



Specifications

section 5

This section includes specifications and information about Fibrebond's precast concrete structures.

SECTION 13 4200 – PRE-FABRICATED PRECAST CONCRETE STRUCTURES

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes engineering and structural design, off-site fabrication, delivery, and on-site erection of all precast concrete structures and other related precast concrete elements that are included in the building manufacturer's scope of work.
- B. Pre-fabricated precast concrete structure includes the following:
 - 1. Exterior walls
 - 2. Interior walls
 - 3. Roof Slab (not final roofing)
 - 4. Floor Slab (not final flooring)
 - 5. Interior finishes (in areas noted)
 - 6. Mechanical and electrical components (as indicated on drawings)
- C. Building Sizes: Building may consist of multiple sections designed so that the sections may be joined together to form a complete structure that maintains a positive alignment of floors, walls, and roof. The interior height, floor to ceiling shall be minimum 8'-6".

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide prefabricated concrete structure capable of withstanding the following design loads within limits and under conditions indicated:
 - 1. Wall Dead Load: 65 psf
 - 2. Floor Live Loads: 40 psf
 - 3. Floor Dead Load: 40 psf
 - 4. Roof Live Load: 20 psf
 - 5. Roof Dead Load: 40 psf
 - 6. Wind Loads: 140 mph
 - 7. UBC Seismic Loads: Per Building Code
 - 8. Design framing system and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live load deflection, shrinkage and creep of primary building structure, and other building movements. Member deflections shall meet the limits of ACI 318 and PCI MNL-116.
 - 9. Thermal Movements: Provide for thermal movements noted.
 - a. The precast system design shall consider the maximum seasonal climatic temperature change.
 - b. Member and connection design shall consider through thickness thermal gradients as appropriate.

1.3 DESIGN REQUIREMENTS

- A. Structure Interface and Integration with Building: Design precast concrete units to integrate and interface with building components, concrete structures, mechanical and electrical components, and other related systems.

Provide precast concrete units to conform to the dimensions and configurations shown on the contract bid documents.

- B. Precast concrete structures shall be cast as four, five, or six-sided as dictated by project design. All building units will incorporate insulated sandwich panel exterior walls.
- C. All work shall conform to the standards of the applicable building codes:
 - 1. International Building Code, 2003 – 2006 Edition
 - 2. Americans with Disabilities Act, Current Edition
 - 3. International Mechanical Code, 2003 – 2006 Edition
 - 4. Uniform Plumbing Code, 2006 Edition
 - 5. International Plumbing Code, 2003 – 2006 Edition
 - 6. National Electrical Code, 2002 – 2005 Edition
 - 7. International Fire Code, 2003 – 2006 Edition
 - 8. International Energy Conservation Code, 2—3 Edition

1.4 REFERENCE STANDARDS

- 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 Concrete.
 - 4. ACI 309, Consolidation of Concrete.
 - 5. ACI 318, Building Code Requirements for Reinforced Concrete
- B. American Society Testing and Materials (ASTM)
 - 1. ASTM A36, Carbon Structural Steel
 - 2. ASTM A82, Steel Wire for Concrete Reinforcement
 - 3. ASTM A108, Steel Bars, Carbon, Cold-Finished, Standard Quality
 - 4. ASTM A153, Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 5. ASTM A185, Welded Steel Wire Fabric for Concrete Reinforcement
 - 6. ASTM A497, Welded Deformed Steel Wire Fabric for Concrete Reinforcement
 - 7. ASTM A615, Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - 8. ASTM C33, Concrete Aggregates
 - 9. ASTM C150, Portland Cement
 - 10. ASTM C494, Chemical Admixtures for Concrete
 - 11. ASTM C618, Coal Fly Ash for Use as a Mineral Admixture in Concrete
- 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/Prestressed Concrete Institute (PCI)
 - 1. PCI MNL-116, Manual of 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 of Design Connections for Precast/Prestressed Concrete
 - 4. PCI MNL-124, PCI Design for Fire Resistance of Precast/Prestressed Concrete
 - 5. PCI MNL-127, Recommended Practice for Erection of Precast Concrete

