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(JSCE/JSA)

**Construction drawings for civil
engineering**

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Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	3
4 Size and format of drawings	3
5 Layout of the drawing	4
5.1 General layout	4
5.2 Space for drawing	5
5.3 Space for text	5
6 Scale	8
7 Lines	8
7.1 Type of lines and their applications	8
7.2 Line widths	15
8 Leader line and reference line	16
9 Characters	16
10 Projection method	16
11 Representation of figures	16
12 Indication of dimensions	17
13 Indication of limit deviations	17
13.1 General principles	17
13.2 Indication of limit deviations	17
14 Indication of surface textures	19
15 Simplified representation of structural metal works	19
15.1 Simplified representation of bars and profile sections	19
15.2 Schematic representation of structural metal work	21
16 Simplified representation of bolts and rivets	23
16.1 Representation on projection planes normal to the axes of the bolts and rivets	23
16.2 Representation on projection planes parallel to the axes of the bolts and rivets	24
16.3 Dimensioning	25
17 Symbolic representation of welds	27

18	Representation of reinforcement and PC steel materials	27
18.1	Reinforcement	27
18.2	Prestressed concrete reinforcement	34
18.3	Marking of bars	35
18.4	Bending information for reinforcement bars	36
18.5	Bar schedule	45
19	Landscape drawing practice	49
19.1	General rules	49
19.2	Conventions	49
19.3	Schedules	54
19.4	Reference grid	55
19.5	Indication of irregular curve	55
Annex JA (informative)	Comparison table between JIS and corresponding International Standards	57

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Land, Infrastructure, Transport and Tourism, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Society of Civil Engineers (JSCE)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS A 0101:2003** is replaced with this Standard.

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Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

Construction drawings for civil engineering

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 128-23** : 1999, **ISO 3766** : 2003, **ISO 5261** : 1995, **ISO 5845-1** : 1995, **ISO 6284** : 1996, **ISO 9431** : 1990 and **ISO 11091** : 1994, without modifying the technical contents for the corresponding parts, but adding some specification contents unique to Japanese Industrial Standard that are not given in the said International Standards.

The portions with dotted underlines are the matters either not given in or modified from the corresponding International Standards. A list of modifications with explanations is given in Annex JA.

1 Scope

This Standard specifies construction drawings for the civil engineering used for proposing, investigating, planning, designing, manufacturing, constructing, maintaining and managing of the infrastructure itself or civil structures constituting it.

NOTE : The International Standards corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 128-23 : 1999 *Technical drawings — General principles of presentation — Part 23 : Lines on construction drawings*

ISO 3766 : 2003 *Construction drawings — Simplified representation of concrete reinforcement*

ISO 5261 : 1995 *Technical drawings — Simplified representation of bars and profile sections*

ISO 5845-1 : 1995 *Technical drawings — Simplified representation of the assembly of parts with fasteners — Part 1 : General principles*

ISO 6284 : 1996 *Construction drawings — Indication of limit deviations*

ISO 9431 : 1990 *Construction drawings — Spaces for drawing and for text, and title blocks on drawing sheets*

ISO 11091 : 1994 *Construction drawings — Landscape drawing practice* (Overall evaluation : MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0031 *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

NOTE : Corresponding International Standard : **ISO 1302** : 2002 *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation* (IDT)

JIS B 0601 *Geometrical Product Specifications (GPS) — Surface texture : Profile method — Terms, definitions and surface texture parameters*

NOTE : Corresponding International Standard : **ISO 4287** : 1997 *Geometrical Product Specifications (GPS) — Surface texture : Profile method — Terms, definitions and surface texture parameters* (IDT)

JIS B 0633 *Geometrical Product Specifications (GPS) — Surface texture : Profile method — Rules and procedures for the assessment of surface texture*

NOTE : Corresponding International Standard : **ISO 4288** : 1996 *Geometrical Product Specifications (GPS) — Surface texture : Profile method — Rules and procedures for the assessment of surface texture* (IDT)

JIS Z 3021 *Welding and allied processes — Symbolic representation*

NOTE : Corresponding International Standard : **ISO 2553** : 1992 *Welded, brazed and soldered joints — Symbolic representation on drawings* (MOD)

JIS Z 8114 *Technical product documentation — Terms relating to technical drawings*

NOTE : Corresponding International Standard : **ISO 10209-1** : 1992 *Technical product documentation — Vocabulary — Part 1 : Terms relating to technical drawings : general and types of drawings* and **ISO 10209-2** : 1993 *Technical product documentation — Vocabulary — Part 2 : Terms relating to projection methods* (Overall : MOD)

JIS Z 8311 *Technical drawings — Sizes and layout of drawing sheets*

NOTE : Corresponding International Standard : **ISO 5457** : 1980 *Technical drawings — Sizes and layout of drawing sheets* (IDT)

JIS Z 8312 *Technical drawings — General principles of presentation — Basic convention for lines*

