C.
5. On/Off light and fan wall switches furnished and installed by Electrical Contractor.
6. Matching stainless steel perimeter closure panels to finished ceiling; K.E.C. to verify ceiling height.
7. Hanger rods and support system from structure above by K.E.C.
8. Integral stainless steel hanger brackets.
9. Accessories:
  - #18 gauge stainless steel wall flashing full length of hood to extend from top of finish floor coved base up to bottom edge of hood body. Attach to wall with non-exposed fasteners and seal with clear silicone sealant.
  - Structural front panel.
  - Field wrapper.

**ITEM #25: HEATED TRANSPORT CABINET, MOBILE**

---

QUANTITY: Two (2)  
MANUFACTURER: InterMetro  
MODEL NO.: C5T-BCPS-12JS (N058)  
PERTINENT DATA: Insulated, Half-Size, Adjustable Bottom Load Slides, Digital Solid State Controls  
With Mobile Power Option, For Baltimore County Public Schools  
UTILITIES REQ'D: 12.0A, 120V, 1PH  
ALTERNATE MFRS: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Accessories:
  - #C5T-TRVL travel latch/hasp.

**ITEM #26: PASS-THRU REFRIGERATOR, MOBILE**

---

QUANTITY: Two (2)  
MANUFACTURER: Victory  
MODEL NO.: RS-1D-S1-PT-HD (N058)  
PERTINENT DATA: One-Section, Self-Contained, Stainless Steel Interior/Exterior  
UTILITIES REQ'D: 9.8A, 120V, 1PH  
ALTERNATE MFRS.: None



**ITEM #26: (Continued)**

---

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Half-height doors hinged per Equipment Plan, both sides.
2. Cylinder door locks, keyed-alike.
3. Type A/C #16 gauge stainless steel universal angle-type, bottom support pan slides in lieu of wire shelves installed on 3" centers in top compartment, eight (8) pair total; standard wire shelves in bottom compartment, four (4) total, each unit.
4. Exterior mounted digital thermometer installed on kitchen side.
5. Plastic laminate finish factory applied to door front fascia on serving side only, color as selected by Architect; K.E.C. to verify
6. 5" diameter heavy-duty swivel casters, two (2) with brakes.
7. Cord and plug set.

**ITEM #27: PASS-THRU WARMING CABINET, MOBILE**

---

QUANTITY: Two (2)  
MANUFACTURER: Victory  
MODEL NO.: HS-1D-1-PT-HD (N058)  
PERTINENT DATA: One-Section, Self-Contained, Stainless Steel Interior/Exterior  
UTILITIES REQ'D: 6.3A, 208V, 1PH  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Half-height doors hinged per Equipment Plan, both sides.
2. Cylinder door locks, keyed-alike.
3. Type A/C #16 gauge stainless steel universal angle-type, bottom support pan slides in lieu of wire shelves installed on 3" centers, eight (8) pair total; sixteen (16) total, each unit.
4. Exterior mounted digital thermometer installed on kitchen side.
5. Plastic laminate finish factory applied to door front fascia on serving side only, color as selected by Architect; K.E.C. to verify
6. 5" diameter heavy-duty swivel casters, two (2) with brakes.
7. Cord and plug with matching receptacle furnished and installed by Electrical Contractor.

**ITEM #28: ICE CREAM CABINET, MOBILE**

---

QUANTITY: One (1)  
MANUFACTURER: Master-Bilt  
MODEL NO.: DC-2S (N058)  
PERTINENT DATA: 5.2 Cu. Ft. Capacity, Stainless Steel Top, White Painted Cabinet, Hinged Lids  
UTILITIES REQ'D: 5.7A, 120V, 1PH  
ALTERNATE MFRS.: Norlake

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Accessories:
  - Lid locking device.
  - One (1) set of four (4) 3" diameter casters with heavy duty bracket.
2. Cord and plug set.

**ITEM #29: MILK COOLER, MOBILE**

---

QUANTITY: Two (2)  
MANUFACTURER: Beverage-Air Corporation  
MODEL NO.: SMF34Y-1-S (N058)  
PERTINENT DATA: 34" Wide, Single Access, 8-Case Capacity, Forced-Air Type  
UTILITIES REQ'D: 4.2A, 120V, 1PH  
ALTERNATE MFRS.: None

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Stainless steel exterior and interior finish.
2. Cord and plug set.
3. Cylinder lid lock.
4. Swivel casters.
5. Accessories:
  - #00C01-012A-01 corner bumper kit, each unit.

**ITEM #30: SPARE NUMBER**

---

**ITEM #31: SERVING COUNTER**

---

QUANTITY: One (1)  
MANUFACTURER: The Delfield Company  
MODEL NO.: Shelleyglas Modular Sections, BCPS Prototype Specifications (N058)  
PERTINENT DATA: Straight-Line Configuration, #14 GA Stainless Steel Tops, One Piece Continuous Tray Slide  
UTILITIES REQ'D: 80.0A (Service) 120/208V, 1PH (Single-Point-Connection)  
ALTERNATE MFR.: ColorPoint by Low-Temp Industries

**ITEM #31: (Continued)**

---

Refer to individual counter components listed under alpha headings for specification.

**ITEM #31A: HOT FOOD COUNTER**

---

QUANTITY: Two (2)  
MANUFACTURER: Shelleyglas by The Delfield Company  
MODEL NO.: KH-5-NU-MOD (N058)  
PERTINENT DATA: Open Base, Five (5) Wells, With Drains  
UTILITIES REQ'D: 40.0A, 120/208V, 1PH, 1/2" HW, (5)3/4" IW  
ALTERNATE MFR.: ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Shop Drawing and the following:

1. (A) - 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front mounted on rigid brackets @ 29" A.F.F.
2. (E) - 6" wide full-length fold-down stainless steel plate shelf on server's side.
3. (G) - Sloped front food protector with tempered glass front and fixed end panels.
4. (M) - Radiant heat lamp with incandescent lights and on/off switch.
5. (F) - Line-up interlock for counter body.
6. (QQ) – Food wells with individual drains and quarter-turn ball valves piped independently to isolated compartment within counter base on end opposite Item #31B with stainless steel hinged access door per Detail, Sheet K1.03.
7. (P) - Open understorage with bottom stainless steel shelf.
8. (V) - 6" high stainless steel legs with adjustable bullet feet.
9. Cord and plug with matching receptacle.
10. Standard counter height of 36" A.F.F. turn end down to align and interlock with adjacent frost top counter.
11. All components pre-wired to isolated circuit breaker panel for single-point electrical connection mounted on Item #31B: Frost Top Counter with hinged access door.
12. Exterior body color as selected by Architect; K.E.C. to verify.
13. Accessories:
  - T&S #B-0101-A96 pre-rinse spray with aerator and pull-out 96" long flexible hose mounted on end opposite Item #31B: Frost Top Counter. Furnish counter top with stainless steel escutcheon plate to hold pre-rinse spray.

**ITEM #31B: FROST TOP COUNTER**

---

QUANTITY: Two (2)  
MANUFACTURER: Shelleyglas by The Delfield Company  
MODEL NO.: KCFT-60-NU-MOD (N058)  
PERTINENT DATA: Mechanically Refrigerated, Open Base  
UTILITIES REQ'D: 8.0, 120V, 1PH; 3/4" IW  
ALTERNATE MFR.: ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Shop Drawing and the following:

1. (A) - 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front mounted on rigid brackets @ 29" A.F.F.
2. (G) - Sloped front food protector with tempered glass front and fixed end panels. Provide reduced-height front adjustable panel for self-service.
3. (L) - Fluorescent light fixtures.
4. (F) - Line-up interlock for counter body.
5. (P) - Open understorage with bottom stainless steel shelf.
6. (V) - 6" high stainless steel legs with adjustable bullet feet.
7. Cord and plug with matching receptacle.
8. Modified counter height of 30" A.F.F.
9. Modify length of frost top and food protector to provide an opening adjacent to Item #31A: Hot Food Counter for clear passage of 10"x12" tray.
10. Modified frost top recessed 1" and sized to accept 18"x26" sheet pan.
11. Provide drain line less shut-off valve. Plumber to extend copper drain line to nearest floor sink.
12. All electrical components shall be pre-wired at fabricator's shop to circuit breaker panel located on end of counter per Detail, Sheet K1.04. Panel shall have individual circuit breakers for each component and identified by label.
13. Exterior body color as selected by Architect; K.E.C. to verify.

**ITEM #31C: SOLID TOP COUNTER**

---

QUANTITY: Two (2)  
MANUFACTURER: Shelleyglas by The Delfield Company  
MODEL NO.: KC-28-NU-MOD (N058)  
PERTINENT DATA: 30" Long, Open Base  
UTILITIES REQ'D: 1.0KW, 120V, 1PH (Convenience Receptacle)  
ALTERNATE MFR.: ColorPoint by Low-Temp Industries

**ITEM #31C: (Continued)**

---

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Shop Drawing and the following:

1. (A) - 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front mounted on rigid brackets @ 29" A.F.F.
2. (F) - Line-up interlock for counter body.
3. (P) - Open understorage with bottom stainless steel shelf.
4. (V) - 6" high stainless steel legs with adjustable bullet feet.
5. (Q) – One (1) 15A, 120V, duplex receptacle mounted in counter apron, server's side.
6. Cord and plug with matching receptacle.
7. Modified counter height set @ 30" A.F.F.
8. Provide cut-out in top for Item #32: Ice Cream Display Merchandiser. Counter base shall have isolated compressor housing with louvered stainless steel removable access panel and remote on/off compressor switch, operator's side.
9. All components pre-wired to isolated circuit breaker panel for single-point electrical connection mounted on Item #31B: Frost Top Counter with hinged access door.
10. Exterior body color as selected by Architect; K.E.C. to verify.

**ITEM #31D: CASHIER STAND**

---

QUANTITY: Two (2)  
MANUFACTURER: Shelleyglas by The Delfield Company  
MODEL NO.: KCS-30-MOD (N058)  
PERTINENT DATA: 30" Long  
UTILITIES REQ'D: 15.0A (Dedicated Circuit), 120V, 1PH  
ALTERNATE MFR.: ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Shop Drawing and the following:

1. (A) - 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front mounted on rigid brackets @ 29" A.F.F.
2. (Q) – One (1) 15A convenience outlet mounted below top in counter body. Provide die-raised opening in top for power cord access.
3. Cashier's utility drawer assembly with locking provision.
4. (P) - Open understorage with bottom stainless steel shelf open to server's side. Provide stainless steel undershelf below cashier's drawer in lieu of footrest.
5. (V) - 6" high stainless steel legs with adjustable bullet feet.

**ITEM #31D: (Continued)**

---

6. Cord and plug with matching receptacle.
7. Standard counter height set @ 36" A.F.F. Turn end down to align and interlock with adjacent solid top counter.
8. All components pre-wired to isolated circuit breaker panel for single-point electrical connection mounted on Item #31B: Frost Top Counter with hinged access door.
9. Exterior body color as selected by Architect; K.E.C. to verify.

**ITEM #32: ICE CREAM DISPLAY MERCHANDISER**

---

QUANTITY: Two (2)  
MANUFACTURER: Silver King  
MODEL NO.: SKCTMDI (N058)  
PERTINENT DATA: Drop-In, Hinged Lid  
UTILITIES REQ'D: 2.7A, 120V, 1PH  
ALTERNATE MFRS.: ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K1.01, Manufacturer's Instructions and the following:

1. Accessories:  
-- #10315-08 lock bar kit, each unit.
2. Cord and plug set.

**ITEM #33: CASH REGISTER -- (N.I.C. – FURNISHED BY OWNER)**

---

QUANTITY: Two (2)

**ITEM #34: CONDIMENT COUNTER, MOBILE**

---

QUANTITY: One (1)  
MANUFACTURER: Shelleyglas by The Delfield Company  
MODEL NO.: KC-50-NU-MOD (N058)  
PERTINENT DATA: Storage Base, 50" Long, #14 Gauge Stainless Steel Top  
UTILITIES REQ'D: ----  
ALTERNATE MFR.: ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K1.01; Manufacturer's Shop Drawing and the following:

1. (A) - 10" wide full-length fold-down solid stainless steel tray slide mounted @ 29" A.F.F., both sides.
2. Enclosed understorage base with bottom stainless steel shelf and stainless steel hinged doors with cylinder lock.
3. Modified counter height of 30" A.F.F.

**ITEM #34: (Continued)**

---

4. Four (4) 5" diameter heavy-duty swivel casters, all four (4) with brakes.
5. Exterior body color as selected by Architect; K.E.C. to verify.

**ITEM #35: BREAKFAST CART, MOBILE -- (N.I.C. – FURNISHED BY OWNER)**

---

QUANTITY: Three (3)

**ITEM #36: SIGNAGE -- (N.I.C. - FURNISHED BY OWNER)**

---

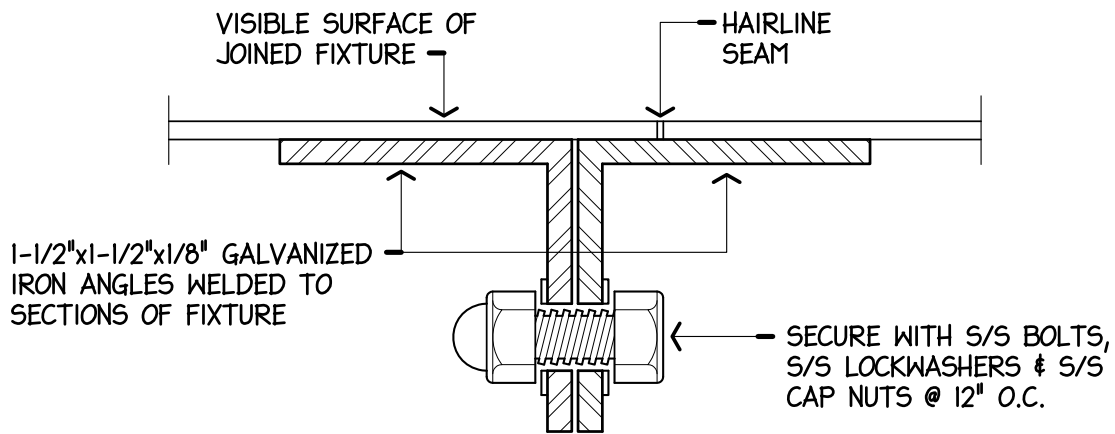
QUANTITY: Two (2)

Furnished by Owner and installed by Contractor per Equipment Plan, Sheet K1.01 and Manufacturer's Instructions.

(END OF FOODSERVICE ITEMIZED SPECIFICATIONS)

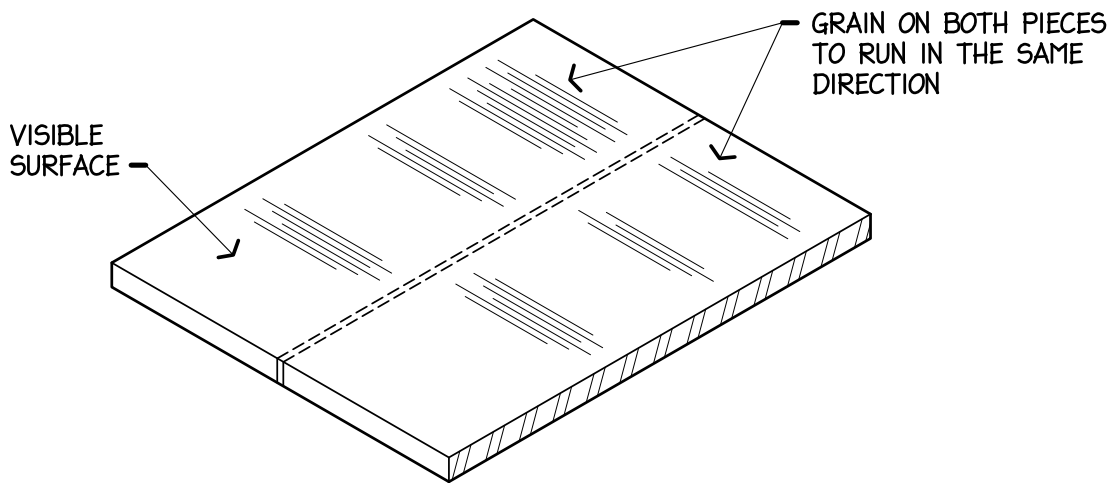
# STANDARD DETAILS





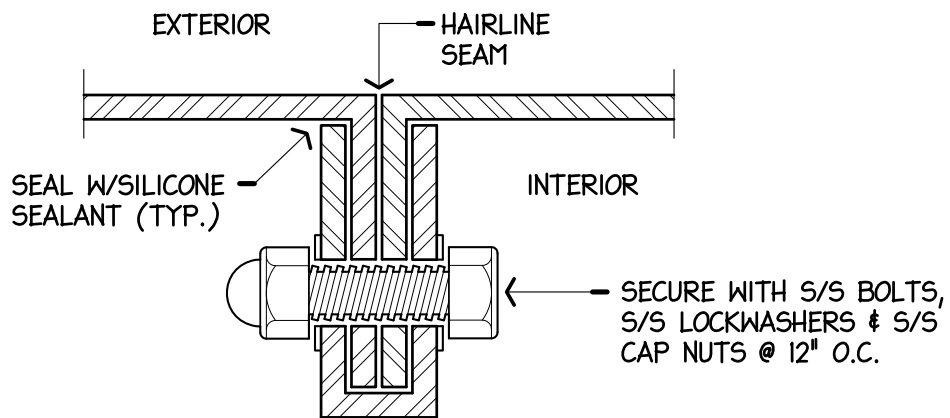
NOTE! JOINED SECTIONS SHALL BE DRAWN TOGETHER LEAVING ONLY A HAIRLINE SEAM.

**A. BOLT DRAWN JOINT**




NOTE! ON FIXTURES SPECIFIED WITH WELDED FIELD JOINTS, WELDS SHALL BE CONTINUOUS, GROUND & POLISHED LEAVING NO VISIBLE EVIDENCE OF WELD.

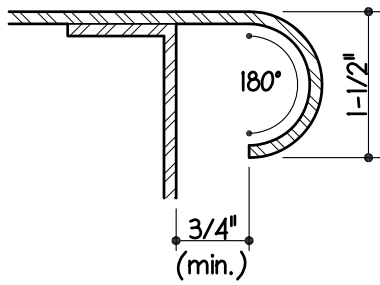
**B. WELDED BUTT JOINT**



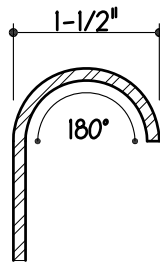
NOTE! JOINED SECTIONS SHALL BE DRAWN TOGETHER LEAVING ONLY A HAIRLINE SEAM.

