

# **BALTIMORE COUNTY EASTERN FAMILY RESOURCE CENTER SPECIFICATION ADDENDA**

## **OWNER**

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The following Addenda were issued during the Bid Phase and now form part of the Contract Documents.

**CHANGES TO SPECIFICATIONS**

ADD: New specifications:

<b>Section No.</b>	<b>Title</b>
07 81 00	APPLIED FIREPROOFING
08 91 19	FIXED LOUVERS
11 65 00	GYMNASIUM AND PLAY FIELD EQUIPMENT
11 68 00	PLAY FIELD EQUIPMENT AND STRUCTURES
32 18 16.13	PLAYGROUND PROTECTIVE SURFACING

**CHANGES TO SPECIFICATIONS**

REPLACE: Reissued specifications:

<b>Section No.</b>	<b>Title</b>
12 93 00	SITE FURNISHINGS
22 30 00	PLUMBING EQUIPMENT

**CHANGES TO SPECIFICATIONS**

ADD: Change or clarification below to existing specification section:

<b><u>Section-Page#</u></b>	<b><u>Article / Paragraph</u></b>	<b><u>Change or Clarification</u></b>
04 20 00 – 6	2.5 - C - 7	DELETE "2-1/4 inches high by 7-5/8 inches long" ADD "3-5/8 inches high by 11-5/8 inches long"
07 54 23 – 3	1.11 - A	ADD "3. Provide single-source warranty for roof membrane system and vegetative roof system."
07 21 00 – 2	2.1-A	ADD "Manufacturer's insulation system must meet requirements of NFPA 285."
08 11 13 – 2	2.1 - A	ADD "4. Curries Company; ASSA ABLOY."
08 71 00 – 10	2.4 - B	CHANGE "7-pin" to "6-pin"

08 71 00 – 24 3.5

REPLACE Set #51 with the following:

**SET #51 - Delayed Egress 20M**

Doors: 271B

3 Hinges	CB168 4 1/2 X 4 1/2 NRP	US26D	ST
1 Power Transfer	EPT-5		PR
1 Delayed Egress Exit UL	DE FL 2101	630	PR
1 Mortise Cylinder	Medeco X4 SFIC	26	ME
1 Door Closer	QDC115	689	SH
1 Kick Plate	KO050 8" x 2" LDW CSK	630	TR
1 Wall Bumper	1270WX	626	TR
1 Gasketing	5050 T-17 17'		NA
1 Door Position Switch	MC-4		SDC
1 Power Supply	PS160-6		PR
1 Wiring Diagram	BY HARDWARE SUPPLIER		BY

NOTE: COORDINATION WITH ELECTRICAL IS REQUIRED.

OPERATION DESCRIPTION: Door normally closed, latched and secure. No access from pull side of door. 30 second delayed egress when armed while simultaneously sounding a local or remote audible alarm. Immediate free egress upon activation of Fire Alarm System.

08 71 00 – 38 3.5

DELETE Hardware Sets 92 and 93.

10 73 43 – 3 2.2 - A - 1

DELETE "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:"  
ADD "Basis-of-Design Product: Subject to compliance with requirements, provide Austin Mowhawk; SHE-610-C or comparable product by one of the following:"

11 31 00 – 3 2.5 - C

DELETE "CLS-01" from project.

11 40 00 – 37

n/a

Replace the entire specification of Item #17:  
Fryer Assembly, Mobile with the following:

**ITEM #17: FRYER ASSEMBLY, MOBILE**

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QUANTITY: One (1)  
MANUFACTURER: Frymaster Corporation  
MODEL NO.: FPH155 (N058)  
PERTINENT DATA: 50-Pound Capacity, High Efficiency, Full Pot, With Basket Lifts  
UTILITIES REQ'D: 4.0A, 120V, 1PH (Controls); 9.0A, 120V, 1PH (Filter); 3/4" Natural Gas @ 80 MBH  
ALTERNATE MFRS.: Pitco

Furnish and set-in-place per Equipment Plan, Sheet K1.1; Manufacturer's Instructions and the following:

1. Stainless steel pot, door, and cabinet sides.
2. Automatic basket lifters.
3. Electronic timer controller.
4. Accessories:
  - One (1) #806-3068 full-pot covers.
  - One (1) #803-0103 full-pot sediment tray.
  - Two (2) #803-0271 twin-size baskets.
  - Heavy-duty 5" diameter swivel casters, front (2) with brakes.
  - Built-in filtration system with stainless steel spreader cabinet mounted on right end with #FWH-1 food warmer and holding station.
  - One (1) #PSDU50 shortening disposal unit.
5. Mechanical & electrical services provided thru Utility Raceway, Item #15.

12 24 13 – 2

2.1 - A

ADD "3. Springs Window Fashions;  
SWFcontract."

23 07 00 – 6

3.3 - A - 1 - b

REPLACE with "b. HVAC supply ductwork from fan discharge to terminal unit, including all duct accessories (sound attenuators, etc.)."

23 07 00 – 6

3.3 - A - 1 - d

REPLACE with "d. Medium pressure supply air ductwork. Provide double-wall internally insulated construction for exposed medium pressure supply air ductwork in sleeping rooms."

23 07 00 – 6

3.3 - A - 2 - b

REPLACE with "b. Rigit Fiberglass: 2" (50 mm) thick, application limited to exposed ductwork located in mechanical rooms."

23 07 00 – 6

3.3 - A - 2 - c

DELETE item "c." in entirety.

23 07 00 – 9	3.6 - B	REPLACE with “Lined Ductwork: Except as otherwise indicated, reduce insulation on ductwork where internal insulation or sound lining has been specified by the thickness of sound lining specified.”
23 64 00 – 2	2.1 - A	ADD “5. Temptrol.”
23 37 00 – 2	2.1 - A	DELETE “6. Metalaire.”
23 73 13 – 3	2.1 - A	ADD “5. Carrier.”
26 32 13 – 6	2.8	ADD “H. Fuel fill pipe/provision to allow fuel tank to be filled without having to open the generator enclosure.”
26 36 00 – 4	2.3	ADD “E. Two additional sets of form C dry contacts for connection to Owner external monitoring system for monitoring ATS in normal position and ATS in generator position. Two sets per monitoring point.”
27 02 00 – 4	2.2	ADD “C. Contractor shall paint Interior walls of each and every telecom room, floor to ceiling, with fire rated 3/4" plywood and painted with 2 coats of fire retardant paint preferred black or a neutral color. Paint shall be or equal to: Flame Control Coatings, LLC. Flame Control NO. 20-20A. Fire Hazard Classification, ATSM E-84 (NFPA 255) Class “A”.”
27 02 00 – 6	2.5	ADD “D. Contractor shall provide grounding and bonding of all cable trays and racks. All telecom room ground bus bars shall be grounded to the main building ground using #2 or greater AWG copper wire. Contractor shall connect cabinets, racks, cable trays and frames to single-point ground which is connected to telecommunications room grounding bar via #6 AWG green insulated copper grounding conductor.”

