General Notes:

1. *This guide specification is to be inserted into an existing specification section.*
2. *Proposed modifications shall be reviewed by Harger Lightning and Grounding.*
3. *The finalized version shall be included in the project contract documents.*

*Editing Notes:*

1. *This specification section must only be altered by notation (i.e. deleted text with strikethrough and additional text with double underline). This shall be accomplished by using Tools / Track Changes / Highlight Changes, and select “Track changes while editing” in MS Word or equivalent.*
2. *The Review Submittal Specification section shall be provided in electronic form for Harger Review.*
3. *Leave the following note (“For Construction Document Review, Design Submittal”) as part of the review submittal to aid any reviewer to understand WHY there are strikeouts and underlines.*
4. *After comments are received from Harger and incorporated, the strikeouts, underlines and reviewer notes are to be deleted before the spec is issued for Bidding.*

SECTION 26 05 26

Grounding and bonding for electrical systems

1. PRODUCTS
	1. APPROVED MANUFACTURER
		1.  301 Ziegler Drive, Grayslake IL 60030

<http://www.harger.com> | [hargersales@harger.com](file:///%5C%5Cdronebee%5Csys%5CShared%5CLP%20Product%20Development%5CSpecifications%5Chargersales%40harger.com)

* 1. Ultrafill® earth (ground) enhancement material
		1. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding Part No. [Ultrafill](http://google.com).
		2. Product Features:
			1. Low resistance carbon based backfill material
			2. Easy to use, safe, and environmentally friendly.
			3. Complies with FAA-STD-019e requirements.
		3. Product Usage:
			1. Vertical Applications (lbs. required):

|  |  |  |
| --- | --- | --- |
| Augured Hole Size | 5/8” Ground Rod | 2” EGR |
| 4” (100mm) | 3.5 | 2.7 |
| 6” (150mm) | 8.1 | 7.3 |
| 8” (200mm) | 14.5 | 13.6 |
| 10” (250mm) | 22.6 | 21.8 |
| 12” (300mm) | 32.6 | 31.8 |

* + - 1. Horizontal Applications (lbs. required)::

|  |  |
| --- | --- |
| Trench Width | Thickness of Ultrafill |
| 1” (25mm) | 2” (50mm) | 3” (75mm) | 4” (100mm) |
| 4” (100mm) | 1.2 | 2.3 | 3.5 | 4.6 |
| 6” (150mm) | 1.7 | 3.5 | 5.2 | 6.9 |
| 8” (200mm) | 2.3 | 4.6 | 6.9 | 9.3 |
| 10” (250mm) | 2.5 | 5.8 | 8.7 | 11.6 |
| 12” (300mm) | 3.5 | 6.9 | 10.4 | 13.9 |

1. EXECUTION
	1. INSTALLATION

Modify augured hole diameter as required for project conditions.

* + 1. For vertical applications (ground rods), a clean augured hole is required. Insert electrode in center of a 6” augured hole. Directly pour Ultrafill into hole up to the full height of the ground electrode. Refer to Division 31 specifications for additional backfilling and restoration requirements.

Modify bed thickness as required for project conditions.

* + 1. For horizontal applications (ground loop conductors, radials, etc.), trench to the required depth. The final installation is to be a 4” (100mm) deep bed of Ultrafill; directly pour in 2” (50mm) of Ultrafill into bottom of trench, install ground electrode, pour remaining Ultrafill to achieve a 4” (100mm) deep bed. Refer to Division 31 specifications for additional backfilling and restoration requirements.
		2. Direct Pour-in (Dry Mix)
			1. Pour directly into trench or augured hole, Ultrafill ground enhancement material shall fully encase grounding electrode.
		3. Liquid Pour-In (Wet Mix)
			1. For pumping applications; mix six parts water, one part bentonite and one part Ultrafill.

END OF SECTION