



Development of Joint Duct Bank Standard Detail & Specifications

November 2, 2022



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Added Section 250.002. RIGHT-OF-WAY ACCOMMODATION FOR BROADBAND-ONLY PROVIDERS.

(a) In this section:

- (1) "Broadband-only provider" means an entity that exclusively provides broadband service.
- (2) "Broadband service" means Internet service with the capability of providing:
 - (A) a download speed of 25 megabits per second or faster; and
 - (B) an upload speed of three megabits per second or faster.

(b) The commission by rule shall:

- (1) on a competitively and technologically neutral and nondiscriminatory basis with respect to other providers of broadband service, establish an accommodation process that authorizes broadband-only providers to use state highway rights-of-way, subject to highway purposes, for:
 - (A) new broadband facility installations;
 - (B) additions to or maintenance of existing broadband facility installations;
 - (C) adjustments or relocations of broadband facilities; and
 - (D) existing broadband facilities retained within the rights-of-way; and
- (2) prescribe minimum requirements for the accommodation, method, materials, and location for the installation, adjustment, and maintenance of broadband facilities under the accommodation process.

<https://statutes.capitol.texas.gov/Docs/TN/htm/TN.250.htm>



Updates to TAC
&
ROW Utility Manual

Broadband
Accommodation
Program (BAP)



Implementation of
Joint Trench
Application

Passage of
Texas House Bill
HB 2422



Joint Duct Bank
Standard for
Telecommunications

Design Standards
and Special
Specifications

Consultant Project Team



SANDEE KHOURY, PE



PROJECT MANAGER

24+ years of experience involving utility adjustment coordination & engineering, utility design and construction projects. Extensive experience in joint trench and bid installations in State ROW.



HARSHA SHETTY, P.E.



PROJECT ENGINEER

9+ years of experience in utility adjustment coordination, engineering and design, including joint trench and bid installations in State ROW.



JON KING, P.E.



CONSTRUCTIBILITY REVIEW

15+ years of experience providing engineering design, project management, utility adjustment coordination & engineering, and construction management/oversight.

Other Stakeholders / Key Contributors



TXDOT ROW DIVISION

TXDOT DESIGN DIVISION

TXDOT BRIDGE DIVISION

TXDOT TRAFFIC DIVISION



**TXDOT MAINTENANCE
DIVISION**

**TXDOT CONSTRUCTION
DIVISION**

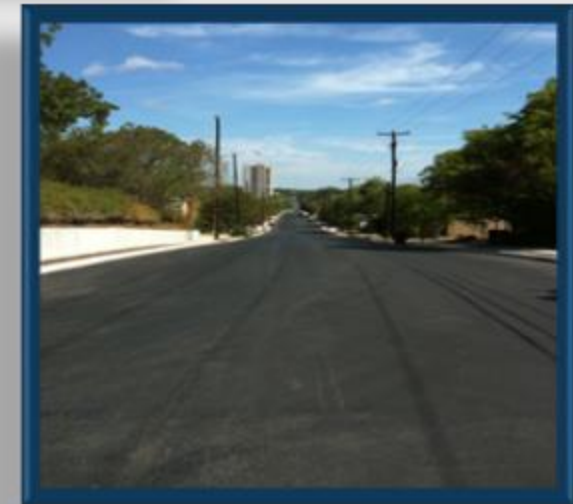
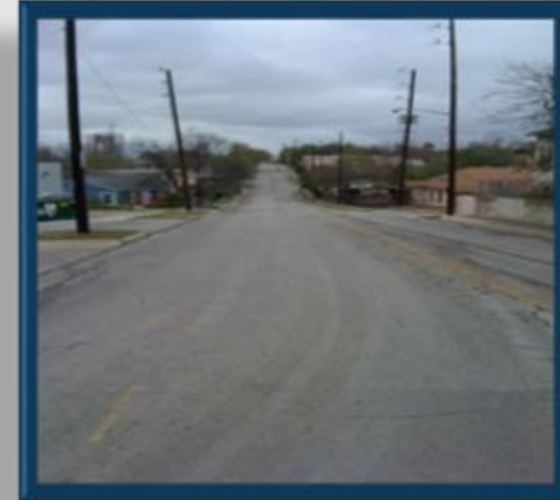
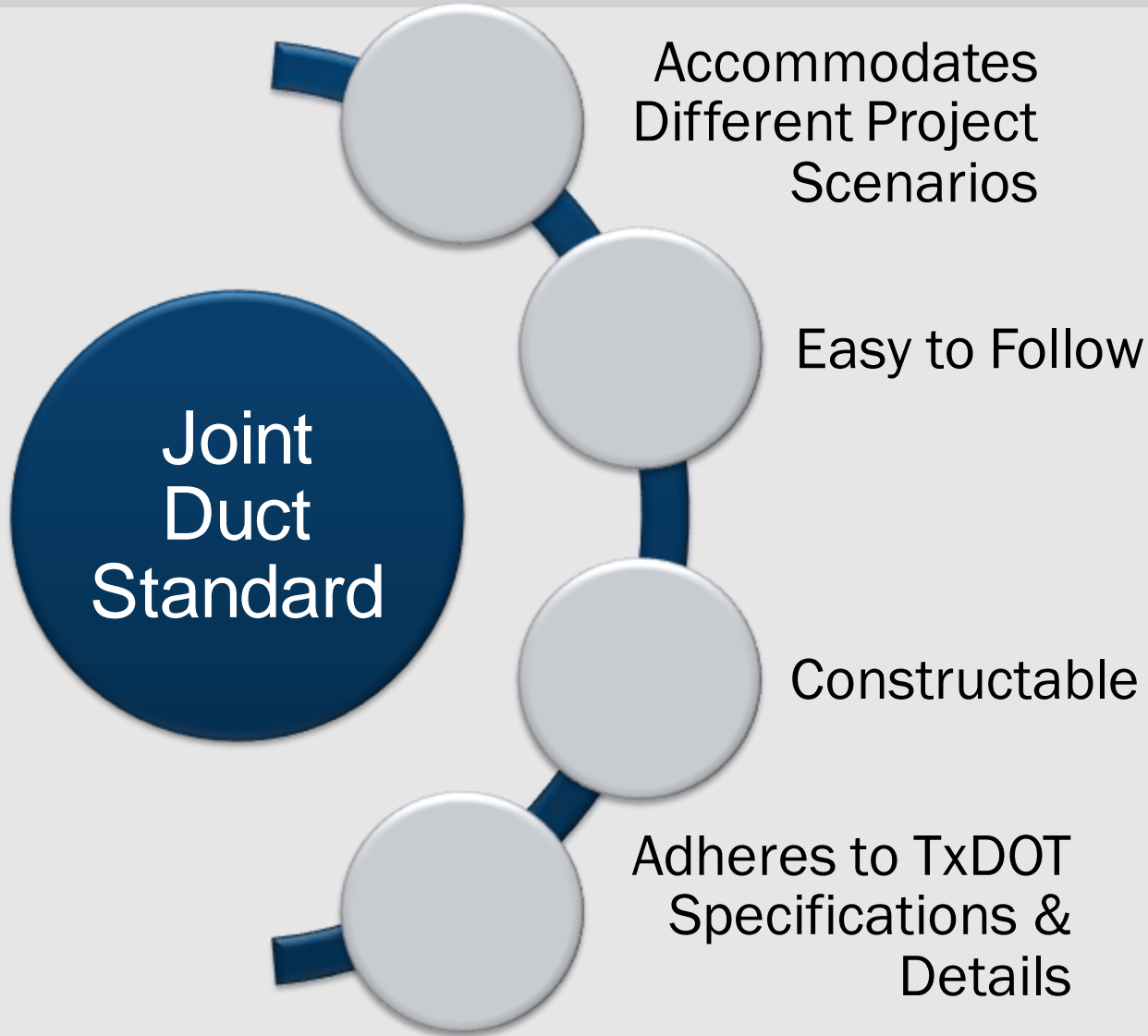
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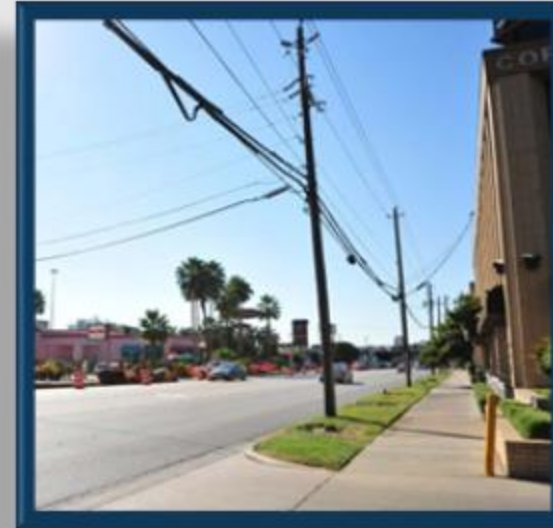
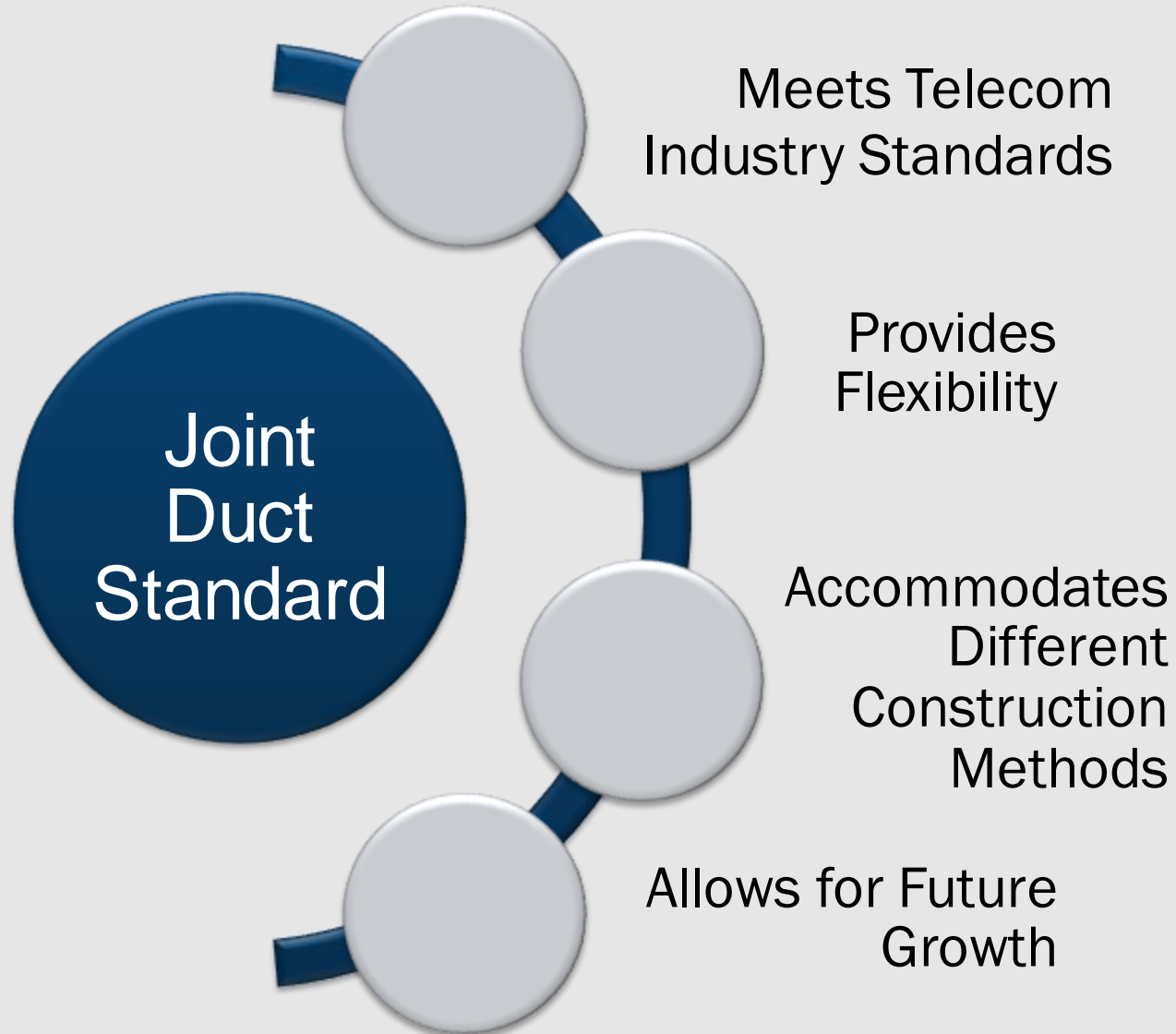


