

SECTION 13 31 30 – FABRIC STRUCTURES SPECIFICATION

TEXTILE FACADE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Textile Facade System as shown on drawings and specified in this section.
2. Architect's drawings indicate design intent with respect to sizes, shapes, and configurations of the Textile Facade System. Textile Facade System manufacturer to provide all components and accessories required for a complete Textile Facade System, whether or not specifically shown or specified.
3. Textile Facade support frame will assume bolted/pinned connections for field assembly. No field welding will be permitted.

B. Related Sections:

1. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Division 03 Section "Cast-in-Place Concrete" for concrete caissons for posts of Textile Facade System structural support.
3. Division 05 Sections "Structural Steel Framing" and "Architecturally Exposed Structural Steel" for steel structure supporting the Textile Facade System.
4. Division 09 Sections "Finishes".
5. Division 10 Sections "Specialties".

C. The Textile Facade System Subcontractor shall be responsible for the structural design, detailing, fabrication, supply, and installation of the Work specified herein. The intent of this specification is to establish in the first instance an undivided, single-source responsibility of the Subcontractor for all of the foregoing functions.

D. Subcontractor's Work shall include the structural design, supply, fabrication, shipment, and installation of the following items:

1. Architectural Textile Facade as indicated on the drawings and in these specifications.
2. Perimeter, catenary, and sectionalized aluminum tension frame system with tension clips.
3. Structural steel, struts, and beams as indicated on the drawings.
4. Finishes Covers and Fasteners.

E. This Project is a US Green Building Council LEEDTM – CI project:

1. Select materials to maximize use of recycled steel and aluminum.
2. Select locally or regionally fabricated products when possible.

1.2 REFERENCES

A. Definitions:

1. Textile Facade System: Facade Cladding Panel supported by an extruded aluminum frame and retained via EFS Clips (EFS Part #14-000)

B. Reference Standards: Except as otherwise shown or noted, all work shall comply with the requirements of the following codes and standards:

1. American Institute of Steel Construction (AISC)
 - a. Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings.
 - b. Code of Standard Practices for Steel Buildings and Bridges.
 - c. Specifications for Structural Steel Buildings – Allowable Stress Design and Plastic Design.
 - d. Specification for Allowable Stress Design of Single-angle Members.
 - e. Seismic Provisions for Structural Steel Buildings.
2. American Society of Civil Engineers
 - a. ASCE 19: Structural Applications of Steel Cables for Buildings.
3. American Society of Testing and Materials (ASTM)
 - a. ASTM A586: Standard Specifications for Zinc-Coated Parallel and Helical Steel Wire Structural Strand.
 - b. ASTM D4851: Standard Test Methods for Coated Laminated and Woven Fabrics for Architectural Use.
 - c. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
 - d. ASTM C423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - e. ASTM A36/A36M Specification for Carbon Structural Steel.
 - f. ASTM A500/A500M Specification for Cold-Formed Welded Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
4. American Welding Society (AWS)
 - a. AWS D1.1: Structural Welding Code (Steel).
 - b. AWS A2.4: Symbols for Welding, Brazing & Nondestructive Examination.
 - c. AWS D1.2 Structural Welding Code (Aluminum).
5. National Fire Protection Association (NFPA)
 - a. NFPA 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

6. The Society for Protective Coatings (SSPC)
 - a. Steel Structures Painting Manual, Volumes 1 and 2.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product

1. Include styles, material data, material descriptions, construction details, fabrication details, dimensions of individual components and profiles, hardware, fittings, mounting accessories, features, and finishes for Textile Facade Cladding Systems.
2. Include rated capacities, light transmissions, and operating characteristics of furnished specialties and accessories.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.
2. Product Certificates for Credit MR 5.1[and Credit MR 5.2]: For products and materials required to comply with requirements for regionally manufactured materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location and distance of manufacturer to Project for each regionally manufactured material.

C. Design Drawings:

1. Include plans, elevations, sections, mounting heights, and frame assembly details.
2. Preliminary support frame member sizes with wall thickness TBD.
3. Preliminary footing layout and foundation design with final size, shape and depth TBD.
4. Show fabric attachment hardware and details.
5. Show details of fabric panel anchorage and connection details, dimensions including length of spans, seam locations and interferences with building construction.

D. Engineered Drawings (Submit after Design Drawings are approved):

1. Calculations with Wet Stamp seal of a Professional Engineer licensed in the same state as the project location.
2. Include plans, elevations, sections, mounting heights, and frame assembly details.
3. Provide frame support member sizes and required wall thicknesses.
4. Identify all welding requirements.
5. Detail all bolted and/or pin connection points for frame assembly.
6. Identify required sizes of bolts, pins, plates and tubing.
7. Verify fabric selection meets minimum engineering requirements.

