097.13 DPWH
12-01-2005

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
MANILA

NOV 30 2005

DEPARTMENT ORDER)
NO. 95)
Series of 2005)

SUBJECT: Use of Monofilament Polypropylene Fiber (Fibrin 23) as Additive to Concrete Mix

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In line with the continuing efforts to upgrade the construction technology thru the adoption of successful research studies, this Department has approved the use of Fibrin 23 as Additive to concrete subject to its specifications hereto attached. A Certificate of Conditional Approval had been issued by this Department, accrediting the use of Fibrin 23 in DPWH projects from September 2004 until September 2009.

This order takes effect immediately.

HERMOGENES E. EBDANE, JR.
Acting Secretary

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DEPARTMENT ORDER)
NO. 95)
SERIES OF 2005)

ANNEX "A"

SPECIFICATION ON THE USE OF FIBRIN 23 (MONOFILAMENT POLYPROPYLENE FIBERS) IN PORTLAND CEMENT CONCRETE PAVEMENT

1.0 Description

This item shall consists of furnishing and placing of FIBRIN 23 in portland cement concrete pavement, with or without reinforcement, constructed on the prepared base in accordance with this specification and in conformity with the lines, grades, thickness and typical cross-sections shown on the Plans, or as established by the Engineer.

2.0 Material Requirements

2.1 FIBRIN 23

FIBRIN 23 is a monofilament polypropylene extract fiber, non-toxic and not hazardous to health and is resistant to acid and alkali designed to enhance the overall quality of concrete.

Properties of FIBRIN 23

Physical

Material	-	Polypropylene extract synthetic fiber
Design	-	Micromonofilament
Fiber Length	-	12 mm
Diameter	-	18 µ nominal dia. (almost half the dia. of human hair).
Shape	-	Crimped
Color	-	Natural
Tensile Strength	-	550 Mpa max.
Softening Point	-	160 °C max.
UV Resistance	-	High
Matrix Bonding	-	Excellent

Chemical

Surface	-	Coated for dispersion, adhesion and bonding
Density	-	0.91 g nominal
Absorption	-	Nil
Chemical Resistance	-	Satisfactory
Conductivity	-	Minimal

2.2 Portland Cement

It shall conform to the requirements of Subsection 311.2.1, Portland Cement, Item 311 – Portland Cement Concrete Pavement.

2.3 Fine Aggregate

It shall conform to the requirements of Subsection 311.2.2, Fine Aggregate, Item 311 – Portland Cement Concrete Pavement.

2.4 Coarse Aggregate

It shall conform to the requirements of Subsection 311.2.3, Coarse Aggregate, Item 311 – Portland Cement Concrete Pavement.

2.5 Water

It shall conform to the requirements of Subsection 311.2.4, Water, Item 311 – Portland Cement Concrete Pavement.

2.6 Reinforcing Steel

It shall conform to the requirements of Subsection 311.2.5, Reinforcing Steel, Item 311 – Portland Cement Concrete Pavement.

2.7 Joint Fillers

It shall conform to the requirements of Subsection 311.2.6, Joint Fillers, Item 311 – Portland Cement Concrete Pavement.

2.8 Admixtures

It shall conform to the requirements of Subsection 311.2.7, Admixtures, Item 311 – Portland Cement Concrete Pavement.

2.9 Curing Materials

It shall conform to the requirements of Subsection 311.2.8, Curing Materials, Item 311 – Portland Cement Concrete Pavement.

2.10 Calcium Chloride

It shall conform to AASHTO M144, if specified or permitted by the Engineer.

2.11 Storage of Cement and Aggregate

It shall conform to the requirements of Subsection 311.2.10, Storage of Cement and Aggregate, Item 311 – Portland Cement Concrete Pavement.

2.12 Packaging, Dispensing and Storage of FIBRIN 23

Fibers are packed in the desired measured quantities in either plastic or degradable paper bags. Paper degradable bags should be added to the truck or

plant mixer unopened. Plastic bags will need to be opened and the fibers added manually. One bag of fiber is the required amount per one cubic meter of concrete.

All boxes of fibers shall be stored, immediately upon delivery at the site, on a clean surface, in dry conditions under cover, away from the possibility of damage and in the place approved by the Engineer.

2.13 Proportioning, Consistency and Strength of Concrete

It shall conform to the requirements of Subsection 311.2.11, Proportioning, Consistency and Strength of Concrete.

3.0 Construction Requirements

3.1 Quality Control of Concrete

It shall conform to the requirements of Subsection 311.3.1, Quality Control of Concrete, Item 311 – Portland Cement Concrete Pavement.

3.2 Equipment

It shall conform to the requirements of Subsection 311.3.2, Equipment, Item 311 – Portland Cement Concrete Pavement.

3.3 Preparation of Grade

It shall conform to the requirements of Subsection 311.3.3, Preparation of Grade, Item 311 – Portland Cement Concrete Pavement.

3.4 Setting Forms

It shall conform to the requirements of Subsection 311.3.4, Setting Forms, Item 311 – Portland Cement Concrete Pavement.

3.5 Conditioning of Subgrade or Base Course

It shall conform to the requirements of Subsection 311.3.5, Conditioning of Subgrade or Base Course, Item 311 – Portland Cement Concrete Pavement.

3.6 Handling, Measuring and Batching Materials

It shall conform to the requirements of Subsection 311.3.6, Handling, Measuring and Batching Materials, Item 311 – Portland Cement Concrete Pavement.

