

SUPPLEMENT TO
SPECIFICATIONS FOR
ELECTRICAL INSTALLATIONS

SINGLE PHASE OUTDOOR
PAD MOUNTED TRANSFORMER

ELECTRIC SYSTEM BULLETIN No. 754-A

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Niagara Mohawk

A **National Grid** Company



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I. INTRODUCTION

A. Purpose

1. This Supplement to Electric System Bulletin (ESB) #750 provides specific Company guidance for those Customers whose service point is the secondary side of a Niagara Mohawk Power Corporation owned outdoor single phase pad mounted transformer.
2. **It is important that the Customer obtain and refer to the Specifications for Electrical Installations book (ESB #750) in conjunction with this supplement for these installations.**
3. These requirements apply to a service lateral installation served by a single underground cable tap from an overhead distribution line or in some cases, an underground line.
4. These requirements are to insure that the electric facilities will render satisfactory service to the Customer, and will not interfere with the electric supply to others served by the Company's system.
5. Underground Residential Distribution (URD) areas are excluded.

B. Scope

1. These requirements do not cover the Customer's complete electrical installation design, but concern only those points in which the Customer, their consulting engineer, electrical contractor, and the Company have a mutual interest.
2. This bulletin provides more complete information for an electric service installation where the supply voltage designated by the Company is 120/240 volts from a Company-owned single phase pad mounted transformer.
3. Company Furnishes:
 - a. The Company will furnish, install, own and provide maintenance for a foundation, ground grid, and an outdoor pad mounted transformer at no charge to the Customer.
 - b. The Company will furnish, install, own and provide maintenance for the primary cable.
 - c. The installed cost of the primary cable shall be borne by the Customer in accordance with the Company's filed tariffs.
 - d. The Company will specify the size of the transformer furnished.
4. Customer Furnishes:
 - a. The Customer shall provide property on which to construct the transformer foundation.
 - b. The Customer shall provide the primary cable trench and outdoor pad mounted transformer foundation excavation.
 - c. And, where required, the Customer shall provide a primary conduit system.
 - d. The Customer shall backfill all trenching and excavations after primary cable installation.
 - e. The Customer shall provide fender posts if required by the Company.

C. Customer's Responsibility

1. The Customer should aim to provide a modern, adequate electrical installation with ample provision for future needs.

2. The Customer shall obtain building permits and/or zoning variances as required for construction.

D. Cooperation

1. For a specific electric service installation, it is essential that the Company meet with the Customer or their representative to mutually establish the arrangement and location of the proposed facilities.
2. Information concerning the route of the primary service lateral and other data applicable to the specific installation will be forwarded separately.
3. Specific information furnished by the Company shall be subject to review by the Company if significant changes are made in the design or scheduling of the project.
4. The information the Customer or their contractor furnishes the Company in regard to the Customer's proposed electrical installation shall be in writing.
5. When an issue arises which is not contained in this booklet or Electric System Bulletin #750, the Company invites inquiries.
6. The complexity of modern electrical installations makes it essential that there be continuous close cooperation between all parties involved.

E. Codes and Standards

1. The Customer's electric service equipment and its installation shall conform to the requirements of the latest edition of the National Electrical Code (NEC), American National Standards Institute (ANSI), Insulated Cable Engineers Association (ICEA), National Electrical Manufacturer's Association (NEMA), National Fire Protection Association (NFPA), all local ordinances, building codes and Company requirements and specifications.
2. The Customer should consult their insurance carrier for any special safeguards which the carrier may require for the Customer's outdoor single-phase pad mounted transformer installation.

F. Inspection

(Refer to ESB #750 Section 1)

G. Compliance

1. The Customer shall provide two (2) copies of a fully dimensioned plot plan indicating property lines, building outlines and detail of the preferred location for the electrical service equipment, as well as the proposed location of other buried facilities.
2. The Company will designate the pole from which the primary cable will be extended.
3. The Company will respond indicating the route of the service lateral cable or conduit and recommended pullbox locations if a cable-in-conduit system is used.
4. The Company's Consumer Relations Department will advise the Customer concerning any contribution required in accordance with the Company's filed tariff.
5. For general compliance with these specifications, the Company normally limits its review to the details of the service lateral, the service protective device, the transformer pad location and the location of the metering equipment.
6. Plans of any primary conduit installations shall be submitted to and approved by the Company before trenching is started and before conduit placement.

II. DEFINITIONS

Note: Definitions as used in this specification are provided in the "**Specifications for Electrical Installations**" book (ESB#750), Section 2.

III. GENERAL

A. Access

1. Facilities shall be provided so that authorized Company Employees and vehicles have access to the Customer's electric service installation and Company-owned Metering equipment.
2. The Customer shall insure that accessways are free of vehicles, equipment, or personnel obstructions.

