

MASTER GUIDE SPECIFICATION

COMPOSITE STEEL JOIST AND CONCRETE FLOOR FRAMING SYSTEM SECTION 05 21 26



COMPOSITE TOTALJOIST (CTJ) GUIDE NOTE: This master specification section includes COMPOSITE TOTALJOIST GUIDE NOTES identified as “CTJ GUIDE NOTE” for information purposes and to assist the specification writer in making appropriate decisions. The CTJ GUIDE NOTE always immediately precedes the text to which it is referring. The section serves as a guideline only and should be edited with deletions and additions to meet specific project requirements.

CTJ GUIDE NOTE: This specification section follows the recommendations of Construction Specifications Canada’s, Manual of Practice, including MasterFormat™, SectionFormat™, and PageFormat™. Optional text is indicated by square brackets []; delete the unused optional text including the brackets in the final copy of the specification. Delete the CTJ GUIDE NOTES in the final copy of the specification. Trade/brand names with appropriate product model numbers, styles and types are used in CTJ GUIDE NOTES and in the specification text Article or Paragraph titled AAcceptable Material@.

CTJ GUIDE NOTE: A separate master guide specification for project work in Canada is available from your CTJ representative at iSPAN Systems LP.

PART 1 - GENERAL

1.01 SUMMARY OF WORK

- .1 This Section specifies fire-rated composite steel joist and concrete floor framing system and accessories.

1.02 RELATED REQUIREMENTS

CTJ GUIDE NOTE: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Paragraph below. Do not include Division 00 Documents or Division 01 Sections since it is assumed that all technical sections are related to all project Division 00 Documents and Division 01 Sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered a legal part of the Contract. Edit the following paragraphs to suit specific project conditions.

- .1 Section [03 30 00 - Cast-in-place Concrete].
- .2 Section [_____].

CTJ GUIDE NOTE: In the following Article, include only those reference standards which appear in the finished version of the project specification.

1.03 REFERENCE STANDARDS

- .1 ASTM International (ASTM).
 - .1 ASTM C39/C39M-[2010], Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - .2 ASTM A185/A185M-[2007], Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .3 ASTM A497/A497M-[2007], Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
 - .4 ASTM A653/A653M-[2010], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.



- .5 ASTM A780/A780M-[2009], Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- .6 ASTM A1008/A1008M-[2013], Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
- .7 ASTM A1011/A1011M-[2013], Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
- .2 US Green Building Council (USGBC).
 - .1 LEED® NC Version 2.2-[2009], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.
- .3 American National Standards Institute/American Iron and Steel Institute (ANSI/AISI).
 - .1 ANSI/AISI S100-[2007], North American Specification for the Design of Cold-Formed Steel Structural Members.
- .4 American National Standards Institute/Steel Deck Institute (ANSI/SDI).
 - .1 ANSI/SDI-NC1.0-[2006], Non-Composite Steel Floor Deck.
 - .2 ANSI/SDI C-[2011], Standard for Composite Steel Floor Deck - Slabs.
- .5 American National Standards Institute/American Institute of Steel Construction (ANSI/AISC).
 - .1 ANSI/AISC 360-[2010], Specification for Structural Steel Buildings.
 - .2 ANSI/AISC Design Guide 11 Floor Vibrations Due to Human Activity.
- .6 Underwriter's Laboratories Inc. (UL).
 - .1 UL 263-[2011], Fire Tests of Building Construction and Materials Standard Methods of Fire Endurance Tests of Building Construction and Materials.
- .7 American Welding Society (AWS)
 - .1 AWS D1.1-[2006], Structural Welding Code - Steel
 - .2 AWS D1.3-[1998], Structural Welding Code - Sheet Steel
 - .3 AWS C1.1-[2012], Recommended Practices for Resistance Welding
- .8 American Concrete Institute (ACI)
 - .1 ACI 318-[2011], Building Code Requirements for Structural Concrete and Commentary.
 - .2 ACI 301-[2010], Specifications for Structural Concrete

CTJ GUIDE NOTE: Article below includes submittal of relevant data to be furnished by Contractor.

1.04 SUBMITTALS

- .1 Make submittals in accordance with Contract Conditions and Section 01 33 00 Submittal Procedures.
- .2 Product Data: Submit product data including manufacturer's literature for composite joist components and accessories.
- .3 Shop Drawings: Submit shop drawings indicating member type, location, spacing, and size of members, method of attachment to supporting members, bridging, cross bridging, and other accessories and details required for proper installation.

