

CHAPTER 13

UTILITIES

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UTILITIES

13-01 DEFINITION OF UTILITIES

The term "utility" means and includes all privately, publicly or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, wastes, storm water not connected with highway drainage, and other similar commodities, including publicly owned fire and police signal systems and street lighting systems, which directly or indirectly serve the public or any part thereof. The term "utility" shall also mean the utility company or agency.

The major utilities in Puerto Rico are the following:

P.R. Water Resources Authority (PRWRA)
P.R. Aqueduct and Sewer Authority (PRASA)
P.R. Telephone Company (PRTC)
P.R. Communications Authority (PRCA)
Pipelines of Puerto Rico Inc. (PLPR)
San Juan Gas Company (SJGCO)

13-02 GENERAL POLICY

It is generally in the public interest to accommodate on the right-of-way of Commonwealth highways the facilities of those utilities which serve the public provided such use and occupancy of the highway rights-of-way does not interfere with the integrity, function, operational safety and maintenance of the highway. Such use shall not be in conflict with the provisions of Commonwealth and Federal laws and regulations.

The requirements of the Department of Transportation and Public Works are covered in the "Policy on the Accommodation of Utilities on Highways Rights-of-Way" of May 1973. The requirements on Federal-aid projects are covered in the FHWA Highway Program Manual (Vol. 6, Chap. 6, Sect. 3, Subsection 2). The designer of a highway project involving utility work should be familiar with and have access to these publications. The designer should also have available and be familiar with the following AASHTO publications:

- A Policy on the Accommodation of Utilities on Freeway Rights-of-Way (1969).
- A Guide for Accommodating Utilities on Highway Rights-of-Way (1969).

13-03 UTILITIES AND ROADSIDE SAFETY

Poles and certain other utility facilities constitute major roadside hazards, particularly on high-speed highways, and should be treated as such. The designer of a new or relocated utility facility should insure that the horizontal and vertical location of utility lines within a highway right-of-way conforms to the clear roadside policies applicable to the highway class and to the specific conditions for the highway section involved.

Since poles supporting overhead lines can not normally be designed with breakaway features, they should be located as far from the traveled way as feasible. When utility poles or other fixed utility facilities must intrude upon the designated clear roadside space, suitable protective barriers should be installed. The principles, guide warrants and standards covered in Chapter 8 of this manual shall be followed.

13-04 DESIGN PROCESS - UTILITY RELOCATIONS

Highway improvement projects, whether reconstruction or new construction, frequently require the relocation of existing utility facilities, particularly in urban areas. On some projects,

the utility relocation work may be minor but in other projects, such as expressways in large cities, the cost can run into the hundreds of thousands of dollars.

It is very important to identify during the early stages of the project the utility relocation work that must be performed in order that adequate provisions be made with the utilities concerned to plan this work and coordinate it with the construction schedule for the project. Failure to do so can result in substantial delays and, in some instances, increased project costs. Whenever feasible, any required utility relocation work should be performed in advance of awarding a construction contract for the highway project.

13-04.01 SURVEY PHASE

1. The highway project survey is made by the Surveying Division of the Photogrammetric Office or by a consultant. As part of the project survey, all known existing utility facilities shall be located and identified by the field parties.

2. As part of the survey phase, the responsible unit shall contact the various utilities to complete the data on types, sizes, etc. of the utility facilities located by the survey crew, and to determine the location, types and sizes of any other underground utility facilities that may exist within the survey area but were not readily apparent to the surveyors.

13-04.02 PRELIMINARY DESIGN PHASE

1. The existing utility data shall be plotted in the preliminary highway project plans. Underground utilities should be plotted in the cross sections and major utility crossings should be plotted in the profile. Standard symbols used by the Department for utility facilities are illustrated in Figures 13-A, 13-B and 13-C. For PLPR and SJGCO facilities use symbols similar to those in Figure 13-C but identified by the letter "F" or "G" respectively. Common abbreviations used on plans are included in Chapter 19.

