SECTION 13122 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pre-engineered metal building, complete with structural framing (columns, rafters, struts, purlins, girts); prefinished roofing, siding; roof and wall insulation; building canopies; metal flashings; trim; gutters and downspouts; diagonal bracing; fasteners; and roof and wall accessories and other components and material required for a complete installation.
2. Alternates Roofing selections

1.2 DESCRIPTIONS

A. Type: Clear span gabled rigid frame with variable depth column and rafter sections of shop welded steel plates.

B. Roof Slope: 1:12

C. Column Spacing at Exterior Walls: As shown on drawings and compatible with placement of openings and other requirements.

D. Top of Steel @ Eave Height: 13'-0, measured vertically as indicated on plans. The maximum vertical clearance from finished floor to underneath the rigid frame rafter is not critical, except at coiling door head - verify before fabrication.

E. Grouting under columns is not required.

1.3 QUALITY ASSURANCE

A. Codes and Standards:
1. Use following where applicable in building design:
a. AWS D1.1 Section 8, "Structural Welding Code-Steel."
b. MBMA "Low-Rise Building Systems Manual," Latest Edition.
c. AISI "Specifications for the Design of Cold Formed Steel Structural Members," Latest Edition.
d. AISC "Manual of Steel Construction Manual", ninth edition.
e. AISC "Specifications for Structural Joints Using ASTM A325 or ASTM A490 bolts."
f. SDI "Steel Roof Deck Design Manual."
g. "North Carolina State Building Code," 1996/97 Edition.

2. Use the following where applicable in other phases of design:
a. Building Code and regulations of other governing authorities having jurisdiction at project site.
b. Applicable portions of the Structural Steel Painting Council (SSPC) Standards, as referenced herein.
c. Federal (Fed. Spec.), Military (MIL) and Commercial (CS) Standards and Specifications, as referenced herein.
d. American Society for Testing and Materials (ASTM), Standards as referenced herein.
e. Ratings by: Underwriters' Laboratories, Inc. (UL Classification 90).

B. Design Loads:

1. Basic Design Loads: To include live, ground snow, wind, and earthquake (if applicable), in addition to dead loads and including loading imposed by mechanical units. Consider all other design loads, whether they be of static or dynamic nature, as auxiliary loads.
2. Vertical Live Loads: As follows, to be in addition to applicable dead loads and applied to horizontal projection of roof:
   a. Purlins and Roof Joists: Design for 20 PSF uniformly distributed over roof area which they support.
   b. Primary Framing (Frames): Design for 20 PSF for tributary area less than 200 PSF, 16 PSF for tributary area 201-600 PSF, and 12 PSF for tributary area greater than 600 PSF, uniformly distributed over roof area which it supports.
   c. Roof Covering: Design to support either 50 PSF uniformly distributed or 200 lb. concentrated (point) load (over 1' x 1' area) located at center of maximum roofing (panel) span; most severe condition shall govern.
   d. Design all framing components for a 5 PSF uniform mechanical load.

3. Seismic Load: Building and components to be designed for Ay=0.075, Aa=0.075 in accordance with NC Building Code. Building is to resist seismic loads imposed on structure by 8" CMU walls not by metal building manufacturer.

4. Wind Loads: Design structure for Exposure C - 80 MPH velocity proportioned and applied as horizontal and uplift forces according to Low-Rise Building Systems Manual design practices.

5. Horizontal deflections of sheeting, secondary and primary structural shall follow AISC's "Serviceable Design Considerations for low Rise Buildings"

6. Load Combinations: The loads listed herein shall be considered to act in the following combinations, whichever produces the most unfavorable effects on the building or structural member concerned:
   a. D + L
   b. D + S
   c. D + A
   d. D + W (or E)
   e. D + S + A
   f. D + S + E
   g. D + .5W (or 1.0E) + A
   h. D + S + .5W
   i. D + .5S + W

   where,

   D = Dead plus collateral loads
   L = Roof live loads
   S = Roof snow loads
   W = Wind loads
   E = Seismic loads
   A = Auxiliary loads

7. NOTES:
   a. Roof snow loads in loading combination (e) shall be: Zero when the roof snow loads are less than or equal to 13 PSF; .5S when it is greater than 13 PSF, but less than 31 PSF; .75S when it is equal to or greater than 31 PSF.

b. Roof snow loads in loading combination (f) shall be: Zero when roof snow loads are less than 31 PSF; .25S when it is equal to or greater than 31 PSF.

