SECTION 03 15 11 – CONCRETE INSULATED CONNECTIONS

**This section includes engineered, factory-fabricated, insulated structural assemblies to provide thermally broken construction at exterior-interior connections of concrete-framed buildings, as produced by Schöck Bauteile GmbH, which is located at:**

**Schöckstraße 1, 76534 Baden-Baden (Germany), tel: 001 49 7223 967 0**

**Distributed by Schoeck USA Inc., located at:**

**2 Advantage Court, Unit B, Bordentown NJ 08505, tel: 855-572-4625**

**Email: info-na@schoeck.com/en-us/home**

**Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including MasterFormat, SectionFormat, and PageFormat, as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition*.**

**This section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.**

**Section numbers are from *MasterFormat 2014 Edition*.**

**Design responsibilities for the manufacture of the Work of this Section are delegated to the Contractor through the manufacturer’s professional engineering services.**

**Revise the word "Architect" when this term conflicts with the design professional defined in the General and Supplementary Conditions.**

1. **GENERAL**
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes: Engineered, factory-fabricated, thermally broken structural assemblies for connecting exterior concrete projections to interior concrete floors.
				2. Related Sections:

Retain Sections in subparagraphs below that contain requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 032000 “Concrete Reinforcing” for connecting structural thermal break reinforcing bars with reinforcing bars in the concrete structure.

Section 033000 "Cast-in-Place Concrete" for placing connection anchors in concrete, formwork preparation, adjacent reinforcing, and placing concrete.

Section 034000 “Precast Concrete” for use of the connection in precast applications.

Section 072100 "Thermal Insulation" for thermal barrier materials.

* + - 1. REFERENCE STANDARDS
				1. ASTM: American Society for Testing Materials.

ASTM A276: Standard Specification for Stainless Steel Bars and Shapes.

ASTM A615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

ASTM A955: Standard Specification for Deformed and Plain Stainless-Steel Bars for Concrete Reinforcement.

* + - 1. ADMINISTRATIVE REQUIREMENTS
				1. Coordination:

Coordinate work with installation of connections to supporting structural components.

Furnish anchorage items to be embedded in, or attached to, other construction before starting that Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

Edit Pre-installation meetings as necessary. Delete if not required.

* + - * 1. Pre-installation Meetings: Conduct conference at project site.

Before fabricating assemblies, review special inspection and inspecting agency procedures for quality control, anchorage device installation tolerances, steel reinforcement installation, minimum requirements for concrete mixes and compressive strengths and examine procedures for ensuring quality of materials. Require representatives of each entity directly concerned with the work to attend, including the following:

Contractor's superintendent.

Independent testing agency responsible for quality control.

Concrete subcontractor.

Structural thermal break assembly manufacturer, to be available by teleconference.

* + - 1. ACTION SUBMITTALS
				1. Product Data: For each type of product indicated.
				2. Sustainable Design Submittals:

 For LEED Credit MR 4.

Product Data: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.

Coordinate the requirement for Shop Drawings with Section 033000 "Cast-in-Place Concrete." Ensure their requirements and wording in paragraph below allow for simultaneous review.

* + - * 1. Shop Drawings: Include assembly locations, plans, elevations, dimensions, shapes and sections, support conditions, and types of reinforcement, including special reinforcement. Detail fabrication and installation of structural thermal break assemblies.

Delete subparagraphs below not applicable to Project.

Reinforcing Steel: Comply with ACI 315 - Details and Detailing of Concrete Reinforcement.

Indicate welded connections by AWS standard symbols. Show size, length, and type of each weld.

Detail connections.

Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.

Indicate location of each thermal break assembly unit by same identification mark placed on assembly unit.

Indicate relationship of assemblies to adjacent materials.

Indicate locations and details of special supports or cambering.

Ensure general requirements for Delegated-Design Submittals and for professional engineer’s qualifications are specified in Section Submittal Procedures.

* + - * 1. Delegated Design Submittal: For each structural thermal break assembly provide analysis data signed and sealed by the qualified professional engineer licensed in the state of the installation, demonstrating compliance with performance requirements and design criteria. Submitted after return of approved Shop Drawings.
			1. INFORMATIONAL SUBMITTALS

Ensure general requirements for Quality Assurance paragraphs below are specified in Division 01 Section Quality Requirements.

* + - * 1. Qualification Data: For manufacturer, installer, inspection agency and professional engineer.

Retain paragraph below for material certificates from manufacturers.

* + - * 1. Material Certificates: For the following, from manufacturer:

Revise list below to suit Project.

Reinforcing materials.

Anchors.

* + - * 1. Thermal Design: Provide thermal modeling analysis indicating compliance with performance requirements.

