SECTION 133419 - METAL BUILDING SYSTEMS

1.1 QUALITY ASSURANCE

A. Manufacturer: IAS AC472 accredited.

1.2 WARRANTY

A. Metal Panel Finishes: 25 years.

B. Weathertightness for Standing-Seam Metal Roof Panels: 20years.

1.3 METAL BUILDING SYSTEMS

A. Description:

1. Primary-Frame Type: Rigid clear span.
2. End-Wall Framing: Not expandable.
3. Secondary-Frame Type: Flush-framed girts.
4. Eave Height: Manufacturer's standard height, as indicated by nominal height on Drawings.
5. Bay Spacing: As determined by manufacturer.
6. Roof Slope: 8%.
7. Roof System: Refer to Section 074116 “Insulated Metal Roof Panels”
8. Exterior Wall System: Refer to Section 074213.19 “Insulated Metal Wall Panels”.
9. Exterior Storefront system refer to Section 084113 “Aluminum Framed Entrances and Storefronts”
10. Exterior Window refer to Section 085113 “Aluminum Windows”
11. Glass and Glazing refer to Section 088000 “Glazing”.

1.4 METAL BUILDING SYSTEM PERFORMANCE

A. Engineering design of metal building systems by Contractor.

B. Structural Performance:

1. Design Loads: As per Structural General Notes and SBC Code.
2. Deflection and Drift Limits: As per Structural General Notes and SBC Code.

C. Thermal Performance:

1. U-Factor for Metal Roof Panel Assemblies: 0.25.
2. U-Factor for Metal Wall Panel Assemblies: 0.2.

D. Metal Building System Certificates: For each type of metal building system, from manufacturer.
   1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
      a. Name and location of Project.
      b. Order number.
      c. Name of manufacturer.
      d. Name of Contractor.
      e. Building dimensions including width, length, height, and roof slope.
      f. Indicate compliance with SBC 201 for hot-rolled steel and SBC 201 for cold-rolled steel.
      g. Governing building code SBC 2018.
      h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
      i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
      j. Building-Use Category: Indicate category of building use and its effect on load importance factors.

E. Erector Certificates: For each product, from manufacturer.

F. Manufacturer Certificates: For each product, from manufacturer.

G. Material Test Reports: For each of the following products:

   1. Structural steel including chemical and physical properties.
   2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   3. Tension-control, high-strength, bolt-nut-washer assemblies.
   4. Shop primers.
   5. Non-shrinkage grout.

1.5 METAL BUILDING REQUIREMENTS

A. Framing:

   1. Structural-quality normal-mild steel sections and profiles as necessary for beams, posts, rafters and bracings that are dimensioned and fabricated to satisfy loading requirements and materials and finishes specified.
   2. To maximum possible extent, provide framing system that is assembled in bolted connections. Use of welded jointing and splices shall entail the written approval of Employer during tendering phase.
   3. All components of the steel framing shall be finished with two coats of zinc-rich epoxy-based primer; the two coats are to be applied prior and after assembly.
   4. All bolts and connections are to be zinc-coated normal mild steel.
   5. Provide base plates with fabricated galvanized bolt pre-set in the slab of grade for each structural column, post or vertical support.

B. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Structural Performance: Metal building systems shall withstand the effects of gravity loads in accordance with SBC 301.
   1. Wind Loads: calculated in accordance with SBC 301. Refer to structural Engineer’s Documentation, Specification and Drawings for Wind report.
   2. Seismic loads: calculated in accordance with SBC 301. Refer to structural Engineer’s Documentation, Specification and Drawings for seismic report.

3. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
   a. Purlins and Rafters: Vertical deflection of 1/240 of the span.
   b. Girts: Horizontal deflection of 1/240 of the span.
   c. Metal Roof Panels: Vertical deflection of 1/240 of the span.
   d. Metal Wall Panels: Horizontal deflection of 1/240 of the span.
   e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
4. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:
   a. Lateral Drift: Maximum of 1/400 of the building height.
5. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E[CG(1]1592.

D. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   Temperature Change (Range): 67 deg C, ambient; 100 deg C, material surfaces.

1.6 COMPONENTS

A. Structural-Steel Framing:

1. Frame Configuration: Load-bearing wall
2. Exterior Column Type: Uniform depth.
3. Rafter Type: Uniform depth.
4. Purlins: C- or Z-shaped sections.
5. Girts: C- or Z-shaped sections.
6. Canopy Framing: Straight-beam, eave type.

B. Cement

1. The Cement Type shall be selected as per the geotechnical recommendations depending on the exposure conditions of each structural elements and the soil/groundwater chemical contamination.

2. Type of Portland cement shall conform to “Specifications for Portland Cement”, ASTM C150/C150M as recommended. Ordinary Portland cement Type I shall be used for all superstructure concrete elements. Triple blend cement: Moderate sulphate resisting cement Type II with C3A content ranging between 5% and 8%, in combination of silica fume (5% to 10% of cementitious weight) with either Fly ash (25% to 35% of cementitious weight) or GGBS (50% to 60% of cementitious weight) shall be used for reinforced substructure concrete elements. Cement Type V shall be used for all sewerage concrete and plain/unreinforced concrete elements. Type of cement will be verified once the geotechnical chemical tests are finalized and as per the final recommendations.

C. Reinforcement Steel

1. Reinforcing steel bars are conforming to ASTM A615, Grade60, deformed high tensile steel bars having a minimum yield strength of fy = 420 MPa and maximum carbon content of 0.3%.

2. Reinforcement shall be fixed, supported and maintained in position by the adequate use of chairs, spacers and tying wire.

D. Insulated Metal Roof and Wall Panels:

1. Refer to Sections 074213.19 “Insulated Metal Wall Panels” and 074116 “Insulated Metal Roof Panels”.

E. Metal Soffit Panels: Match Wall Panels.

F. Thermal Insulation: Mineral Fiber Insulation core with a density of 100 kg/m3..

G. Doors and Frames:

1. Refer to Section 084229.23 “Sliding Automatic Entrances”.

H. Storefront System: Refer to Section 084113 “Aluminum Framed Entrances and Storefronts”.

I. Aluminum Windows: Within the Storefront System, refer to 085113 Section “Aluminum Windows”.

J. Accessories:

1. Flashing and trim.
2. Gutters.
3. Downspouts.
4. Louvers: Refer to Section 089119 “Fixed Louvers”.

1.7 SOURCE AND FIELD QUALITY CONTROL

A. Source Quality Control: Accredited manufacturer.

B. Field Quality Control: -Engage a special inspector.

END OF SECTION 133419

SECTION 133423 - FABRICATED CONTROL BOOTHS

1.1 PERFORMANCE REQUIREMENTS

A. Accessibility: ADA-ABA Accessibility Guidelines and ICC A117.1.

B. Delegated Design: Contractor to design fabricated control booths.

1.2 PRODUCTS

A. Fabricated Aluminum Security Control Booths: Framing of aluminum structural tubing or extrusions.

1. Building Style: Standard square corners.
2. Doors: Swinging door on back.
3. Windows: Horizontal sliding.
4. Glazing: Clear insulating glass.
5. Wall Panels: Aluminum sheet, insulated.
6. Base: Raised assembly, with insulation.
7. Finished Floor: Vinyl composition flooring.
8. Roof/Ceiling Assembly: Aluminum sheet, insulated.

a. Canopy fascia: Flush.
b. Downspouts.
c. Roof scuppers.

9. Work Counters: Plastic laminate.
10. Electrical Power Service: unless otherwise indicated by Electrical Engineer, the electrical characteristics shall be: 125 A, 120/240 V, single phase, three wire.

a. Power and communications connections.
b. Interior lighting fixtures.
c. Exterior lighting fixtures.

11. Cooling unit.
12. Finish: Baked enamel or powder coat.

1.3 INSTALLATION

A. Anchor prefabricated control booths to concrete bases.

B. Connect to electrical power service and communication systems.

END OF SECTION 133423.16