NOTE : Corresponding International Standard : **ISO 128-20** : 1996 *Technical drawings — General principles of presentation — Part 20 : Basic conventions for lines* (IDT)

JIS Z 8313-0 *Technical drawings — Lettering — Part 0 : General requirements*

NOTE : Corresponding International Standard : **ISO/FDIS 3098-0** : 1997 *Technical product documentation — Lettering — Part 0 : General requirements* (IDT)

JIS Z 8313-1 *Technical drawings — Lettering — Part 1 : Currently used characters*

NOTE : Corresponding International Standard : **ISO 3098-1** : 1974 *Technical drawings — Lettering — Part 1 : Currently used characters* (IDT)

JIS Z 8313-10 *Technical drawings — Lettering — Part 10 : Japanese characters*

(Kana and kanji)

JIS Z 8314 *Technical drawings — Scales*

NOTE : Corresponding International Standard : **ISO 5455** : 1979 *Technical drawings — Scales* (MOD)

JIS Z 8315-2 *Technical drawings — Projection methods — Part 2 : Orthographic representations*

NOTE : Corresponding International Standard : **ISO 5456-2** : 1996 *Technical drawings — Projection methods — Part 2 : Orthographic representations* (IDT)

JIS Z 8315-3 *Technical drawings — Projection method — Part 3 : Axonometric representations*

NOTE : Corresponding International Standard : **ISO 5456-3** : 1996 *Technical drawings — Projection methods — Part 3 : Axonometric representations* (IDT)

JIS Z 8315-4 *Technical drawings — Projection method — Part 4 : Central projection*

NOTE : Corresponding International Standard : **ISO 5456-4** : 1996 *Technical drawings — Projection methods — Part 4 : Central projection* (IDT)

JIS Z 8316 *Technical drawings — General principles of presentation*

NOTE : Corresponding International Standard : **ISO 128** : 1982 *Technical drawings — General principles of presentation* (MOD)

JIS Z 8317-1 *Technical drawings — Indications of dimensions and tolerances — Part 1 : General principles*

NOTE : Corresponding International Standard : **ISO 129-1** : 2004 *Technical drawings — Indication of dimensions and tolerances — Part 1 : General principles* (MOD)

JIS Z 8322 *Technical drawings — General principles of presentation — Basic conventions and applications for leader lines and reference lines*

NOTE : Corresponding International Standard : **ISO 128-22** : 1999 *Technical drawings — General principles of presentation — Part 22 : Basic conventions and applications for leader lines and reference lines* (MOD)

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in **JIS Z 8114** apply.

4 Size and format of drawings

The size and format of drawings shall be in accordance with **JIS Z 8311** and as follows.

- a) The portion of the title block should be situated in the bottom right-hand corner of the drawing space, both for sheets positioned horizontally, type X or for those posi-

tioned vertically, type Y.

NOTE : In **JIS Z 8311**, in order to economize on preprinted sheets, it is permitted to use sheets type X in the vertical position and sheets type Y in the horizontal position. In this case, the title block would be positioned in the right-hand top corner of the drawing space. In construction drawings for civil engineering, this is prohibited.

- b) The identification zone shall be positioned at the right-hand bottom corner of the title block, columns such as ① the registration or identification number of the drawing, ② the title of the drawing and ③ the name of the legal owner of the drawing shall be provided. Examples of the arrangements of ①, ② and ③ in the title block are shown in figure 1.

NOTE : This provision is in accordance with **ISO 7200 : 1984** *Technical drawings – Title blocks*.

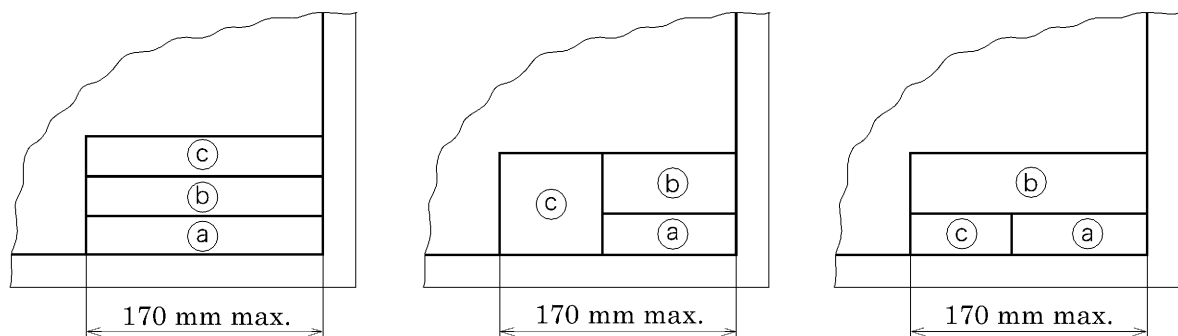


Figure 1

5 Layout of the drawing

5.1 General layout

The space on a drawing sheet is primarily divided into (see figure 2 and figure 3).

