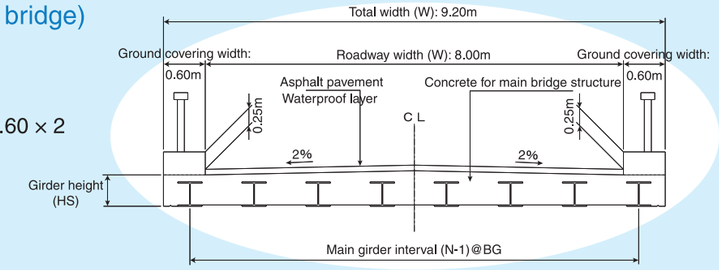
Example of main girder used for Easy Slab Bridge (Reference values)

■Design conditions (Road bridge)

Design load (Live load B)
Roadway width (W): 8.00m
Ground covering width (W): 0.60 × 2
Total width (W): 9.20m

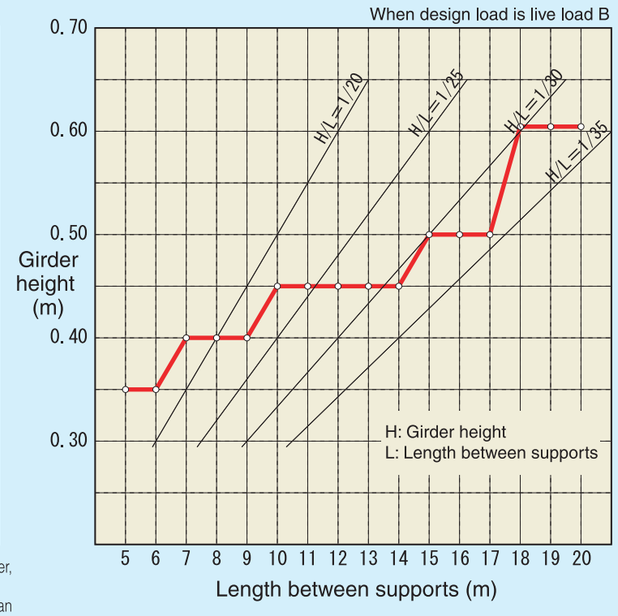


Reference list for main girder used

Length between supports (m)	Size of H steel shapes	Material	Girder height HS (m)	The number of girders N (Number)	Girder interval BG (m)
5.00	250×250	SS400	0.35	11	0.85
6.00	〃	〃	〃	13	0.71
7.00	300×300	〃	0.40	12	0.77
8.00	〃	SM490	〃	11	0.85
9.00	〃	〃	〃	13	0.71
10.00	350×350	〃	0.45	10	0.94
11.00	〃	〃	〃	11	0.85
12.00	〃	SM490Y	〃	〃	〃
13.00	〃	〃	〃	13	0.71
14.00	〃	〃	〃	15	0.61
15.00	400×400	〃	0.50	12	0.77
16.00	〃	〃	〃	14	0.65
17.00	〃	〃	〃	16	0.57
18.00	502×475	〃	0.61	10	0.92
19.00	〃	〃	〃	12	0.76
20.00	〃	〃	〃	13	0.70

Note 1: Weathering steel (SMA400W, SMA490W) can be used as H steel shapes. However, as it may require longer manufacturing period, please confirm in advance.
Note 2: As for the size of H steel shapes, middle width, narrow width and build-up type can be used in addition to the above mentioned wide width type.

Standard girder height chart



●Steel girder can be reused.

- Steel girder (H steel shapes) used for existing bridges and temporary bridges can be reused as main girder for Easy Slab Bridge.
- Steel girder which has been scrapped until now can be used as main girder for Easy Slab Bridge. Therefore, environmental impact as well as cost can be reduced.

US PAT. No. 6, 792, 638
JP PAT. No. 3, 708, 495
KR PAT. No. 10-0685725

Easy Slab Bridge Association

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US PAT. No. 6, 792, 638 etc.

