

ROTONDO WEIRICH ENTERPRISES, INC.
SECTION 13 ##### PREFABRICATED PRECAST CONCRETE CELL MODULES

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- A. Engineering and design, submittals, offsite/onsite prefabrication, mockups, production, fixtures, hollow metal doors and frames, door hardware (excluding locks), windows and glazing, mechanical and electrical components, general and accessible cell module furnishings, delivery, erection and anchorage connections for a complete installation.
- B. Fabrication and erection by Precast Cell Manufacturer (PCM): See article Quality Assurance of this section.
- C. Providing products, systems and system components of other related Sections for prefabricated precast concrete cell module units of modular design.

1.2 RELATED SECTIONS

1.3 DESIGN AND PERFORMANCE

- A. Engineer, fabricate, erect precast concrete cell modules, and provide materials and products complying with pertinent requirements of current edition of the Building Codes and reference standards.
 - 1. Standard Building Code SBCCI
 - 2. Uniform Building Code ICBO
 - 3. National Building Code BOCA
 - 4. International Building Code ICC
- B. Program requirements: Design precast concrete module units to comply with stated provisions and the following requirements:
 - 1. Module interface and integration with building: Design modular units to integrate and interface with building components, mechanical and electrical, security, and related systems.
 - 2. Monolithic construction: Provide cell modules utilizing five-sided monolithic construction, maximizing the number of cells within each modular unit as conditions allow; modules shall be manufactured with the least possible seams and joints.
- C. Standard design loads: Comply with building codes. Engineer, fabricate, erect, and structurally connect each ground level cell module to foundations and each mezzanine level cell module to the module below.
 - 1. Dead load: Actual calculated weight of a permanent and fixed construction.

2. Floor live load: 40 psf (1.9 kPa) in room units; 100 psf (4.8 kPa) on balconies.
3. Wind load: As governed by local code.
4. Roof load: 30 psf (1.4 kPa).
5. Seismic loads: Satisfy applicable codes as required by the project site location verified by a registered structural engineer within the state of the project.
6. Wall mounted furniture attachments, embeds, and inserts: Coordinate location of all wall-mounted furniture with architectural design requirements. Provide secure anchoring system to accommodate loading requirements of furniture. Where possible, anchors shall be cast-in inserts embedded in the original casting of precast modular units.
7. Support mechanical loads as indicated.
8. Provide and install embedded plates for welded connections of the following:
 - a. Support of mezzanine balcony where not monolithically cast.
 - b. Support for mezzanine stairs.
 - c. Support for mezzanine guardrails.
 - d. Support for connecting adjacent walls and/or roof structures.
9. Maximum allowable deflection
 - a. Span divided by 360 for live load.
10. Design precast modular units to interface with furnishings, mechanical, plumbing, and electrical systems and components shown or indicated on drawings or specifications.
11. Accommodate system for construction tolerance, deflection of other building structural members and clearances of intended openings.

1.4 REFERENCES

A. American Concrete Institute (ACI)

1. ACI 117 Standard Specifications for Concrete Construction and Materials
2. ACI 301 Structural Concrete for Buildings
3. ACI 304 Measuring, Mixing, Transporting and Placing of Concrete
4. ACI 309 Consolidation of Concrete
5. ACI 315 Manual of Engineering and Placing Drawings for Reinforced Concrete Structures
6. ACI 318 Building Code Requirements for Structural Concrete

B. American Society for Testing and Materials (ASTM):

1. ASTM A 36 Specification for Structural Steel
2. ASTM A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement
3. ASTM A 108 Specification for Steel Bars, Carbon, Cold Finished, Standard Quality
4. ASTM A 153 Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
5. ASTM A 185 Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
6. ASTM A 615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
7. ASTM C 31 Standard Practice for Making and Curing Test Specimens in the Field

