SECTION 13 21

CONTROLLED ENVIRONMENT ROOMS – MODULAR MISSION CRITICAL FACILITY ENCLOSURE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Furnish and install modular mission critical facility enclosure including:
    a. Perimeter floor channels with gaskets.
    b. Support columns.
    c. Ceiling joists.
    d. Wall and ceiling panels.
    e. Floor panels.
    f. Door with applicable footer, header and side panels.
    g. Portal panels.
    h. Assembly hardware.
    i. Paint and other specified finishes.

B. Related Sections:

1. Division 15 - Mechanical.
2. Division 16 – Electrical.

1.02 REFERENCES

A. American Society for Testing and Materials:

1. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
2. ASTM E 814 - Standard Method of Fire Tests of Through-Penetration Fire Stops.

B. International Code Council:

1. 2006 International Building Code.

1.03 DEFINITONS

A. Sound Transmission Class (STC): Single number quantifier used to rate partitions, doors and windows for their effectiveness in blocking sound per ASTM E90.

1.04 SUBMITTALS

A. General: Provide listed submittals in accordance with Conditions of the Contract Submittal Procedures.

B. Product Data: Submit applicable current performance data, application recommendations and product limitations.

C. Shop Drawings: Submit assembly and installation drawings showing product components and assembly details.

D. Contract Closeout Submittals:

1. Owner’s Manual
2. Warranty that all products shall perform in accordance with Contract Documents for the life of the product provided the Owner has the enclosure inspected and re-certified on an annual basis by a manufacturer’s authorized agent. Any deficiencies identified during the annual inspection shall be corrected promptly after receipt of written notice from Owner.

1.05 QUALITY ASSURANCE

A. Installer's Qualifications: Installation, disassembly and reassembly shall be by a manufacturer approved, trained installer.

B. Manufacturer's Qualifications: Approved manufacturer listed in this section with minimum 5 years experience in the manufacture of modular mission critical facility enclosures. Obtain modular

mission critical facility enclosure through one source from a single approved manufacturer.

C. Enclosure shall be engineered to withstand the applicable design loads dictated by the installation and as specified in the 2006 International Building Code, Chapter 16, Structural Design, to include dead and live loads, snow loads, wind loads and earthquake loads.

D. Assembled enclosure shall be fully rated to comply with ASTM E119 90 minute rating including the hose stream test along with an ASTM 90 minute rating of the penetrations such as doors, ducts, conduit/cable penetrations, and plumbing penetrations.

E. All cable openings or other penetrations through enclosures including doors, cable, wire, and plumbing penetrations shall be equally rated as specified in the 2006 International Building Code, Section 6.3, as part of an entire assembly with a minimum positive furnace pressure differential of 2.5 Pa (0.01 in. of water) under ASTM E 814, Standard Method of Fire Tests of Through-Penetration Fire Stops. All ducts for mechanical equipment shall be provided with automatic fire and smoke dampers where the ducts pass through the required enclosure construction.

1.06 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirements.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials near installation point at temperature and humidity conditions recommended by the manufacturer. Retain protective packaging.

1.07 FIELD CONDITIONS

A. Floor Level Specification: Floor under wall panels not to exceed ¼" variation per 10 feet.

B. Entire installation area shall be free of debris and broom clean prior to start of installation.

C. Field Measurements: Obtain required field measurements from General Trades Contractor and indicate on shop drawings.

1.08 COORDINATION

A. Coordinate installation of concrete slab supporting modular mission critical facility enclosure meeting the following flatness tolerance requirements:

1. Floor shall be level and true to within 1/4 inch non-cumulative in 10 feet for the entire area supporting the room.

2. The elevation of the concrete slab around the perimeter of the room shall not vary at any point by more than plus or minus 1/4 inch from level.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Modular MCF iFortress™ enclosure constructed with iGuard Armor Panels™.

1. iFortress, Inc, 228 Lackawanna Avenue, Woodland Park (Formerly West Paterson), New Jersey 07427; Telephone: (972) 812-6400; Fax: (973) 812-6471; E-mail: jlyons@ifortress.com; Web site: www.ifortress.com

B. Substitutions: Submit prior to bidding in accordance with Division 1 Substitution Procedures.

2.02 SYSTEM DESCRIPTION

A. Design Requirements: Modular steel panel system incorporating structural, hydro-dynamic, fire resistant and thermal resistant core components. Panels shall be 4" thick by 2' wide and varying lengths. Panels shall be assembled utilizing a cam-lock mechanism and gaskets to form a fire resistant, thermal resistant, self contained, airtight, watertight, hermetically sealed enclosure.

2.03 PERFORMANCE REQUIREMENTS

A. The system shall withstand the fire exposure and water hose tests, as required, for 90-minute fire endurance rating under the condition of ASTM E-119.