2. Minor utility facilities generally have little effect on the geometric design. However, the designer shall consider major utility facilities as one of the controlling factors in the project design.

3. The design of the relocation of utility facilities should be initiated as soon as advance project plans have progressed to where the following is available:

- a. Plan and profiles
- b. Right-of-way limits
- c. Location of major structures (bridges, culverts, retaining walls, etc.)
- d. Proposed drainage facilities
- e. Preliminary cross sections

4. When the design of the utility relocation is to be done in-house or by the utility, the advance detail plans shall be forwarded by the Project Manager to the Utilities and Lighting Office of the Highway Design Office. Since PRTC, PRCA, PLPR and SJGCO always design and construct the relocation of their own facilities, the advance highway plans are sent by the Utilities Office to them for action. In the case of PRASA and PRWRA, the relocation design may be done either in-house, by a consultant or by the respective utility as agreed upon for each specific project.

5. When the utility relocation design is to be performed by a consultant, he is responsible for coordinating his design effort, through the project manager, with the utility concerned. The consultant shall comply with the design standards of the respective utility as well as with the Department's policies, guides and standards.

6. In the case of utility designs, the utility is requested to check the plotted details of its existing facilities for accuracy and to mark on the plans their proposed relocation. The

relocation plan shall show facilities to remain, to be removed or abandoned, to be installed, and any provisional facilities. The marked plans are returned to the Utilities Office together with a preliminary estimate of cost except when the relocation work is to be included in the highway contract or is not eligible for payment by the Department.

7. In the case of in-house design, the Utilities Office coordinates with the utilities concerned and obtains their approval of the proposed relocation plans.

8. Consultant preliminary designs and estimates are submitted, through the Project Manager, to the Utilities Office. The submission shall show evidence of the utilities' approval of the proposed relocation plan.

9. The Utilities Office reviews all preliminary relocation plans and estimates for conformance with the Department's utility accommodation and payment policies. On Federal-aid projects, these preliminary utility relocation plans and estimates are sent by the Utilities Office to the FHWA Division Office for review and comments.

10. The preliminary plans phase is completed when agreement is reached between the Department and the respective utilities on the proposed relocation plans, how the construction will be accomplished (whether by the utility or the highway contractor) and the preliminary estimate of cost when applicable.

13-04.03 CONSTRUCTION PLANS PHASE

1. The existing facilities and proposed utility relocations, temporary and/or final, shall be plotted in the utility sheets of the contract plans (see chapter 19). The plans shall clearly indicate the capacity of the facilities and who will perform the various items of relocation work; when betterments are included, the extents of such betterments shall also be indicated. Reference shall be made as to the required vertical clearance between overhead lines and pavement; and pedestrian areas.

Major relocations of utilities shall be part of the construction phases of the project.

2. During the preparation of the final contract plans, the need for some revisions to the utility relocation plans may arise. In such cases, the Project Manager shall advise the Utilities Office so that the latter may coordinate necessary action with the utilities concerned.

3. For utility relocation work to be performed by the contractor, complete details must be included in the contract plans to clearly define the scope of the work to be accomplished. A detailed cost estimate of the relocation work is also prepared.

4. When the relocation work is to be performed by a utility, the highway project contract plans need only include the essential data on existing facilities and proposed relocations necessary for coordination of the highway construction with the utility work. However, the utility will prepare more detailed plans for its own use and for the necessary approval by, and agreement with, the Department. If payment by the Department is involved, the utility will also prepare and submit a detailed estimate of cost.

5. The final construction plans and estimate (if payment by the Department is involved) on all utility relocation work are subject to review and approval by the Utilities Office. When betterments are to be included in the contract plans their cost of installation shall be estimated separately and the Utilities Office shall obtain a written acceptance from the Agency concerned. Costs of betterments shall be reimbursed to the Highway Authority by the Agency concerned.

6. On Federal-aid projects the utility relocation plans are also subject to approval by the FHWA Division Office. If Federal funds participate in the relocation cost, the estimate is also subject to FHWA approval.