8. ASTM C 33 Specification for Concrete Aggregates
9. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
10. ASTM C 143 Standard Test Method for Slump of Hydraulic Cement Concrete
11. ASTM C 150 Specification for Portland Cement
12. ASTM C 172 Standard Practice for Sampling Freshly Mixed Concrete
13. ASTM C 494 Specification for Chemical Admixtures for Concrete
14. ASTM E 329 Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction
15. ASTM C 1107 Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink)

C. American Welding Society (AWS):

1. AWS D1.1 Structural Welding Code – Steel
2. AWS D1.4 Structural Welding Code – Reinforcing Steel

D. Concrete Reinforcing Steel Institute (CRSI): CRSI Manual of Standard Practice

E. Precast Concrete Institute (PCI):

1. PCI MNL 116 Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products
2. PCI MNL 120 Design Handbook: Precast and Prestressed Concrete
3. PCI MNL 123 Manual on Design of Connections for Precast and Prestressed Concrete Products
4. PCI MNL 124 PCI Design for Fire Resistance of Precast and Prestressed Concrete
5. PCI MNL 127 Recommended Practice for Erection of Precast Concrete
6. PCI MNL 135 Tolerance Manual for Precast and Prestressed Concrete Construction

1.5 SUBMITTALS

- A. Precast cell geometry drawings: Once approved PCM can proceed with mold fabrication/modification.
- B. Shop Drawings: Show precast concrete module unit plans, elevations and sections, dimensioned layouts and embedded accessories for connection to non-modular construction, including foundations, roof, and adjoining construction, including walls and floors.
- C. Structural calculations: Submit structural design calculation prepared, signed and sealed by structural engineer registered in the state of the project.
 1. Provide a written narrative with structural calculations describing design methodology employed, including design values and formulas used.
 2. Submit calculations, which clearly demonstrate ability of modular units to support the imposed loads specified.

D. Product Data: Manufacturer's original catalog cut-sheets, published specifications, material descriptions, applicable test reports, and maintenance instructions for each product incorporated into the units.

1. Provide calculations complying with ASHRAE/IESNA standard 90.1 and confirming the effective thermal resistance for the insulated concrete sandwich wall system, if required.

E. LEED® compliance submittals/documentation if required:

1. Product data for credit WE 3.1 and credit WE 3.2: Documentation indicating flow and water consumption requirements.
2. Product data for credit MR4.1 and credit MR4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
3. Product certificates for credit MR 5.1 and credit MR 5.2: For products and materials required to comply with requirements for regionally manufactured and regionally extracted and manufactured materials.
 - a. Include statement indicating location of manufacturer and distance to project for each regionally manufactured material.
4. Product data for credit EQ 4.1: For adhesives and sealants, documentation including printed statement of VOC content.
5. Product data for credit EQ 4.1: For solvent cements and adhesive primers for plastic pipe components, documentation including printed statement of VOC content.
6. Product data for credit EQ 4.2: For paints and coatings, documentation including printed statement of VOC content.

F. Quality Control Submittals:

1. Concrete mix: Mix Design and test results.
2. Plant quality control tests and reports: Plant Quality Control Inspector certified test results for interim review and ongoing documentation of performance of raw materials used to fabricate precast modular cells. Reports shall be prepared by the Plant Quality Control Inspector for each type of concrete employed:
 - b. Concrete slump tests.
 - c. Concrete air content tests.
 - d. Concrete compression strength tests.
3. Certifications:
 - a. PCI Plant Certification for product group and category C1, or comparable QA/QC program.
 - b. Welders: Provide copies of certifications in compliance with AWS codes specified.
 - c. Materials certificates for cement and cementitious materials, aggregate and admixtures, certifying that each item meets or exceeds the requirements specified herein.
 - d. Mill test reports for reinforcing steel.

4. Manufacturer's quality control program: Detailed program including all inspection and testing procedures and frequencies for the manufacturer and erection of the modular units. Provide report forms for review and acceptance if required.

G. Close-out submittals:

1. Modular unit warranty: PCM's one year guarantee and replacement warranty, signed by responsible corporate official and noting commencement on date of substantial completion of project.
2. Operation and maintenance manual: Operations and maintenance information and documents for contractor's operation and maintenance manual submission.

