



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

097.13 DPWH

06.05.2023

MAY 04 2023

DEPARTMENT ORDER)
No. 54)
Series of 2023)
A 6/5/2023

SUBJECT : DPWH Standard Specification for
Polymer Stabilized Subbase/ Base/
Surface Course

In line with the continuing efforts to upgrade the construction technology thru adoption of successful research studies, this Department has approved the use of Polymer Liquid Soil Stabilizer, subject to the specifications hereto attached. A Certificate of Product Accreditation has been issued by this Department authorizing its use in various DPWH infrastructure projects.

This Standard Specification shall form part of the DPWH Standard Specifications for Highways, Bridges and Airports, Volume II and is now included in the Project and Contract Management Application (PCMA).

This Order supersedes the Standard Specification for Item 206, Chemically Stabilized Road Mix Sub-base/ Base Course and shall take effect immediately.


MANUEL M. BONOAN
Secretary

14.1.2 MLL/JDV/RPF

Department of Public Works and Highways
Office of the Secretary



WIN3U01862

DPWH STANDARD SPECIFICATION FOR POLYMER STABILIZED SUBBASE/ BASE/ SURFACE COURSE

206.1 Description

This Item shall consist of furnishing, placing and compacting soil with polymer liquid soil stabilizer to be used as subbase, base or surfacing materials along low, medium and high trafficked and at unpaved roads in accordance with this Specification and the lines, grades, thickness and typical cross-sections shown on the Plans, or as established by the Engineer.

206.2 Material Requirements

206.2.1 Soil Aggregates

It shall consist of any combination of gravel, sand, silt and clay or other approved combination of materials free from vegetable or other objectionable matter. It may be materials encountered in the construction site or materials obtained from approved sources. The crushed or uncrushed granular material shall consist of hard, durable stones and rocks of accepted quality, free from an excess of flat, elongated, soft or disintegrated pieces or other objectionable matter. It is the intent of this Specification to utilize soils existing on the roadbed if the quality is satisfactory. If the quality and/or quantity is deficient, the soil aggregate shall be obtained wholly or partly from approved outside sources.

206.2.2 Polymer Liquid Soil Stabilizer

The Polymer Liquid Soil Stabilizer shall be water soluble and environmentally safe chemical as indicated in the Materials Safety Data Sheet and Manufacturer's Mill Certificate.

206.2.3 Water

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

206.2.4 Strength of Mixture

The soaked CBR value of treated soil material with polymer liquid soil stabilizer shall not be less than the strength requirement of aggregate subbase, base or surface course. The soaked CBR of untreated soil shall be determined by AASHTO T 193, Standard Method of Test for The California Bearing Ratio.

206.3 Construction Requirements

206.3.1 Weather Limitations

Polymer liquid solution shall not be applied during rainy or impending bad weather condition.

In the event rain occurs during operations, the work shall be promptly stopped and the entire section shall be reconstructed in accordance with this Specification.

206.3.2 Construction Equipment

Equipment and tools necessary for handling the material and performing all parts of the works shall be approved by the Engineer. The equipment shall be at the jobsite sufficiently ahead of the start of the application.

206.3.3 Trial Section

Trial sections shall be constructed at least two (2) weeks before actual construction. The purpose of the trial sections is to check the suitability of the materials, efficiency of the equipment and the construction method which is proposed to be used by the Contractor. This shall conform to the applicable requirements of subsection 200.3.4, Trial Sections of Item 200, Aggregate Subbase Course.

206.3.4 Subgrade Preparation

The existing road surface shall be scarified to a depth of 150 mm to 200 mm and the existing soil aggregate materials shall be stockpiled on both sides of the road. Oversized rocks stones/rocks shall be removed while holes/depressions shall be filled with soil aggregates.

Rolling of subgrade shall follow until the required compaction is attained.

206.3.5 Proportioning of Mixture

One (1) liter of polymer liquid stabilizer shall be added in every 50 to 100 liters of water. The exact dilution rate shall be fixed by the Engineer on the basis of preliminary laboratory tests and trial mixes of materials furnished.

206.3.6 Application, Spreading and Compaction of Subbase/Base/Surface Course with Polymer Liquid Soil Stabilizer

After the preparation of subgrade, a windrow procedure on stockpiled soil aggregate materials shall be carried out in the application of Polymer Liquid Soil Stabilizer. The Polymer Liquid Soil Stabilizer shall be mixed with water inside a drum/water truck as per the required dilution rate. The liquid solution shall be applied to the stockpiled soil at a rate of 0.04 L/sq.m. or 0.20 L/cu.m. and shall be mixed thoroughly.

After the soil aggregates have been thoroughly mixed with the liquid solution, the treated soil shall be spread and compacted to the specified thickness as per approved Plan.

Spreading and compacting shall be in accordance with Subsection 200.3.3, Spreading and Compacting of Item 200.

206.3.7 Tolerances

The stabilized subbase/base/surface course shall be laid to the designed level and transverse slopes as indicated on the Plans. The allowable tolerances shall be in accordance with Subsection 200.3.5, Tolerance of Item 200, Aggregate Subbase Course, Subsection 201.3.5, Tolerance of Item 201, Aggregate Base Course and Subsection 300.3.4, Surface Course Thickness and Tolerances of Item 300, Aggregate Surface Course.

206.4 Acceptance

The California Bearing Ratio (CBR) of in-placed stabilized soil shall be greater than 30% for subbase course and 80% for base and surface courses as determined using a Dynamic Cone Penetrometer in accordance with ASTM 6951M, Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications.

206.5 Method of Measurement

Soil treated with polymer liquid soil stabilizer shall be measured in cubic meter (m³). The quantity to be paid for shall be the design volume compacted in-place as shown on the Plans, and accepted in the completed course. No allowance shall be given for materials placed outside the design limits shown on the cross-sections. Trial sections shall not be measured separately but shall be included in the quantity of treated soil herein measured.

206.6 Basis of Payment

The accepted quantities, measured as prescribed in Section 206.5, Method of Measurement, shall be paid for at the Contract Unit Price for the quantity of Polymer Stabilized Subbase/Base/Surface Course which price and payment shall be full compensation for furnishing and placing all materials, including all labor, equipment, tools and incidentals necessary to complete the work prescribed in the Item.

Payment shall be made under:

Pay Item Number	Description	Unit of Measurement
206 (1)	Polymer Stabilized Subbase/ Base/ Surface Course	Cubic meter

References:

1. *Final Evaluation Report on the Study on the Use of RT-20 as Polymer Liquid Soil Stabilizer*
2. *DPWH Standard Specifications for Highways, Bridges and Airport, Volume II, 2004 Edition*
3. *American Association of State Highway and Transportation Officials (AASHTO), 2019 Edition*
4. *American Society for Testing and Materials (ASTM)*

CERTIFICATE OF PRODUCT ACCREDITATION

This is to certify that

RT-20 SOIL STABILIZER

Supplied by

TOPPS Product Phils., Inc.

901 SRMC Bldg., Aurora Boulevard
Cubao, Quezon City

is duly accredited for use in DPWH projects as a polymer liquid soil stabilizer, subject to its specifications (hereto attached) pursuant to the provisions of Department Order No. 189, series of 2002.

Accreditation Number : **0011**
Date Issued : **March 29, 2023**


MANUEL M. BONOAN
Secretary

Department of Public Works and Highways
Office of the Secretary

