

City of Ocala
Utility Services



Electric Engineering Division

RESIDENTIAL CONDUIT RULES AND REGULATION



Electric Engineering Division

Dear Developer:

Over the next few months, the City of Ocala Utility Services (OUS) will be working closely with you and your contractors to install the electrical conduit system for your project. We in the Electric Engineering Division are looking forward to working with your contractors and wants the installation to proceed as smooth as possible.

Attached, please find the City of Ocala Residential Conduit Rules and Regulations for use by your electrical conduit contractor. If the contractor has any questions that are not addressed in this guide, please contact the City representative responsible for the project.

Respectfully
Ocala Utility Services
Engineering Division

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L. TERMS AND DEFINITIONS

Conduit System:	Any combination of duct, conduits and vaults joined to form an integrated whole.
Conduit Stub-up:	Any vertical length of conduit that allows above ground access to an underground electrical conduit raceway.
Developer:	Architect, engineer, electrician, owner, or contractor responsible for the installation of the electric facilities.
Utility Easement:	A legal document giving the Utility limited use of private property to provide electric service.
Ells:	Heavy wall rigid PVC conduit elbow; gray in color; 24 inch radius, Electrical grade.
Final Grade:	The grade at the time of completion of the site including all buildings.
Overhead Construction:	The standard placement of electric distribution lines on wood or concrete poles above ground.
Point of Service:	The point within a parcel of property that is determined the closest and most reasonable for Ocala Utility Services to provide electric service. Typically where OUS facilities end and the customer's begin.
Primary Cable:	Electrical cable used for the purpose of transmitting high voltage (above one thousand volts) from one point to another.
Primary Riser:	Any vertical length of conduit used to transition overhead primary to underground primary.
Primary Cabinet:	An above ground metal enclosure, used for joining primary electrical cables.
Primary Conduit:	Conduit intended for use with primary cable.
Secondary/Service Conduit:	Conduit intended for use with secondary or service cable.
Raceway:	An enclosed channel designed expressly for holding wire or cables. A conduit is a raceway, so is a duct.
Right-of-way:	A strip of land occupied or intended to be occupied by a road, crosswalk, railroad, electric power line, oil or gas pipeline, water main, sanitary or storm sewer main, or for similar use.

Secondary Cabinet:	Junction point to terminate secondary conductor. Above ground cabinet usually contains Utility cable and customer cable within the same enclosure.
Secondary Cable:	Electrical cable used for the purpose of transmitting low voltage (600 volt cable) from one point to another.
Secondary Riser:	Any vertical length of conduit used to transition overhead secondary to underground secondary.
Secondary Vault:	A below ground fiberglass enclosure, used for joining secondary electrical cables.
Sweep:	A gradual curve of the conduit raceway used to change direction of the conduit run.
Transformer:	Electrical device used for converting voltage levels.
Transformer Pad:	A ground mounted platform used to support a transformer.
Underground Construction:	The placement of electric primary and/or secondary cable and conduit below final grade.
Warning Tape:	Six-inch wide red warning tape installed in all trenches above conduit system at 12 inches below final grade.

DEVELOPERS RESPONSIBILITIES

1. Installation of the underground electric conduit system shall not begin until the contractor is issued prints stamped “**APPROVED FOR CONSTRUCTION**” and initialed by the Engineer assigned to the project. Any print(s) that are unstamped or stamped “preliminary” cannot be used for construction. Field changes to the conduit design must be approved by OUS in writing.
2. Construction site must be within six (6) inches of final grade or the Developer must provide elevations for the conduit route before any conduit installation may begin.
3. The conduit system must be inspected by an authorized inspector Ocala Utility Services, Engineering Division, 351-6620 prior to closing the trench. Failure to comply will result in re-opening of the trench. The cost for re-opening will be borne by the Developer.
4. The Developer will be responsible for staking all electrical cable routes, junction vaults and transformer locations as indicated in the approved construction drawings supplied by OUS. Any relocation needed after the conduit is installed will be at the Developer’s expense.
5. The Developer shall be responsible for supplying property markers, right-of-way markers, radius of curvature markers, sidewalk markers, and curb markers as needed for the electrical conduit installation before, during and after construction.
6. The Developer shall be held responsible and liable for the electrical conduit system until the Ocala Utility Services, Engineering Division accepts it. The conduit installed will be officially accepted when the Ocala Utility Services successfully installs cable in the conduit system. All as-built drawings must be submitted to the Electric Engineering Division prior to final acceptance.
7. The Developer shall be responsible to ensure that shrubs, plants, and structures are kept nine (9) feet from the front side of padmount transformers, and three (3) feet from the other sides. Ocala Utility Services reserves the right to remove any obstructions without notice to the owner if any deviations from this standard are encountered in the field. (SEE EXHIBIT “12”).
8. City, County or State Road Permits and Railroad Permits will be obtained by Ocala Utility Services as necessary. No construction can be started until all applicable approved permits are received.
9. The developer must provide a ten (10) foot utility easement on each side and along the road right-of-way lines for all roads within the development. All trees, and other obstructions, must be removed within this easement area.
10. If a temporary construction service is required the meter post will be installed at the right side rear of the transformer or the rear of the secondary vault. (SEE EXHIBIT “18”)
11. The Developer shall provide service conduit from the meter can to the secondary vault or padmounted transformer.