1.6 QUALITY ASSURANCE

- A. General: Perform work in compliance with the applicable requirements of ACI 318 and PCI MNL 116, PCI MNL 120, PCI MNL 123, PCI MNL 124, PCI MNL 127, PCI MNL 135.

- B. Provide Owner and Architect representative access to manufacturing plant for inspections.

- C. PCM Sole Responsibility: Provide complete fabrication and finishing of precast concrete module units including the following:

1. Interior surface finishes and coatings. Room module interior walls and ceilings, dayroom face, and underside of mezzanine level balconies to receive concrete surface filler/primer. Cell room interior walls and ceilings to receive epoxy paint coating system.
2. Fixed window frame/frameless window opening dependent on design.
3. Hollow metal frame cell access door and frame.
4. Chase access doors: plate steel access panel with continuous piano hinge.
5. Door and chase door hinges (all other hardware by others).
6. Glazing for window and security cell door, as required.
7. Security fasteners, anchors, and supports.
8. Embeds including steel plates, threaded inserts, supports.
9. Embedded ENT conduit, junction boxes and fittings.
10. Cell interior light fixtures.
11. Cell interior plumbing fixtures.
12. Cell interior required furnishings.
13. Supply and return air grilles cast integral with precast module for HVAC system.

D. Qualifications:

1. Production Facility: Precast concrete plant shall be certified operated in accordance with MNL 116 quality control standards.
2. PCM Sole Responsibility – Erection: Provide erection/installation of the precast modular units.
 - a. Actual erection/installation shall be performed employing the PCM's own forces or by an erector prequalified by the PCM. Erector shall meet the following criteria:

- i. Minimum of 3 years experience erecting precast modular components.
 - ii. Performs under periodic supervision of PCM's erection superintendent who is an experienced, full time employee, trained by the PCM and who has successfully supervised at least 2 similar and successful modular unit installations.
 - iii. PCI Erector Certification.
 3. Professional Engineer: Structural Engineer, licensed to practice in the state of the project and experienced in design and fabrication of precast concrete modular construction, under whose direct supervision the precast concrete components and structural anchorages are designed.
 4. Welders: Qualified in compliance with AWS D1.1 and AWS D1.4; qualifications to remain in force for duration of project.
- E. Mock-ups: Provide a first floor precast cell module mockup with all finishes, fixtures, and furnishings that will comprise a completed module in the project. This would include the specified paint system, plumbing fixtures, electrical fixtures, wiring, hollow metal doors and frames, window components, glazing, and HVAC grilles provided by the PCM.
 1. Provide a cell module mock-up produced according to the approved module shop drawings to establish quality expectations of the final product with regard to finishes and quality of workmanship only.
 2. Approved module mock-up to be incorporated into the project.
 3. Provide a plywood chase mock-up for coordination between subcontractors, incorporating all required plumbing fixtures, valves, HVAC grilles and ductwork, electrical components and other items as specified.
- F. Tolerances:
 1. Manufacture modular units to meet tolerances recommended in PCI Committee Report Product Tolerances for Precast and Pre-stressed Concrete, section 2.1.5, Prison Cell Modules and this Section.
 2. Provide details with sufficient adjustment to erect modules on slab on grade constructed to tolerances of ACI 117.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Provide transport and delivery of modular units to the job site.
 1. Erect fully fabricated and finished modular units with all finishes, fixtures, and furnishings including all plumbing and electrical fixtures, wiring, hollow metal doors and frames, window components, glazing and HVAC grilles provided by the PCM.
 2. Provide bracing and protection required to ensure precast units will be transported, stored and installed into the building construction without damage.
- B. Handling: Handle precast modular units in a manner consistent with their shape and design to ensure protection from damage during handling.

1. Lift and support modular units only from engineered support and lifting points.
2. Provide lifting and handling devices capable of supporting units into position anticipated during storage, transportation, and erection.