B. Easements

1. Where the Customer's service lateral extends beyond their property, the Customer will be required to obtain any necessary permits and Right-of-Way easements.
2. Easements for the underground primary service lateral shall be obtained and recorded.
3. The Company will provide easement forms upon request.

IV. SERVICE CONNECTION

(Reference ESB #750, Section 4.)

B. Customer's Service Cable

1. The Customer shall furnish, install, own and maintain the service lateral conductors (maximum size 500 kcmil Cu or 750 kcmil Al; when parallel conductors, 2 maximum, are used - maximum size is 350 kcmil each) between their service equipment and the Company's transformer.
2. The Customer shall install service lateral conductors approved for direct burial at a minimum depth of 24 inches below final grade.
3. At least 10 feet of Customer's service cable shall be coiled within one foot of transformer for connection by Company.
4. The ends of the cable shall be sealed with suitable moisture end-cap seals.
5. All connections, permanent or temporary, at the Company's transformer shall be made by the Company.
6. The Company will not permit this connection to be made by others.

V. TRANSFORMER INSTALLATIONS ON CUSTOMER PREMISES - EXCLUDING UNDERGROUND RESIDENTIAL DISTRIBUTION (URD)

(Reference ESB #750, Section 9.)

A. Padmount Transformer Location

Factors to Consider

1. The Customer shall provide property on which to construct the transformer foundation.
2. This location shall be mutually agreed upon by the Company and the Customer.

Proximity of Buildings

3. The edge of the transformer pad shall be at least 4 feet from a non-combustible building and at least 10 feet from any combustible building.
4. The pad shall be at least 10 feet from openings in any building wall.
5. If the building has an overhang, the distance to the edge of the transformer pad shall be measured horizontally from the outer edge of the overhang.
6. Greater distances may be required in certain cases.

Proximity of Buried Facilities

7. An area measuring ten (10) feet from each edge of the transformer foundation shall be kept free of all buried waterlines, gas lines, sewer lines, other electric lines, storage tanks etc.

Vehicular Traffic

8. Where the transformer installation is exposed to vehicular traffic, grass cutting, or snow plowing equipment, adequate fender posts acceptable to the Company shall be provided and installed by the Customer.

Orientation

9. The doors of padmounted transformers should normally face the street or access road.

Clear Working Area

10. Bushes, trees, walls, fences or other obstructions shall not be planted or installed in front of the doors.
11. The Customer shall maintain a clear working area in front of the doors of 10 feet minimum for operating and maintenance of the transformer.

Accessibility

12. The transformer site must be accessible to Company trucks equipped for the installation and removal of heavy transformers.
13. Access ways to transformer sites in grass areas require a solid, well-drained base under the grass. The area should be capable of supporting trucks and equipment having a maximum bearing weight of 6,500 lb. per square foot without creating a depression of more than two (2) inches. If this criteria is not met by the Customer, appropriate fill material or steel plating will be required, as determined by Company personnel, and the Customer will be responsible for the cost of any such extra measures taken by the Company.

B. Padmount Transformer Foundation

1. The Customer shall provide the excavation for the padmount transformer foundation approximately 6-1/2 ft. x 6-1/2 ft. x 30 inches deep, as indicated in Figure 1.
2. The Customer shall do all backfilling after the cable and transformer foundation are installed.

VI. GROUNDING

Note: Refer to "Specifications for Electrical Installations" book (ESB#750), Section 6 for grounding requirements.

