

GENERAL CONSTRUCTION NOTES
INSTALLATION OF UNDERGROUND ELECTRIC DISTRIBUTION SYSTEM
RESIDENTIAL, COMMERCIAL AND INDUSTRIAL PROJECTS
Revised: October 2008

OWNER, PROJECT DEVELOPER OR CONTRACTOR NOTES:

Owner, project developer or contractor shall furnish all labor, material, equipment and services to construct and complete an underground electric substructure system. These include but not limited to excavation, shoring of excavation, installation of conduits and concrete substructures, concrete encasement, backfilling, compaction of backfill, permanent resurfacing, reconstruction of concrete improvements, disposal of construction debris and all appurtenant work.

1) PROJECT PLANS: Owner, project developer, consultant or designated agent shall prepare a drawing or plans showing the scope and extent of the work involved. Project plans involving the method of electric service or incoming utility lines for electric service shall be submitted for review to Azusa Light & Water. All underground electric substructures shall be installed as per approved plan and specifications for the project.

2) EXCAVATION PERMIT: Prior to starting construction, the owner, project developer or contractor shall obtain duly approved excavation permits for any work that involves digging in the public right-of-way or easements.

Excavation Permit:

Engineering Department
809 North Angeleno Avenue
Azusa, California 91702
Tel. # (626) 812-5247

3) CONTRACTOR RESPONSIBILITY: Contractor shall notify Underground Service Alert (USA) before commencing with any excavations. Contractor shall determine the exact location of all underground substructures or utilities including service connections and protect these existing substructures during construction. Any damage done by the contractor to these existing substructures will be the total responsibility of the owner / contractor and that these damaged substructures shall be restored to their original condition. Unknown field conditions, existing substructures or utilities not shown on the approved plan shall be the responsibility of contractor performing the work.

4) CONSTRUCTION INSPECTION: Installation of underground electric conduits & substructures require field inspection and approval by Azusa Light & Water Department during construction. Contractor to notify Azusa Light & Water Department and schedule an appointment for inspection 24 hours in advance. Completed installation "as built" drawings shall be submitted by contractor or owner. Installed underground substructures will not be accepted unless duly inspected and approved by Azusa Light & Water Department. Contractor or owner shall perform the corrections required by Azusa Light & Water prior to pulling cable and energizing the service.



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5) ELECTRIC SUBSTRUCTURE INTERCEPTION: Contractor shall contact Azusa Light & Water Department and schedule a safety man to be present when entering or breaking into conduits, vaults, pull boxes or transformer pads that contain energized cables & equipment.

6) FIELD CHANGES / PLAN REVISIONS: If it becomes necessary to make a change or deviate from the approved plan, Contractor shall duly notify the owner, Engineer, and authorized representative of the Azusa Light & Water Department before implementing any major changes from the approved plan. The Engineer shall give the contractor a duly revised plans which shall become part of the approved plans. Contractor shall avoid verbal orders when implementing major plan changes or revisions in the field.

7) RIGHT-OF-WAY / EASEMENTS: Installation of underground electric substructures in private property requires the grant of easement. Landowner shall secure and grant to Azusa Light & Water Department the electric easement necessary to install the electric facilities in private property.

CONDUITS:

8) CONDUIT, SWEEPS, and BENDS SPECIFICATION: All buried conduits and sweeps shall be approved PVC plastic schedule 40 and shall conform to NEMA Standard #TC-6 and ASTM #F512. Except pole riser for primary or high voltage line, all exposed or above ground conduits and sweeps shall be schedule 80. Pole riser conduits and sweeps for primary or high voltage line shall be rigid galvanized steel. All conduits and sweeps shall be installed as per plan and in accordance with latest revision of Western Underground Committee Standard Placement Instruction.

9) CONDUIT SWEEPS, AND BENDS: All conduit sweeps, and bends shall be approved PVC plastic schedule 40. Minimum radius, for low voltage line shall be 12 times the conduit diameter in inches, 150 inches for main lines, and 72 inches for tap lines. Steel riser pole sweep shall be installed including the first ten feet of straight steel riser pole conduits when riser conduits are exposed to potential damage from vehicular traffic. Conduit sizes are 5" or 4" for primary conduits, 4" for secondary conduits and 3" for all service conduits as specified in the approved plan. In any conduit run the total angular degree of sweeps and bends between two connection points shall not exceed 270 .