27 50 00 – 1	1.1 - A	ADD the following:
	<ul style="list-style-type: none"> <li>• “Contractor: Responsible for supplying and installing the following: <ul style="list-style-type: none"> <li>○ Data Rack</li> <li>○ Patch Panels <ul style="list-style-type: none"> <li>▪ Terminate building cables to the patch panel</li> <li>▪ Label all cables.</li> </ul> </li> <li>○ Phone Punch-Down Block <ul style="list-style-type: none"> <li>▪ Terminate the phone cable (Verizon line)</li> <li>▪ Label the phone cable</li> </ul> </li> </ul> </li> <li>• Phone/Data: Contractor shall be responsible for installing data jacks, installing and terminating cable between patch panel and wall jack (including at systems furniture).</li> <li>• WiFi: Contractor shall be responsible for installing data jacks, installing and terminating cable between patch panel and wall jack. Owner shall be responsible for installing wifi devices.</li> <li>• TV cable: Contractor shall be responsible for installing conduit/cabling and rough box with cable jack at wall location. Coil up all cable runs in the IT rooms and install crimped on cable ends. Owner shall be responsible for coordinating with Comcast. Comcast to install cable and connection devices in IT closet and connect to contractor-supplied cable.”</li> </ul>	
11 68 00 – 5	2.3 - B - 3	DELETE “Blast Off (#ZZXX0594)” ADD “Whirligig (#ZZXX0043)”
11 68 00 – 6	2.4 - A - 1	DELETE “Design A (#ZZPD5020)” ADD “Mighty Fun Mountain (#PSD-1101-FTD)”
27 50 00 – 1	1.1 - B	ADD “The owner shall be responsible for supplying and installing all necessary network equipment (Switches, Routers, UPS, etc.).”
27 500 00 – 1	1.1	DELETE paragraphs 1.1-E, 1.1-F, 1.1-G, 1.1-H & 1.1-I in their entirety.
27 51 23 – 4	2.02 - A	CHANGE “15 watt” to “120 watt”
28 23 00 – 1	1.2 A	ADD the following:
	<ul style="list-style-type: none"> <li>• “Contractor: Responsible for installing the conduits, cables, and rough-ins. <ul style="list-style-type: none"> <li>○ Cables to be labeled.</li> <li>○ Cables to be looped inside the data closet and at the rough-in location.</li> </ul> </li> <li>• Owner: Responsible for installing “Smarts and Parts” <ul style="list-style-type: none"> <li>○ Owner will furnish and install all cameras, video door entry systems, hardware and software.</li> <li>○ Making final connections at data closet and at the rough-in location.”</li> </ul> </li> </ul>	
28 23 00 – 4	2.1	DELETE section 2.1 in its entirety.
28 23 00 – 5	2.3	DELETE section 2.3 in its entirety.

28 40 00 – 1                      1.1 - A                      ADD the following:

- “Contractor: Responsible for installing the conduits, cables, and rough-ins.
  - Cables to be labeled.
  - Cables to be looped inside the data closet and at the rough-in location.
- Owner: Responsible for installing “Smarts and Parts”
  - Owner will furnish and install all card readers, door entry systems, control panels, hardware and software.
  - Making final connections at data closet and at the rough-in location.”

28 40 00 – 2                      2.1                      DELETE section 2.1 in its entirety.

28 40 00 – 3                      2.2                      DELETE section 2.2 in its entirety.

28 40 00 – 4                      2.3                      DELETE section 2.3 in its entirety.



## **SECTION 07 81 00**

### **APPLIED FIREPROOFING**

#### **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 sprayed fire-resistive materials.

##### **1.3 DEFINITIONS**

- A. SFRM: Sprayed fire-resistive materials.

##### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product, including the following:
  - 1. For paints and coatings used on the interior of the building, include a statement of VOC content in g/L.

##### **1.5 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For each type of fireproofing.
- B. Evaluation Reports: For fireproofing, from ICC-ES.
- C. Manufacturer's written installation instructions.

##### **1.6 QUALITY ASSURANCE**

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

##### **1.7 FIELD CONDITIONS**

- A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is 44 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.

- B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. VOC Content: Coating products used on the interior of the building (defined as inside the weatherproofing system and applied on-site) shall comply with VOC content limits of authorities having jurisdiction and the following VOC limits:
  - 1. Do not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993 and the following VOC limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
    - a. Flat Topcoat: 50 g/L.
    - b. Non-Flat Topcoat: 100 g/L.
    - c. Primer or Undercoat: 100 g/L.
  - 2. Anticorrosive and Antirust Paints Applied to Interior Ferrous Metal Substrates: Do not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition, January 7, 1997.
- E. Asbestos: Provide products containing no detectable asbestos.

### **2.2 SPRAYED FIRE-RESISTIVE MATERIALS**

- A. Concealed Sprayed Fire-Resistive Material: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application or conveyed in a dry state and mixed with atomized water at place of application.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Carbolite Company; a subsidiary of RPM International; Southwest Type 5GP.
    - b. Grace Construction Products; W.R. Grace & Co. – Conn.; Monokote MK-6 or Monokote MK-6/HY.
    - c. Isolatak International; Cafco 300 or Cafco Blaze-Shield II.
  - 2. Bond Strength: Minimum 150-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E 736.

3. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E 605.
  4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.3125 inch.
  5. Combustion Characteristics: ASTM E 136.
  6. Surface-Burning Characteristics: Flame-spread and smoke-developed indexes of 10 or less according to ASTM E 84.
  7. Compressive Strength: Minimum 10 lbf/sq. in. according to ASTM E 761.
  8. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
  9. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
  10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
  11. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E 859.
  12. Locations: Sprayed fire-resistive materials (SFRM) applied to structural steel beams, columns, bracing, and their connections, where covered by other construction.
- B. Exposed SFRM: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application or conveyed in a dry state and mixed with atomized water at place of application.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Carbolite Company; a subsidiary of RPM International; Southwest Type 7GP.
    - b. Grace Construction Products; W.R. Grace & Co. – Conn.; Monokote Z-106 or Monokote Z-106/HY.
    - c. Isolatek International; Cafco 400 or Cafco Blaze-Shield HP.
  2. Bond Strength: Minimum 150-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E 736.
  3. Density: Not less than 22 lb/cu. ft. and as specified in the approved fire-resistance design, according to ASTM E 605.
  4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.3125 inch.
  5. Combustion Characteristics: ASTM E 136.
  6. Surface-Burning Characteristics: Flame-spread and smoke-developed indexes of 10 or less according to ASTM E 84.
  7. Compressive Strength: Minimum 51 lbf/sq. in. according to ASTM E 761.
  8. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
  9. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
  10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
  11. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E 859.
  12. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G 21 or rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273.
  13. Finish: As selected by Architect from manufacturer's standard finishes.
    - a. Color of Topcoat: As selected by Architect from manufacturer's full range.
  14. Locations: Sprayed fire-resistive materials (SFRM) applied to exposed structural steel beams, columns, bracing, their connections, and to steel deck.

