SECTION 08640 METAL FRAMED GLASS FLOOR SYSTEM

Or

SECTION 08 88 53 – STRUCTURAL GLAZED FLOORS

\*\* NOTE TO SPECIFIER \*\* Greenlite Glass Systems Inc. ; LITELAM Fire-rated Glass floor system products.
 .
 This section is based on the products of Greenlite Glass Systems Inc. , which is located at:
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Web: [www.greenliteglass.com](http://www.greenliteglass.com)
[ [Click Here](http://www.arcat.com/arcatcos/cos45/arc45727.html) ] for additional information.

 Greenlite Glass Systems provides distribution and technical service for St. Gobain Glass, a world leader in glass manufacturing for the last 300 years. With a primary focus specialty glass products Greenlite Glass offers Architects and designers unique and creative alternatives to traditional applications. Together with our clients, we develop sophisticated solutions for specific tasks and architectural statements. The integrate structures of our constructions set worldwide standards in lightness and transparency, stability and precision, economy and sound environment practice.

 LITELAM is a fully tested Fire-rated Glass-floor system. The patented "load bi-pass" system gives LITEFLAM a superb range performance with over 90mins integrity/90mins insulation and /90mins load-bearing capability - meeting the requirements of US Building Regulations ASTM E 119, British Standards, European Norms.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Fire Rated Glass Floor System.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03300 - Cast-in-Place Concrete: Concrete structure and slabs.
		2. Section 078443 - Firestopping: Firestop at system junction with structure.
		3. Section 07900 - Joint Sealers: Sealant installation requirements.
		4. Section 088000 – GLASS TYPES
		5. Section 09900 - Painting.
	1. REFERENCES STANDARDS

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. UL263 / ASTM E 119 / CAN ULC-S101 - Standard test methods for fire tests of building construction and materials.
		2. ASTM E1300-09a Standard Practice for Determining Load Resistance of Glass in Buildings
		3. ASTM E2751/E2751M-13 Standard Practice for Design and Performance of Supported Laminated Glass Walkways
		4. ASTM C 1028 - Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces
		5. ASTM G155
		6. SSPC SP 6 - Commercial Blast Cleaning.
		7. AAMA 800 -Voluntary Specifications and Test Methods for Sealants
		8. AAMA 1503-1998: Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
	1. DESIGN / PERFORMANCE REQUIREMENTS
		1. 2 hour Fire Performance Evaluation of a Load Bearing Glass Floor/Ceiling/Skylight assembly in accordance to UL263 / ASTM-E119
		2. Design glass floor system assemblies and attachments to resist the following loads:
			1. Floor Live and dead loads with L/500 of span maximum deflection.
				1. Live Loads: 60 psf (2.9 kPa) uniform load and concentrated load of 300 psf (14.4 kPa) .

OR

* + - * 1. Live Loads: 100 psf (4.8 kPa) uniform load and concentrated load of 300 psf (14.4 kPa).
				2. Dead Loads: Actual weight of materials incorporated into Work.
			1. Seismic Loads: As calculated in accordance with applicable code.
		1. Project Specific Loading by Specification Writer
	1. SUBMITTALS
		1. Submit under provisions of Section 01300.
		2. Product Data: Manufacturer's data sheets on each product to be used, including:
			1. Preparation instructions and recommendations.
			2. Storage and handling requirements and recommendations.
			3. Installation methods.
		3. Shop Drawings:
			1. Show methods of installation, location and spacing of anchors, and relationship to adjoining work.
			2. Indicate floor layout, interruptions to grid, special sized panels, panels requiring drilling or cut-out for appurtenances or interruptions, edge details.
		4. Design Data: Signed and sealed by professional engineer.
			1. Submit calculations and analysis to support design. Submit structural calculations, sealed by a licensed professional engineer prepared in compliance with referenced documents and these specifications. Where specifications and code differ, the more severe requirements shall govern. Test reports are not an acceptable substitute for calculations. Calculations shall include the following information:
				1. Analysis for all applicable loads on framing members.
				2. Analysis for all applicable loads on anchors, including anchors embedded in concrete.
				3. Section property computations for framing members.
				4. Seal and signature of professional engineer on drawings and calculations.
		5. Verification Samples: For each finish product specified, two samples, minimum size 12 inches (300 mm) square, representing actual product, color, and patterns.
		6. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
		7. Qualification Data: For qualified Installer.
		8. Product/Material test reports.
		9. Field quality-control reports.
			+ 1. Flood test report Certified by Owner's authorized representative and Roofing Contractor.
		10. Warranties: Sample of special warranties.
		11. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of all components.
	2. QUALITY ASSURANCE
		1. Qualifications