VII. CUSTOMER'S SERVICE EQUIPMENT

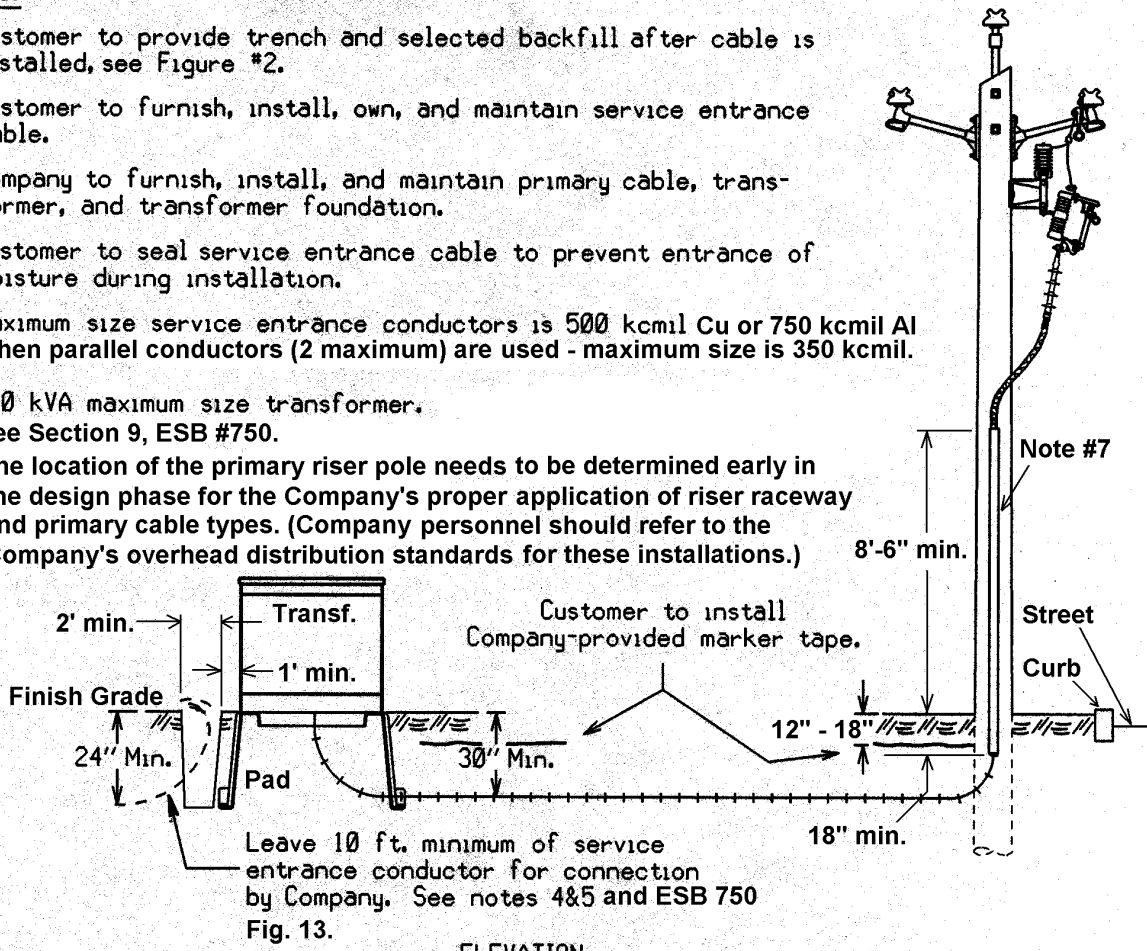
(Reference ESB #750, Sections 5 and 9.)

VIII. METERING

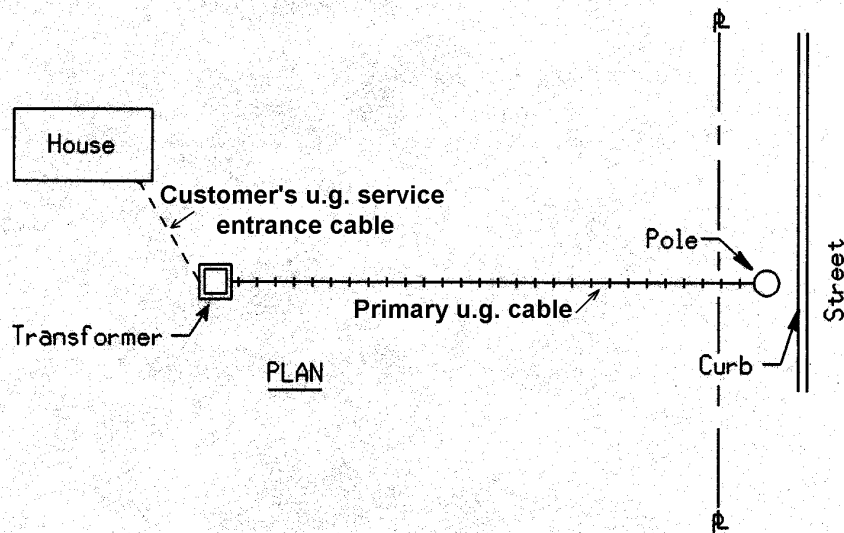
(Reference ESB #750, Section 7.)

NOTES:

1. Customer to provide trench and selected backfill after cable is installed, see Figure #2.
2. Customer to furnish, install, own, and maintain service entrance cable.
3. Company to furnish, install, and maintain primary cable, transformer, and transformer foundation.
4. Customer to seal service entrance cable to prevent entrance of moisture during installation.
5. Maximum size service entrance conductors is 500 kcmil Cu or 750 kcmil Al when parallel conductors (2 maximum) are used - maximum size is 350 kcmil.
6. 100 kVA maximum size transformer.
See Section 9, ESB #750.
7. The location of the primary riser pole needs to be determined early in the design phase for the Company's proper application of riser raceway and primary cable types. (Company personnel should refer to the Company's overhead distribution standards for these installations.)



