

# DIVISION ELEVEN – EQUIPMENT

## DETENTION MODULAR STEEL CELLS                      SECTION 11198

### PART 1 – GENERAL

#### 1.1 SCOPE

This specification covers the requirements, including labor, materials, services, and equipment for the manufacturing, delivering and installing of pre-engineered, prefabricated Steel Detention Cells.

#### 1.2 RELATED DOCUMENTS

Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 specification sections, apply to work of this section.

#### 1.3 REFERENCES

The publications listed in this section form a part of this specification to the extent referenced. The publications are referenced herein by basic designation only.

ASTM A336M – Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality  
ASTM A569/A569M – Specification for Steel, Carbon (015 Maximum, Percent), Hot-rolled Sheet and Strip Commercial Quality  
ASTM A653/A653M – Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip process  
ASTM A666 – Specification for Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar  
ASTM B117 – Standard Practice for Operating Salt Spray (Fog) Testing Apparatus  
ASTM D2794 – Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)  
ASTM D3359 – Test Methods for Measuring Adhesion by Tape Test  
ASTM D3363 – Test Methods for Film Hardness by Pencil Test  
ASTM F2322-03 – Standard Test Methods for Physical Assault on Vertical Fixed Barriers for Detention and Correctional Facilities  
ASTM F1450 – Test Methods for Hollow Metal Swinging Door Assemblies for Detention Facilities  
ANSI/NAAMM HMMA 863 – Guide Specifications for Detention Security Hollow Metal Doors and Frames  
ANSI/AWS D1.1 – Structural Welding Code – Steel  
ANSI/AWS D1.3 – Structural Welding Code – Sheet Steel  
AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings  
AISC Load and Resistance Factor Design Specification for Structural Steel Buildings  
AISI ASDLRFD Design Specification for Cold-Formed Steel Structural Members  
SSPC-SP1 – Solvent Cleaning  
SSPC-SP6 – Commercial Blast Cleaning  
SSPC-SP7 – Brush-off Blast Cleaning  
IBC Label approved – (Industrialized Building Commission) – inspected and applied to individual cells as required

#### 1.4 SUMMARY

The Steel Detention Cell Manufacturer (DCM) shall provide the following as applicable and indicated on the Architectural plans.

1. Security Doors and Frames
2. Chase Doors and Frames
3. All Door Hardware and Locks
4. Manual Track Units
5. Security Metal Ceilings (By Sweeper Metal Fabricators, for use at Corridors, Dayroom, etc.)
6. Windows
7. Glass and glazing
8. Furnishings
9. Plumbing Equipment and Fixtures
10. Electrical, Lighting, and wiring terminated at chase
11. HVAC Duct and Grilles, with Sleeve
12. Mezzanines
13. Installation

## **1.5 APPROVED MANUFACTURERS**

1. Sweeper Metal Fabricators Corp., Drumright, OK 918-352-9180.
2. Any other manufacturers of Steel Detention Cells wishing to submit a sub-bid to the General Contractor shall evidence to the Architect, in writing, fourteen (14) days prior to the Bid Date, that their firm has 10 years prior experience in the design, manufacturing, equipping, delivery, installation, and contract bonding/financial capabilities of steel detention cells as shown on the applicable Drawings and Specifications. All approvals granted on this basis shall be by Addendum prior to the Bid Date.
3. Grounds for disqualifications shall exist if the above requested data is submitted inaccurately, or in the opinion of the Architect, does not satisfy the requirements set forth.

## **1.6 SUBMITTALS**

1. General: Submit the following according to conditions of Contract and Division.
2. Product data and instructions for manufactured materials and products. Include manufacturer's certifications and laboratory test reports as required.
3. Shop drawings prepared by or under supervision of a qualified licensed professional Engineer, showing complete information for fabrication and installation of Steel Detention Cell units. Indicate member dimensions and cross-section; location, size and type of reinforcement, including special reinforcement; and lifting devices necessary for handling and erection. Coordinate shop drawings with other trades to ensure compatibility of required service connections.
4. Provide catalog data with full performance criteria and dimensions for components purchased from outside sources.