1.4 SUBMITTALS

A. General: To Comply with general conditions.

B. Shop Drawings and Calculations:

1. Design Calculations and Erection Drawings: Prepared by, or under direct supervision of, Registered Professional Engineer, licensed to practice in State of North Carolina with all drawings and calculations bearing his seal.

2. Show each type structural building frame required and their locations within structure; details of anchor bolt settings; sidewall, endwall, and roof framing; diagonal bracing and location within structure; metal floor deck and joist types; wall and roof insulation and types; longitudinal and transverse cross sections; details of curbs, roof jacks, and items penetrating roof; canopy framing and details; trim, gutters, downspouts, liner panels, wall and roof coverings, and all accessory items; materials; finishes; construction and installation details; and other pertinent information required for proper and complete fabrication, assembly and erection of watertight metal building system.

C. Material and Color Samples:

1. For each specific material sample requested by architect, submit in size, form, and number directed.

2. Submit duplicate color sample sets showing full color range available, for selection purposes.

D. Product Data: Two (2) copies of manufacturer's specifications and descriptive literature.

E. Certification: Two (2) copies of written certification, prepared and signed by Registered Professional Engineer licensed to practice in State of North Carolina, attesting that building design meets specified loading requirements, requirements of codes and authorities having jurisdiction at project site,

F. Metal building manufacturer shall submit certification of design to the architect to be an approved manufacturer and that the roof system shall qualify for UL Class 90 and state construction number.

1.5 PRODUCT HANDLING, DELIVERY AND STORAGE

A. Deliver and store prefabricated components, sheets, panels, and other manufactured items so they will not be damaged or deformed.

B. Stack materials on platforms or pallets above grade or on concrete slab, covered with opaque tarpaulins or other approved weather-resistant ventilated covering.

C. Store metal sheets and panels if subjected to water accumulation in such a manner so they will drain freely. Do not store sheets and panels in contact with other materials which might cause staining.

D. Damaged material must be reported to determine if replacement is required.

E. Inspect panels to prevent moisture between panels, and secure as required.

1.6 WARRANTIES

A. All Components: Manufacturer's standard one (1) year workmanship warranty.

B. Roof Panels including any Canopy Roof Panels: Manufacturer's standard twenty (20) year paint finish warranty and/or manufacturer's standard twenty (20) year no-perforation warranty.

C. Wall Panels: Manufacturer's standard twenty (20) year paint finish warranty.

PART 2 - PRODUCTS AND FABRICATION

2.1 MANUFACTURERS: Manufacturer of pre-engineered metal building shall be one of the following or an approved equal:

A. Varco-Pruden Comapny
B. Butler Manufacturer Company
C. Ceco Building Corporation
D. Inland Building Company

2.2 STRUCTURAL STEEL

A. Materials:
   1. Structural Plate or Bar Stock: Minimum yield strength (Fy) of 50,000 PSI.
   2. Cold Formed Structural Steel: Minimum yield strength (Fy) of 55,000 PSI.
   3. Primary Structural Bolts and Nuts: ASTM A325; size and quantity required by metal building system manufacturer.
   4. Prime Coat Paint: Manufacturer's standard equal to Fed. Spec. TT-P-636D.

B. Fabrication:
   1. Primary Framing: Rigid frames of shop-welded steel plate columns and rafters, both tapered and uniform depth sections as required by drawings, complete with all necessary stiffeners, connection plates and holes for field-bolted assembly.
      a. Columns and Rafters: Fabricated with holes in web and/or flanges for attachment of secondary members.
      b. Splice Plates: Factory fabricate for precision for all rafter-to-rafter and/or column-to-rafter connections, complete with connection bolt holes.
      c. Base Plates, Cap Plates, Splice Plates and Stiffeners: Fabricate to sizes required, complete with all holes for connection of primary and secondary structural members. Factory weld into place.
      d. Join flanges and webs of structural members fabricated of plate or bar stock together by continuous automatic submerged arc welding process with all welding performed under the supervision of certified welders in accordance with standard practices of AWS D1.1.
      e. Make all primary rigid frame field-bolted connections with A325 high-strength bolts of size required by building system manufacturer.
      f. Clean all components of oil, dirt, loose scale, and foreign matters. Factory paint with one (1) coat of manufacturer's standard primer.
   2. Endwall Framing: Precision cold-formed and/or shop-welded steel plate members consisting of rafters and columns fabricated for field-bolted assembly.
      a. Columns, Rafters, Splice Plates, Clips, Angles and Channels: Factory fabricate to size required.
      b. Plate Stock Endwall Framing Members: Join flanges and webs by continuous automatic submerged arc welding process, under the supervision of welders certified in accordance with standard practices of AWS D1.1.
      c. Clean components of oil, dirt, loose scale and foreign matter and apply one (1) coat of manufacturer's standard primer.

