Encroachment Permit Clearances from Electric Facilities

ISSUING DIVISION: Electric Engineering **Signed by** O J Plum
SVP SPONSOR: Orville Plum, Manager **Date Signed** April 5, 2013
Revision: 0 **SHEET: Sheet 1 of 15**

SECTION: Clearances UG 1250

Scope of Standard

Silicon Valley Power (SVP) has underground and aboveground electric facilities installed within the street right of way, public utility easements, and electric easements in the City of Santa Clara. Other utilities, agencies, developers, or property owners may desire to install structures in the vicinity of SVP's facilities. In accordance with Santa Clara City Code, an encroachment permit is required for work to be performed within City easements or the street right of way. In order to preserve and protect the structural integrity and maintainability of SVP's facilities, minimum clearances from SVP's facilities are required of facilities installed by others. This document is intended to provide some guidance and direction on acceptable design requirements for installing structures and facilities around existing poles, luminaires, electric ducts, pullboxes, manholes, and other SVP substructures.

Purpose of Revision

This is a new document in the Substructures section of the Underground Construction Manual. There is no revision at this time.

References

- Hubbell Power Systems, *HPS Chance Anchoring Tips*, PowerPoint, 2007
- Hubbell Power Systems, *Hubbell Power Systems - Products for Electric Utilities, Telecommunications and Construction Industries*. Web. 20 July 2011. <http://www.hubbellpowersystems.com>.
- Santa Clara City Code Chapter 12.25, "Excavation and Use of City Rights Of Way."
- State of California, *General Order 95,* Latest Issue
- State of California , *General Order 128*, Latest Issue
- SVP Standard Document UG 1000, Most Recent Revision, "Installation of Underground Substructures by Developers."

Rescissions

None – This is an original document that has not been previously issued by the SVP Electric Engineering Division.

Definition of Terms

- **Applicant:** The person or entity that has submitted an encroachment permit application into the City for performing excavation work within easements or the street right of way.
- **Anchor**: a device that serves as a point of connection to the ground for the down guy.
- **Contractor**: The person or persons, firm, partnership, corporation or combination thereof, who has entered into a contract with a Developer, or The City of Santa Clara, as a party or parties of the second part of his or their legal representative.
- **City:** City of Santa Clara or the City Council of the City of Santa Clara.
- **Developer**: A developer is any person who causes land to be divided into two or more parcels for himself or others; or is engaged in the development of property, in whole or in part, by the placing of any improvements thereon, whether the property was previously developed in whole, in part, or at all.
- **Down Guy** means a guy wire which has its lower connection at an anchor in the earth and its upper connection on a pole structure. It is sometimes called a sidewalk guy, truss guy, anchor guy, or ground guy.
- **High Voltage (Marking):** Safety identifier of any electric system where the nominal system voltage is greater than 1000 volts. This is not the same as the NEC definition for "High Voltage".
- **Low Voltage:** Any electric system where the nominal system voltage is less than 600 volts.
- **Manhole:** Underground concrete enclosure used as a place to connect primary electric cables. Typical exterior dimensions are 6'W x 11'L x 8'D, but they may vary from location to location. Only the access opening, with a 24" neck, is visible at ground level. The remainder of the structure is located below ground level. Specific details about the substructure are available in SVP Standard Document UG 1000.
- **National Electric Code (NEC):** Standard, issued by the National Fire Protection Association (NFPA) for the safe installation of electrical wiring and equipment.
- **Public Works Inspector:** City of Santa Clara Public Works Dept. Inspector, responsible for verifying proper installation and repair of all non-electric facilities and improvements within City right of ways and easements.
- **Silicon Valley Power (SVP):** Municipal Electric Department of the City of Santa Clara.
- **Splice Box:** Underground polymer concrete enclosure used as a place to connect low voltage electric and fiber electric system cables. Typical dimensions will vary depending on the location of the splice box. The exterior top cover of a splice box is typically flush with

ground level, with the remainder of splice box enclosure below ground level. Specific details about a splice box are available in SVP Standard Document UG 1000.

- **SVP Inspector:** Silicon Valley Power Electric Inspector responsible for verifying proper installation of electric substructures installed for use by and/or ownership of SVP.

- **Substructures:** Conduits, ducts, manholes, pipes, splice boxes, vaults, and other similar infrastructure items that are installed at or below the finished ground surface. SVP substructures are described more fully in SVP Standard Document UG 1000. Other utility substructures may be better described by the specific design and construction details of the respective utilities.