These specifications reflect minimum requirements and Ocala Utility Services reserves the right to alter or impose more stringent requirements as necessary for good engineering design.

TRENCH SPECIFICATIONS AND PROCEDURES

1. All primary and secondary conduits shall utilize the same trench whenever possible.
2. **Depth:** All trenches must be level and dug to allow thirty-six (36) inches from the top of the conduit to final grade.
3. **Width:** All trenches must be a minimum of six (6) inches in width. If more than one conduit is being installed in a trench, no stacking of conduits is permitted. All conduits must lay flat in the trench. (SEE EXHIBIT “19”)
4. After the Electric Engineering Division has inspected and approved the conduit within an opened trench, the trench must then be backfilled with soil free from any debris. This backfill soil must be on site and inspected prior to use for backfilling.
5. The Developer shall be responsible for the disposal of any foreign materials that are removed from any trench.
6. The Developer shall be responsible for any and all compaction (if needed) within the road right-of-way and on private property. This includes all landscaping and swale reconstruction.
7. Whenever applicable, trenching and backfilling including compaction will conform to City, County, or State jurisdictions. Where trench crosses present or future pavement or roadways, compaction and density testing may be required to conform to article 125-8.3 of the Florida Department of Transportation Specifications for Road and Bridge Construction.
8. The Developer shall supply and install underground warning tape directly above the conduit in all trenches and at a depth of twelve (12) inches below final grade. (SEE EXHIBIT “9”)

REQUIREMENTS FOR JOINT USE OF TRENCH

For other utilities wanting to utilize the same trench with Ocala Utility Services, the following guidelines and requirements must be followed:

- a) Two (2) foreign utilities, telephone and cable TV, are permitted (with a joint use agreement) to utilize an electric trench. When either of these utilities wants to utilize the same trench, each utility must maintain a minimum vertical clearance of twelve (12) inches separating the electric cable from the other utility and a horizontal clearance of eighteen (18) inches. (SEE EXHIBIT “10”)

- b) Water, Gas and Sewer are not permitted to utilize an electric trench except for coincidental crossings that may occur. In this event there must be a minimum of twelve (12) inch vertical clearance separating the electric cable from the other utility (SEE EXHIBIT “11”)

CONDUIT SPECIFICATIONS

1. Size and type of conduit and ells will be specified on construction print(s).
2. **All conduits** shall be SCH 80 or SCH 40 rigid PVC conduit electrical grade; NEMA TC-2 specification; UL approved; rated for 90 degree C cable; furnished with coupling or integral long bell; gray in color; underground applications.
3. **Conduit couplings** shall be “long line” type.
4. **Primary/Secondary/Service/Lighting risers** shall be schedule 80 PVC conduit and are the responsibility of OUS.
5. **Primary/Secondary/Service/lighting Stub-ups** shall be schedule 80.
6. **Ells** used in primary, secondary, or service, conduit systems are 90 degree, schedule 40 PVC, and twenty-four (24) inch radius, unless otherwise specified.
7. **Lighting Ells** shall be one (1) inch, 90 degree, schedule 40 PVC, twelve (12) inch radius, unless otherwise specified.
8. **C.T. metering ells** shall be one (1) inch, 90 degree, schedule 40 PVC, 12 inch radius.
9. **C.T. metering conduit** shall be one (1) inch schedule 40 PVC. Maximum length from the transformer pad to metering equipment to be twenty-five (25) feet.
10. **Primary Conduit raceways** shall be schedule 40 PVC conduit.
11. **Secondary Conduit raceways**, from transformer to secondary cabinet, shall be schedule 40 PVC conduit.
12. **Lighting conduit raceways** shall be one (1) inch, schedule 40 PVC conduit, unless otherwise specified.
13. **Primary, Secondary, Service, and lighting stub-ups** shall be schedule 80 PVC conduit at the base of the pole and is schedule 40 PVC at any other location.