**TELECOMMUNICATION
UTILITY OWNERS**

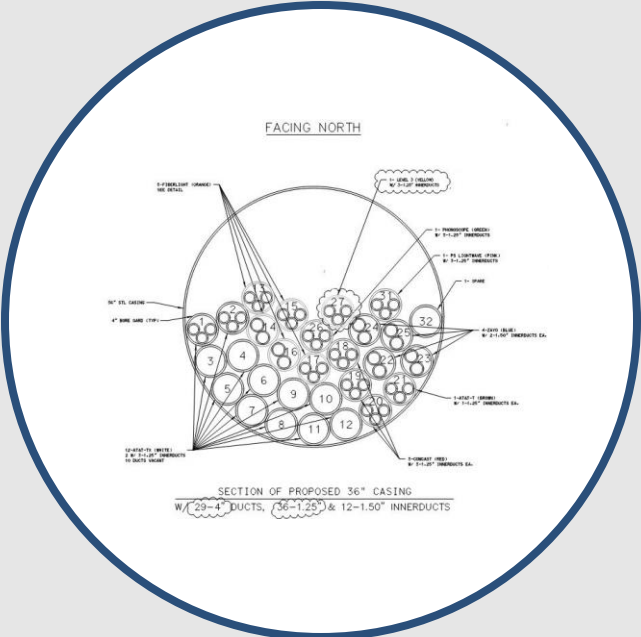
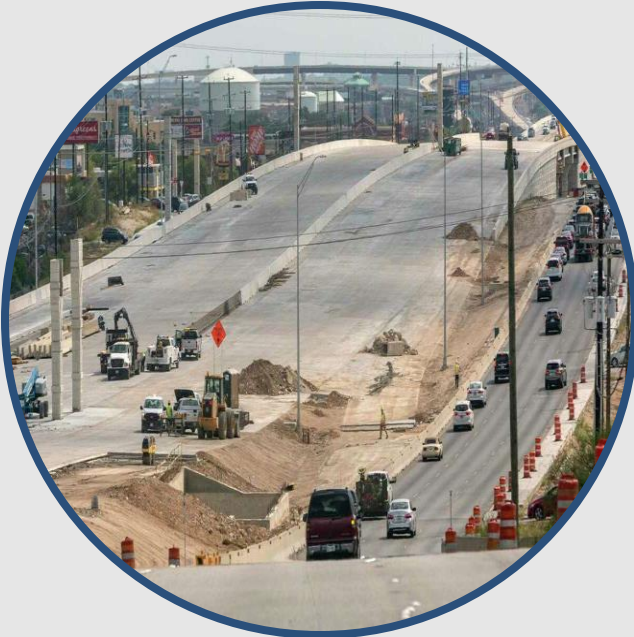
**TXDOT INFORMATION
TECHNOLOGY DIVISION**

UTILITY CONSULTANTS





Relevant Project Experience



Mobility35 Corridor
TxDOT Austin

US 281 – Phase 1
AT&T/ TxDOT San Antonio

I-10/I-69 Interchange
TxDOT Houston

Relevant Project Experience



I-20 at Midkiff
TxDOT Odessa



Bell Boulevard
City of Cedar Park / TxDOT



IH-35E PH 2 Design Build
TxDOT Dallas



- Duct Configuration
- Trench Width
- Restoration Details

TRENCHING



- Boring Methods
- Casing Pipe & Limits
- Duct Configuration

BORED CROSSINGS



- Size & Number of Ducts
- Hanger Details
- Expansion Couplings

BRIDGE ATTACHMENTS





- Size & Type of Vaults
- Spacing
- Access from Trench

ACCESS POINTS



- Location in ROW
- Depth of Cover
- Crossing / Parallel Utilities

TEXAS ADMINISTRATIVE CODE (UAR)



