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

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Contents

Foreword.....	vii
Introduction.....	viii
1 — Scope.....	1
2 — Normative references.....	1
3 — Terms and definitions.....	3
4 — Symbols.....	8
5 — Materials.....	10
5.1 — General.....	10
5.2 — Concrete.....	10
5.2.1 — Cement.....	10
5.2.2 — Aggregates.....	10
5.2.3 — Water.....	10
5.2.4 — Admixtures.....	11
5.2.5 — Additions.....	11
5.2.6 — Concrete mixture specification.....	11
5.3 — Steel tubes.....	11
5.4 — Steel reinforcement.....	11
5.4.1 — Deformed reinforcement.....	11
5.4.2 — Plain reinforcement.....	12
5.5 — Other materials.....	12
5.5.1 — Welding consumables.....	12
5.5.2 — Fasteners.....	12
5.5.3 — Protective paint systems.....	12
5.6 — Storage of materials.....	12
6 — Design and construction procedure.....	12
7 — General guides.....	14
7.1 — Limitations.....	14
7.1.1 — CFST members.....	14
7.1.2 — Trussed concrete-filled steel tubular (CFST) hybrid structures.....	15
7.1.3 — Concrete-encased concrete-filled steel tubular (CFST) hybrid structures.....	15
7.2 — Limit states.....	16
7.3 — Ultimate limit state design format.....	17
7.3.1 — General.....	17
7.3.2 — Factored load effects.....	17
7.3.3 — Design resistances.....	17
7.4 — Serviceability limit state design format.....	18
8 — Specific guides.....	18
8.1 — Design working life.....	18
8.2 — Selections of materials, structural plans and detailing.....	18
8.3 — Seismic design requirements.....	18
8.4 — Selections of constructional methods and techniques.....	19
9 — Actions (loads).....	19
9.1 — General.....	19
9.2 — Dead loads.....	19

9.3	Live loads	19
9.4	Snow loads	19
9.5	Wind forces	19
9.6	Earthquake forces	19
9.7	Thermal forces	20
9.8	Load partial factors and load combinations	20
10	Analysis	20
10.1	General	20
10.1.1	Structural analysis purpose	20
10.1.2	Structural analysis methods	20
10.1.3	Structural analysis requirements	21
10.1.4	Loading cases	21
10.1.5	Construction stage analysis	21
10.2	Stress-strain relationships for materials	22
10.2.1	General	22
10.2.2	Concrete	23
10.2.3	Steel	29
10.3	Indices for the strength and stiffness of CFST hybrid structures	31
10.3.1	CFST cross-section	31
10.3.2	CFST hybrid structures	33
11	Ultimate limit states of trussed concrete-filled steel tubular (CFST) hybrid structures	34
11.1	General	34
11.2	Resistances to compression and bending	35
11.2.1	Axial compression	35
11.2.2	Bending	38
11.2.3	Combined compression and bending	39
11.2.4	Resistances of CFST chords	42
11.2.5	Resistances of webs	50
11.3	Resistance to shear	50
11.3.1	With horizontal webs	50
11.3.2	With diagonal webs	50
12	Ultimate limit states of concrete-encased concrete-filled steel tubular (CFST) hybrid structures	50
12.1	General	50
12.2	Resistances of single-chord structures	50
12.2.1	Axial compression	50
12.2.2	Combined compression and bending	51
12.2.3	Tension	54
12.3	Resistances of four-chord structures	55
12.3.1	Axial compression	55
12.3.2	Combined compression and bending	55
12.4	Resistances of six-chord structures	59
12.4.1	Axial compression	59
12.4.2	Combined compression and bending	59
12.5	Resistances of slender structures	62
12.5.1	Axial compression	62
12.5.2	Combined compression and bending	62
12.6	Resistance subjected to long-term loading	63
12.7	Resistance to shear	63
12.8	Resistance to combined axial force, bending and shear	64