**C. RAISED CAP SEAM - KNUCKLE JOINT**

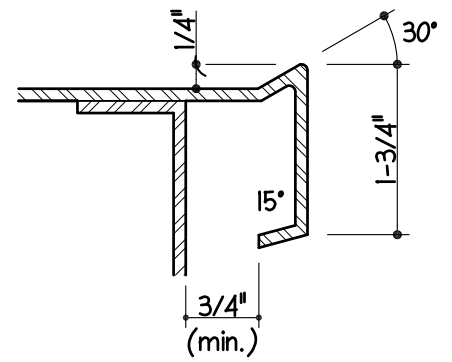
 <p><b>NYIKOS ASSOCIATES, INC.</b> Food Facilities Design/Consulting</p>	DESCRIPTION:	STANDARD DTL:
	FIELD JOINTS & ASSEMBLY	1.01
		PAGE:
		114000-49



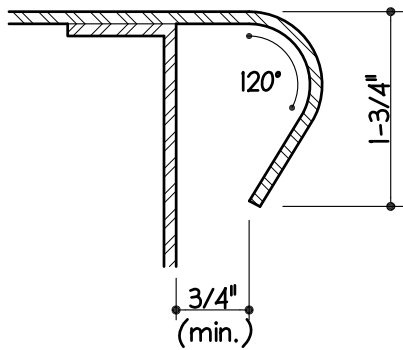
**ROLLED A.**



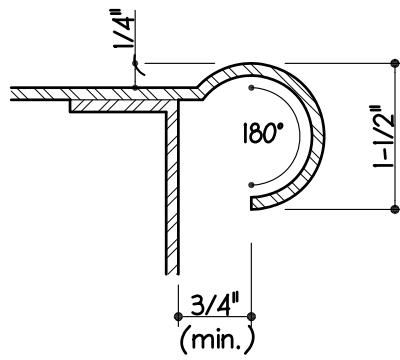
**RAISED ROLLED B.**



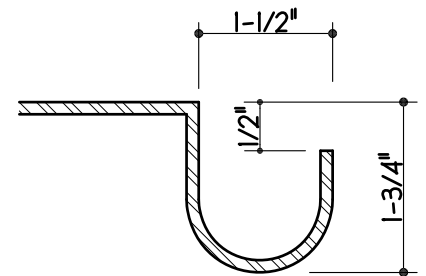
**INVERTED "V" EDGE C.**



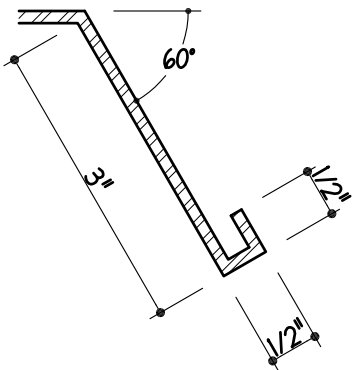
**BULL NOSE ROLLED D.**



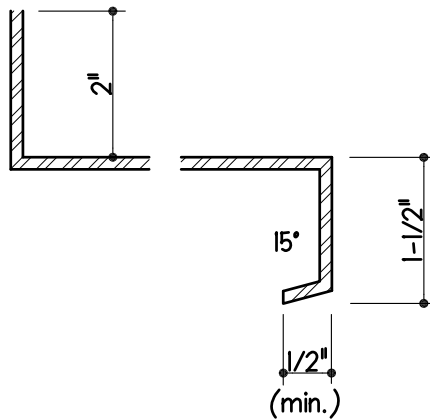
**MARINE EDGE E.**



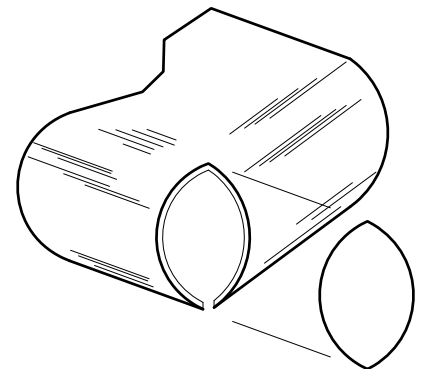
**FLOUR GUTTER F.**



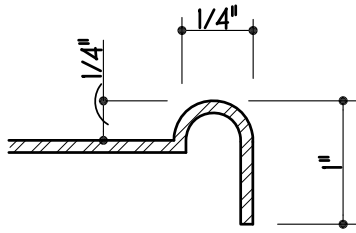
**RECIPE CARD HOLDER G.**



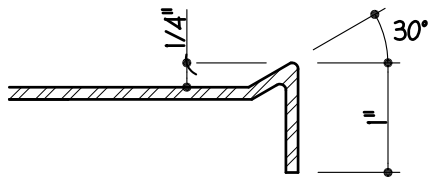
**UNDERSHELF EDGE H.**



**BULL NOSE CORNER I.**

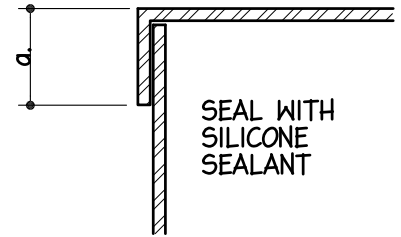


**RAISED OPENING EDGE J.**

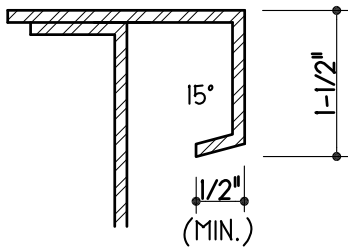


**RAISED OPENING EDGE K.**

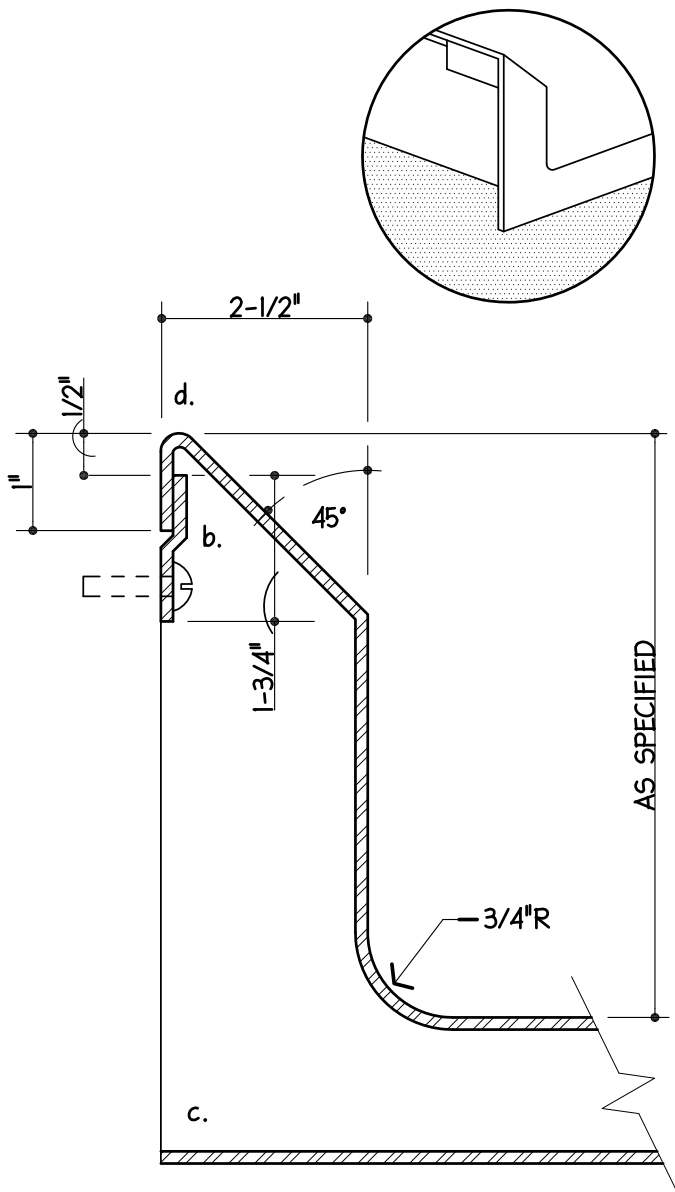
a. AS SPECIFIED, TO MATCH ADJACENT ROLLED EDGES



**STRAIGHT TURN DOWN L.**



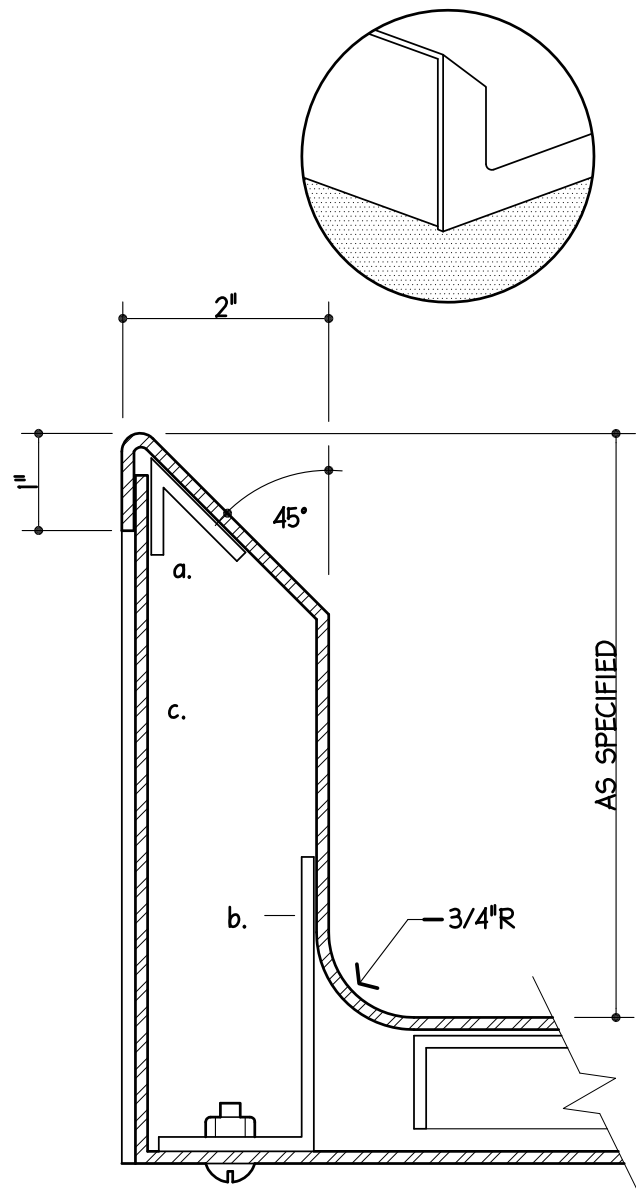
**TURNDOWN EDGE M.**



### WALL UNIT

#### DETAIL A

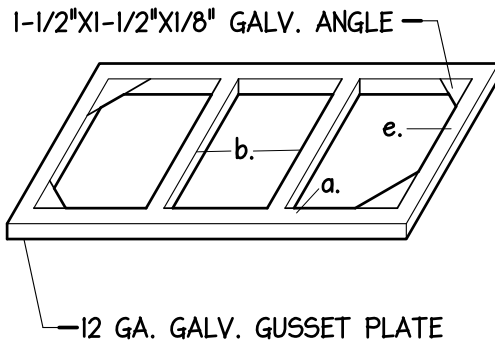
- 2-1/2" AT SINK TO ALLOW FOR CONNECTED OVERFLOW
- 12 GA. S/S CLIPS, 4" LONG, FASTENED TO EACH WALL END OF EACH UNIT & 4'-0" ON CENTER. SECURE TO WALL W/A MINIMUM OF TWO 1/4"x20 S/S TOGGLE BOLTS OR EXPANSION SHIELDS.
- EXPOSED ENDS TO BE FULLY WELDED CLOSED.
- SEAL ALL AROUND TO WALL WITH SILICONE SEALANT.



### FREE STANDING UNIT

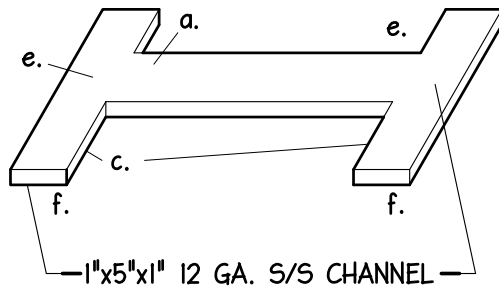
#### DETAIL B

- 1"x1"x14 GA. S/S x1-1/2" LONG RETAINING CLIP WELDED IN PLACE. ONE AT EACH END OF UNIT AND 12" ON CENTER.
- 2-1/2"x1-1/2"x1-1/2" 14 GA. S/S CLIP WELDED TO SPLASH. ONE AT OF EACH UNIT & 12" ON CENTER.
- 14 GA S/S PANEL SECURED TO CLIPS W/ S/S OVALHEAD BOLT. WELD NUT TO CLIP.
- EXPOSED ENDS TO BE FULLY WELDED.



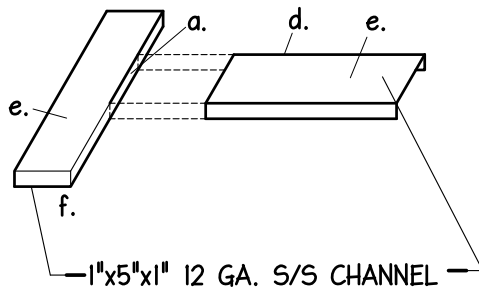
**TABLES**

**A.**



**DISHTABLES**

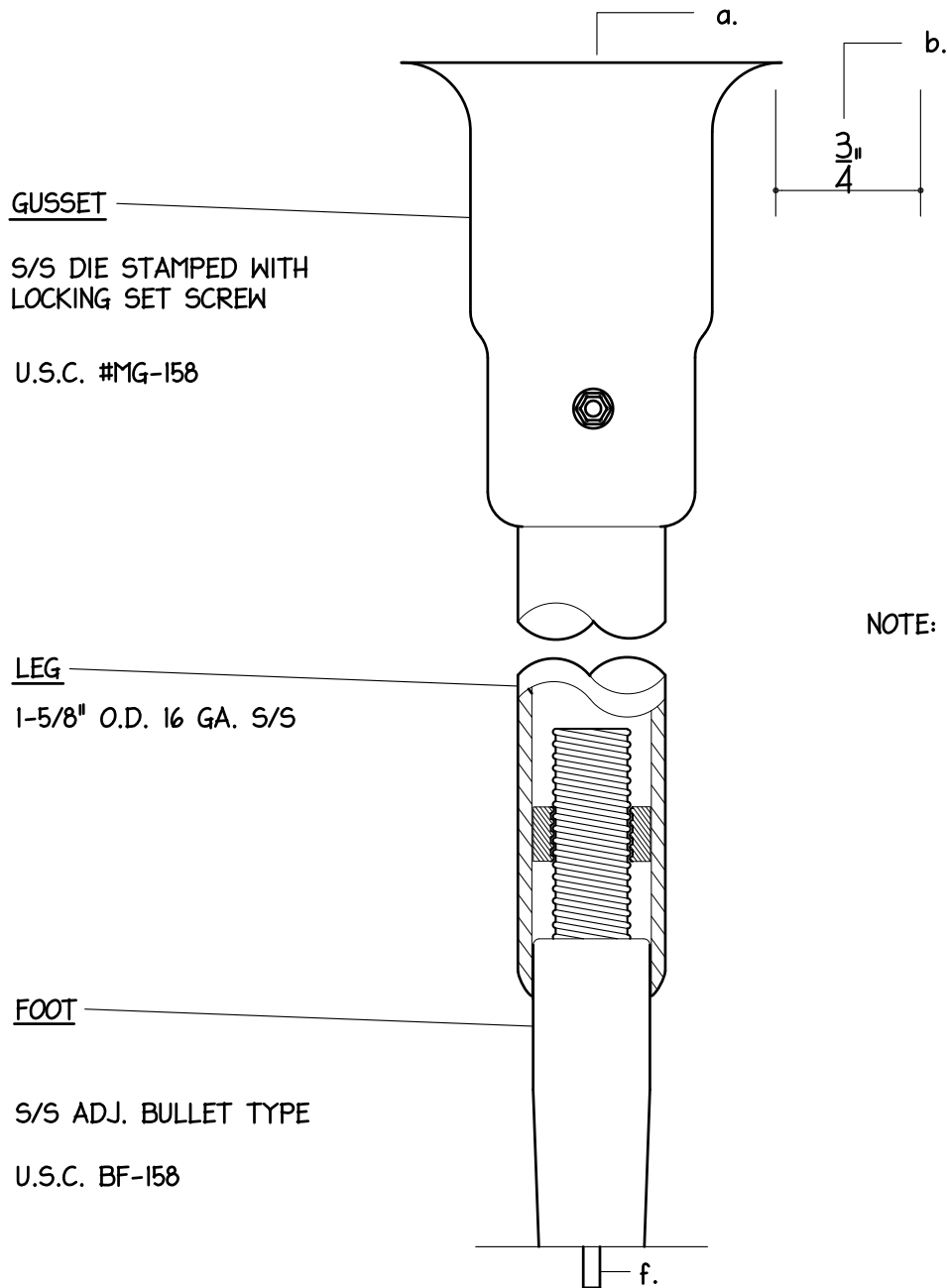
**B.**



**SINK  
DRAINBOARDS**

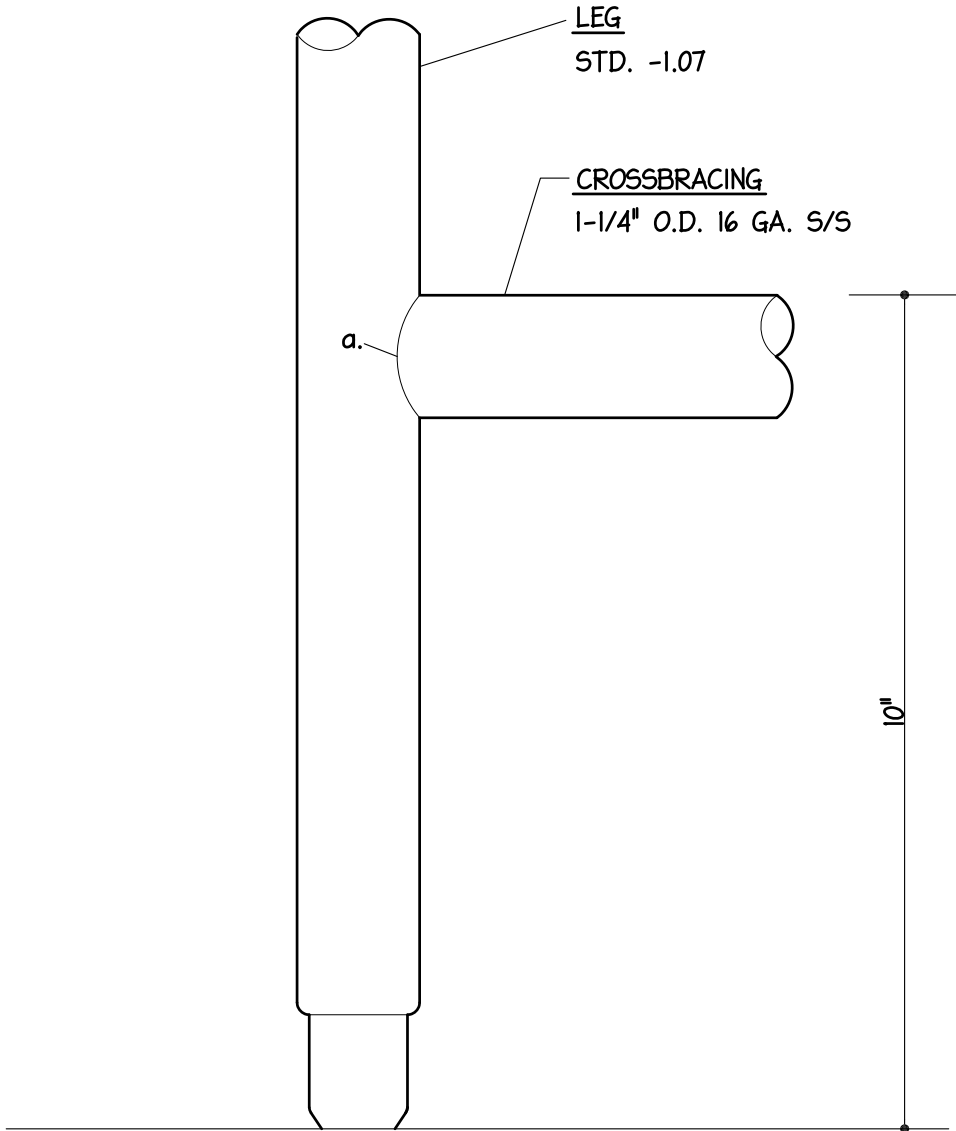
**C.**

- a. FULLY WELDED CONSTRUCTION.
- b. ANGLE LOCATION - ENDS; SIDES OF TOP INSETS; INTERMEDIATES  
24" ON CENTER.
- c. CHANNEL LOCATION - ENDS AND INTERMEDIATE MAXIMUM 6'-6" O.C.
- d. ADD CENTER CHANNEL WHEN DRAINBOARD LENGHT EXCEEDS 2'-6".
- e. SECURE TOP TO FRAMEWORK WITH WELDED STUDS, S/S LOCKWASHERS  
AND CAP NUTS.
- f. CLOSE CHANNEL AT FRONT ONLY.