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8. Detail fabric attachment methods, cable type (wire rope), cable end connections, clamps and other attachment components.
 9. Call out all cable sizes and pre-tensioning requirements.
 10. Submit anchor-bolt plans and specifications before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach the Textile Facade System to foundation. Indicate column reaction loads at each location.
- E. Samples for Initial Selection: Electronic submittals of available frame finish colors.
- F. Samples for Verification of the following:
1. Fabric: Qty (3) 8 ½" x 11" fabric samples selected by the architect.
 2. Frame Finish: Qty (3) sample chips with a minimum size of 2" x 3"
- G. Provide a Schedule of Values within (2) weeks of project award.
- 1.4 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installers, Fabricator and Professional Engineer.
 - B. Welding Certificates.
 - C. Fabric Manufacturer's Warranty.
- 1.5 CLOSEOUT SUBMITTALS
- A. Maintenance Data: Textile Facade System to include Maintenance Manuals.
 1. Include the following information:
 - a. Methods for maintaining Textile Facade System.
 - b. Precautions on cleaning solutions, materials and methods that could be detrimental to fabrics, finishes, and performance of the Textile Facade System
- 1.6 QUALITY ASSURANCE
- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate Textile Facade Systems similar in size & complexity to those required for this Project with a successful record in-service performance.
 1. Fabricator's responsibilities include the fabrication of the Textile Facade System and providing professional engineering services.
 2. Engineering must utilize Finite Element Analysis software that performs fabric form finding and includes fabric material properties and pre-stress characteristics.
 3. Fabricator must have proven record of at least five (5) successful projects similar in size and similar specified fabric material.
 4. Fabricator must have been in continuous operation as a professional Textile Facade System manufacturer for minimum of ten (10) years prior to this Project.

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5. Fabricator must be a Made-in-America in-house manufacturing facility for both frame and fabric components.

B. Installer Qualifications:

1. Must be a licensed contractor or have authority and required insurance to legally perform work in the state where the Textile Facade System is being installed.
2. Must provide required insurance coverage required by the project.

C. Welding Qualifications: Qualify personnel procedures and personnel according to the following:

1. AWS D1.1/D1.1M Structural Welding Code - (Steel)
2. AWS D1.2 Structural Welding Code - (Aluminum)

1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of Textile Facade System in exterior locations performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: When Textile Facade System installation is indicated to fit to other work, verify dimensions by Project Site field measurements before fabrication starts. Submit measurements on Shop Drawings to Architect for approval. Allow clearances for fenestration operation throughout the entire operating range. Notify Architect of discrepancies immediately. Coordinate fabrication schedule with construction progress to avoid any delays to the Project.

1.8 WARRANTY

- A. Special Warranty: Fabric Manufacturer and Textile Facade System fabricator agree to repair or replace components of Textile Facade System that fail in material or workmanship within specified Warranty period of one (1) year from the date of Substantial Completion.
 1. Failures include, but are not limited to:
 - a. Structural or framework failures.
 - b. Fabric deterioration including any seam failure.
 - c. Metals, metal finishes, and any other materials beyond normal weathering.
 2. Fabric Warranty: Fabric manufacturer's limited Warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Approved Manufacturer: Eide Industries, Inc., 16215 Piuma Avenue, Cerritos, CA 90703, Toll-Free: (800) 422-6827, Phone: (562) 402-8335, Fax: (562) 924-2233, Contact: Angela Juarez, Email: ajuarez@eideindustries.com, Website: www.eideindustries.com
- B. Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.
- C. Substitutions: [Section 01 25 00 - Substitution Procedures] No substitutions permitted.

2.2 DESCRIPTION

- A. General: Provide a Textile Facade Cladding System that complies with requirements specified herein by testing the Subcontractor's corresponding membrane system in accordance with the indicated test methods.
- B. Regulatory Requirements: Provide Textile Facade System in compliance with requirements and limitations of Jurisdictional Authorities that are within Subcontractor's control.
 - 1. Building Code Criteria: The Textile Facade System shall comply with the International Building Code, 2009 Edition.
 - 2. Comply with Local Building Codes and respective loading criteria for Snow Loads, Live Loads, Dead Loads, Wind Speed, and Seismic Loads.
 - 3. Life Safety: Textile Facade System shall be detailed so that no life safety issue is created in the event of the loss of fabric membrane or associated parts. The Textile Facade System does not rely on any membrane for structural stability.

2.3 PERFORMANCE / DESIGN CRITERIA

- A. Delegated Design: Retain a qualified Professional Engineer to design Textile Facade System. Design Engineering requirements to include, but are not limited to, the following:
 - 1. Prepare structural design drawings defining the precise interface geometry determination, reaction loads imposed on structural steel framing, anchoring loads, connection details, interfaces and seam layouts.
- B. In engineering the Textile Facade System, fittings and accessories to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
 - 1. Steel: 72 percent of minimum yield strength.
 - 2. Stainless Steel: 60 percent of minimum yield strength.
 - 3. Aluminum: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.
- C. Structural Performance: Textile Facade System shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7:
 - 1. Wind Loads: To be determined by Subcontractor's Engineer of Record.
 - 2. Live Loads: To be determined by Subcontractor's Engineer of Record.
 - 3. Seismic Loads: To be determined by Subcontractor's Engineer of Record.
- D. Thermal Movements: Allowance for thermal movements from ambient and surface temperature changes.
 - 1. Material Surface Temperature Change: 22 degrees F to 158 degrees F
- E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