- **V**ault: Underground concrete enclosure used as a place to connect primary electric cables and as a support structure for some electrical equipment. Typical exterior dimensions are 8'W x 10'L x 9'D, but they may vary from location to location. The exterior top surface of a vault is typically about 3" above ground level, with the remainder of the structure below ground level. Specific details about a vault structure are available in SVP Standard Document UG 1000.

General Requirements

If SVP electric substructures are installed concurrently with another utility's substructures, then the minimum separation requirements may be reduced to match separation distances shown in SVP Standard Document UG 1000. If the other utility substructures are installed after SVP substructures are installed, and backfilled, then the clearance requirements of this document shall apply.

Applicants of encroachment permits are required to meet the separation and clearance distances as specified in this document.

Applicants are responsible for the cost of repair of any damage they may cause to SVP facilities. Applicants must contact Underground Service Alert, (USA), prior to construction. Applicants must have an approved encroachment permit, issued by the City, prior to performing excavation work in easements or the street right of way.

If the clearance and separation requirements contained in this document cannot be achieved, the Applicant is to contact SVP Electric Engineering Division to discuss relocation options.

If trenchless construction methods (directional drilling, directional boring, horizontal drilling, jack and bore, or similar methods) are used to install the new conduits, then the minimum required separation distance is 5 feet from the edge of the SVP substructures. The area in the vicinity of the SVP facilities shall be "potholed" during the installation of the new conduits to verify that the minimum separation distance is maintained. The SVP Inspector is to be on site while the new conduits are installed, and exposed, to verify that the minimum separation is achieved and maintained during the boring operation.

Conduits Located Parallel to Electric Ducts

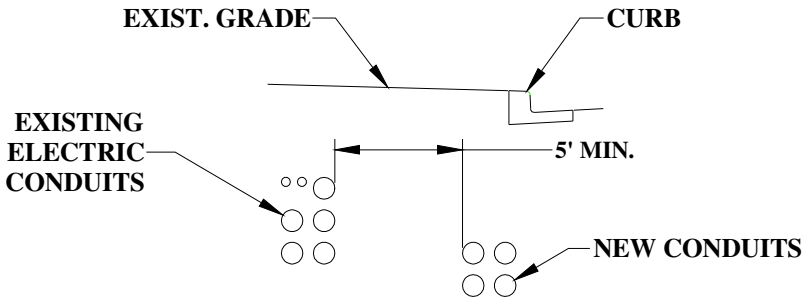

Figure 1: Minimum Separation from SVP Electric Conduits

Figure 1 shows typical situations where new conduits or piping are installed parallel to existing or proposed SVP facilities. Figure 1 shows the minimum required longitudinal separation distance between new conduits or piping systems and any existing or proposed SVP conduit systems. This is a typical installation with all substructures installed at similar elevations. The distances noted in Figure 1 apply regardless of the installation method used for the new conduits or piping systems.

If trenchless construction methods (directional drilling, directional boring, horizontal drilling or similar methods) are used to install the parallel piping or conduit system, then the minimum required separation distance is 5 feet. If an external casing is used to protect or house the conduit system, then the separation distances are applied to the external wall of the casing rather than the conduits or piping system directly.