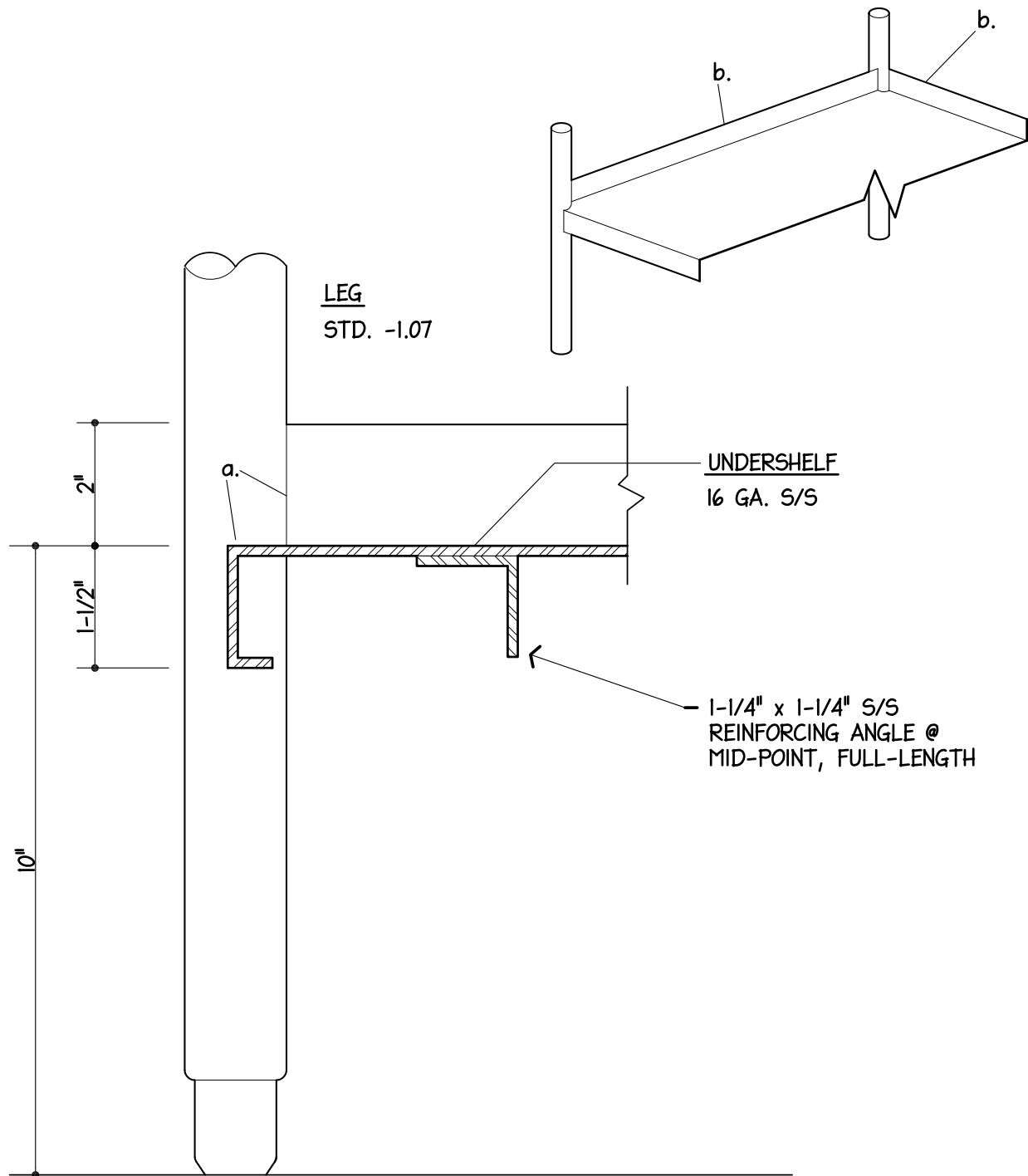
NOTE: ENTIRE FINISHED STRUCTURE AND INDIVIDUAL COMPONENTS TO MEET NSF REQUIREMENTS

- a. FULLY WELD GUSSET TO FRAMEWORK OR SINK
- b. 3/4" MINIMUM CLEARANCE ALL AROUND
- c. SET SCREW NOT VISIBLE TO WORKING SIDE OF EQUIPMENT.
- d. MAXIMUM 1/32" CLEARANCE BETWEEN LEG AND FOOT
- e. FOOT SET AT MIDPOINT TO ALLOW 1" ADJUSTMENT UP AND 1" DOWN. WITHOUT THREAD EXPOSURE.
- f. LEGS UNSUPPORTED Laterally BY CROSSBACKING OR UNDERSHELVES SHALL BE PINNED TO FLOOR USING 1/4" DIA. X 1/2" PINS WELDED TO FOOT AND SET IN MATCHING HOLES IN THE FLOOR.




a. FULLY WELD, GRIND SMOOTH AND POLISH.

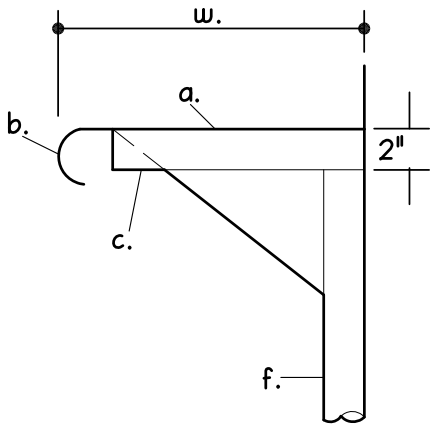
 <p><b>NYIKOS ASSOCIATES, INC.</b> Food Facilities Design/Consulting</p>	<p>DESCRIPTION:</p> <p style="text-align: center;"><b>CROSSBRACING</b></p>	<p>STANDARD DTL: <b>1.10</b></p> <p>PAGE: <b>114000-55</b></p>
--	--	--



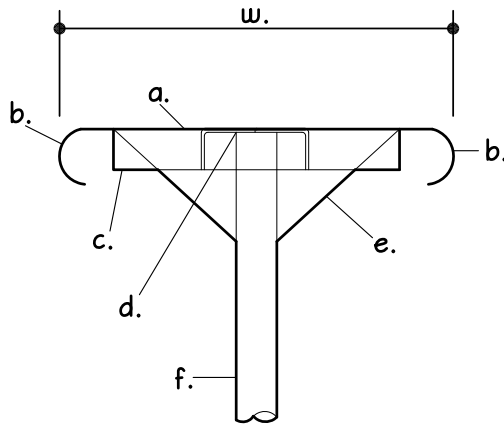
- a. FULLY WELD, GRIND SMOOTH AND POLISH.
- b. WHEN SPECIFIED, TURN REAR AND ENDS UP 2".

 <b>NYIKOS ASSOCIATES, INC.</b> <i>Food Facilities Design/Consulting</i>	DESCRIPTION:	STANDARD DTL:
	<b>UNDERSHELF</b>	<b>1.11</b>
		PAGE:
		<b>114000-56</b>

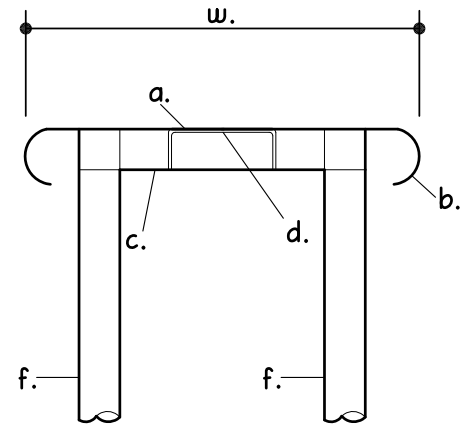




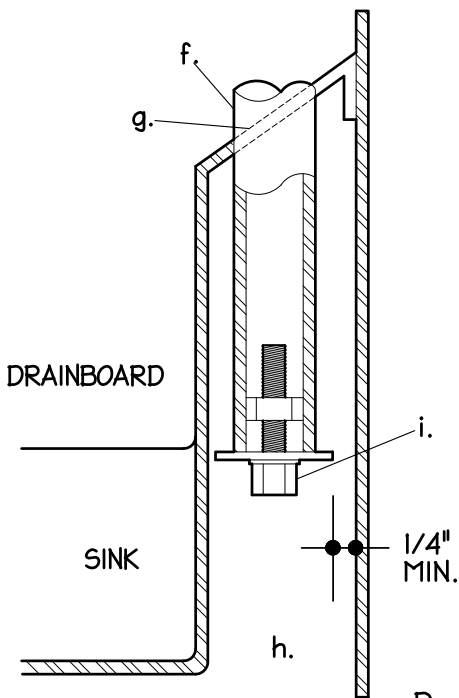
A.



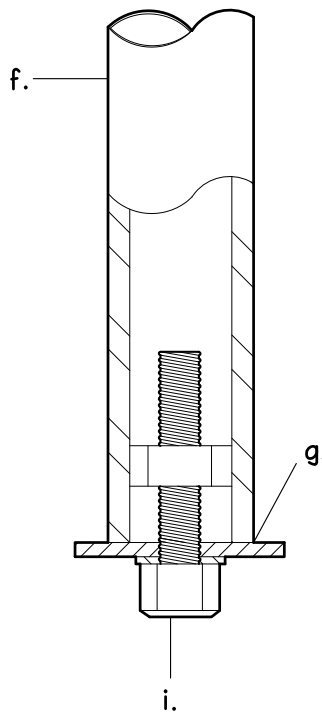
B.



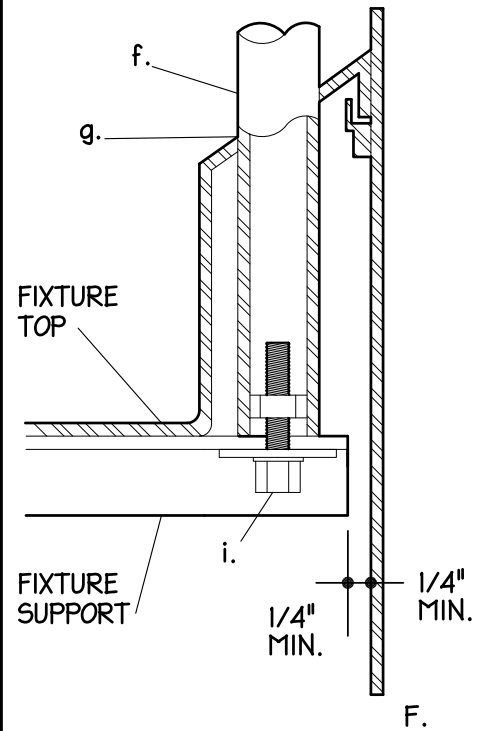
C.



D.

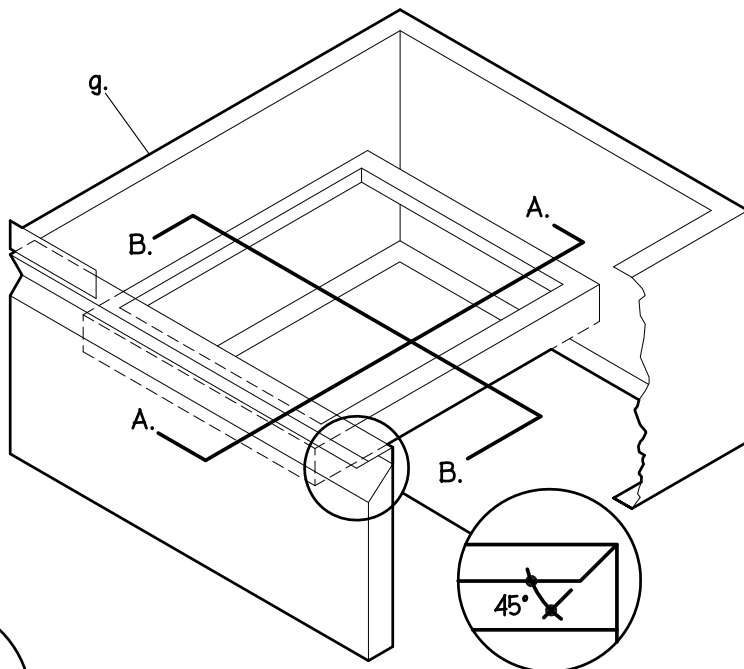


E.

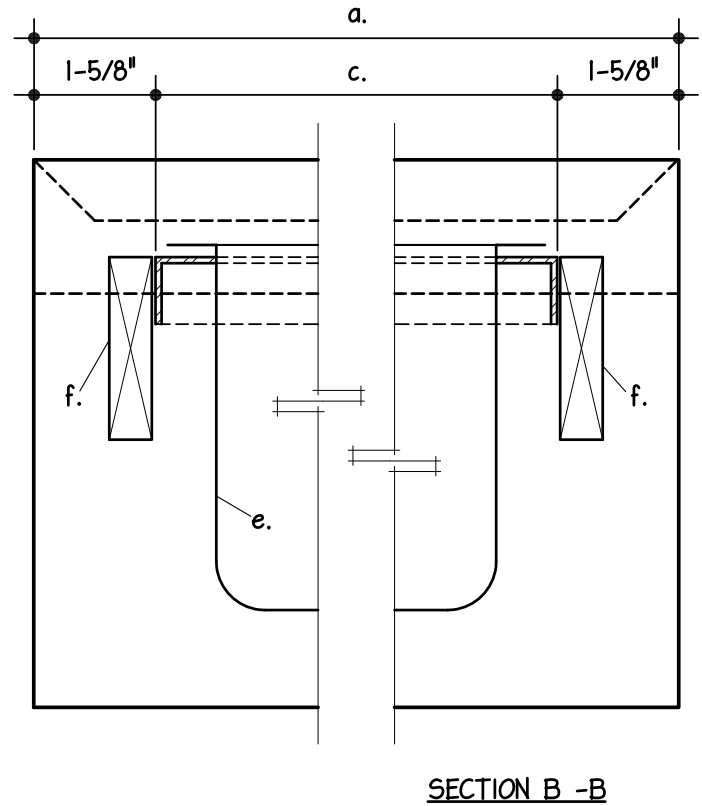
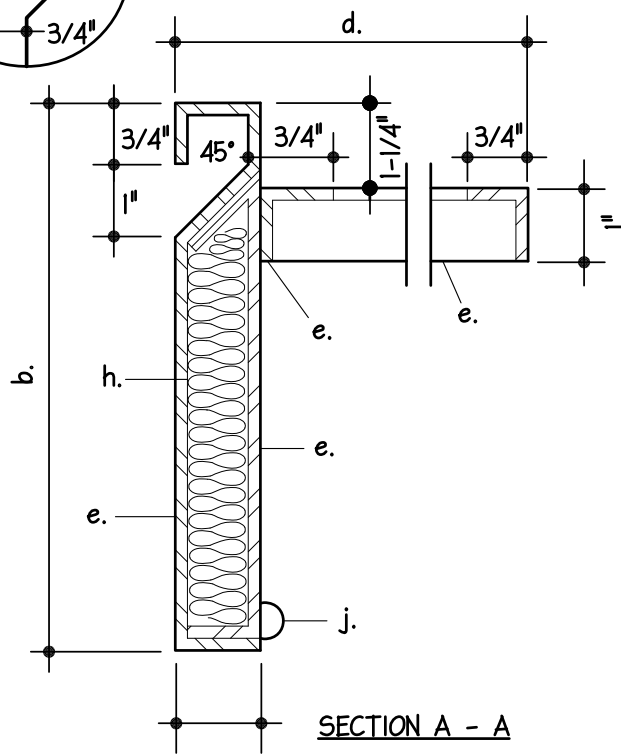
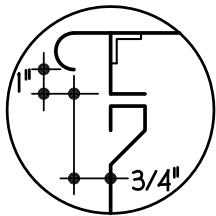


F.

- a. 16 GA S/S SHELF
- b. STD.- 1.02 EDGE
- c. 1"x 3"x 1" 14 GA. S/S CROSS CHANEL
- d. 1"x 3"x 1" 14 GA. S/S LENGTHWISE CHANNEL WHEN LENGTH BETWEEN SUPPORTS EXCEEDS 42"
- e. 14 GA. S/S BRACKETS FULLY WELDED TO SUPPORT AND CHANNEL..
- f. 1-1/4" O.D. 16 GA. S/S UPRIGHT. MAXIMUM 5'-0" ON CENTER.
- g. TIGHT FIT. SEAL WITH SILICONE SEALANT.
- h. 1-1/2"x 1-1/2" 12 GA. S/S CLIPS WELDED TO REAR OF SPLASH AT DRAINBOARD HEIGHT.
- i. 3/8"x 16 S.S. HEX HEAD BOLT, S/S NUT & S/S LOCKWASHER. NUT WELDED IN TUBE.
- w. WIDTH AS SPECIFIED.

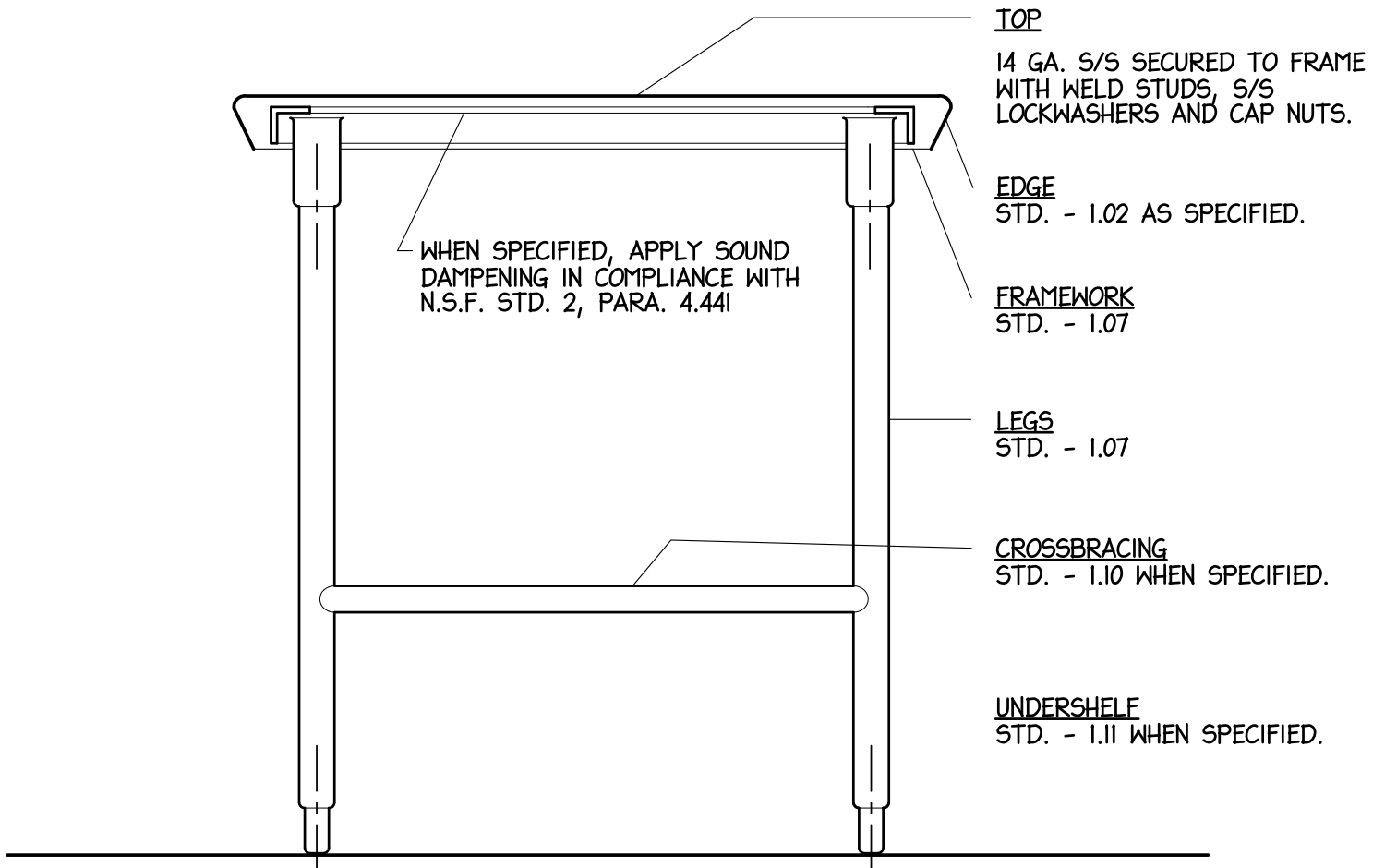
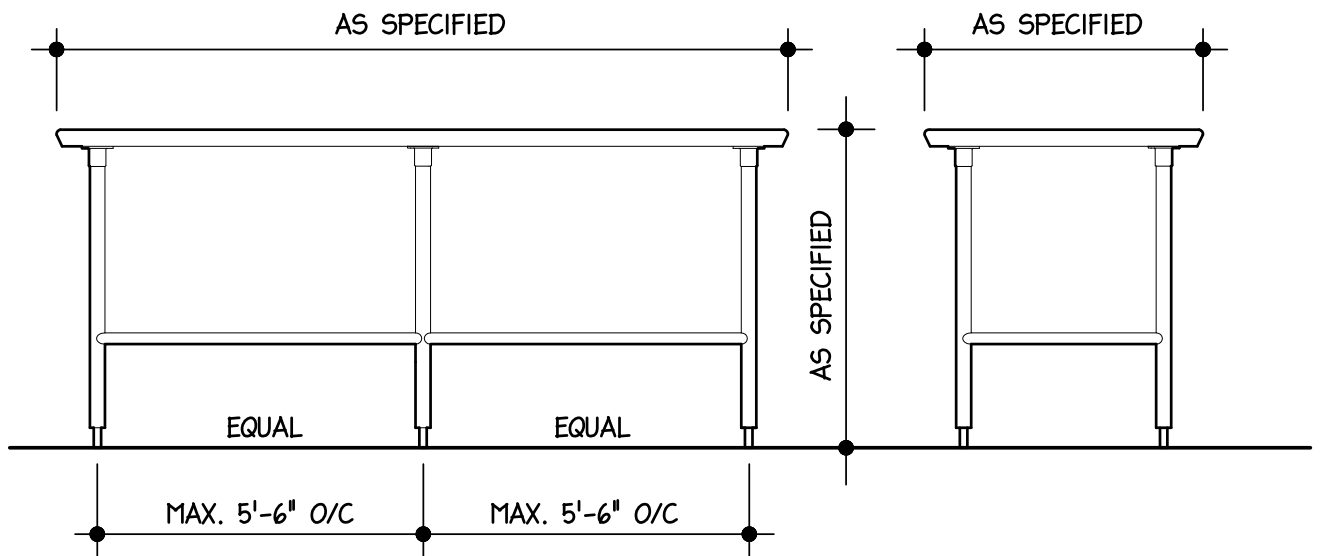