3. Secondary Framing, (Purlins, Girts, Struts, Flange Braces, Base Angles, as required):

a. Purlins: Manufacturer's standard 8" Z sections, roll formed from minimum (Fy) 55,000 PSI steel, punched for attachment.

b. Girts: 8" Z or channel sections of roll formed Fy 55,000 PSI steel, punched for attachment with 1/2" diameter bolts.

c. Eave Struts: 7 1/4" x 4" sections of cold formed minimum Fy 55,000 PSI steel, with vertical web to receive sidewall panels and two (2) 1/2" diameter bolt attachments to rigid frame in factory-punched holes in column or bracket.

d. Roof Struts: Provide as required, detailed and shown on final shop drawings, as required by design analysis, with attachment to top flange or rigid frame rafters by two (2) 1/2" minimum size diameter bolts at each end of strut.

e. Flange Braces: Steel angles attached to purlin or girt, to stiffen rigid frame flanges as dictated by design and noted on final shop drawings.

f. Optional Base Angle for Wall Panels: 3" x 2" x 0.071" angle of commercial grade steel, for field attachment to foundation with approved type drive anchors.

g. Clean secondary framing components to be free from oil, dirt, loose scale and foreign matter and apply one (1) coat of manufacturer's standard primer.

C. ROOFING & SIDING

1. Roofing and Siding Panels:

a. Roof Panels:

(1) Base Bid: SSR Roof

Description: The standing seam roof panel shall be precision roll-formed to provide 24" net coverage from 24, 50,000 PSI minimum yield steel. The panel edges shall join together to form a 3" high box rib with a 7/8" high standing seam. The seam shall be a machine-closed, double lock (360 degrees) design with factory-applied sealant. The panel flats shall be embossed with cross ribs at 6" o.c. to minimize oil-can and flutter. The panel ends shall be factory-notched for end splicing (when required). Panels shall be longest length possible to minimize end splices. The panels shall be secured to the structure with concealed clips designed to accommodate the roof expansion/contraction and to provide a 1" insulation stand-off. Perimeter trim, start/finish panels, ridge cover and transition flashing shall be provided and shall be designed to accommodate the roof's expansion/contraction. Closures, sealants and fasteners shall be provided as required for a weathertight installation. Equal to "SSR" panels produced by Varco-Pruden Company.

(2) Alternate # 5: SLR Architectural Standing Seam Roof Panels

Description: 16 inches wide net coverage with major ribs formed at the panel side laps, for field seaming using electrically operated seaming machine. Equal to SLF roof panels produced by Varco-Pruden Company.

(3) Alternate # 10: Roof Panels: Panel Rib: 36 inch wide net coverage, with 1 3/16 inch high major ribs at 12 inches on center with minor ribs spaced between the major ribs. Equal to Panel Rib Panels produced by Varco-Pruden Company.

b. Wall Panels:

(1) Description: The ribbed wall panel shall be precision roll-formed to provide 36" net coverage from 26, 50,000 PSI minimum yield steel. The panels shall have 1 1/8" high major ribs 12" o.c. with two minor ribs symmetrically spaced between the major ribs. Panel sidelaps shall be formed by lapping major ribs at the panel edges. The underlapping rib shall have full bearing legs to support the sidelap. Panels shall be longest length possible to minimize endlaps. Panel end splices (when required) shall be over a structural member and shall be a 4" minimum lap. Corner trim, base trim and transition flashings shall be provided as required to complete the wall assembly. Closures and fasteners shall be provided as required for a weathertight installation. Fastener spacing and type to be determined by manufacturer's standard offering. Equal to "Vee Rib" wall panels produced by Varco-Pruden Company.

c. Panel Finishes:

(1) Standing Seam Roof Panel:

(a) Manufacturer's standard galvalume finish

d. Architectural Wall Panels:

(1) Manufacturer's standard G-90 galvanized coating with manufacturer's standard SP-20 color siliconized polyester finish.

2. Fasteners:

a. Wall Panels: Manufacturer's standard long-life coated #12 x 7/8" self-drilling carbon steel screws for liner panels and #12-14 x 1 1/4" self- drilling. All exposed fastener heads will be factory colored to match color of panels.

b. Standing Seam Roof Panels:

(1) Panel Clips: Manufacturer's standard sliding design to allow for unrestrained expansion and contraction movement of panels. Provide complete with 1/4-14 x 1 1/2" plated self-drilling fasteners at each clip.

