

Trenching

1. Purpose

This Standard is to be used as the specification for the applicant's portion of the Underground Distribution System for NV Energy.

2. Table of Contents

1.	Purpose	1
2.	Table of Contents	1
3.	Preparation of Trench Bed	1
4.	Placement of Bedding Material.....	1
5.	Power Trench Sand.....	2
6.	Approved Trench Sand Supplier	2
7.	Trench Backfill above Sand Bedding	3
8.	Unacceptable Bedding or Trench Backfill Material.....	3

3. Preparation of Trench Bed

1. All excessive loose material shall be removed from the trench. Excessive loose material may be defined as any material which would cause settlement, create soft unstable conditions, or that would contaminate or intrude into bedding material. The bottom shall be smooth and even.
2. Unstable soils such as older trench fills or soft natural ground shall be over-excavated and replaced with compacted granular material in compliance with the Trench Backfill section.
3. Where the excavation is in rock with a rough surface, the bottom shall be leveled with pre-moistened, machine compacted sand fill to provide a smooth, firm bottom prior to placing the bedding material.

4. Placement of Bedding Material

1. Sand material for bedding shall consist of clean, granular material that will firmly consolidate with flooding.
NOTE: In areas of expanding clay soils, trench flooding may not be allowed by local government agencies. In those areas, the sand must be pre-moistened and machine compacted.
2. The cables or conduits shall be embedded with a minimum depth of four inches of sand below the cable or conduits, three inches on the sides, and a minimum depth of eight inches of sand over cables or conduits.
3. With the cables or conduits installed, the bedding material shall be consolidated by light flooding (see note above). Low water pressure should be used at the bottom of the trench to prevent washing materials from the walls of the trench and also avoid erosion of the sand cover over the cables or conduits. Machine compaction or compaction testing equipment should not be used within eight inches of the cable or conduits.

				Electric Service Requirements		RT-1
				Power Trench Sand and Backfill Requirements		
Drawn:	Eng:	Appr:	Date:			Revision: 1
DH	DH	KL	6/07			Page 1 of 4

Trenching

5. Power Trench Sand

- Power Trench Sand shall conform to Clark County (CC) Specification 208:
208.02.03 Sand Backfill: Shall consist of natural sand or a mixture of sand with gravel or stone. In addition, the material shall conform to the following gradation requirements:

Sieve Sizes	Percentage By Weight Passing
3/8"	100
No. 4	80-100
No. 16	40 – 80 (*)
No. 200	2 – 20 (*)

(*) NVE requirements to minimize the void ratio for thermal conductivity. Uniformly graded material, such as pea gravel (high void ratio), is not acceptable. The soluble sulfate content shall not exceed 0.3% by dry weight of soil.

- The plasticity index of the material shall conform to Clark County (CC) Specification 704.
704.02.03 Plastic Limits: When specified, aggregates shall conform to the applicable requirements of the following table:

Percentage By Weight Passing 200 Sieve	Plasticity Index Maximum
0.1 to 3.0	15
3.1 to 4.0	12
4.1 to 5.0	9
5.1 to 8.0	6
8.1 to 11.0	4
11.1 to 15.0	3
15.1 to 20.0	3

6. Approved Trench Sand Supplier

- Refer to RT-2 for a current list of Approved Trench Sand Suppliers and sources (also available at www.nvenergy.com).
- Approval of a sand source and supplier is effective for a period of 3 years and is contingent upon continued compliance with NVE and Clark County (CC) standards. If at anytime the sand does not meet NVE/CC standards, the sand will be rejected and the supplier may have to re-qualify the source of the non-conforming sand.
- To become an approved Power Trench Sand supplier, the following documents and a sample must be submitted to NVE T&D Standards. A representative from a licensed soil testing laboratory shall collect sand samples at the source location for testing.
 - Test report(s) from a licensed soil testing laboratory signed and stamped by a professional engineer.

				Electric Service Requirements		RT-1
				Power Trench Sand and Backfill Requirements		
Drawn:	Eng:	Appr:	Date:			Revision: 1
DH	DH	KL	6/07			Page 2 of 4

Trenching

- B. Letter from the testing facility stating that all submitted test reports conform to requirements in NVE RT-1 specifications. The letter must be signed and stamped from a professional engineer from the testing facility.
- C. Sample of the tested sand in a one quart container. The sample container shall be labeled with: 1) Source Location, 2) Supplier Name, 3) Supplier Telephone Number, 4) Testing Laboratory Name, 5) Testing Laboratory Telephone Number, and 6) Test Date.

Hand deliver and/or fax all of the required information to the following location:

NV Energy
 T&D Standards Department
 6226 W. Sahara Avenue
 P.O. Box 98910 M/S 19
 Las Vegas, NV 89151-0001
 Ph: (702) 367-5310
 Fax: (702) 227-2826

7. Trench Backfill above Sand Bedding

1. To comply with the Clark County Uniform Standard Specifications, all trench backfill under existing or future streets and sidewalks within existing or future street right-of-way, shall be compacted to a minimum of 90% of the maximum dry density per ASTM D1557 and AASHTO – T180 or as specified by the governing authority.
2. Material shall be compacted in lifts with a compacted thickness not greater than 6” for each layer.
3. The native soils (or import materials) used as a backfill shall comply with the following:
 - A. Shall contain no rocks larger than 3”.
 - B. Shall be free of organic materials that will decompose.
 - C. Shall not contain broken rocks such as caliche or concrete debris, which have sharp edges.
 - D. Soil classified as CL or CH (moderate to high plasticity clay) are not acceptable on the basis that moisture control and the ability to compact these soils in trenches to 90% is very difficult to impossible to accomplish. Soils classified as SS and GC (clayey sands or clayey gravels) are generally acceptable for compaction.

8. Unacceptable Bedding or Trench Backfill Material

The rejection of any material, by the inspector, may be made on the basis of the existing condition of the soils and the ability to be properly compacted according to specifications. These conditions include soils that are too wet, too dry, or in hard clods, which will not blend and can not be compacted by the equipment used.

NOTE: State and Federal highway crossing are to be installed per their respective requirements.

				Electric Service Requirements		RT-1
				Power Trench Sand and Backfill Requirements		
Drawn:	Eng:	Appr:	Date:			Revision: 1
DH	DH	KL	6/07			Page 3 of 4

THIS PAGE INTENTIONALLY LEFT BLANK

				Electric Service Requirements		RT-1
				Power Trench Sand and Backfill Requirements		
Drawn:	Eng:	Appr:	Date:	Revision: 1		
DH	DH	KL	6/07	Page 4 of 4		