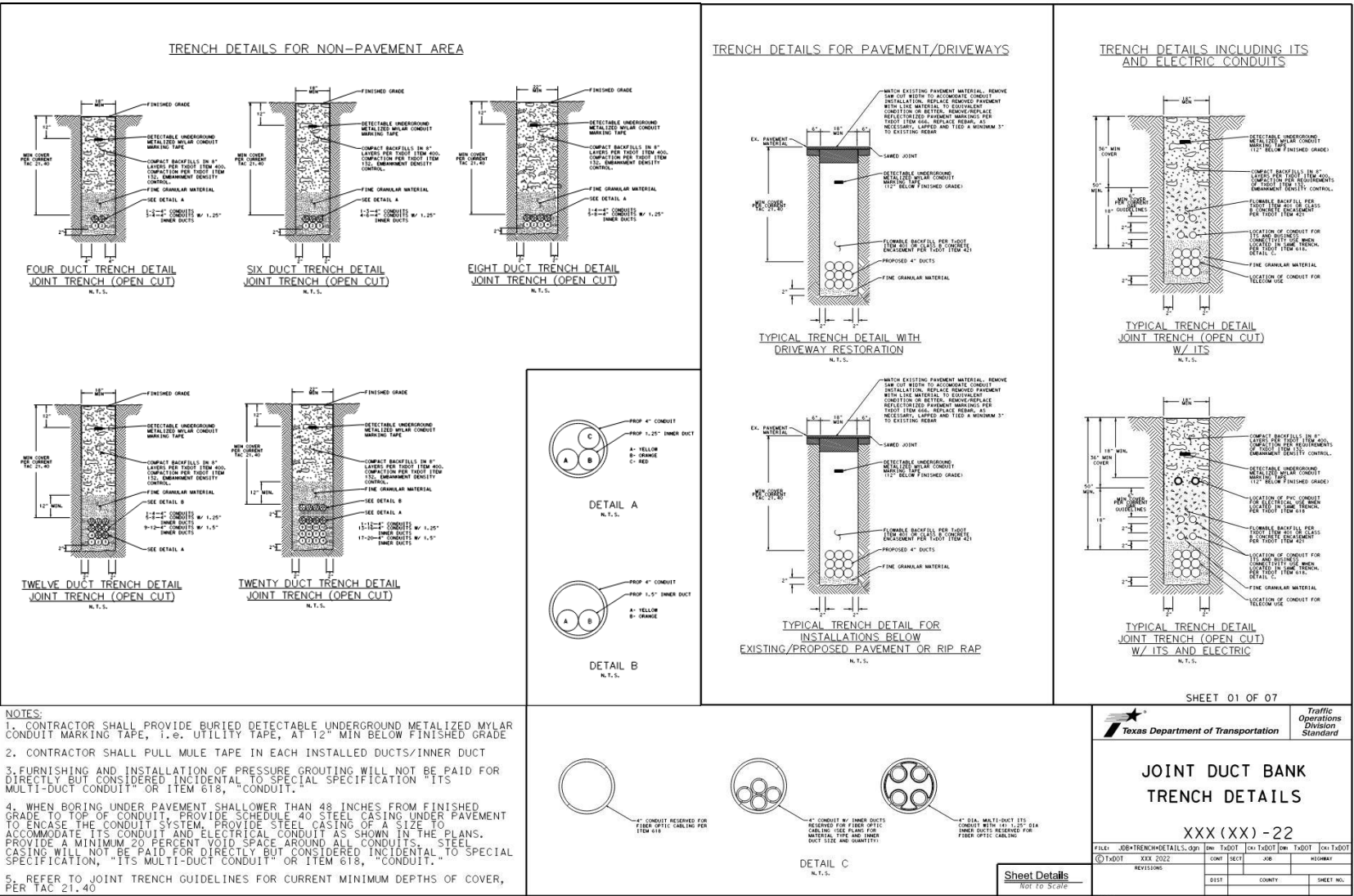
- Copper vs Fiber
- Size of Ducts
- Pipe Material

TELECOM INDUSTRY





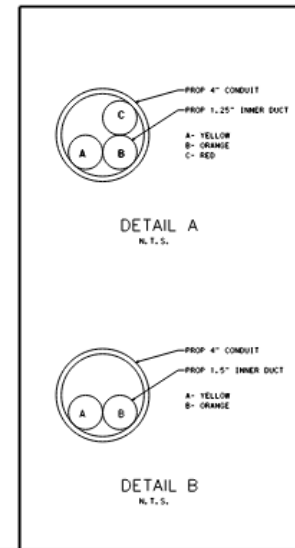
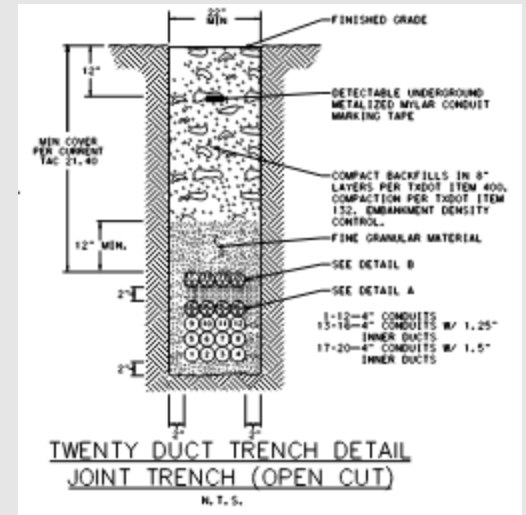
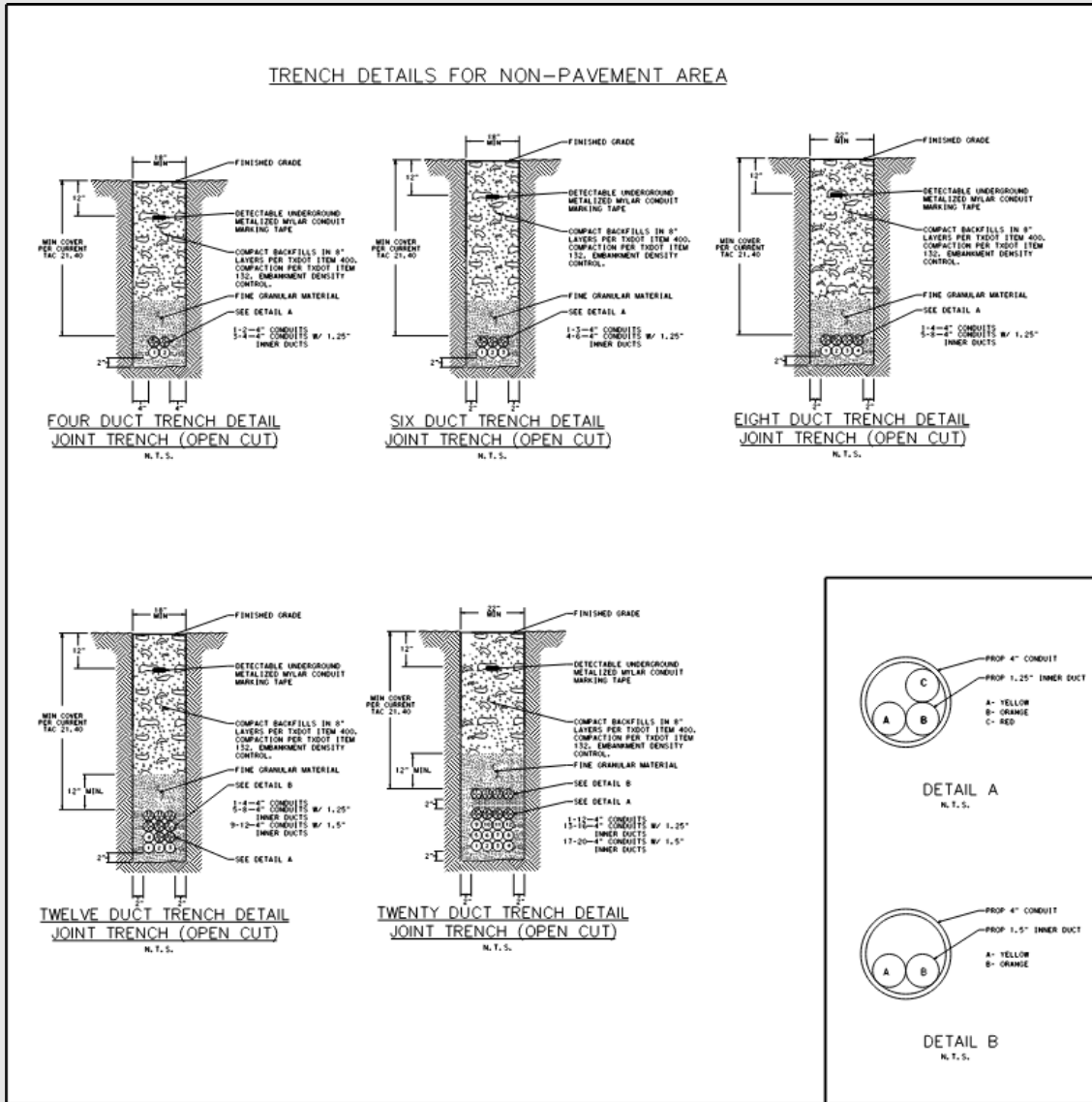
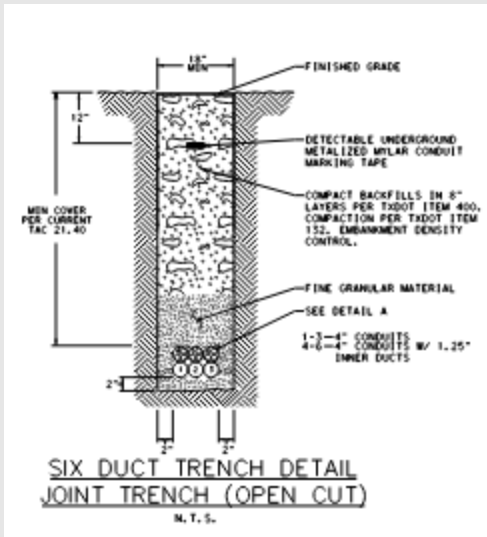
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- Various Duct Trench Configurations
- Accommodates Installation of Copper & Fiber Facilities
- Trench Restoration
- Inclusion of TxDOT ITS, Business Connectivity & Electric Ducts
- Duct Naming Convention



