# Division 061736

**Open-Web Pin-Connected Trusses**

## GENERAL

### Scope

* + 1. Shop fabricated open-web pin-connected trusses with wood chords and tubular steel webs

### Reference Standards

* + 1. ICC-ES Acceptance Criteria for Pin-connected Open-web trusses with wood chords and tubular steel webs (AC306)
		2. International Code Council (ICC) ES Report ESR-1774

### Related Work Specified Elsewhere

* + 1. Rough Carpentry
			1. Dimension lumber framing
			2. Floor and roof sheathing
			3. Engineered wood products members
				1. Laminated veneer lumber
				2. Wood I-joists
				3. Wood rim boards
				4. Glue laminated members
				5. Metal framing connectors

### Submittals

* + 1. *Product data:* Manufacturer’s literature on products, installation, fire assemblies, sound assemblies, and connectors.
		2. *Drawings:*
			1. consistent with member types, spacing, and design loads indicated in the project construction documents
			2. truss schedule indicating series, profiles, depths, quantity, pitch, and camber
			3. layouts, showing framing members, spacing, framed openings, outriggers, bracing, and bearing
			4. Details indicating bearing clips, fastener spacing, and attachment of trusses to adjacent construction
		3. *Design Calculations*
			1. Stamped or sealed by manufacturers’ licensed engineer registered in the state where the project is located.
		4. Long Span (Over 60’ spans) installation
			1. Material handling plan for long span truss module lifting operation.
		5. *Production:*
			1. Fabrication shall not proceed until the contractor and architect/project engineer have returned the approved submittal package.

### Delivery, Storage, and Handling

* + 1. Store all material on a level surface on raised wood sleepers tall enough to prevent splash from precipitation. Sleepers should be placed below bottom chord truss pin connections.
		2. Protect material from weather. Securely anchor waterproof sheeting to protect stored material. Provide air circulation under sheeting to prevent mold or excess humidity.
		3. Provide sufficient space around stored trusses to prevent damage and to provide access for material handling.
		4. Store trusses in upright vertical position, banded together in bundles.
		5. Inspect stored material immediately after delivery to the job site and prior to installation. If trusses are damaged, immediately notify the project architect/engineer and truss manufacturer. Do not install damaged material.

## PRODUCTS

### Open-web pin-connected trusses: basis of design

* + 1. Provide RedBuilt, LLC open-web pin connected trusses, truss hardware, consistent with series and profiles indicated in the construction documents, unless a substitute manufacturer is approved as an acceptable alternate by the project architect/structural engineer at least seven days prior to the bid date.
		2. Manufacturer Acceptable Alternative Request
			1. In addition to Division 1 Project Requirements, manufacturers requesting to be considered as an acceptable alternate will provide the following during the project bid period:
				1. Documentation showing a minimum of three years of experience fabricating open-web pin-connected trusses meeting the requirements of ICC-ES Acceptance Criteria for Pin-connected Open-web trusses with wood chords and tubular steel webs (AC306).
				2. Code reports indicating that design properties meet or exceed the design properties of the specified manufacturer and series. Manufacturer requesting substitution will clearly indicate all properties that are lower than the Basis of Design products’ design properties.
				3. Current International Code Council (ICC) ES Report for the proposed substitute products.
				4. Documentation that required submittals will be performed under direct supervision of a Professional Engineer experienced in open-web truss design and licensed in the state or province where the project is located.

#### Open web pin-connected trusses: materials

* + - 1. Wood Chords shall be finger jointed MSR (MACHINE STRESS RATED) lumber, laminated veneer lumber, or laminated strand lumber with strength properties required to support the project design loads and meet performance requirements.
			2. Tubular steel webs, solid steel connecting pins, bearing clips and truss accessories consistent with manufacturing standards and sufficient to meet the project design loads and performance requirements.
			3. Provide spring-clip washers on the ends of connecting pins for all trusses with chords in a vertical orientation (RedBuilt Red-S, Red-M, Red-H).

### Identification

#### Each truss will be marked with a stamp or sticker indicating the truss series, ICC-ES report number, manufacturer’s name, plant location, and independent inspection agency logo.

* + 1. Each truss bundle will be marked with the manufacturing date, project name, and member designation that matches the submittal drawings.
		2. Asymmetric trusses: mark one end of bearing chord with paint to indicate starting line based on corresponding truss shown in the submittal drawings.
	1. **Metal framing connectors for open-web trusses**
		1. Simpson Strong-Tie, Inc. framing connectors for open-web trusses with published design values that meet or exceed the project design loads.