1.5 SUBMITTALS

- A. Product Data: Manufacturers catalog cut-sheets, published specifications, and material description for each sub-component that is incorporated in the pre-fabricated precast concrete structure, and other if requested by Architect.
- B. Shop Drawings:
 - 1. Fabrication drawings and attachment of the various components, including reinforcement detailing, bending, and placing concrete reinforcement in compliance with ACI 318 and CRSI Manual of Standard Practice.
 - 2. Elevations, sections, and dimensions for all precast concrete units including anchors, inserts, and embedded cast-in place items.
 - 3. Mechanical, electrical, and plumbing layouts indicating location of all respective equipment, and routing of conduits and plumbing lines.
 - 4. Drawings and structural calculations shall be signed and sealed by a Professional Engineer registered in the State of the project, who is experienced in the design of the precast concrete structure components.

1.6 QUALITY ASSURANCE

- A. General: Precast Concrete Structure Manufacturer shall perform work in compliance with applicable requirements of ACI 318, and PCI MNL-116, PCI MNL-120, PCI MNL-123, PCI MNL-124, and PCI MNL-127.
- B. Provide Owner and Architect access to manufacturing facility for inspections.
- C. Manufacturer Qualifications: A firm that complies with the following requirements and is experienced in producing precast concrete units similar to those indicated for this Project and with a record of successful in-service performance.
 - 1. Assumes responsibility for engineering structural precast concrete units to comply with performance requirements. The responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
 - 2. Has sufficient production capacity to produce required units without delaying the Work.
 - 3. Is registered with and approved by authorities having jurisdiction.
 - 4. Plant of manufacturer shall be certified by the Precast/Prestressed Concrete Institute (PCI).
 - 5. Must have a minimum of five (5) years documented experience in the design and production of precast concrete building components.
 - 6. Must have a minimum of two (2) completed projects of equal size and magnitude of this project.
- D. Design Standards: Comply with ACI 318 (ACI 318M) and the design recommendations of PCI MNL 120, "PCI Design Handbook – Precast and Prestressed Concrete," applicable to types of structural precast concrete units indicated.

- E. Quality-Control Standard: For manufacturing procedures and testing requirements and quality control recommendations for types of units required, comply with PCI MNL 116, "Manual for Quality Control for Plants and Production of Structural Concrete Products."
- F. Comply with camber and dimensional tolerances of ACI 318 and PCI MNL 135, "Tolerance Manual for Precast and Prestressed Concrete Construction."
- G. Product Options: Drawings indicate size, profiles and dimensional requirements of precast concrete units and are based on the specific types of units indicated. Other fabricators' precast concrete units complying with requirements may be considered. Refer to Division 1 Section "Substitutions."
- H. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel"; and AWS D1.4, "Structural Welding Code – Reinforcing Steel."
- I. Fire Resistance: Where indicated, provide structural precast concrete units whose fire resistance meets the prescriptive requirements of the governing code or has been calculated according to ACI 216.1/TMS 0216.1, "Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies," and is acceptable to authorities having jurisdiction.

1.7 PRODUCT STORAGE, DELIVERY, AND HANDLING

- A. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, staining, and to prevent cracking, distortion, warping or other physical damage.
- B. Store units, unless otherwise specified, with dunnage across full width of each bearing point.
- C. Place stored units so identification marks are clearly visible, and units can be inspected.
- D. Deliver all structural precast concrete units in such quantities and at such times to assure compliance with the schedule and proper setting sequence to ensure continuity of installation.
- E. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses which would cause cracking or damage.
- F. Place dunnage of even thickness between each unit.
- G. Lift and support units only at designated points shown on the Shop Drawings.

1.8 SEQUENCING: Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

1.9 CONCRETE TESTING SERVICE: The fabricator shall employ a full time quality assurance person or persons to perform material evaluation tests and to design concrete mixes.

1.10 SINGLE-SOURCE ENGINEERING RESPONSIBILITY: Provide engineered pre-fabricated concrete structure to support the local design codes, with design approved and certified by a qualified professional engineer.

