

Evaluation method and improvement of energy absorption of RC and PC structure member by using DFST

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Evaluation method and improvement of energy absorption of RC and PC structure member by using DFST

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一般

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構造工学・地震工学

Research Institution

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Concrete-filled Steel Tube / Energy Absorption / Concrete Dowel / Composite Beam / Bond Strength

Research Abstract

The RC and PC structures subjected to the impact-load such as earthquake and rock-fall are destroyed in brittleness. It is proposed that such a load having a low occurrence probability and huge energy should be absorbed by the plasticity deformation of structure. The development of structure members with excellent energy absorption and the establishment of its evaluation method are indispensable for that. This study has developed a new composite structure member by using concrete-filled steel pipe (CEST) instead of the compression steel-bars of RC and PC members and applied it to the structure which needs the high energy absorption. This report is arranged about the following items.

1. Push-out tests concerning bond strength of concrete-filled steel pipe (CFST) and the concrete block
 - (1)The concrete dowels, which are formed by using the bored steel-tube, are effective for the bond strength between the steel-tube and concrete block.
 - (2)The adhesion of steel-tube and concrete has been increased by the sand blasting processing of the steel-tube surface and/or by spreading adhesive agent on it.
2. Static bending test and impact load test on the composite beam reinforced with CFST were done. It was confirmed that toughness (deformability) was improved by using CFST for compression reinforcements.
3. Static bending load and axial force were applied on steel-tube and concrete composite column. The hole of the bored steel-tube becomes a defect, when the column is subjected to cyclic load.
4. Static load tests were done on a half-size model to simulate the real structure, i.e. rockshed.

Research Products (10 results)

All Other

All Publications (10 results)

- [Publications] Koji Maegawa: "Ductility of Steel Tube Reinforced Concrete Composite Beams" IABSE Conference Report "Composite Construction". 807-812 (1997) ▼
- [Publications] 前川幸次: "孔あきコンクリート充填鋼管の付着に関する研究" 土木学会中部支部平成9年度研究発表会講演概要集. 35-36 (1998) ▼
- [Publications] 上村浩茂: "コンクリート充填鋼管連続ばりの載荷実験とロックシェッド設計への応用" 構造工学論文集. 44A. 1575-1585 (1998) ▼
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- [Publications] Koji MAEGAWA: "DUCTILITY OF STEEL TUBE REINFORCED CONCRETE BEAMS" IABSE CONFERENCE REPORT"COMPOSITE CONSTRUCTION". 807-812 (1997) ▼
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- [Publications] Masanori SHIOMI: "PUSH OUT TEST OF BORED STEEL-TUBE AND CONCRETE BLOCK" THE 53-rd JSCE ANNUAL MEETING REPORT,COMMON SESSION. 336-337 (1998) ▼

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