



TOWN OF QUEEN CREEK
Community Development Department
Engineering Division
22350 S. Ellsworth Road
Queen Creek, Arizona 85242

DESIGN STANDARD

TO: Development Community
Consulting Engineers
Town Staff

FROM: Michael Pacelli, P.E., Traffic Engineer
Lester Godsey, Information Technology Division Manager

DATE: March 19, 2007

RE: Telecommunication Conduit Standards

The Town Council adopted general guidelines establishing telecommunication conduit standards on September 20, 2006. This memo provides the additional design details needed to implement the concept approved by the Council. As with all design guidelines, the standards described herein are subject to change at any time, without notice, as deemed necessary in the best interests of the Town.

Furthermore, it must be emphasized that these guidelines represent the *typical* design for the telecommunication conduit, but the inclusion or exclusion of telecommunication conduit along a given roadway, the number of conduits, trench configurations, and all other installation details are subject to modification by the Town on a case-by-case basis. Final approval of conduit types, routing, pull box types and locations, and installation details shall be at the discretion of the Traffic Engineer or IT Manager.

The Council-approved concept established two typical conduit standards: Municipal Use Standard and Q-Street Standard. Each is briefly described below, followed by General Installation Details, which apply to both conduit standards.

MUNICIPAL USE STANDARD

The Municipal Use Standard (commonly referred to as “traffic signal interconnect”) provides conduit capacity for various municipal uses, and shall generally be installed on all section-line roads, as well as key non-section-line roads needed to reach traffic signals or other Town-owned facilities, including Rittenhouse Rd and Cloud Rd. The exact conduit routing shall be determined through the Telecommunication Master Plan and ITS Master Plan development process.

This standard shall consist of four (4) three-inch PVC Schedule 40 conduits, and shall generally be installed as two separate trenches with two (2) three-inch conduits located behind the outer curb along each side of the roadway, allowing for construction of a single two-conduit trench with half-street improvements. One conduit in each trench shall be reserved for the Public Works Department for traffic signal interconnect and intelligent transportation systems, and the other for use by the Information Technology Division for various other municipal uses.

The conduit shall be installed between the back of curb and right-of-way line, and shall generally be located under sidewalk to the greatest extent possible (when installed prior to sidewalk construction). Pull boxes shall not be installed in the sidewalk whenever possible, and shall be located where meandering sidewalk allows the box to be installed without notably sweeping the conduit from its path.

Pull boxes shall be provided as follows:

- No. 9 pull boxes shall be installed as near as practical to the corner at intersections which have or are likely to have traffic signals. At a minimum, this includes all existing section-line and half-section intersections.
- No. 9 pull boxes shall be installed so as to intercept crossing conduit runs whenever a Municipal Use trench crosses another Municipal Use or Q-Street trench.
- No. 7 (with one extension) pull boxes shall be located as needed along the conduit run to facilitate cable pulling.
- Pull boxes shall be approximately evenly spaced where practical, but in no case shall the distance between adjacent pull boxes exceed 1,000 feet.

Q-STREET STANDARD

The Q-Street Standard provides conduit capacity for various municipal uses, as well as providing limited additional capacity in a common trench for other governmental agencies and third-party telecom service providers in order to reduce the need to excavate key roadways in the future. The exact locations for the Q-Street routing shall be determined through the Telecommunication Master Plan development process. At present, the only defined Q-Street corridor is Ellsworth Rd / Ellsworth Loop Rd from Germann Rd to Empire Blvd, although several others are anticipated.

This standard shall consist of four (4) three-inch PVC Schedule 40 conduits for municipal use and four (4) four-inch PVC Schedule 40 conduits for future third party use. Two three-inch conduits in the municipal cluster shall be reserved for the Public Works Department for traffic signal interconnect and intelligent transportation systems, and the other two three-inch conduits shall be for use by the Information Technology Division for various other municipal uses.

