**SECTION 32 01 90.16 Amending Soils**

**Fast-Acting Soil Neutralizer**

GENERAL

1.01 SUMMARY

1. This section specifies the dry-applied Aqua-pHix™ Granular designed to decrease the pH of alkaline soils and substrates. This product is intended to be incorporated into soils or topdressed and used in conjunction with sustained release soil pH neutralizers.
2. Related Sections: Other Specification Sections, which directly relate to the work of this Section include, but are not limited to the following:
   1. *Section 01 57 00 – Temporary Erosion and Sediment Control*
   2. *Section 02 24 23 – Chemical Sampling and Analysis of Soils*
   3. *Section 31 00 00 – Earthwork*
   4. *Section 31 25 00 – Erosion and Sedimentation Controls*
   5. *Section 31 91 00 – Planting Preparation*
   6. *Section 32 92 00 – Turf and Grasses*

1.02 SUBMITTALS

1. Product Data: Submit manufacturer’s product data and installation instructions. Include required substrate preparation, list of materials and application rate.
2. Certifications: Manufacturer shall submit a letter of certification that the product meets or exceeds all technical and packaging requirements and is made in the USA.

1.03 DELIVERY, STORAGE AND HANDLING

1. Deliver materials and products in weather-resistant factory labeled packages. Store and handle in strict compliance with manufacturer’s instructions and recommendations. Protect from damage, weather, excessive temperatures and construction operations.

PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

1. PROFILE Products LLC

750 Lake Cook Road – Suite 440

Buffalo Grove, IL 60089

International - +1-847-215-1144

United States and Canada – 800-366-1180 (Fax 847-215-0577)

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2.02 MATERIALS

1. The Slow-Release Soil Neutralizer shall be Aqua-pHix™ Granular and conform to the following characteristics:
   1. pH: < 1.0

2.03 COMPOSITION

1. All components of the Slow-Release Soil Neutralizer shall be pre-packaged by the manufacturer to assure both material performance, optimal mixing and compliance with the following values. No additives with the exception of hydraulic mulch, fertilizer, biotic soil media and additional biostimulant materials should be added to this product.
   1. Hydrochloric Acid 1%
   2. Phosphoric Acid 1%
   3. Oxalic Acid 0.1%
   4. Citric Acid 0.1%
   5. Calcined Fuller Earth (Calcined Clay) 97.8%

2.04 PACKAGING

1. Bags: Net Weight – 50 lb (22.7 kg), weather-resistant

Pallets: Weather-proof, stretch-wrapped with pallet cover

Pallet Quantity: 40 bags/pallet or 1 ton (909 kg)/pallet

EXECUTION

3.01 SOIL TESTING

1. Soil Samples shall be taken and sent to a third-party, independent lab for analysis and in compliance with Section 02 24 23 *–* Chemical Sampling and Analysis of Soils, if applicable.
2. The tests shall include analysis and interpretation of results.
3. The soil testing methods used shall be compliant with recognized agronomic testing standards, as outlined in *Section 02 24 23* The soil testing methods used shall be compliant with recognized agronomic testing standards, as outlined in *Section 02 24 23 – Chemical Sampling and Analysis of Soils*, for revegetation of disturbed sites.
4. Soil Analysis shall include results for:
   1. Soil pH
   2. Soluble Salts
   3. Excess Carbonate
   4. Organic Matter
   5. Nutrient readings for:
      1. Nitrogen, Phosphorus, Potassium
      2. Magnesium, Calcium, Sodium, Manganese, Sulfur, Zinc, Copper, Iron, Boron
   6. Cation Exchange Capacity
   7. Percent Base Saturation Sodium
5. ProGanics™ BSM™, JumpStart™, BioPrime™ and/or other amendments shall be specified according to *Section 32 01 90.16 – Amending Soils* and applied with the hydroseeding slurry at Manufacturer recommended rates based on soil test results.
   1. If JumpStart is recommended to amend the substrate, Aqua-pHix must be applied first and in a separate application without JumpStart or seed.

