

VESCOM SPECIFICATION

SECTION 05 22 00 | VESCOM COMPOSITE FLOOR SYSTEM

PART 1 – GENERAL

1 SECTION INCLUDES

- a. Vescom composite joists.
- b. Steel decking.
- c. Slab reinforcement.
- d. Concrete slab.
- e. Accessories.

2 RELATED WORK

- a. Section 03 20 00 – Concrete Reinforcing: Slab reinforcement.
- b. Section 03 30 00 – Cast-in-Place Concrete: Concrete slab.
- c. Section 05 12 00 – Structural Steel.
- d. Section 05 31 13 – Steel Floor Decking.
- e. Section 05 31 00 – Steel Decking.

3 REFERENCE STANDARDS

- a. American Concrete Institute (ACI) (www.concrete.org):
 - i. ACI 318 – Building Code Requirements for Structural Concrete and Commentary.
- b. American Institute of Steel Construction (AISC)
 - i. AISC 360 – Specifications for Structural Steel Buildings and Commentary.
- c. American Welding Society (AWS) (www.aws.org):
 - i. AWS D1.1/D1.1M – Structural Welding Code - Steel.
 - ii. AWS D1.3/D1.3M – Structural Welding Code - Sheet Steel.
- d. ASTM International (ASTM) (www.astm.org):
 - i. ASTM A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.
 - ii. ASTM F3125/F3125M – Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength ASTM A529/A529M – Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
 - iii. ASTM A563/A563M – Standard Specification for Carbon and Alloy Steel Nuts.
 - iv. ASTM A572/A572M – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 - v. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - vi. ASTM A992/A992M – Standard Specification for Structural Steel Shapes For Use in Building Framing.
 - vii. ASTM A1008/A1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.
 - viii. ASTM F436/F436M – Standard Specification for Hardened Steel Washers.
- e. Society for Protective Coatings (SSPC) (www.sspc.org):
 - i. SSPC Painting Manual.
 - ii. SSPC-Paint 15.
- f. Steel Joist Institute (SJI) (steeljoist.org):
 - i. Code of Standard Practice for Composite Joists (SJI-CJ COSP-2015)
 - ii. SJI Technical Digests (TD13)
- g. Steel Deck Institute (SDI) (www.sdi.org):
 - i. SDI FDDM – Floor Deck Design Manual.
 - ii. SDI MOC3 – Manual of Construction with Steel Deck.

4 PRE-INSTALLATION MEETING

- a. Convene pre-installation meeting 1 week before start of Work of this Section.
- b. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, Engineer, and installer.
- c. Review the Following:
 - i. Materials.
 - ii. Installation/erection.
 - iii. Field quality control.
 - iv. Adjusting.
 - v. Protection.
 - vi. Coordination with other Work.

5 SUBMITTALS

- a. Comply with Division 01.
- b. Submittals for Review:
 - i. Product Data: Submit manufacturer's product data, indicating joist and decking profiles, characteristics, dimensions, structural properties, materials, and finishes.
 - ii. Joist Layout Drawings: Submit manufacturer's layout drawings, including plans, slab openings per structural drawings, elevations, sections, and details, indicating the following:
 1. Joists: Joist identification numbers, types, locations, spacings, and attachments.
 2. Decking: Decking plan, support locations, relevant details, and accessories.
 3. Calculations: Comprehensive engineering analysis of composite joists [signed and sealed by the qualified professional engineer]. Submitted after approval process prior to fabrication.

6 QUALITY ASSURANCE

- a. Manufacturer's Qualifications: Member of the Steel Joist Institute who regularly produces composite steel joists and joist girders conforming to SJI's requirements.
- b. Manufacturer's responsibilities include providing engineering services for designing joists that comply with performance requirements shown on the approved joist layout drawings.
- c. Field Welder's Qualifications: AWS D1.1/D1.1M and AWS D1.3/D1.3M.