3.7 Mixing Concrete

It shall conform to the requirements of Subsection 311.3.7, Mixing Concrete, Item 311 – Portland Cement Concrete Pavement.

3.8 Addition and Mixing of FIBRIN 23 in Concrete Mix

The amount of FIBRIN 23 to be added in concrete mix shall be at a recommended dosage of 0.91 kg/m³ (0.1% by volume or 1 liter per cubic meter). The fibers shall be added at either a conventional batching/mixing plant or by hand to the ready mix truck on site. An even distribution throughout the concrete can be achieved in truck mixers in four to five minutes at full mixing speed.

3.9 Limitation of Mixing

It shall conform to the requirements of Subsection 311.3.8, Limitation of Mixing, Item 311 – Portland Cement Concrete Pavement.

3.10 Placing Concrete

It shall conform to the requirements of Subsection 311.3.9, Placing Concrete, Item 311 – Portland Cement Concrete Pavement.

3.11 Test Specimens

It shall meet the requirements of Subsection 311.3.10, Test Specimens, Item 311 – Portland Cement Concrete Pavement.

3.12 Strike-off of Concrete and Placement of Reinforcement

It shall conform to the requirements of Subsection 311.3.11, Strike-off of Concrete and Placement of Reinforcement, Item 311 – Portland Cement Concrete Pavement.

3.13 Joints

It shall conform to the requirements of Subsection 311.3.12, Joints, Item 311 – Portland Cement Concrete Pavement.

3.14 Final Strike-off (Consolidation and Finishing)

It shall conform to the requirements of Subsection 311.3.13, Final Strike-off (Consolidation and Finishing), Item 311 – Portland Cement Concrete Pavement.

3.15 Surface Test

It shall conform to the requirements of Subsection 311.3.14, Surface Test, Item 311 – Portland Cement Concrete Pavement.

3.16 Curing

It shall conform to the requirements of Subsection 311.3.15, Curing, Item 311 – Portland Cement Concrete Pavement.

If steam curing at a temperature in excess of 160 °C is to be used, polypropylene fibers should not be used.

3.17 Removal of Forms

It shall conform to the requirements of Subsection 311.3.16, Removal of Forms, Item 311 – Portland Cement Concrete Pavement.

3.18 Sealing Joints

It shall conform to the requirements of Subsection 311.3.17, Sealing Joints, Item 311 – Portland Cement Concrete Pavement.

3.19 Protection of Pavement

It shall conform to the requirements of Subsection 311.3.18, Protection of Pavement, Item 311 – Portland Cement Concrete Pavement.

3.20 Concrete Pavement – Slip Form Method

It shall conform to the requirements of Subsection 311.3.19, Concrete Pavement – Slip Form Method, Item 311 – Portland Cement Concrete Pavement.

3.21 Acceptance of Concrete

It shall conform to the requirements of Subsection 311.3.20, Acceptance of Concrete, Item 311 – Portland Cement Concrete Pavement.

3.22 Opening to Traffic

It shall conform to the requirements of Subsection 311.3.21, Opening to Traffic, Item 311 – Portland Cement Concrete Pavement.

3.23 Tolerance and Pavement Thickness

It shall conform to the requirements of Subsection 311.3.22, Tolerance and Pavement Thickness, Item 311 – Portland Cement Concrete Pavement.

4.0 Method of Measurement

The area to be paid for under Item 311 shall be the number of square meters (m^2) of concrete pavement placed and accepted in the completed pavement. The width for measurements will be the width from outside edge to outside edge of

completed pavement as placed in accordance with the Plans or as otherwise required by the Engineer in writing. The length will be measured horizontally along the center line of each roadway or ramp. Any curb and gutter placed shall not be included in the area of concrete pavement measured.

FIBRIN 23 will be measured separately in cubic meter (m^3).

5.0 Basis of Payment

The accepted quantity, measured as prescribed in Section 4, shall be paid for at the contract unit price for Portland Cement Concrete Pavement and FIBRIN 23, which price and payment shall be full compensation for preparation of roadbed and finishing of shoulders, unless otherwise provided by the Special Provisions, furnishing all materials, for mixing, placing, finishing and curing all concrete, for furnishing and placing all joint materials, for sawing weakened plane joints, for fitting the prefabricated center metal joint, for facilitating and controlling traffic, and for furnishing all labor, equipment, tools and incidentals necessary to complete the item.

Payment will be made under:

Payment Item Number	Description	Unit of Measurement
311(1)	PCC Pavement (Plain)	Square meter
311(2)	PCC Pavement (Reinforced)	Square meter
	FIBRIN 23	Cubic meter

Republic of the Philippines
Department of Public Works and Highways
Office of the Secretary

CERTIFICATE OF CONDITIONAL APPROVAL

Product Accreditation

This is to certify that

FIBRIN 23

which is exclusively distributed
in the Philippines by:

Tertex International Phils., Inc.
401 Earthrise Bldg., Javier corner Victor Streets
Makati City

is duly accredited for use in DPWH projects as additive to Portland Cement Concrete Pavement (PCCP), subject to its specifications (hereto attached) pursuant to the provisions of DPWH Department Order No. 189, series of 2002.

This Accreditation shall remain in force until expiry date printed below, subject to compliance with the requirements of the aforementioned Department Order.

Conditional Approval No.	:	004
Date Issued	:	September 2004
Expiry Date	:	September 2009

FLORANTE SORIQUEZ
Acting Secretary