Complex plate deck bridge with excellent structure performance and construction property as well as environmentally-friendly method

Easy Slab Bridge

Easy Slab Bridge
(RC plate deck bridge of embedded H steel girder type)

Works for changing the superstructure of Kubo Bridge,
Bridge length: 24.80m (7.40 + 17.40)
Komatsu City, Ishikawa Pref. (Built in May, 2004)

Goal of development

Strong	(Load bearing ability)
Long	(Endurance)
Fast	(Short period of days for building works on the site)
Inexpensive	(Reduced cost for construction, maintenance and management)
Beautiful	(Low girder)
Less impact on the environment	(Reuse of existing girders)

Works for changing the superstructure of Tarota Bridge,
Bridge length: 13.10m
Kanazawa City, Ishikawa Pref. (Built in September, 2004)

Easy Slab Bridge Association

What is Easy Slab Bridge?

Easy Slab Bridge (RC plate deck bridge of embedded H steel girder type)

Easy Slab Bridge is a complex structure (SRC structure) bridge with a main bridge structure built by lining up H steel shapes with simple processing (drilling), setting framework for lower girder face between lower flanges, passing through the lateral connection reinforcement into the holes on the web plate (web), fixing the both ends with a nut, placing reinforcement for upper girder face and casting concrete between girders.

Characteristics of Easy Slab Bridge

Simple structure

- As for bridge axis direction, cross section of H steel girder is calculated in terns of reinforcement cross section to be designed as RC cross section. This allows simple structure.
- As for vertical direction of bridge axis, lateral connection reinforcement and reinforcement for upper girder face are used as main reinforcement and stress intensity as RC cross section is examined.

Realization of construction of low girder at low cost.

- As a bridge with low girder can be built at low cost, Easy Slab Bridge is suitable for an area in the city where low girder is required.

Easy Slab Bridge can be applied to various shapes of plain surfaces.

- Easy Slab Bridge can be applied to complex plain surface shapes (trapezoid and corner cutoff) that are common in the bridges near intersections.

Simple construction works and short period for site works

- On-site building works require very little special techniques. Girders are hoisted with a crane to be placed in parallel and framework for lower girder face is placed between lower flanges. Next, lateral connection reinforcement is passed through the holes on the girder web and the both ends are fastened up with nuts. Then, reinforcement for upper girder face, binding reinforcement and framework for lateral parts are assembled. After that, concrete is casted for the main bridge structure and this is all for the works for main bridge structure.
- Although this is a cast-in-place type bridge, on-site construction works finished after a short period of time because supporting works are unnecessary.

Construction works in the narrow area

- As H steel shapes are used as main girders, girder weight is light and they can be easily handled.
- This construction method has excellent applicability to various occasions such as construction works in the narrow area and inconvenient road conditions to the construction site.

Divided construction works

- As this method allows divided construction works, construction works can be done while switching the traffic on site and detours and temporary brides are unnecessary. This can minimize the construction cost and impact on the surrounding environment.

Minimum maintenance

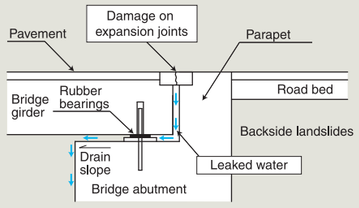
- As H steel girder adopts corrosion proof method with considerable endurance such as hot-dip galvanization and aluminum-zinc spraying, maintenance cost is low.
- Jointless structure can be adopted for this method, which can produce various effects including reduced cost for construction, maintenance and management, improved traveling performance, and enhanced durability with no water leak around bearings.

Applied conditions

- Maximum length between supports: Approx. 20m
- Bevel: 45 to 90 degrees

Adoption of jointless structure

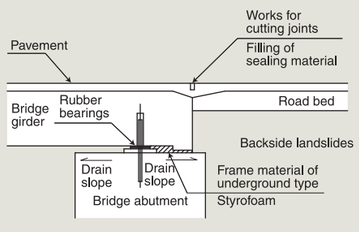
Conventional structure



Due to water leakage from the damaged part of expansion joint, deteriorations and damages are frequently caused on the member around the girder ends.