- 1.11 PROFESSIONAL ENGINEERING QUALIFICATIONS:** A professional engineer who is legally authorized to practice in the state of the project and who is experienced in providing engineering services of the kind indicated that have resulted in installing pre-fabricated concrete structures similar to those indicated for this Project and with a record of successful in-service performance.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Provide materials and products to fabricate precast concrete structures in compliance with applicable requirements and reference standards.
 - 1. Provide pre-fabricated precast concrete structures consisting of four, five, or six-sided units. Coordinate installation of hollow metal door and window frames, electrical, plumbing, fixtures and other items as specified in this section.

2.2 ACCEPTABLE MANUFACTURERS

- A. Fibrebond Corporation or equal

2.2 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Metal or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Forms for Unexposed Finish Concrete: Metal or another acceptable material.
- C. Form Release Agent: Provide Fister – Q2 form release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.3 REINFORCING MATERIALS

- A. Rebar: ASTM A615 Gr. 60 and/or ASTM A706 (for welding applications only).
- B. Welded Wire Fabric: ASTM A497.

2.4 STRUCTURAL MATERIALS

- A. Structural Beam/Channels: ASTM A992.
- B. Structural Tubing: ASTM A500 Gr. B.
- C. Angles/Flats: ASTM A36.

2.5 CONCRETE MATERIALS

- A. Portland Cement: TXI: ASTM C 150, Type 1.
 - 1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.

- B. Fine aggregate in accordance with ASTM C 33. Provide aggregates from a single source for exposed concrete.
- C. Aggregates: Light-weight aggregate in accordance with ASTM C 330. Provide aggregates from a single source for exposed concrete.
- D. Water: Potable.
- E. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.
- F. Water-Reducing Admixture: ASTM C 494, Type F & G.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Basis of Design: Pro-Mix, Propel Excell 25.
 - b. Additional Manufacturers: Subject to compliance with requirements, provide products of one of the following:

Pro-Mix Co.
Euclid Chemical Co.
Grace & Co.
Sika Corp.
- G. High-Range Water-Reducing Admixture: ASTM C 494, Type E.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Basis of Design: Pro-Mix Turbo Cast
 - b. Additional Manufacturers: Subject to compliance with requirements, provide products of one of the following:

Pro-Mix
Euclid Chemical Co.
W.R. Grace & Co.
Sika Corp.

2.6 RELATED MATERIALS

- A. Liquid Membrane-Forming Curing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type 1, Class A. Moisture loss not more than 0.55 kg/sq. meter when applied at 200 sq. ft./gal.
 - 1. Products: Subject to compliance with requirements, provide one of the following:

Confilm, Pro-Mix Co.
Eucofire, Euclid Chemical Co.
Masterkure, Master Builders, Inc.
CS-309, W.R. Meadows, Inc.

Kure-N-Seal, Sonneborn-Chemrex.
Stontop CS2, Stonhard, Inc.

- B. Epoxy Adhesive: ASTM C 881, two-component gel epoxy suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Basis of Design: Sika Hi-Mod 31.
 - b. Additional Manufacturers: Subject to compliance with requirements, provide products of one of the following:

The Burke Co.
Euclid Chemical Co.
L & M Construction Chemicals, Inc.
Master Builders, Inc.
- C. Roof Joint Epoxy: ASTM C 881, two-component gel epoxy suitable for use on dry or damp surfaces.
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Basis of Design: Prairie Epoxy 7095

2.7 PROPORTIONING AND DESIGNING MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- B. Proportion of concrete mixes: Expanded Clay Shale light weight concrete.
 - 1. Designed Unit Weight: 115 (+/- 2) pounds per cubic foot.
 - 2. Concrete strip strength: 2,750 psi at 24 hours.
 - 3. Concrete compressive strength: 5,000 psi at 28 days.
- C. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
 - 1. The target slump limit shall be 7 (+/- 2) inches.
 - 2. The slump shall be monitored by full time quality assurance plant personnel.
- A. Adjustment to Concrete Mixes: Mix design adjustments may be requested by fabricator when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.8 ADMIXTURES

- A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability or when pumping concrete.
- B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F (10 degrees C).
- C. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

2.9 CONCRETE MIXING

- A. Concrete: Comply with requirements of ASTM C 94. Concrete must be produced/batched at the manufacturing facility location. Transit mixed concrete will not be accepted.

