City of Dallas

Planning For Fiber Optic Installation on Public Rodway Infrastructure: A Local Perspective

Public Works Round Up
September 13, 2022

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Presentation Overview

1. Purpose
2. Background
3. 43 TAC § 21.40-Underground communication lines
4. COD Fiber-Optic Conduit Standard Details
5. Connectivity to COD Facility
6. Summary
7. Discussion

Purpose

- Present a local perspective on planning for transportation related fiber-optic infrastructure provision to include:
  - Development of standard detail sheet(s)
  - Challenges for proper placement and maintenance
- Discussion

Background

- Advancement of technology is requiring a state-of-the-art telecommunication capabilities
- Telecommunication in the transportation field generally involves data and video capabilities
- On April 6, 2022, the city of Dallas Department of Transportation (DDOT) presented a briefing about traffic signals
- The briefing outlined current and future advancements in traffic signal operations including:
  - the provision for the activation of the connected vehicles/autonomous vehicles (CV/AV) modules
  - Wi-Fi capabilities
- Other briefings included the provisions of streetlights with Wi-Fi capabilities

https://www.fhwa.dot.gov/bipartisan-infrastructure-law/ Accessed 4/25/2022

Background

- DDOT's approach is integrated into the wider COD 'Smart City' concept
- Fiber Optic (FO) provision includes two main areas:
  - Placement:
    - Roadway facility reconstruction
    - Retrofitting/placement in existing roadway infrastructure
  - Connectivity to a COD facility
- Consideration for placement include the incorporation of industry/regulatory provisions such as:
  - National Electrical Code (NEC)-24" minimal burial depth under streets, highways, roads, alleys, driveways, and parking lots
  - Texas Administrative Code (TAC): 43 TAC § 21.40

43 TAC § 21.40-Underground communication lines

- FO Longitudinal placement:
  - minimum depth of cover for fiber optic facilities shall be 42 inches but may be reduced to 36 inches under certain indemnification provisions
- FO Crossing placement:
  - minimum of 42 inches below the ditch grade or 18 inches below the pavement structure or 60 inches below the top of the pavement surface whichever is greater
  - may be reduced to 36 inches below the ditch grade or 60 inches below the top of the pavement surface, whichever is greater under certain indemnification provisions
- Certain other provisions apply such as placement next to a structure of if encasement is applied

https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=T&app=9&p_dir=F&p_rloc=169413&p_tloc=14995&p_ploc=1&pg=2&p_tac=&ti=43&pt=1&ch=21&rl=40
Accessed 9/5/2022

COD Fiber-Optic Conduit Standard Details

- DDOT's planning for FO placement includes the development of a standard placement detail sheet (s) which provides
  - Consistency in placement requirements
  - Standardization of the conduit material specification
  - Mitigating long term maintenance challenges
- Interim standard detail sheet was issued in early 2022
- Currently updating it which may incorporate additional details/sheets