Retain paragraph below for material test reports that are Contractor's responsibility. Add appropriate paragraphs if testing of reinforcing steel is required, to ensure that the quality and properties of reinforcing steel conform to requirements specified. Normally, mill test reports are acceptable in lieu of testing.

* + - * 1. Material Test Reports: For reinforcing steel, certified copies of mill test report of materials analysis.
				2. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following, indicating compliance with performance requirements.

Each type of structural thermal break assembly.

Tension performance of reinforcing bars and associated welds.

Retain paragraph below if Contractor is responsible for field quality-control inspecting. Include option if Contractor is responsible for special inspections.

* + - * 1. Field quality control and special inspection reports.
			1. QUALITY ASSURANCE

Retain paragraph below if Substitutions option is permitted in Manufacturers article in Part 2.

* + - * 1. Manufacturer Qualifications:

Assumes responsibility for engineering structural thermal break assemblies to comply with the performance requirements.

Assumes responsibility for preparation of Shop Drawings and comprehensive engineering analysis by a qualified engineer.

Has minimum of 5 years’ experience in the manufacture of structural thermal break products for concrete applications.

Has experience with North American projects of a similar scope and scale.

* + - * 1. Installer Qualifications: Qualified installers must attend a preconstruction meeting with the manufacturer to review installation requirements for the thermal break assembly prior to installation. Preconstruction meetings may be held either in person or virtually.

Retain paragraph below if Contractor retains inspection agency for Field Quality Control specified in Part 3, or if field quality-control inspection agency employed by Contractor must be approved by authorities having jurisdiction. Testing agency is normally engaged by Owner.

* + - * 1. Inspection Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
				2. Design Standards: Comply with the following specifications and documents, as applicable to types of structural thermal break assemblies indicated, unless modified by requirements in the Contract Documents.

ACI 301 - Specifications for Structural Concrete.

ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.

ACI 318 - Building Code Requirements for Structural Concrete.

CRSI - Manual of Standard Practice.

* + - * 1. Mockups: Fabricate full-sized mockups of structural thermal break assemblies before production, to verify selections made under sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver materials to site in manufacturer’s original containers and packaging, and place units with labels or other identifying marks clearly visible to allow for inspection.
				2. Store assemblies according to Installation Manual, with adequate support and protection to keep clean and dry and prevent staining, displacement or physical damage.
				3. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses that would cause displacement or physical damage.
				4. Protect exposed ends of reinforcement to prevent injury; provide continuous wood bar across ends, or suitably sized plastic caps.
1. **PRODUCTS**
	* + 1. MANUFACTURERS
				1. Manufacturer: Subject to compliance with requirements, provide Isokorb® products by:

Schöck Bauteile GmbH, Schöckstraße 1, 76534 Baden-Baden (Germany);
Tel. 001 49 7223 967 0; export@schoeck.com, [www.schoeck.com](http://www.schoeck.com)

Distributor: Schöck USA Inc., 2 Advantage Court, Unit B, Bordentown, NJ 08505, Tel. 855 572 4625, info­-na@schoeck.com [www.schoeck.com](http://www.schoeck.com/en-us/home)

* + - * 1. Substitutions: [**Not permitted**] [**Comply with requirements in Division 01 Section for “Substitution Procedures”**].
			1. PERFORMANCE REQUIREMENTS
			2. Sustainable Requirements:

Retain subparagraph below if recycled content is required for LEED Credit MR 4.1 and 4.2. USGBC and CaGBC allow a default value of 25 percent to be used for steel, without documentation; higher percentages can be claimed if they are supported by appropriate documentation.

Recycled Content of Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than [**50**]<**Insert number**> percent.

* + - * 1. Delegated Design: Design structural thermal break assemblies, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

Restrict statements to describe the requirements for each type of assembly using performance data obtained from Structural Engineer of record. List assemblies separately when various assembly types or conditions are required.

* + - * 1. Structural Performance: Provide structural thermal break assemblies and connections capable of withstanding the following design loads:

Provide assembly connections capable of withstanding dead loads, snow loads, and design loads in conformance with applicable codes and the following:

Live Loads: [**As indicated on Drawings**]<**Insert KN**>.

Seismic Loads: [**As indicated on Drawings**]<**Insert Loads**>.

Design assemblies and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, accommodate live-load deflection, shrinkage / creep of primary building structure and other building movements. Maintain structural concrete deflections within limits of ACI 318 (ACI 318M).

Revise first subparagraph below to suit exposure and local conditions. Temperature data are available from National Climatic Data Center, www.ncdc.noaa.gov for projects in U.S; consult Climatic Information for Building for Design in Canada published in the National Building Code of Canada.