## 2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer and complying with one or both of the following requirements:
  - 1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 2. Primer's bond strength in required fire-resistance design complies with specified bond strength for fireproofing and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E 736.
- C. Bonding Agent: Product approved by fireproofing manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.
- D. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
  - 1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.
  - 2. Verify that objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
  - 3. Verify that substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.
- B. Verify that concrete work on steel deck is complete before beginning fireproofing work.
- C. Verify that roof construction, installation of rooftop HVAC equipment, and other related work are complete before beginning fireproofing work.
- D. Conduct tests according to fireproofing manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.
- E. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application. Provide temporary enclosure as required to confine spraying operations, protect the environment, and ensure maintenance of adequate ambient conditions for temperature and ventilation.
- B. Clean substrates of substances that could impair bond of fireproofing material, including oil, grease, rolling compounds, incompatible primers, and loose mill scale.
- C. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

### 3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.
  - 1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
  - 2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.
- D. Metal Decks:
  - 1. Do not apply fireproofing to underside of metal deck substrates until concrete topping, if any, is completed.
  - 2. Do not apply fireproofing to underside of metal roof deck until roofing is completed; prohibit roof traffic during application and drying of fireproofing.
    - a. If roof traffic is anticipated after SFRM application is complete, then specified roof walkways must be installed.
- E. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.

- F. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- G. Extend fireproofing in full thickness over entire area of each substrate to be protected.
- H. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.
- I. Where sealers are used, apply products that are tinted to differentiate them from fireproofing over which they are applied.
- J. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.
- K. Cure fireproofing according to fireproofing manufacturer's written instructions.
- L. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.
- M. Finishes: Where indicated, apply fireproofing to produce the following finishes:
  - 1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.
  - 2. Spray-Textured Finish: Finish left as spray applied with no further treatment.
  - 3. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.
  - 4. Skip-Troweled Finish: Even leveled surface produced by troweling spray-applied finish to smooth out the texture and neaten edges.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
  - 1. Test and inspect as required by the IBC, Subsection 17 05 .13, "Sprayed Fire-Resistant Materials."
  - 2. Test and inspect in accordance with the AWCI "Technical Manual 12-A - Standard Practice for the Testing and Inspection of Field-Applied Sprayed Fire-Resistive Materials; an Annotated Guide," most current edition.
- B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fireproofing for the next area until test results for previously completed applications of fireproofing show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.
- C. Fireproofing will be considered defective if it does not pass tests and inspections.
  - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
  - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- D. Prepare test and inspection reports.

3.5 CLEANING, PROTECTING, AND REPAIRING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Protect fireproofing, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fireproofing is without damage or deterioration at time of Substantial Completion.
- C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to work of other trades.
- D. Repair fireproofing damaged by other work before concealing it with other construction.
- E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

**END OF SECTION 07 81 00**





## **SECTION 08 91 19**

### **FIXED LOUVERS**

#### **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 fixed, extruded-aluminum louvers.

##### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
  - 1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
  - 2. Show mullion profiles and locations.
- C. Samples: For each type of metal finish required.
- D. Delegated-Design Submittal: For louvers indicated to comply with structural performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

##### **1.4 FIELD CONDITIONS**

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

#### **PART 2 - PRODUCTS**

##### **2.1 MANUFACTURERS**

- A. Source Limitations: Obtain louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural performance requirements and design criteria indicated.
- B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
  - 1. Wind Loads: Determine loads based on pressures as indicated on Drawings.
- C. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- E. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

## 2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal, Drainable-Blade Louver:
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Airolite Company, LLC (The); K638HP Drainable Louver or comparable product by one of the following:
    - a. All-Lite Architectural Products.
    - b. Construction Specialties, Inc.
    - c. Reliable Products, Inc.
    - d. Ruskin Company.
  - 2. Louver Depth: 4 inches.
  - 3. Frame and Blade Nominal Thickness: Not less than 0.080 inch.
  - 4. Mullion Type: Exposed.
  - 5. Louver Performance Ratings:
    - a. Free Area: Not less than 8.0 sq. ft. for 48-inch- wide by 48-inch- high louver.
    - b. Point of Beginning Water Penetration: Not less than 850 fpm.
    - c. Air Performance: Not more than 0.15-inch wg static pressure drop at 850 fpm free-area velocity.

## 2.4 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
  2. Screening Type: Bird screening.
- B. Louver Screen Frames: Same type and form of metal as indicated for louver to which screens are attached.
- C. Louver Screening for Aluminum Louvers:
1. Bird Screening: Aluminum, 1/2-inch- square mesh, 0.063-inch wire.
    - a. Locations: Provide behind louver areas for mechanical intake or exhaust of air.
  2. Insect Screening: Aluminum, 18-by-16 mesh, 0.012-inch wire.
    - a. Locations: Provide behind other louver areas or vents not requiring bird screens.

## 2.5 BLANK-OFF PANELS

- A. Insulated, Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.
1. Thickness: 1 inch.
  2. Metal Facing Sheets: Aluminum sheet, not less than 0.032-inch nominal thickness.
  3. Insulating Core: Rigid, glass-fiber-board insulation or extruded-polystyrene foam.
  4. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard extruded-aluminum-channel frames, not less than 0.080-inch nominal thickness, with corners mitered and with same finish as panels.
  5. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
  6. Panel Finish: Same finish applied to louvers.
  7. Attach blank-off panels with clips.

## 2.6 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.
  2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
  3. For color-finished louvers, use fasteners with heads that match color of louvers.
- D. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed for masonry, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

## 2.7 FABRICATION

- A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
  - 1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern unless horizontal mullions are indicated.
  - 2. Horizontal Mullions: Provide horizontal mullions at joints unless continuous vertical assemblies are indicated.
- C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
  - 1. Frame Type: Channel unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated, but not more than is recommended by manufacturer, or 72 inches o.c., whichever is less.
  - 1. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.
- G. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

## 2.8 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and openings, 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 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

### 3.3 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 07 92 00 "Joint Sealants" for sealants applied during louver installation.

### 3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
  - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

**END OF SECTION 08 91 19**



**SECTION 11 65 00**

**GYMNASIUM AND PLAY FIELD EQUIPMENT**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

A. Gymnasium and Play Field Equipment:

1. Outdoor basketball backstops.
2. Outdoor basketball backboards.
3. Outdoor basketball goals.

**1.2 RELATED SECTIONS**

- A. Division 5 (Division 05) Metals Sections: Structural steel and steel joists.
- B. Division 9 (Division 09) Finishes Section: Finish painting of factory-primed surfaces.