Piping Systems Crossing Electric Conduits

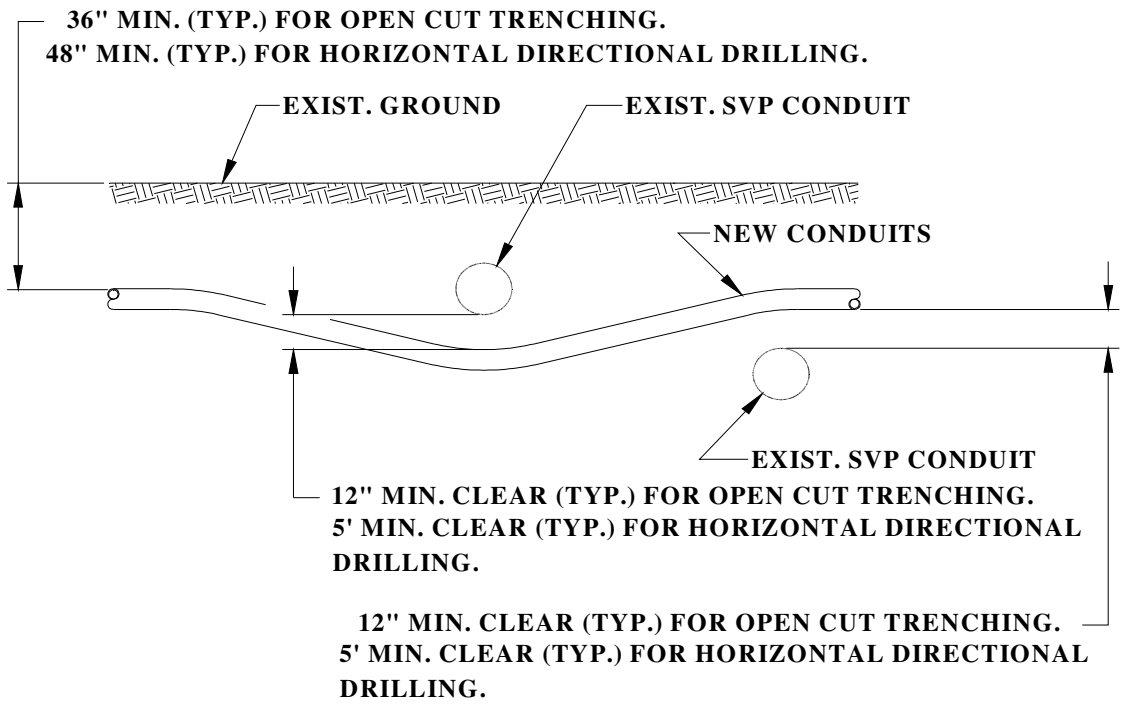

Figure 2: Perpendicular crossing of SVP Electric Conduits by new conduits

Figure 2 depicts a situation where new conduits or piping are installed perpendicular to existing SVP conduits. The minimum separation between the outside walls of both the new conduit and the existing SVP conduits is 12 inches for open trench installations. **The crossing shall not be backfilled until the SVP Inspector has inspected the crossing to verify that the minimum separation is achieved and maintained during backfilling.**

If trenchless construction methods (directional drilling, directional boring, horizontal drilling or similar methods) are used to install the perpendicular piping or conduit crossing, then the minimum required separation distance is 5 feet. If an external casing is used to protect or house the conduit system, then the separation distances are applied to the external wall of the casing rather than the conduits or piping system directly.

Conduits Located Near Electric Poles or Electroliers

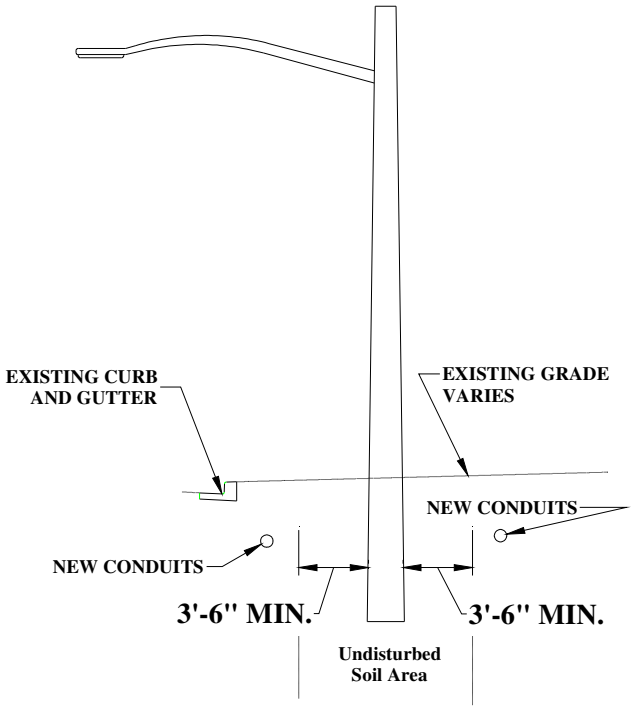

Figure 3: Minimum Separation between SVP Pole Foundations and New Conduits

Figure 3 depicts a situation where new conduits or piping are installed in an open trench in the vicinity of existing aboveground SVP facilities such as a pole or electrolier. This includes guy stub poles, service clearance poles, self-supporting steel pole structures, and lighting poles. The minimum amount of undisturbed soil required around a pole or pole foundation is 3.5 feet. Excavation for new conduits, pipes, or subsurface structures shall not encroach into the 3.5 foot area as measured from the surface of the SVP structure. Exception shall be made for riser pipes or conduits whose placement and location have been reviewed and approved by SVP. New conduits are not allowed to be installed under existing poles or luminaires. Excavations in the vicinity of SVP poles may require supervision from SVP. **The new conduits shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling.**