1. Manufacturers: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.

2. Installers: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

3. Testing Agencies

* + 1. Delegated design: For the performance requirements listed below requiring structuraldesign provide data, calculations and drawings signed and sealed by an engineer licensed in the state where the project is located.
		2. Certificates

1. Manufacturer's Certificates:

a. Certify that products meet or exceed specified requirements.

b. Certification showing that all components of the floor assembly are being supplied and warranted by the manufacturer(s) as a single system

c. Manufacturer has not less than three years of documented experience producing fire rated glazing systems.

2. Installer's qualification data.

a. Installer of flooring system meets the training and qualification requirements of manufacturer.

b. Installer has not less than a minimum three years of experience installing fire rated glazing systems.

* + 1. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by an approved independent agency maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer’s listing.
		2. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
		3. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies.
		4. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
		5. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.
		6. Installer Qualifications: Company specializing in performing Work of this section with minimum three years documented experience and approved by manufacturer.
		7. Design floor system structure layout for this Project under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.
		8. Welders Certificates: Certify welders and welding procedures employed on the Work, verifying AWS qualification within previous 12 months.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. *OPTIONAL $$$* Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
			1. Finish floor system in area designated by Architect.
			2. Do not proceed with remaining work until workmanship and color are approved by Architect.
			3. Refinish mock-up area as required to produce acceptable work.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Store products in manufacturer's unopened packaging until ready for installation.
		2. Store materials in dry place, off the ground, where temperature will not exceed 90 degrees F (32 degrees C).
		3. Handle material in manner that will prevent damage to finished surfaces. Do not install scratched or damaged components.
	2. SEQUENCING
		1. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
		2. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
	4. WARRANTY
		1. Manufacture warrants that its LITEFLAM-XT-120 glazing to be free of substantial obstruction of vision from dust or other foreign substances, film formation or moisture accumulation between glass lites resulting from seal failure due to defective materials or workmanship for: a) a period of five (5) years for the fire-rated (Contraflam) and load bearing glazing (LiteFloor) assembly and from the date of shipment to jobsite.

b) for a period of one (1) year for the load bearing (LiteFloor) and Sacrificial Lite assembly from the date of substantial completion, not to exceed 2.5 years of date of shipment to jobsite.

This warranty does not include wear and tear of the slip resistant Sacrificial Lite finish on its exposed surface; a warranty for the life span of the slip resistant Sacrificial Lite finish cannot be offered.

The interlayer materials used in the production of laminated safety glass for the top sheet(s) (LiteFloor and Sacrificial Lite) are lightly hygroscopic and depending on climatic conditions, small delamination and bubbles (≤30mm) along the glass edge may occur due to migrations of humidity or softener of sealing materials Vetrotech Saint-Gobain warrants for a period of five (5) years from the date of shipment to jobsite, that the multilayer load bearing glass is not detached under proper usage and treatment and when being used under normal conditions. Optically any occurrence of edge delamination is minimal at normal viewing distance and does not represent a visual defect and shall not be considered cause for rejection or claim.

1. PRODUCTS
	1. MANUFACTURERS
		1. Basis of Design: Underwriters Laboratory (UL) Listed – LITEFLAM-XT-120 System as manufactured and supplied by Greenlite Glass Systems Inc, or comparable product provided by the following:
		2. Acceptable Manufacturer: Greenlite Glass Systems Inc. ; Email: [request info (info@greenliteglass.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Greenlite%20Glass%20Systems%20Inc.%20&coid=45727&rep=&fax=&message=RE:%20Spec%20Question%20(08640gre):%20%20&mf=); Web: [www.greenliteglass.com](http://www.greenliteglass.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted. (Or as per section D)
		2. Requests for substitutions will be considered in accordance with provisions of Section 01600.
	1. METAL FRAMED GLASS FLOOR DESCRIPTION
		1. System Description:
			1. Steel support framing requires four sided steel support as primary and secondary support. Steel support is mild steel rolled hollow sections protected with intumescent paper and ceramic tape. Primed and painted with intumescent paint for fire rated systems.
			2. Glass floor systems combine the fire rated glass and structural glass into a single steel frame protected by intumescent paint.
		2. Glazing Description:
			1. LITEFLAM-XT-120 2hr Fire-Rated Glass Floor Assembly

