



Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
Manila

097.13 DPWH
02-14-2008

FEB 13 2008

DEPARTMENT ORDER) SUBJECT: DPWH Standard Specifications for
No. 08) Non-Shrink Grout, Item 727
Series of 2008 02-14-08)

In line with the mandate of the Department in providing effective standard specifications to be used in the implementation of various infrastructure projects and in view of the need of setting standard specifications for non-shrink grout, the attached **DPWH Standard Specifications for Non-Shrink Grout, Item 727**, are hereby prescribed, for the guidance and compliance of all concerned.

These specifications shall form part of the revised edition of the DPWH Standard Specifications (Volume II-Highways, Bridges and Airports).

This Order shall take effect immediately.

HERMOGENES E. EDDANE, JR.
Secretary

Attachment: As stated



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DPWH STANDARD SPECIFICATION FOR

ITEM 727 – NON-SHRINK GROUT

727.1 Description

This item shall consist of mixing and placing of non-shrink grout on anchor bolts, retrofitted reinforcing steel, steel column bases, bearing plates, precast concrete key ways and other installations that require high early and high ultimate strength making it stable and capable of handling load transfers in accordance with this specification and in conformity with the lines, grades, dimensions and cross-sections shown on the approved Plans or as established by the Engineer.

727.2 Material Requirements

727.2.1 Non-Shrink Grout (Pre-mixed Powder)

Non-shrink grout (pre-mixed powder) shall be non-metallic, contains no chlorides and shall conform to ASTM C 1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink).

727.2.2 Water

Water shall conform to the requirements of Item 714, Water.

727.2.3 Curing Compound

Curing compound shall conform to ASTM C 309, Liquid Membrane – Forming Compounds for Curing Concrete.

727.3 Construction Requirements

727.3.1 Surface Preparation

Surfaces to receive the grout must be clean and free of any type of foreign matter, grease, paint, oil, scale, rust, dust or efflorescence. Concrete surfaces shall be sound and roughed to promote mechanical adhesion. The area shall be thoroughly flushed and soaked with clean water prior to grouting, leaving no standing water.

727.3.2 Formworks

Formworks shall be firmly in place and kept watertight. All joints in formwork shall be caulked with suitable caulking material to prevent leakage. Forms shall be lined or coated with bond-breaker for easy removal. High points shall be adequately vented to allow entrapped air to escape.

727.3.3 Mixing

The non-shrink grout shall be mixed in mechanical mixing equipment of a type that will produce uniform and thoroughly mixed grout.

Pre-gauged mixing water shall first be added to the mixer followed by pre-mixed powder. Non-shrink grout mix shall be mechanically mixed continuously for a minimum of 3 minutes or as recommended by the manufacturer until an even consistency is attained. Lumping of the mixture shall be avoided at all times during the mixing procedure. Grout mix shall be kept well agitated until placed.

Non-shrink grout shall not be amended with cement or sand, and shall not be reconditioned with water after initial mixing.

727.3.4 Placement

Unless otherwise recommended by the manufacturer, minimum application thickness of non-shrink grout shall be 10 mm and shall be placed within 60 minutes after mixing.

Non-shrink grout mix shall be placed into forms in normal manner to avoid air entrapment. The most suitable means shall be used to completely fill the void to be grouted. Non-shrink grout shall be poured from one side of the plate towards the open side. If necessary and allowed by the manufacturer, grout mix shall be vibrated, pumped, or rammed to achieve flow or compaction.

When carrying out baseplate grouting, concrete surfaces shall be prewet for 24 hours and sufficient pressure head shall be maintained to keep non-shrink grout flow uninterrupted. Cable or chain shall be used to make sure that all cavities are filled and entrapped air escaped.

If required in the plans or as directed by the Engineer, non-shrink grout may be placed or packed with the use of an approved commercial concrete bonding agent applied to all cured concrete surfaces being grouted. The bonding agent shall be compatible with the brand of non-shrink grout being used. Water as a substitute for commercial bonding agent for non-shrink grout shall not be allowed.

If necessary, low-pressure cement grout pumping equipment may be used. Unused non-shrink grout shall be discarded after 20 minutes and shall not be used.

After non-shrink grout has achieved final set, forms shall be removed and the exposed grout shoulders shall be trimmed or shaped to designed profile.

Non-shrink grout shall not be used in areas of extreme high vibration, nor where service temperatures will exceed 175⁰ C, nor where contact with acids or alkalies are likely.

727.3.5 Curing

Unless required by the manufacturer, exposed surfaces of non-shrink grout shall be wet cured for a minimum of 3 days or shall be applied with a curing compound meeting the requirements of Subsection 727.2.3.

727.3.6 Temperature

Ambient and grout temperature shall be maintained at 10⁰C to 32⁰C (50⁰-90⁰F)

727.3.7 Handling and Storage

Keep bag/container closed in a cool dry place. The contractor shall provide suitable means of storing and protecting the non-shrink grout against dampness. Non-shrink grouts which for any reason has become partially set or which contains lumps of caked non-shrink grout shall be rejected. Non-shrink grout salvaged from discarded or used bags/containers shall not be used.

727.4 Acceptance

Non-shrink grout shall be evaluated by visual inspection and by a mill certification from the manufacturer. Non-shrink grout accepted by certification may be sampled and tested at any time. If found not in conformance with the contract, the material shall be rejected whether in place or not.

727.5 Measurement and Payment

Non-shrink grout shall not be measured and paid for separately, but the cost thereof shall be considered as included in the contract unit price of the items where called for.

References:

1. American Society for Testing and Materials (ASTM)
2. American Association of State Highways and Transportation Officials (AASHTO)
3. Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-03, Metric Units), U.S. Department of Transportation Federal Highway Administration
4. Construction Standard Specifications, Public Works Standards, Department of Environmental Services, City of Gresham, Oregon, USA
5. DPWH Standard Specifications for Highways, Bridges and Airport, Volume II, 2004 Edition
6. Non-Shrink Grout (SikaGrout 212, 112 and 215) Product Brochure, Sika Philippines, Inc.
7. Non-Shrink Grout (SikaGrout 328) Product Brochure, Sika Corporation, New Jersey, USA
8. Non-Shrink Grout (Quikrete FastSet) Product Brochure, The Quikrete Companies, Atlanta, Georgia, USA
9. King Non-Shrink Grout 410 Product Brochure
10. Today's Non-Shrink Grouts (An article from "L & M Concrete News Magazine", USA)
11. Wikipedia Encyclopedia