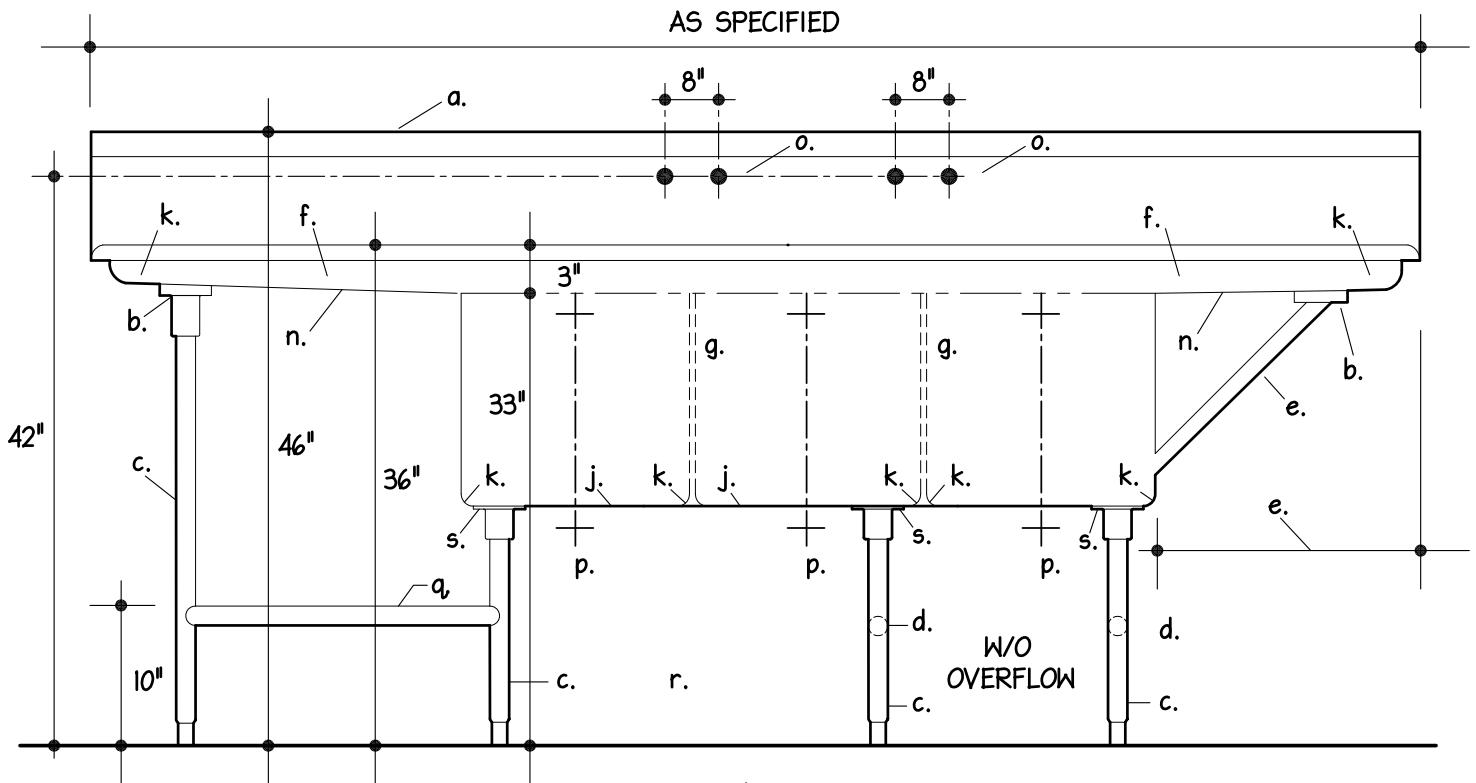
- e. 16 GA. S/S ALL WELDED.
- f. 3 PIECE SELF CLOSING DWR. SLIDE AS MFD. BY COMPONENT HARDWARE, S52 SERIES WITH S/S ROLLER BEARINGS. PITCH SLIDE DOWNWARD 3/8" PER FOOT FOR SELF-CLOSING ACTION.
- g. 18 GA. S/S DWR. ENCLOSURE. ALL WELDED.
- h. SEMI - RIGID FIBERGLASS SOUND DAMPENING.
- j. HARD RUBBER DRAWER BUMPER EACH CORNER.



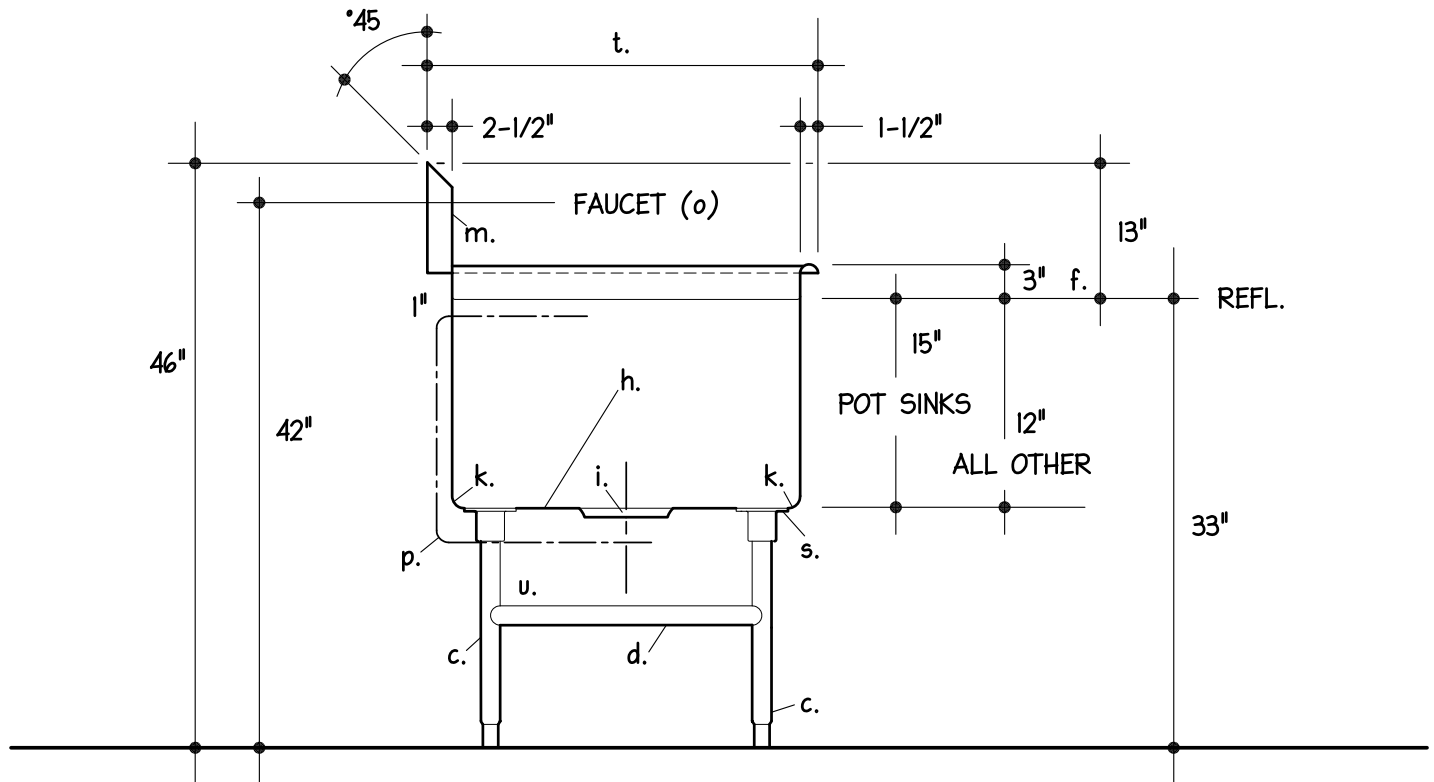
i. PROVIDE DIE - STAMPED #18 GA. S/S DWR. PANS AS FOLLOWS:

TYPE	NO.	PANS	a.	b.	c.	d.
I	1	20x20x5 DP.	25	7-1/2	21-3/4	22-3/4
II	1	20x20x8 DP.	25	10-1/2	21-3/4	22-3/4
III	1	12x20x4 DP.	25	6-1/2	21-3/4	14-1/2
IV	2	12x20x4 DP.	28	6-1/2	26-1/4	22-1/2
V	1	12x20x4 DP.	17	13-1/2	13-1/2	22-1/2





**ELEVATION**



**TYPICAL SECTION**


- a. MATERIAL - 14 GA. S/S.
- b. STD. - 1.05c.
- c. STD. - 1.07
- d. STD. - 1.10

CONTINUED ON STD.- 3.01.I

<p style="margin: 0;"><b>NYIKOS ASSOCIATES, INC.</b> Food Facilities Design/Consulting</p>	<p><b>DESCRIPTION:</b></p> <p style="font-size: 1.2em;"><b>SINKS AND DRAINBOARDS</b></p>	<p>STANDARD DTL:</p> <p style="font-size: 1.5em;"><b>3.01</b></p>	
			<p>PAGE:</p> <p><b>114000-60</b></p>

- e. DRAINBOARDS UP TO 24" IN LENGTH REQUIRE NO LEGS OR BRACES. DRAINBOARDS 25" TO 30" REQUIRE 1" O.D. 16 GA. S/S BRACE. DRAINBOARDS OVER 30" REQUIRE LEGS AND CHANNEL FRAMEWORK.
- f. DRAINBOARDS SHALL PITCH TO SINK 1/8" PER FOOT OF LENGTH TO PROVIDE COMPLETE DRAINING WITHOUT POOLING. THE 3" HIGH RAISED ROLLED RIM AT THE SINK SHALL DECREASE IN HEIGHT TOWARD THE OUTER ENDS OF THE DRAINBOARD.
- g. PARTITIONS BETWEEN COMPARTMENTS TO BE DOUBLE WALLED CONSTRUCTION WITH ROUNDED TOP, ALL WELDED INTEGRAL WITH SINK BODY.
- h. BACK, BOTTOM, AND FRONT SHALL BE ONE CONTINUOUS PIECE WITH ENDS WELDED INTEGRAL, WITHOUT OVERLAPPING JOINTS OR OPEN SPACES, BETWEEN COMPARTMENTS.
- i. WASTES SHALL BE SEATED IN DIE STAMPED DEPRESSIONS WITHOUT USE OF SOLDER, RIVETS OR WELDING. INSTALLED COMPONENTS SHALL BE FLUSH WITH SURROUNDING SURFACE.
- j. EACH SINK COMPARTMENT TO BE PITCHED AND CREASED TO WASTE TO ASSURE COMPLETE DRAINING WITHOUT POOLING.
- k. ENTIRE UNIT SHALL BE ALL WELDED COVE CORNERED CONSTRUCTION WITH VERTICAL AND HORIZONTAL AND INTERIOR CORNERS HAVING A 3/4" RADIUS.
- l. STD.- 1.02 b EDGE.
- m. STD. - 1.04a. BACKSPLASH.
- n. UNDERSIDE OF DRAINBOARDS AND SINKS TO BE SPRAYED WITH SOUND DAMPENING IN COMPLIANCE WITH N.S.F. STD. 2 PARA 4.44I WHEN SPECIFIED.
- o. FAUCETS - T&S MODEL B-232 WITH AERATOR B-199, REMOVABLE MONEL SEATS AND 1/2" I.P.S. MALE INLETS.
- p. WASTES - 2" NICKEL PLATED BRONZE ROTARY HANDLE WASTE S/S STRAINER PLATE WITH CHROME WITH CHROME PLATED BRASS CONNECTED OVERFLOW, STANDARD- KIEL HARDWARE MFG. CO. #1770-1015-1000.
- q. REAR CROSS BRACING ONLY.
- r. OMIT FRONT AND REAR LENGTHWISE CROSSBRACIG UNDER SINKS.
- s. 12 GAUGE STAINLESS STEEL 6"x 6" TRIANGULAR SUPPORT PLATE WELDED TO UNDERSIDE OF SINKS.
- t. WIDTH AS SPECIFIED.

(END OF SECTION 114000)

 <p><b>NYIKOS ASSOCIATES, INC.</b> Food Facilities Design/Consulting</p>	DESCRIPTION:	STANDARD DTL:
	SINK AND DRAINBOARDS	3.01.1
		PAGE: 114000-61

## SECTION 11 52 13 - PROJECTION SCREENS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Flexible operable rear-projection screens
  - 2. Rigid rear-projection screens.
- B. Permanently tensioned and fixed wall mounted screen for rear screen projection. 165" diagonal viewing area (16:10 aspect ratio image size).

#### 1.3 FLEXIBLE REAR-PROJECTION SCREEN MATERIAL

#### 1.4 OPTICALLY COATED RIGID REAR-PROJECTION SCREENS

- A. General-Purpose Screens: Peak gain of not less than 1.8, and half-gain angle of at least 28 degrees from the axis of the screen surface.
- B. Protective Coating: Provide formulation designed by screen manufacturer as a permanent topcoat over optical coatings to protect against normal abrasion before, during, and after installation.

#### 1.5 HIGH-PERFORMANCE RIGID REAR-PROJECTION SCREENS

- A. High-Performance Screens, General: Acrylic screen with Fresnel lens on rear surface and linear lenses on front surface.
- B. Performance: Peak gain of 5.0, and horizontal half-gain angle of at least 25 degrees from the axis of the screen surface.

#### 1.6 RIGID REAR-PROJECTION SCREEN ACCESSORIES

- A. Factory Frames: Screen manufacturer's standard frames of profile indicated, fabricated to sizes required to fit screens from aluminum extrusions complying with **ASTM B 221 (ASTM B 221M)** for 6063-T5 alloy and temper.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Install Da-Lite Screen Company, Inc. Contact: P.O. Box 137, 3100 N. Detroit St., Warsaw, IN 46581-0137; Telephone: (800) 622-3737, (574) 267-8101; Fax: (877) 325-4832, (574) 267-7804; E-mail: [info@da-lite.com](mailto:info@da-lite.com); website: [www.da-lite.com](http://www.da-lite.com).

2.2 REPRESENTATIVE PRODUCT

- A. Type 2: Tensioned System.
- B. Screen Operation: Electrically operated, UL and ULC listed, retractable, heavy duty, with rigid metal roller and motor housed within the roller. Tab guide cable tensioning system to maintain even, lateral tension and hold viewing surface flat. Bottom end of fabric to be inserted into a custom aluminum slat bar with added weight to provide vertical tension on the screen surface.
- A. Motor: Single motor, UL and ULC certified, 3-wire permanently lubricated reversal-type, attached to header, with preset adjustable limit switches to automatically stop viewing surface in UP or DOWN position. Includes automatic thermal overload protection, integral gears, capacitor and electric brake to prevent coasting.
  - 1. Voltage, Frequency: [115 V, 60 Hz] [220/240 V, 50 Hz].
  - 2. Amperage: 2.4 amps.
  - 3. Limit Switches: Preset and adjustable to automatically stop viewing surface in UP or DOWN position.
  - 4. Housing: Inside metal roller.

2.3 Screen Mounting: [Wall] [Ceiling] [Ceiling recessed].

2.4 Screen Case: Designed to receive mounting hardware and sized to suit projection screen.

- A. Material: Wood with double top member for rigidity.
- B. Case Finish:
  - 1. Prime painted black.

2.5 Screen Size:

- A. Viewing Area: H [ ] × W [ ]
- B. Overall Dimensions: H = 11ft. × W = 18ft.

2.6 Acceptable Material: Da-Lite Screen Company, Inc., Tensioned Professional Electrol Projection Screen.

Specifier Note: Include the black backed screen material option only when specifying a front projection screen viewing surface.

A. Screen Material:

1. Front and Rear projection, flame retardant, mildew-resistant seamless vinyl, [black backed], [with] [without] standard black borders, easily cleaned with mild soap and water solution.

Specifier Note: The higher the gain number, the brighter the image. Gain numbers generally vary depending on the surface materials of the screen.

2. Gain: To SMPTE RP 94-2000, [0.7] [0.8] [1.0] [1.1] [1.3] [1.5] [1.85] [2.4] [3.0].

Specifier Note: The larger the viewing angle, the less need there is to be directly in front of the screen for proper viewing. Generally, viewing angles vary depending on the surface materials of the screen.

3. Viewing Angle: [10] [11] [30] [35] [40] [45] [50] [60] [80].

Specifier Note: The screen format is expressed as a ratio of width/height. Specify the screen format that best suits the graphic display and project requirements.

- B. Format: [NTSC or Video - 1.33:1] [HDTV - 1.78:1] [16:10 Wide - 1.60:1] [Cinemascope - 2.35:1] [Letterbox - 1.85:1] [Square - 1:1] [\_\_\_\_\_].

## PART 3 - EXECUTION

### 3.1 FRONT-PROJECTION SCREEN INSTALLATION

- A. Install front-projection screens at locations indicated to comply with screen manufacturer's written instructions.

### 3.2 INSTALLATION

- A. Install rear-projection screens at locations indicated to comply with screen manufacturer's written instructions. Handle screens carefully during installation using procedures and tools recommended by screen manufacturer; do not abrade screen surfaces.

### 3.3 RIGID REAR-PROJECTION SCREENS

- A. Provide temporary covering of rear-projection screens until time of Substantial Completion. Use type of covering approved by screen manufacturer that will effectively protect screen from abrasion, breakage, or other damage.
- B. Clean rear-projection screens on both faces immediately before date scheduled for inspection intended to establish date of Substantial Completion. Use methods and cleaning materials recommended by screen manufacturer, taking care not to scratch or damage optical coatings or screen substrates.

### 3.4 PROJECTION SCREEN SCHEDULE

- A. Electrically Operated, Rear-Projection Screen Type



- B. Rigid Rear-Projection Screen Type: Optically coated screen.
- C. Rigid Rear-Projection Screen Type: High-performance screen.

END OF SECTION 11 52 13

## SECTION 11 54 13 - KILNS

### PA RT 1 – GENERAL

#### 1.1 CONDITIONS AND REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, and Division 01 – General Requirements apply.

#### 1.2 SECTION INCLUDES

- A. Electric kilns.
- B. Downdraft ventilation system.
- C. Accessories.

#### 1.3 RELATED SECTIONS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Services and connections to kilns and ventilation systems.

#### 1.4 DESIGN REQUIREMENTS

- A. Install kiln in well-ventilated, sheltered area. Do not permit temperature to exceed 105 degrees F while kiln is in use.
- B. Provide a minimum of 18 inches between kiln and adjacent walls, other kilns, shelving, and other obstructions. When installing multiple kilns in the same room, ensure that the control boxes on the kilns are not facing adjacent kilns.
- C. Locate kiln in a room or space with a bare concrete floor. If a bare concrete floor is not available provide a non-combustible substrate and two (2) inches of masonry below the kiln extending a minimum of 12 inches beyond the outside dimensions of the kiln.
- D. If installing kilns in a room or space with a fire suppression system, do not place kilns in such a manner so as to cause sprinkler heads to go off.
- E. If installing kilns in proximity to a marine environment, locate the kilns indoors and protect from exposure to damp air to avoid corrosion.

#### 1.5 SUBMITTALS

- A. Product Data: Submit for kilns, ventilation systems, and accessories. Include product data, installation instructions, and manufacturer's recommendations.
- B. Shop Drawings: Submit for kilns. Include plans indicating space required and relationship to work of other sections.
- C. Operating and Maintenance Data: For kilns and ventilation systems to include in maintenance manuals.
- D. Warranties: Special warranties specified in this section.

#### 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain kilns, ventilation systems, and accessories through one (1) source from a single manufacturer. Kiln and ventilation system to be UL listed as a system.
- B. Regulatory Requirements: Comply with provisions of the following product certifications:
  - 1. NFPA: Provide kilns and ventilation systems listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
  - 2. UL and NEMA: Provide electrical components required as part of kilns and ventilation systems that are listed and labeled by UL and that comply with applicable NEMA standards.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver kilns, ventilation systems, and accessories in manufacturer's original packaging with protective covering intact.
- B. Do not stack other items on top of packaged kilns during transportation and storage. Stack kilns with top end up.
- C. Utilize equipment capable of moving the kiln and packaging without damage and install kilns into location.
- D. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 WARRANTY

- A. Special Warranties: Manufacturer's standard form in which manufacturer of each kiln specified agrees to repair or replace kilns that fail in materials or workmanship within specified warranty period. Warranty includes labor for repair or replacement.
  - 1. Kiln: Two-year limited warranty.