If trenchless construction methods (directional drilling, directional boring, horizontal drilling or similar methods) are used to install the new conduits, then the minimum required separation distance is 5 feet from the edge of the pole or foundation. The area in the vicinity of the SVP facilities shall be "potholed" to verify that the minimum separation distance is maintained. The SVP Inspector is to be on site while the conduits are installed to verify that the minimum separation is achieved and maintained during the boring operation.

Note that Figure 3 would also apply to a reverse situation where installation of a new non-SVP pole is proposed in the vicinity of existing SVP conduits. An example might be for a parking lot light, a temporary power pole, a new communications pole, or similar application. A minimum separation of 3.5 feet is required between the outside edge of the SVP conduits and the excavation edge for the new pole.

Splice Boxes Located Near Electric Ducts

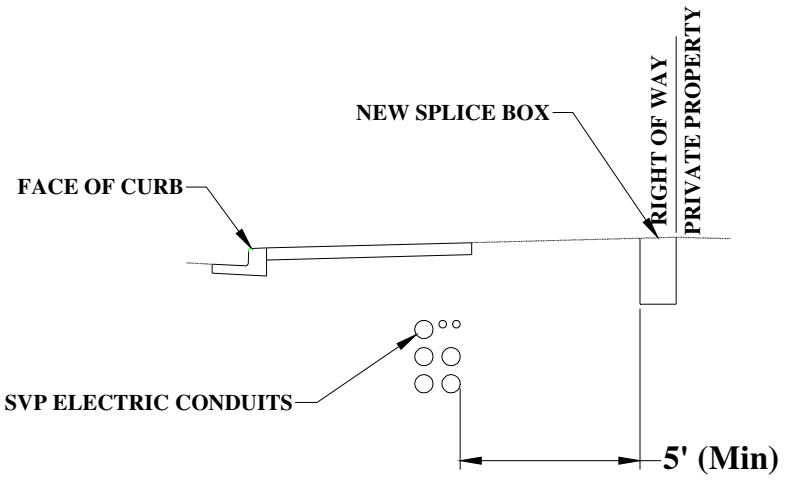

Figure 4: Separation Between New Splice Boxes and SVP Electric Ducts

Figure 4 depicts a situation where new splice boxes, pull boxes, manholes, vaults, or similar subsurface facilities are installed in the vicinity of existing SVP substructure facilities. Figure 4 shows the minimum required longitudinal separation distance between new subsurface enclosures and any existing SVP conduit systems. **The new subsurface enclosures shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling.**

See Figures 9 and 10 of this document for explanations and restrictions regarding the placement of new manholes and vaults installed in the vicinity of existing SVP manholes or vaults.