(2) Exposed Fasteners for Eave, End Splice, Ridge Cover and Flashings: Manufacturer's standard #12-14 x 1 1/4" self-drilling screw with sealing washer. Cap head and washer backer with 0.008" thick Type 302 stainless steel caps or zinc/aluminum alloy head. Painted or unpainted.

c. Trim Fasteners: Manufacturer's standard plated and finish painted #8 x 5/8" self-drilling screws with 1/4" hex washer head.

3. Standing Seam Sealant: Approved type nonshrinking, nondrying butyl-based sealant specifically formulated for factory application in standing seams and to allow roof panel assembly at temperatures from minus 10 degrees F to 140 degrees F.

4. Roof Panel Sealant: Approved type, nonshrinking, nondrying butyl-based sealant, specifically formulated for roof application at temperatures from 20 degrees F to 120 degrees F.

D. WIND BRACING

1. Commercial grade steel rod bracing or portal frames located as determined by manufacturer on the final shop drawings.

a. Steel Rod Bracing: Provide complete with necessary slope washers, flat washers and adjusting nuts at each end.

2. Clean components free of oil, dirt, loose scale and foreign matter.

3. Provide Portal Framing

E. WALL AND ROOF INSULATION

1. Wall and Roof Fiberglass Insulation

a. Manufacturer's standard noncombustible fiberglass blanket insulation with flexible white vinyl vapor barrier providing no more than .02 PERMS moisture vapor transmission (ASTM- E-96 Method A), 6" thick with Thermal Resistance (R) value of not less than 19 for all areas, unless shown otherwise on drawings.

b. Provide insulation and facing (as a composite material) carrying UL fire hazard (UL 723) rating indicating a flame spread rating of 15 or less; or FM classification as Class 1 material when rating is applied to each individual component if field assembled, or to composite unit if supplied factory assembled.

F. ACCESSORIES

1. Gutters and Downspouts

a. Gutters for standing seam roof shall be suspended box sections of 26-gauge galvanized steel formed to match the configuration of the gable trim. Gutters shall be independent of the roof seal and shall be attached to the eave strut adapter by means of a gutter hanger.

(1) Gutter hangers shall be spaced at 4'-0" centers and attached to inside face of gutter and eave adapter by #12 self-drilling screws and to outer face of gutter by trim fasteners.

(2) Gutter sections shall be lapped 2" and sealed with sealant and then fastened with fasteners as specified on manufacturer's drawings.

(3) Gutter end closures shall be sealed with sealant and fastened with pop rivets as specified on manufacturer's drawings.

b. Gutters for ribbed roof (single-skin and factory- insulated) shall be suspended box sections of 26- gauge galvanized factory-colored steel formed to match the configuration of the gable trim and shall have a minimum cross section of 36 square inches. Gutter shall be attached to the roof panel using standard fasteners as specified on manufacturer's drawings. Gutter sections shall be lapped and all splices and end closures shall be sealed with aluminized sealant and then fastened with trim fasteners as specified on manufacturer's drawings.

c. Downspouts shall be 29-gauge galvanized factory-colored steel with a minimum cross section of 20 square inches.

(1) Downspouts shall be located according to design requirements as specified.

(2) Downspouts shall be attached to a thimble installed in the gutter. Downspouts shall be attached to the wall panel using 26-gauge galvanized factory-colored steel straps on 10'-0" centers. A 75-degree elbow shall be provided at the base of all downspouts to direct the water flow away from the building.

d. Finish: Manufacturer's standard siliconized polyester system finish in color as selected by architect.

2. Coiling Doors (Frames only)

a. Framed opening for overhead door shall consist of .074" thick minimum cold-roll-formed steel channel jambs and header of either red oxide primer painted or galvanized material as specified by design.

(1) Framed opening jambs shall extend above the header to allow trim and hardware to be applied.

(2) Openings shall be trimmed to accept wall panels according to manufacturer's standard profile.

3. Roof Jacks and Pipe Flashing:

a. Roof jack shall be a 26-guage, Shell White steel cone factory installed and sealed to roof panel. Cone shall be made of same material.