**1.3 REFERENCES**

- A. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM F 2440 – Standard Specification for Indoor Wall/Feature Padding.
- C. Federal Standard 191 – Textile Test Methods.
- D. NFPA 101 – Life Safety Code.
- E. NFPA 255 – Surface Burning Characteristics of Building Materials.
- F. NFPA 286 – Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- G. NFPA 701 – Methods of Fire Tests for Flame-Resistant Textiles and Films.
- H. UL 214 – Test for Flame-Propagation of Fabrics and Films.

**1.4 DESIGN REQUIREMENTS**

- A. Basketball Backstops: Locate overhead attachments of basketball backstops in keeping with static equivalent loading and point reactions.

**1.5 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data, including materials, components, fabrication, finish, and installation instructions.
- B. Shop Drawings:
1. Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating locations, quantities, dimensions, tolerances, materials, fabrication, connections, hardware, fasteners, finish, electrical wiring diagrams, options, and accessories.
  2. Show location and detail of attachment to building structure.

- C. Design Data:
    - 1. Basketball Backstops:
      - a. Submit manufacturer's design data, indicating static loads and point reactions.
      - b. Submit calculations complete, showing hanger and hoist pulley points.
      - c. General load charts or generic product laboratory test data will not be considered sufficient data.
  - D. Test Reports: Submit manufacturer's certified test reports from testing performed by accredited independent testing laboratory, indicating compliance of materials with requirements as specified.
  - E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
  - F. Manufacturer's Project References: Submit manufacturer's list of recently completed projects, including project name and location, name of architect, and type and quantity of gymnasium and play field equipment installed.
  - G. Operation and Maintenance Manual: Submit manufacturer's operation and maintenance manual; including operation, maintenance, adjustment, and cleaning instructions; trouble shooting guide; parts list; and electrical wiring diagrams.
  - H. Warranty: Submit manufacturer's standard, lifetime, and additional warranties.
- 1.6 QUALITY ASSURANCE
- A. Single Source Responsibility: Provide gymnasium and play field equipment from single manufacturer.
  - B. Manufacturer's Qualifications: Minimum of 5 consecutive years experience manufacturing gymnasium and play field equipment similar to that specified.
  - C. Installer's Qualifications: Trained and approved by manufacturer.
  - D. Regulatory Requirements: Gymnasium and play field equipment shall conform to latest rules and regulations.
    - 1. International Basketball Federation / Federation International de Basketball (FIBA).
    - 2. National Association for Girls and Women in Sport (NAGWS).
    - 3. National Basketball Association (NBA).
    - 4. National Collegiate Athletic Association (NCAA).
    - 5. National Federation of State High School Associations (NFHS).
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
  - B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions. Keep temporary protective coverings in place.
  - C. Handling: Protect materials and finish from damage during handling and installation.
- 1.8 WARRANTY



- A. Provide 1-year warranty against defects in materials and workmanship, unless otherwise specified.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURER**

- A. Porter Athletic, Inc., 601 Mercury Drive, PO Box 1790, Champaign, Illinois 61824-1790. Toll Free (888) 277-7778. Phone (217) 367-8438. Fax (217) 239-2255. Web Site [www.porterathletic.com](http://www.porterathletic.com). E-Mail [porter@porterathletic.com](mailto:porter@porterathletic.com), or approved equal.

### **2.2 OUTDOOR BASKETBALL BACKSTOPS**

- A. Outdoor Basketball Backstops: Model No. R-176-8 outdoor backstop.
  - 1. Backstop: 5-9/16-inch O.D. gooseneck upright and 6-foot extension. Complete with support post system, backboard, and goal with net.
  - 2. Face of Backboard: 6'-0" extended from center line of formed upright support.
  - 3. Upright Support: 5-9/16-inch O.D. heavy-wall galvanized pipe formed to approximate 24-inch radius.
  - 4. Vertical Section: Extend 3'-7" into concrete footing and secured with anchor pin.
  - 5. Horizontal Section: Fabricated with slotted mounting plate to level backboard and goal.
  - 6. Bolts from Front-Mounted Goal: Mount directly through backboard and into Center-Strut mounting plate to eliminate strain on bank, should player hang on front-mounted goal.

### **2.3 OUTDOOR BASKETBALL BACKBOARDS**

- A. Outdoor Basketball Backboards: Model No. 00216000 rectangular-shaped, fiberglass backboard.

### **2.4 OUTDOOR BASKETBALL GOALS**

- A. Outdoor Basketball Goals: Model No. 236H00 Indoor/Outdoor Powr-Flex II Goal.
  - 1. Provide each outdoor backstop with goal.
  - 2. Net: White nylon net.
  - 3. Mounting Hardware: Plated.
  - 4. Finish: Official orange powder coated.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas and supporting structure to receive gymnasium and play field equipment. Notify Architect in writing of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

### **3.2 INSTALLATION**

- A. Install gymnasium and play field equipment in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install equipment plumb, level, straight, square, accurately aligned, correctly located, to proper

elevation, and secure.

- C. Install equipment using manufacturer's supplied hardware and fasteners.
- F. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- G. Remove and replace damaged components that cannot be successfully repaired, as determined by Architect.

### 3.3 ADJUSTING

- A. Adjust basketball backstops, backboards, and goals for plumb and level.

### 3.4 CLEANING

- A. Clean gymnasium and play field equipment promptly after installation in accordance with manufacturer's instructions.
- B. Remove labels and temporary protective coverings.
- C. Do not use harsh cleaning materials or methods that would damage finish.

### 3.5 DEMONSTRATION

- A. Demonstrate operation and maintenance of gymnasium and play field equipment to Owner's personnel.
- B. Furnish Owner with keys to equipment after demonstration.

### 3.6 PROTECTION

- A. Protect installed gymnasium and play field equipment to ensure equipment will be without damage or deterioration at time of substantial completion.

**END OF SECTION 11 65 00**

## **SECTION 11 68 00**

### **PLAY FIELD EQUIPMENT AND STRUCTURES**

#### **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 playground equipment as follows:

- 1. Freestanding playground equipment.
- 2. Composite playground equipment.

##### **1.3 DEFINITIONS**

- A. Definitions in ASTM F 1487 apply to Work of this Section.
- B. IPEMA: International Play Equipment Manufacturers Association.

##### **1.4 PREINSTALLATION MEETINGS**

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

##### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of playground equipment.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Include fall heights and use zones for playground equipment, coordinated with the critical-height values of protective surfacing specified in Section 321816.13 "Playground Protective Surfacing."
- C. Samples for Initial Selection: For each type of exposed finish.
  - 1. Manufacturer's color charts.
  - 2. Include Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish on the following products:
  - 1. Include Samples of accessories to verify color and finish selection.
  - 2. Posts and Rails: Minimum 6 inches long.