PART 3 – EXECUTION

3.1 GENERAL

- A. Coordinate the installation of joint materials and other related materials with placement of forms and reinforcing steel.

3.2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 318 and PCI MNL-116 limits: Provide Class B tolerances for concrete surfaces exposed to view.
- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, recesses, anchorages and inserts, and other features required in the Work.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
- D. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- E. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.3 PLACING REINFORCEMENT

- A. General: Comply with ACI 318, PCI MNL-116, and CSRI: Manual of Standard Practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.
- B. Clean reinforcement of earth, ice, and other materials that reduce or destroy bond with concrete.

- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.
- D. Place reinforcement to maintain minimum coverages as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

3.4 INSTALLING EMBEDDED ITEMS

- A. General: Comply with PCI MNL-123 "Manual of Design for Connection for Precast and Prestressed Concrete Products" and as specified. Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

3.5 PREPARING FORM SURFACES

- A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.

3.6 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in.
- B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and PCI MNL-116 "Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products" as specified.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. Deposit concrete to avoid segregation at its final location.
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
- E. Consolidate placed concrete by mechanical vibrating equipment. Use equipment and procedures for consolidation of concrete complying with ACI 309 and PCI MNL-116.
- F. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of forms, until completing placement of a panel or section.
- G. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
- H. Bring slab surfaces to correct level with a straightedge and strike off.
- I. Maintain reinforcing in proper position on chairs during concrete placement.

3.7 FINISHING

- A. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces. Repair and patch defective areas with fins and other projections completely removed and smoothed.
- B. Non-Formed Finish: Provide an acceptable, level surface on non-formed concrete surfaces with power screed or power trowel equipment. Repair and patch defective areas with fins and other projections completely removed and smoothed.

3.8 QUALITY CONTROL TESTING DURING FABRICATION

- A. General: The fabricator will employ a full time quality assurance person or persons to perform tests and to submit test reports.
- B. Sampling and testing for quality control during concrete placement may include the following, as directed by Architect.
 - a. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - b. Slump: ASTM C 143; one test at point of discharge for each structure cast; additional tests when concrete consistency seems to have changed.
 - c. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
 - d. Compressive-Strength Tests: ASTM C 39; one set for each day's pour or for each structure cast; one specimen tested at 24 hours, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
- C. Test results may be reported in writing to Architect and Contractor at their request. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 24 hour tests and 28-day tests.
- D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

3.9 CONSTRUCTION DESCRIPTIONS

- A. Exterior Walls (exposed to conditioned space):
 - 1. Exterior wall panels will be of insulated sandwich panel construction with a final thickness of eight inches. The construction method employed should yield a concrete finish on both the interior and exterior of the building. Insulation should be installed between the concrete layers to yield an R-value of 11. Reinforcement should be properly placed in both wythes of the concrete panel to provide adequate reinforcement and cover. Panels should be poured to include all attachments necessary to lift and fully assemble the building units. Typical wall construction would consist of two inches of 5000-PSI lightweight concrete, two inches of insulating foam, and four inches of 5000-PSI lightweight

concrete respectively. Connectors should be installed between the two wythes of concrete that pass through the foam and prevent floating or shifting in the foam during the pouring process. All concrete units should be poured on flat smooth steel form-work that yields no visible seams in the finished panel. The side of the wall panels that faces the exterior should be finished in one of the available finish options offered and will be selected by the Architect. The interior side of all panels should yield a paintable surface. Wall panels must be bolted or welded to the adjoining floor and roof.

B. Exterior Walls (not exposed to conditioned space):

1. Exterior wall panels will be of solid or "ribbed" walls will be a minimum of four inches in thickness. Reinforcement should be properly placed in the concrete panel to provide adequate reinforcement and cover. Panels should be poured to include all attachments necessary to lift and fully assemble the building units. Wall panels should be poured on flat smooth steel form-work. Small air pockets (1/4") and pits will be acceptable.

C. Roofs:

1. Building roofs will be constructed of six-inch "ribbed" panel construction. Roofs must be bolted to adjoining walls. Properly reinforced 5000-PSI lightweight concrete should be used for all roof panels. Concrete ribs will be placed a maximum of 48" on center. Concrete ribs will be of adequate size to resist the loadings applicable of the building design.