**PA RT 2 – PRODUCTS**

2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for kilns, ventilation systems, and accessories is Skutt Kilns, 6441 SE Johnson Creek Blvd, Portland, OR 97206-9552, Telephone: 503-774-6000, Fax: 503-774-7833, Web Site: www.skutt.com.
- B. AMACO/brent. 6060 Guion Road, Indianapolis, IN 46254-1222
  - 1. Model EX-365SF round kiln with Select Fire™ Computer Control and EZ-Lift
- C. equal product.

2.2 ELECTRIC KILNS

- A. Electric Kilns: Manufacturer's Model No. [Insert kiln model number] [10-sided] [12-sided] electric kilns with components, options, and accessories needed to comply with requirements and provide complete functional kilns including the following components.
  - 1. Kiln stand.
  - 2. Kiln floor or slab.
  - 3. Fire brick.
  - 4. Kiln elements.
  - 5. Ring latch.
  - 6. Chest handle.
  - 7. Lid with lifter and latch.
  - 8. Control box.
  - 9. Thermocouple.
  - 10. Controller touch pad.
  - 11. Peep plugs.
- B. Factory pre-wire kilns for electrical switching devices and computer interface system. Factory predrill holes in the kiln lid and floor for the downdraft ventilation system.

2.3 DOWNDRAFT VENTILATION SYSTEM

- A. Downdraft Ventilation System: Skutt "EnviroVent 2" negative pressure downdraft ventilation system; capable of removing hazardous fumes only, not heat. System to consist of the following components:
  - 1. Blower motor with six (6) ft. power cord and in-line switch.
  - 2. 8 x 12 inch mounting plate.
  - 3. Eight (8) ft. x three (3) inch flexible aluminum duct.

4. Spring-loaded plenum cup assembly.
  5. Blower inlet tube.
  6. Blower discharge tube.
  7. Plenum spring.
  8. Three (3) to four (4) inch connector.
  9. Floor mounting plate.
  10. Mounting hardware.
- B. System fits a single top-loading, multi-sided, electric kiln with a chamber size less than 12 cu. ft. Provide a dual intake kit to vent a single kiln over 12 cu. ft. or two (2) kilns with chamber volumes each under 12 cu. ft. Maximum chamber volume that can be vented with one (1) motor is 24 cu. ft.
- C. Electrical Switching Device: Skutt “EnviroLink” electrical switching device utilizing a programmable power output in the controller to turn the downdraft ventilation system on and off.

#### 2.4 ACCESSORIES

- A. Angled Touchpad Mount: Skutt “Easyview” Angled Touchpad; permits easy viewing and programming of kiln controls.
- B. Computer Interface System (CIS): Computer interface system including required software and hardware to connect a computer to the kiln controller.
- C. Furniture Kits: Kit includes shelves and one (1) or more posts. Kits are designed to fire to Cone 10 temperatures.

### PA RT 3 – EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where kilns, ventilation systems, and accessories, for compliance with requirements that affect installation and with requirements for installation tolerances. Notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Downdraft Ventilation System:
  1. Ensure that kiln stand is a minimum of eight (8) inches high. If stand is lower than eight (8) inches high, either shim legs to increase distance from floor to eight (8) inches or replace stand with one (1) that is eight (8) inches high.
  2. If kiln does not have factory drilled holes, provide number, size of holes as recommended by the manufacturer for the specific kiln model. Locate holes in accordance with manufacturer’s recommendations.

#### 3.3 INSTALLATION

- A. Install in strict accordance with manufacturer’s written installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances.
- B. Install units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- C. Set units level, plumb, properly aligned, and securely in place.
- D. See Division 26 sections for electrical requirements.
- E. Downdraft Ventilation System:
  1. Assemble and install system components on kiln in accordance with manufacturer’s written instructions.

2. Install the blower and motor assembly on the wall in a location that is close enough for the flexible aluminum duct to reach the kiln without overstretching the duct. Where wall-mounting is not possible, mount the vent motor on the floor or above the ceiling.

**3.4 CLEANING AND PROTECTION**

- A. Test kilns, ventilation systems, and accessories to verify proper operation. Make necessary adjustments.
- B. Verify that accessories required have been furnished and installed.
- C. Remove packing material and leave kilns in clean condition, ready for operation.

**END OF SECTION**

## SECTION 11 66 20 - GYMNASIUM EQUIPMENT

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following gymnasium equipment:
  - 1. Motorized Overhead Suspended Basketball Backstops
  - 2. Fixed wall Mounted Basketball Backstops
  - 3. Exercise equipment
  - 4. Safety pads.
- B. Related Sections include the following:
  - 1. Division 11 Section "Movable Partitions."
  - 2. Division 26 Sections for electrical service for motor operators, controls, and other powered devices for motorized gymnasium equipment.

#### 1.3 DEFINITIONS

- A. NFHS: The National Federation of State High School Associations.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Provide basketball backboards capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads."

#### 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. If applicable, include assembly, disassembly, and storage instructions for removable equipment.
  - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- B. LEED Submittal:
  - 1. Product Data for Credit EQ 4.4: For particleboard, documentation indicating that product contains no urea formaldehyde.

- C. Shop Drawings: For gymnasium equipment. Include plans, elevations, sections, details, attachments to other work, and the following:
  - 1. Method of field assembly for removable equipment, connections, installation details, mountings, floor inserts, attachments to other work, and operational clearances.
  - 2. Transport and storage accessories for removable equipment.
- D. Structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation including loads, point reactions, and locations for attachment of gymnasium equipment to structure.
- E. Coordination Drawings: Court layout plans, drawn to scale, and coordinating floor inserts, game lines, and markers applied to finished flooring.
- F. Samples for Initial Selection: For each type of gymnasium equipment indicated.
- G. Samples for Verification: For the following products:
  - 1. Basketball Net: Full size.
  - 2. Pad Fabric: Not less than 3 inches (76 mm) square, with specified treatments applied. Mark face of material.
- H. Product Certificates: For each type of gymnasium equipment, signed by product manufacturer.
- I. Qualification Data: For Installer and professional engineer to certify structural anchoring of basketball equipment.
- J. Operation and Maintenance Data: For gymnasium equipment to include in emergency, operation, and maintenance manuals.
- K. Warranty: Special warranty specified in this Section.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Composite Wood Products: Made without urea formaldehyde.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

- B. Field Measurements: Verify position and elevation of floor inserts and layout for gymnasium equipment.

## 1.8 COORDINATION

- A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.
- B. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension system components with other construction including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Basketball backboard failures including glass breakage.
    - b. Faulty operation of electronic basketball equipment.
  - 2. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - 1. Extruded Bars, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
  - 2. Cast Aluminum: ASTM B 179.
  - 3. Flat Sheet: ASTM B 209 (ASTM B 209M).
- B. Steel: Comply with the following:
  - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
  - 2. Steel Tubing: ASTM A 500 or ASTM A 513, cold formed.
  - 3. Steel Sheet: ASTM A 1011/A 1011M.
- C. Support Cable: Manufacturer's standard galvanized steel aircraft cable with a breaking strength of 7000 lb (3175 kg). Provide fittings complying with cable manufacturer's written instructions for size, number, and method of installation.
- D. Support Chain and Fittings: Grade 80 hardened alloy steel chain rated for overhead lifting, ASTM A 391/A 391M, with commercial-quality, steel connectors and hangars.



- E. Castings and Hangers: Malleable iron, ASTM A 47/A 47M, grade required for structural loading.
- F. Softwood Plywood: DOC PS 1, exterior.
- G. Particleboard: ANSI A208.1, made with adhesive containing no urea formaldehyde.
- H. Equipment Wall-Mounting Board: Wood, transparent or neutral-color painted finish, size, and quantity as required to mount gymnasium equipment according to manufacturer's written instructions.
- I. Anchors, Fasteners, Fittings and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; tamperproof, vandal- and theft-resistant design.
- J. Grout: Nonshrink, nonmetallic, premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107 with minimum strength recommended in writing by gymnasium equipment manufacturer.

## 2.2 BASKETBALL EQUIPMENT

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Motorized Overhead Suspended Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
  - 1. Sports Unlimited, Spalding: Geared Forward Fold Ceiling Suspended Backstop
  - 2. Porter Athletic Equipment Company.
- D. Permanent Wall Mounted Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
  - 1. Draper Inc.
  - 2. AALCO Manufacturing.
  - 3. Arizona Courtlines, Inc.
  - 4. ADP Lemco Inc.
  - 5. Basketball Products International; a division of American Athletic, Inc.
  - 6. Bison Inc.
  - 7. Douglas Industries, Inc.
  - 8. Institutional Products Inc.
  - 9. Jaypro Sports, LLC.
  - 10. L. A. Steelcraft.
  - 11. Performance Sports Systems.
  - 12. P. W. Athletic Mfg. Co.
- E. General: Provide equipment complying with requirements in NFHS's "NFHS Basketball Rule Book."
- F. Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.

- G. Motorized Overhead Suspended Geared Forward Fold Front Braced Basketball Backboard:
1. Motorized Type: Manufacturer's standard assembly.
  2. Folding Type: Provide manufacturer's standard assembly for forward-folding, front-braced backboard, with hardware and fittings to permit folding.
  3. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
    - a. Center-Mast Frame: Welded with side sway bracing.
    - b. Finish: Manufacturer's standard powder-coat finish.
  4. Goal Height Adjuster: Adjustable from 8 to 10 feet (2.4 to 3 m) with gear-drive mechanism, locking in any position within adjustment range, with visible height scale attached to side of framing.
    - a. Operation: Electric with integral gear-drive motor, with limit switches preset to goal heights, and two detachable electric control devices.
- H. Wall-Mounted Backboards: Complete assembly extending from wall, including support framing to building structure, bracing, cables, chains, pulleys, fittings, hardware, pipe anchors, equipment pads, and fasteners.
1. Stationary Type: Provide manufacturer's standard assembly for stationary backboard.
  2. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
    - a. Finish: Manufacturer's standard powder-coat finish.
  3. Extension: As recommended for Elementary School installations.
  4. Goal Height Adjuster: Adjustable from 8 to 10 feet (2.4 to 3 m) with gear-drive mechanism, locking in any position within adjustment range, with visible height scale attached to side of framing.
    - a. Operation: Manual with detachable crank handle.
- I. Backboard Safety Device: Designed to limit free fall if support cable, support chain, pulleys, fittings, winch, or related components fail; with mechanical automatic reset; 6000-lb (2722-kg) load capacity; one per folding backboard.
1. Retractor Device: Manufacturer's standard device designed to retract both support and safety cables, chains, and straps away from play of the basketball when backboard is in playing position; one per folding backboard.
- J. Backboard Electric Operator: Provide operating machine of size and capacity recommended by manufacturer for equipment specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, and remote controls. Coordinate wiring requirements and electrical characteristics with building electrical system.
1. Operator Type: Cable drum with grooved drum and cable tension device to automatically take up cable slack and retain cable in grooves.
  2. Operator Mounting: Manufacturer's standard.

3. Motor Characteristics: Sufficient to start, accelerate, reverse, and operate connected loads at designated speeds within installed environment and with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1, and the following:
  4. Voltage: 208-220 V.
  5. Horsepower: ½ or ¾ hp.
  6. Enclosure: Manufacturer's standard.
  7. Duty: Continuous duty at ambient temperature of 105 deg F (40 deg C) and at altitude of 3300 feet (1005 m) above sea level.
  8. Service Factor: 1.15 for open dripproof motors; 1.0 for totally enclosed motors.
  9. Phase: One.
  10. Remote-Control Station(s): NEMA ICS 6, Type 1 enclosure for **recessed or flush** mounting, momentary-contact, three-position switch-operated control with up, down, and off functions.
    - a. Group Key Switch Control Stations: One switch per each backboard.
    - b. Keys: Provide two sets of dual keys per station.
    - c. Switches, Ganged: Single faceplate with multiple switch cut-outs for two switches – one for each of two backboards.
    - d. Control Station Enclosure: Provide prime-painted metal enclosure with key access with two sets of keys per enclosure.
11. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop basketball equipment at fully retracted and fully lowered positions.

K. Basketball Backboard:

1. Shape and Size:
  - a. Rectangular, 72 by 42 inches (1800 by 1050 mm).
2. Backboard Material: With predrilled holes or preset inserts for mounting goals, and as follows:
  - a. Glass: Not less than 1/2-inch- (13-mm-) thick, transparent tempered glass. Provide glass with impact-absorbing resilient rubber or PVC gasket around perimeter in a fully welded, brushed-natural-finish, extruded-aluminum frame, with steel subframe, reinforcement, and bracing, including center-strut frame reinforcement, and with mounting slots for mounting backboard frame to backboard support framing.
    - 1) Standard Mount: Provide steel corner reinforcement with mounting slots for mounting backboard frame to backboard support framing at standard mounting centers.
    - 2) Direct Mount: Designed for mounting backboard frame to center mast of backboard framing to maximize relief of stresses on backboard frame and glass.
    - 3) Rim-Restraining Device: Complying with NCAA and NFHS rules and designed to ensure that basket remains attached if glass backboard breaks.
3. Target Area and Border Markings: Permanently etched in white color, marked in manufacturer's standard pattern and stripe width for elementary and middle schools.
4. Finish: Manufacturer's standard factory-applied, white background.

- L. Goal Mounting Assembly: Manufacturer's standard for direct goal attachment.
  - 1. Glass Backboard Goal Mounting Assembly: Goal support framing and reinforcement designed to transmit load from goal to backboard frame and to minimize stresses on glass backboard.
  
- M. Basketball Goals: Complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring.
  - 1. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication per manufacturer's standard design.
  - 2. Type: Fixed, non-movable.
  - 3. Type: Movable, breakaway design with manufacturer's standard breakaway mechanism and rebound characteristics identical to those of fixed, nonmovable ring.
  - 4. Mount: Front.
  - 5. Net Attachment: No-tie loops for attaching net to rim without tying.
  - 6. Finish: Manufacturer's standard finish.
  
- N. Basketball Nets: 12-loop-mesh net, between 15 and 18 inches (400 to 450 mm) long, sized to fit rim diameter, and as follows:
  - 1. Cord: Made from white cotton.
  - 2. Competition Cord: Antiwhip, made from white nylon cord not less than 120- or more than 144-gm thread.
  - 3. Chain: Nontangle, nonstretch design that will not scratch or impede the ball, made from zinc-coated steel chain.

### 2.3 EXERCISE EQUIPMENT

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  
- C. Basis-of-Design Product: Subject to compliance with requirements, provide or a comparable product by one of the following:
  - 1. Draper Inc.
  - 2. Jaypro Sports, LLC.
  - 3. Performance Sports Systems.
  - 4. Porter Athletic Equipment Company.
  
- D. General: Manufacturer's standard equipment wall-mounting board(s).
  
- E. Pull-up Bar: Wall mounted.
  - 1. Fixed height.
  - 2. Adjustable Height: In 6-inch (150-mm) increments within a range of 18 inches (460 mm).
  - 3. Bar Length: Not less than 40 inches (1000 mm).
  - 4. Bar: Not less than 1-1/16-inch- (27-mm-) diameter, round, plated solid-steel bar.

5. Support Frame: Steel-angle end brackets attached to wood stringers or steel channels or bars.
  6. Bar Installation Height and Wall Clearance: As indicated at not less than 12 inches (300 mm) from wall.
- F. Pegged Board Vertical Climber: Wall-mounted board; size as indicated; with two peg hand holds per board.
- G. Climbing Rope: 1-1/2-inch- (38-mm-) diameter rope; with top end securely clamped in fitting designed for attaching to supporting structure indicated.
1. Description: manila rope.
  2. Length: 24' +/- plus 2' on floor.
  3. Rope Bottom End: Tied in a turk knot.
  4. Tambourine: 24-inch (600-mm) diameter; not less than 1/2-inch- (13-mm-) thick, painted plywood disk for restricting climbing and for exercise competition.
  5. Safety Guard: 3/16-inch (5-mm-) support chain or 1/8-inch- (3-mm-) diameter cable, clamp, and fittings designed for attaching guard to supporting structure indicated.
  6. Pipe Beam: Ceiling mounted; not less than 3-1/2-inch- (89-mm-) OD steel pipe or tubing beam with not less than 2-3/8-inch- (60-mm-) OD drop pipes, bracing, and connectors designed for transferring load and securely attaching to supporting structure indicated.
- H. Rope Hoist (Cargo Net): Wall attached; consisting of #10 bell cord or 1/4-inch- (6-mm-) diameter, synthetic polyfiber rope, snap swivel fitting, rope adjuster, rope weight, weight bag, pulley, rope cleat, clear-finished wood wall equipment pads for pulley and cleat attachment, clamps, and fasteners.
- I. Metal Finish: Manufacturer's standard factory-applied, baked powder-coat finish.
- J. Wood Finish: Manufacturer's standard transparent or opaque-painted finish.

## 2.4 SAFETY PADS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Class A fire-rated pads by Draper Inc.
- C. or a comparable product by one of the following:
1. AALCO Manufacturing.
  2. ADP Lemco Inc.
  3. American Athletic, Inc.
  4. Institutional Products Inc.
  5. Jaypro Sports, LLC.
  6. Performance Sports Systems.
  7. Porter Athletic Equipment Company.

- D. Safety Pad Surface-Burning Characteristics: ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Flame-Spread Index: 25 or less.
  2. Smoke-Developed Index: 450 or less.
- E. Pad Coverings: Provide safety pad fabric covering fabricated from puncture- and tear-resistant, not less than 14-oz./sq. yd (475-g/sq. m) PVC-coated polyester or nylon-reinforced PVC fabric treated with fungicide for mildew resistance; with surface-burning characteristics indicated[.
- F. Wall Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered by seamless fabric covering, free of sag and wrinkles and firmly attached to back of backer board.
1. Backer Board: Not less than 3/8-inch- (9.5-mm-) thick plywood, mat formed, or composite panel.
  2. Fire-Resistive Fill: Multiple-impact-resistant foam not less than 2-inch- (50-mm-) thick fire-resistive neoprene, 6.0-lb/cu. ft. (96-kg/cu. m) density.
  3. Size: Each panel section, 24 inches (600 mm) wide by not less than 72 inches (1800 mm) long.
  4. Number of Panel Sections: See Drawings.
  5. Installation Method: top and bottom fabric attachment flange with exposed fasteners.
  6. Fabric Covering Color(s): As selected by Architect from manufacturer's full range.
- G. Corner Wall Safety Pads: Wall corner pad consisting of not less than 1-1/4-inch- (32-mm-) thick, multiple-impact-resistant, closed-cell polyethylene-foam filler, covered on both sides and all edges by fabric covering with backer board and manufacturer's standard anchorage to wall.
1. Length: Each pad [not less than 72 inches (1800 mm)].
  2. Fabric Covering Color(s): As selected by Architect from manufacturer's full range.
- H. Column Safety Pads: Pads covering exposed flange of columns to height indicated, consisting of not less than 1-1/4-inch- (32-mm-) thick, multiple-impact-resistant, closed-cell polyethylene-foam filler, covered on both sides and all edges by fabric covering with backer board and manufacturer's standard anchorage to column.
1. Length: Each pad [not less than 72 inches (1800 mm)].
  2. Fabric Covering Color(s): As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, [ **accurate locations of connections to building electrical system,**] and other conditions affecting performance.
1. Verify critical dimensions.

2. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements have been clearly marked. Locate reinforcements and mark locations.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment. Complete equipment field assembly, where required.
- B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, have been completed.
- C. Permanently Placed Gymnasium Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.
  1. Floor Insert Location: Coordinate location with application of game lines and markers, and core drill floor for inserts after game lines have been applied.
  2. Floor Insert Elevation: Coordinate installed heights of floor insert with installation and field finishing of finish flooring and type of floor plate.
  3. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.
- D. Floor Insert Setting: Position sleeve in oversized, recessed voids in concrete slabs. Clean voids of debris. Fill void around sleeves with grout, mixed and placed to comply with grout manufacturer's written instructions. Protect portion of sleeve above subfloor[ and footing] from splatter. Verify that sleeves are set plumb, aligned, and at correct height and spacing; hold in position during placement and finishing operations until grout is sufficiently cured. Set insert so top surface of completed unit is flush with finished flooring surface.
- E. Wall, corner and column Safety Pads: Mount with bottom edge at 4 inches (102 mm) above finished floor.
- F. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed gymnasium equipment to structural support and for properly transferring load to in-place construction.
- G. Connections: Connect automatic operators to building electrical system.
- H. Removable Gymnasium Equipment and Components: Assemble in place to verify that equipment and components are complete and in proper working order. Instruct Owner's designated personnel in properly handling, assembling, adjusting, disassembling, transporting, storing, and maintaining units. Disassemble removable gymnasium equipment after assembled configuration has been approved by Architect, and store units in location indicated on Drawings.