Building Foundations or Walls Located Near Electric Ducts

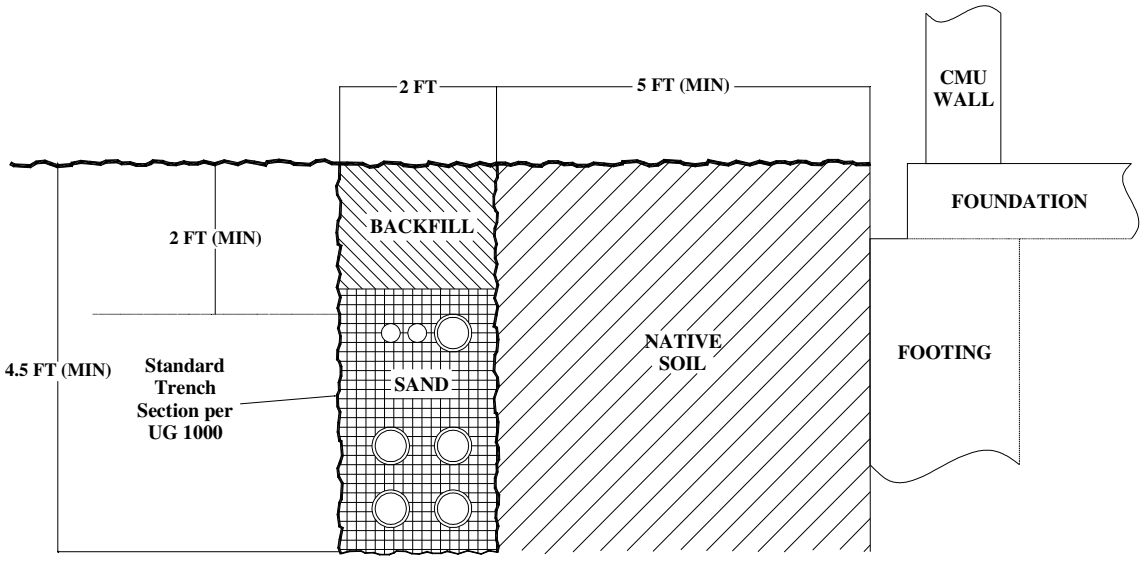

Figure 5: Electric Duct Separation from Walls and Footings

Figure 5 depicts a situation where new SVP conduits or other substructures are installed in the vicinity of either a new, or existing, concrete structure, such as a building wall, building footing, retaining wall, landscape planter, tree root barrier, or other subsurface wall or structure. The minimum separation between the edge of the new conduit trench and the existing wall or footing, is 5 feet.

The new conduits shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling. Specific details about SVP trench construction and backfill requirements are available in SVP Standard Document UG 1000.

Note that Figure 5 would also apply to a reverse situation where the installation of a new wall or footing is proposed in the vicinity of existing SVP conduits. The same separation requirements of Figure 5, noted above, also would apply to the reverse situation.

Posts or Pole Structures Located Near Electric Ducts

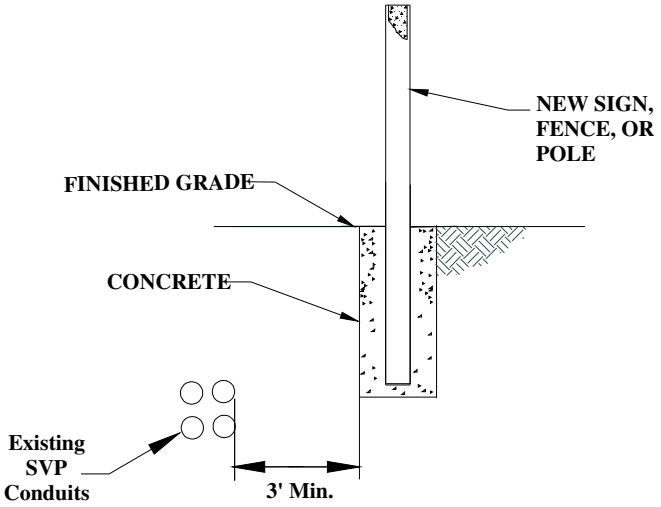

Figure 6: Duct Separation Between SVP Electric Conduits and Posts

Figure 6 depicts a situation where a new post is installed in the vicinity of existing underground SVP facilities such as conduits, manholes or splice boxes. This includes sign posts, barrier pipes or bollards, fence posts, and other similar structures. The minimum separation between the outside edge of the new excavation and the existing SVP substructure is 3 feet. New posts are not to be installed over existing conduits or substructures. Care must be taken so as not to undermine any existing SVP facilities by the new excavation. **The new post shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling**.