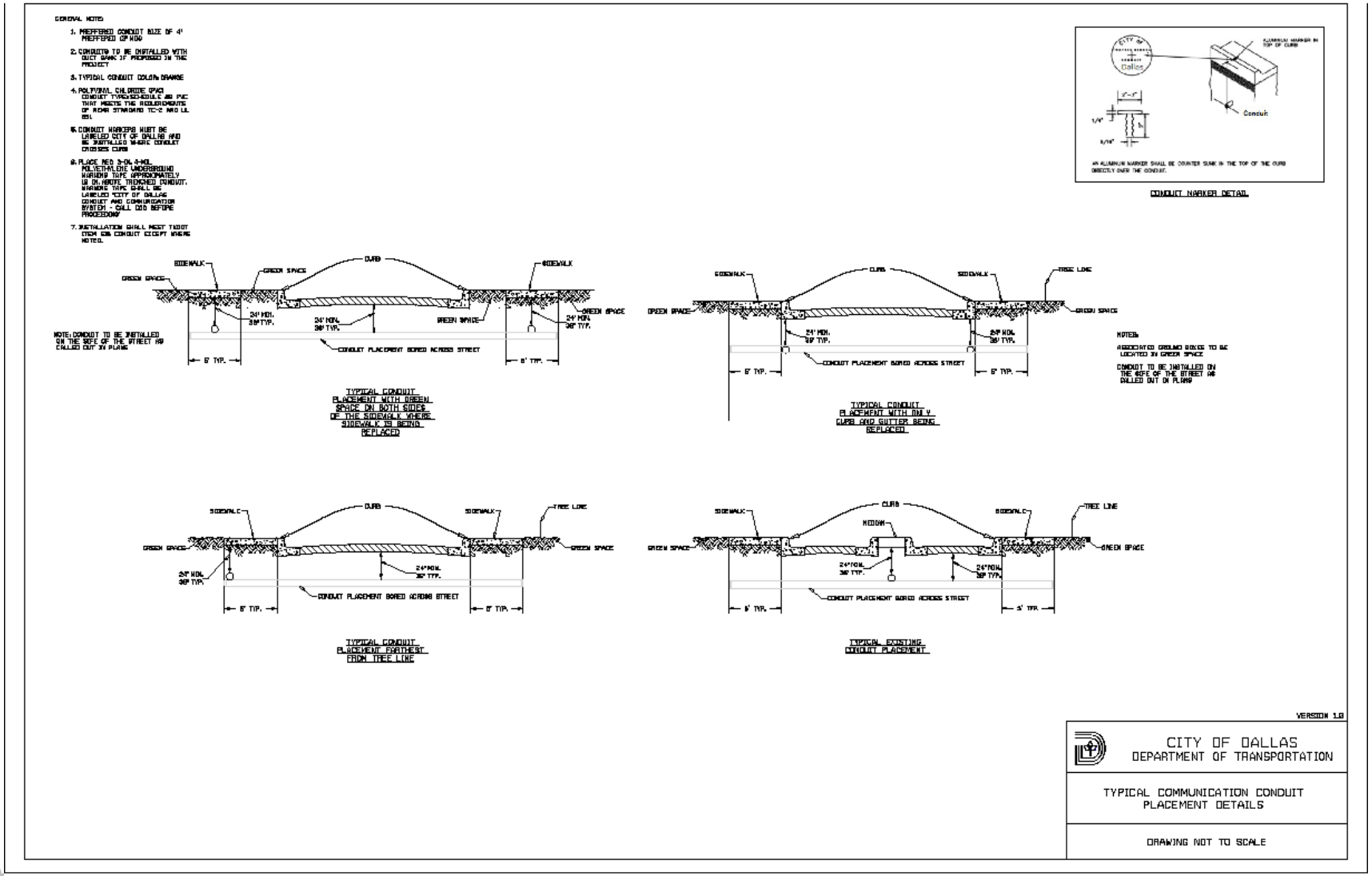
COD Fiber-Optic Conduit Standard Details

- Key provisions/details included in the standard details sheet:
  - Conduit material/size:
    - Conduit size requirement-4" preferred, minimum 3"
    - Conduit Color-Orange
    - Conduit material Type: schedule 80 PVC that meets the requirements of NEMA standard TC-2 and UL 651 with a placement of a warning tape about 10" above conduit
    - Installation shall meet Texas Department of Transportation-TxDOT's item 618 conduit except where noted.
- Specifications are currently being refined

COD Fiber-Optic Conduit Standard Details

- Key provisions/details included in the standard details sheet:
  - Placement-New construction
    - Placement under sidewalk with green area offset
    - Placement under sidewalk adjacent to back of curb
    - Placement under pavement when only pavement being constructed
  - Placement-existing conditions
    - Trenchless/jack-and-bore method
    - Open cut
    - Combination of trenchless and open cut
- Specifications are currently being refined

COD Fiber-Optic Conduit Standard Details



COD Fiber-Optic Conduit Standard Details

- Maintenance provisions
  - Tying location to GIS map
  - Aluminum marker placed at the top of the curb in the area where the FO is placed
  - Placement, frequency and material types of junction boxes
  - Splicing requirements in case conduit is damaged
- Specifications are currently being refined

Connectivity to COD Facility

- Connectivity to a COD facility plays a key role in planning the routing/location for placement of FO conduit ad line. Key considerations include:
  - Proximity to a COD facility
  - Facility capability
  - Route constraints including:
    - bridges/other structures
    - Geotechnical, ROW and existing utilities conditions/constraints
    - Equipment/placement constraints
    - Involvement of other agencies
    - Other area-specific issues/opportunities
  - Specifications are currently being refined

Summary

- Proper planning For Fiber Optic installation on public roadway infrastructure is necessary especially when the public ROW is increasingly more constrained with increased utilities congestion
- Internal and external continued coordination and cooperation is critical for a consistent and safer placement

Discussion

- General questions/comments/feedback

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