C. Storage: Schedule and sequence delivery to jobsite and ensure the progress of the Work.

1. Provide temporary locks on cell access doors to ensure the secure storage of modular units onsite.
2. Provide secure staging area, bracing and protective materials as required to protect from damage or loss.

1.8 WARRANTY

A. Provide a one-year warranty initiated by the PCM and signed by the PCM and CM, commencing on the date of Substantial Completion of the project, to indicate the following:

1. Modular work contains no defective materials, products or equipment or conditions of careless or unskilled workmanship.
2. Mechanical and electrical components, equipment, machines, devices, and component devices, provided as a part of PCM's scope of work, are functional and will operate with care and attention under conditions of the application.
3. Security and detention components equipment, machines, devices, and component devices, provided as part of PCM's scope of work are functional and will operate with care and attention under conditions of the application.

B. Provide copies of manufacturer's warranties for items and equipment incorporated into modular units.

PART 2 – PRODUCTS

2.1 GENERAL

A. Provide materials and products and fabricate modular units in compliance with applicable requirements and reference standards.

B. Typical wall thickness:

1. Rear walls and exposed exterior module side walls: 10 inch insulated mass walls with sandwich panel insulation to achieve an assembly R-value of minimum 10.
2. Front walls: 6 inches
3. Demising (side) walls: 3 ¾ inches

C. Typical ceiling thickness: 5 inches

- D. Variation from typical wall thicknesses dependent on structural design requirements: wall thicknesses on drawings are for typical pre-cast concrete cell module units. Wall thicknesses may vary from those shown on the contract documents. Maintain the overall floor-to-floor vertical dimensions and the overall outside module dimensions.
- E. Walls are not to be tapered in design.

2.2 ACCEPTABLE MANUFACTURERS – PCM

- A. Rotondo Weirich Enterprises, Inc.
PO Box 429
Lederach, PA 19450
Phone 215.256.7940
Fax 215.256.7943

2.3 CONCRETE MATERIALS AND ACCESSORIES

- A. Portland cement concrete: 5000 psi at 28 days, with the following requirements:
 - 1. Portland cement: ASTM C 150, Type III.
 - 2. Fine aggregate: ASTM C 33.
 - 3. Coarse aggregate: ASTM C33.
 - 4. Water: Potable
 - 5. Cement content: Minimum 564 pounds of Portland cement per cubic yard.
 - 6. Water/cementitious material ratio: Maximum 0.45 by weight
- B. Concrete admixtures: Chloride free
 - 1. Less than 0.1 percent chloride ions by weight in the admixture.
 - 2. Water reducing agent: High range, conforming to ASTM C 494.
- C. Reinforcing Steel: ASTM A615, Grade 60, deformed bars and welded steel wire fabric for concrete reinforcement, ASTM A185, ASTM A496, ASTM A497 for wire mesh.
- D. Non-shrink grout: ASTM C 1107, non-metallic, factory pre-mixed. Minimum compressive strength 6000 psi at 28 days.
- E. Shim packs and bearing pads: Material type and thickness required by PCM structural design.

2.4 CONCRETE EMBEDMENTS

A. Cast-in anchors:

1. Embedments for connection and supporting devices: ASTM A 36 or ASTM A 572, Grade 50, carbon steel plates, angles, items cast into concrete, and inserts, conforming to PCI MNL 123, prime painted after welding and field installation. Items exposed to weather in the finished building shall be hot-dip galvanized in compliance with ASTM A 153.
2. Bolts: ASTM A 307.
3. Headed stud anchors (nelson studs): ASTM A 108 grades C-1010 through C-1020 cold drawn steel for use with a gun using ferrules specifically designed for intended application.
4. Prime paint all connections following installation.

B. Concrete inserts:

1. Lifting inserts: Integrally cast, design for lifting and erection capability.
2. Threaded inserts: For mounting detention equipment accessories with threaded security fasteners including furnishings, window components, light fixtures and plumbing fixtures.
 - a. Type: Form mounted, high tensile strength, conical threaded, die-cast zinc alloy or zinc-nickel coated.