D. Floors:

1. Building floors should be of six-inch ribbed construction with proper rib size and spacing to meet the required floor loadings. Properly reinforced 5000-PSI lightweight concrete should be used for all floor panels. Concrete ribs will be placed a maximum of 48" on center. Concrete ribs will be of adequate size to resist the loadings applicable of the building design. Reinforcement should be properly placed in the concrete panel to provide adequate reinforcement and cover. Panels should be poured to include all attachments necessary to lift and fully assemble the building units. All concrete units should be poured on flat smooth steel form-work. Floor must be bolted to adjoining walls. All structures to be shipped with floor systems fully assembled to walls.

E. Transportation:

1. All buildings must be shipped fully assembled including walls, floors and roof. Building units should be transported to the site in a manner and with proper bracing to keep buildings from shifting or racking during the transportation process. Proper shipping protection should be used under the building units to keep any concrete floors from contacting trailer decks and absorb bumps during transport. Any openings must be weatherproofed during transport to the extent deemed necessary by the building supplier to keep any interior components from getting damaged.

F. Site Installation:

1. Building units to be set onto foundations adequately installed for this type of construction. High density plastic shims are to be placed under each unit at intervals to achieve a setting surface level to +/- 1/8". During the installation process of the building units all wall and roof joints should be maintained flush and plumb with one and other. After final positioning of building units, all horizontal and vertical seams shall be weatherproofed. All building-to-foundation and building-to-building section interconnections shall be installed (anchored or welded) to meet code requirements for the installation. Connections must be designed and approved by a licensed structural engineer. All interior and exterior building joints shall be finished in a manner that complies with architectural finish schedule.

PART 4 – SPECIFIC LIST OF STANDARD COMPONENTS

Classrooms:

- **Exterior:**
 - 6" flat or single sloping concrete roof
 - Conklin® Rapid Roof 3-ply roofing system for temporary roofing

- **Interior**
 - Smooth concrete walls ready to be primed, textured, and painted

- **Doors:**
 - One (1) 3070 18 gauge steel hollow metal door with 16 gauge steel cast-in steel hollow metal frame primed and painted with 5" x 20" vision window
 - 4.5" door hinges, three (3) per door
 - Door silencers
 - Hydraulic door closer
 - Classroom function door lock with lever handle (exterior doors only)
 - ADA compliant threshold (exterior doors only)
 - Weather stripping (exterior doors only)
 - Door stop

- **Windows:**
 - Insulated windows installed in 16 gauge cast-in steel frame

- **Specialities:**
 - One (1) cork board (size to be determined by client/architect)
 - One (1) marker board (size to be determined by client/architect)

- **Electrical:**
 - One (1) 200 amp 42 space main breaker load center enclosure with 100 amp main breaker and associated circuit breakers
 - Twelve (12) 20 amp interior duplex receptacles
 - One (1) 20 amp exterior GFCI receptacle
 - One (1) 20 amp interior duplex receptacle for TV
 - One (1) cast-in junction box with associated conduit and pull strings installed directly above marker board for clock installation
 - One (1) cast-in junction box with associated conduit and pull strings installed adjacent to TV receptacle for CCTV
 - One (1) cast-in junction box with associated conduit and pull strings installed for fire alarm/strobe
 - Eight (8) cast-in 4" junction boxes with associated conduit and pull strings installed for data
 - One (1) cast-in 4" junction box with associated conduit and pull strings installed for intercom
 - One (1) cast-in junction box with associated conduit and pull strings installed for fire alarm pull box
 - Two (2) 20 amp 120V 1 pole light switches for interior lights
 - One (1) 20 amp 120V 1 pole light switches for exterior light
 - Twelve (12) 2' x 4', 32 watt, T-8, 2 bulb lay-in light fixtures