7 DELIVERY, STORAGE, AND HANDLING

- a. Deliver, store, and handle Vescom joists, decking, and accessories as recommended in SJI Specifications and SJI TD13.
- b. Store joists and decking off ground.
- c. Protect materials from damage.
- d. Store decking in accordance with SDI MOC3, with one end elevated to provide drainage.
- e. Protect decking with vented, waterproof covering.
- f. Place decking bundles on structural steel members in accordance with SDI MOC3.
- g. Tie down loose decking bundles to prevent wind damage.

PART 2 – PRODUCTS

1 MANUFACTURERS

- a. Manufacturer: CSC/Vescom

2 DESIGN CRITERIA

- a. Design Requirements:
 - i. Design composite floor joists under supervision of a professional engineer.
 - ii. Camber joists based on constant radius of 2400 ft.
 - iii. Maximum Allowable Live Load Deflection: Span/360

3 MATERIALS

- a. Composite Joists
 - i. Steel Shapes:
 - 1. ASTM A572/A572M, 50 ksi.
 - 2. ASTM A529/A529M, 50 ksi.
 - 3. ASTM A992/A992M.
- b. Galvanized Steel Sheet:
 - i. ASTM A653/A653M Grade 40, 50, or 80 as indicated on structural drawings.
- c. Uncoated or Shop Primed Steel Sheet:
 - i. ASTM A1008/A1008M. Grade 40, 50, or 80 as indicated on structural drawings
- d. Slab Reinforcement: Specified in Section 03 20 00.
- e. Concrete Slab: Specified in Section 03 30 00.
- f. Accessories
 - i. Bolts, Nuts, and Washers: ASTM A307, ASTM A325, ASTM A563, and ASTM F436.
 - ii. Screws: ASTM C1513.
- g. Touch-Up Paint for Galvanized Surfaces: SSPC-Paint 20, Type I or II.
- h. Welding Materials: AWS D1.1/D1.1M and AWS D1.3/D1.3M; type required for materials being welded.

4 FABRICATION OF VESCOM JOISTS

- a. Fabricate steel joists in accordance with manufacturer's standard practice.
- b. Top and Bottom Chord Members:
 - i. Two structural steel angles welded back-to-back top chord.
 - ii. Two structural steel equal leg angles bottom chord.
 - iii. Minimum Yield Strength: 50,000 psi.
- c. Web Members:
 - i. Round rods; crimped or un-crimped angles; rectangular bars; cold-formed angles.
 - ii. Minimum Yield Strength: 50,000 psi.
- d. Welding Materials and Methods: In accordance with SJI COSP.
- e. Primer: Apply manufacturer's standard gray primer in accordance with SSPC-Paint 15 and manufacturer's recommendations and standards. With the exception of the top chords. Top chords vertical legs shall have no more than 30% coverage of primer.

5 FABRICATION OF STEEL DECKING

- a. Manufacture steel decking and accessories in accordance with SDI FDDM2.
- b. Manufacture decking as indicated on structural drawings.
 - i. Metal deck coating shall meet or exceed the drawings specifications.
 - ii. Finish: As indicated on drawings.
 - iii. Accessories: Fabricate in accordance with SDI FDM02 and manufacturer's standards.

PART 3 – EXECUTION

1 EXAMINATION

- a. Examine areas to receive composite floor system.
- b. Verify surfaces to support composite floor system are clean, dry, flat, plumb, level, square, stable, rigid, and capable of supporting the weight.
- c. Notify Architect of conditions that would adversely affect installation.
- d. Do not begin installation until unacceptable conditions are corrected.

2 INSTALLATION – GENERAL

- a. Install composite floor system in accordance with manufacturer's instructions at locations indicated on the drawings.
- b. Install composite joists plumb, level, square, and true to line.
- c. Anchor composite floor system securely in place to supports as indicated on the drawings.

