STANDARD OPERATING PROCEDURE
FOR
GENERAL GUIDANCE ON POLES AND PENETRATIONS IN OR NEAR (WITHIN 15 FT OF LEVEE TOE) *LEVEE EMBANKMENTS* OR NEAR (WITHIN 8 FT OF BASE OF FLOODWALL) *FLOODWALLS*

3 January 2014

Existing Poles/Penetrations

Poles and penetrations (e.g. – guy wires, monitoring wells, earth retaining structures) located in the levee embankment or within the 15 feet of the levee toe or within 8 feet of the base of a floodwall have the potential to shorten the seepage path beneath the levee or floodwall facilitating piping and ultimately embankment failure. The cases detailed below should be used to determine the risk of such an event and evaluate whether existing poles and penetrations should be allowed to remain. All poles and penetrations submitted for review should be marked and submitted with GPS points and marking type for identification during future inspections.

Levees:

1. A pole/penetration ***located on the riverside*** of the levee embankment can remain.

2. If a pole/penetration is ***located on the landside slope of a levee and does not penetrate*** below the foundation of the levee, the pole/penetration can remain provided the levee embankment is constructed from impermeable soil (e.g. - SC, CL, ML).

3. If a pole/penetration is ***located on the levee embankment and penetrates*** below the foundation of the levee or is ***located within 15 feet of the landside toe*** of the levee - a review of boring logs from the As-Built/Construction drawings shall be accomplished. The pole/penetration can remain if the boring logs indicate the pole is founded in a layer of impermeable (e.g. - SC, CL, ML) soil extending a minimum of 3 feet below the bottom of the pole and a minimum of 15 from the levee toe.

4. If a pole/penetration is ***located on the levee embankment and penetrates*** below the foundation of the levee or is ***located within 15 feet of the landside toe*** of the levee - a review of boring logs from the As-Built/Construction drawings shall be accomplished. The pole/penetration must be removed if the pole extends into a layer of a permeable soil (e.g. - SP, GP, SW, GW); there is <3 of impermeable soil (e.g. – SC, CL, ML) between the bottom of the pole and a permeable layer of soil; there is >3 feet of impermeable soil between the bottom of the pole and a

permeable layer of soil, but the impermeable layer does not extend more than 15 feet from the landside levee toe.

Floodwalls:

1. A pole/penetration ***located on the riverside*** of the floodwall can remain.

2. If a pole/penetration is ***located within 8 feet of the landside base*** of the floodwall - a review of boring logs from the As-Built/Construction drawings shall be accomplished. The pole/penetration can remain if the boring logs indicate the pole is founded in a layer of impermeable (e.g. - SC, CL, ML) soil extending a minimum of 3 feet below the bottom of the pole and a minimum of 8 from the landside base of the floodwall.

3. If a pole/penetration is ***located within 8 feet of the landside base*** of the floodwall - a review of boring logs from the As-Built/Construction drawings shall be accomplished. The pole/penetration must be removed if the pole extends into a layer of a permeable soil (e.g. - SP, GP, SW, GW); there is <3 of impermeable soil (e.g. – SC, CL, ML) between the bottom of the pole and a permeable layer of soil; or there is >3 feet of impermeable soil between the bottom of the pole and a permeable layer of soil, but the impermeable layer does not extend more than 8 feet from the landside base of the floodwall.

New Poles/penetrations

1. New poles/penetrations are not allowed within 15 feet of the levee toe or within 8 feet of the floodwall base without and approved permit.

Backfill Procedures for Removed Poles/Penetrations

Once an existing pole or penetration is removed, the remaining hole should be backfilled using one of the following methods:

1. ***Backfill with Bentonite.*** Vertical holes shall be backfilled with granulated bentonite in not greater than 1-foot increments. Bridging of the cavity during bentonite placement can occur; therefore, soundings of hole shall be performed to confirm backfill material has reached the bottom of the hole. If dry conditions cannot be maintained, coated bentonite pellets shall used. The upper two feet of the hole shall be backfilled with soil to allow establishment of vegetation.

2. ***Backfill with Grout.*** Grout the vertical holes using the tremie method and a VOLCLAY Grout which will set to a consistency of a stiff soil with a permeability of 10^{-7} to 10^{-8} cm/sec.

TABLE 11.1 Recommended Pole-Setting Depths in Soil and Rock for Various Lengths of Wood Poles

Length of pole, ft	Setting depth in soil, ft	Setting depth in rock, ft
25	5.0	3.5
30	5.5	3.5
35	6.0	4.0
40	6.0	4.0
45	6.5	4.5
50	7.0	4.5
55	7.5	5.0
60	8.0	5.0
65	8.5	6.0
70	9.0	6.0
75	9.5	6.0
80	10.0	6.5
85	10.5	7.0
90	11.0	7.5
95	11.0	7.5
100	11.0	7.5
105	12.0	8.0
110	12.0	8.0
115	12.0	8.0
120	13.0	8.5
125	13.0	8.5
130	13.0	8.5
135	14.0	9.0

Source: Commonwealth Edison Company.