Thermal Movements: Allow for in-plane thermal movements resulting from ambient temperature changes of minus [**30**]<**Insert temperature**> to plus [**120**] <**Insert temperature**> deg F.

Retain subparagraph below if fire-resistance rating is required. Fire ratings depend on occupancy and building construction type, and are generally a building code requirement.

Durability: Design structural thermal break assemblies to achieve exposure classes and minimum concrete compressive strengths as specified in Division 03 Section Cast-in-Place Concrete.

Shear forces must be addressed by reinforcement bars to insure proper anchoring within the concrete slab.

* + - 1. STRUCTURAL THERMAL BREAK ASSEMBLIES, CONCRETE
				1. Concrete-to-Concrete Structural Thermal Break Assembly: Provide concrete-to-concrete thermal break assemblies, engineered, tested and sized to suit structure as indicated.

Concrete Cover: As required to meet performance requirements.

Thermal Break Assembly Height: [**As indicated in Drawings**] <**Insert value**>.

Fire Protection: Provide UL listed assembly or an equivalent assembly tested in accordance with DIN EN standards or other fire resistance rating standard acceptable to authorities having jurisdiction.

Rating: 120 minutes.

Cast-in-place connective reinforcement for 100 percent design strength with minimum concrete strength of 4,000 psi (27.5 MPa).

* + - 1. FABRICATION
				1. Welding: Comply with applicable AWS D1.1/D1.1M and AWS D1.4 for welding, welding electrodes, appearance, quality of welds and methods used in correcting welding work.

Weld studs according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."

Remove, re-weld, or repair incomplete and defective welds.

* + - * 1. Reinforce structural thermal break assemblies to resist handling, transportation and erection stresses.
				2. Protect strand ends and anchorages with manufacturer recommended removable protective coatings or coverings to avoid corrosion.
				3. Discard and replace structural thermal break assembly units that do not comply with requirements, including structural, manufacturing tolerance and appearance, unless repairs meet Architect's approval.
				4. Size assemblies to accommodate required thicknesses of integrated thermal barrier materials.
				5. Fabricate structural break assemblies straight and true to size and shape and to applicable requirements of ACI 117.
1. **EXECUTION**
	* + 1. EXAMINATION
				1. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance of the Work.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
				3. Do not install precast concrete units until supporting, cast-in-place, building structural framing has attained minimum allowable design compressive strength or until supporting steel or other structure is complete.
			2. PREPARATION
				1. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete, immediately prior to placing of concrete.
				2. Discard and replace structural thermal break assembly units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet Architect's approval.
			3. INSTALLATION
				1. Install structural thermal break assemblies according to manufacturer's written instructions and approved shop drawings.
				2. Install structural thermal break assemblies level, plumb, and square within specified allowable tolerances. Provide temporary structural supports, and bracing as required to maintain position, stability, and alignment of units until permanent connection or support.
				3. Reinforcement: Comply with recommendations in referenced design standards for fabricating, placing and supporting reinforcement, and Manual of Standard Practice by CRSI.

Reinforcing Type: Tension and Shear reinforcing bars each comprising stainless steel reinforcing bars within insulated part of assembly end-welded to plain steel bars.

Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.

Place reinforcement to maintain at least 3/4-inch (19 mm) minimum coverage. Increase cover requirements according to referenced design standards when units are exposed to corrosive environment or severe exposure conditions, but not less than 1-1/2 inches (38 mm). Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.

* + - * 1. Connection of reinforcement: Comply with manufacturer’s written instructions.
				2. Field cutting of components is not permitted without approval of Structural Engineer.
				3. Field welding of components is not permitted.
				4. Installation Tolerances:

Maximum Variation from Plumb and Level of Structural Thermal Break Assemblies: 1/8 inch (3 mm).

* + - 1. FIELD QUALITY CONTROL

Retain first option in paragraph below if authorities having jurisdiction require Owner to engage a special inspector. If special inspections are not required by code, second option may be retained based on project scope.

* + - * 1. Inspections: [**Owner**][**Contractor**] will engage an inspecting engineer to perform field inspections and prepare reports determining compliance with the structural plans.

Provide inspector access to installed assemblies to facilitate inspection of steel reinforcement placement.

Inspector will report findings promptly and in writing to Contractor and Architect.

Any inconsistencies identified in the report shall be corrected or verification of conformance shall be received from manufacturer.

* + - 1. CLEANING
				1. Clean reinforcement of loose rust and mill scale, earth, ice and other foreign materials that would reduce bond to concrete.

END OF SECTION 03 15 11