5. Submit color samples for review and selection by the Owner. Submit samples of the cell finish, color and texture.
6. Submit samples of recommended bearing pads and/or special anchoring devices.
7. Provide shipping, lifting, and handling diagrams indicating point loads and net and gross loads.

## **PART 2 – PRODUCTS**

### **2.1 CONSTRUCTION**

Units shall be constructed using 3/16" steel plate (12 gauge galvanized steel is available) to sheath interior surfaces of steel plate walls. Ceilings should be sheathed with 12 gauge hot rolled P & O (12 gauge galvanized steel is available). In cases where a steel floor is required, the floor shall be decked using 10 gauge steel (10 gauge galvanized steel is available). In order to limit contraband and tampering, all joints between butting sheets, at interior surfaces, shall be minimized and shall be tight fitting. Mechanical fastening of joints and seams is not allowed. Each side wall shall be framed using perimeter vertical structural angles and perimeter horizontal structural steel tubular members. Front, back and sidewalls shall be stiffened using intermediate vertical press brake formed channels. Walls shall additionally be reinforced with 3" steel channels to support cantilevered wall mounted furniture where used. Ceilings shall be stiffened using "z" shaped cross section stiffeners. Exterior surfaces at front of cells, and at other exterior walls of cells that are to be exposed to inmates, shall be sheathed with 12 gauge steel. All fabrication and assembly of sheet metal and structural components shall be performed by the approved manufacturer. All cell framing, wall panels, furniture, detention light framing, windows, door frames and doors shall be manufactured by the Detention Modular Steel Cell Manufacturer.

### **2.2 ENGINEERING AND DESIGN**

Professional certification shall be provided by the DCM for the design of the manufactured Steel Detention Cells to support superimposed dead loads and live loads as indicated on the contract drawings. The DCM shall certify the design for compliance with governing Code requirements; with the ability to stack four high (if required).

The design shall include integration of Steel Detention Cells into the physical floor plan sections, elevations and structural design of the facility and shall assure that all systems specified in the contract documents are interfaced completely with Steel Detention Cells for a fully installed, fully working facility.

### **2.3 WORKMANSHIP**

1. All units shall be tightly fitted and securely fastened with no through seams or cracks.
2. All panels and assemblies shall be inspected for correct dimensions, joint configuration, straightness, fairness, and squareness.
3. All exposed edges shall be chamfered or bent for finger contact.
4. Out-to-out length, width and height dimensions of individual cell units shall be to a tolerance of +/- 1/4 in. (6.4 mm). The cumulative tolerance in any direction shall not exceed the available horizontal or vertical dimension for the entire assembly of cell units.

5. Where cells are placed on a finished concrete slab, all floor joints shall be filled with high strength detention epoxy caulk.
6. Joints to be welded shall be cleaned and prepared as necessary to assure quality welds.
7. Welding shall be controlled and sequenced to reduce warpage and distortion.
8. All welds shall be free of deleterious porosity, pinholes and cracks.
9. Finished welds shall be smooth and weld spatter and flux shall be removed.
10. Applicable up to date welding certification shall be provided if requested.