COMPOSITE STEEL JOIST AND CONCRETE FLOOR FRAMING SYSTEM SECTION 05 21 26



- .1 Show calculated dimensions on shop drawings.
- .2 Scaling of drawings is not permitted.
- .4 Sustainable Design (LEED).
 - .1 Provide LEED Submittals when specified: In accordance with Section [01 35 21 - LEED Requirements]
- .5 Installer Qualifications:
 - .1 Installer must be experienced with work similar to work of this Section or
 - .2 Installer must be trained by a CTJ representative on method for installation
- .6 Submit welder's certifications signed by Contractor certifying welders comply with quality assurance requirements.

1.05 CLOSEOUT SUBMITTALS

- .1 Record Documentation: In accordance with Section 01 78 00 Closeout Submittals.
 - .1 List materials used in composite joist work.
 - .2 Warranty: Submit warranty documents specified.

1.06 QUALITY ASSURANCE

- .1 Welder's Certification:
 - .1 Ensure that all welders are certified in accordance with AWS D1.1 and AWS D1.3 as required.
 - .2 All field repairs to be completed by welders certified in accordance with AWS D1.1 and AWS D1.3 as required.

CTJ GUIDE NOTE: The following Article although not part of Quality Assurance, can be used to enhance the quality of materials by ensuring that they are delivered and handled properly at the work site.

1.07 DELIVERY STORAGE AND HANDLING

- .1 Delivery and Requirements:
 - .1 Deliver material in accordance with Section 01 61 00 Common Product Requirements.
 - .2 Deliver materials and components in manufacturer's original packaging with identification labels intact and in sizes to suit project.
 - .1 Include tracking number and joist mark on joists.
- .2 Storage and Handling Requirements: Store materials off ground and protected from exposure to harmful weather conditions.
 - .1 Exercise care to avoid damage during unloading, storing, handling, and installation.
 - .2 Do not stack joists.

1.08 WARRANTY

- .1 Project Warranty: Refer to Contract Conditions for special project warranty provisions if applicable.
- .2 Manufacturer's warranty: Provide a one year warranty free from manufacturer defects.
- .3 Warranty period: 1 year commencing on Date of Delivery of Work.



PART 2 - PRODUCTS

2.01 MANUFACTURER

- 1 Manufacturer: iSPAN® Systems LP, 70 Brentwood Drive; Princeton, Ontario, NOJ 1V0, Canada, Phone: (519) 458-4222, FAX: (519) 458-4460, e-mail: info@totaljoist.com , URL: www.totaljoist.com.

2.02 DESCRIPTION

- 1 Lightweight, cold-formed steel and concrete fire rated composite joist floor system with steel deck. .
- 2 Basis of Design: Composite TotalJoist by iSPAN Systems LP, Total-Lewis-Deck by iSPAN Systems LP.

2.03 DESIGN CRITERIA

- 1 Design steel deck and joists to AISI S100.
- 2 Design concrete slab, transverse to direction of joist framing to ACI 318.
- 3 Design deck and joists to withstand construction loads to SDI C-[2011].

CTJ GUIDE NOTE: Edit the following paragraph to suit project conditions.

- 4 Design joists to withstand service loads including:
 - 1 Self-weight of floor framing including joists, deck, welded wire mesh, concrete slab, bridging, cross-bridging, [furring channels] and gypsum board as indicated.
 - 2 Superimposed dead loads and live loads as indicated.
- 5 Design joists to withstand design loads with deflections as follows (where L indicates joist span):
 - 1 Live Load Deflection: $L / [480]$ maximum.
 - 2 Total Service Load Deflection: $L / [240]$ maximum.
- 6 Design floor framing to meet vibration criteria to AISC Design Guide Series 11
- 7 Fire and Acoustical Characteristics:
 - 1 FRR: [1] hour.
 - 2 STC: [50].
 - 3 IIC: [45].

2.04 COMPONENTS

- 1 Steel Joists: To ASTM A653/A653M Grade 50, G60 galvanized coating.
 - 1 Joist type: As indicated.
 - 2 Joist depth: As indicated
 - 3 Joist Web Holes: [Standard web holes with first hole located 4 feet minimum from end of joist to center of first hole and remaining holes spaced at 4 feet on center], [left aligned] [centered in joists] [Custom web holes as indicated] [No web holes].
- 2 Steel Deck: To ASTM A653/A653M Grade 33, galvanized coating G60.
 - 1 Acceptable Material: [Total-Lewis-Deck by iSPAN Systems LP].
- 3 Cast-in Place Concrete: [ACI 318] [In accordance with Section 03 30 00 - Cast in Place Concrete].



