

アルカリシリカ反応によって劣化したコンクリートの残留膨張の予測に関する基礎研究

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1995 Fiscal Year Final Research Report Summary

Fundamental Study on the Prediction of Residual Expansion of ASR Deteriorated Concrete

Research Project

Project/Area Number

06650497

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

土木材料・力学一般

Research Institution

Kanazawa University

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Project Period (FY)

1994 - 1995

Keywords

Alkali-Aggregate Reaction / NaCl / Residual Expansion / Accelerated Test / Pore Solution / Concrete Core

Research Abstract

The results obtained are divided into the following two categories.

(I) Expansion behavior of concrete cores drilled from the existing ASR deteriorated concrete structures under the two curing conditions and (II) Discussion on the significance of the accelerated testing from the viewpoint of the relation between the expansion of reactive aggregate-containing

mortars and pore solution composition. The results of the foamer are summarized as follows ; (1) Relatively large amounts of chloride existed in the ASR deteriorated concrete structures. The chloride may come from NaCl used as a deicing agent.(2) The residual expansion of ASR affected concrete can be predicted during shorter periods by the Danish method than by the usual accelerated testing.(3) The discrimination between ASR affected concretes with and without residual expansiveness is more sharply defined by the Danish method than the usual accelerated testing. The results of the latter are summarized as follows ; (1) OH-ion concentration in the pore solution in mortars immersed in the saturated NaCl solution rapidly increased immediately after immersion. The maximum OH-ion concentration was proportional to the alkali content in the mortars.(2) Expansions of mortars containing reactive flint immersed in the saturated NaCl solution were as large as approximately twice those of the corresponding mortars under a moist environment in the usual accelerated testing. The correlation between both was very good.

Research Products (11 results)

All Other

All Publications (11 results)

[Publications] 川村 満紀: "異なる自然環境下におけるコンクリートのアルカリシリカ反応による膨張とひびわれ" 自然環境とコンクリート性能に関するシンポジウム論文集. 243-248 (1993) ▼

[Publications] K.Takeuchi: "Texture of Existing Concretes Affected by the Alkali-Silica Reaction and Prediction of their Residual Expansion Capacity" Proc.of 6th Int.Conf.on Durability of Building Materials and Components. 2. 1343-1352 (1993) ▼

[Publications] 竹内 勝信: "アルカリシリカ反応によって劣化したコンクリートの組織と残留膨張性の予測" 材料学会誌材料. 43. 963-969 (1994) ▼

[Publications] M.Kawamura: "Alkali-Silica Reaction and Pore Solution Composition in Mortars in Sea Water" Proc.of R.N.Swamy Symposium in 5th CANMET/ACI Int.Conf. 235-250 (1995) ▼

[Publications] 川村 満紀.: "ASRによって劣化したコンクリート橋脚の残存膨張性の予測" 土木学会第48回年次学術講演会. 456-457 (1993) ▼

[Publications] 竹内 勝信: "飽和NaCl溶液中の反応性骨材含有モルタルの膨張と細孔溶液の組成" 土木学会第49回年次学術講演会. 716-717 (1994) ▼

[Publications] M.Kawamura et al: "Expansion and Cracking due to Alkali-Silica Reaction in Concretes under Two Natural Different Environments" Proc. of JCI Conf. on Performance of Concrete under Natural Weathering Conditions (in Japanese). 243-248 (1993) ▼

[Publications] K.Takeuchi et al.: "Texture of Existing Concretes Affected by the Alkali-Silica Reaction and Prediction of their Residual Expansion" Proc. of 6th Int. Conf. on Durability of Building Materials and Components. 1343-1352 (1993) ▼

[Publications] M.Kawamura et al.: "Alkali-Silica Reaction and Pore Solution Composition in Mortars in Sea Water" Proc. of R.N.Swamy Symposium. 235-250 (1995) ▼

[Publications] M.Kawamura et al.: "Prediction of Residual Expansion of damaged Concrete Piers due to ASR" Proc. of 48th Annual Conf. on the Society of Civil Engineering (in Japanese). 5. 456-457 (1993) ▼

[Publications] K.Takeuchi et al.: "Expansion of Pore Solution Compositions in Reactive Aggregate Bearing Mortars in the Saturated NaCl Solution" Proc. of 48th Annual Conf. on the Society of Civil Engineering (in Japanese). 5. 716-717 (1994) ▼

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