3. Platforms: Minimum 6 inches square.
4. Molded Plastic: Minimum 3 inches square.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of playground equipment.
- C. Material Certificates: For the following items:
  1. Shop finishes.
  2. Wood-Preservative Treatment: Include certification by treating plant that states type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
- D. Field quality-control reports.
- E. Sample Warranty: For manufacturer's special warranties.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For playground equipment and finishes to include in maintenance manuals.

#### 1.8 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 entity that employs installers and supervisors who are trained and approved by manufacturer.

#### 1.9 WARRANTY

- A. Special Warranty: 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 and use.
  2. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations: Obtain playground equipment from single source from single manufacturer.
- B. Playground equipment and components shall have the IPEMA Certification Seal.
- C. The following playground equipment and components shall have the IPEMA Certification Seal:
  - 1. All proposed equipment

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Safety Standard: Provide playground equipment according to ASTM F 1487.

### **2.3 FREESTANDING PLAYGROUND EQUIPMENT**

- A. Climber: Tri-Geo Climber (#ZZXX0131)
  - 1. Frame: Manufacturer's standard galvanized-steel pipe or tubing.
  - 2. Colors: As selected by Architect from manufacturer's full range.
- B. Rocking/Springing Equipment:
  - 1. Model: Spring Mates Turtle (#ZZXX0741)
    - a. Color: As selected by Architect from manufacturer's full range.
  - 2. Model: Sidewinder Cycle with Sidecar (#ZZXX0584)
    - a. Color: As selected by Architect from manufacturer's full range.
  - 3. Model: Blast Off (#ZZXX0594)
    - a. Color: As selected by Architect from manufacturer's full range.

### **2.4 COMPOSITE PLAYGROUND EQUIPMENT**

- A. Composite Play Structure: Integral play assembly that provides more than one play activity; manufactured as a system or assembled from manufacturer's standard modular-sized units.
  - 1. Model: Design A (#ZZPD5020).
  - 2. Metal Frame: Galvanized-steel pipe or tubing connected with bolts or clamps.
    - a. Main Frame Posts: Not less than 4-inch OD.
    - b. Color: As selected by Architect from manufacturer's full range.
  - 3. Platforms: Perforated metal.

- a. Color: As selected by Architect from manufacturer's full range.
  - 4. Roofs: Plastic
    - a. Color: As selected by Architect from manufacturer's full range.
  - 5. Play Structure Access Component(s): Ladder, Stairs.
    - a. Handholds: Protective barriers, Handrails.
  - 6. Arrangement: As indicated on Drawings.
- B. Composite Play Structure: Integral play assembly that provides more than one play activity; manufactured as a system or assembled from manufacturer's standard modular-sized units.
- 1. Model: Up & Down (#500-1008).
  - 2. Metal Frame: Galvanized-steel pipe or tubing connected with bolts or clamps.
    - a. Main Frame Posts: Not less than 4-inch OD.
    - b. Color: As selected by Architect from manufacturer's full range.
  - 3. Platforms: Perforated metal.
    - a. Color: As selected by Architect from manufacturer's full range.
  - 4. Play Structure Access Component(s): Ladder, Stairs.
    - a. Handholds: Protective barriers, Handrails.
  - 5. Arrangement: As indicated on Drawings.

## 2.5 FABRICATION

- A. Provide sizes, strengths, thicknesses, wall thickness, and weights of components as required to comply with requirements in ASTM F 1487. Factory drill components for field assembly. Unnecessary holes in components, not required for field assembly, are not permitted. Provide complete play structures, including supporting members and connections, means of access and egress, designated play surfaces, barriers, guardrails, handrails, handholds, and other components indicated or required for equipment indicated.
- B. Metal Frame: Fabricate main-frame upright support posts from metal pipe or tubing with cross-section profile and dimensions as required. Unless otherwise indicated, provide each pipe or tubing main-frame member with manufacturer's standard drainable bottom plate or support flange. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.
- C. Wood Frame: Fabricate main-frame upright support posts from wood. Fabricate secondary frame members, bracing, and connections from wood, steel, or aluminum.
- D. Composite Frame: Fabricate main-frame upright support posts from metal and plastic. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.

- E. Play Surfaces: Manufacturer's standard elevated drainable decks, platforms, landings, walkways, ramps, and similar transitional play surfaces, designed to withstand loads; fabricated from perforated or expanded metal made into floor units with slip-resistant finish. Fabricate units in modular sizes and shapes to form assembled play surfaces indicated.
- F. Protective Barriers: Fabricate according to ASTM F 1487. Extend barriers to height above the protected elevated surface according to requirements for use by age group indicated. Fabricate from **[ one or more of ]** the following:
  - 1. Welded-metal pipe or tubing with vertical bars.
  - 2. Steel sheet with openings for vision and ventilation.
  - 3. Metal-pipe or -tubing frame with wire-mesh infill panels.
  - 4. Opaque plastic panels with openings.
  - 5. Vertical wood balusters with metal pipe or tubing or wood frame.
  - 6. Wood panels with openings for vision and ventilation.
- G. Guardrails: Provide guardrails configured to completely surround the protected area, except for access openings. Fabricate from welded metal pipe or tubing. Extend guardrails according to requirements for use by age group indicated.
- H. Handrails: Welded metal pipe or tubing.
  - 1. Provide handrails at heights to comply with requirements for use by age group indicated according to ASTM F 1487.
- I. Roofs and Canopies: Designed to discourage and minimize climbing by users.
  - 1. Fabricated from opaque plastic or polyethylene.

## 2.6 MATERIALS

- A. Aluminum: Material, alloy, and temper recommended by manufacturer for type of use and finish indicated.
- B. Steel: Material types, alloys, and forms recommended by manufacturer for type of use and finish indicated.
- C. Stainless-Steel Sheet: Type 304; finished on exposed faces with No. 2B finish.
- D. Opaque Plastics: Color impregnated, UV stabilized, and mold resistant.
- E. Transparent Plastic: Abrasion-resistant, UV-stabilized polycarbonate sheet; not less than 3/16 inch thick.
- F. Iron Castings and Hangers: Malleable iron, ASTM A 47/A 47M, Grade 32510, hot-dip galvanized.
- G. Post Caps: color to match posts.
- H. Platform Clamps and Hangers: not less than 0.105-inch-nominal thickness.
- I. Hardware: Manufacturer's standard; commercial-quality; corrosion-resistant; hot-dip galvanized steel and iron, stainless steel, or aluminum; of a vandal-resistant design.

- J. Fasteners: Manufacturer's standard; corrosion-resistant; hot-dip galvanized or zinc-plated steel and iron, or stainless steel; permanently capped; and theft resistant.