13	Serviceability limit states of concrete-filled steel tubular (CFST) hybrid structures	65
13.1	Calculation of structural response	65
13.2	Serviceability limitations	65
14	Protective design	65
14.1	General	65
14.1.1	Corrosion resistance	65
14.1.2	Fire resistance	66
14.1.3	Impact resistance	66
14.2	Design of corrosion resistance	66
14.2.1	Anti-corrosion measures	66
14.2.2	Corrosion resistance calculation	66
14.3	Design of fire resistance	67
14.3.1	Load ratio during fire	67
14.3.2	Fireproof coating	67
14.3.3	Fire resistance ratings	68
14.3.4	Detailing requirements	68
14.4	Design of impact resistance	69
14.4.1	Bending resistance under impact	69
14.4.2	Dynamic increase factor for circular CFST chords under impact	70
14.4.3	Deformation of circular CFST chords under impact	70
15	Connections	70
15.1	General	70
15.2	Joints of trussed concrete-filled steel tubular (CFST) hybrid structures	71
15.2.1	General requirements	71
15.2.2	Typical forms of joints	71
15.2.3	Welding requirements	73
15.2.4	Detailing requirements of webs	73
15.2.5	Inserted plate connections	73
15.2.6	Gusset plate connections	74
15.2.7	Intersecting welded plane K-joints and N-joints	75
15.2.8	Plane T-joints, Y-joints and X-joints	77
15.2.9	Multiplanar joints	78
15.3	Joints of concrete-encased concrete-filled steel tubular (CFST) hybrid structures	78
15.3.1	Steel beam-to-column ring plate joints	78
15.3.2	Reinforced concrete beam-to-column joints	79
15.3.3	Detailing requirements of beam-to-column joints	80
15.3.4	Connections between steel tubes	80
15.4	Column bases and supporting connections	81
15.4.1	Column bases and supporting connections of trussed CFST hybrid structures	81
15.4.2	Column bases of concrete-encased CFST hybrid structures	85
15.5	Fatigue design of joints	86
15.5.1	General requirements	86
15.5.2	Design methods	86
15.5.3	Hot spot stress ranges under constant amplitude fatigue	86
15.5.4	Hot spot stress ranges under variable amplitude fatigue	87
15.5.5	Detailing requirements	88
16	Construction and acceptance	89
16.1	General	89
16.2	Fabrication and erection of steel tubes	89
16.2.1	Documents	89

16.2.2	Fabrication	89
16.2.3	Surface protection	90
16.2.4	Transportation and erection	90
16.3	Construction of core concrete	90
16.3.1	General requirements	90
16.3.2	Mixture design	91
16.3.3	Requirements of self-compacting concrete	91
16.3.4	Use of cement plaster	91
16.3.5	Placement preparation	91
16.3.6	Placement methods	91
16.3.7	Placement process	91
16.3.8	Treatment of post-placement holes on steel tubes	91
16.3.9	Requirements of limiting values of core concrete void in steel tubes	92
16.4	Construction of concrete encasement	93
16.4.1	Construction preparation	93
16.4.2	Workability of concrete	93
16.4.3	Construction order	93
16.5	Inspection and acceptance	93
16.5.1	Steel structures	93
16.5.2	Core concrete	93
16.5.3	Concrete encasement	94
16.5.4	Documents and records	94
Annex A (informative) Long-term load coefficients for concrete-encased circular CFST hybrid structures		95
Annex B (informative) Fire resistance ratings of single-chord concrete-encased circular CFST hybrid structures		100
Foreword		xi
Introduction		xii
1	Scope	1
2	Normative references	1
3	Terms and definitions	3
4	Symbols	9
5	Materials	12
5.1	General	12
5.2	Concrete	12
5.2.1	Cement	12
5.2.2	Aggregates	12
5.2.3	Water	12
5.2.4	Admixtures	12
5.2.5	Additions	13
5.2.6	Concrete mixture specification	13
5.3	Steel tubes	13
5.4	Steel reinforcement	13
5.4.1	Deformed reinforcement	13
5.4.2	Plain reinforcement	13
5.5	Other materials	14
5.5.1	Welding consumables	14

5.5.2	Fasteners.....	14
5.5.3	Protective paint systems.....	14
5.6	Storage of materials.....	14
6	Design and construction procedure.....	14
7	General guides.....	16
7.1	Limitations.....	16
7.1.1	CFST members.....	16
7.1.2	Trussed concrete-filled steel tubular (CFST) hybrid structures.....	18
7.1.3	Concrete-encased concrete-filled steel tubular (CFST) hybrid structures.....	18
7.2	Limit states.....	19
7.3	Ultimate limit state design format.....	20
7.3.1	General.....	20
7.3.2	Factored load effects.....	20
7.3.3	Design resistances.....	20
7.4	Serviceability limit state design format.....	21
8	Specific guides.....	21
8.1	Design working life.....	21
8.2	Selections of materials, structural plans and detailing.....	21
8.3	Seismic design requirements.....	22
8.4	Selections of constructional methods and techniques.....	22
9	Actions (loads).....	22
9.1	General.....	22
9.2	Dead loads.....	22
9.3	Live loads.....	22
9.4	Snow loads.....	22
9.5	Wind forces.....	22
9.6	Earthquake forces.....	23
9.7	Thermal forces.....	23
9.8	Load partial factors and load combinations.....	23
10	Analysis.....	23
10.1	General.....	23
10.1.1	Structural analysis purpose.....	23
10.1.2	Structural analysis methods.....	23
10.1.3	Structural analysis requirements.....	24
10.1.4	Loading cases.....	24
10.1.5	Construction stage analysis.....	25
10.2	Stress-strain relationships for materials.....	25
10.2.1	General.....	25
10.2.2	Concrete.....	26
10.2.3	Steel.....	36
10.3	Indices for the strength and stiffness of CFST hybrid structures.....	38
10.3.1	CFST cross-section.....	38
10.3.2	CFST hybrid structures.....	41
11	Ultimate limit states of trussed concrete-filled steel tubular (CFST) hybrid structures....	42
11.1	General.....	42
11.2	Resistances to compression and bending.....	42
11.2.1	Axial compression.....	42
11.2.2	Bending.....	46
11.2.3	Combined compression and bending.....	48