CONDUIT PROCEDURES

Raceways:

1. Primary conduit run shall not have more than three (3) bends within the run regardless of whether the bend is constructed from a 90 degree or 45 degree ell. This includes the ells for stub-ups.
2. Field bending of conduit, by heating, is not permitted.
3. Any conduit that passes under pavement may be encased in concrete with a minimum of six (6) inches of concrete on all sides. (SEE EXHIBIT “2”) Installation of concrete is not a normal construction practice. Conduit supports must be installed very five (5) feet and the conduit must be secured in a manner that will prevent the conduit from floating during the installation of the concrete.
4. Conduit shall be installed in straight lines and remain level at all times. Sweeps shall not be used unless specified on the construction print. If more than one conduit is being installed, the placement of conduits must be installed in a horizontal alignment (side by side configuration).
5. Routing of conduit raceways, within easement, shall remain at seven (7) feet behind the road right-of-way. (SEE EXHIBIT “3”) The placement of all conduit runs shall conform to the City and County requirements.
6. **Depths:** Primary and secondary conduit - minimum thirty-six (36) inches (to the top of the conduit) below final grade. (SEE EXHIBIT “4”)
7. A continuous length of polypropylene 200 pound pull line shall be installed in each conduit with an excess of ten (10) feet secured at each end. (Spare riser conduits shall have thirty (30) feet of excess length of nylon pull string for future use). The cord shall be installed after the conduit is glued together and all joints are cured to prevent the cord from sticking to the conduit.
8. Open ends of all conduits shall be covered/sealed with duct tape applied at double thickness. The tape shall cover the entire opening and all exposed string to prevent entry of water and other foreign materials. This also includes unfinished conduit runs left in a trench at the end of each workday. (SEE EXHIBIT “7”)
9. All conduit runs shall be marked at the top of the stub-up with the same identification number as the first up-line or down-line electrical device to identify ends of conduit runs. Marks shall be made with a permanent marking pen, black in color. Identification numbers are indicated on the construction print with an alphanumeric character (EX. F1123). Any questions should be referred to the OUS representative responsible for the project.
10. PVC cleaner and cement shall be applied to all conduit joints in accordance with the manufacturer’s specifications.
11. The raceway(s) are to be clear of any obstructions. The utility will pull a steel mandrel through the raceway to verify proper installation. The contractor must correct any obstructions encountered.

Risers :

1. Primary risers shall consist of ninety- (90) degree schedule 40 PVC ells at the bottom of the trench with a five (5) foot schedule 80 stub up that is contractor supplied and installed. (SEE EXHIBIT “14”)
2. Riser conduits shall be installed on the side of the pole opposite oncoming traffic or the field side of pole.
3. Secondary and service riser conduits shall be installed by OUE to the conduit stub up installed by the contractor. (SEE EXHIBIT 1”).

Transformers:

1. All conduits shall be stubbed up and capped at a minimum of four (4) feet above final grade at all transformer locations.
2. There shall be a seven (7) inch minimum separation between the primary and secondary conduit for single phase transformer locations. (SEE EXHIBIT “4”)
3. There shall be a twenty (20) inch minimum separation between the primary and secondary conduits for all three phase transformer location, unless otherwise specified on transformer pad drawing. (SEE EXHIBIT “4”)
4. Construct three phase transformer/secondary cabinet concrete pad. Concrete to be 3000 PSI at twenty-eight (28) days.
6. Number 3 reinforcing rods to be installed twelve (12) inches center. Dimensions of pad are site specific and are to be supplied by OUS. Pad forms are to be inspected prior to pouring concrete.

Vaults:

1. Conduit stub-ups at all single phase primary vault locations shall be grouped together with one (1) inch of separation between each conduit. The conduit shall be stubbed up and capped at a minimum of four (4) feet above final grade. Conduit configuration shall not exceed twelve (12) inches in width and fifteen (15) inches in length. (SEE EXHIBIT “5”)
2. Conduit stub-ups at all two (2) and three (3) phase vault locations shall be grouped in phases. Same phase conduits shall have one (1) inch of separation between each conduit and six (6) inches shall separate the phases. The conduit shall be stubbed up and capped at a minimum of four (4) feet above final grade. Conduit configuration shall not exceed twelve (12) inches in width and fifty (50) inches length. (SEE EXHIBIT”6”)

SUMMARY

WORK TO BE PERFORMED AND MATERIAL TO BE FURNISHED BY THE DEVELOPER:

1. Open and close all trenches as required by the work order.
2. Furnish and install all conduits as required by the work order.
3. Provide a pull line in the conduit for use by Ocala Utility Services.
4. Supply and install warning tape above all conduit runs.
5. Construct concrete transformer/secondary cabinet pad per work order specifications.
6. Install secondary to transformer, secondary cabinet, or secondary vault as required.

WORK TO BE PERFORMED AND MATERIAL TO BE FURNISHED BY THE OCALA UTILITY SERVICES:

1. Furnish and install distribution transformers.
2. Furnish and install all primary and secondary vaults.
3. Furnish, and install primary (high voltage) conductors.
4. Provide all construction prints needed for the electrical conduit installation.
5. Furnish, and install all secondary conductors from the transformer to the secondary cabinets, if specified.
6. Perform regular inspections of the conduit system as it is being installed.
7. Furnish and install all riser conduits.