13-04.04 UTILITY AGREEMENTS

The necessary written agreement between each utility and the Department covering the relocation work are coordinated and processed by the Utilities Office after approval of the final relocation plans, estimates and other supporting documents.

STANDARD SYMBOLS — P.R.A.S.A. FACILITIES

— W OR S ● — EXISTING PIPE LINE TO REMAIN ⁽¹⁾

— W OR S ● ● — NEW PIPE LINE TO BE INSTALLED ⁽¹⁾

— W OR S ● ● — EXISTING PIPE LINE TO BE REMOVED
OR ABANDONED AS INDICATED ⁽¹⁾

— ● ● ● ● — PROVISIONAL PIPE LINE TO BE INSTALLED ⁽¹⁾

--- ● ● --- PIPE LINE IN CASING ⁽²⁾

VA
○ EXISTING VALVE TO REMAIN ⁽³⁾

VA
⊕ EXISTING VALVE TO BE REMOVED
OR ABANDONED AS INDICATED ⁽³⁾

VA
⊙ NEW VALVE TO BE INSTALLED ⁽³⁾

⊙ EXISTING AIR VENT TO REMAIN ⁽³⁾

⊙ EXISTING AIR VENT TO BE REMOVED
OR ABANDONED AS INDICATED ⁽³⁾

⊙ NEW AIR VENT TO BE INSTALLED ⁽³⁾

⊙ EXISTING BLOWOFF TO REMAIN ⁽³⁾

⊕ EXISTING BLOWOFF TO BE REMOVED
OR ABANDONED AS INDICATED ⁽³⁾

⊙ EXISTING BLOWOFF TO BE INSTALLED ⁽³⁾

MTR
□ EXISTING WATER METER TO REMAIN ⁽³⁾

MTR
■ EXISTING WATER METER TO BE REMOVED ⁽³⁾

MTR
■ NEW WATER METER TO BE INSTALLED ⁽³⁾

RED
△ EXISTING REDUCER TO REMAIN

RED
△ EXISTING REDUCER TO BE REMOVED
OR ABANDONED AS INDICATED

▲ NEW REDUCER TO BE INSTALLED

SMH
○ No. — EXISTING SANITARY MANHOLE TO REMAIN ⁽⁴⁾

SMH
⊕ No. — EXISTING SANITARY MANHOLE
TO BE REMOVED ⁽⁴⁾

SMH
● No. — NEW SANITARY MANHOLE ⁽⁴⁾

NOTES:

(1) INDICATE WHETHER WATER (W) OR SANITARY (S)
AND PIPE SIZE AND TYPE.






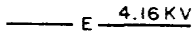
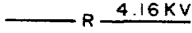
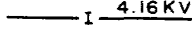

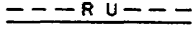
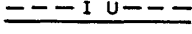

















(2) SHOW CASING SIZE AND TYPE.

(3) INDICATE SIZE.

(4) IDENTIFY BY NUMBER.