B. The enclosure shall have a minimum STC rating as measured per ASTM E90 of 30.

2.04 COMPONENTS

A. Floor Channels Plates: Exterior floor channel plates shall consist of 4 x 2 angles. Interior floor channels shall consist of 2 x 2 angles. Wall panels shall be set into installed floor channel plates using approved gasket material in strict accordance with manufacturer's detailed instructions.

B. Panel Connectors: Panels shall be joined with cam locks at 2' intervals, and provide 1000 lbs per linear foot joint tensile strength. Cam locks shall be provided with 5/8" female thread for use as anchor points for attaching interior equipment to the walls and ceilings.

C. Ceiling Support Columns and Joists: Steel tube columns, 4 x 4, with base plate and top support plate for anchoring a pair of open web joists designed to support the ceiling panel system.

D. Wall and Ceiling Panels: Four (4) inches thick, (2) feet wide reinforced steel pan/skin panels, the iGuard Armor Panel™. The panels are composed of a 16 gauge outer skin, a 16 gauge inner skin, connected by a 14 gauge rail and frame system. The panels shall contain a core material to comply with the ASTM E119 90 minute rating.

E. Door Header, Footer and Side Panels: Panels of construction identical to that of the wall and ceiling panels, appropriately sized for the specified installation. The door header and footer panels shall be sized to accommodate varying heights of raised floor systems.

F. Floor Panels: ½" Dura Rock-Cement Board with 14 gauge cold-rolled steel surface.

G. Portal Panels: Wall panel as described above provided with a portal as described in Accessories.

H. Door:

1. Construction: The iPassage™ door system, with double steel wall construction, performance specific core to resists thermal intrusion, multi-gasket seals, access neutral locking device, crash bar hardware, easy and light swing action hinge design, and time response sensor with associated switch and buzzer/strobe apparatus.
2. Actuator: Mechanical actuation/indicator operates by either manually initiating the process with a push button located on the control panel or automatically activated through a BMS alarm that registers with the Modular iBunker™ control panel. Connected to the system's Buzzer/Strobe timing device, the actuator can be engaged automatically if the door is left in the open position.
3. Access Neutral Locking Device: Neutral system provides basic locking engagement when door is closed. Access control devices such as keypunches, card swipe, biometrics scanning, voice activated or retinal scanning are supplementary to this device.
4. Crash Bar: Mechanical crash bar design ensures that egress from within is unencumbered and consistent with national fire code standards.
5. Timer, Switch, Buzzer and Strobe: Magnetic switches are used with automatic timer device to indicate door position. These are connected to a buzzer/strobe for audible and visual signaling in cases where door is left ajar for set period of time. Buzzer is low audible and strobe simultaneously sends a blue visual signal based on predetermined duration of time.

I. Finish: Interior shall be finished with high reflectance white paint. Owner to specify outer finish requirements.

2.05 ACCESSORIES

A. Portals: Used to accommodate conduit or piping up to 4" diameter. Light gauge steel consisting of two separate but inter-fitting halves. Each half shall be put into position on either side of an iPortal™ Transfer Panel, which has been manufactured to allow for the installation of an iPortal™ Transfer Portal at a specific location. Once in position, the iPortal™ Transfer Panel and housing shall be secured together with threaded bolts. The exterior half shall be inserted into the interior half, which houses a compressible inner 'doughnut'. A compression plate shall be mounted over the inner half through the threaded bolts. Nuts are then turned down, and the resulting compression forces pressure on the eXo-Therm™ Portal Blocks ensuring the airtight seal.

B. Portal Blocks: Specially engineered eXo-Therm Portal Blocks™ are non-conductive, non-combustible, inert blocks intended to allow cables, wires, and pipes to be managed through a Wall Panel. Penetrations enter the enclosure in a controlled manner. Should the system be exposed to a hazard like a fire; the chemical composition of these blocks, which include intumescent properties, shall be designed to prevent the hazard from breaching the iPortal™ by reacting to the flames and

heat, with its inherent expansion and impervious properties.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine modular mission critical facility enclosure installation areas for compliance with requirements for installation tolerances including required overhead clearances, floor levelness and other existing conditions affecting installation and performance. Process with unit installation upon correction of unsatisfactory conditions.

B. Confirm that substrate floor is level and true to within 1/4 inch measured from a 10 foot straight edge for the entire area supporting the room (American Concrete Institute Class C tolerance).

C. Slope does not exceed 1/4 inch over 10 feet.

D. Offset between adjacent slabs: ¼ inch.

3.02 INSTALLATION

A. Modular mission critical facility enclosure shall be installed either by manufacturer approved, trained installer.

B. Install units plumb, level and true.

C. Install in accordance with manufacturer's recommendations and approved submittals.

3.03 CLEANING

A. Clean all surfaces according to manufacturer's recommendations.

B. Remove all packaging and construction debris.

3.04 DEMONSTRATION

A. Train Owner's personnel to operate and maintain enclosure.

B. Turn over maintenance instructions to Owner.

END OF SECTION