#### Framing connector finish:

* + - 1. Interior low corrosion environments:
				1. Concealed framing connectors: zinc galvanized (G90).
				2. Exposed framing connectors: powder coated baked on paint.
		1. Fasteners for metal framing connectors shall be of the size and material recommended by the framing connector manufacturer to support the loads being transferred. Fastener coatings shall match the finish of corresponding metal connectors.
	1. **Fabrication**
		1. The trusses shall be manufactured in a plant listed in the manufacturer’s ICC-ES report under the supervision of a third-party inspection agency.
		2. Fabricate trusses with camber indicated on project construction documents. Where camber is not indicated in the construction documents,
			1. Sloped Snow Roofs: equal to the dead load deflection plus one half the live load deflection.
			2. Flat Snow Roofs: equal to the total load deflection.
			3. Non-Snow Roofs: equal to 1.5 times the dead load deflection.
			4. Floors: equal to 1.5 times the dead load deflection.

## Installation

### General

* + 1. Open web pin-connected trusses should only be installed in dry service condition environments.
		2. Verify that supporting construction is plumb, level, undamaged, and ready to support open-web trusses.
		3. Verify that field dimensions of supporting material are consistent with the dimensions indicated on the layout submittal drawing. Do not install open-web trusses until field dimensions match the dimensions shown on the layout drawings.
		4. Install open-web trusses in compliance with the manufacturer’s written installation information.
		5. Set open-web trusses plumb and level in the correct location.
		6. Use fasteners recommended by connector manufacturer to attach trusses to bearings, framing connectors, bracing, bridging and accessories. Use proper fastener diameters and lengths to fill every fastener hole in bearing clips, framing connectors, bracing, and accessories.
		7. Install temporary safety bracing as each truss is placed.
		8. Install permanent bracing indicated on layout drawings.
			1. Starter strut bracing: 2x4 anchored to end wall, beam, or ledger.
			2. Floor strut bracing: tubular steel flattened and attached to underside of top chord of open web trusses.
			3. Roof strut bracing: tubular steel flattened and attached to the upper side of the top chord of open web trusses.
			4. Install strongback bridging and bottom chord nailers. Provide 12” overlap at bridging and nailer end splices.
			5. Cross bracing: Install cross bracing on each bottom bearing truss as each truss is set.
		9. Do not stack construction material on open-web trusses before all truss bearings and bracing are permanently attached. Do not exceed project design loads for stored building material.
		10. Do not walk on trusses until all bearings and bracing have been permanently attached.
		11. Install blocking, headers and opening supports indicated on submittal documents.
		12. Prior to enclosing the trusses, the Contractor shall give notification to the open-web truss manufacturer’s field representative to provide an opportunity for review of the installation.
		13. Do not field cut or modify open-web trusses and accessories without approval of the project architect or structural engineer.

### Long Span (Over 70 feet) Truss Installation

* + 1. Install long span open web trusses in accordance with truss manufacturer’s installation instructions.
		2. Due to shipping limitations, long span trusses may be delivered in sections, and must be spliced together at the project site using hardware provided by the open web truss manufacturer.
		3. Plumb and shore bearing walls and verify that support points are ready to receive trusses.
		4. Open-web trusses shall be installed in rigid modules at least 8 feet in width, accurately assembled in a jig with final sheathing permanently and totally attached while on the ground.
		5. Bridging shall be installed in each module as detailed in the layout drawings.
		6. Lift long span truss modules at pick points designated by the open-web truss manufacturer. Protect the truss modules from damage during lifting due to lift lines and slings.
		7. When a module is lifted into place, ensure the truss module is aligned properly with the supporting structure and securely attached to bearing before releasing the crane.

### Fire Rating/Sound Ratings

* + 1. Fire and sound ratings are to be established in accordance with assemblies detailed in one of the following:
			1. ICC ES Report No. ESR-1774
			2. *Directory of Listed Products* published by PFS Corporation
			3. Intertek Spec ID 34752.

### Warranty

* + 1. Open-web trusses shall be free from manufacturing errors or defects in workmanship and material. The products, when correctly installed and maintained, shall be warranted to perform as designed for the normal and expected life of the building.

### Protection

* + 1. Protect open-web trusses from damage and moisture during storage, installation, and through completion of the project.