New Conduits Located Near Electric Boxes and Vaults

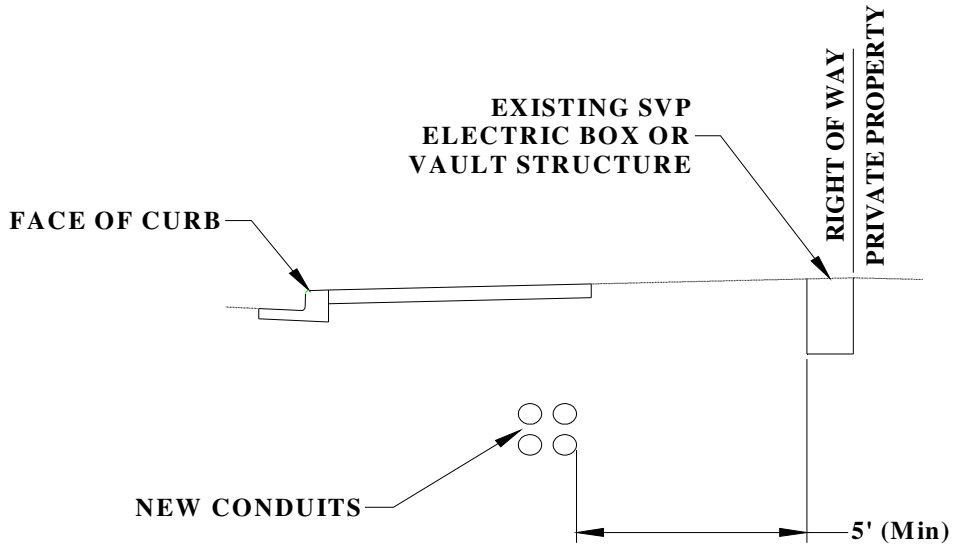

Figure 7: Separation Between New Conduits and Existing SVP Boxes

Figure 7 depicts a situation where new conduits are installed in the vicinity of existing underground SVP facilities such as vaults, manholes or splice boxes. The minimum separation between the outside edge of the new conduits and the existing SVP substructure is 5 feet. **The new conduits shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling.**

If trenchless construction methods (directional drilling, directional boring, horizontal drilling, jack and bore, or similar methods) are used to install the new conduits, then the minimum required separation distance is 5 feet from the edge of the existing SVP enclosure. If an external casing is used to protect or house the conduit system, then the separation distances are applied to the external wall of the casing rather than the conduits or piping system directly. The area in the vicinity of the SVP facilities shall be "potholed" to verify that the minimum separation distance is maintained. The SVP Inspector is to be on site while the conduits are installed to verify that the minimum separation is achieved and maintained during the boring operation.

New Conduits Located Near Electric Manholes

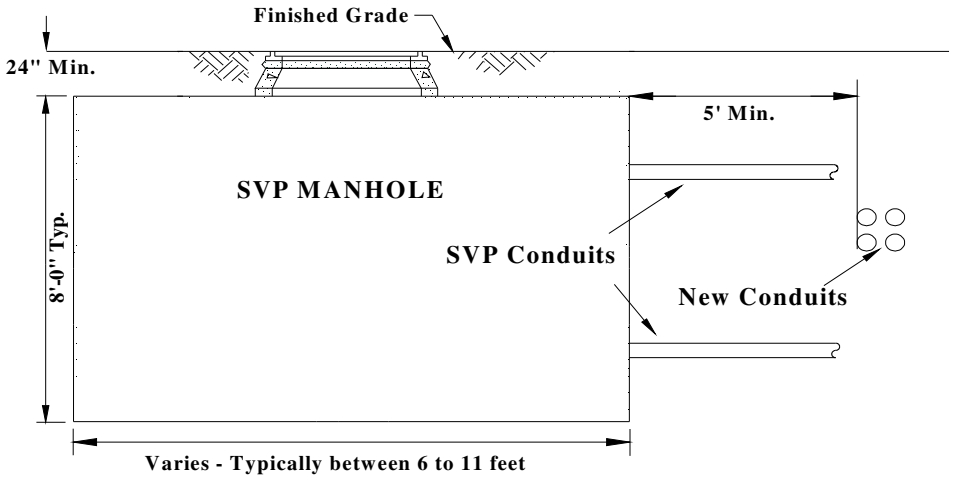

Figure 8: Separation of New Conduits from Existing SVP Manholes

Figure 8 depicts a situation where new conduits are installed in the vicinity of existing underground SVP manholes or vaults. The minimum separation between the outside edge of the new conduits and the existing SVP substructure is 5 feet. New conduits must also comply with the separation requirements between conduits as noted in this document. **The new conduits shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling**.

If trenchless construction methods (directional drilling, directional boring, horizontal drilling, jack and bore, or similar methods) are used to install the new conduits, then the minimum required separation distance is 5 feet from the edge of the manhole or vault. If an external casing is used to protect or house the conduit system, then the separation distances are applied to the external wall of the casing rather than the conduits or piping system directly. The area in the vicinity of the SVP facilities shall be "potholed" to verify that the minimum separation distance is maintained. The SVP Inspector is to be on site while the conduits are installed to verify that the minimum separation is achieved and maintained during the boring operation.