2.05 ACCESSORIES

- .1 Shoes / Diagonal: To ASTM A1011/A1011M or ASTM A1008/A1008M, Grade 50.
 - .1 Basis of design: iSPAN Systems LP, Composite TotalJoist
- .2 Bridging: To ASTM A653/A653M Grade 33, galvanized coating G60.
 - .1 Basis of design: iSPAN Systems LP, TotalJoist Bridging.
- .3 Cross Bridging: To ASTM A653/A653M Grade 33, galvanized coating G60.
 - .1 Basis of design: iSPAN Systems LP, TotalJoist Blocking.
- .4 Pour Stop: To ASTM A653/A653M Grade 33, galvanized coating G60.

CTJ GUIDE NOTE: iSPAN recommends that concrete reinforcement fabric be supplied and used in 8 feet x 20 feet sheets or larger.

- .5 Concrete Reinforcement: Welded steel fabric to [ASTM A497] [ASTM A185], supplied in [8 x 20] foot flat sheets

2.06 PRODUCT SUBSTITUTIONS

- .1 Ensure all accessories come from same source as composite joist.
- .2 Substitutions: [In accordance with Section 01 23 13 - Product Substitution Procedures] [No substitutions permitted].

PART 3 - EXECUTION

3.01 INSTALLERS

CTJ GUIDE NOTE: iSPAN authorized installers use only iSPAN Systems LP manufactured or approved components.

- .1 Use only installers experienced in performing work of this section, who have specialized in the installation of work similar to that required for this project, or who have been trained by a CTJ representative.

3.02 EXAMINATION OF SITE CONDITIONS

- .1 Verification of Site Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for composite joist installation in accordance with literature.
 - .1 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.



3.03 INSTALLATION

CTJ GUIDE NOTE: Composite TotalJoist cold-formed steel joists come complete with modular components such as bridging and cross bridging. The joists themselves are delivered to site manufactured to length and marked for location as indicated on the joist drawings.

- .1 Install joists level, plumb and at locations and elevations indicated in accordance with manufacturer's installation guide and written recommendations.
- .2 Do not overload joists, deck, or concrete slab with construction loads:
 - .1 Do not place loads on the floor, such as bundles of gypsum board, exceeding design load of the joists, deck, or concrete slab.
 - .2 If loads which exceed design loads must be placed on the floor, the loads must be fully supported and shored to grade.
- .3 Joist Installation: Install joists in accordance with manufacturer's literature.
 - .1 Do not install damaged joists.
 - .2 Locate joists aligned with bearing studs or provide distribution members.
 - .1 Fasten joists and accessories as indicated on the joist drawings.
 - .3 Install and space bridging along length of joists as indicated on the joist drawings.
 - .4 Install cross bridging at locations indicated on the joist drawings.
- .4 Deck Installation: Install steel deck in accordance with manufacturer's written recommendations.
 - .1 Install Total-Lewis-Deck in accordance with deck manufacturer's literature and as indicated on the drawings.
 - .2 For fire rated floors: Install Total-Lewis-Deck in accordance with manufacturer's literature and [UL 263].
 - .3 Ensure fasteners are not aligned with joist web by offsetting fasteners from center of joist; maintain minimum screw edge distance in accordance with AISI S100.
- .5 Concrete placement: Do concrete work: To ACI 301 and in accordance with Section [03 30 00 - Cast in Place Concrete].
 - .1 Welded Wire Fabric: Place welded wire fabric as indicated. Laps to ACI 301.
 - .2 Place concrete to constant thickness over joist as indicated on the drawings. Do not place concrete in excess of specified thickness at any location in the floor.
 - .3 Do not place large quantities of concrete in concentrated areas over joists or deck.
 - .4 Vibrate concrete lightly and thoroughly.
 - .5 Construction joints:
 - .1 Parallel to joists: Include construction joints midway between joists when joint is parallel to joist, but no closer than 8 inches from centerline of joist.
 - .2 Perpendicular to joists: Locate construction joists over supporting wall or beam.

3.04 FIELD QUALITY CONTROL

- .1 Field Inspection: Site Contractor to Coordinate field inspection in accordance with Section [01 45 00 Quality Control].
- .2 Do concrete compressive strength test to ASTM C39 and in accordance with Section [03 30 00 - Cast-in-place Concrete].

MASTER GUIDE SPECIFICATION

COMPOSITE STEEL JOIST AND CONCRETE FLOOR FRAMING SYSTEM SECTION 05 21 26



- .3 Site Installation Tolerances:
 - .1 Installed sweep in joist: 1/8 inch in 10 feet maximum.

3.05 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Touch-Up Paint: Repair damage in joist or accessory coating with paint complying with ASTM A780.
- .3 Protect concrete in accordance with Section 03 30 00 - Cast in Place Concrete.

END OF SECTION 05 21 26 - COMPOSITE STEEL JOIST AND CONCRETE FLOOR FRAMING SYSTEM