C. Insulation and thermal transfer:

1. Acceptable manufacturer:
 - a. The THERMOMASS® Building System, as supplied by Composite Technologies Corporation, PO Box 950, Boone, Iowa 50036 (800.232.1748) consisting of both:
 - i. Insulation
 1. DOW® laminated extruded polystyrene board insulation: Complying with ASTM C 578, Type IV, with regularly spaced holes identifying connector placement locations.
--OR--
 2. DOW® /ISOCAST® Polyisocyanurate board insulation: Complying with ASTM C 1289, Type I, with regularly spaced holes identifying connector placement locations.
 - ii. Non-conductive, non-corrosive, fiber-composite connectors, having a tensile strength of 120,000 psi, minimum glass content of 76 percent by weight, and a coefficient of thermal expansion of 5×10^{-6} in/in/°F, nominal.
 - iii. System comprises connectors, pre-cut, rigid insulation with pre-installed twist-lock retainers, adhesive tape. Each connector comprises a fiber-composite connector with a polymer wing that controls the position of the connector within the twist-lock retainer and provides leverage during connector installation. When installed in the twist-lock retainers, the connectors position the insulation in the form during concrete placement.

D. Steel Tie Wire: ASTM A 82, annealed, steel, uncoated.

2.5 FABRICATION ACCESSORIES

A. Joint sealants:

1. Secure sealant to be utilized in inmate accessible areas.

B. Multi-part epoxy paint system

1. Amercoat 965 by PPG Protective and Marine: Prime coat for cell interior walls and ceilings, undersides of mezzanine balconies, and dayroom face of cell units.
2. Amerlock 400 by PPG Protective and Marine: High solids epoxy coating for interior cell walls and ceilings (manufacturer's standard color).

C. Detention cell and chase doors, frames, hardware: Provide and coordinate installation of products specified in other related sections and installed as part of the work of this section.

1. Detention hollow metal swinging cell access door and door frame with 3 hinges. Doors and frames shall be constructed of material conforming to ASTM A653/A653M (A60). Door face sheets shall be 14 gauge sheets. Doors shall have edges continuously welded and ground smooth. Door and frame shall be prime painted. Frames shall be constructed of 12 gauge minimum thickness steel sheet. Cast-in-place anchors of 12 gauge minimum shall be required at a minimum 3 locations on each frame jamb.
2. Chase Access Doors and Frames:
 - a. Detention hollow metal chase door and frame with 2 hinges and lock preparation. Doors and frames shall be constructed of material conforming to ASTM A653/A653M (A60). Door face sheets shall be 14 gauge sheets. Doors shall have edges continuously welded and ground smooth. Door and frame shall be prime painted. Frames shall be constructed of 12 gauge minimum thickness steel sheet.
--OR--
 - b. Steel plate security chase door and frame with continuous piano hinge and lock preparation. Doors and frames shall be constructed of material conforming to ASTM A653/A653M (A60). Door face sheets shall be 10 gauge sheets.
3. Detention windows
 - a. Pre-cast frameless opening with stainless steel glazing stop secured with stainless steel security fasteners. Glazing as required.
--OR--
 - b. Cast in place steel window frame. Glazing stops secured with stainless steel security fasteners. Glazing as required.

D. Detention furnishings, equipment and accessories: Provide and coordinate installation of products as listed below. Provide detention products as specified for all areas as required including the following:

1. Furnishings including bunks, desks, stools, and shelf with collapsible clothes hooks.
2. Stainless steel mirrors.
3. Handicapped grab bars.

4. Security fasteners: Detention grade steel or stainless steel security/detention fasteners.

E. Mechanical:

1. Stainless steel security combination lavatory-water closet fixture by Willoughby Industries, Inc., Acorn Engineering, Inc. or approved equal.
2. Security supply and exhaust cast-in HVAC grilles.