- a space for drawing (see 5.2)
- a space for text (see 5.3)
- a title block (see clause 4)

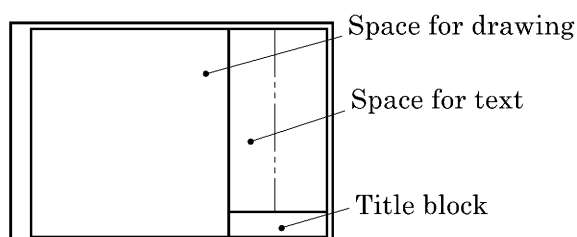


Figure 2

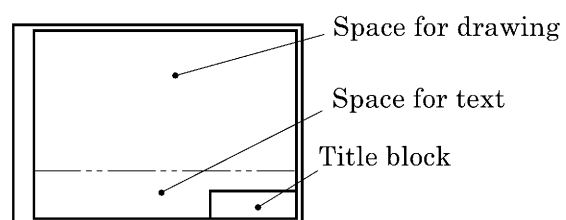


Figure 3

5.2 Space for drawing

The figures comprising a drawing shall be arranged in horizontal rows and vertical columns. A main figure, if one is identified as such, shall be placed at the top left of the drawing or at the top left of a group of figures. If possible, consideration shall be taken of A4-size folds of a drawing sheet when figures are drawn.

5.3 Space for text

5.3.1 General

The space for text on a drawing sheet shall contain all information necessary for the understanding of the contents of the drawing (see 5.3.2), except for the text which needs to be placed adjacent to the figures in the space for drawing.

The space for text shall normally be placed at the right-hand edge of the drawing sheet (see figure 2); the width of the space shall be equal to that of the title block, i.e. maximum 170 mm, or at least 100 mm.

If a figure takes up the whole width of the drawing sheet, the space for text shall be placed at the bottom edge of the drawing sheet (see figure 3); the height of the space shall be chosen as required. The space for text shall be divided into columns of appropriate width; if possible, account shall be taken of folds in a folded drawing when deciding on column width.

5.3.2 Information to be placed in space for text

- a) **General** The following information is normally placed in the space for text.
- explanations [see b)]
 - instructions [see c)]
 - references [see d)]
 - location figure [see e)]
 - revision table [see f)]
- b) **Explanations** Under “Explanations”, information shall be given which is needed to read the drawing, e.g. explanations of special symbols, designations, abbreviations and units of dimensions.
- c) **Instructions** Under “Instructions”, information, supplementary to the information in the space for drawing, shall be given which is needed to perform what is shown on the drawing, e.g. instructions relating to material, realization, surface treatment, assembly placing, number of units and combined dimensions.
- If several objects are shown on the drawing, general instructions shall be placed in the space for text and special instructions shall be placed adjacent to the relevant figures.
- d) **References** Under “References”, reference shall be made to supplementary drawings and other documents.
- e) **Location figure** A location figure shall be placed so that it remains visible after

the drawing has been folded.

A location figure shall comprise, as required, the following figures :

- schematic site plan with area, arrow indicating the north, building, part of building, etc. marked (see figure 4);
- schematic plan of building with area, part, etc. indicated (see figure 5);
- schematic section through building with floor plan, direction of view, etc. indicated (see figure 6).

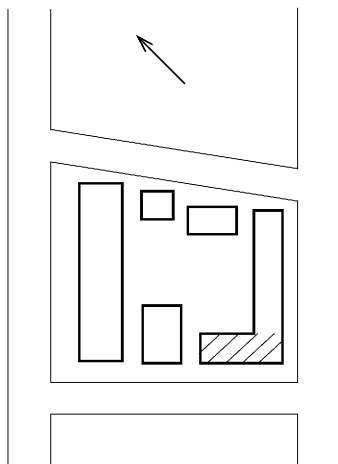


Figure 4

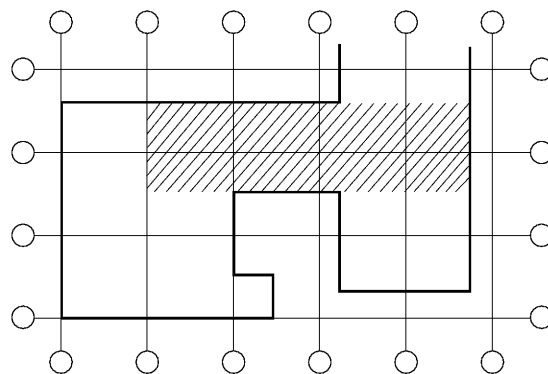


Figure 5

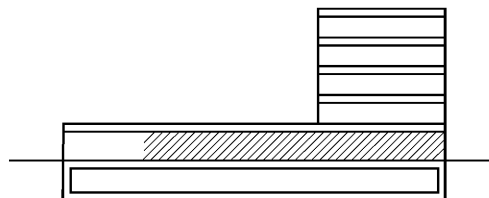


Figure 6

- f) **Revision table** A revision table shall be used to record all revisions such as corrections and/or amendments following the first issue. In addition, any other factor which might influence the validity of the drawing shall be recorded in the revision table.

