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Earthquake-Proof Composite Bridge Column Using Deformed H-Shapes

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(Yoshitake Oka)

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Synopsis :
A proposed composite bridge column (REED method) has been developed with the aims of speedy construction, labor saving, and increase in resistance against earthquake. For the purpose of achieving these objects, the composite bridge column consists of precast forms, deformed H-shapes as an alternative material for reinforcing bars, and filled-in concrete. The present study has verified the mechanical characteristics and the construction conditions of the composite bridge column. As a result of the studies, the followings are confirmed: (1) The composite structure can be designed on the basis of RC method wherein deformed H-shapes are treated as equivalents for reinforcing bars. (2) The ductility (resistance against earthquake) of the composite structure is more excellent than that of a conventional reinforced structure. (3) The reduction ratios of the construction period and the labor force of the composite pier method, as compared with those of a conventional method, are 64 á and 46 á , respectively.

突起付 H 形鋼を用いた高耐震複合構造橋脚*

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要旨

橋脚の耐震性向上，橋脚施工の合理化といったニーズに答えうる工法として，突起付 H 形鋼とプレキャスト埋設型枠を用いた鉄骨コンクリート複合構造橋脚（DEEP 工法）を開発し，構造特性と

工の合理化、ならびに安全性の向上などの施工上の利点が大き

Steel	Strain on allowable stress * (μ)	Yield strength (MPa)	Tensile strength (MPa)	Modulus of elasticity (GPa)

Legend		Specimen		
		RC	SC	SCP
Concrete strength	Compressive strength	36.1	35.0	28.8

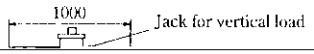
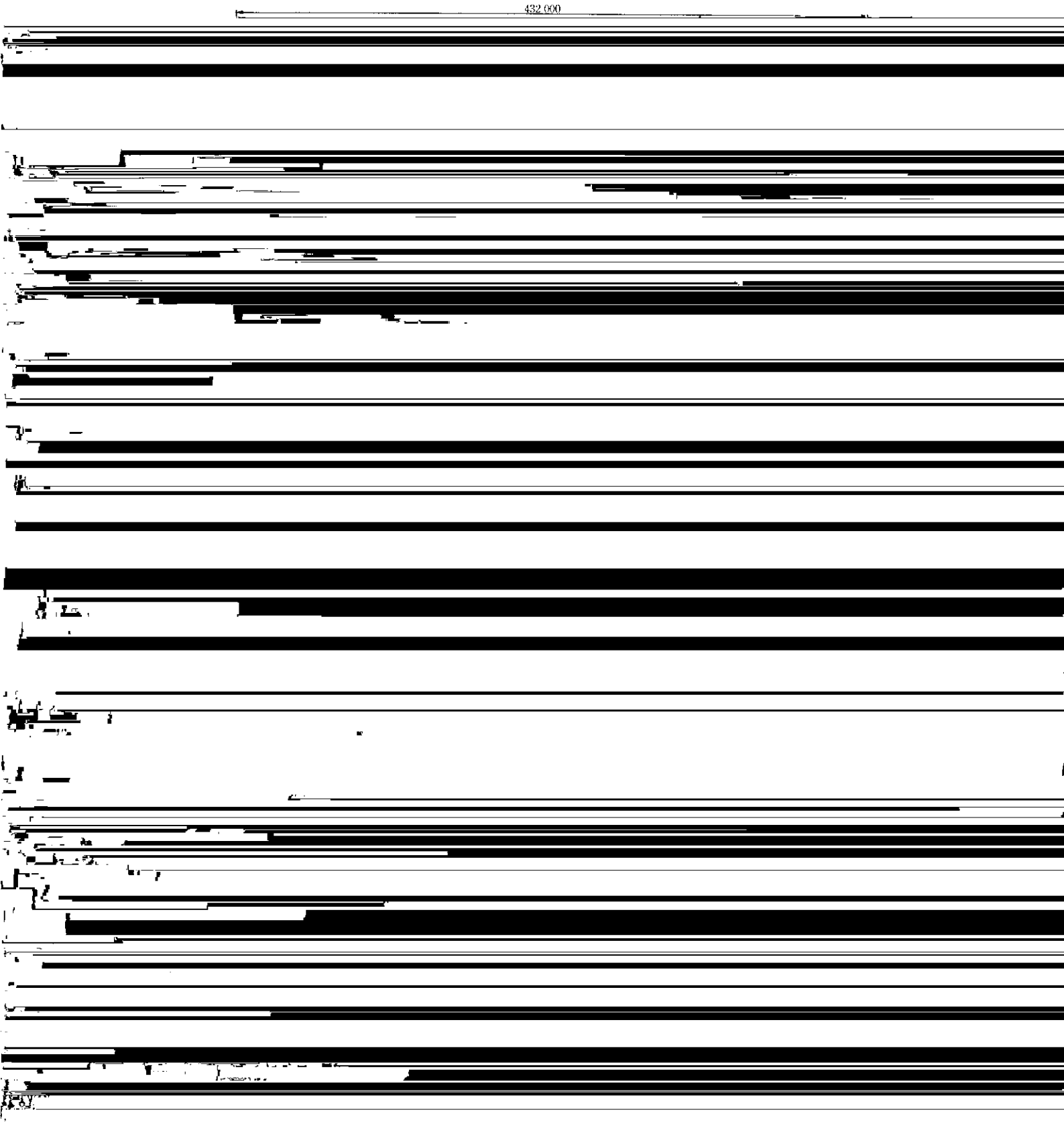


Table 5 Material properties of concretes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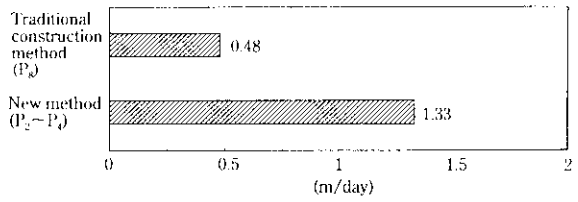
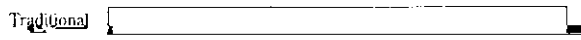


Fig. 12 Speed of construction



（2） 梁曲げせん断試験において，突起付 H 形鋼を用いた鉄骨コンクリート試験体（プレキャスト型枠なし）に発生した最大ひび割れ幅は，ひび割れに対する配慮が必要な使用限界状態に相当する荷重レベルでは，RC 試験体とほぼ同等であった。

一方，これら 2 つの供試体よりも，この鉄骨コンクリート構造の表面にステンレスファイバーを混入したプレキャスト型枠「SEED フォーム」を配置した試験体（提案した構造）の方が，すべての荷重レベルにおいて最大ひび割れ幅が小さかった。

（3） 水平交番載荷実験において，RC 試験体が 7δy で終局に至っ