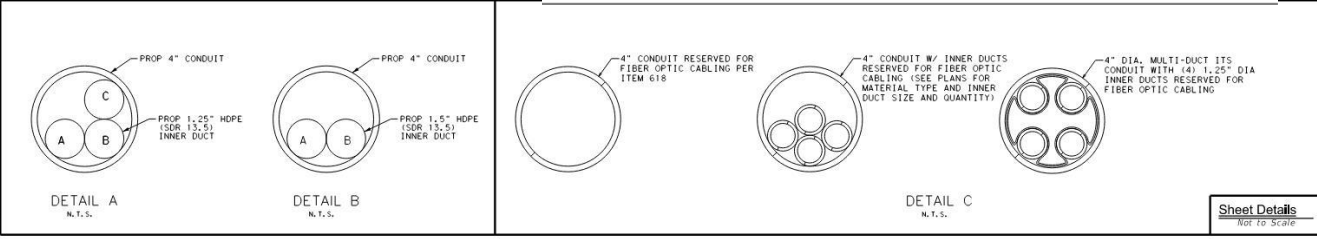
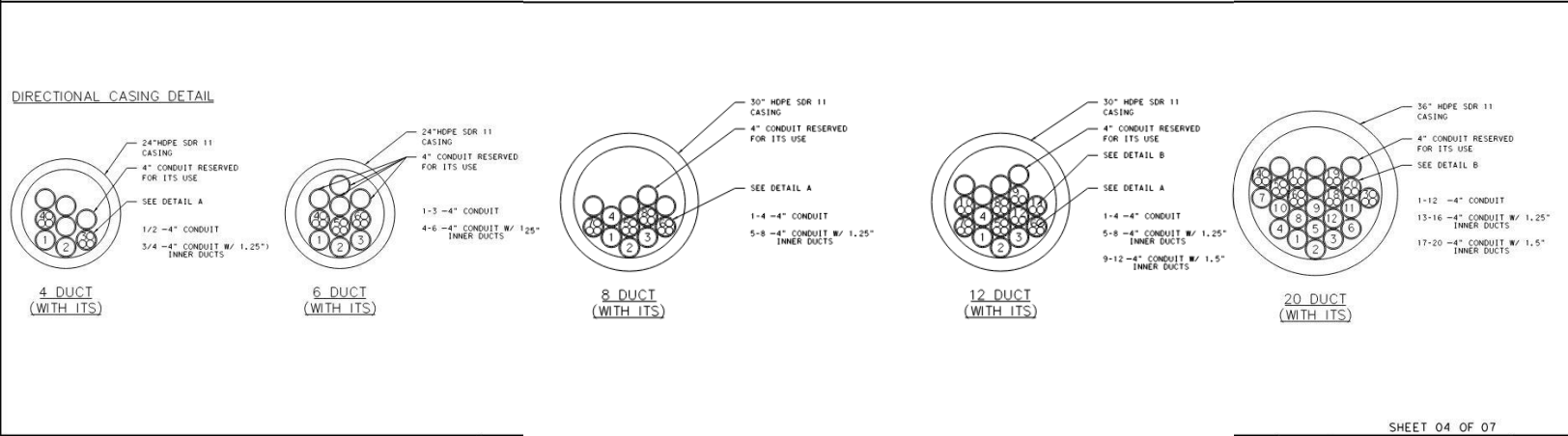
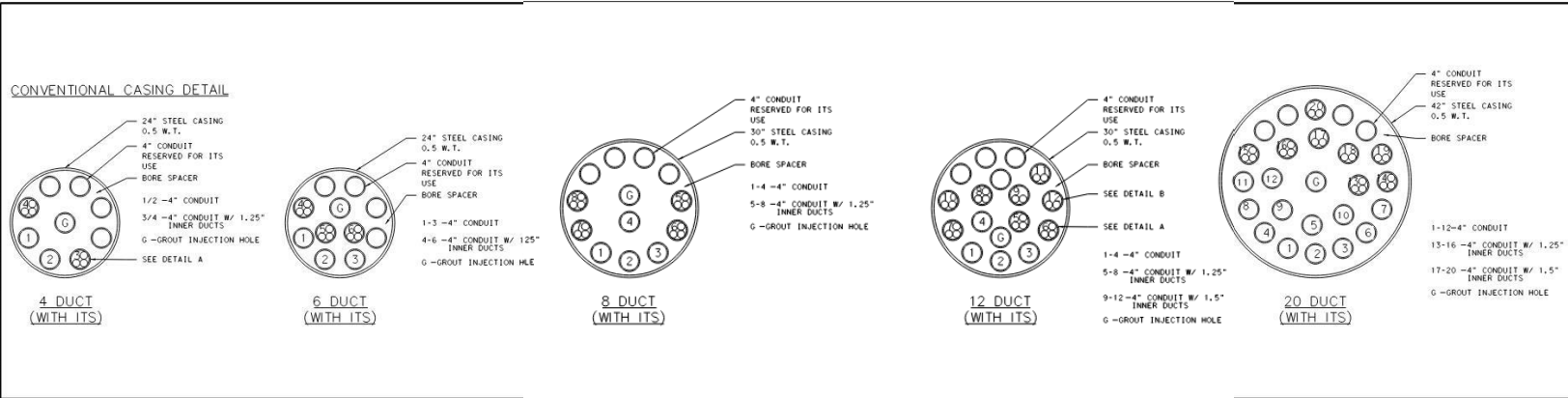
TRENCH DETAILS FOR NON-PAVEMENT AREA



Bore Casing Details



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SHEET 04 OF 07

Texas Department of Transportation
 Traffic Operations Division Standard

JOINT DUCT BANK CASING DETAILS
 XXX (XX) - 22

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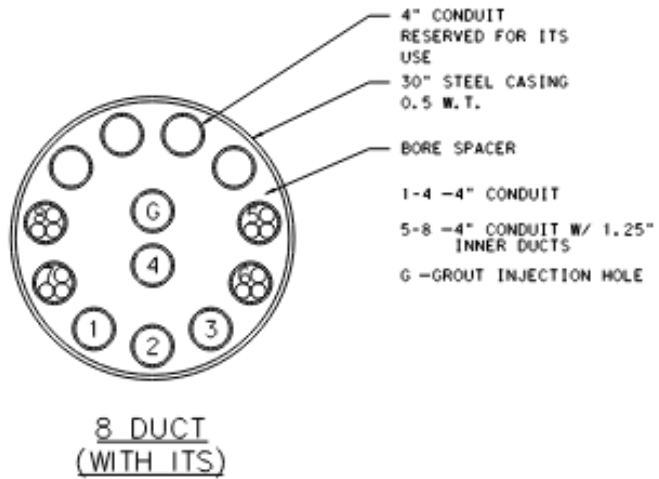
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- Various Duct Configurations
- Accommodates Installation of Copper & Fiber Facilities
- Inclusion of TxDOT ITS Ducts
- Accommodates Steel & HDPE Casing Pipe