A revision table shall contain the following information :

- designations of revision and, if required, number of places where correction has been made;
- details concerning the revision;
- date of revision;
- signature of person responsible for revision.

The width of the revision table shall be equal to either

- 1) the width of the title block, if the revision table is placed immediately above the title block.
- 2) at least 100 mm, if the revision table is placed to the left of the title block.

The height of each line in the revision table shall be in accordance with the rules given in **JIS Z 8313-1** and **JIS Z 8313-10**, and shall meet the minimum requirement for spacing of base lines.

An example of the layout of a revision table is illustrated in figure 7.

	Designation	Details of revision	Date
			Sign

Figure 7

5.3.3 Layout

Examples of the layout of the space for text on the drawing sheet are given in figure 8, figure 9 and figure 10.

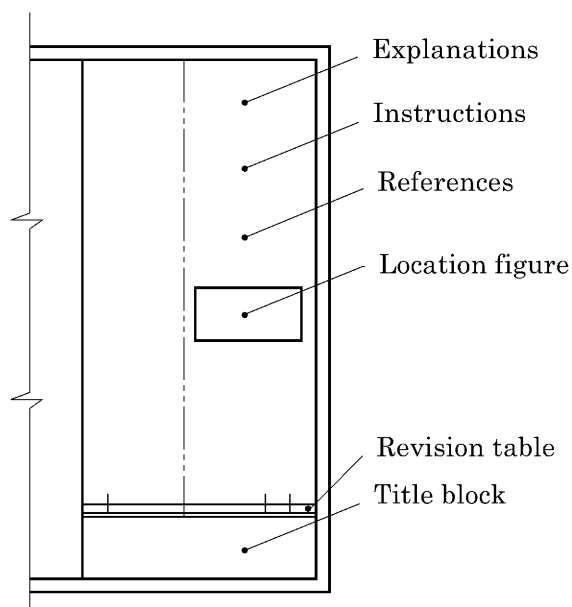


Figure 8

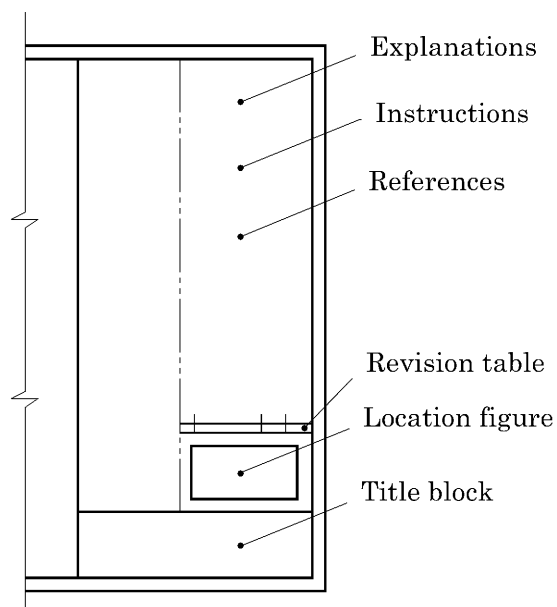


Figure 9

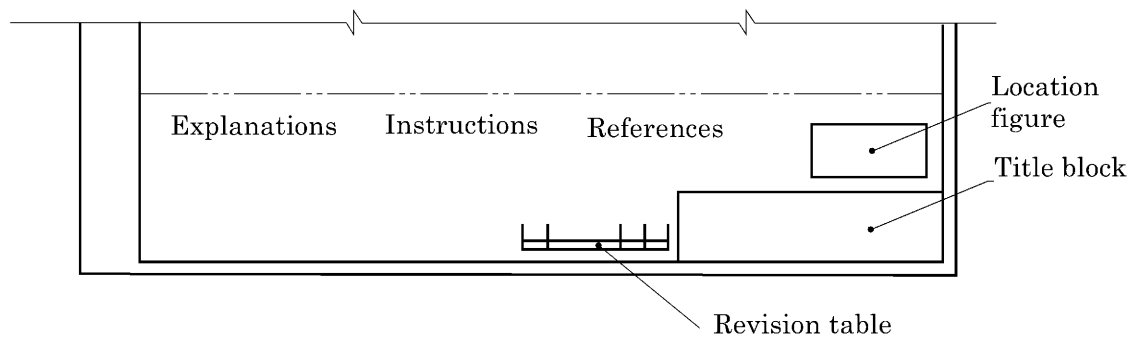


Figure 10

NOTE : In figure 2, figure 3, figure 8, figure 9 and figure 10, the continuous lines or the long dashed double-dotted lines separating the spaces for drawing and text are for explanation only and not required in the actual drawing.