2.4 TEXTILE FACADE MATERIALS

- A. Product: Subject to compliance with requirements, provide fabric as called out and specified by the Architect in the bid set drawings and specifications.
- B. Fire-Test-Response Characteristics: Provide Textile Facade System fabric with the Fire-Test-Response characteristics indicated, determined by testing identical products according to the test method indicated below by a recognized testing and inspection agencies acceptable to authorities having jurisdiction on the Project:
 - 1. Flame-Resistance Ratings: Passes NFPA 701
 - 2. California State Fire Marshal Tittle 19
- C. Textile Manufacturer: The following is a list of approved fabrics for the Textile Facade System; reference drawings for fabric call out.
 - 1. Serge Ferrari Textiles
 - a. Product line
 - 1) Serge Ferrari Frontside Safe P 35
 - 2) Serge Ferrari Frontside View 381
 - 3) Serge Ferrari Soltis Horizon 86
 - 4) Serge Ferrari Soltis Perform 92
 - b. Color: To be selected from the manufacturer's range of available colors

2.5 TEXTILE FACADE SYSTEM FRAME, FITTINGS AND ACCESSORIES

- A. General: Provide standard accessories with Textile Facade System fabricator as specified. Fabricate and finish accessories in the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles as well as dimensional and structural requirements.
- B. Metal Surfaces: Provide materials with smooth seamless surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- C. Fabric Retention Frame shall be constructed of Extruded ASTM alloy 6061 and then heat-treated to T6.
- D. Support frame material shall be constructed of cold rolled carbon steel unless otherwise specified by the Architect in the bid drawings.
- E. Steel and Iron:
 - 1. Tubing: ASTM A500/A500M Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes –A513/A513M Electric-Resistance–Welded Carbon and Alloy Steel Mechanical Tubing
 - 2. Bars: ASTM A29/A29M Steel Bars, Carbon and Alloy, Hot-Wrought, Grade 1010
 - 3. Plates, Shapes, and Bars: ASTM A36 Carbon Structural Steel or ASTM A572 High-Strength Low-Alloy Columbium-Vanadium Structural Steel per engineer requirements.

F. Aluminum Support Extrusions

1. EIDE Facade System per parts list attached. Job Specific.
2. Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.
3. Extruded Bars and Shapes: ASTM B221 Aluminum & Aluminum – Alloy Extruded Bars, Rods, Wire, Profiles and Tubes, Alloy 6063-T5/T52.

2.6 TEXTILE FACADE FRAME FINISH

A. Frame Finish shall be Polyester Powder Coat unless otherwise specified by the Architect on the bid set drawings.

1. Polyester Powder Coat Finish:

- a. Commercial blast clean surface in accordance to SSPC-SP 10.
- b. Apply Polyester Powder Coat to a minimum of 3 mils thick.
- c. Color: As selected from manufacturer's available stock colors.

2. Three Part Paint Finish for Corrosive Environments:

- a. Commercial blast clean surface in accordance to SSPC-SP 10.
- b. Primer Material properties – (1) coat of PPG/Ameron's Dimecoat 9 at 2.5-4.0 mils MDFT.
- c. Paint Material properties – (1) coat of PPG/Ameron's Amerlock 2 at 3.0-7.0 mil MDFT per coat.
- d. Paint Material properties – (1) coat of PPG/Ameron's PSX 700 at 3.0-7.0 mil MDFT per coat.
- e. Minimum thickness – 8.5-18 mils TDFT.
- f. Color: As selected from manufacturer's available stock colors

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine structural steel framing and other substrates, with Authorized Installation Technician present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Authorized Installation Technician, listing conditions detrimental to performance.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 JOB SITE SAFETY








- A. Supervisor required to have completed 30-hour Occupational Safety and Health Training Course in Construction Safety and Health and all installers to be certified First Aid trained.

3.3 ERECTION












- A. Proceed with installation of Textile Facade System only when weather conditions permit work to be performed in accordance with manufacturer’s recommendations.
- B. Erect frame and fabric in accordance with the procedures of the approved manufacturer.
- C. Adequate pre-stress what shall be applied to eliminate fabric wrinkles.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: A factory-authorized service Authorized Installation Technician must be present during all tests and inspections of components, assemblies, and equipment installations, including connections.
- B. Prepare tests and inspection reports.

PROFILE	EIDE PART NO.	LENGTH
	EFS #14-000	500
	EFS #14-200	20
	EFS #14-240	20
	EFS #14-260	20
	EFS #14-300	20
	EFS #14-320	20
	EFS #14-360	20

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PROFILE	EIDE PART NO.	LENGTH
	EFS #14-380	20
	EFS #14-420	20
	EFS #14-800	20
	EFS #14-820	20
	EFS #14-860	20
	EFS #14-864	20
	EFS #14-880	20
	EFS #15-000	20
	EFS #15-020	20
	EFS #15-180	100
	EFS #15-190	100

END OF SECTION 133130