

## Part 1 – General

### 1.1 SUMMARY

- .1 This section includes the design, supply, and installation of a tensioned membrane structure (coverall structure), including fabric membrane and structural steel frame.

### 1.2 REFERENCES

- .1 Ontario Building Code (OBC), Latest Edition.
- .2 CAN/CSA-S16 – Design of Steel Structures.
- .3 CAN/CSA-S136 – North American Specification for the Design of Cold-Formed Steel Structural Members.
- .4 CAN/CSA-A23.1/A23.2 – Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .5 CAN/CSA-W47.1 – Certification of Companies for Fusion Welding of Steel.
- .6 CAN/ULC 109:2014 - Standard Method for Flame Tests of Flame-resistant Fabrics and Films.
- .7 ASTM D751 – Standard Test Methods for Coated Fabrics.
- .8 ASTM E84 – Surface Burning Characteristics of Building Materials.
- .9 ASTM E330 – Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls.
- .10 NFPA 701 – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- .11 ANSI/SPRI ES-1 – Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

### 1.3 SYSTEM DESCRIPTION

- .1 Pre-engineered, tensioned fabric structure consisting of:
  - .1 Galvanized or painted structural steel frame.
  - .2 Flame-retardant coated fabric membrane roof and walls.
  - .3 Anchoring systems suitable for concrete foundations or screw pile installations.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Design structure to meet or exceed applicable structural and environmental loads in accordance with the latest Ontario Building Code (OBC).
- .2 Wind load: According to OBC Climatic Data.
- .3 Snow load: According to OBC for Richmond Hill.
- .4 Fabric membrane: Minimum tensile strength of 400 lb/in (warp and fill).
- .5 Fire performance: Comply with NFPA 701 and CAN/ULC-S109.

#### **1.5 SUBMITTALS**

- .1 Product data.
- .2 Shop drawings sealed by a licensed professional engineer in Ontario.
- .3 Fabric certification.
- .4 Welding certificates.
- .5 Installation instructions.
- .6 Maintenance manual.

#### **1.6 QUALITY ASSURANCE**

- .1 Manufacturer to have a minimum of 10 years experience in fabric structure design and manufacturing.
- .2 Installer to be certified or approved by manufacturer.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver components in original packaging.
- .2 Store in dry conditions above ground.
- .3 Protect fabric from UV exposure during storage.

#### **1.8 WARRANTY**

- .1 Minimum 15-year limited warranty on fabric membrane.

- .2 Minimum 20-year limited warranty on structural steel frame.

## **Part 2 – Products**

### **2.1 MANUFACTURERS**

- .1 Acceptable manufacturers:
  - .1 Norseman Structures.
  - .2 Calhoun Super Structure.
  - .3 Britespan Building Systems Inc.
  - .4 Coverco Buildings Ltd.
  - .5 Edgewood Matting Ltd.
  - .6 Winkler Structures
- .2 Or approved equivalent meeting the requirements of this section.

### **2.2 STRUCTURAL FRAME**

- .1 Material: ASTM A500 Grade B or CSA G40.21, Class C galvanized steel tubing
- .2 Connections: Bolted or welded, per CSA W59
- .3 Finish: Hot-dip galvanized per ASTM A123 or powder-coated

### **2.3 FABRIC MEMBRANE**

- .1 Material: PVC-coated polyester fabric
- .2 Weight: 22 oz/yd<sup>2</sup> minimum
- .3 UV resistance:  $\geq 90\%$  after 2,000 hours exposure
- .4 Fire resistance: NFPA 701 and CAN/ULC-S109 compliant
- .5 Colour: As selected from manufacturer's standard range

### **2.4 FOUNDATION SYSTEMS**

- .1 Reinforced concrete pier or slab foundation per CAN/CSA-A23.1

## **Part 3 – Execution**

### **3.1 EXAMINATION**

- .1 Verify site conditions are acceptable for installation

### **3.2 INSTALLATION**

- .1 Install per manufacturer's guidelines and engineered shop drawings
- .2 Ensure tensioning of membrane to design standards
- .3 Secure structural components to foundation

### **3.3 CLEANING AND PROTECTION**

- .1 Clean structure of construction debris.
- .2 Provide touch-up to damaged coatings.
- .3 Protect structure until final acceptance.

### **3.4 COMMISSIONING**

- .1 Provide training for Owner's representative.

**END OF SECTION**