If practical, the preference shall be for the single conduit bank to be installed in the median of divided arterials, with pull boxes located within raised landscaped areas. Except in extraordinary situations, pull boxes shall not be installed in paved areas.

The locations of all access points shall be determined in coordination with the Traffic Engineer and IT Manager, and shall generally be as follows:

- Access points shall be provided at distances not to exceed 1,000 feet, and shall consist of two No. 9 pull boxes per location.
- The boxes shall be located in close proximity to each other, but shall be staggered both along the run and laterally to ensure that clear access is provided to all sides of each box.
- The three-inch municipal conduits shall be swept into one pull box, and the four-inch third party conduits shall be swept into the other.
- Two (2) three-inch conduit shall also be provided between the two pull boxes for future cross-connections.
- At each access point, two (2) three-inch conduits shall be provided, perpendicular to the roadway, from the municipal box on the median to a No. 7 (with one extension) pull box behind the curb on each side of the roadway for future connections to municipal facilities.
- A single three-inch conduit shall be provided for traffic signal interconnect from the curbside No. 7 to another No. 7 (with one extension) located in close proximity to the controller cabinet at existing or planned signalized locations. If the location of the controller cabinet is not known, the location of the signal interconnect shall be determined in coordination with the Traffic Engineer.

GENERAL INSTALLATION DETAILS

The conduits and pull boxes shall be installed in accordance with the most recent standard details of the Maricopa County Department of Transportation (MCDOT), except as noted below. The standard detail drawings are available on the web at www.mcdot.maricopa.gov/manuals/.

1. Conduit shall be installed per MCDOT Det. 4801, modified as follows:
 - a. The number and size of conduits shall be as described in this guideline.
 - b. The configuration of conduit within the trench may be adjusted as determined by the Engineer, and may be modified by written request of the Contractor and approved, in writing, by the Town to account for site conditions, availability of equipment, etc. For example, the Q-Street conduits may be installed as a quad of four-inch conduits with a quad of three-inch conduits installed above in a narrow, deep trench, or, alternately, with the quads installed side-by-side in a wider, shallower trench, to suit soil conditions and the type of excavating equipment available.
 - c. The depth of cover to the topmost conduit shall be a minimum of 36 inches.
 - d. The depth of controlled low strength material (CLSM) from the topmost conduit shall be 18 inches.
 - e. The warning tape shall be located at a depth of 18 inches from finished grade.
 - f. Street lighting conduit may be located in a common trench, if approved by SRP, and provided a minimum of 12 inches of vertical separation is maintained between the electrical conduit and communications conduit.
 - g. All conduits designated for Information Technology Division use in the above sections shall include MaxCell brand or approved equivalent textile innerduct (3" 3-cell configuration) with individual non-detectable pull tapes. A detectable pull tape shall be included in the conduit, outside in the innerduct, per the MCDOT detail.
2. No. 7 (with one extension) pull boxes and entering conduits shall be installed per MCDOT Det. 4810, modified as follows:
 - a. The depth of cover to the topmost conduit shall be a minimum of 36 inches.
 - b. The warning tape shall be located at a depth of 18 inches from finished grade.
 - c. The title cast on the pull box cover shall read "TOQC COMMUNICATION".
3. No. 9 pull boxes and entering conduits shall be installed per MCDOT Det. 4811, modified as follows:
 - a. The depth of cover to the topmost conduit shall be a minimum of 36 inches.
 - b. The warning tape shall be located at a depth of 18 inches from finished grade.
4. No. 9 pull boxes shall be constructed per MCDOT Det. 4820, modified as follows:
 - a. The title embossed on the lid of municipal use pull boxes shall read "TOQC COMMUNICATION".
 - b. The title embossed on the lid of third-party use pull boxes shall read "Q-STREET COMMUNICATION".
5. Connections between Municipal Use conduit runs and existing or future signalized intersections shall generally be configured per MCDOT Det. 4717.

QUESTIONS / PROJECT COORDINATION

Questions regarding these standards or requests for coordination with private development projects should be directed to:

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