## **2.4 STRUCTURAL COMPONENTS**

1. Framing, floors, walls and ceilings, as required, shall be constructed of steel shapes, tubing, stiffened plates, cold-formed sections and/or sheets stiffened with formed sections from steels conforming to design requirements to provide adequate structural strength including the ability to support loading as specified.
2. Structural steel shall be designed to AISC – Specification for the Design, Fabrication and Erection of Structural Steel for Buildings or ASIC – Load and Resistance Factor Design Specification for Structural Steel Buildings. Cold-formed steel shall be designed to AISI – Specification for the Design of Cold-Formed Steel Structural Members.
3. Welding shall be in conformance with ANSE/WAS D1.1, Structural Welding Code-Steel and/or ANSE/AWA #1.3, Structural Welding Code – Sheet Steel, is applicable.
4. Bolts or nuts used in panel assembly shall not be accessible from the interior of the cell.
5. Tamper resistant fasteners shall be used for all exposed fasteners where required for accessories.
6. Mounting and bearing pads, anchorages, spacers and alignment devices, except those shown to be field installed, shall be furnished and attached.
7. Fire Resistance Rated Steel Units: Where units are shown or scheduled as requiring fire resistance classification, provide units of design or assemblies or construction materials.
8. Walls must satisfy the following performance requirements: ASTM 2322-03: Physical Assault on Vertical Fixed Barriers for Detention and Correctional Facilities. Any damage that allows forcible digress shall be deemed as constituting a failure. Test shall be in accordance with Figure #1 and Figure #2 illustrated in ASTM 2322-03. In order to successfully pass the test the following theories of impact shall be delivered to 8 ft. (2438 mm) high by 8 ft. (2143 mm) wide cell wall panels as required by the standard.
  - a. Test at solid half of wall: 600 impacts at vertical joint mid height (as applicable), 600 impacts at center of one panel mid height, and 600 impacts at any opening (as applicable).
  - b. Test half of wall with an exterior window: 600 impacts to window frame sill at center.

## **2.5 DOORS, WINDOWS AND FRAMES**

1. All door, window and frame construction shall be in accordance with ANSE/NAAMM HMMA 863.
2. Materials:
  - a. Interior security and cell doors: Face sheets shall be 0.093 in. (2.3 mm) minimum thickness conforming to ASTM (A569/A569M) steel.  
For interior areas subject to corrosive conditions, specify ASTM A653/a653W (A60, G60/Z180, ZF180).
  - b. Exterior doors: Face sheets shall be 0.093 in. (2.3 mm) minimum thickness conforming to ASTM A653/A63M (A60, G60, Z80, ZF180) Steel.  
For both exterior and interior doors subjected to severely corrosive conditions and/or where specified on individual openings, specify ASTM A666, Type 304, stainless steel
  - c. Door and window frames shall be 0.093 in. (2.3 mm) minimum thickness
3. Manual Track Units for sliding doors shall be Sweeper Metal Fabricator Corp. Model # 672 Manual Track Unit

## **2.6 ELECTRICAL**

1. Each Steel Detention Cell shall be designed, manufactured, and equipped to receive required electrical fixtures. Light fixtures to be 120 volts.
2. The DCM shall provide, when specified in Part 5, electrical distribution conduit, wiring, fixtures, switches, receptacles, and other devices of this specification.
3. All electrical materials and equipment shall be new and conform to the applicable specification and national electrical standards.

## **2.7 PLUMBING**

1. Each Steel Detention Cell shall be designed, manufactured and equipped to receive required plumbing fixtures specified in other divisions of this specification.
2. The DCM shall provide, when specified in Part 5, equipment, fixtures, devices and accessories as required; however, water valves and flush valves shall be provided uninstalled, for installation by others.
3. All plumbing materials and equipment shall be new and conform to the applicable specification.

## **2.8 HVAC**

1. Each Steel Detention Cell shall be designed, manufactured, and equipped to receive required HVAC fixtures specified in other divisions of the specification.
2. The DCM shall provide, when specified in Part 5, HVAC ducts, grilles, diffusers, and accessories. The grille shall be an integral part of the wall.
3. All HVAC materials and equipment shall be new and conform to the applicable specification.

## **2.9 THERMAL AND ACOUSTICAL INSULATION**

1. Insulation Material: Materials shall be approved by the applicable codes of NFPA and governing authorities, and shall have a 3-hour fire rating.
2. Thermal Insulation: Walls, floors, and ceilings shall be insulated to R-values as indicated on contract drawing.
3. Acoustical Insulation: The walls between cells and adjacent rooms shall have a minimum Sound Transmission Classification of 56 (STC-56).