New Vaults or Manholes Located Near Electric Manholes

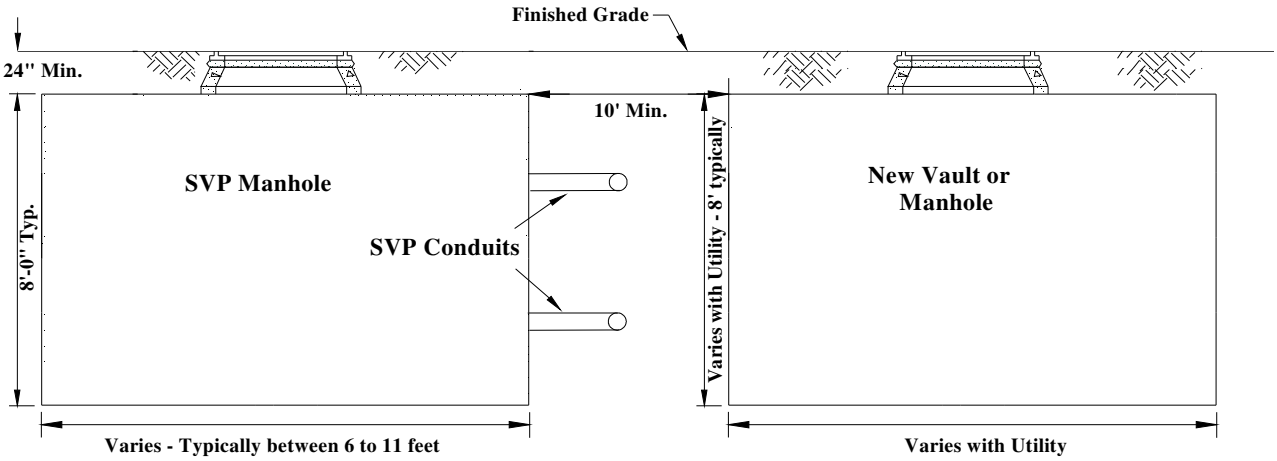

Figure 9: Separation of New Vaults from Existing SVP Manholes

Figures 9 and 10 depict situations where a new vault or manhole is installed in the vicinity of an existing underground SVP manhole or vault. The minimum separation between the outside edge of the new vault or manhole and the existing SVP substructure is 10 feet. Dimensions shown are finished dimensions and do not include any shoring or excavation to protect existing facilities. **The new vault or manhole shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling.**

In addition to the minimum separation shown in Figure 9, the new vault or manhole must be installed such that it is offset from the center of the SVP manhole. Figure 10 illustrates the concept of the offset from a plan view perspective. One end of the new manhole shall not extend past the center of the existing SVP manhole. This is to allow for conduits from both manholes to be able to connect to their respective vaults or manholes. Entering and exiting conduits from each manhole or vault need to maintain the same separation requirements as required in this document.

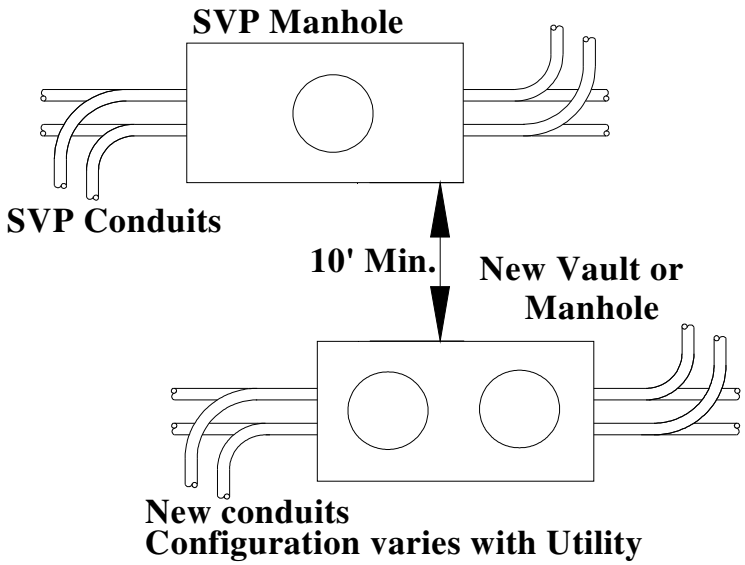

Figure 10: Offset Requirements Between Manholes

The same clearance requirements apply to situations where wet utility manhole type structures are proposed to be installed in the vicinity of existing SVP pullboxes and manholes. A minimum horizontal separation of ten feet, as shown in Figure 9, is required between the outside edge of the existing SVP substructures and the outside edge of a water meter vault, oil-water separator enclosure, or similar type of structure. The new structure is to be offset as shown in Figure 10 as well.