F. Electrical:

1. Cell ceiling and/or wall surface mounted security light fixtures, inclusive of specified lamps, ballasts, security fasteners, junction box, conduits, and conductors. Light fixtures manufactured by Kenall lighting or approved equal.
2. PCM to provide junction box, fittings, and conduit with pull strings for devices located inside cell units, and a termination box to be located in the cell chase. Conduit to be ¾" flexible ENT as manufactured by Carlon or approved equal.

2.6 FABRICATION – PRECAST CONCRETE CELLS

A. General: Provide precast modular unit types as indicated on drawings.

B. Component fabrication: Comply with applicable provisions of PCI MNL 116.

1. Provide accessories, fixtures, products, components indicated to be cast-in as specified, and ensure availability prior to placing concrete.
2. Provide modular units incorporating the following:
 - a. Installed cell door and door frame, prime painted.
 - b. Conical threaded inserts for cell furnishings.
 - c. Mechanical chase cell walls:
 - i. Security supply and return HVAC grilles with sleeve extension.
 - ii. Stainless steel plumbing fixtures with pneumatic **OR** electronic valves (per design), trim, rough-ins and mounted to chase wall at cast-in wall sleeve or opening.
 - d. Light fixtures: Ceiling and/or wall surface mounted powder coated security type at cells with conduit and wiring to mechanical chase junction box.
 - e. Cell interior grout joint after erection of precast concrete cell units. Grouted joint to be struck flush and painted with cell interior paint coating product **OR** recessed and security caulked (per design).
 - f. Factory installed full perimeter security sealant to all wall and ceiling mounted items and window openings.
3. Integrated components: Provide the following items with precast concrete module units:
 - a. Surface mounted security cell interior light fixtures with conduit and wiring to mechanical chase.
 - b. Required openings, sleeves and embed for drains, leaders, plumbing vents and other penetrations indicated.

- c. Conduits, boxes, and embed attachment plates for wall or ceiling mounted devices.
- d. Embed anchorage for structural connections.
- e. Continuous embed at mezzanine level balcony for field installation of stair and guard rail system.

C. Reinforcement placement: ACI 117 or PCI 116.

1. Secure reinforcement against displacement during concrete placement operations with annealed steel wire ties or suitable plastic stand-off clips.
2. Provide and maintain during concrete placement minimum 5/8 inch clearance between reinforcement and face of forms.

D. Concrete placement: ACI 304

1. Do not place concrete until forms and embeds have inspected and approved by the Plant Quality Control Inspector.
2. Place concrete in one continuous operations, without re-tempering, with equal and continuous placement on all sides, parallel to grade.
3. Perform cold and hot weather concrete placement in compliance with the applicable ACI guidelines.

E. Consolidation: ACI 309

1. Consolidate concrete using external form vibrators and proper placing procedures to assure consolidation adjacent to forms and around embedded items.

F. Floor surface: provide floor surfaces with hard steel troweled surfaces. Onsite sealing of floor surfaces as required shall be performed by others.

G. Curing: Cure in compliance with applicable PCI and ACI recommendations.

2.7 FINISHES

A. Concrete finishes: Concrete surfaces shall be finished as follows:

1. Exterior and exposed end walls (outside walls): Smooth form, as cast finish **OR** simulated texture formliner finish.
2. Formliner shall be an elastomeric formliner used for simulated textured finish on all specified exterior insulated walls. Formliner shall be a low profile texture manufactured by Scott System, Inc., Fitzgerald Formliners, or approved equal.
3. Dayroom wall: PCI finish grade B – steel form finish per MNL 116.3 Air holes over ¼ inch in size shall be filled.
4. Sidewalls: PCI commercial grade – as cast finish. Concrete may have form marks, surface air holes, watermarks, streaks of color or cast marks, scaling, and minor grout bleed and minor chips or spalls. Large fins, large joint bleeding or honeycomb and large spalls shall be repaired. The following additional requirements shall apply:

- a. Sidewall finishes other than commercial grade shall be marked on erection drawings.
- b. Cracks .013 inches and smaller shall not require treatment.
- c. Top of precast module, mechanical level floor: float finish. Surface shall be struck off with a screed and troweled with a bull float to +/- ¼ inch of true plane.