3.3 ADJUSTING

- A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING

- A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 11 66 23



## SECTION 11 68 00 - PLAYGROUND EQUIPMENT

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Section includes freestanding and composite structure playground equipment

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For playground equipment and structures. Include plans, elevations, sections, details, and attachments to other work.
- C. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
  - 1. Extent of surface systems and use zones for equipment.
  - 2. Critical heights for playground surface, or fall heights for equipment.
- D. Samples for Initial Selection: For each type of playground equipment and structure indicated.
  - 1. Manufacturer's color charts.
  - 2. Include similar Samples of playground equipment and accessories involving color selection.
- E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
  - 1. Posts and Rails: Not less than 6 inches long.
  - 2. Platforms: Not less than 6 inches square.
  - 3. Molded Plastic: Not less than 3 inches square.
- F. Product test reports.
- G. Field quality-control reports.
- H. Maintenance data: For playground equipment and finishes to include in maintenance manuals.
- I. Qualification Data: For Installer and manufacturer.
- J. Warranty: Special warranty specified in this Section.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm whose playground equipment components have been certified by IPEMA's third-party product certification service.

- B. Installer Qualifications: An employer of workers approved by manufacturer.
- C. Safety Standards: Provide playground equipment complying with or exceeding requirements in ASTM F 1487 CPSC No. 325.
- D. Preinstallation Conference: Conduct conference at Project site.

#### 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of playground equipment that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period:
    - a. Lifetime limited warranty on support posts (uprights) and hardware
    - b. 15-year limited warranty on punched steel decks, pipes, rails, loops, rungs, and rotomolded polyethylene

#### PART 2 - PRODUCTS

##### 2.1 MANUFACTURER

- A. Playground equipment pre-selected by Baltimore County Public Schools (BCPS) and as noted on the plans.

##### 2.2 MATERIALS

- A. Punched Steel Decks:
  - 1. Fabricate from 12 gauge punched steel or from 11 gauge as recommended by manufacturer.
  - 2. Coated products shall consist of a welded assembly with an oven cured matte finish polyvinyl chloride (PVC) coating with a minimum coating thickness of .080". The PVC coating shall have a hardness of Shore A 83 +/-5 normal durometer range. Coating material shall be classed as "Self Extinguishing", meeting or exceeding automotive specifications NVSS302, and containing ultraviolet inhibitors.
  - 3. For ADA Ramp Accessible decks and ramps, the hole shall measure 1/4" diameter after coating.
  - 4. For standard decks and ramps, the hole size shall measure 1-1/4" diameter after coating.
- B. Stairs:

1. Fabricated from punched steel in conformance with the specifications outlined herein.
2. Stair stringers shall be made from 11 gauge (.120" thick) hot rolled flat steel.
3. Stairs and stringers shall be an all welded assembly finished with the matte PVC coating per the specifications herein.
4. Ladder handrails shall be fabricated from 1-5/16" O.D. x .083" (14 gauge) wall galvanized steel tubing. Handrails shall be an all welded assembly and shall be coated after fabrication with TGIC polyester powder coating.

C. Rotationally Molded Products:

1. All polyethylene shall be linear low-density material with UV-stabilized color and an anti-static compound additive.
2. All rotationally molded products shall meet or exceed the following specifications: ASTM D-1248, type 2, class A and Federal specification LP-390C, type 1, class M, grade 2, category 3; Density (ASTM D- 1505); Brittleness Temperature (ASTM D-746); Tensile Values (ASTM D-638); Flexural Modulus (ASTM D-790); Heat Distortion (ASTM-648); Low Temperature Impact (ARM-STD).

D. Hardware:

1. All nuts, bolts, screws, inserts, and lockwashers used in the assembly of all play equipment, shall be stainless steel, yellow dichromate plated steel, blue-coat plated steel, mechanically galvanized or powder coated/yellow dichromate plated steel.
2. All primary fasteners shall be 300 series stainless steel. Fasteners with yellow dichromate treatment have an electro deposited, 99.9% pure zinc substrate applied from a specially formulated solution sealed with a yellow dichromate top coat designed to work in conjunction with the zinc plating.

E. Powder Coat Finish:

1. Powder coat shall be an electrostatically applied custom formula of TGIC polyester powder. All components shall be free of sharp edges and excess weld spatter and shall be cleaned in a six stage bath system with an iron phosphate wash before coating. In addition, all welds shall be protectively coated with zinc rich primer prior to powder coating.
2. Powder coating shall attain a minimum 3.0 mil thickness after having been oven cured between 375 to 425 degrees Fahrenheit.
3. Pencil Hardness H (ASTM D-3363), Impact (ASTM D-2794- 69), Wedge Bend (ASTM D-522-68), Adhesion (Cross Hatch ASTM D-3359 & Knife Scratch ASTM D-2197), Environmental (Stain Resistance ASTM D-1308, Humidity ASTM D-2247 - 87, Salt Spray ASTM B-117 & Fadometer 300 hrs with no loss of gloss), Over-bake Stability 100% at 400 degrees Fahrenheit.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, site surface and subgrade drainage, and other conditions affecting performance.

1. Do not begin installation before final grading required for placing protective surfacing is completed, unless otherwise permitted by Architect.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Verify locations of playground perimeter and pathways. Verify that playground layout and equipment locations comply with requirements for each type and component of equipment.

### 3.3 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.

1. Maximum Equipment Height: Coordinate installed heights of equipment and components with finished elevations of protective surfacing. Set equipment so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that playground equipment elevations comply with requirements for each type and component of equipment.

- B. Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.

- C. Post Set on Subgrade: Level bearing surfaces with drainage fill to required elevation.

- D. Post Set with Concrete Footing: Comply with ACI 301 for measuring, batching, mixing, transporting, forming, and placing concrete.

1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.

- a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

2. Embedded Items: Use setting drawings and manufacturer's written instructions to ensure correct installation of anchorages for equipment.

3. Concrete Footings: Smooth top, and shape to shed water.

- E. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

- F. Tests and Inspections: For playground and playground equipment and components at final completion and to certify compliance with ASTM F.

- G. Prepare test and inspection reports.

H. Notify Architect 48 hours in advance of date and time of final inspection.

END OF SECTION 11 68 00

SECTION 11 90 20 – WEATHER STATION (ADD ALTERNATE)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following gymnasium equipment:
  - 1. Complete fully operational weather station system.
- B. Related Sections include the following:
  - 1. Division 26 Sections for electrical service and Division 27 Sections data requirements.
  - 2. Division 5 Sections for mounting the station to the building.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. Product data for all equipment.
- B. LEED Submittal:
  - 1. Innovation in Design: The Weatherbug qualifies as a LEED Innovation in Design point.
- C. Shop Drawings: Include plans, elevations, details, attachments to other work, and the following:
  - 1. Method of field assembly for removable equipment, connections, installation details, mountings, attachment inserts, attachments to other work, and operational clearances.
  - 2. Transport and storage accessories for removable equipment.
- D. Qualification Data: For Installer.
- E. Operation and Maintenance Data: Provide O&M Manuals.
- F. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.

- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

#### 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Vendor to confirm location for weather station.
- B. Field Measurements: Verify position and elevation for weather station equipment.

#### 1.6 COORDINATION

- A. Coordinate layout and installation of weather station.

#### 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of equipment that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Weather station equipment.
    - b. LCD display and computer programming.
  - 2. Warranty Period: 5 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 BASIS OF DESIGN

- A. Earth Networks: 12410 Milestone Center Dr, Suite 300 Germantown, MD 20876. Phone: 301-250-4000. Toll Free: 800-544-4429
- B. Weatherbug Weather Station
- C. Weather Station gathers and analyzes 27 key atmospheric conditions – including temperature, wind speed and direction, humidity and more. Wind sensor, data appliance, sensor shelter, total lightning sensor, rain gauge, digital display.

#### 2.2 EQUIPMENT

- A. Hardened weather station including complete array of sensors (Anemometer, TRH, Rain Gauge).
- B. Broadcast Television partners who include WeatherBug schools in their weather reports.

- C. Lifetime site license to WeatherBug's Award Winning STEM Education software package Achieve. Every teacher and every student at your school can have access to real-time data, lesson plans and tools.
- D. LCD Display: 21" LCD Display unit (plug and play, reports real-time weather conditions from your station, the 3 day forecast, Doppler radar, and local National Weather Service alerts).
- E. Online Weather Center to link to your website.
- F. WeatherBug App Community
- G. HD Pan-Tilt-ZoomPTZ Camera

**PART 3 - EXECUTION**

**3.1 INSTALLATION, GENERAL**

- A. General: Comply with manufacturer's written installation instructions.

**3.2 ADJUSTING**

- A. Adjust movable components of equipment to operate properly.

**3.3 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain weather station equipment. Refer to Division 01 Section "Demonstration and Training."

**END OF SECTION 11 90 20**



## SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following types of venetian blinds and accessories:
  - 1. Operable Horizontal Louver Blinds (Venetian) with aluminum louver slats for all exterior window locations.
  - 2. Operable Horizontal Louver Blinds (Mini) with aluminum louver slats for all interior sidelights.
- B. Related Sections include the following:
  - 1. Division 1 Section "Substitutions" for substitution procedure.
  - 2. Division 6 Section "Miscellaneous Carpentry" for wood blocking and grounds for mounting horizontal louver blinds and accessories.

#### 1.3 DEFINITIONS

- A. Horizontal Louver Blinds (Venetian) with nominal 2-inch wide louver slat.
- B. Horizontal Louver Blinds (Mini) with nominal 1-inch wide louver slat.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
- B. Shop Drawings: Show location and extent of horizontal louver blinds. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other Work, operational clearances, and relationship to adjoining work.
- C. Samples for Initial Selection: For each colored component of each type of horizontal louver blind indicated.
  - 1. Include similar Samples of accessories involving color selection.

- D. Samples for Verification: For the following products, prepared on Samples from the same material to be used for the Work.
  - 1. Louver Slat: Not less than 12 inches long.
  - 2. Tapes: Full width, not less than 6 inches long.
  - 3. Horizontal Louver Blind: Full-size unit, not less than 16 inches wide by 24 inches long.
- E. Window Treatment Schedule: Include horizontal louver blinds in schedule using same room designations indicated on Drawings.
- F. Product Certificates: For each type of horizontal louver blind product, signed by product manufacturer.
- G. Product Test Reports: For each type of horizontal louver blind product.
- H. Maintenance Data: For horizontal louver blinds to include in maintenance manuals. Include the following:
  - 1. Methods for maintaining horizontal louver blinds and finishes.
  - 2. Precautions about cleaning materials and methods that could be detrimental to finishes and performance.
  - 3. Operating hardware.

## **1.5 QUALITY ASSURANCE**

- A. Source Limitations: Obtain horizontal louver blinds through one source from a single manufacturer.
- B. Fire-Test-Response Characteristics: Provide horizontal louver blinds with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. Flame-Resistance Ratings: Passes NFPA 701.
- C. Corded Window Covering Product Standard: Provide horizontal louver blinds complying with WCMA A 100.1.
- D. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
  - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
  - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver blinds in factory packages, marked with manufacturer and product name, and location of installation using same room designations indicated on Drawings and in a window treatment schedule.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

## 1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Horizontal Louver Blinds: Before installation begins, for each size, color, texture, pattern, and gloss indicated, full-size units equal to 5 percent of amount installed.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Horizontal Louver Blinds, Aluminum Louver Slats:
    - a. Hunter Douglas Window Fashions.
    - b. Levolor Contract; a Newell Company; Levolor.
    - c. Springs Window Fashions Contract Division, Inc.; Bali., (Basis of Design)
    - d. Verosol USA, Inc.

### 2.2 HORIZONTAL LOUVER BLINDS, ALUMINUM LOUVER SLATS

- A. Louver Slats: Aluminum, alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radiused corners.
- B. Type 1: Venetian Blind, Bali 2" Aluminum School Blind, Basis of Design
  - 1. Nominal Slat Width: 2 inch blinds.
    - a. Slat Spacing: Manufacturer's standard.
    - b. Slat Thickness: .008 Inch.
    - c. Slat Finish: One color as selected by architect.
    - d. Headrail: 1-5/8" high x 2-1/4" wide x .22" thick U-shaped steel with 1/8" light blocking lip.
    - e. Bottom Rail: C Shaped, 9/16" high x 2" wide x 0.40" thick anodized aluminum.

- C. Type 2: Mini Blind, Bali Classics Aluminum Blinds
  - 1. Nominal Slat Width: 1 inch blinds.
    - a. Slat Spacing: Manufacturer's standard.
    - b. Slat Thickness: .008 Inch.
    - c. Slat Finish: One color as selected by architect.
    - d. Headrail: 1" high x 1-1/2" wide x .25" thick U-shaped steel with 1/8" light blocking lip.
    - e. Bottom Rail: Enclosed Tubular shape made of phosphate-treated steel for corrosion resistance and shall measure 0.25" thick.
- D. Headrail: Formed steel or extruded aluminum; long edges returned or rolled; fully enclosing operating mechanisms on three sides and ends; capacity for one blind[s] per headrail, unless otherwise indicated.
- E. Bottom Rail: Formed-steel or extruded-aluminum tube, sealed with plastic or metal capped ends top contoured to match crowned shape of louver slat; with enclosed and protected ladders and tapes to prevent their contact with sill.
- F. Tilt Control: Consisting of enclosed worm gear mechanism and linkage rod, for the following operation:
  - 1. Tilt Operation: Manual with clear plastic wand.
  - 2. Length of Tilt Control: Length required to make operation convenient from floor level.
  - 3. Tilt: Full.
- G. Lift Operation: Manual, cord lock; locks pull cord to stop blind at any position in ascending or descending travel.
- H. Tilt-Control and Cord-Lock Position: Right side and left side of headrail, respectively, unless otherwise indicated.
- I. Ladders: Evenly spaced to prevent long-term louver sag.
  - 1. For Blinds with Nominal Slat Width 2 Inch: 1-1/2" Reinforced Vinyl Tapes.
    - a. Tape Color, Texture, and Pattern: Color, texture, and pattern as selected by Architect from manufacturer's full range.
  - 2. For Blinds with Nominal Slat Width 1 Inch or Less: Braided string of 100% Polyester yarn, incorporating two extra strength rungs per ladder for slat support.
- J. Mounting: Under horizontal window head mounting permitting easy removal and replacement without damaging blind or adjacent surfaces and finishes; with spacers and shims required for blind placement and alignment indicated.
  - 1. Provide intermediate support brackets if end support spacing exceeds spacing recommended by manufacturer for weight and size of blind.
- K. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard, as indicated.
- L. Colors, Textures, Patterns, and Gloss: As selected by Architect from manufacturer's full range.

### 2.3 HORIZONTAL LOUVER BLINDS FABRICATION

- A. Product Standard and Description: Comply with AWCMA Document 1029, unless otherwise indicated, for each horizontal louver blind designed to be self-leveling and consisting of louver slats, rails, ladders, tapes, lifting and tilting mechanisms, cord, cord lock, tilt control, and installation hardware.
- B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
  - 1. Lifting and Tilting Mechanisms: With permanently lubricated moving parts.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
  - 1. Blind Units Installed between (Inside) Jambs: Width equal to 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch, less than jamb-to-jamb dimension of opening in which each blind is installed. Length equal to 1/4 inch, plus or minus 1/8 inch, less than head-to-sill dimension of opening in which each blind is installed.
- D. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, and operating hardware, and for hardware position and blind mounting method indicated.
- E. Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal noncorrosive to blind hardware and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.
- F. Color-Coated Finish:
  - 1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
- G. Component Color: Provide rails, cords, ladders, and exposed-to-view metal and plastic matching or coordinating with slat color, unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 HORIZONTAL LOUVER BLIND INSTALLATION

- A. Install blinds level and plumb and aligned with adjacent units according to manufacturer's written instructions, and located so exterior louver edges in any position are not closer than 1 inch to interior face of glass. Install intermediate support as required to prevent deflection in

headrail. Allow clearances between adjacent blinds and for operating glazed opening's operation hardware, if any.

- B. Flush Mounted: Install blinds with louver edges flush with finish face of opening if slats are tilted open.
- C. Head Mounted: Install headrail on underside of opening head.

### **3.3 ADJUSTING**

- A. Adjust horizontal louver blinds to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

### **3.4 CLEANING AND PROTECTION**

- A. Clean blind surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged blinds that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

**END OF SECTION 12 21 13**

## **SECTION 12 35 00 – LIBRARY SHELVING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. The items highlighted in this section can be referenced in the following locations as shown on in the architectural drawings:
  - 1. Circulation Desk / Self Check Out
  - 2. Walk Up / Sit Down Computer Terminals
  - 3. Library Stacks
- B. This Section includes the following:
  - 1. Plastic Laminate Circulation Desk / Self Check Out Stations.
  - 2. Plastic Laminate Walk-Up/ Sit Down Computer Terminals
  - 3. Plastic Laminate End Panels and Shelving.
  - 4. Plastic Laminate Tops for Shelves.

#### **1.3 RELATED SECTIONS INCLUDE THE FOLLOWING:**

- A. Section 06– Rough Carpentry: Framing and blocking in walls, floors, and ceilings to support casework and equipment.
- B. Section 09 - Resilient Base: Floor base molding and corners.
- C. Section 16 - Basic Electrical Materials and Methods: Furnishing, installing and connecting of service supply lines and conduits within equipment and reagent racks, connecting of exposed service lines, connecting of services in tunnels or service turrets through, under, or along backs of working surfaces as required for utility service fixtures. Installing all utility service outlet accessory fittings and fixtures furnished by casework contractor, pulling of wire and connecting of electrical fixtures in service lines, provision of ground fault protection for circuits requiring such.

#### **1.4 DEFINITIONS**

- A. Library Furniture: All casework consisting of the custom built-in circulation desk, computer stations, shelving with end panels and tops; their associated work surfaces, top mounted power & data service fixtures, and any special top mounted hardware; filler or enclosure panels; special support frames or other material required to provide a completely finished, functional installation as defined by the project drawings.

- B. Scheduling: Delivery shall be made at that point in the construction sequence when the areas to receive the Library Casework and Shelving are environmentally protected from excessive temperature variations and humidity, have final finishes on surfaces upon or against which the equipment will be installed, and are adequately lighted to allow detail work to be performed. Prior to this state of readiness, all necessary concealed support framing for utilities, or other cosmetically non-critical material may be delivered upon approval by owner.
- A. Installation: Work to be performed under this contract will consist of the following:
1. Receiving and unloading of all Library Furniture and accessory items indicated on the drawings and / or equipment list as part of this specification section.
  2. Damage and shortage reporting to Architect upon receipt of shipment at jobsite.
  3. Distribution of Library Furniture and equipment to area of installation
  4. Erection of all Library Furniture in place.
  5. Turn over to the appropriate trade for assembly, installation and connection, the electrical service fixtures furnished by the manufacturer under this section.
  6. Complete functional adjustment of all equipment installed under this contract.
  7. Clean-up and maintenance of work areas during and after completion.
  8. Obtaining necessary building information prior to and during construction to allow manufacturer to adequately fulfill his obligations to provide properly dimensioned and complete equipment design.
  9. Full ten - year warranty on all work performed under this contract.
  10. A representative employed directly by the manufacturer with experience in the design, manufacture and installation of this equipment to perform monitoring before, during construction and prior to turnover to the owner.

## **1.5 SUBMITTALS**

- A. Product Data: For panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate, solid-surfacing material, fire-retardant-treated materials, cabinet hardware and accessories, handrail brackets, and finishing materials and processes.
1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Show details full size.
  2. Show locations and sizes of blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
  3. Show locations and sizes of cutouts and holes for other items installed in architectural woodwork.
  4. Show plastic laminate panels with dimensions, grain direction, exposed face.
  5. Show location of countertop seams.
  6. Apply AWI-certified compliance label to first page of Shop Drawings.
- C. Samples for Initial Selection:
1. For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
  2. Countertop materials specified.



- D. Samples for Verification:
  - 1. Plastic Laminate panel products, 8 by 10 inches.
  - 2. Plastic Laminate Counter top materials, 6 inches square.
  - 3. Hardware
- E. Product Certificates: For each type of product, signed by product manufacturer.
- F. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- G. Qualification Data: For fabricator/installer.

## **1.6 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.
- B. Installer Qualifications: Fabricator of products and certified participant in AWI's Quality Certification Program.
- C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork from single source provider.
- D. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for Premium Grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
  - 1. Provide AWI Quality Certification Program labels and certificates indicating that woodwork, including installation, complies with requirements of grades specified.
  - 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with such selections and requirements in addition to the quality standard.
- E. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.
- F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver Library Furniture until painting and similar operations that could damage casework and shelving have been completed in installation areas. If casework and shelving must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

## 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install Library Furniture until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where Library Furniture is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
  - 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

## 1.9 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers / dealers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Manufacturers:
      - 1) Agati Furniture
      - 2) BCI Libraries
      - 3) Brodart Furniture
      - 4) MJ Industries, J. P. Jay Associates
      - 5) Storage Logic, Inc.