- Two (2) junction boxes with associated conduits and pull strings installed above ceiling for heat detector and smoke detector
- Three (3) ¾" and three (3) ½" conduits installed from loadcenter to above ceiling height for future use
- One (1) 2" conduit with 2" rigid nipple and weather-proof cap installed from load center to exterior for electrical service entry
- Stainless steel (satin finish) cover plates installed on all receptacles and light switches
- **HVAC:**
 - HVAC supply duct, sheet metal main trunk line (no insulation), flex duct drops, supply diffusers
 - HVAC return air duct, return air grill

Single Occupant Restrooms:

- **Interior:**
 - 20 gauge steel stud partition walls with moisture-resistant gypsum board
- **Doors:**
 - One (1) 3070 18 gauge steel hollow metal door with 16 gauge steel cast-in steel hollow metal frame primed and painted
 - 4.5" door hinges, three (3) per door
 - Door silencers
 - Hydraulic door closer
 - Restroom function door lock with lever handle
 - Door stop
- **Specialities:**
 - One (1) 42" stainless steel (satin finish) grab bar
 - One (1) 36" stainless steel (satin finish) grab bar
 - One (1) stainless steel paper towel (satin finish) dispenser
 - One (1) stainless steel (satin finish) hand soap dispenser
 - One (1) stainless steel (satin finish) toilet paper dispenser
 - One (1) 38" x 24" stainless steel (satin finish) channel framed mirror
- **Mechanical:**
 - Ceiling mounted 95 CFM exhaust fan with rigid duct and exterior mounted wall cap
- **Plumbing:**
 - One (1) wall mounted vitreous china lavatory with lever handle faucet and protective covers for p-trap and shut-off valves
 - One (1) floor mounted rear discharge water closet with flush valve
 - One (1) instantaneous water heater
- **Electrical:**
 - One (1) 20 amp exterior GFCI receptacle
 - Two (2) 2' x 4', 32 watt, T-8, 2 bulb lay-in light fixtures
 - One (1) 20 amp 120V 1 pole light switches for interior lights

Multi-Occupant Restroom:

- **Exterior:**
 - 6" flat or single sloping concrete roof
 - Conklin® Rapid Roof 3-ply roofing system for temporary roofing

- **Interior:**
 - Lightly textured concrete walls primed and painted
 - Steel T-grid with humidity resistant acoustical tiles and R-19 batt insulation
 - Ceramic tile directly to concrete

- **Girls Side:**
 - Five (5) standard stalls with floor mounted rear discharge water closets and flush valves
 - One (1) semi-ambulatory stall with floor mounted rear discharge water closet and flush valve
 - One (1) ADA compliant stall with floor mounted rear discharge water closet and flush valve
 - Two (2) vitreous china wall mounted lavatories with lever handle faucets and protective covers for p-trap and shut-off valves
 - Stainless steel (satin finish) grab bars
 - Stainless steel (satin finish) paper towel dispensers
 - Stainless steel (satin finish) toilet paper dispensers
 - Stainless steel (satin finish) soap dispensers
 - Solid HDPE plastic privacy partitions
 - Janitor closet with stainless steel mop sink and 3070 18 gauge steel door and 16 gauge steel frame
 - Ceiling mounted heater with built-in thermostat
 - Ceiling mounted exhaust fan with rigid duct to exterior with wall cap
 - Wall mounted electric drinking fountain

- **Boys' Side:**
 - Three (3) standard stalls with floor mounted rear discharge water closets and flush valves
 - One (1) semi-ambulatory stall with floor mounted rear discharge water closet and flush valve
 - One (1) ADA compliant stall with floor mounted rear discharge water closet and flush valve
 - Two (2) vitreous china wall mounted urinals with flush valves
 - Two (2) vitreous china wall mounted lavatories with lever handle faucets and protective covers for p-trap and shut-off valves
 - Stainless steel (satin finish) grab bars
 - Stainless steel (satin finish) paper towel dispensers
 - Stainless steel (satin finish) toilet paper dispensers
 - Stainless steel (satin finish) soap dispensers
 - Solid HDPE plastic privacy partitions
 - Janitor closet with stainless steel mop sink and 3070 18 gauge steel door and 16 gauge steel frame
 - Ceiling mounted heater with built-in thermostat
 - Ceiling mounted exhaust fan with rigid duct to exterior with wall cap
 - Wall mounted electric drinking fountain

END OF SECTION 13 4200