6 Scale

Scale shall be in accordance with **JIS Z 8314**. In the case where it is difficult to express an object with an equal scale in lateral and longitudinal directions, different scales between the directions may be employed.

7 Lines

7.1 Types of lines and their applications

The types of lines and their applications are shown in table 1 and table 2. First two digits of the numbers in table 1 indicate the number of line type in **JIS Z 8312**.

Table 1 Types of lines and their application

No.	Description and representation	Application
01.1	Continuous narrow line 	. 1 boundaries of different materials in view, cut and section (alternatively, see 01.2.2)
		. 2 hatching
		. 3 diagonals for indication of openings, holes and recesses
		. 4 arrow lines in stairs, ramps and sloping areas
		. 5 modular grid lines, with minimum spacing
		. 6 short centrelines
		. 7 extension lines
		. 8 dimension lines and their terminators
		. 9 leader lines
		. 10 existing contours on landscape drawings (alternatively, see 02.1.1)
		. 11 visible outlines of parts in view (alternatively see 01.2.3)
		. 12 simplified representation of doors, windows, stairs, fittings etc. (alternatively, see 01.2.4)
		. 13 framing of details
	Continuous narrow lines with zigzags 	. 14 limits of partial or interrupted views, cuts and sections (alternatively, see 04.1.6)
01.2	Continuous wide lines 	. 1 visible outlines of parts in cut and section when hatching is used
		. 2 boundaries of different materials in view, cut and section (alternatively, see 01.1.1)
		. 3 visible outlines of parts in view (alternatively, see 01.1.11)
		. 4 simplified representation of doors, windows, stairs, fittings etc. (alternatively, see 01.1.12)
		. 5 modular grid lines, with maximum spacing
		. 6 arrow lines for marking of views, cuts and sections
		. 7 proposed contours on landscape drawings
01.3	Continuous extra-wide line 	. 1 visible outlines of parts in cut and section when hatching is not used
		. 2 reinforcing bars (see 02.3.1)
		. 3 lines of special importance
02.1	Dashed narrow line 	. 1 existing contours on landscape drawings (alternatively, see 01.1.10)
		. 2 subdivision of plant beds/grass
		. 3 hidden outlines (alternatively, see 02.2.1)
02.2	Dashed wide line 	. 1 hidden outlines (alternatively, see 02.1.3)
02.3	Dashed extra-wide line 	. 1 reinforcing bars in bottom layer on plan and far face layer in elevation when bottom and top layers and near and far face layers are shown on the same sketch

Table 1 (concluded)

No.	Description and representation	Application
04.1	Long dashed dotted narrow line — · — · — · — · —	. 1 cutting planes (line 04.2 at ends and changes of direction)
		. 2 centrelines
		. 3 lines of symmetry (identified at the ends by two narrow short parallel lines drawn at right angle)
		. 4 framing of enlarged details
		. 5 reference lines
		. 6 limits of partial or interrupted views, cuts and sections (especially for short lines and in narrow situations: see examples 01.1.2 , 01.2.1 , 01.3.1 , etc., in table 2; alternatively, see 01.1.14)
04.2	Long dashed dotted wide line — · — · — · — · —	. 1 cutting planes (at ends and changes of direction; see 04.1.1)
		. 2 outlines of visible parts situated in front of the cutting plane
04.3	Long dashed dotted extra-wide line — · — · — · — · —	. 1 secondary lines for setting out and arbitrary reference lines
		. 2 indication of lines or surfaces to which a special requirement applies
		. 3 boundary lines for contracts, stages, zones etc.
05.1	Long dashed double-dotted narrow line — · — · — · — · —	. 1 alternative and extreme positions of movable parts
		. 2 centroidal line
		. 3 outlines of adjacent parts
05.2	Long dashed double-dotted wide line — · — · — · — · —	. 1 outlines of hidden parts situated in front of the cutting plane
05.3	Long dashed double-dotted extra-wide line — · — · — · — · —	. 1 reinforcing prestressed bars and cables
07.1	Dotted narrow line	. 1 outlines of parts not included in the project

Table 2 Examples of application

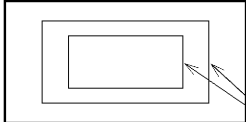
No.	Line type	Example of application
01.1	Continuous narrow line	
01.1.1	Boundaries of different materials in view, cut and section	 Line 01.1 View of a floor with different materials

Table 2 (continued)

