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Sampling and Shipment of Soil/Backfill Samples for Thermal Analysis

Undisturbed Tube Samples and Bulk Samples

- If cohesive soils (clayey or silty) are encountered, samples should be taken in nominal 3" diameter Shelby tubes or large diameter California sampler with brass liners (no rings), otherwise, standard split spoon samples or auger cuttings should be taken (see bulk soil section below).
- Please do not extrude sample from Shelby tube. Cut the bottom 6" section (+/- 1/2") of the tube, seal both ends with plastic caps and tape it to prevent any moisture loss.
- Identify the samples with Project Name, Location, Bore Hole, Depth, Date samples taken, etc
- The samples should be representative of the soil at the cable (or ductbank) burial depth. If the soil above this elevation is different, it should be sampled as well.
- Please include a copy of the borehole logs.
- Email the details of the shipment - courier name, tracking number, etc. to info@geothermusa.com and lab@geothermusa.com
- If **bedrock** is encountered, take core samples (minimum 2" diameter by 5" long) or block samples of about 5" cube of irregular shape.

Bulk Soil or Backfill Samples

- Send ~10 pounds of each sample, contained in double heavy-duty plastic (Ziploc) bags, identified with Project Name, Sample Location, Bore Hole, Depth, Date samples taken, etc...
- Email the details of the shipment - courier name, tracking number, etc. to info@geothermusa.com and lab@geothermusa.com
- For all foreign shipments
 - declare a value of \$10 for the entire package and send it via **FedEx or UPS** overnight service (or 2nd day air service).
 - Mark the package "**Aggregate samples for laboratory testing only**".
 - Request import permit instructions to info@geothermusa.com
- Provide the Proctor (Standard or Modified) density, starting moisture content and percent compaction effort.

COOL SOLUTIONS FOR UNDERGROUND POWER CABLES
THERMAL SURVEYS, CORRECTIVE BACKFILLS & INSTRUMENTATION

Serving the electric power industry since 1978



Purpose for testing (in-situ vs. construction phase), the following apply:

For thermal resistivity measurements to determine in-situ values

- For soils that are cohesive
 - Undisturbed tube samples
 - bottom 6-inches of Shelby tube or
 - brass/stainless steel liner (minimum diameter of 2-inches)
 - must be continuous and NOT ring samplers
 - Disturbed samples
 - Provide Proctor Density Curve for each sample (Standard or Modified)
 - Provide percent (%) compaction (i.e. 95%, 90% or 85%)
 - ***In-situ moisture content unless otherwise specified***

For thermal resistivity measurements to determine construction phase (materials to be used around cables)

- Disturbed samples
 - Provide Proctor Density Curve for each sample (Standard or Modified)
 - Provide percent (%) compaction (i.e. 95%, 90% or 85%)
 - Provide moisture content the sample should be installed at (i.e. in-situ, optimum or %)
1. Provide soil descriptions or borehole logs, a business card or contact information with the samples in a separate Ziploc bag.
 2. Please issue a PO or a charge to number with the samples
 3. Email the tracking number to info@geothermusa.com and lab@geothermusa.com
 4. Turnaround time is about 12 calendar days after we receive all the necessary information

Ship all samples to:

**GEO THERM USA
ATTN: Lab Manager
21239 FM529 Road, Bldg F
Cypress, Texas 77433
Tel: 281-985-9344**



Native Soil or Backfill Chain of Custody Form

Company Name: _____ Contact Name: _____

Contact Number: _____ Project Name: _____

Project Location: _____ Project Number: _____

PO/Job Number: _____ Company to Invoice: _____

A/P Email Address: _____ Rush Testing (additional fee) Yes No

Thermal Requirements: _____

Testing Instructions – for bulk samples, all sample testing instructions are required for testing to begin.

1) Proctor - (Modified or Standard) Max Dry Density and Optimum Moisture Content

2) Compaction Effort(s) – how the material will be placed back in the ground

3) Test Moisture Content(s) - Please Select all that apply

Proctor Type¹: Standard (ASTM D698) Modified (ASTM D1557)

Material/Sample Information				Proctor Results (Bulk)		Testing Requirements		
Sample ID	Collection Date	Sample Depth (ft)	Sample Type	Soil/Backfill Description	Max Dry Density (lb/ft ³)	Optimum M/C (%)	Compaction Effort(s) for testing ² (% of Max Density)	highest Moisture Content for Testing ³ Select all that apply
			<input type="checkbox"/> Tube <input type="checkbox"/> Bulk <input type="checkbox"/> Both					<input type="checkbox"/> Optimum <input type="checkbox"/> In-Situ/As Received: _____ Specified: _____
			<input type="checkbox"/> Tube <input type="checkbox"/> Bulk <input type="checkbox"/> Both					<input type="checkbox"/> Optimum <input type="checkbox"/> In-Situ/As Received: _____ Specified: _____
			<input type="checkbox"/> Tube <input type="checkbox"/> Bulk <input type="checkbox"/> Both					<input type="checkbox"/> Optimum <input type="checkbox"/> In-Situ/As Received: _____ Specified: _____
			<input type="checkbox"/> Tube <input type="checkbox"/> Bulk <input type="checkbox"/> Both					<input type="checkbox"/> Optimum <input type="checkbox"/> In-Situ/As Received: _____ Specified: _____
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			<input type="checkbox"/> Tube <input type="checkbox"/> Bulk <input type="checkbox"/> Both					<input type="checkbox"/> Optimum <input type="checkbox"/> In-Situ/As Received: _____ Specified: _____