 Max area per panel = 16ft2

 Max length per panel = 69inches

* + - 1. LITEFLAM-XT-120 Glazing composed of a) replaceable top Sacrificial Lite, b) SGG LiteFloor structural glass panels and c) CONTRAFLAM® lower fire rated glass panels (Glazing Systems W12, W 13)
1. Replaceable Top-Lite – aka Sacrificial Lite: (exterior top lite glass walking surface) **Tested in Accordance to ASTM-G155**

10 mm SGG DIAMANT® extra-clear low-iron heat-strengthened glass, with a SGG LITE-FLOOR® anti-slip screen print pattern (Static Coefficient of Friction: 0.89 Dry, 0.72 Wet per ASTM C1028) – 30-50% print gradient, not conforming to ASTM C 1028.

1.52 mm PVB diffused translucent interlayer

6-mm SGG SECURIT® fully tempered & heat soaked with SGG COOL-LITE® solar reflective glass on SGG DIAMANT® substrate incl. edge perimeter frit

EDGETECH SuperSpacerTM (or equal) – nominal thickness 6-mm incl. sealant

1. Laminated Glass Floor: (Load Bearing):

 SGG LITE-FLOOR® structural floor panel consisting of three (3) lites of 10-mm SGG DIAMANT® heat-strengthened low-iron glass

1.52 clear PVB interlayers incl. a screen-printed obscuration band to visually conceal panel perimeter conditions

Stainless Steel Air-Spacer – black color

1. Fire Resistive Glass: CONTRAFLAM® LiteFlam 120:

Part 1: Multi-layer glass and intumescing interlayer material. Glass panes from SGG PLANICLEAR® clear where compatible, fully tempered & heat soak tested.

Part 2: Similar to Part 1, except the addition of a heat-strengthened laminated bottom lite for overhead glazing.

* + - 1. Assembly:
				1. Glass supported on steel frame or concrete precast shall deflect no more than L/500 under the specified loading. Minimum edge support for the glass panels is 20 to 30 mm.
				2. Sealant Seals between panel and edge to be constructed using two-part polysulphide sealant in standard color as specified in Section 07900.
				3. Bedding Strip: Bedding strip between glass and supporting steelwork to be 60 shore hardness continuous silicone strip in standard color. Minimum bedding thickness shall be 5 mm.
				4. Steel or Concrete support assembly to be backed by Rated Mineral Wool fire-rated insulation between glazing frame.
			2. Test Certification: Fire performance of load-bearing glass floor/ceiling assembly has been tested in accordance with ASTM E 119, "Standard test methods for fire tests of building construction and materials".
	1. FABRICATION
		1. Fit and shop assemble in largest practical sections, for delivery to site and field bolted assembly.
		2. Fabricate components with joints tightly fitted and secured.
		3. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
		4. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
		5. Prepare steel component surfaces in accordance with SSPC SP 6.
		6. Shop prime and paint steel members. Do not prime surfaces that will be in contact with concrete, or high strength bolted.
			1. Finish paint with white Intumescent paint. Level 4 finish

\*\* NOTE TO SPECIFIER \*\* Select the following optional paragraph if required and delete if not required.

* + - 1. Color top coat can be provided as selected by the Architect.
		1. Supply steelwork to site with intumescent paint protection provided up to base coat level only. Final decorative finish coat to be applied on site after installation of steelwork is completed.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly prepared.
		2. Verify field measurements are as shown on shop drawings.
		3. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions.
		2. Install components plumb and level, accurately fitted, free from distortion or defects.
		3. Allow for erection loads, and for sufficient temporary bracing to maintain platform safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
		4. Make field connections with threaded fasteners.
		5. Install panels on frames with full bearing.
		6. Do not field cut or alter structural members without approval of Architect and glass floor system manufacturer.
		7. After erection, touch up abrasions to match shop finishes.
		8. Field finish components as specified in Section 09900.
	4. FIELD QUALITY CONTROL
		1. Bolted Connections: Inspect in accordance with AISC specifications.
		2. Visually inspect all bolted connections.
	5. PROTECTION
		1. Protect installed products until completion of project.
		2. Do not permit traffic over unprotected floor surface.
		3. Touch-up, repair or replace damaged products before Substantial Completion.
	6. SCHEDULES

\*\* NOTE TO SPECIFIER \*\* Retain Paragraph below if required to suit project requirements. Identify products by name on the Drawings or use this paragraph to define the location of each type of material to be used. The following are some examples of schedule references. Edit as required to suit project or delete and identify products on the Drawings.

* + 1. :
		2. :

END OF SECTION