## **2. 10 EQUIPMENT, FURNISHINGS, AND ACCESSORIES**

1. Steel Cell Furniture: Where shown on the contract drawings as cell furniture to be so provided, the DCM shall provide and install wall mounted bunks, tables, stools, mirror, shelf and stainless steel ball and spring suicide proof clothes hooks. Bunks, tables, shelf, and stools shall be 0.123 in. (3.1 mm) minimum thickness and of the sizes shown. Manufacturer shall include drawings, which detail materials, construction, and attachment. These drawings shall be a part of the submittals as outlined in Section 1.5 herein. Fabrication of these items shall not begin prior to the Architect's approval.
2. Fixtures, Furnishings and Accessories Load and Impact Test: Reinforce walls, stiffen furnishings, and provide connections as required to support dead loads plus single point (concentrated) static live loads as required herein. Provide reports from an independent testing agency showing that the following performance requirements have been met using test fixtures in accordance with the requirements of ASTM F 1450 Door Assembly Impact Test, and as required herein, and at maximum distance on each from wall and from supports for each of the following:
  - a. Wall Mounted Desk Top – The desk top, using test standard ASTM F 1450 Door Assembly Impact Test, 400 blows at 200 lbf delivered to within 6" of the center edge furthest away from the wall panel, damage that enables forcible removal of the desktop from the wall or which causes the desktop to deflect enough that the dart misses the target, shall constitute a failure.
  - b. Wall Mounted Desk Top – Unsupported desktop, evaluated using Test Standard ASTM F 1450 Door Static Load Test, a desktop shall be secured to the wall and 9500 ft. lbs of downward force applied at an unsupported corner; a total collapse of the desktop corner, from inability to support load constitutes failure.
  - c. Grab bars – At Grab bars secured to wall, with 600 lbf of downward force applied to the center of the Grab bar, a collapse of the Grab bar shall constitute a failure.
  - d. Shelf – Using Test Standard ASTM F 1450 Door Assembly Impact Test, with the shelf secured to the wall, deliver 400 blows at 200 ft-lbf within 6" of the center edge furthest away from the wall panel. Deflection of the desk, sufficient enough to cause the impact dart to miss the target, shall constitute a failure. Damage to the desk sufficient enough to enable forcible removal of the shelf from the wall shall constitute a failure.
  - e. Wall Mounted Bunk – An unsupported bunk, evaluated using Test Standard ASTM F 1450 Door Static Load Test, with a bunk secured to the wall and with a downward force of 6200 lbf applied at an unsupported corner, damage sustained that enables forcible removal of the bunk from the wall or the total collapse of the bunk corner such that it cannot support the load, shall constitute a failure.
  - f. Wall Mounted Bunk – Using Test Standard ASTM F 1450 Door Assembly Impact Test, a bunk secured to a wall panel shall sustain 400 blows at 200 lbf delivered to within 6" of the corner furthest away from the wall panel without sustaining damage sufficient to enable forcible removal of the bunk from the wall. Damage sustained that enables forcible removal of the bunk from the wall or damage such that the bunk deflects sufficiently that the dart misses the target shall constitute a failure.

- g. Wall Mounted Desk Seat – The Desk Seat, evaluated using Test Standard ASTM F 1450 Door Static Load Test, shall be secured to the wall and shall have a downward force of 14,000 lbs applied at an unsupported corner. Damage that enables forcible removal of desk seat from the wall or total collapse of the desk seat corner such that it cannot support the load shall constitute a failure.
  - h. Wall Mounted Desk Seat – Evaluated using Test Standard ASTM F 1450 Door Assembly Impact Test, 300 impacts of 200 lbf delivered to within 6” of the center edge furthest away from the wall panel. Damage that enables forcible removal of the desk seat from the wall or that results in a total collapse of the desk seat such that it cannot support the load shall constitute a failure.
  - i. Wall Panel – Testing in accordance with ASTM F 1450 Door Assembly Impact Test, at an 8 ft. high by 7ft. wide cell wall panel supported four sides in each half of the wall frame deliver 400 impacts at 200 lbf mid height on a vertical joint where applicable and 400 blows at mid height in the center of one panel and deliver 400 impacts at 200 lbf at the center of a window frame sill. Forcible egress shall constitute a failure.
  - j. Wall Panel Corner Joint – Testing in accordance with ASTM F 1450 Door Assembly Impact Test, a typical corner assembly, the test sample having a minimum of 30” width of wall panel on each side of corner, full height corner sample shall sustain 400 impacts at 200 lbf delivered to within 6” of the corner joint at mid height. Possible egress as a result of the impact shall constitute a failure.
3. Provide independent test reports on actual equipment. Theoretical engineers report **will not be acceptable.**