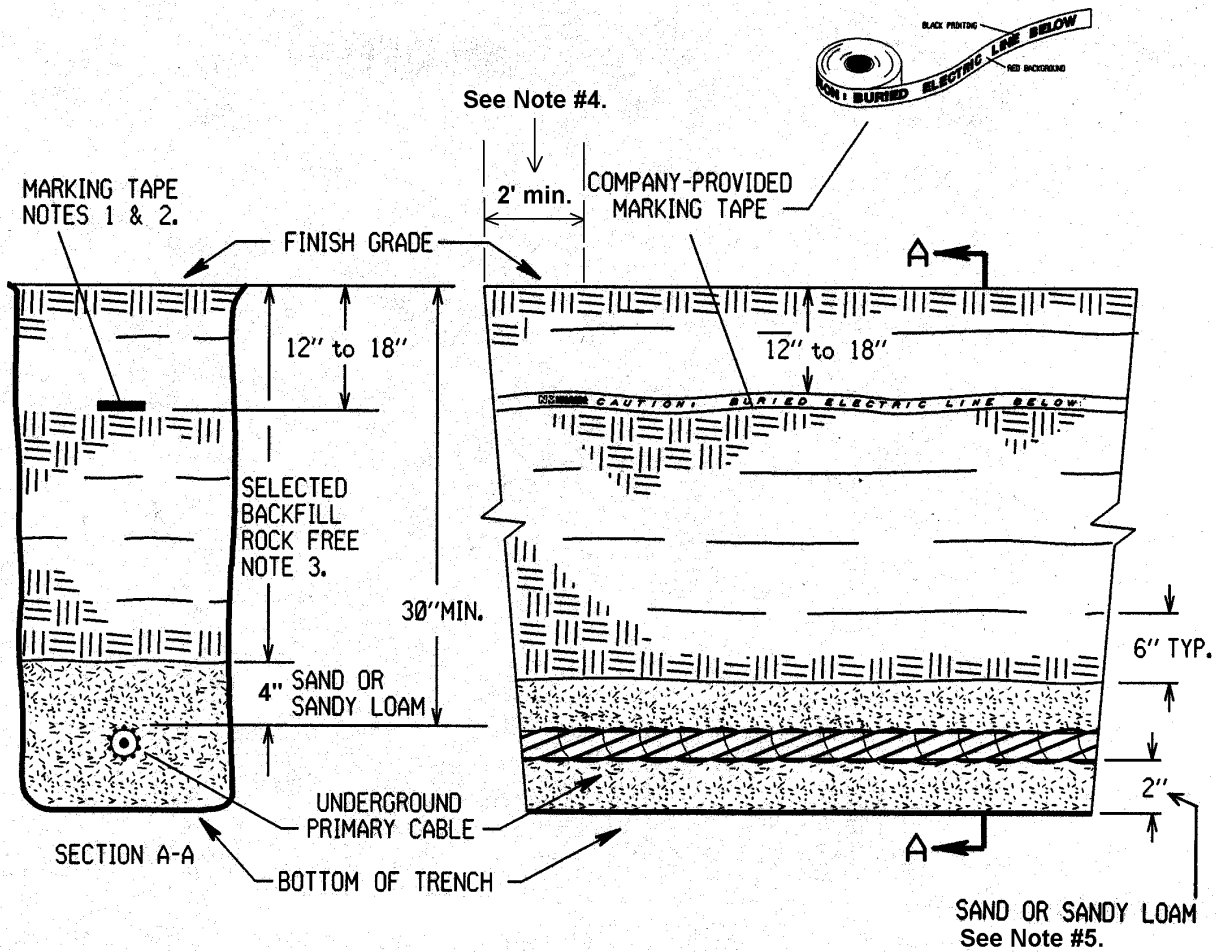
ELEVATION



PLAN

**TYPICAL OUTDOOR SINGLE-PHASE
PAD-MOUNTED TRANSFORMER INSTALLATION
FROM AN OVERHEAD LINE**

**Figure 1
ESB #754A**



Notes: (See ESB #750, Section 4.)

1. All underground primary cable shall be marked in the trench using Company-provided marking tape.
2. The marking tape shall be placed approximately 12 inches to 18 inches below finished grade as shown above, while backfilling cable trench.
3. Selected backfill of rock-free soil shall be placed in 6 inch layers at a time and each layer well tamped.
4. Placement of spoils shall not be less than 2 ft. from trench, greater distance if required by OSHA regulations.
5. 4 inch smooth well-tamped backfill shall be placed over rock or rocky soil bottom before applying the 2 inches of sand or sandy loam.

TYPICAL BACKFILLING DETAILS OF UNDERGROUND PRIMARY CABLE AND MARKING TAPE INSTALLATION IN TRENCH

Figure 2
ESB #754A