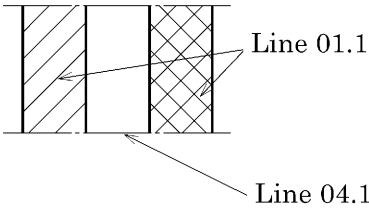
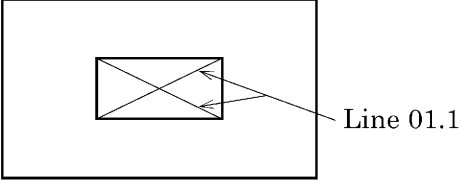
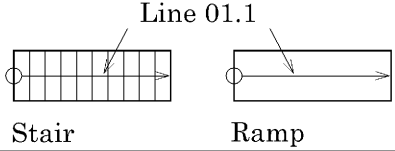
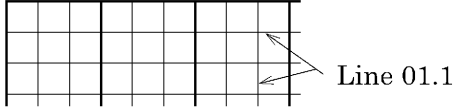
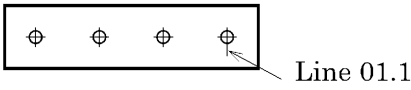
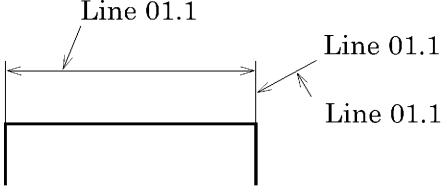
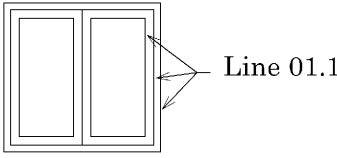
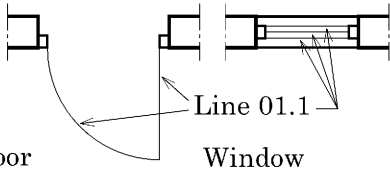
No.	Line type	Example of application
01.1.2	Hatching	 Line 01.1 Line 04.1 Vertical section of a wall
01.1.3	Diagonals for indication of openings, holes and recesses	 Line 01.1 View of a wall with an opening
01.1.4	Arrow lines in stairs, ramps and sloping areas	 Line 01.1 Stair Ramp
01.1.5	Modular grid lines with minimum spacing	 Line 01.1
01.1.6	Short centrelines	 Line 01.1
01.1.7 01.1.8 01.1.9	Extension lines Dimension lines and their terminators Leader lines	 Line 01.1 Line 01.1 Line 01.1
01.1.10	Existing contours on landscape drawings	 33 32 Line 01.1
01.1.11	Visible outlines of parts in view (alternatively, see 01.2.3)	 Line 01.1
01.1.12	Simplified representation of doors, windows, stairs, fittings etc. (alternatively, see 01.2.4)	 Line 01.1 Door Window

Table 2 (continued)

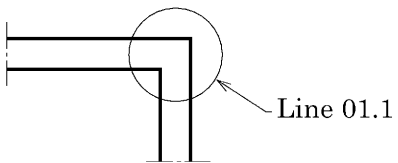
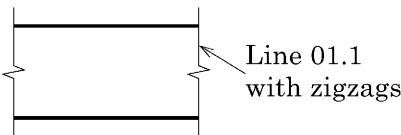
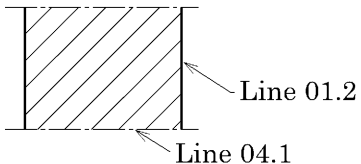
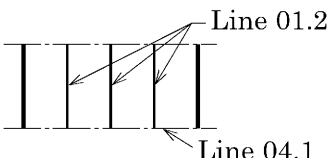
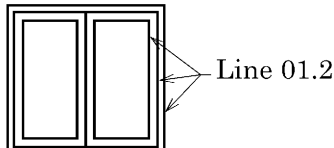
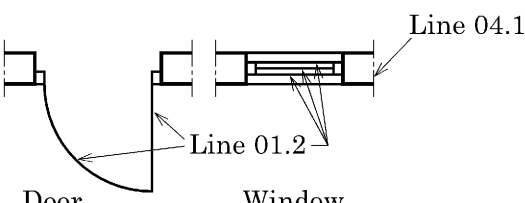
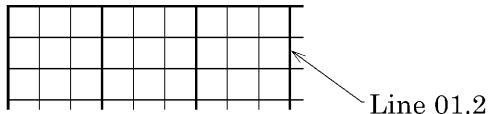
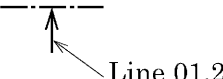
No.	Line type	Example of application
01.1.13	Framing of details	
01.1.14	Limits of partial or interrupted views, cuts and sections	
01.2	Continuous wide line	
01.2.1	Visible outlines of parts in cut and section when hatching is used	
01.2.2	Boundaries of different materials in view, cut and section	
01.2.3	Visible outlines of parts in view (alternatively, see 01.1.11)	
01.2.4	Simplified representation of doors, windows, stairs, fittings etc. (alternatively, see 01.1.12)	
01.2.5	Modular grid lines with maximum spacing	
01.2.6	Arrow lines for marking of views, cuts and sections	
01.2.7	Proposed contours on landscape drawings	
01.3	Continuous extra-wide line	

Table 2 (continued)