**2. 11 FINISH**

- 1. The Society for Protective Coatings Specifications SSPC-SP10 Near White Blast Clean, with 1.2 to 2.5 mils blast profile is utilized for interior of cell, cleaning prior to paint applied. Blasting is the required means of obtaining a clean surface suitable for application of epoxy.
- 2. Painting: All cell interior steel wall and ceiling assemblies shall be finish coated on all exposed surfaces with Powder Coat Finish, or alternately with High Solids Epoxy Coating. The coatings shall meet this criteria as a minimum:

**Powder Coat**

**Generic:** Polyester Based Powder Coat

**General Description:** A high performance, weatherable, multi- purpose, surface tolerant, coating for industrial or high performance architectural coating (HIPAC) applications. Polyester Based Powder Coatings possess outstanding over bake resistance, exterior exposure qualities, and excellent performance characteristics and mechanical properties.

**Typical Uses:** Applications include sports and recreation equipment, outdoor furniture, fence, automotive and marine aftermarket parts, architectural, lawn and garden implements, institutional and detention furnishings, and various other products and materials requiring long lasting durable protective coatings.

**Application Conditions:** All oil and grease, mill scale and rust, must be removed. Iron or Zinc Phosphate pretreatment is recommended for optimal performance.

**Cure Schedule F/MIN:** 400 F/10 MIN

**Application Method:** Electrostatic Spray

**Recommended Film Thickness:** 1.8 – 2.2

**Powder Properties:**

<b>Property</b>	<b>Test Method</b>	<b>Results</b>
Specific Gravity:	Calculated	1.63

Square Foot Coverage (ft <sup>2</sup> /lb/mil):	Calculated	117.97
60 Degree Gloss:	ASTM D523	90+

**Typical Performance Characteristics:**

Pencil Hardness/Mar:	ASTM D3363	2H
Pencil Hardness/Gouge:	ASTM D3363	6H
Cross Hatch Adhesion:	ASTM D3359	5B
Salt Spray Resistance:	ASTM B117	3000+ hours– 1/8” “x” scribe
Impact Resistance:	ASTM D2794	140

**High Solids Epoxy (Available Upon Request)**

**Generic:** Catalyzed Polyamide Epoxy.

**General Description:** A high performance, multi- purpose, surface tolerant, two-component chemically-cured epoxy semi-gloss coating for industrial or high performance architectural coating (HIPAC) applications. For use on properly prepared steel or masonry surfaces.

**Typical Uses:** Ideal for protection at hard surface areas at correctional facilities, schools, commercial and restaurant kitchens where a high performance architectural coating (HIPAC) is required, and also for structural steel, piping, tanks, and equipment in chemical, fertilizer, power plants, petroleum refineries, pulp and paper mills, water and sewage treatment plants and mining operations.

**Application Conditions:** All oil and grease, mill scale and rust, must be removed. Surfaces shall be sandblasted to near white metal surface cleanliness in accordance with SSPC-SP10. Blast Profile on Steel should be 38-63 microns in depth and of a sharp jagged nature. Surfaces must be free of grit dust.

**Application Method:** Spray is preferred for appearance and film build control.

**Recommended Film Thickness:** 4.0 - 8.0 mils (100-200 microns) dry/5.3 – 10.7 mils (155-267 microns) wet.

<b><u>Performance Characteristics:</u></b>	<b><u>Test Method</u></b>	<b><u>Results</u></b>
Adhesion:	ASTM D4541	Excellent
Salt Spray Resistance:	ASTM B117	Excellent
Direct Impact Resistance:	ASTM D2794	Very Good
Abrasion Resistance:	ASTM D4060	Excellent
Humidity Resistance:	ASTM D4585	Excellent
Hardness:	ASTM D3363	3H @ 7 Day Cure at 77°F
Chemical Resistance:	ASTM D1308	Excellent

3. Exterior surfaces of cell module and interior surfaces of plumbing chase (where front chase is used) shall be painted with manufacturer’s standard shop primer.
4. Cells shall be of a single color as selected by the Owner from samples submitted by the manufacturer. As an additive option, doors furnished with cells may be a second color as selected by the Owner. Available colors shall be included with cell product data submittals.