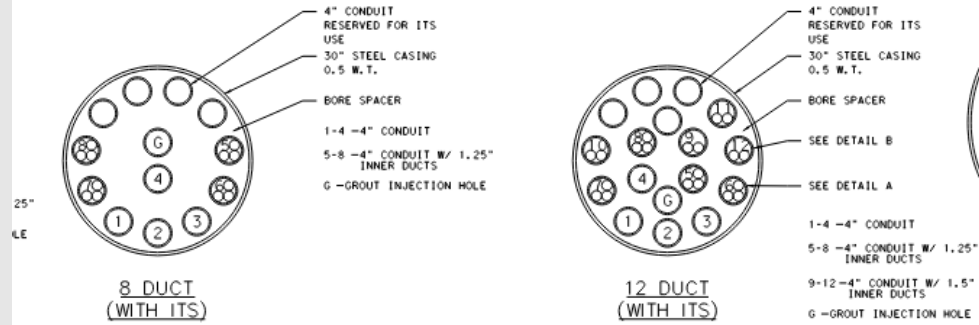
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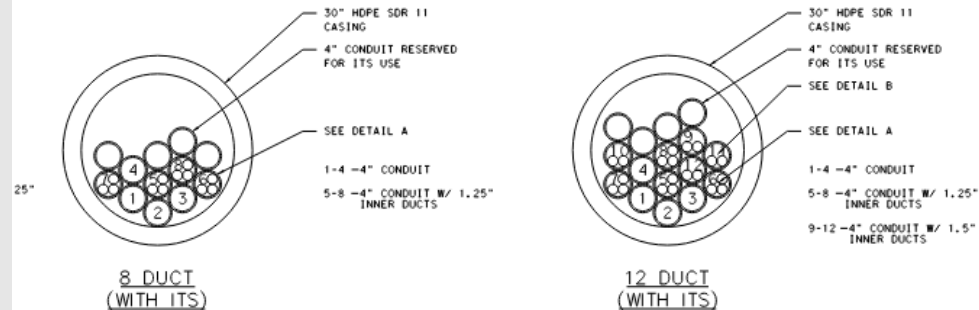
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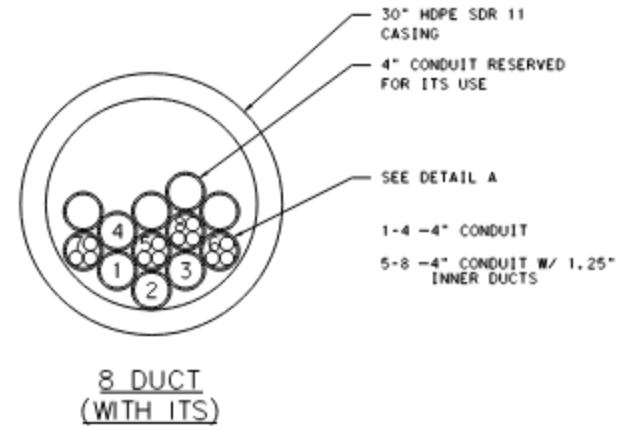
CONVENTIONAL CASING DETAIL



DIRECTIONAL CASING DETAIL



DIRECTIONAL CASING DETAIL

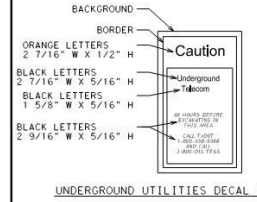
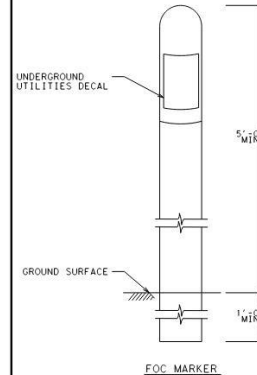
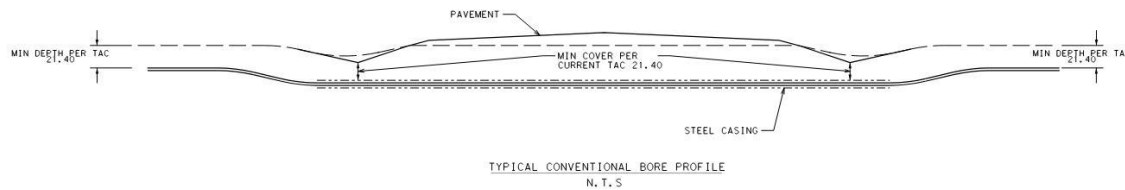
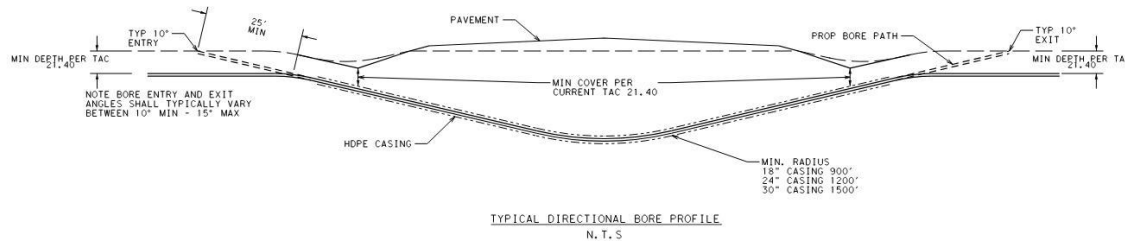
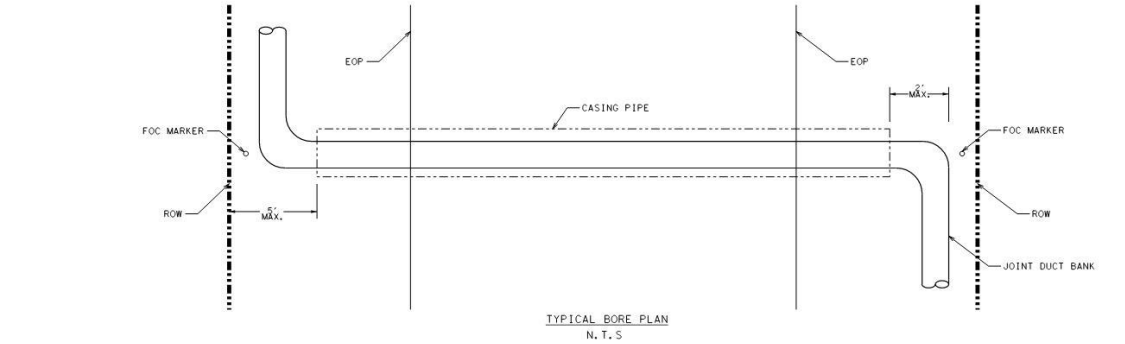


Bore Crossing Details



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BORE GENERAL NOTES

- CONTRACTOR TO BAND/BUNDLE INNER CONDUITS IN 10' INCREMENTS IN CASING WHEN BORE SPACERS ARE NOT UTILIZED.
- CONTRACTOR SHALL RECORD, MAINTAIN, AND PROVIDE THE ENGINEER WITH ALL BORE LOG TRAJECTORY, TENSION AND PRESSURE READINGS UPON COMPLETION OF PILOT HOLE FOR VERIFICATION OF ALIGNMENT PRIOR TO BACK REAM PROCESS.
- CONTRACTOR TO PROVIDE GROUTING SYSTEM WITH SUFFICIENT GAUGES AND MONITORING DEVICES TO CONFIRM EFFECTIVENESS OF GROUTING OPERATION AND TO ENSURE COMPLIANCE WITH PIPE SPECIFICATIONS AND DESIGN PARAMETERS TO AVOID CRUSHING OR DAMAGING THE DUCTS/CASING.
- REFER TO JOINT TRENCH GUIDELINES FOR CURRENT MINIMUM DEPTHS OF COVER AND ENCASMENT GUIDELINES. PER TAC 21.40