B. Concrete finishes: Cracks occurring shall be measured for width and treated as follows:

1. Any working cracks or fresh cracks greater than .020 inches shall be evaluated by the PCM's engineer.
2. Cracks larger than .013 inches shall be injected with epoxy designed for concrete repair.
3. Cracks from .005 to .013 inches shall be rubbed.
4. Cracks smaller than .005 inches shall be ignored.

C. Cell concrete surface preparation:

1. Fill and patch voids that are greater in width and depth than can be filled with an initial paint filler coat. Fill voids with a cementitious patch and void material compatible with subsequent primer and finishing materials.
2. Apply no surface finish coating until the prepared surface has been inspected and approved by the Plant Quality Control Inspector.

2.8 SOURCE QUALITY CONTROL

A. Maintain plant records and quality control program during production of precast members.

PART 3 – EXECUTION

3.1 COORDINATION

A. Schedule installation with other work and ensure that sufficient equipment, staging and storage area, and access to the building is available for full installation period.

3.2 PREPERATION

A. Assure that all ancillary work required under other contracts are complete, and that required access to installation locations is available for full term of erection and installation, prior to effecting delivery.

B. Ensure lifting devices used for placement of modular units are available and are types approved by Field Quality Control Inspector.

C. Inspect surfaces to receive modular units:

1. Inspect surfaces to ensure that are adequate, flat, and level in compliance with ACI 117.
2. Ensure that surfaces not within tolerance for flatness, level or alignment and position are addressed with Architect and an appropriate method of correction is approved by all parties.

3.3 ERECTION

- A. General: PCI MNL 127 Recommended Practice for Erection of Precast Concrete.
- B. Provide all required coring devices and drilling in foundations and floors for installation of anchorage devices. Anchorage devices/systems by PCM.
- C. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.
- D. Align and maintain uniform horizontal and vertical joints, as erection progresses.
- E. Align and maintain horizontal and vertical plane of dayroom cell surfaces to adjacent module surfaces.
- F. Provide for full uniform transfer of loads in walls between cells and to foundation, using grout bed, neoprene pads, or other method as required by design. Partial grouting is not acceptable. Joints shall be uniform and of width indicated.
- G. Secure units in place as required by design, to resist vertical and lateral loads.
- H. Provide temporary shoring, bracing, and lateral support to prevent bowing, twisting or warping of members.
- I. Welding: All welding shall be in accordance with AWS D1.1 and performed by certified welders.

3.4 FIELD QUALITY ASSURANCE

A. Erection tolerances: Erect members level, plumb and true. Erection shall be in compliance with the reviewed shop drawings and within the following non-cumulative erection tolerances. Each unit, piece, or panel shall be set in position, carefully plumbed, aligned, and securely anchored as detailed or as required.

	<u>Inches</u>
1. Plan location from building grid datum	+/- 1/4
2. Top elevation from nominal top elevation	
a. Exposed individual cell surfaces	+/- 1/4
b. Non-exposed individual cell surfaces	+/- 1/2
c. Exposed relative to adjacent cell surfaces	1/4
d. Non-exposed relative to adjacent cell surfaces	1/2
3. Support elevation from nominal elevation	
a. Maximum low	1/2
b. Maximum high	1/2
4. Plumb in any 10 feet of element height	1/4
5. Maximum jog in alignment of matching edges	1/4
6. Joint width (governs over joint taper)	+/- 1/4
7. Joint taper maximum	3/8
8. Joint taper over 10 feet length	1/4
9. Maximum jog in alignment of matching edges	1/4
10. Differential bowing or camber, as erected, between adjacent members of same design	1/4

3.5 CLEANING AND PROTECTION

A. Exclude entry into the cell modules following erection and final placement with temporary cell access door restrictors.

B. Modules to be clean and presentable for inspection following completion of erection.

END OF SECTION