**PART 3 – DELIVERY AND INSTALLATION**

**3.1 DELIVERY SEQUENCING AND SCHEDULING**

1. Manufacturer shall coordinate with the scheduling of delivery to the project site. A mutually approved schedule shall be determined by the project schedule and DCM at the pre-construction meeting. The sequencing of the cell units shall conform to this schedule to properly interface the delivery and installation of cells at the proper time during the construction period. A factory representative shall be present for setting of the cells. An



authorized factory representative shall be present for completing all installation of locks, sliders or any other equipment that is to be site installed by DCM.

2. DCM shall deliver cell units, to a designated project site, properly protected from shipping damage. The General Contractor shall provide suitable protective coverings, devices or such methods and procedures to protect cells from damage or vandalism. Protective measures shall remain throughout the construction period. Unloading and handling of the cell units shall be the responsibility of the DCM.

### **3.2 SITE INSPECTION**

Installer of the structural steel cell units shall examine areas and conditions under which structural steel cells are to be installed. Notify contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

### **3.3 INSTALLATION**

1. The General Contractor shall provide a proper area for staging. The DCM shall provide lifting equipment for the installation of the cells. The DCM shall provide qualified personnel on the project site to perform the proper method of receiving and installation of the cell units.
2. Steel cell units shall be set in place by the installer and shall be checked for correct alignment and level. Shims shall be installed as necessary and securely welded to embeds in the foundation. When properly secured, caulk shall be applied by others to seal gap between cell and finished concrete floor (if applicable). Complete all connections, trim, and touch up, meeting the acceptable industry standards and manufacturers recommendations. Gaps at cell to concrete floor larger than 1/4" shall be ground or grouted by the concrete subcontractor.

## **PART 4 – WARRANTIES**

Provide special project warranty signed by the DCM, installer, and Contractor agreeing to repair defective materials and workmanship of the steel cell, installation, and related work. The cell warranty shall be conditional upon the normal use of the institution. Abuse such as riots is not considered normal use. The Warranty shall be for a period of one (1) year after substantial completion.

## **PART 5 – DIVISION OF RESPONSIBILITY**

### **1. INSTALLATION ITEMS EXCLUDED BY DCM**

1. Foundation Grouting.
2. On-site Mechanical Plumbing and Electrical Connections.
3. Jobsite Weather Protection.
4. On-site Installation of Detention Equipment.
5. Water Piping
6. Waste, Vent, Drain Piping.
7. HVAC Duct
8. Caulking between cell and floor

### **2. INSTALLATION ITEMS FURNISHED BY DCM**

1. Cell Off-Load and erection

2. Shim Packs for Leveling Cells to Foundations/Floor Slabs
3. Lifting Eyes on Cells.
4. Spreader Beams and Rigging for Cell Off Loading or Installation Diagrams for same.
5. Installation of On-site Detention Equipment

3. **FURNISHINGS PROVIDED BY DCM** (WITHIN CELL) as applicable and indicated on the Architectural plans and by specifications.

1. Security mirror
2. Sink and toilet combo
3. Plumbing fixtures
4. Light Fixtures (120v)
5. Security supply grille
6. Security return grille
7. Wall mounted stools
8. Wall mounted desk
9. Book shelf
10. Suicide resistant clothes hooks
11. Bunks
12. Interior finish coatings
13. Industrialized Buildings Commission (IBC) Labels (where required by applicable building codes)
14. Door Locks and Hardware
15. HVAC Grilles

GC and DCM should make final coordination of responsibility prior to bidding to ensure no exceptions or qualifications exist in proposal relationship.

END OF SECTION.