ISO/~~DIS~~ FDIS 16521:~~2024(E)~~

ISO-/TC-71~~/WG 2~~

Secretariat:- JISC

Date: 2024-~~01-16~~06-24

Design of concrete-filled steel tubular (CFST) hybrid structures

FDIS stage

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: + 41 22 749 01 11
~~Email~~E-mail: copyright@iso.org
Website: ~~www.iso.org~~www.iso.org

Published in Switzerland

Contents

© ISO 2024 – All rights reserved
iii

© ISO 2024 – All rights reserved
iv

© ISO 2024 – All rights reserved
vi

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see ~~www.iso.org/directives~~www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at ~~www.iso.org/patents~~.www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see ~~www.iso.org/iso/foreword.html~~www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and prestressed concrete*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at ~~www.iso.org/members.html~~www.iso.org/members.html.

Introduction

Concrete-filled steel tubular (CFST) hybrid structures employ CFST members as their main members, and construct with steel or reinforced concrete members or components to act compositely. They consist of trussed CFST hybrid structures, concrete-encased CFST hybrid structures, etc. The economic and environmental benefits of CFST hybrid structures have made them one of the desirable structural types for constructions in relatively tough and harsh conditions, such as mountainous areas, earthquake-prone regions, corrosive environments, and less-developed regions. They can also be used in conventional structures, such as multi-storey residential buildings and relatively short-span bridges.

Design of concrete-filled steel tubular (CFST) hybrid structures

1 Scope

This document provides guidelines for the design, construction, and inspection of concrete-filled steel tubular (CFST) hybrid structures. These structures can be used as main structural components like columns, girders, piers, or arches in buildings, bridges, especially in high-rise structures, long-span spatial structures, and large-scale bridges.

CFST hybrid structures can employ CFST members with a circular cross-section as their chords, and they can also use square or rectangular CFST chords.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes the requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 630-2, *Structural steels — Part 2: Technical delivery conditions for structural steels for general purposes*

ISO 679, *Cement — Test methods — Determination of strength*

ISO 863, *Cement — Test methods — Pozzolanicity test for pozzolanic cements*

ISO 898 (all parts), *Mechanical properties of fasteners*

ISO 1920 (all parts), *Testing of concrete*

ISO 2394:2015, *General principles on reliability for structures*

ISO 2560, *Welding consumables — Covered electrodes for manual metal arc welding of non-alloy and fine grain steels — Classification*

ISO 3010, *Bases for design of structures — Seismic actions on structures*

ISO 3580, *Welding consumables — Covered electrodes for manual metal arc welding of creep-resisting steels — Classification*

ISO 4354, *Wind actions on structures*

ISO 4355, *Determination of snow loads on roofs*

ISO/TR 4553, *Deformations and displacements of buildings and building elements at serviceability limit states*

ISO 6935-1, *Steel for the reinforcement of concrete — Part 1: Plain bars*

ISO 6935-2, *Steel for the reinforcement of concrete — Part 2: Ribbed bars*

ISO 9194, *Bases for design of structures — Actions due to the self-weight of structures, non-structural elements and stored materials — Density*

ISO 9597, *Cement — Test methods — Determination of setting time and soundness*

ISO 10137, *Bases for design of structures - Serviceability of buildings and walkways against vibrations*

ISO 10144, *Certification scheme for steel bars and wires for the reinforcement of concrete — Welded wire Reinforcement*

ISO 10252, *Bases for design of structures — Accidental actions*

ISO 10721-1, *Steel structures — Part 1: Materials and design*

ISO 10799 (all parts), *Cold-formed welded structural hollow sections of non-alloy and fine grain steels*

ISO 12439, *Mixing water for concrete*

ISO 12633 (all parts), *Hot-finished structural hollow sections of non-alloy and fine grain steels*

ISO 12944 (all parts), *Corrosion protection of steel structures by protective paint systems*

ISO 13315 (all parts), *Environmental management for concrete and concrete structures*

ISO 13822, *Bases for design of structures — Assessment of existing structures*

ISO 13823, *General principles on the design of structures for durability*

ISO 14174, *Welding consumables — Fluxes for submerged arc welding and electroslag welding — Classification*

ISO 14341, *Welding consumables — Wire electrodes and weld deposits for gas shielded metal arc welding of non alloy and fine grain steels — Classification*

ISO 14346, *Static design procedure for welded hollow-section joints — Recommendations*

ISO 14347, *Fatigue — Design procedure for welded hollow-section joints — Recommendations*

ISO 15673, *Guidelines for the simplified design of structural reinforced concrete for buildings*

ISO 17607, (all parts), *Steel structures — Execution of structural steelwork*

ISO 17632, *Welding consumables — Tubular cored electrodes for gas shielded and non-gas shielded metal arc welding of non-alloy and fine grain steels — Classification*

ISO 17634, *Welding consumables — Tubular cored electrodes for gas shielded metal arc welding of creep-resisting steels — Classification*

ISO 19338, *Performance and assessment requirements for design standards on structural concrete*

ISO 19595, *Natural aggregates for concrete*

ISO 19596, *Admixtures for concrete*

ISO 20290 (all parts), *Aggregates for concrete — Test methods for mechanical and physical properties*

ISO 20378, *Welding consumables — Rods for gas welding of non-alloy and creep-resisting steels — Classification*