## 2.7 CAST-IN-PLACE CONCRETE

- A. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete for normal-weight concrete.
- B. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C 387/C 387M and mixed at site with potable water, according to manufacturer's written instructions, for normal-weight concrete with minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch-maximum-size aggregate.

## 2.8 ALUMINUM FINISHES

- A. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils, medium gloss. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
- B. PVC Finish: UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on PVC finish, with flame retardant added, and with minimum dry film thickness of 80 mils. Comply with coating manufacturer's written instructions for pretreatment and application.

## 2.9 IRON AND STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils. Comply with coating manufacturer's written instructions for pretreatment, applying, and baking.
- B. PVC Finish: UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on PVC finish, with flame retardant added, and with minimum dry film thickness of 80 mils. Comply with coating manufacturer's written instructions for pretreatment and application.

## 2.10 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Bright, Cold-Rolled, Unpolished Finish: No. 2B.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for earthwork, subgrade elevations, surface and subgrade drainage, and other conditions affecting performance of the Work.



1. Do not begin installation before final grading required for placing playground equipment and protective surfacing is completed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written installation instructions for each equipment type unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.
  1. Maximum Equipment Height: Coordinate installed fall heights of equipment with finished elevations and critical-height values 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 Section 033000 "Cast-in-Place Concrete" 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: Follow equipment manufacturer's written instructions and drawings to ensure correct installation of anchorages for equipment.
  3. Finishing Footings: Smooth top, and shape to shed water.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative.
  1. Perform inspection and testing for each type of installed playground equipment according to ASTM F 1487.
- C. Playground equipment items will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Notify Owner 48 hours in advance of date(s) and time(s) of testing and inspection.

**END OF SECTION 11 68 00**

## **SECTION 32 18 16.13**

### **PLAYGROUND PROTECTIVE SURFACING**

#### **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. Unitary, seamless surfacing.

##### **1.3 DEFINITIONS**

- A. Definitions in ASTM F 2223 apply to Work of this Section.
- B. Critical Height: Standard measure of shock attenuation according to ASTM F 2223; same as "critical fall height" in ASTM F 1292. According to ASTM F 1292, this approximates "the maximum fall height from which a life-threatening head injury would not be expected to occur."
- C. SBR: Styrene-butadiene rubber.
- D. Unitary Surfacing: A protective surfacing of one or more material components bound together to form a continuous surface; same as "unitary system" in ASTM F 2223.

##### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. LEED Submittals:
  - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
- C. Shop Drawings: For each type of protective surfacing.
  - 1. Include plans, sections, placement and penetration details, and attachment to substrates.
  - 2. Include accessories and edge terminations.
  - 3. Include fall heights and use zones for equipment and structures.
- D. Samples for Initial Selection: For each type of exposed finish.
  - 1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type of protective surfacing and exposed finish.

1. Include Samples of accessories to verify color and finish selection.
2. Unitary, Seamless Surfacing: Minimum 9 by 9 inches.

F. Product Schedule: For protective surfacing.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Material Certificates: For each type of loose-fill surfacing.
- C. Product Certificates: For each type of unitary surfacing product.
- D. Field quality-control reports.
- E. Sample Warranty: For manufacturer's special warranty.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For playground protective surfacing to include in maintenance manuals.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for materials and execution.
  1. Build mockups for protective surfacing including accessories.
    - a. Size: 48 inches by 48 inches.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.8 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace components of protective surfacing that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Reduction in impact attenuation as measured by reduction of critical fall height.
    - b. Deterioration of protective surfacing and other materials beyond normal weathering.

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

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations: Obtain protective surfacing materials from single source from single manufacturer.
  1. Provide geosynthetic accessories of each type from source recommended by manufacturer of protective surfacing materials.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Impact Attenuation: Critical fall height tested according to ASTM F 1292.
- B. Accessibility Standard: Minimum surfacing performance according to ASTM F 1951.

### **2.3 UNITARY, DUAL-DENSITY, SEAMLESS SURFACING**

- A. Description: Manufacturer's standard, site-mixed and applied, two-layer material with wearing layer over cushioning layer, with combined, overall thickness as required, tested for impact attenuation according to ASTM F 1292 and for accessibility according to ASTM F 1951.
  1. Manufacturer: Surface America, Inc.
  2. Surfacing System: PlayBound Poured-In-Place, Extreme 10.
  3. Wearing Layer: Formulation of EPDM rubber particles, binder, and other organic and inorganic components.
  4. Cushioning Layer: Formulation of SBR particles and binder.
  5. Binder: Weather-resistant, UV-stabilized, flexible, nonhardening, 100 percent solids polyurethane.
  6. Lacquer Topcoat: Manufacturer's standard polyurethane-based formulation.
  7. Critical Height: 9 feet.
  8. Overall Thickness: Not less than 5-1/2 inches.
  9. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location.
  10. Wearing Layer Color(s): As selected by Architect from manufacturer's full range.
- B. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by protective surfacing manufacturer.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for subgrade elevations, slope, and drainage and for other conditions affecting performance of the Work.

1. Verify that substrates are sound and without high spots, ridges, holes, and depressions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare substrates to receive surfacing products according to protective surfacing manufacturer's written instructions.

### 3.3 INSTALLATION OF SEAMLESS SURFACING

- A. Mix and apply components of seamless surfacing according to manufacturer's written instructions to produce uniform, monolithic, and impact-attenuating protective surfacing of required overall thickness.
  1. Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.
  2. Poured Cushioning Layer: Spread evenly over primed substrate to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints.
  3. Intercoat Primer: Over cured cushioning layer, apply primer at manufacturer's standard spreading rate.
  4. Wearing Layer: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with no cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.
  5. Lacquer Topcoat: Spray or roller applied at manufacturer's standard coating rate in one continuous operation.
  6. Edge Treatment: Extended surface course. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with performance requirements.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests.
- B. Perform the following tests with the assistance of a factory-authorized service representative:
  1. Perform "Installed Surface Performance Test" according to ASTM F 1292 for each protective surfacing type and thickness in each playground area.
  2. Perform installed-surface-performance tests at no less than one series of tests for each 1000 sq. ft. of each type and thickness of in-place protective surfacing or part thereof.
- C. Playground protective surfacing will be considered defective if it does not pass tests.
- D. Prepare test reports.

### 3.5 PROTECTION

- A. Prevent traffic over seamless surfacing for not less than 48 hours after installation.

**END OF SECTION 32 18 16.13**





## **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 Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Bicycle rack
  - 2. Picnic Table
  - 3. Bench
- B. Related Sections include the following:
  - 1. Division 03 Section "Cast-in-Place Concrete".

##### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For units with factory-applied color finishes.
- 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
  - 2. The owner may choose a different exposed finishes at no additional cost.
- D. Product Schedule: For site furnishings. Use same designations indicated on Drawings.
- E. Material Certificates: For site furnishings, signed by manufacturers.
- F. Maintenance Data: For site furnishings to include in maintenance manuals.

##### **1.4 QUALITY ASSURANCE**

- A. Source Limitations: Obtain each type of site furnishing(s) through one source from a single manufacturer.

## **PART 2 - PRODUCTS**

### **2.1 BICYCLE RACK**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
  - 1. Belson Outdoors, Inc.
  - 2. Dumor, Inc.
  - 3. Victor Stanley, Inc.
  - 4. Fairweather, Inc.
- B. Bicycle Rack Construction:
  - 1. Frame: Steel
  - 2. Style: BRG 18-P.
    - a. Length: 10'
  - 3. Installation Method: Surface mount.
- C. Steel Finish: Powder Coat
  - 1. Color: Black

### **2.2 PICNIC TABLE**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
  - 1. Dumor, Inc.
  - 2. Victor Stanley, Inc.
  - 3. Fairweather, Inc.
- B. Table Construction:
  - 1. Frame: Steel
  - 2. Style: 77-80PL.
  - 3. Slats:
    - a. Color: Redwood
  - 4. Installation Method: Surface mount.
- C. Steel Finish: Powder Coat
  - 1. Color: Black

### **2.3 BENCH**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

1. Dumor, Inc.
2. Victor Stanley, Inc.
3. Fairweather, Inc.

B. Bench Construction:

1. Frame: Steel
  - a. 3" square tube
2. Slats: Recycled plastic
  - a. Color: Redwood
3. Style: 88 Series PL.
  - a. Length: 6'
4. Installation Method: Cast in concrete.

C. Steel Finish: Powder Coat

1. Color: Black

**END OF SECTION 12 93 00**



## **SECTION 22 30 00**

### **PLUMBING EQUIPMENT**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION OF WORK**

- A. Extent of plumbing equipment work is indicated on drawings and provisions of this section, including schedules and equipment lists associated with either drawings or this section.
- B. Types of plumbing equipment required for project include the following:
  - 1. Domestic Water Heaters:
    - a. Commercial gas-fired water heaters
  - 2. Domestic Water Expansion Tanks
  - 3. Interceptors:
    - a. Grease interceptors

##### **1.2 QUALITY ASSURANCE**

- A. UL and NEMA Compliance: Provide electric motors and electrical components required as part of plumbing equipment, which have been listed and labeled by Underwriters Laboratories and comply with NEMA standards.
- B. NEC Compliance: Comply with National Electrical Code (ANSI/NFPA 70) as applicable to installation and electrical connections of ancillary electrical components of plumbing equipment.
- C. ANSI Compliance: Comply with ANSI Z223.1 (NFPA 54) "National Fuel Gas Code", as applicable to installation of gas-fired water heaters.
- D. ANSI Testing Standard: Water heaters shall comply with ANSI Z21.10.3 testing standard.
- E. AGA and NSF Labels: Provide water heaters which have been listed and labeled by American Gas Association and National Sanitation Foundation.
- F. ASME Code Symbol Stamps: For the following equipment, comply with ASME Boiler and Pressure Vessel Code for construction, and stamp with ASME Code symbol:
  - 1. Commercial water heater
  - 2. Domestic water expansion tank
- G. ASME Relief Valve Stamps: Provide water heaters with safety relief valves bearing ASME valve markings.

- H. PDI Compliance: Comply with applicable Plumbing and Drainage Institute standards pertaining to grease interceptors.
- I. Water heaters shall comply with the Energy Policy Act of 2005 (EPACT-2005) and ASHRAE Standard 90.1b regarding energy efficiency. Minimum thermal efficiency shall be 78%.
- J. Lead Free Compliance: All components associated with potable water systems (including, but not limited to, valves, end use devices/fixtures, pipe, pipe fittings, solder/flux, etc.) shall be "lead-free" in accordance with all local, state and federal codes, as well as NSF/ANSI 372 (NSF 61-G)..

### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's plumbing equipment specifications, installation and start-up instructions, and capacity and ratings, with selection points clearly indicated.
- B. Shop Drawings: Submit assembly type shop drawings indicating dimensions, weights, required clearances, and methods of assembly of all components.
- C. Wiring Diagrams: Submit ladder-type wiring diagrams for all components, clearly indicating all required field electrical connections.
- D. Maintenance Data: Submit maintenance data and parts lists for each item of plumbing equipment. Include "trouble-shooting" maintenance guides. Include this data in maintenance manual.

## PART 2 - PRODUCTS

### 2.1 DOMESTIC WATER HEATERS

- A. Commercial Gas-Fired Water Heaters:
  - 1. General: Provide commercial gas-fired water heaters of size and capacity as indicated on schedule. Comply with ANSI/ASHRAE/IES 90A for energy efficiency. Provide certification of design by AGA under Volume III tests for commercial water heaters. Provide approval by NSF.
  - 2. Heater: Working pressure of 150 psi (1020 kPa); boiler-type hand hole cleanout; ~~magnesium anode rod; 3/4" (20 mm) tapping~~ **and tapped** for relief valve; glass lining on internal surfaces exposed to water.
  - 3. Safety Controls: Equip with automatic gas shutoff device to shut off entire gas supply in event of excessive temperature in tank; and pilot safety shutoff.
  - 4. Draft Hood: Equip with AGA certified draft hood.
  - 5. Jacket: Insulate tank with vermin-proof glass fiber insulation. Provide outer steel jacket with baked enamel finish over bonderized undercoating.
  - 6. Warranty: Furnish ~~three (3)~~ **ten (10)** year limited warranty for tank leakage.
  - 7. Accessories: Provide brass drain valve; 3/4" (20mm) pressure and temperature relief valve; radian floor shield.
  - 8. Controls: ~~Provide gas pressure regulator with atmospheric vent; pilot gas regulator; thermostat.~~ **Heater shall employ an electronic operating**

control with digital temperature readout. Operator shall be capable of connecting to a building automation system through serial connection using Modbus RTU protocol. Combustion shall be controlled by an electronic flame safeguard with pre-purge and post-purge. Standard safety controls shall include a secondary operating limit, an automatic-reset high temperature limit and an ASME-rated temperature and pressure relief valve. Operating and safety controls shall meet the requirements of UL 795 and FM.

**B. Manufacturers:**

1. **Available Manufacturers:** Manufacturer shall be a company specializing in manufacturing the products specified in this section with minimum five years' experience. The water heaters shall be manufactured by a company that has achieved certification to the ISO 9001 Quality Management System.
2. The water heaters shall be ETL listed as a complete unit. The heater shall satisfy current Federal Energy Policy Act standards for both thermal efficiency and stand-by heat losses as established for gas fired water heaters incorporating storage tanks.
3. **Service Access:** The water heater shall be provided with access covers for easily accessing all serviceable components. All gas train components must be accessible and able to adjust without the removal of cabinet components.
4. **Manufacturers:** PVI is the basis of design. Acceptable manufacturers shall be subject to compliance with the requirements. The storage capacity of the specified product represents the quantity of water available at usable temperature. The storage tanks from alternate suppliers will be upsized as necessary to equal the amount of water available at usable temperature in the specified product.