3 INSTALLATION OF VESCOM COMPOSITE JOISTS

- a. Care shall be exercised to avoid damage through careless handling during unloading, storing and erecting.
- b. No construction loads shall be placed within a bay until all Vescom joists, trusses, and deck have been properly attached per project plans.
- c. During the construction period, the contractor shall provide means of adequate distribution of concentrated loads so that the carrying capacity is not exceeded.
- d. Joists must be attached per the approved drawings to support members before any decking is placed.
- e. Joists shall have a nominal bearing of 2 ½" on steel and 3 ½" when installed directly on masonry and concrete. Bearing conditions on masonry and concrete shall be in accordance with the provisions of ACI 530 and ACI 530.1.
- f. Tie joists and trusses shall be bolted or welded at the top chords only. After the concrete has been placed, and all construction loads are in place, the bottom chord members shall be welded to the columns. (Do not remove any guy wires until all top and bottom chords have been secured.)
- g. Erect steel joists and accessories in accordance with manufacturer's instructions, SJI Specifications, and as indicated on the drawings.
- h. Lift and support joists in upright position during unloading and erection.
- i. Place joists plumb, at elevations, lines, and spacings as indicated on the drawings.
- j. Complete joist attachment to supporting members before placing decking.
- k. Complete joist and decking attachments in each bay before applying construction loads.
- l. Provide minimum bearing length as indicated on the drawings.
- m. Provide for distribution of concentrated loads incurred during erection.
- n. Welding: Conform to AWS D1.1 requirements.
- o. Do not make corrections or alterations to joists without approval of manufacturer and structural engineer of record.

4 INSTALLATION OF STEEL DECKING

- a. Install steel decking and accessories in accordance with manufacturer's instructions, SDI Specifications, and as indicated on the drawings.
- b. Place sheets with edges up, center the end laps over the support and nest the side lap one-half corrugation.
- c. Nominal bearing shall be 1 ½" unless otherwise shown.
- d. Place decking flat and square, without warp or deflection.
- e. Provide bearing on steel in accordance with manufacturer's instructions.

5 ATTACHMENT TO SUPPORTING MEMBERS

- a. Mechanically fasten or weld decking to supporting members as indicated on the drawings.
- b. Welding: Conform to AWS D1.3/D1.3M.

6 CUTTING AND FITTING DECKING

- a. Cut and fit deck units and accessories at perimeter and around projections and openings.
- b. Make cuts neat and trim.

7 POUR STOPS

- a. Install pour stops where indicated on drawings, upturned to top of slab.
- b. Mechanically fasten or weld pour stops in place.

8 PLACEMENT OF CONCRETE SLAB

- a. Slab Reinforcement:
 - i. Welded wire fabric shall conform to ASTM A185-72, standard specifications for welded steel wire fabric for concrete reinforcement, $F_y = 60,000$ P.S.I. minimum.
 - ii. Welded wire fabric shall be rolled out perpendicular to the Vescom composite joists, allowing proper drape.
 - iii. Place slab reinforcement for concrete slab as indicated on the drawings.
- b. Locate slab openings not shown on the drawings a minimum of 6 inches from edge of top chord of joists.
- c. Place concrete for slab as specified in Section 03 30 00 and SDI MOC3.
- d. Maintain minimum concrete slab thicknesses as indicated on the drawings.
- e. Terminate Concrete Placement:
 - i. Above beams or girders, wherever possible.
 - ii. Parallel to joists midway between joists.
- f. Locate Joints:
 - i. Perpendicular to joists over supporting member.
 - ii. Parallel to joists midway between joists.

PART 4 – INSPECTION

- a. Follow inspection requirements required by owner and Section 05 12 00.
- b. Inspect steel joists for conformance to specified requirements:
 - i. Verify placement including location, alignment, and bearing.
 - ii. Inspect seat-to-support welds.
- c. Inspect steel decking for conformance to specified requirements:
 - i. Verify decking type and gage.
 - ii. Verify decking placement and alignment.
 - iii. Inspect welds and weld pattern.
 - iv. Inspect fastener types, locations, quantities, and placement.
- d. Protection
 - i. Protect installed composite floor system from damage during construction.