FIGURE 13-A

STANDARD SYMBOLS - P.R.W.R.A. FACILITIES

<p> EXISTING POLE TO REMAIN</p> <p> EXISTING POLE TO BE REMOVED</p> <p> NEW POLE TO BE INSTALLED</p> <p> GUY WIRE</p> <p> OVERHEAD GUY WIRE WITH STUB POLE</p> <p> EXISTING AERIAL LINE TO REMAIN ⁽¹⁾</p> <p> EXISTING AERIAL LINE TO BE REMOVED ⁽¹⁾</p> <p> NEW AERIAL LINE TO BE INSTALLED ⁽¹⁾</p> <p> EXISTING UNDERGROUND LINE TO REMAIN ⁽²⁾</p> <p> EXISTING UNDERGROUND LINE TO BE REMOVED ⁽²⁾</p> <p> NEW UNDERGROUND LINE TO BE INSTALLED ⁽²⁾</p> <p> EXISTING POLE MOUNTED TRANSFORMER ⁽³⁾</p> <p> NEW POLE MOUNTED TRANSFORMER ⁽³⁾</p> <p> EXISTING PAD MOUNTED TRANSFORMER ⁽³⁾</p> <p> NEW PAD MOUNTED TRANSFORMER ⁽³⁾</p> <p> EXISTING SWITCHING UNIT TO REMAIN</p> <p> EXISTING SWITCHING UNIT TO BE REMOVED</p> <p> NEW SWITCHING UNIT TO BE INSTALLED</p>	<p> EXISTING SPLICING BOX TO REMAIN</p> <p> EXISTING SPLICING BOX TO BE REMOVED</p> <p> NEW SPLICING BOX TO BE INSTALLED</p> <p> EXISTING PULL BOX TO REMAIN</p> <p> EXISTING PULL BOX TO BE REMOVED</p> <p> NEW PULL BOX TO BE INSTALLED</p> <p> EXISTING MANHOLE TO REMAIN ⁽⁴⁾</p> <p> EXISTING MANHOLE TO BE REMOVED ⁽⁴⁾</p> <p> NEW MANHOLE TO BE INSTALLED ⁽⁴⁾</p> <p> TRANSMISSION LINE METAL TOWER</p>
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NOTES:

- (1) INDICATE VOLTAGE.
- (2) INDICATE VOLTAGE AND CONDUIT DATA.
- (3) INDICATE APPLICABLE DATA.
- (4) IDENTIFY BY NUMBER.

FIGURE 13-B

STANDARD SYMBOLS – COMMUNICATION FACILITIES

<u>P. R. T. C.</u> ⁽¹⁾	<u>P. R. C. A.</u> ⁽²⁾	
ET ●	EC ●	EXISTING POLE TO REMAIN
RT ●	RC ●	EXISTING POLE TO BE REMOVED
IT ●	IC ●	NEW POLE TO BE INSTALLED
← T	← C	GUY WIRE
← ▷ ●	← ▷ ●	OVERHEAD GUY WIRE WITH STUB POLE
—— ET ——	—— EC ——	EXISTING AERIAL LINE TO REMAIN ⁽³⁾
—— RT ——	—— RC ——	EXISTING AERIAL LINE TO BE REMOVED ⁽³⁾
—— IT ——	—— IC ——	NEW AERIAL LINE TO BE INSTALLED ⁽³⁾
--- EUT ---	--- EUC ---	EXISTING UNDERGROUND LINE TO REMAIN ⁽⁴⁾
--- RUT ---	--- RUC ---	EXISTING UNDERGROUND LINE TO BE REMOVED ⁽⁴⁾
--- IUT ---	--- IUC ---	NEW UNDERGROUND LINE TO BE INSTALLED ⁽⁴⁾
ET □ MH —	EC □ MH —	EXISTING MANHOLE TO REMAIN ⁽⁵⁾
RT □ MH —	RC □ MH —	EXISTING MANHOLE TO BE REMOVED ⁽⁵⁾
IT □ MH —	IC □ MH —	NEW MANHOLE TO BE INSTALLED ⁽⁵⁾
ET ▣ SB	EC ▣ SB	EXISTING SPLICING BOX TO REMAIN
RT ▣ SB	RC ▣ SB	EXISTING SPLICING BOX TO BE REMOVED
IT ▣ SB	IC ▣ SB	NEW SPLICING BOX TO BE INSTALLED
ET ▣ PB	EC ▣ PB	EXISTING PULL BOX TO REMAIN
RT ▣ PB	RC ▣ PB	EXISTING PULL BOX TO BE REMOVED
IT ▣ PB	IC ▣ PB	NEW PULL BOX TO BE INSTALLED
O T	O C	RISER

NOTES :

- (1) P. R. TELEPHONE CO.
- (2) P. R. COMMUNICATIONS AUTHORITY.
- (3) PROVIDE CABLE AND TERMINAL DATA.
- (4) PROVIDE CABLE, TERMINAL AND CONDUIT DATA.
- (5) INDICATE MH NUMBER.

FIGURE 13-C