**C. Construction and Design:**

1. Water heater will be a 4-pass, fire tube, storage-type design firing natural gas.
2. The storage section of the water heater shall be ASME stamped and National Board Registered for a maximum allowable working pressure of 150 psi and pressure tested to 1-1/2 times working pressure.
3. All tank connections/ fittings shall be nonferrous and non 300 series stainless steel.
4. The storage tank shall be an unlined pressure vessel constructed from phase-balanced austenitic and ferritic duplex steel with a chemical structure containing a minimum of 21% chromium to prevent corrosion and mill certified per ASTM A 923 Methods A to ensure that the product is free of detrimental chemical precipitation that affects corrosion resistance. The material selected shall be tested and certified to pass stress chloride cracking test protocols as defined in ISO 3651-2 and ASTM G123 - 00(2005) "Standard Test Method for Evaluating Stress-Corrosion Cracking of Stainless Alloys with Different Nickel Content in Boiling Acidified Sodium Chloride Solution."
5. Waterside surfaces shall be welded internally utilizing joint designs to minimize volume of weld deposit and heat input. All heat affected zones (HAZ) shall be processed after welding to ensure the HAZ

corrosion resistance is consistent with the mill condition base metal chemical composition. Weld procedures (amperage, volts, welding speed, filler metals and shielding gases) utilized shall result in a narrow range of austenite-ferrite microstructure content consistent with phase balanced objectives for welds, HAZ and the base metal.

6. To attain the highest level of corrosion resistance to potable water and condensation, all internal and external surfaces shall undergo full immersion passivation and pickling processing to meet critical temperature, duration and chemical concentration controls required to complete corrosion resistance restoration of pressure vessel surfaces. Other passivation and pickling methods are not accepted. Immersion passivation and pickling certification documents are required and shall be provided with each product.
7. Materials shall meet ASME Section II material requirements and be accepted by NSF 61 for municipal potable water systems. Storage tank materials shall contain more than 80% post-consumer recycled materials and be 100% recyclable.
8. The pre-condensing heat exchanger shall be a fire tube design with the combustion chamber and all heating surfaces completely water-backed. The fireside of the combustion chamber shall be of boiler-grade steel. The waterside of the combustion chamber shall be non-ferrous. The fire tubes shall be solid copper. The heat exchanger shall be field removable from the pressure vessel, allowing 100% access to waterside surfaces.
9. The condensing heat exchanger shall consist of a series of u-bend fire tubes that are completely submerged in the lower section of the storage tank.
10. When heating water from 40°F to 140°F, the gas-fired water heater shall operate at a minimum 99% thermal efficiency at maximum burner firing rate.
11. Water heaters that must reduce firing rate to achieve thermal efficiency of 99% when heating water to 140°F will not be acceptable.
12. When tested to the ANSI Z21.10.3 efficiency standard, result shall be no less than 97% thermal efficiency at maximum burner firing rate.
13. Water heater will vent through PVC and can connect to PVC immediately at the appliance's vent connection.

## 2.2 DOMESTIC WATER EXPANSION TANK

### A. Commercial Potable Water Expansion Tank:

1. General: Provide commercial potable water expansion tank suitable for use with potable water systems and with all wetted surfaces/components of the Food and Drug Administration approved materials. Comply with ASME Section VIII requirements.
2. Removable and replaceable heavy-duty butyl bladder.
3. Suitable for operating temperature up to and including 240°F (116°C).
4. Working pressure 150 PSIG (1034.4 Kpa) minimum. Shall be pre-charged to capacities as shown in schedule or shall be pre-charged to 60 PSI if no schedule is shown on the drawings.



5. Shall have charging valve with pressure gauge, lifting ring and 1" NPT drain connection on the side and on the bottom with plugs. Shall be suitable for horizontal or vertical mounting.
6. Acceptance capacities shall be as shown on the drawings, or if not shown on the drawings, shall have not less than eleven (11) gallons of acceptance volume minimum.

## 2.3 INTERCEPTORS

### A. Grease Interceptors:

1. General: Provide pre-cast concrete two (2) compartment grease interceptor for underground installation. Refer to Grease Interceptor Detail on Contract Drawings for size and capacity and construction details. Conform to PDI G101, and provide PDI Seal of Approval.
2. Grease interceptor submittal shall include an engineered certified drawing with a current professional engineer's stamp and signature to certify that the minimum retention time is in accordance with the requirements of the local authority having jurisdiction.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF DOMESTIC WATER HEATERS

#### A. Water Heaters (General):

1. General: Install water heaters as indicated, in accordance with manufacturer's installation instructions, and in compliance with applicable codes.
2. Support: Set units on concrete pads, orient so controls and devices needing service and maintenance have adequate access. Level and plumb unit.
3. Piping: Connect hot and cold water piping to units with unions. Provide shut off valve on cold water line. Connect recirculating water line to unit with shut off valve, check valve, and union.

#### B. Gas-Fired Water Heaters:

1. Gas Supply: Connect to gas line with drip leg, tee, gas cock, and union; full size of unit inlet connection. Locate piping so as not to interfere with service of unit.
2. Flue: Connect flue to draft hood with gas-tight connection.
3. ~~Start-Up: Start-up, test, and adjust gas-fired water heaters in accordance with manufacturer's start-up instructions, and utility company's requirements. Check and calibrate controls, adjust burner for maximum efficiency.~~
3. **Start-up on the gas fired water heaters, including flue gas analysis, will be performed by factory trained and authorized personnel. A copy of the startup report will be provided to the Owner.**

3.2 INSTALLATION OF DOMESTIC WATER EXPANSION TANK

- A. Domestic water expansion tank shall be securely suspended from the structure above or shall be pad mounted on a 4" high concrete pad.
- B. Tie piping connection into cold water feed line to domestic water heater between shut-off valve and inlet of domestic water heater, or as indicated on the drawings. Provide shut-off valve and union on connecting pipe to allow service and inspection of expansion tank.

3.3 INSTALLATION OF INTERCEPTORS

- A. General: Install interceptors as indicated, in accordance with manufacturer's installation instructions, and in compliance with applicable codes.
- B. Support: Anchor interceptors securely to substrate, locate so adequate clearance is provided to remove covers and sediment baskets. Set recessed units so top of cover is flush with finished floor.
- C. Piping: Connect inlet and outlet piping to interceptors.

**END OF SECTION 22 30 00**