SHEET 03 OF 07



JOINT DUCT BANK
BORE CROSSING DETAILS
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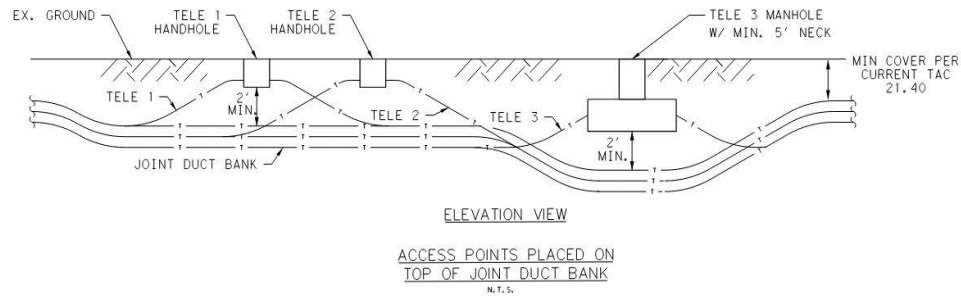
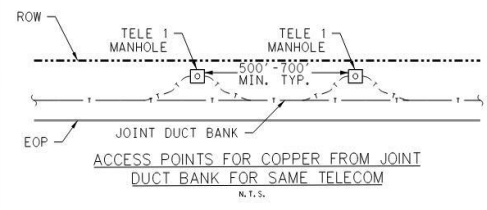
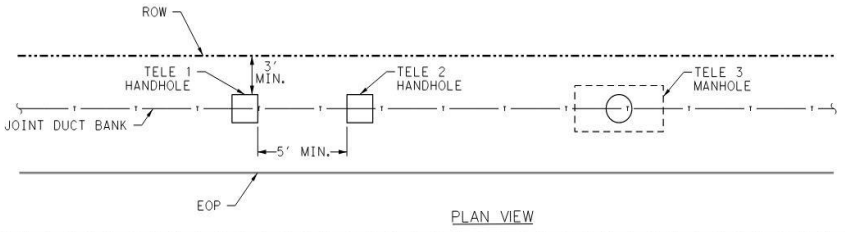
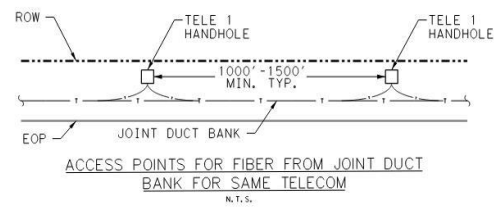
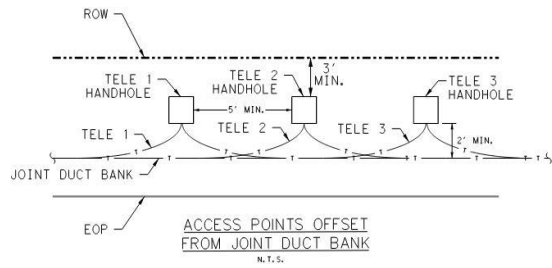
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- Limits of Encasement
- Typical Bore Profiles
 - HDD
 - Conventional
- Marker Details

Access Point Details



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SHEET 05 OF 07

Texas Department of Transportation
 Traffic Operations Division Standard

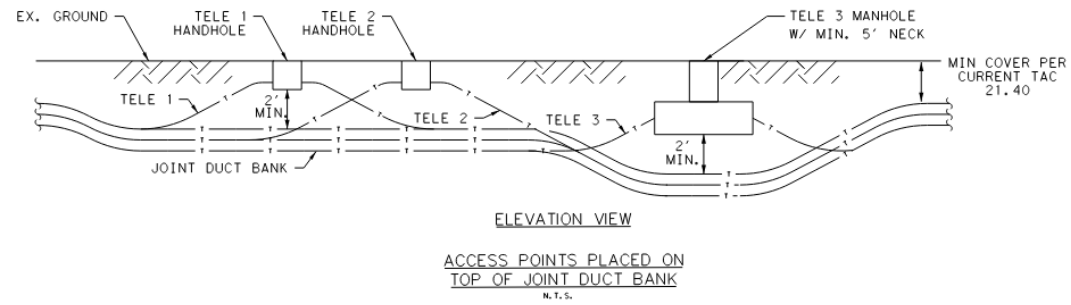
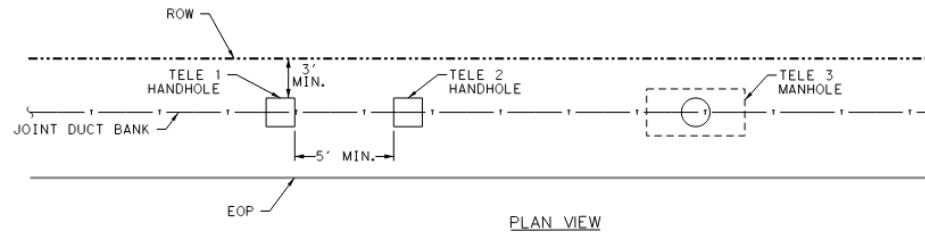
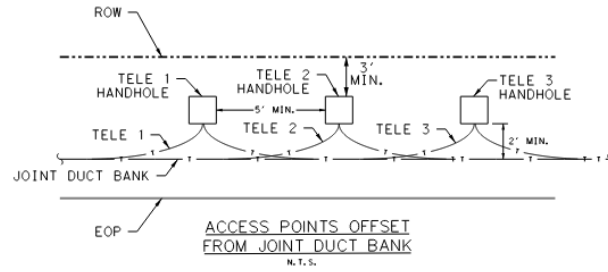
JOINT DUCT BANK
ACCESS POINT DETAILS
 XXX (XX) -22