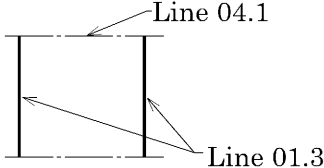
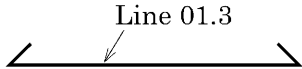
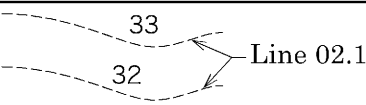
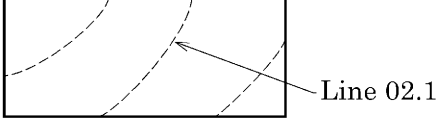
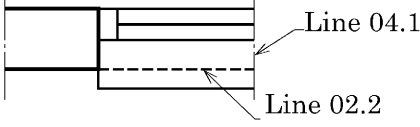
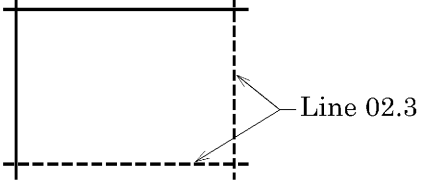
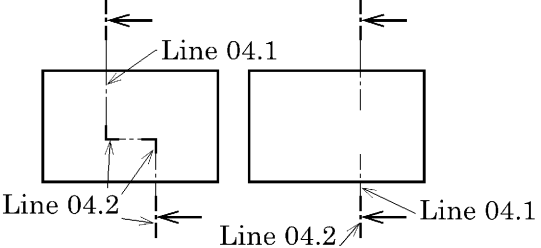
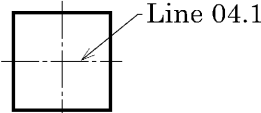
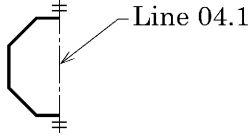
No.	Line type	Example of application
01.3.1	Visible outlines of parts in cut and section when hatching is not used	 Line 04.1 Line 01.3 Vertical section of a wall
01.3.2	Reinforcing bars	 Line 01.3
02.1	Dashed narrow line	
02.1.1	Existing contours on landscape drawings (alternatively, see 01.1.10)	 33 32 Line 02.1
02.1.2	Subdivision of plant beds/grass	 Line 02.1
02.2	Dashed wide line	
02.2.1	Hidden outlines	 Line 04.1 Line 02.2
02.3	Dashed extra-wide line	
02.3.1	Reinforcing bars in bottom layer on plan and far face layer in elevation when bottom and top layers are shown on the same sketch	 Line 02.3
04.1	Long dashed dotted narrow line	
04.1.1	Cutting planes (drawn with line 04.2 at ends and changes of direction)	 Line 04.1 Line 04.2 Line 04.1 Line 04.2
04.1.2	Centrelines	 Line 04.1
04.1.3	Lines of symmetry	 Line 04.1

Table 2 (continued)

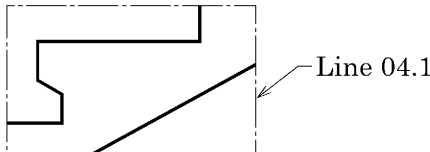
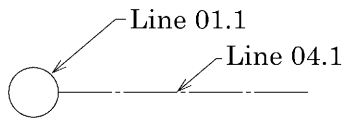
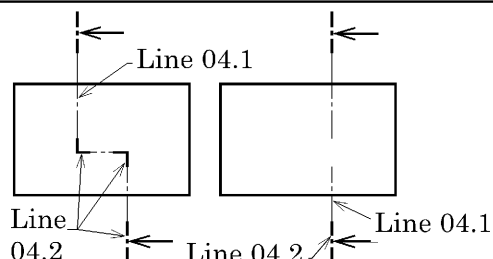
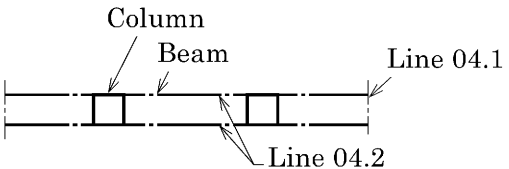
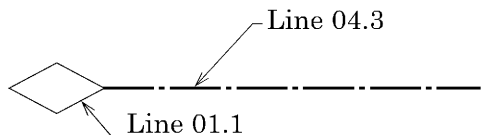
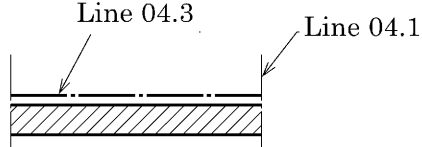
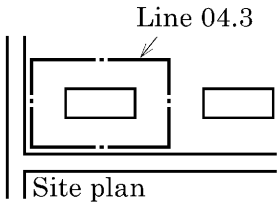
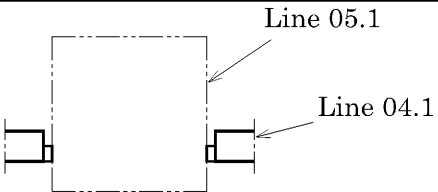
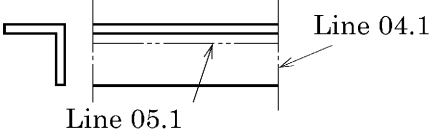
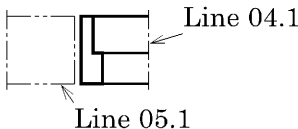
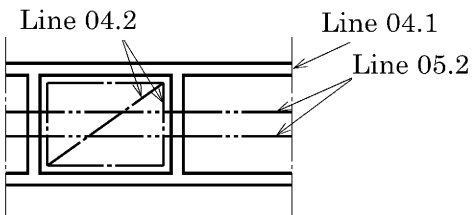
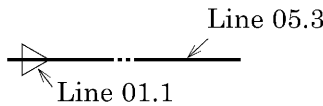
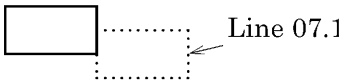
No.	Line type	Example of application
04.1.4	Framing of enlarged details	
04.1.5	Reference lines	
04.2	Long dashed dotted wide line	
04.2.1	Cutting planes (drawn with line 04.2 at ends and changes of direction; the rest is drawn with line 04.1)	
04.2.2	Outlines of visible parts situated in front of the cutting plane	
04.3	Long dashed dotted extra-wide line	
04.3.1	Secondary lines for setting out and arbitrary reference lines	
04.3.2	Indication of lines or surfaces to which a special requirement applies	
04.3.3	Boundary lines for contracts, stages, zones, etc.	
05.1	Long dashed double-dotted narrow line	
05.1.1	Extreme position of movable parts	