Jointless structure

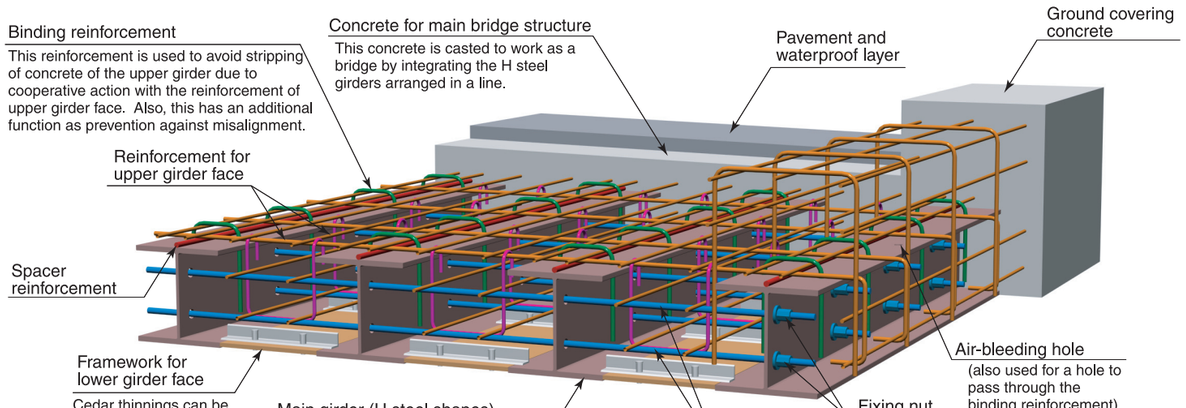
- Prevention of noise and oscillation
- Improved traveling performance
- Enhanced durability due to protection against water leakage
- Reduced construction cost
- Reduced maintenance and management cost



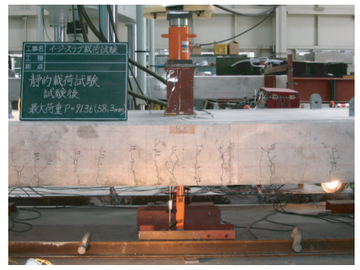
There is no water leakage around bearings and on the bridge bottom face any more.

Example of construction works for jointless structure

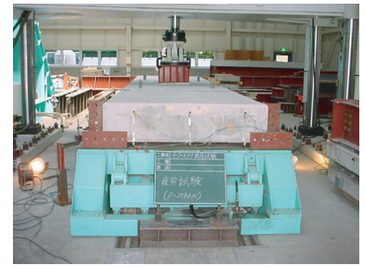
Figure for the image of the structure



Production of test girder



Destructive test

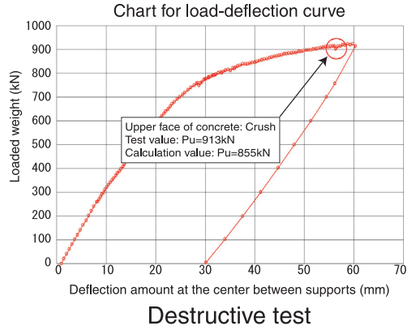


Cyclic load testing (2,000,000 times)

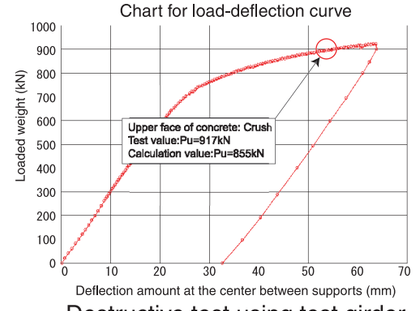
■Test for safety verification

In August, 2003 (at Faculty of Engineering, Kanazawa University)
Test for checking of lateral load distribution effects

In August, 2004 (In Tsukuba City, Ibaraki Pref.)
Destructive test
Cyclic load testing (2,000,000 times)
Destructive test using test girder after cyclic load testing



Destructive test



Destructive test using test girder after cyclic load testing

Construction flow

① Preparatory works

② Production of girders in a plant (drilling)

③ Construction of girders for installing rubber bearings and displacement limit equipments

④ Assembling of lateral connection reinforcement and reinforcement for upper girder face

⑤ Casting of concrete for main bridge structure

⑥ Bridge face works

⑦ Completion of construction works