



Ground Enhancing Material (GEM)

ERICO's Ground Enhancing Material (GEM) is a superior conductive material that improves grounding effectiveness, especially in areas of poor conductivity such as rocky ground, areas of moisture variation, and sandy soils.

Features

- Effective-typical resistivity 12-18 Ohm cms (20 times lower than bentonite clay)
- Once in its "set" form, maintains constant resistance for the "life" of the ground system
- Performs in all soil conditions even during dry spells
- Permanent - does not dissolve, decompose or leach out with time
- Meets (USA) Environmental Protection Authority requirements for landfill
- Can be installed using Trench or Ground Rod Backfill methods



Applications

GEM is ideal for areas with poor conductivity such as rocky ground, mountain tops, sandy soil and areas of moisture variation.

More Information

GEM Calculator

Download the latest version of ERICO's [GEM Software Calculator](#). Available in four languages (English, French, German and Spanish), the calculator estimates the amount of GEM required for an installation and converts Metric and Imperial measurement units.

How to Specify

- Ground enhancement material in its set form shall have a resistivity of not more than 20 ohm-cm
- Ground enhancement material must be permanent and maintenance-free (no recharging with salts or chemicals which may be corrosive) and maintain its earth resistance with time
- It must set up firmly and not dissolve or decompose or otherwise pollute the soil or the local water table
- The ground enhancement material shall be suitable for installation in a slurry form
- The ground enhancement material shall not depend on the continuous presence of water to maintain its conductivity

Ground Enhancing Material (GEM) Installation Methods

Trench Installation

| Estimated linear feet of ground conductor covering with each bag of GEM | | | | |
|---|------------------------|-------------|-------------|-------------|
| Trench Width | Total Thickness of GEM | | | |
| | 2.5cm (1") | 5.1cm (2") | 7.6cm (3") | 10.2cm (4") |
| 10cm (4") | 4.3m (14.0') | 2.1m (7.0') | 1.4m (4.7') | 1.1m (3.5') |
| 15cm (6") | 2.8m (9.3') | 1.4m (4.7') | 0.9m (3.1') | 0.7m (2.3') |
| 20cm (8") | 2.1m (7.0') | 1.1m (3.5') | 0.7m (2.3') | 0.5m (1.8') |
| 25cm (10") | 1.7m (5.6') | 0.9m (2.8') | 0.6m (1.9') | 0.4m (1.4') |
| 30 cm (12") | 1.4m (4.7') | 0.7m (2.3') | 0.5m (1.6') | 0.4m (1.2') |

A 11.1 kg bag of GEM will cover 2.1m (7 linear feet) of conductor length for a 10.2cm - (4-inch) wide, 5.1cm (2-inch) thick covering 2.5cm (1 inch) below and 2.1cm (1 inch) above the conductor), based on 1017 kg /m³ (63.5 lb/cu ft).

Method

TRENCH INSTALLATION

1. Premix GEM into a slurry form. Use 1-1/2 to 2 gallons (5.7 to 7.6 liters) of clean potable water per pail of GEM.
2. To mix GEM into a slurry form, use a standard cement mixer or mix in the GEM pail, a mixing box, wheelbarrow, etc. Use 1-1/2 to 2 gallons (5.7 to 7.6 liters) of clean-potable water per pail of GEM. Do not mix GEM with salt water.
3. Spread out enough GEM to uniformly cover bottom of trench—about 1 inch (2.5 cm) deep. (See table)
4. Place conductor on top of GEM. (See Note 1)
5. Spread more GEM on top of conductor to completely cover conductor—about 1 inch (2.5 cm) deep. Allow GEM to harden.

6. Carefully cover the GEM with soil to a depth of about 4 inches (10 cm), making sure not to expose the conductor.
7. Tamp down the soil, then fill in the trench.

Note 1: 4" (10 cm) of insulation should be applied to the conductors and ground rods exiting the GEM, starting 2" (5 cm) inside the GEM.

Note 2: Excess standing water must be removed from trench.

Please note that this is a guide to installation only. Full instructions will be supplied at time of product purchase.

Ground Rod Backfill Installation

| Estimated bags of GEM for backfilling around ground rods to a density of 1442 kg/m ³ (90 lb/cu ft) | | | | | | | |
|---|------------------------|-----------|-----------|-----------|------------|------------|------------|
| Diameter of hole | Depth of hole (feet) * | | | | | | |
| | 1.8m (6') | 2.1m (7') | 2.4m (8') | 2.7m (9') | 5.2m (17') | 5.8m (19') | 6.1m (20') |
| 7.5cm (3") | 2 | 2 | 2 | 2 | 4 | 4 | 4 |
| 10.0cm (4") | 2 | 3 | 3 | 3 | 6 | 7 | 7 |
| 12.5cm (5") | 3 | 4 | 4 | 5 | 9 | 10 | 10 |
| 15.0cm (6") | 5 | 5 | 6 | 7 | 13 | 14 | 15 |
| 17.5cm (7") | 6 | 7 | 8 | 9 | 17 | 19 | 20 |
| 20.0cm (8") | 8 | 9 | 11 | 12 | 22 | 25 | 26 |
| 22.5cm (9") | 10 | 12 | 13 | 15 | 28 | 31 | 32 |
| 25.0cm (10") | 12 | 14 | 16 | 18 | 34 | 38 | 40 |

* 2.44m (8 foot) minimum rod length required to be in contact with the soil (or GEM). As per NEC 250-83c.

Method

1. Auger a 3-inch (7.5 cm) or larger diameter hole to a depth of 6 inches (15 cm) less than the length of the ground rod.
2. Place ground rod into augered hole and drive one foot (if possible) into bottom of the hole. The top of the ground rod will be approximately 6 inches (15 cm) below grade. At this time, make any connections to ground rod using CADWELD connections. (See Note 1).
3. Premix GEM into a slurry form. Use 1-1/2 to 2 gallons (5.7 to 7.6 liters) of clean-potable water per pail of GEM.
4. Pour the appropriate amount of GEM (see table) around the ground rod. To ensure the GEM material completely fills the hole, tamp around the ground rod with a pole.
5. Fill remainder of augered hole with soil removed during augering. For various augered-hole diameters and depths, see the table below.

Note 1: 4" (10 cm) of insulation should be applied to the conductors and ground rods exiting the GEM, starting 2" (5 cm) inside the GEM.

Note 2: Excess standing water must be removed from the hole.

Please note that this is a guide to installation only. Full instructions will be supplied at time of product purchase.

Due to a policy of continued product development, specifications are subject to change without notice.

WARNING

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