11.2.4 Resistances of CFST chords	53
11.2.5 Resistances of webs.....	62
11.3 Resistance to shear.....	62
11.3.1 With horizontal webs	62
11.3.2 With diagonal webs.....	62
12 Ultimate limit states of concrete-encased concrete-filled steel tubular (CFST) hybrid structures.....	62
12.1 General.....	62
12.2 Resistances of single-chord structures	62
12.2.1 Axial compression	62
12.2.2 Combined compression and bending	63
12.2.3 Tension	67
12.3 Resistances of four-chord structures	68
12.3.1 Axial compression	68
12.3.2 Combined compression and bending	69
12.4 Resistances of six-chord structures	73
12.4.1 Axial compression	73
12.4.2 Combined compression and bending	73
12.5 Resistances of slender structures.....	77
12.5.1 Axial compression	77
12.5.2 Combined compression and bending	77
12.6 Resistance subjected to long-term loading	78
12.7 Resistance to shear.....	78
12.8 Resistance to combined axial force, bending and shear.....	79
13 Serviceability limit states of concrete-filled steel tubular (CFST) hybrid structures	79
13.1 Calculation of structural response	79
13.2 Serviceability limitations.....	80
14 Protective design	80
14.1 General.....	80
14.1.1 Corrosion resistance.....	80
14.1.2 Fire resistance.....	80
14.1.3 Impact resistance.....	80
14.2 Design of corrosion resistance.....	81
14.2.1 Anti-corrosion measures	81
14.2.2 Corrosion resistance calculation.....	81
14.3 Design of fire resistance	82
14.3.1 Load ratio during fire	82
14.3.2 Fireproof coating.....	82
14.3.3 Fire resistance ratings	83
14.3.4 Detailing requirements	83
14.4 Design of impact resistance	85
14.4.1 Bending resistance under impact	85
14.4.2 Dynamic increase factor for circular CFST chords under impact.....	85
14.4.3 Deformation of circular CFST chords under impact.....	85
15 Connections.....	86
15.1 General.....	86
15.2 Joints of trussed concrete-filled steel tubular (CFST) hybrid structures	86
15.2.1 General requirements.....	86
15.2.2 Typical forms of joints.....	86
15.2.3 Welding requirements.....	90

15.2.4	Detailing requirements of webs	90
15.2.5	Inserted plate connections	90
15.2.6	Gusset plate connections	91
15.2.7	Intersecting welded plane K-joints and N-joints	92
15.2.8	Plane T-joints, Y-joints and X-joints	96
15.2.9	Multiplanar joints	96
15.3	Joints of concrete-encased concrete-filled steel tubular (CFST) hybrid structures	96
15.3.1	Steel beam-to-column ring plate joints	96
15.3.2	Reinforced concrete beam-to-column joints	97
15.3.3	Detailing requirements of beam-to-column joints	99
15.3.4	Connections between steel tubes	99
15.4	Column bases and supporting connections	100
15.4.1	Column bases and supporting connections of trussed CFST hybrid structures	100
15.4.2	Column bases of concrete-encased CFST hybrid structures	106
15.5	Fatigue design of joints	107
15.5.1	General requirements	107
15.5.2	Design methods	108
15.5.3	Hot spot stress ranges under constant amplitude fatigue	108
15.5.4	Hot spot stress ranges under variable amplitude fatigue	109
15.5.5	Detailing requirements	110
16	Construction and acceptance	110
16.1	General	110
16.2	Fabrication and erection of steel tubes	111
16.2.1	General	111
16.2.2	Documents	111
16.2.3	Fabrication	111
16.2.4	Surface protection	111
16.2.5	Transportation and erection	112
16.3	Construction of core concrete	112
16.3.1	General	112
16.3.2	General requirements	112
16.3.3	Mixture design	113
16.3.4	Requirements of self-compacting concrete	113
16.3.5	Use of cement plaster	113
16.3.6	Placement preparation	113
16.3.7	Placement methods	113
16.3.8	Placement process	113
16.3.9	Treatment of post-placement holes on steel tubes	113
16.3.10	Requirements of limiting values of core concrete void in steel tubes	114
16.4	Construction of concrete encasement	115
16.4.1	General	115
16.4.2	Construction preparation	115
16.4.3	Workability of concrete	115
16.4.4	Construction order	115
16.5	Inspection and acceptance	116
16.5.1	General	116
16.5.2	Steel structures	116
16.5.3	Core concrete	116
16.5.4	Concrete encasement	116
16.5.5	Documents and records	116

<u>Annex A (informative) Long-term load coefficients for concrete-encased circular CFST hybrid structures.....</u>	118
<u>Annex B (informative) Fire resistance ratings of single-chord concrete-encased circular CFST hybrid structures</u>	123
<u>Bibliography</u>	125
<u>Bibliography</u>	102

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Foreword

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This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and prestressed concrete*. standards.iteh.ai/catalog/standards/iso/32348305-cb27-4c89-ac42-e8dadf13165b/iso-fdis-16521

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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.

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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~~