Implant Bell Cap Bridge

Rapidly built economical structure for emergency temporary bridges, temporary platforms and permanent bridges etc.

Category | Prefabricated Steel Single-pier Bridge
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**Characteristics**

**Application**

Emergency Temporary Bridge

**Construction Sequence**

Step 1: Installation of Tubular Pile

Step 2: Installation of Bell Cap

Step 3: Completion of Pier Structure

Step 4: Installation of Main Crossbeam

Step 5: Installation of Steel Deck

Step 6: Move to next piling position

**Geotechnical information can be obtained from pile penetration resistance force during rotary jack-in installation.**

**Structural Advantages**

- Multi stress dispersion system with the bell cap drastically increasing bearing capacity and lateral resistance of the piers.
- Embedded depth of tubular piles can be reduced by the increased stress dispersion effect of the bell cap.

**Advantages of Construction Method**

- Gyropress Method (Rotary Jack-in Method) is applicable in any ground conditions.
- Real-time geotechnical information can be obtained during the pile installation process, which verifies the structural stability of the bridge.
- The bridge can easily be constructed and dismantled, therefore it can be re-used for future projects.
- Environmentally Friendly (ultra low noise and vibration)

**Overview of Implant Bell Cap Bridge**

For more contact information, please visit: [http://www.giken.com/en/contactus/groupcompanies](http://www.giken.com/en/contactus/groupcompanies)
Full-scale Field Tests

1. **Date**
   Thu 25/02/2016

2. **Location**
   GIKEN Ltd. Test Field in Konan-shi, Kochi, Japan

3. **Purpose**
   Verification of vertical and lateral bearing capacity of Implant Bell Cap Bridge

4. **Bridge Pier Components**
   - Tubular Pile: 800mm O.D.
     - L=9.0m (embedded depth of 4.4m)
   - Bell Cap: 2,200mm O.D.

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Load Testings

1. **Vertical Static Load Testing**
   - **Date**: Thu 25/02/2016
   - **Location**: GIKEN Ltd. Test Field in Konan-shi, Kochi, Japan
   - **Purpose**: Verification of vertical and lateral bearing capacity of Implant Bell Cap Bridge

   **Bridge Pier Components**
   - Tubular Pile: 800mm O.D.
   - Bell Cap: 2,200mm O.D.

   **Details of Structure**
   - Steel Deck
   - Universal Column
   - Main Crossbeam
   - Bell Cap

   **Loads at 80mm pile head displacement (i.e. 10% of the pile diameter)**
   - Tubular Pile without Bell Cap: 577.2kN
   - Tubular Pile with Bell Cap: 993.8kN
   (70% greater than that of the pile without Bell Cap)

   **Load at 15mm lateral displacement at ground level**
   - Tubular Pile without Bell Cap: 78.7kN
   - Tubular Pile with Bell Cap: 125.1kN
   (60% greater than that of the pile without Bell Cap)

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Vertical Static Load Testing

- Hydraulic Jack
- Load Cell
- Test Pile
- Reaction Pile

Lateral Static Load Testing

- Hydraulic Jack
- Load Cell
- Tensile Steel Bar φ36mm
- Test Pile
- Reaction Pile

**Load Cell**

- Hydraulic Jack
- Load Cell
- Tensile Steel Bar φ36mm
- Test Pile
- Reaction Pile

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**Steel Deck**

- Universal Column
- Main Crossbeam

**Bell Cap**

<table>
<thead>
<tr>
<th>Item</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Deck</td>
<td>3644kg</td>
</tr>
<tr>
<td>Tubular Pile</td>
<td>233kg/m</td>
</tr>
<tr>
<td>Main Crossbeam</td>
<td>2900kg</td>
</tr>
<tr>
<td>Bell Cap</td>
<td>1300kg</td>
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</tbody>
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