Table 2 (concluded)

No.	Line type	Example of application
05.1.2	Centroidal lines	
05.1.3	Outlines of adjacent parts	
05.2	Long dashed double-dotted wide line	
05.2.1	Outlines of hidden parts situated in front of the cutting plane	
05.3	Long dashed double-dotted extra-wide line	
05.3.1	Reinforcing prestressed bars and cables	
07	Dotted narrow line	
07.1	Outlines of parts not included in the project	

7.2 Line widths

On a construction drawing three line widths, narrow, wide and extra-wide, are normally used (see table 3).

The proportions between the line widths are 1 : 2 : 4.

The line width of graphical symbols is situated between the width of the narrow and the wide line.

The line widths shall be chosen according to the type, size and scale of the drawing and the requirements for microcopying and other methods of reproduction.

Table 3 Line widths

				Unit : mm
Line group	Narrow line	Wide line	Extra-wide line	Line widths for graphical symbols
0.25	0.13	0.25	0.5	0.18
0.35	0.18	0.35	0.7	0.25
0.5	0.25	0.5	1	0.35
0.7	0.35	0.7	1.4	0.5
1	0.5	1	2	0.7

8 Leader line and reference line

Leader line and reference line shall be in accordance with **JIS Z 8322**.

9 Characters

Characters shall be in accordance with **JIS Z 8313-0**, **JIS Z 8313-1** and **JIS Z 8313-10**.

10 Projection method

Projection method shall be in accordance with either of first angle projection method or third angle projection method. In those cases where it is advantageous to position the views not according to the strict pattern of the first or the third angle projection method, the use of the reference arrows method permits the various views to be freely positioned. The first angle projection method, third angle projection method and the reference arrow method shall be in accordance with **JIS Z 8315-2** and clause 2 of **JIS Z 8316**.

In the case that single view drawings are required for ease of understanding of the objects, isometric projection, oblique projection and perspective projection shall be employed. The isometric projection and oblique projection shall be in accordance with **JIS Z 8315-3**, and perspective projection shall be in accordance with **JIS Z 8315-4**.

11 Representation of figures

Representation of figures shall be in accordance with clause 4 and clause 5 of **JIS Z 8316** and the following.

- a) When the cutting plane is straight, the plane shall be drawn to a suitable length for legibility (see figure 11). If the cutting plane is not straight, the plane shall be drawn to its full length (see figure 12).

NOTE : This provision is in accordance with **ISO 8048 : 1984** *Technical drawings — Construction drawings — Representation of views, sections and cuts*.

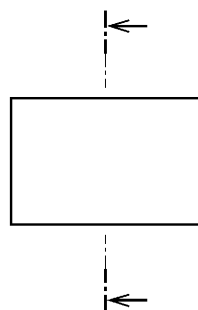


Figure 11

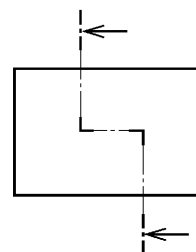


Figure 12

- b) Designations of views, sections, cuts and details shall be used in order, as shown in figure 13: capital letters; numerals; lower-case letters. The designation can be sup-