- B. Casework Arrangement: As indicated on Drawings.
- C. Shelving Arrangement: As indicated on Drawings.
- D. Owner and Architect to approve all products submitted for compliance with Library Furniture as drawn and desired aesthetic.

## 2.2 MATERIALS

- A. Plastic Laminate Library Casework Materials General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
  - 1. All materials shall be the best of their respective kinds for the purpose intended and all methods used shall conform to the best practices of the Library Equipment Industry, including any specialized materials required.
- B. Special Materials:
  - 1. Particleboard: Core material for plastic laminate surfaced casework, panels, and countertops shall be  $\frac{3}{4}$  inch or 1 inch thick industrial grade, 45 pound density particleboard with a moisture content not to exceed eight ( 8 ) percent. Plywood core is provided only when indicated as furnished in lieu of particle board.
  - 2. Hardboard: S.I.S., nonprint where unexposed, shall be  $\frac{1}{4}$  inch thick; hardboard, S.I.S. All hardboard shall be composed of wood fibers and a resinous binder compressed under heat and pressure.
  - 3. Tempered Hardboard: Shall be a wood fiber/resinous combination formed with heat and pressure into sheets providing a hard, smooth surface.

## 2.3 PRODUCTS

- A. **Plastic Laminate Casework Circulation Desk Construction:**
  - 1. **Description:** A curved plastic laminate circulation desk comprised of two areas – one (1) at a lower 30" desk height and one (1) ADA compliant desk height at 34" with a Hi / Low transaction top area for checking out books. The standard size worksurface, including the waterfall edge detail are as shown on the drawings. Open plastic laminate shelving will be at the staff side for storage.
    - a. All Circulation Desk dimensions to be verified prior to fabrication by the manufacturer and the architect.
  - 2. **Wire Management:** Access door under work surface (at power & data conduit feed location only, thru floor by others) concealed in wall panel framing, to dual-channel data/power horizontal trough under desktop with integral power receptacles. Task lighting, under transaction counter, with concealed conduit feeds from power trough. CPU holders under worksurface, as indicated on the drawings (CPU's by others). Grommets for field install.
  - 3. **Electrical Fittings:** Electrical fittings shall contain 20 amp, 125 volt AC 3-wire polarized grounded receptacles unless otherwise specified. All electrical fixtures or fittings called for or to be furnished under these specifications shall meet NEC requirements
  - 4. **Hardware and Trim:**

- a. Floor Glides: Shall be a non-marring material at least 1 inch dia. to prevent indenting composition flooring and shall have at least a 5/8" height adjustment. Metal buttons will not be acceptable.
- b. Shelf Support Clips: Shall be 5 mm pin type for mounting on interior of cabinets. Clips shall be corrosion resistant and shall retain shelves from accidental removal. Shelves are adjustable on 32 mm centers.

**B. Shelving and End Panels: Single & Double Face Shelving**

1. **Description:** All shelving will have plastic laminate end panels for single or double face shelving. The end panel will extend above the wood shelving by 1/2". At locations where there is a top cap, the end panel will extend above the top cap by 1/2". Double face end panels will extend past the shelving units by 1/2" on each side. Single face end panels will extend past the shelving units by 1/2" on the front side only.
  - a. All end panel dimensions to be verified prior to fabrication by the manufacturer and the architect.
2. **Panel:** The end panel is 1-3/16" thick with three ply construction using a 1-1/8" thick 47.5 lb. medium density fiberboard core with plastic laminate on both faces. All four edges of the panel are edge banded. All exposed corners are eased and sand softened to a 1/16" radius.
3. **Top:** The top panel is 1-5/16" thick with three-ply construction using a 1-1/8" thick, 45lb. particle board core covered with plastic laminate on the top and bottom face. When the top is made in more than one section, the filed joint is leveled with a spline or lamellos, and secured with a minimum of two tie joint fasteners inset into the bottom face of the top panel. Top Panels for "Picture Books to be slanted, per architectural drawings.
4. **Base:** All attached perimeter shelving shall have Floor Glides. All freestanding shelving the open areas shall be moveable on casters.
5. **Finish:** Plastic Laminate to be selected by Architect, Full Range of Colors and Patterns.

**C. Walk-Up Terminals**

1. **Description:** A modular plastic laminate end panel, single face carrel with end panels. The carrels have modular construction consisting of end panels, partition panels, center divider panels, worksurfaces. The carrels are configured as required with starter adder units for two workstations and layout specified. The terminal has a worksurface with an inset of 1/8" Plastic Laminate with a pvc edge. The standard size worksurfaces, including the edgeband are as shown on the drawings, including heights, for seated height terminal, and standing height walk-up terminal.
  - a. All end panel dimensions to be verified prior to fabrication by the manufacturer and the architect.
2. **Worksurface Panel:** The worksurface panel is 1-5/16" thick with three ply construction using a 1-1/8" thick 45 lb. particleboard core. The top face is covered with plastic laminate and the bottom face has a phenolic backer for balanced construction. The bottom face of the worksurface is grooved along the sides and back to receive "Z" bar.
3. **Worksurface Attachment:** The worksurface is attached to the end panels, partition panels, and back or center panels with sections of metal "Z" bar located below the worksurface and centered at each end and along the back. The "Z" bar is made with .0625" thick hot rolled steel 1-1/2" wide x 1-1/2" high and has a black powdercoat finish. The "Z" bar is attached to the worksurface, end panels, partition panels, and back or center panels with pan head screws inserted into staggered holes spaced 6" on center along the bar and threading into pilot holes located in the face of the panels.
4. **Worksurface Support:** Each worksurface over 36" wide is braced with a section of 12 gauge cold rolled steel "V" channel mounted parallel to the user's edge. The channel is 1-1/4" high x 3" wide and is attached to the underside of the worksurface panel with #12-3/4" pan head Hi-Fast screws driven through holes spaced 6" on center.

5. **Glides:** Each end panel and partition panel has heavy-duty adjustable glides recessed into the bottom allowing the carrel to be leveled. The glide has a 5/16-18 x 1-1/2" long threaded metal stem with a 1" hexagonal steel base. The base has a black finish. The stem threads into an internally threaded metal insert recessed into the bottom of the panel.
6. **Electrical & Wire Management:** Power / Data Ports reference # elec\_r\_002, elec\_r\_003, elec\_r\_005, & elec\_p\_0011. Locations of data ports and wire management per drawings. For "island units", dual channel Data/Power vertical feeder from floor to underside of desktop, on concealed face of side panel, configured for whip connections to closest floor junction box. For units fed from wall or column, provide for field installation of grommets holes through side panels for access to whip connections to closest wall junction box. Dual channel Data/Power horizontal trough under desktop with grommets holes thru panels between ganged units. Grommets for field install. Recessed Data/Power Box with flip-up lid at back left corner of each worksurface. Under shelf mounted light fixture with fixture-mounted push-switch (dual head for back-to-back carrels) with routed-in vertical channel for power wiring from power trough, on trough side for back-to-back carrels.
7. **Base:** Shall be a non-marring material at least 1 inch dia. to prevent indenting composition flooring and shall have at least a 5/8" height adjustment. Metal buttons will not be acceptable.
8. **Finish:** Plastic Laminate to be selected by Architect, Full Range of Colors and Patterns.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Before installation, condition library casework and furniture to average prevailing humidity conditions in installation areas.
- B. Before installing library casework and furniture, examine shop-fabricated work for completion and complete work as required, including removal of packing.
- C. Installation site shall be prepared, ready, and maintained to conform with SEFA 2.3/1997 conditions including, but not limited, to the following:
  1. Overhead ceiling work, including ductwork, lighting, and acoustical ceiling is complete.
  2. Windows and exterior doors are installed. Building is secure and weather tight.
  3. Air Circulation control system is functioning and maintaining relatively constant temperature and humidity conditions closely approximately those to be maintained by the owner.
  4. Painting and wet work be completed in the areas in which casework is to be installed prior to such installation.
- D. Clean surfaces thoroughly prior to installation.
- E. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.2 INSTALLATION**

- A. All work involving the handling, distribution, erection and installation of library casework and furniture shall be performed by qualified craftsmen, neat in appearance and workmanship, and abiding by local or national codes and ordinances pertaining to this type of work or as designated by owner. All debris resulting from this installation shall be cleaned up and casework interiors cleaned at completion of installation.
- B. Provide ledges and supporting structures and miscellaneous items of equipment as listed in the equipment schedules or as shown on the drawings, including delivery, unpacking, setting in place, leveling, and anchoring to walls and floors as required. Provide filler panels, knee space panels, where specified, and scribes required for a finished installation.
- C. Install library furniture in accordance with manufacturer's instructions.
  - 1. Installation of casework shall be plumb, level, true and straight, with no distortions.
  - 2. Use concealed shims as required.
  - 3. Where library casework butts against other finished work, scribe and cut for an accurate fit.
  - 4. Lubricate operating hardware as recommended by the manufacturer.
- D. Install cabinets without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
  - 1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
- E. Install countertop and edge surfaces in one plane with flush hairline joint. Locate joints only where shown on Shop Drawings.
  - 1. Provide required holes and cutouts for service fittings.
  - 2. Provide scribe moldings for closures at junctures of countertop, backsplash, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent library casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
  - 3. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- F. Provide utility service outlet accessory fittings, electrical receptacles, and switches when required, as listed in equipment schedules, or as shown on drawings as mounted on or in conjunction with the casework.
- G. Provide necessary pathways between electrical and data building feeds to terminal devices built into furniture.
- H. Touch up finishing work specified in this Section after installation of casework. Fill nail holes with matching filler where exposed.

### **3.3 ADJUSTING AND CLEANING**

- A. Repair damaged and defective library casework and furniture, where possible, to eliminate functional and visual defects; where not possible to repair, replace library casework and furniture.

- B. Clean, lubricate, and adjust hardware.
- C. Clean library casework and furniture on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

**3.4 PROTECTION**

- A. Protect installed library casework and shelving until completion of project.
- B. Inspect library casework and furniture for damaged or soiled areas; remove, refinish, and touch-up as required
- C. Cover installed library casework and furniture with 4-mil polyethylene film.
- D. Touch-up, repair, or replace damaged products before Substantial Completion.

**END OF SECTION 12 35 00**

SECTION 12 93 00 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

- 1. Seating.
- 2. Bicycle racks.
- 3. Trash receptacles
- 4. Bollards

- B. Related Sections include the following:

- 1. Division 31 "Earthwork" for excavation for installation of concrete footings.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For units with factory-applied color finishes along with color palettes representing full range of selections offered for each product
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
  - 1. Size: Not less than 6-inch- long linear components and 4-inch- square sheet components.
- D. Maintenance Data: For site furnishings to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of site furnishing through one source from a single manufacturer.



## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials; commercial quality, tamperproof, vandal and theft resistant, concealed, recessed, and capped or plugged.
  - 1. Angle Anchors: For inconspicuously bolting legs of site furnishings to on-grade substrate; one per leg.
- B. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107; recommended in writing by manufacturer, for exterior applications.
- C. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound; resistant to erosion from water exposure without needing protection by a sealer or waterproof coating; recommended in writing by manufacturer, for exterior applications.
- D. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:
  - 1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, polymer film. Internal, same as external or consisting of 81 percent zinc pigmented coating, not less than 0.3 mil thick.
  - 2. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

### 2.2 SEATING

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or an approved comparable product equal in all respects to Model #RMFC-24, powder coated steel, 6-foot long bench as manufactured by Victor Stanley, Inc. Color to be selected by owner from full standard color range offered by manufacturer.

### 2.3 FABRICATION

- A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of

member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

- D. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
- E. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

#### 2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

#### 2.5 STEEL AND GALVANIZED STEEL FINISHES

- A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.
- B. PVC Finish: Manufacturer's standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

- C. Install site furnishings level, plumb, true, and securely anchored and positioned at locations indicated on Drawings.
- D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
- E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.
- F. Pipe Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

### 3.3 CLEANING

- A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION 12 93 00

SECTION 14 21 50 – ADA LIFT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes providing and installing completely refurbished “like new” ADA lifts.
- B. Related Requirements:
  - 1. Section 03 30 00 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
  - 2. Section 05 50 00 "Metal Fabrications" for the following:
    - a. Attachment plates and angle brackets.

1.3 ACTION SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for car enclosures, hoistway entrances, and operation, control, and signal systems.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, and large-scale details indicating service at each landing, coordination with building structure, relationships with other construction, and locations of equipment.
- C. Samples for Initial Selection: For finishes involving color selection.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Manufacturer Certificates: Signed by lift manufacturer certifying that layout and dimensions, as shown on Drawings, and electrical service are adequate for elevator system being provided.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

1.8 COORDINATION

- A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of other work relating to electric traction elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

1.9 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
  - 2. Warranty Period: 1 year from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide 750 pound capacity Hercules II 750 Commercial Vertical Platform Lift by AmeriGlide.

Website: [http://www.ameriglide.com/item/resvplxl\\_access.html](http://www.ameriglide.com/item/resvplxl_access.html)

or comparable product by one of the following:

1. Ram Elevators & Lifts, Commercial Trus-T-Lift Vertical Platform lift, Edmonton, Alberta, Canada (52" or 72" lift height)
2. EZAccess, Passport® Vertical Platform Lift (52" or 72" lift height) Algoma, WA 98001-7408
3. Harmar, CPL Commercial Vertical Platform Lift (53" lift height), Sarasota, FL 34234
4. Bruno Commercial Vertical Platform Lifts VPL-3300 Series(60" lift height),

- B. Source Limitations: Obtain lift components from single manufacturer.

1. Major lift components, including driving machines, controllers, signal fixtures, door operators, and entrances, shall be manufactured by single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.
- B. Accessibility Requirements: Comply with Section 407 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

### 2.3 ADA LIFT

- A. ADA Lift System, General: Manufacturer's standard lift system. Unless otherwise indicated, manufacturer's standard components shall be used, as included in standard elevator systems and as required for complete system.

- B. ADA LIFT NO. 1

1. Description:
2. Machine Type:
3. Lift Height – 53 3/8"
4. Platform Type – 36" x 54" Straight Thru
5. Tower Orientation – Facing the lift on the lower level the tower is on the right.
6. Platform Gate – 36" wide Straight Thru
7. Landing Gate – 36" wide
8. Ramp Type – Fixed (standard)

2.4 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

- A. Controller: Provide microcomputer based control system to perform all functions.
  - 1. Provide emergency stop alarm.
  - 2. Provide two call-send controls.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Alignment: Coordinate installation of lift to ensure that it is fully operable.
- C. Perform final adjustments, and necessary service prior to substantial completion.

3.3 FIELD QUALITY CONTROL

- A. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevator(s).

3.5 MAINTENANCE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 1 months' full maintenance by skilled employees of lift Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
  - 1. Perform maintenance during normal working hours.

END OF SECTION 14 21 50

SECTION 14 24 00 – HOLELESS HYDRAULIC ELEVATORS

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section includes: Hydraulic passenger elevators as shown and specified. Elevator work includes:
1. Standard pre-engineered hydraulic passenger elevators.
  2. Elevator car enclosures, hoistway entrances and signal equipment.
  3. Jack(s).
  4. Operation and control systems.
  5. Accessibility provisions for physically disabled persons.
  6. Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
  7. Materials and accessories as required to complete the elevator installation.
- B. Related Sections:
1. Division 1 General Requirements: Meet or exceed all referenced sustainability requirements.
  2. Division 3 Concrete: Installing inserts, sleeves and anchors in concrete.
  3. Division 4 Masonry: Installing inserts, sleeves and anchors in masonry.
  4. Division 5 Metals:
    - a. Providing hoist beams, pit ladders, steel framing, auxiliary support steel and divider beams for supporting guide-rail brackets.
    - b. Providing steel angle sill supports and grouting hoistway entrance sills and frames.
  5. Division 9 Finishes: Providing elevator car finish flooring and field painting unfinished and shop primed ferrous materials.
  6. Division 22 Plumbing:
    - a. Sump pit and oil interceptor.
  7. Division 23: Heating and Ventilation:
    - a. Heating and ventilating hoistways.
  8. Division 16 Sections:
    - a. Providing electrical service to elevators. (note: fused disconnect switch to be provided as part of elevator manufacture product, see section 2.11 Miscellaneous elevator components for further details.)
    - b. Emergency power supply, transfer switch and auxiliary contacts.
    - c. Heat and smoke sensing devices.
    - d. Convenience outlets and illumination in hoistway and pit.
- C. Work Not Included: General contractor shall provide the following in accordance with the requirements of the Model Building Code and ANSI A17.1 Code. For specific rules, refer to ANSI A17.1, Section 300 for hydraulic elevators. State or local requirements must be used if more stringent.
1. Elevator hoist beam to be provided at top of elevator shaft. Beam must be able to accommodate proper loads and clearances for elevator installation and operation.
  2. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports and bracing including all setting templates and diagrams for placement.
  3. Hatch walls require a minimum two hours of fire rating. Hoistway should be clear and plumb with variations not to exceed 1/2" at any point.
  4. Elevator hoistways shall have barricades, as required.
  5. Install bevel guards at 75° on all recesses, projections or setbacks over 2" (4" for A17.1 2000



- areas) except for loading or unloading.
6. Provide rail bracket supports at pit, each floor and roof. For guide rail bracket supports, provide divider beams between hoistway at each floor and roof.
  7. Pit floor shall be level and free of debris. Reinforce dry pit to sustain normal vertical forces from rails and buffers.
  8. Where pit access is by means of the lowest hoistway entrance, a vertical ladder of non-combustible material extending 42" minimum, (48" minimum for A17.1-2000 areas) shall be provided at the same height, above sill of access door or handgrips.
  9. All wire and conduit should run remote from the hoistways.
  10. When heat, smoke or combustion sensing devices are required, connect to elevator control cabinet terminals. Contacts on the sensors should be sided for 12 volt D.C.
  11. Install and furnish finished flooring in elevator cab.
  12. Finished floors and entrance walls are not to be constructed until after sills and door frames are in place. Consult elevator contractor for rough opening size. The general contractor shall supply the drywall framing so that the wall fire resistance rating is maintained, when drywall construction is used.
  13. Where sheet rock or drywall construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with elevator contractor.
  14. Before erection of rough walls and doors; erect hoistway sills, headers, and frames. After rough walls are finished; erect fascias and toe guards. Set sill level and slightly above finished floor at landings.
  15. To maintain legal fire rating (masonry construction), door frames are to be anchored to walls and properly grouted in place.
  16. The elevator wall shall interface with the hoistway entrance assembly and be in strict compliance with the elevator contractor's requirements.
  17. General Contractor shall fill and grout around entrances, as required.
  18. All walls and sill supports must be plumb where openings occur.
  19. Locate a light fixture (200 lx / 19 fc) and convenience outlet in pit with switch located adjacent to the access door.
  20. Provide telephone line, light fixture (200 lx / 19 fc), and convenience outlet in the hoistway at the landing where the elevator controller is located. Typically this will be at the landing above the 1<sup>st</sup> floor. Final location must be coordinated with elevator contractor.
  21. As indicated by elevator contractor, provide a light outlet for each elevator, in center of hoistway.
  22. For signal systems and power operated door: provide ground and branch wiring circuits.
  23. For car light and fan: provide a feeder and branch wiring circuits to elevator control cabinet.
  24. Controller landing wall thickness must be a minimum of 8 inches thick. This is due to the controller being mounted on the second floor landing in the door frame on the return side of the door. For center opening doors, the controller is located on the right hand frame (from inside the elevator cab looking out). These requirements must be coordinated between the general contractor and the elevator contractor.
  25. Cutting, patching and recesses to accommodate hall button boxes, signal fixtures, etc..

## 1.02 SUBMITTALS

- A. Product data: When requested, the elevator contractor will provide standard cab, entrance and signal fixture data to describe product for approval.
- B. Shop drawings:
  1. Show equipment arrangement in the pit and hoistway. Provide plans, elevations, sections and details of assembly, erection, anchorage, and equipment location.

2. Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
  3. Show floors served, travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
  4. Indicate electrical power requirements and branch circuit protection device recommendations.
- C. Powder Coat Paint selection: Submit manufacturer's standard selection charts for exposed finishes and materials.
- D. Plastic laminate selection: Submit manufacturer's standard selection charts for exposed finishes and materials.
- E. Metal Finishes: Upon request, standard metal samples provided.
- F. Operation and maintenance data. Include the following:
1. Owners Manual and Wiring Diagrams.
  2. Parts list, with recommended parts inventory.