(1) Stack or pipe penetration shall be at the centerline of a major corrugation of the roof panel.

b. Pipe flashing shall consist of a molded rubber cone with an aluminum ring bonded to the base. Pipe flashing shall accommodate pipe diameter as specified and be capable of flashing penetration at any location of the roof panel. Flashing shall be sealed and fastened in accordance with manufacturer's drawings.

END OF SECTION 13122

SECTION 13185 - KENNELS

PART 1 - GENERAL

1.1 SUMMARY

A. Work includes in this section:
   1. Kennel Components
   2. Prefabricated kennels

1.2 SUBMITTALS

A. Product Data: Written technical information and installation instructions for each component, which demonstrates that products comply with contract documents.

B. Shop Drawings:
   1. Comply with the requirements of section 01340.
   2. Include only information on materials, details, and installation instructions not already described in manufactured product data.

C. Contract close-out submittals:
   1. Manufacturer's standard operating instructions and maintenance.

1.3 QUALITY ASSURANCE

A. Provide one manufacturer of prefabricated kennel equipment, complete with operating accessories and installation hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The Mason Company
B. Approved Equals (submit for approval prior to bidding)

2.2 COMPONENTS

A. Isolation panels
   1. A.B.S. or F.R.P Isolation panels

B. Swing Gate Unit
   1. Framework to be ASTM 500 structural grade steel tubing, 2.00” O.D. pipe size. .94 pounds per foot weight, 50,000 PSI minimum yield strength.
   2. Mesh to be 1” uniform diamond square #11 gauge, stretched tight and attached to every intersection with #13 gauge lacing wire so that fabric remains tight.
   3. Horizontal bracing shall be placed outside fabric for rigid support.
   4. Hinges shall be made of malleable cast iron in accordance with ASTM A-47-77 class 32510. Each clamp shall have two halves joined by 5/16” x 1-1 1/2” hot-dip galvanized carriage bolt.
   5. Latch bar and catch shall be made from malleable iron A-47-77 class 32510. The swing pendant shall be made from cast aluminum alloy (#43). Automatically latches when gate is closed. Swinging pendant shall prevent latch bar from opening accidentally. Latch shall be factory installed.

C. Guillotine Kennel Door
   1. Panel to be 1/4”: thick ABS with 3/16” thick channels.
   2. Channels shall be solid extruded aluminum 6063-T5.

3. Provide a 12” long galvanized steel chain extended by 1/4” nylon coed.
4. Provide “S” hooks, pulleys, screw eyes and all required hardware.

D. Raised Floor
1. Flooring shall be plastisol coated expanded metal wire in flat sheet.
2. Diamond pattern to be 1/2” X1” after coating.
3. Coating material shall be 94 durometer Shore A plastisol with a uniform coating of 1/8”. Coating shall contain a fungicide bacteria growth inhibitor.

E. Mesh
1. Mesh panels shall have 1” uniform diamond square pattern of #11 gauge wire, woven into a chainlink fabric.
2. All fabrics shall be manufactured undersized by 1/4” to be fitted into a pipe frame.
3. All fabrics shall be stretched taut to the inside of the centerline of the pipe under tension.
4. Fabric shall be tied with #3 tie wire to all vertical braces.

F. Framework
1. All pre-fabricated kennel framework to be 1 5/8” O.D. minimum, .94 pounds per foot weight, 50,000 PSI minimum yield strength.
2. Exterior surface shall be hot dip galvanized.

G. Rest Bench (Typical each kennel)
1. Rest bench must be non-povous or easily sanitized material.
2. Rest bench shall be of a solid resting surface or surfaces adequate to comfortably hold all occupants of the primary enclosure at the same time.
3. Provide 18” x 36” x 6” rest benches at kennels except for large kennels, (10) provide 24” x 36” X 6” rest benches.

H. Cat Condo:
1. Provide (2) Raintree Cat Condo Units by Mason Company (8 total cages) – See Sheet A-1 for locations.

I. ISO-Care Units
1. By Mason Company with fiberglass enclosures, elevated pastisal – coated mesh floor, aluminum- framed tempered glass door, interior light, exhaust fan, 2 ½” PVC drain outlet, aluminum legs, ABS plastic side panels and removable top cover. See Sheet A-1 for quantity and location.

PART 3 -EXECUTION

3.1 Installation

A. Comply with manufacturer’s directions and approved submittal information.

3.2 Adjusting

A. Field adjust and test all hardware. All operating components shall work with ease.

3.3 Protection

A. After installation and before final acceptance protect all panels and operating hardware from scratches, dents and other damages.
B. Replace parts damaged during construction before final acceptance.

END OF SECTION 13185