10) SUBSTRUCTURE COVERAGE & SEPARATIONS : All conduits installed shall have minimum coverage of 36" from finished grade to top of conduit concrete encasement. Conduits installed in residential private property shall have minimum coverage of 30" from finished grade to top of conduit. Minimum coverage may be reduced to 24" with department approval. Electric conduits shall be separated away from existing substructures or utilities by a minimum parallel clearance of 12" horizontal and 6" vertically when crossing. Other utilities or substructures shall not be installed in parallel directly above electric conduits.



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11) CONDUIT ENCASUREMENT: All high voltage primary conduits including all conduits installed in public right-of-way or easements shall be encased in 3 sack concrete mix containing 1/4" pea gravel. A 2" separation between conduits and a minimum 3" concrete envelope shall be maintained. Plastic spacers should be placed every 8 linear feet of conduits to maintain separation and secure conduits during concrete encasement. Electric conduits shall be separated from existing gas lines by a minimum horizontal clearance of 24" (2ft.). Low voltage secondary conduits in private residential property may be installed without concrete encasement.

12) EXCAVATION / BACKFILL: Contractor shall perform all excavations necessary to install electric substructures. The entire electric conduits shall be laid in parallel to final finished grade. Backfill shall be built and compacted in accordance with the street trench replacement detail. All backfill, soil compaction and final resurfacing shall be the responsibility of contractor and must be in compliance with excavation permit and requirements of the City Engineer. Contractor shall submit certified compaction test report to City Engineer if required.

13) CONDUIT TERMINATION: Conduits terminating in vaults and walls of pull boxes shall have bell ends and grouted on the inside wall. Conduits entering pull boxes from the bottom shall extend no more than 4" above the bottom of the pull box and gravel base. Contractor shall install 1800 lbs polyester muletape with printed sequential footage pull line in all conduits after conduits have been mandrelled. All new conduits must be mandrelled by contractor.

PRECAST CONCRETE SUBSTRUCTURES:

14) PULL BOX, SLAB BOX, & VAULT INSTALLATION: All precast substructures specified shall be installed as per approved plan and in accordance with the manufacturer's instructions. Contractor shall provide crushed rock base under all substructures. Necessary grade rings or neckings shall be provided to bring covers up to final finished grade. Vaults installed in right of way require minimum of 1 grade ring for adjustment. Contractor shall provide all necessary grouting and gasketing material to properly assemble and seal the structure. Contractor shall install two 5/8"x 8' copperweld ground rods separated six feet apart at each pad or primary pull box location. Provide 2/0 stranded bare copper ground cable, connected to the rods, into the pad or pull box.

15) TRANSFORMER PAD INSTALLATION: Contractor shall install transformer pad including slab box & base footing, as per size & location indicated on the approved plan. Transformer pads shall be situated in a secured and accessible location in the customer premises. Contractor to provide the necessary grounding and barriers at pad location. Transformer pad shall be installed with a minimum all around clearance of three feet from a fixed structure.



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16) COVERS: Contractor shall provide sealed pull box or pad covers with the proper cover finish, markings, bolts, hinged opening and lifting handles and galvanized steel or concrete covers. Covers exposed to vehicular traffic shall have traffic covers rated for H-20 loading. Cover and markings for pull boxes or pads shall be as follows:

STRUCTURES	COVER MATERIAL	ALTERNATE MATERIAL	MARKING
VAULT	BOLTED STEEL CAST MANHOLE	NONE	AZUSA HIGH VOLTAGE
PRIMARY PULL BOX & PAD	SPRING ASSISTED HINGED BOLTED GALVANIZED STEEL	NONE	AZUSA HIGH VOLTAGE
SECONDARY PULL BOX (2'x3' & 17"x30")	BOLTED CONCRETE	POLYMER CONCRETE	ELECTRIC
STREET LIGHT PULL BOX (12"x22")	BOLTED CONCRETE	POLYMER CONCRETE	ST LIGHT

17) PROTECTIVE BARRIERS: protective barriers shall be installed around transformer pads and other distribution structures as required on the approved plan or where electric equipment is exposed to vehicular traffic. 4" steel pipe barriers filled with concrete mounted at a minimum of 36" above finished grade shall be installed.

18) STREET LIGHTS: Owner, project developer or contractor shall furnish and install at locations indicated on the approved plan necessary street light pole & fixtures, foundations, pull box and completely wired to the power source or meter pedestal.

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