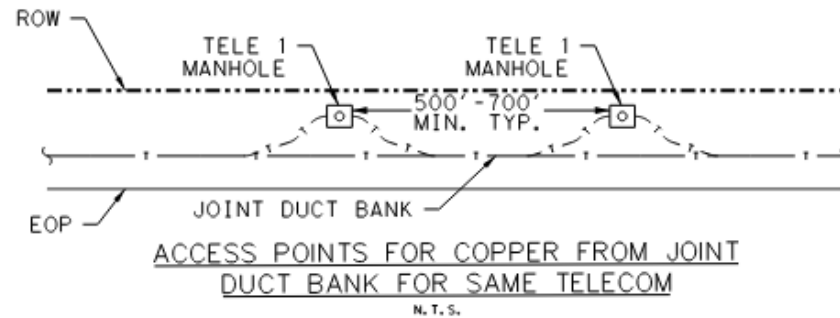
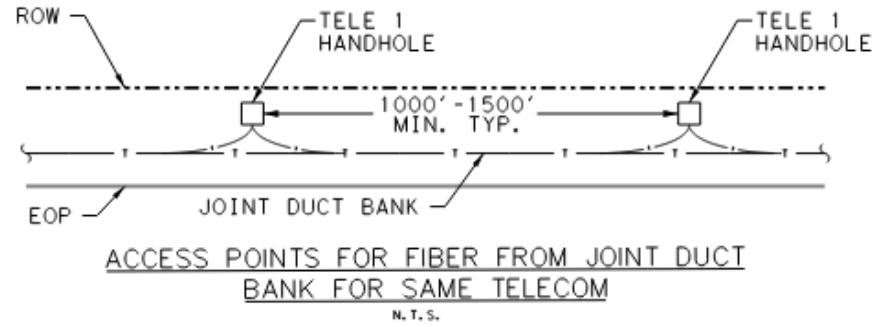
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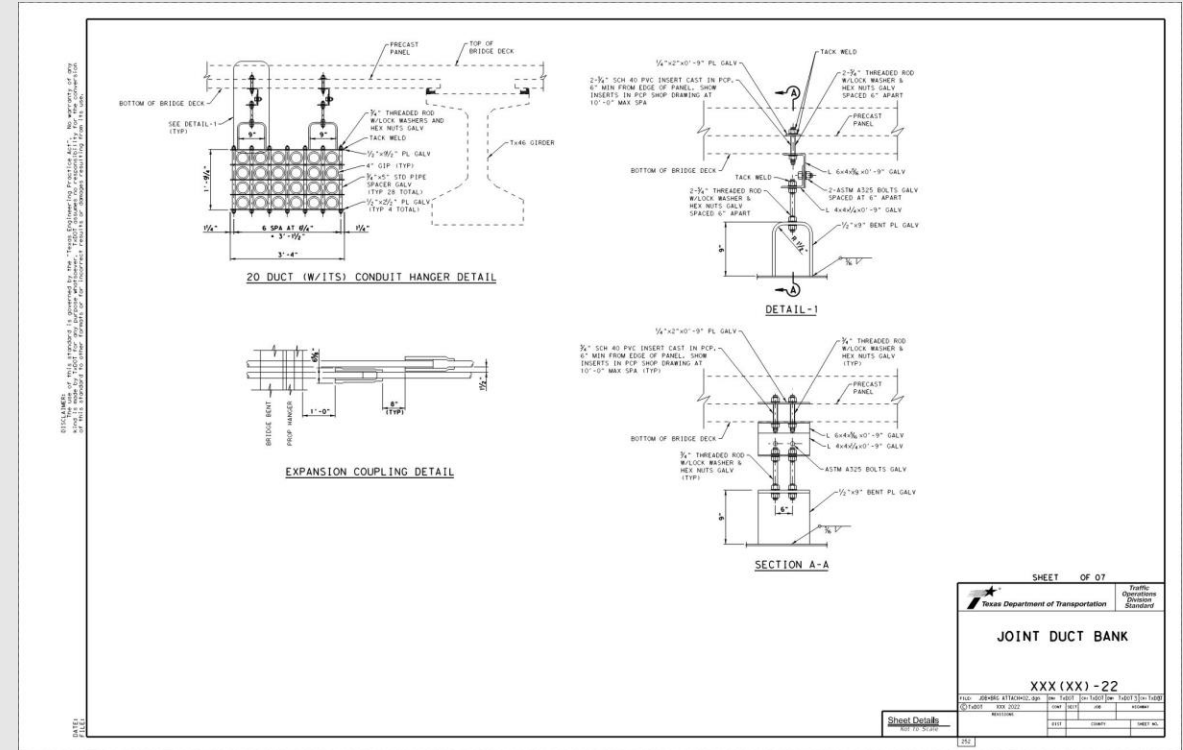
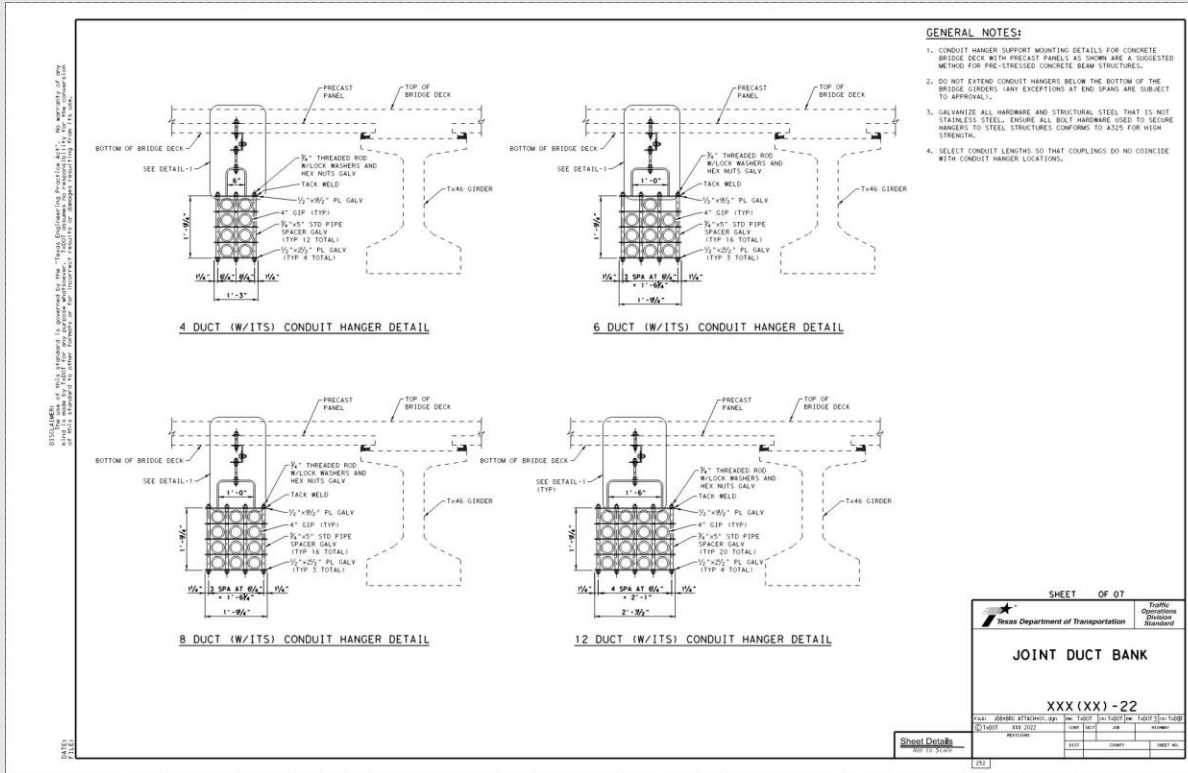
- Location in ROW
- Configuration & Access from Joint Duct Bank to Manholes / Handholes
- Spacing Requirements

Access Point Details





Bridge Attachment Details



- Accommodates Various Number of Ducts
- Expansion/Coupling Details



Special Specification 6XXX Joint Duct Bank



1. DESCRIPTION

Furnish and install Joint Duct Bank.

1.1. **Abbreviations** as used in this Specification refer to the following organizations or technical societies:

- ASTM – American Society for Testing and Materials
- NASTT – North American Society of Trenchless Technology
- NEC – National Electric Code
- NESC – National Electric Safety Code
- RUS – Rural Utility Service

Where reference is made to the Specifications of the above organizations, it is to be construed to mean the latest standard in effect on the date of the proposal.

1.2. **Conduit.** PVC or H.D.P.E. piping material that will be used to house telephone or similar cables. The words "conduit," "duct," "inner duct," and "piping" may be used interchangeably in this Specification.

1.3. **Joint Duct Bank.** Groups of conduits arranged in tiers and encased as specified on the plans.

1.4. **Encasement:** Steel or H.D.P.E. piping material that will be used to house joint duct bank. The words "Encasement" and "Casing Pipe" may be used interchangeably in this Specification.

2. MATERIALS

Furnish all materials in accordance with the requirements shown on the plans and deliver to the project site. Items that will conform to Department Standards and Specifications are as follows.

- Item 100, "Preparing Right of Way"
- Item 104, "Removing Concrete"
- Item 105, "Removing Treated and Untreated Base and Asphalt Pavement"
- Item 132, "Embankment"
- Item 247, "Flexible Base"
- Item 334, "Hot-Mix Cold-Laid Asphalt Concrete Pavement"
- Item 351, "Flexible Pavement Structure Repair"
- Item 361, "Repair of concrete pavement"
- Item 400, "Excavation and Backfill for Structures"
- Item 401, "Flowable Backfill"
- Item 402, "Trench Excavation Protection"
- Item 403, "Temporary Special Shoring"
- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 476, "Jacking, Boring, or Tunneling Pipe or Box"
- Item 479, "Adjusting Manholes and Inlets"
- Item 496, "Removing Structures"
- Item 618, "Conduit"
- Item 500, "Mobilization"

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3. CONSTRUCTION

3.1. **General Requirements.** All work performed must adhere to Engineer's requirements, and the latest editions of both the RUS guidelines and NESC. Unless otherwise specifically stated elsewhere, all work will be performed in accordance with the Utility Accommodation Rules as set forth in 43 Texas Administrative Codes §21.31 et. Seq. adopted by the Department.

If discrepancies exist between the above items and any applicable legal and safety requirement of a federal, state, or local authority, the more stringent requirement must be followed. The Contractor's work is subject to inspection by both Department and Telecom Companies. All personnel must be familiar with Buried Plant Precautions RUS guidelines. Buried Plant: precautions and maintenance to existing systems, before beginning work on any buried facilities Contractor.

3.2. **Safety.** Exercise necessary precautions for the safety of workers and the public and comply with applicable provisions of all Federal and State safety laws and regulations. The safety precautions taken and their adequacy will be the sole responsibility of the Contractor.

When pedestrian facilities are closed or relocated, temporary facilities will be detectable and will include accessibility features consistent with features presented in existing pedestrian facilities. Place temporary facilities in accordance with the Texas Manual on Uniform Traffic Control Devices (MUTCD).

3.3. **Inspection.** All facilities will be inspected under the supervision of the Department after it has passed the testing requirements and is considered to be its final condition. The inspection will determine the completeness of items and any defects will be corrected to the satisfaction of the Engineer. The Engineer's decision of acceptability of the installation will be final. All correspondence and instructions to the Contractor performing the work will be the sole responsibility of the Department.

3.4. Protections and Restoration of Underground Structures and Facilities.

3.4.1. **Telecom Companies Facilities.** Adjust and support existing telephone conduit wherever indicated on plans in accordance with RUS guidelines.

3.4.2. **Existing Utility Facilities (Other than Telecom).** Protect and restore underground structures in accordance with RUS guidelines.

3.5. **Boring.** Install casing pipe and conduits in conformance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." Install bore spacer in accordance with manufacturer's guidelines.

3.6. **Directional Boring.** Install casing pipe and conduits by horizontal directional drill in conformance with the NASTT's "Mini-Horizontal Directional Drilling Manual," (1995) or ASTM F 1962, "Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit under Obstacles including River Crossings."

