New Products & Technologies

Composite Floor with QL Deck-Plate*

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1 Introduction

The QL deck-plate is a composite floor which locks with concrete using embossment on its surface to form a unitary structure. The name "QL" is a shortening of "Quick Lock" floor. Developed by Kawatetsu Steel Products Corp. with technical assistance from the U.S. firm H. H. Robertson, the product offers many outstanding features for use as a floor construction material, and can also be used for fire-resistant floor and cellular race ways. It can achieve the simplification of the work and the shortening of the construction period, and meantime economical work.

2 Outline of Product

QL deck-plate comes in two depths, 50 mm and 75 mm, and two widths, 600 mm and 900 mm. The two of QL-deck plates are shown in **Fig. 1**.

QL deck plate which has a spot welded bottom plate of 1.2-mm thick galvanized steel plate is called **QL cellular**. The specifications for QL-deck plates are shown in **Table 1**. By placing concrete of a thickness of 60 to 100 mm over the deck plate, a composite floor is made. Normally welded wire mesh of ⌀6 × @150 is used as reinforcing against concrete shrinkage cracking.

QL cellular comes in 2-way and 3-way arrangements.

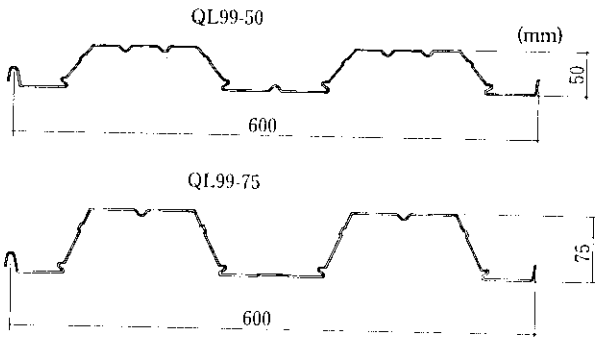

Fig. 1 Profiles

Table 1 Specifications

	QL deck	QL cellular
Profiles	QL99-50, QL99-75	QC99-50, QC99-75
Width (mm)	600, 900	600
Thickness (mm)	1.2, 1.6	1.2/1.2, 1.6/1.2
Surface treatment	Galvanized and primed	Galvanized
Standard	JIS G3352	JIS G3352

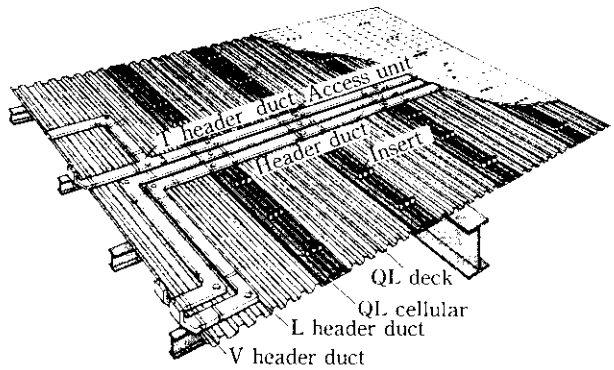

Fig. 2 Cellular ducts system

For 3-way, an additional cell is fixed between the two-way cells. In the cellular race way system, parts are provided so that wiring can be easily installed for electric power supply outlets and telephone connections (**Fig. 2**).

3 Outline of Design

The design of the composite floor with QL-deck plate includes structural, fire resistance, and cellular race way system considerations, as described below:

(1) Structural Design

The structural design is in accordance with the "Standard for Design and Construction of Deck Plate Floor" of the Kozai Club and "Guidelines for Various Composite Structural Designs and Commentaries" of the Architectural Institute of Japan. Actual design work can be easily made by referring to our design manual.

* Originally published in *Kawasaki Steel Giho*, **20**(1988)4, pp. 364-365

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Table 2 Fire resistance floor listings

Design No.	Profile	Concrete*1	Span (m)	Max. load (kgf/m²)	Concrete thickness (mm)	Wire mesh ϕ 6	Deck support
(通) F1001 1 h	QL99-50	Reg	3	550	80	@ 150	Continuous beam support
		LW	3	400	70	@ 150	
	QL99-75	Reg	3	550	80	@ 150	
		LW	3	400	70	@ 150	
(通) F2001 2 h	QL99-50	Reg	2.7	360	95	@ 100	
		LW	2.7	360	85	@ 150	
	QL99-75	Reg	3	360	90	@ 150	
		LW	3	360	85	@ 150	
(通) F1002 1 h	QL99-50	Reg	2.7	400	80	@ 150	Simple beam support
		LW	2.4	550	80	@ 150	
	QL99-75	Reg	2.7	400	80	@ 150	
		LW	2.4	550	80	@ 150	

*1 Reg: Regular type
LW: Light weight type

(2) Fire Resistance Floor Design
The conditions of fire resistance floor using QL deck plate are as per **Table 2**, and classified to the rating.
If the design conditions conform to the conditions of any rating in Table 2, fire-proofing cover is not required.

(3) Cellular Race Way System Design
The QL cellular conforms to the cellular race way material stated in the technical standards concerning electrical facilities.
Interval of QL cellular race way and spacing of outlets are determined depending upon the layout and required number of outlets.

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