3.02 VEGETATION SPECIES SELECTION

1. Once soils have been analyzed for agronomic potential and amendment recommendations, selection of suitable plant species for achieving sustainable growth and effective erosion control shall be determined by a qualified seed supplier, consulting professional and/or regulatory agency. Species selection and establishment shall be compliant with *Section 32 92 00 – Turf and Grasses*, if applicable.
2. Site and project specific information considered for species selection shall include:
   1. Project Location and Planning
      1. Climate
      2. Elevation
      3. Aspect
      4. Slope/Gradient
      5. Permanent or Temporary Planting
      6. Installation Date(s)
   2. Soil Conditions
      1. Soil Texture
      2. Soil pH
      3. Toxicities/Deficiencies noted in the previous section.
   3. Site Maintenance Requirements
      1. Mowing
      2. Irrigation
      3. Animal grazing preference
   4. Preferred Vegetation
      1. Drought Tolerant
      2. Native Vegetation
      3. Shrub Species
      4. Turf Grasses
      5. Cool Season
      6. Warm Season
      7. Blend of Cool and Warm Season
      8. Legume Species
      9. Cover Crops

3.03 EROSION CONTROL SELECTION

1. Use Profile Soil Solutions Software (PS3) or other reputable software program to facilitate design and selection of erosion control techniques.
2. Separate analysis shall be conducted for slope and channel erosion protection criteria, if necessary.
3. Selection of erosion and sediment control techniques shall be detailed and in compliance with Section 31 25 00 – Erosion and Sedimentation Controls, if applicable

3.04 SUBSTRATE PREPARATION

1. Examine substrates and conditions where materials will be applied. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope. Do not proceed with installation until satisfactory conditions are established.
2. Depending upon project sequencing and intended application, prepare seedbed in compliance with other specifications under Section 1.01 B

3.05 INSTALLATION

1. Strictly comply with manufacturer's installation instructions and recommendations. Install materials at the application rates based on the main limiting factor provided by the soil test data in the following chart:

|  |  |  |
| --- | --- | --- |
| Soil Characteristics | Aqua-pHix Granular Application Rates | |
| pH | lb/ac | kg/ha |
| ≥ 10 | Contact Manufacturer for Specific Site Recommendations | |
| ≥ 9.3 & < 10 | 2,200 | 2,488 |
| ≥ 8.6 & < 9.3 | 1,100 | 1,233 |
| ≥ 8.0 & < 8.6 | 560 | 628 |
| ≥ 7.3 & < 8.0 | 280 | 314 |

1. Directions for Topdressing:
   1. Have water pH and mineral content analyses conducted by a reputable lab to calculate appropriate application rate. Use as spot treatment for problem areas or in general broadcast application. May be applied monthly or as necessary to maintain desired salt and bicarbonate levels.
   2. Water immediately after application. Do not apply if the product isn’t under irrigation. Irrigate to field capacity to maximize bicarbonate and salt flushing.

|  |  |
| --- | --- |
| Typical Application Rates | |
| 50 Bicarbonate ppm | 2.5 lbs /1,000 ft2 |
| 100 Bicarbonate ppm | 5 lbs /1,000 ft2 |
| 200 Bicarbonate ppm | 10 lbs /1,000 ft2 |
| 300 Bicarbonate ppm | 15 lbs /1,000 ft2 |
| 400 Bicarbonate ppm | 20 lbs /1,000 ft2 |
| 450 Bicarbonate ppm | 22.5 lbs /1,000 ft2 |

*Do not exceed maximum application rate*

1. Directions for Aeration Incorporation:
   1. Blend with sand to attain Aqua-pHix rate of 200 lbs/1,000 sq ft. Incorporate mixture into the soil by infill after aeration or injection through the DryJect® System. Follow your standard irrigation program after incorporation. Begin monitoring soil pH and bicarbonate levels after six weeks to determine when additional treatments are needed.

3.06 CLEANING AND PROTECTION

1. After application, thoroughly flush equipment to remove all material. Wash all material from the exterior of the machine and remove any spills.
2. Clean spills promptly. Advise owner of methods for protection of treated areas. Do not allow treated areas to be trafficked or subjected to grazing.

3.07 INSPECTION AND MAINTENANCE

1. All inspections and maintenance recommendations shall be conducted by qualified professionals consistent with the owner, engineer/specifier and regulatory entity(s) expectations.
2. Initial inspections shall insure installations are in accordance with the project plans and specifications with material quantities and activities fully documented. Refer to Section 32 92 00 – Turf and Grasses for any additional details.
3. Subsequent inspections shall be conducted at pre-determined time intervals and corrective maintenance activities directed after each significant precipitation or other potentially damaging weather or site event.

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