3.7. **Manholes and Handholes.** Manholes and handholes will be of the size and type as shown on the plans. Set all manholes and handholes to the lines and grades as shown on the plans. Manholes will have a minimum 60 in. cover from finished grade to the top of the manhole box unless specified otherwise on the plans. Place handholes in line with final grade except where noted otherwise on the plans.

3.7.1. **Pre-Cast Manholes.** Install all pre-cast manholes and handholes according to RUS guidelines.

3.7.2. **Cast-In-Place Manholes.** Construct all cast in place manholes in accordance with RUS guidelines.

3.8. Conduit and Conduit Structures.

3.8.1. **General Requirements.** Start work at a tie-in point, unless otherwise indicated on the plans or approved. The work area will be maintained in a neat and orderly fashion.

3.8.2. **Duct Bank.** Refer to RUS guidelines for placing the conduit, including construction of curves, sweeps, and

3.8.2. **Duct Bank.** Refer to RUS guidelines for placing the conduit, including construction of curves, sweeps, and grade changes. Do not use short radius 90° turns. This item will cover requirements for mandrel testing of duct, installing mule tape in each installed conduits and inner ducts, and plugging all installed conduits and inner ducts at each end. Provide mule tape.

3.8.3. **Defective or Damaged Material.** Inspect all materials for defects before being lowered into the trench. Repair any defective, damaged, or unsound material as directed. Should damage materials be placed, the Contractor will furnish at the Contractor's expense all labor and materials required for removing and replacing the defective material at no additional cost to the Department. Should the Contractor damage the materials after installation, the Engineer may permit the damaged section to be cut from the length unless it is the opinion of the Engineer that the entire length was damaged.

3.9. **Marker Posts.** Posts identifying Joint Duct Bank's locations will be placed in accordance with standards at a maximum spacing of 500 ft. along installation. Posts will also be installed at handholes, manholes, street crossings, and changes in direction of Joint Duct Bank and as approved.

3.10. **Installing Manholes over Existing Conduit and Cables.** Refer to RUS guidelines when constructing manholes over existing conduit and cables.

3.11. **Adjusting Existing Ducts and Cables.** Refer to RUS guidelines and procedures when adjusting existing conduits and cables in place. Do not perform any adjustments without prior notice to Telecom Companies. Allow for Telecom Company's inspection.

5. PAYMENT

5.1. **Joint Duct Bank Open Trench.** Payment for this item will be made at the unit price bid for "Trench" the size and type of conduit structure shown on the plans. This price will be full compensation for furnishing and installing conduit; for furnishing and installing all fittings, sweeps, bends, repair couplings, split couplings, adaptors, manhole or handhole termination kits, pre-assembled split repair kits, lubrication access fittings, backfill, replacing pavement structure or Sod or rip rap or curbs or other surface, expansion joints, concrete and underground mylar conduit marking tape; and for all labor, tools, equipment, and incidentals.

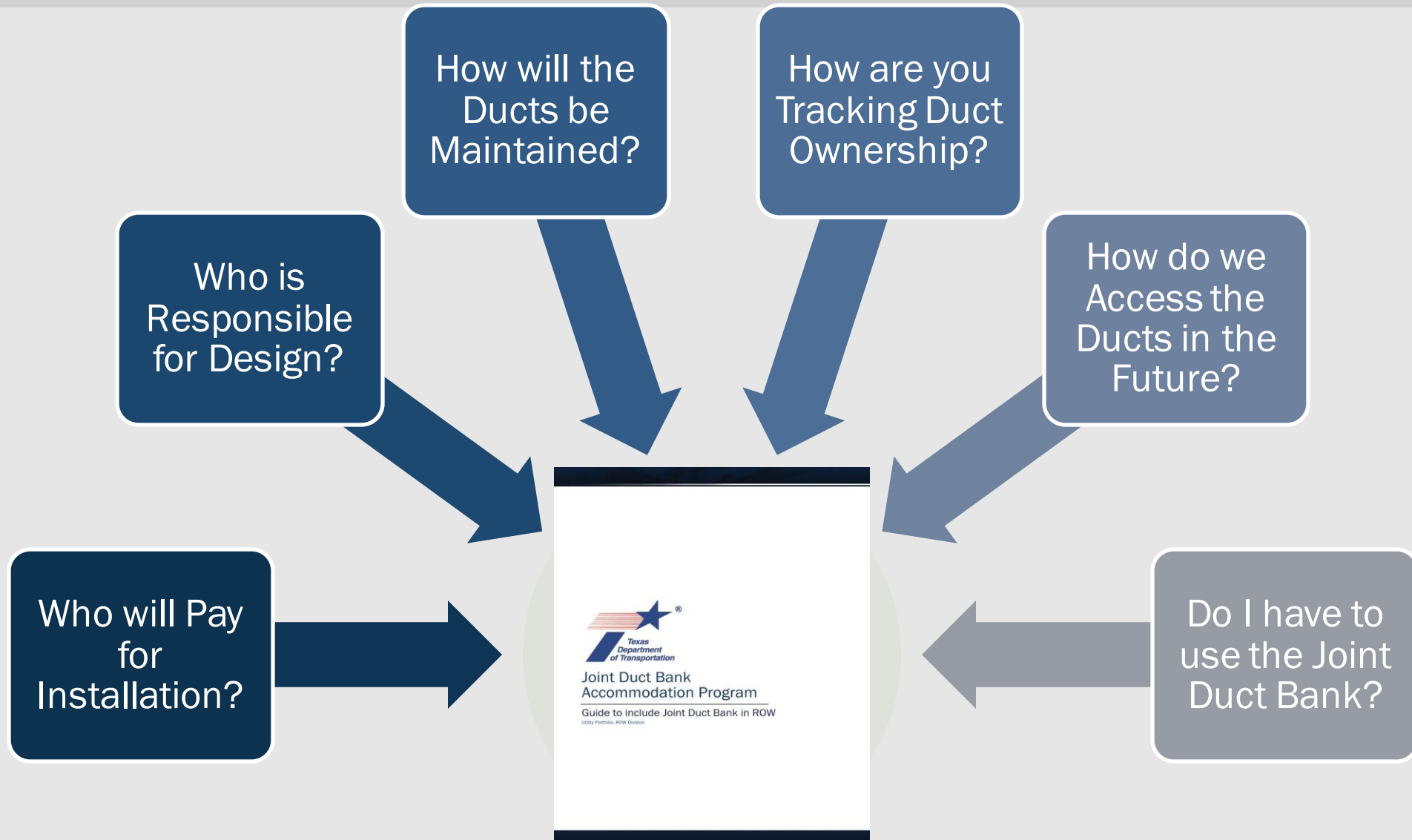
5.2. **Joint Duct Bank Directional Bore.** Payment for this item will be made at the unit price bid for "Direct Bore" of the length specified on the plans, complete in place. This will be full compensation for furnishing and installing the bore, casing pipe and conduits; excavating and supporting bore pits, furnishing and placing backfill, replacing pavement structure, sod, riprap, curbs or other surface; for furnishing all bore equipment, grout, fluids, supplies, fittings, labor, tools, equipment, and incidentals necessary to complete the work.

5.3. **Joint Duct Bank Conventional Bore (Conduits only).** Payment for this item will be made at the unit price bid for "Conv Bore CNDT Only" of the length specified on the plans, complete in place.

5.4. **Manholes and Handholes.** Payment for furnishing and installing manhole will be made by the each for "Manhole" of the size specified complete in place with all racking, ladder, and bonding hardware, rings, frames, covers, and joint sealing compound and will be as detailed on the plans. Payment for furnishing and installing handhole will be made by the each for "Handhole" complete in place with all racking, bonding hardware, rings, bricks, frames, covers, and joint sealing compound and will be as detailed on the plans.

Telecom Companies may supply manhole and handholes, which neck, rings, frames, and covers may or may not be considered subsidiary. Contractor will refer to the notes specified on plans. Where Telecom Companies supplies material and only installation labor is required, the payment will be made by the each for "Manhole (Install)" and "Handhole (Install)" for size specified.

5.5. **Marker Posts.** Payment for this item will not be made directly but will be considered incidental to the Joint Duct Bank installed through open trench and/or bore.





Define
Scope &
Deliverables

Identify
Stakeholders

Develop
Draft
Standard
Detail &
Spec

Stakeholder
Outreach

Finalize
Deliverables

Coordinate
TxDOT
Approvals

Develop
Tracking
System





Q&A