It is strongly recommended that the designer of the proposed new substructures consult with the SVP Electric Engineering Division to determine the best placement of proposed designs and locations of new manholes and vaults in the vicinity of SVP electric manholes, pullboxes, and vaults.

New Conduits Located Near Down Guy Anchors

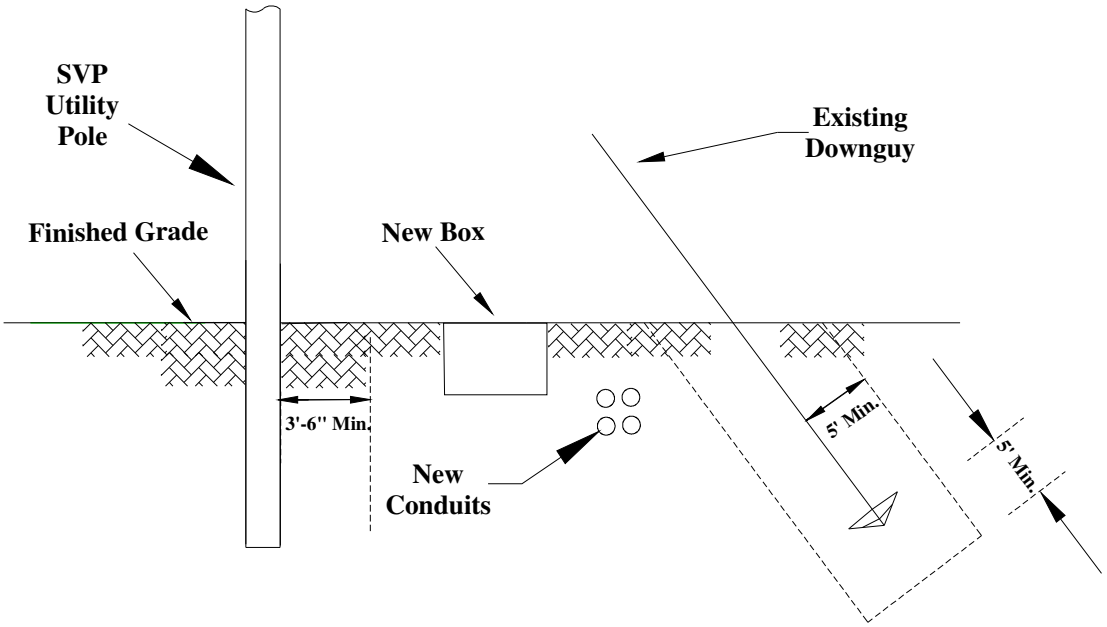

Figure 11: Separation Between New Conduits and Downguy Anchors

Figure 11 depicts a situation where new substructures are installed in the vicinity of an existing SVP downguy anchor. The soil shall not be disturbed for a minimum of 5 feet away from the anchor in any direction. The zone where no excavation may occur is a cylinder with a radius of 5 feet with the anchor in the center. This cylindrical zone extends past the anchor base a distance of 5 feet while the overall length of the anchor in the ground has a length of 10 feet. The soil around the Utility Pole shall not be disturbed for a minimum distance of 3' 6" from the surface of the pole or foundation, as shown in figures 3 and 11 of this document.

Any excavation between the pole and the downguy, shall be done by hand until the excavation is at least 5' clear of the downguy. New conduits shall not be backfilled until the SVP Inspector has inspected the new installation to verify that the minimum separation is achieved and maintained during backfilling. If a new handhole, pullbox, splice box, manhole, and other similar type subsurface structure is proposed to be installed between the pole and the downguy, an SVP inspector shall be on site for the duration of the excavation and backfilling activity.

If trenchless construction methods (directional drilling, directional boring, horizontal drilling or similar methods) are used to install the new piping or conduit, then the minimum required separation distance is 5 feet. If an external casing is used to protect or house the conduit system, then the separation distances are applied to the external wall of the casing rather than the conduits or piping system directly.