### 1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: An approved manufacturer with minimum fifteen years experience in manufacturing, installing, and servicing commercial elevators.
1. Must be the manufacturer of the power unit, controller, signal fixtures, door operators cab, entrances, and all other major parts of the elevator operating equipment.
    - a. The major parts of the elevator equipment shall be manufactured in the United States, and not be an assembled system.
  2. The manufacturer shall have a documented, on-going quality assurance program.
  3. ISO-9001:2000 Manufacturer Certified.
  4. ISO-14001:2004 Environmental Management System Certified.
  5. LEED Gold certified elevator manufacturing facility.
- B. Installer Qualifications: The manufacturer or an authorized agent of the manufacturer with not less than fifteen years of satisfactory experience installing elevators equal in character and performance to the project elevators.
- C. Regulatory Requirements:
1. ASME/ANSI A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.
  2. Building Code: National.
  3. NFPA 70 National Electrical Code.
  4. NFPA 80 Fire Doors and Windows.
  5. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
  6. CAN/CSA C22.1 Canadian Electrical Code.
  7. CAN/CSA B44 Safety Code for Elevators and Escalators.
  8. California Department of Public Health Standard Method V1.1-2010, CA Section 01350
- D. Fire-rated Entrance Assemblies: Opening protective assemblies including frames, hardware, and operation shall comply with ASTM E2074, CAN4-S104 (ULC-S104), UL10(B), and NFPA 80. Provide entrance assembly units bearing Class B or 1 1/2 hour label by a Nationally Recognized Testing

Laboratory (2 hour label in Canada).

- E. Inspection and testing: Elevator Installer shall obtain and pay for all required inspections, tests, permits and fees for elevator installation.
  - 1. Arrange for inspections and make required tests.
  - 2. Deliver to the Owner upon completion and acceptance of elevator work.
  
- F. Product Qualifications:
  - 1. LCA, EPD and HPD data must be provided for all major components of the elevator system.
  - 2. LCA data must be compatible with GaBI Software.
  - 3. Environmental Product Declaration (EPD): Publicly available, critically reviewed life cycle analysis having at least a cradle-to-gate scope.
  
  - 4. GreenScreen Chemical Hazard Analysis: All ingredients of 100 parts-per-million or greater evaluated using GreenScreen for Safer Chemicals Method v1.2.
  
  - 5. Health Product Declarations (HPD v2 or later): Complete, published declaration with full disclosure of known hazards, prepared using the Health Product Declaration Collaborative's "HPD builder" on-line tool; Unknown hazard listed will not be considered acceptable.

#### 1.04 DELIVERY, STORAGE AND HANDLING

- A. Manufacturing will deliver elevator materials, components and equipment and the contractor is responsible to provide secure and safe storage on job site.

#### 1.05 PROJECT CONDITIONS

- A. Prohibited Use: Elevators shall not be used for temporary service or for any other purpose during the construction period before Substantial Completion and acceptance by the purchaser unless agreed upon by Elevator Contractor and General Contractor with signed temporary agreement.

#### 1.06 WARRANTY

- A. Warranty: Submit elevator manufacturer's standard written warranty agreeing to repair, restore or replace defects in elevator work materials and workmanship not due to ordinary wear and tear or improper use or care for 12 months after completion of installation or acceptance thereof by beneficial use, whichever is earlier.

#### 1.07 MAINTENANCE

- A. Furnish maintenance and call back service for a period of 12 months for each elevator after completion of installation or acceptance thereof by beneficial use, whichever is earlier, during normal working hours, excluding callbacks. Service shall consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation.
  - 1. Manufacturer shall have a service office and full time service personnel within a 100 mile radius of the project site.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Manufacturers:
1. ThyssenKrupp Elevator. Model: Endura 3500 MRL Twin Post Hydraulic
  2. Otis Elevator Company. Model: Hydrofit 3500 Holeless Hydraulic
  3. Schumacher Twin Jack Telescopic 3500 Holeless Hydraulic Elevators
  4. Schindler 330A Low-Rise Hydraulic Elevator

## 2.02 MATERIALS, GENERAL

- A. All Elevator Cab materials including frame, buttons, lighting, wall and ceiling assembly, laminates and carpet shall have an EPD and an HPD, and shall meet the California Department of Public Health Standard Method V1.1–2010, CA Section 01350 as mentioned in 1.03.9 of this specification.
- B. Colors, patterns, and finishes: As selected by the Architect from manufacturer's standard colors, patterns, and finish charts.
- C. Steel:
1. Shapes and bars: Carbon.
  2. Sheet: Cold-rolled steel sheet, commercial quality, Class 1, matte finish.
  3. Finish: Factory-applied baked enamel for structural parts, powder coat for architectural parts. Color selection must be based on elevator manufacture's standard selections.
- D. Plastic laminate: Decorative high-pressure type, complying with NEMA LD3, Type GP-50 General Purpose Grade, nominal 0.050" thickness. Laminate selection must be based on elevator manufacture's standard selections.
- E. Carpet: By others.

## 2.03 HOISTWAY EQUIPMENT

- A. Platform: Fabricated frame of formed or structural steel shapes, gusseted and rigidly welded with a wood subfloor. Underside of the platform shall be fireproofed. The car platform shall be designed and fabricated to support one-piece loads weighing up to 25% of the rated capacity.
- B. Sling: Steel stiles affixed to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure.
- C. Guide Rails: Steel, omega shaped, fastened to the building structure with steel brackets.
9. Guide Shoes: Slide guides shall be mounted on top and bottom of the car.
10. Buffers: Provide substantial buffers in the elevator pit. Mount buffers on a steel template that is fastened to the pit floor. Provide extensions if required by project conditions.
11. Jack: Jack unit shall be of sufficient size to lift the gross load the height specified. Factory test jack to insure adequate strength and freedom from leakage. Brittle material, such as gray cast iron, is prohibited in the jack construction. Provide the following jack type: Twin post holeless telescopic 2-stage. Two jacks piped together, mounted one on each side of the car with each having two telescopic sections designed to extend in a synchronized manner when oil is pumped into the Assembly. Each jack section will be guided from within the casing or the plunger assembly used to

house the section. Each plunger shall have a high pressure sealing system which will not allow for seal movement or displacement during the course of operation. Each Jack Assembly shall have a check valve built into the assembly to allow for automatically re-syncing the two plunger sections by moving the jack to its fully contracted position. The jack shall be designed to be mounted on the pit floor or in a recess in the pit floor. Each jack section shall have a bleeder valve to discharge any air trapped in the section.

12. Automatic Self-Leveling: Provide each elevator car with a self-leveling feature to automatically bring the car to the landings and correct for overtravel or undertravel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained approximately level with the landing irrespective of its load.

Wiring, Piping, and Oil: Provide all necessary hoistway wiring in accordance with the National Electrical Code. All necessary code compliant pipe and fittings shall be provided to connect the power unit to the jack unit. Provide proper grade readily biodegradable oil as specified by the manufacturer of the power unit (see Power Unit section 2.04.G for further details).

Pit moisture/water sensor located approximately 1 foot above the pit floor to be provided. Once activated, elevator will perform "flooded pit operation", which will run the car up to the designated floor, cycle the doors and shut down and trip the circuit breaker shunt to remove 3 phase power from all equipment, including pit equipment.

15. Motorized oil line shut-off valve shall be provided that can be remotely operated from the controller landing service panel. Also a means for manual operation at the valve in the pit is required.

## 2.04 POWER UNIT

- A. Power Unit (Oil Pumping and Control Mechanism): A self-contained unit located in the elevator pit consisting of the following items:
  1. NEMA 4/Sealed Oil reservoir with tank cover including vapor removing tank breather
  2. An oil hydraulic pump.
  3. An electric motor.
  4. Electronic oil control valve with the following components built into single housing; high pressure relief valve, check valve, automatic unloading up start valve, lowering and leveling valve, and electro-magnetic controlling solenoids.
- B. Pump: Positive displacement type pump specifically manufactured for oil-hydraulic elevator service. Pump shall be designed for steady discharge with minimum pulsation to give smooth and quiet operation. Output of pump shall not vary more than 10 percent between no load and full load on the elevator car.
- C. Motor: Standard manufacture motor specifically designed for oil-hydraulic elevator service. Duty rating – motors shall be capable of 80 starts per hour with a 30% motor run time during each start.
- D. Oil Control Unit: The following components shall be built into a single housing. Welded manifolds with separate valves to accomplish each function are not acceptable. Adjustments shall be accessible and be made without removing the assembly from the oil line.
  1. Relief valve shall be adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.
  2. Up start and stop valve shall be adjustable and designed to bypass oil flow during start and stop of

motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the jack unit, ensuring smooth up starts and up stops.

3. Check valve shall be designed to close quietly without permitting any perceptible reverse flow.
4. Lowering valve and leveling valve shall be adjustable for down start speed, lowering speed, leveling speed and stopping speed to ensure smooth "down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling after slowdown is initiated.
5. Provided with constant speed regulation in both up and down direction. Feature to compensate for load changes, oil temperature, and viscosity changes.
  
16. Solid State Starting: Provide an electronic starter featuring adjustable starting currents.
  
17. A secondary hydraulic power source (powered by 110VAC single phase) must be provided. This is required to be able to raise (reposition) the elevator in the event of a system component failure (i.e. pump motor, starter, etc.)
  
18. Oil Type: Readily biodegradable that is USDA certified biobased product, ultra low toxicity, readily biodegradable, energy efficient, high performing fluid made from canola oil with antioxidant, anticorrosive, antifoaming, and metal-passivating additives. Especially formulated for operating in environmentally sensitive areas. USDA certified biobased product, 95% bio-based content, per ASTM D6866.

## 2.05 HOISTWAY ENTRANCES

- A. Doors and Frames: Provide complete hollow metal type hoistway entrances at each hoistway opening bolted\knock down construction.
  1. Manufacturer's standard entrance design consisting of hangers, doors, hanger supports, hanger covers, fascia plates, sight guards, and necessary hardware.
  2. Main landing door & frame finish: Stainless steel panels, no. 4 brushed finish.
  3. Typical door & frame finish: Stainless steel panels with no. 4 brushed finish.
  
- B. Integrated Control System: the elevator controller to be mounted to hoistway entrance above 1<sup>st</sup> landing. The entrance at this level, shall be designed to accommodate the control system and provide a means of access to critical electrical components and troubleshooting features. See section 2.09 Control System for additional requirements.
  
- C. At the controller landing, the hoistway entrance frame shall have space to accommodate and provide a lockable means of access (group 2 security) to a 3 phase circuit breaker. See section 2.11 Miscellaneous Elevator Components for further details.
  
- D. Interlocks: Equip each hoistway entrance with an approved type interlock tested as required by code. Provide door restriction devices as required by code.
  
- E. Door Hanger and Tracks: Provide sheave type two point suspension hangers and tracks for each hoistway horizontal sliding door.
  1. Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
  2. Hangers: Provide an adjustable device beneath the track to limit the up-thrust of the doors during operation.
  3. Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

- F. Hoistway Sills: Extruded metal, with groove(s) in top surface. Provide mill finish on aluminum.

## 2.06 CAR ENCLOSURE

- A. Car Enclosure:
1. Walls: Cab type TKLP, durable wood core finished on both sides with high pressure plastic laminate.
  2. Canopy: Cold-rolled steel with hinged exit.
  3. Ceiling: Downlight type, metal pans with suspended LED downlights.
  4. Cab Fronts, Return, Transom, Soffit and Strike: Provide panels faced with brushed stainless steel.
  5. Doors: Horizontal sliding car doors reinforced with steel for panel rigidity. Hang doors on sheave type hangers with polyurethane tires that roll on a polished steel track and are guided at the bottom by non-metallic sliding guides.
    - a. Door Finish: ASTM A1008 steel panels, factory applied powder coat enamel finish.
    - b. Cab Sills: Extruded aluminum, mill finish.
  6. Handrail: Provide 1.5" diameter cylindrical metal on side and rear walls on front opening cars and side walls only on front and rear opening cars. Handrails shall have a stainless steel, no. 4 brushed finish.
  7. Ventilation: Manufacturer's standard exhaust fan, mounted on the car top.
- B. Car Top Inspection: Provide a car top inspection station with an "Auto-Inspection" switch, an "emergency stop" switch, and constant pressure "up and down" direction and safety buttons to make the normal operating devices inoperative. The station will give the inspector complete control of the elevator. The car top inspection station shall be mounted in the door operator assembly.

## 2.07 DOOR OPERATION

- A. Door Operation: Provide a direct current motor driven heavy duty operator designed to operate the car and hoistway doors simultaneously. Door movements shall be electrically cushioned at both limits of travel and the door operating mechanism shall be arranged for manual operation in event of power failure. Doors shall automatically open when the car arrives at the landing and automatically close after an adjustable time interval or when the car is dispatched to another landing. Closed-loop, microprocessor controlled motor-driven linear door operator, with adjustable torque limits, also acceptable. AC controlled units with oil checks or other deviations are not acceptable.
1. No Un-Necessary Door Operation: The car door shall open only if the car is stopping for a car or hall call, answering a car or hall call at the present position or selected as a dispatch car.
  2. Door Open Time Saver: If a car is stopping in response to a car call assignment only (no coincident hall call), the current door hold open time is changed to a shorter field programmable time when the electronic door protection device is activated.
  3. Double Door Operation: When a car stops at a landing with concurrent up and down hall calls, no car calls, and no other hall call assignments, the car door opens to answer the hall call in the direction of the car's current travel. If an onward car call is not registered before the door closes to within 6 inches of fully closed, the travel will reverse and the door will reopen to answer the other call.
  4. Nudging Operation: The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door closing is prevented for a field programmable time, a buzzer will sound. When the obstruction is removed, the door will begin to close at reduced speed. If the infra-red door protection system detects a person or object while closing on nudging, the doors will stop and resume closing only after the obstruction has been removed.

5. Limited Door Reversal: If the doors are closing and the infra-red beam(s) is interrupted, the doors will reverse and reopen partially. After the obstruction is cleared, the doors will begin to close.
6. Door Open Watchdog: If the doors are opening, but do not fully open after a field adjustable time, the doors will recycle closed then attempt to open six times to try and correct the fault.
7. Door Close Watchdog: If the doors are closing, but do not fully close after a field adjustable time, the doors will recycle open then attempt to close six times to try and correct the fault.
8. Door Close Assist: When the doors have failed to fully close and are in the recycle mode, the door drive motor shall have increased torque applied to possibly overcome mechanical resistance or differential air pressure and allow the door to close.

- B. Door Protection Devices: Provide a door protection system using 150 or more microprocessor controlled infra-red light beams. The beams shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed, the doors shall immediately reopen.

## 2.08 CAR OPERATING STATION

- A. Car Operating Station, General: The main car control in each car shall contain the devices required for specific operation mounted in an integral swing return panel requiring no applied faceplate. Swing return shall have a brushed stainless steel finish. The main car operating panel shall be mounted in the return and comply with handicap requirements. Pushbuttons that illuminate using long lasting LED's shall be included for each floor served, and emergency buttons and switches shall be provided per code. Switches for car light and accessories shall be provided.
- B. Emergency Communications System: Integral phone system provided.
- C. Auxiliary Operating Panel: Not Required
- D. Column Mounted Car Riding Lantern: A car riding lantern shall be installed in the elevator cab and located in the entrance. The lantern, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.
- E. Special Equipment: Not Applicable

## 2.09 CONTROL SYSTEMS

- A. Controller: Shall be integrated in a hoistway entrance jamb. Should be microprocessor based, software oriented and protected from environmental extremes and excessive vibrations in a NEMA 1 enclosure. 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.
- B. Service Panel – to be located outside the hoistway in the controller entrance jamb and shall provide the following functionality/features:
1. Access to main control board and CPU
  2. Main controller diagnostics
  3. Main controller fuses
  4. Universal Interface Tool (UIT)
  5. Remote valve adjustment
  6. Electronic motor starter adjustment and diagnostics



7. Operation of pit motorized shut-off valve with LED feedback to the state of the valve in the pit
  8. Operation of auxiliary pump/motor (secondary hydraulic power source)
  9. Operation of electrical assisted manual lowering
  10. Provide male plug to supply 110VAC into the controller
  11. Run/Stop button
- C. Automatic Light and Fan shut down: The control system shall evaluate the system activity and automatically turn off the cab lighting and ventilation fan during periods of inactivity. The settings shall be field programmable.
- D. Special Operation: Not Applicable
- E. 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 will lower to a predetermined level and open the doors. After passengers have exited the car, the doors will close and the car will shutdown. When normal power becomes available, the elevator will automatically resume operation. The battery lowering feature is included in the elevator contract and does not utilize a building-supplied standby power source.

## 2.10 HALL STATIONS

- A. Hall Stations, General: Provide buttons with red-illuminating LED halos to indicate that a call has been registered at that floor for the indicated direction. Provide 1 set of pushbutton risers. Provide one pushbutton riser with faceplates having a brushed stainless steel finish.
1. Phase 1 firefighter's service key switch, with instructions, shall be incorporated into the hall station at the designated level.
- B. Floor Identification Pads: Provide door jamb pads at each floor. Jamb pads shall comply with Americans with Disabilities Act (ADA) requirements.
- C. Hall Position Indicator: Not Applicable
- D. Hall lanterns: Not Applicable
- E. Special Equipment: Not Applicable

## 2.11 MISCELLANEOUS ELEVATOR COMPONENTS

- A. Oil Hydraulic Silencer: Install multiple oil hydraulic silencers (muffler device) at the power unit location. The silencers shall contain pulsation absorbing material inserted in a blowout proof housing.
- B. Lockable three phase circuit breaker with auxiliary contact with shunt trip capability to be provided. Circuit breaker to be located behind locked panel (Group 2 security access) at controller landing entrance jamb and should be sized according to the National Electrical Code.

- C. Lockable single phase 110V circuit breaker for cab light and fan to be provided. Circuit breaker to be located behind locked panel (Group 2 security access) at controller landing entrance jamb should be sized according to the National Electrical Code.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Before starting elevator installation, inspect hoistway, hoistway openings, pits and control space, as constructed and verify all critical dimensions, and examine supporting structures and all other conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

### **3.02 INSTALLATION**

- A. Install elevator systems components and coordinate installation of hoistway wall construction.
  - 1. Work shall be performed by competent elevator installation personnel in accordance with ASME A17.1, manufacturer's installation instructions and approved shop drawings.
  - 2. Comply with the National Electrical Code for electrical work required during installation.
- C. Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.
- D. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum safe, workable dimensions at each landing.
- E. Lubricate operating parts of system where recommended by manufacturer.

### **3.03 FIELD QUALITY CONTROL**

- A. Acceptance testing: Upon completion of the elevator installation and before permitting use of elevator, perform acceptance tests as required by A17.1 Code and local authorities having jurisdiction. Perform other tests, if any, as required by governing regulations or agencies.
- B. Advise Owner, Contractor, Architect, and governing authorities in advance of dates and times tests are to be performed on the elevator.

### **3.04 ADJUSTING**

- A. Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.

### 3.05 CLEANING

- A. Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided. Stainless stall shall be cleaned with soap and water and dried with a non-abrasive surface; shall not be cleaned with bleached-based cleansers.
- B. At completion of elevator work, remove tools, equipment, and surplus materials from site. Clean equipment rooms and hoistway. Remove trash and debris.
  - a. Use environmentally preferable and low VOC emitting cleaners for each application type. Cleaners that contain solvents, pine and/or citrus oils are not permitted.

### 3.06 PROTECTION

- A. At time of Substantial Completion of elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs, or other such methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.

### 3.07 DEMONSTRATION

- 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.
- B. Make a final check of each elevator operation, with Owner's personnel present, immediately before date of substantial completion. Determine that control systems and operating devices are functioning properly.

### 3.08 ELEVATOR SCHEDULE

- A. Elevator Qty. 1
  - 1. Elevator Model: enduraMRL Above-Ground (2-Stage)
  - 2. Rated Capacity: 3500 lbs.
  - 3. Rated Speed: 80 ft./min.
  - 4. Operation System: TAC32
  - 5. Travel: 14'-0"
  - 6. Landings: 2 total
  - 7. Openings:
    - a. Front: 2
    - b. Rear: 0
  - 8. Clear Car Inside: 6' - 8" wide x 5' - 5" deep
  - 9. Cab Height: 9'-0" nominal
  - 10. Hoistway Entrance Size: 3' - 6" wide x 7'-0" high
  - 11. Door Type: Single Speed
  - 12. Power Characteristics: 25 HP, 480 volts, 3 Phase, 60 Hz.
  - 13. Seismic Requirements: Zone 1
  - 14. Fixture & Button Style: Signa4 Signal Fixtures
  - 15. Special Operations: None

3.09 SPECIAL CONDITIONS (Note: Add Special Conditions as Needed)

**END OF SECTION**