

Special Specification 6358

AT&T Telecommunication System



1. DESCRIPTION

This Item will govern the installation of all facilities belonging to AT&T-Texas, hereinafter referred to as AT&T. The Contractor and approved Subcontractors will construct all required utility adjustments within the limits of this project including any peripheral adjustments that may not have been discovered during the design process.

- 1.1. **Telcordia Blue Book – Manual of Construction Procedures.** Refers to AT&T telecommunication construction and maintenance practices accepted and in use by all AT&T personnel and contractors working in this project region. This information is documented in AT&T guidelines and manuals that collectively are referred to as Telcordia Practices and may include best practices that are not written but have been otherwise communicated to AT&T personnel and contractors. Any Contractor that works on the AT&T portion of the project must have and be familiar with the most current Telcordia Practices and will obtain latest version directly from AT&T.
- 1.2. **AT&T APEX.** Refers to AT&T online library of guidelines and manuals. Approved AT&T Contractors have access to AT&T APEX via the contractor portal.
- 1.3. **Cable/Fiber.** Denotes copper cable and/or fiber optic cable. The Contractor must obtain cable prints from AT&T for information on type and size of Cable/Fiber to be placed. Cable/Fiber may be aerial, buried or underground.
- 1.4. **Conduit.** PVC or H.D.P.E. piping material that will be used to house telephone cables. The words "conduit", "duct" and "piping" may be used interchangeably in this specification.
- 1.5. **Split Duct.** PVC piping material that will be used for enclosing fiber optic cables and copper cables, installing conduit around existing cables. The words "split duct" and "split pvc" may be used interchangeably in this specification.
- 1.6. **Conduit Structure (Duct Bank).** Groups of conduits arranged in tiers and encased as specified in the plans.
- 1.7. **Underground.** Refers to facilities housed inside conduit. This excludes facilities that are placed directly in the ground which are referred to as buried facilities.

2. MATERIALS

AT&T will furnish all cable/fiber required for installing telecommunication system complete in place, unless otherwise noted in plans. Contractor will be responsible for providing all other material not directly identified to be the responsibility of AT&T in the design plans.

Procurement of Materials.

Conduit, manholes and all materials, other than cable, will be requested at least 30 days before required delivery.

All cable/fiber will be requested at least 45 days before required delivery date.

Cable/fiber is to be installed within 45 calendar days after receipt of cable.

Remote terminal cabinets, mounting brackets, grounding trees and power switches will be requested at least 30 days before required delivery and must be installed within 45 calendar days after taking delivery.

Serving Area Interface (SAI), mounting brackets, and grounding trees will be requested at least 30 days before required delivery and must be installed within 45 calendar days after taking delivery.

In the event that special order items have been identified in the plan set, these items will be requested at least 60 days before required delivery.

All other non-telecommunication system materials, such as casing pipe (pipe larger than 4 in. ID), galvanized iron pipe, shoring materials, backfill, mortar, tools, supplies, equipment, etc. required to properly complete the work will be furnished by the Contractor, except as otherwise noted. Unless otherwise directed in the plans, all materials furnished by the Contractor must meet Department and AT&T minimum requirements. In the event that a discrepancy exists between Department and AT&T material specifications, the Contractor must adhere to the more stringent specification.

- 2.1. **Buy America Requirements.** Materials must meet the "Buy America" requirements set forth by the Federal Highway Administration (FHWA) and the Texas Department of Transportation (TxDOT).

The Contractor may certify all materials for the entire project at once or suppliers can certify each individual step or separate production process.

Every certification should clearly reference the heat number. When reviewing certifications, compare the heat numbers or other tracing methods on delivered material to the certification document to ensure that the information is the same.

A mill certification should also be produced to prove that the raw steel or iron was smelted and formed in the United States. The certification can be a signed letter or merely included as a signed statement on the delivery tickets.

- 2.2. **Backfill.** All backfill will be in accordance with Item 400, "Excavation and Backfill for Structures"
- 2.3. **Bedding.** All bedding will be bank sand beginning 2 in. below the bottom of the duct bank and extending to 12 in. above top of the duct bank, as shown on the construction plans.
- 2.4. **Cement-Stabilized Backfill.** All cement-stabilized backfill will be in conformance with Item 400, "Excavation and Backfill for Structures." Cement-stabilized backfill will be used to fill trench from top of bedding to bottom of subgrade whenever an excavation is under and within ten feet of a roadway.
- 2.5. **Original Material Backfill (Type A).** Type A backfill will be used whenever an excavation is a distance of 10 ft. or greater from an existing or proposed edge of pavement. Material used for this backfill will be equivalent to original material or better, free of debris, compacted 90%-95% standard proctor density in 8 in. lifts.
- 2.6. **Encasement.**
- 2.6.1. **Concrete Encasement.** All concrete encasement material will conform to Item 421, "Hydraulic Cement Concrete." Class B concrete will be used for encasement of conduits wherever plans indicate concrete encasement.
- 2.6.2. **Steel Encasement.** Steel Encasement will be of a sufficient diameter to encase the conduit(s), will be of a minimum length equivalent to the width of the proposed frontage road fill slope on each side or as noted on the plan sheets, and have a minimum wall thickness of 1/4 in.
- 2.6.3. **HDPE Encasement.** HDPE encasement will be of a sufficient diameter to encase the conduit(s), will be a minimum length equivalent to the width of the proposed frontage road fill slope on each side or as noted on the plan sheets, and will have a minimum SDR 11 wall thickness.
- 2.7. **Foundation.** All concrete foundations will conform to Item 416, "Drilled Shaft Foundations" and Item 420, "Concrete Substructures." Class A concrete will be used for foundations wherever plans indicate foundation.

- 2.8. **Manholes and Handholes.**
- 2.8.1. **Pre-cast manholes and handholes.** All pre-cast manholes and handholes will be provided by AT&T.
- 2.8.2. **Cast-in-place manholes and handholes.** All materials used for cast-in-place manholes and handholes will confirm to AT&T APEX 620-000-188. Hydraulic cement with a nominal compressive strength of 4,000 psi in conformance with ASTM C150 will be used. Rebar will be deformed steel bars having a 60,000 psi yield strength conforming to ASTM A615.
- 2.9. **Defective or Damaged Material.** All materials will be inspected for defects before being lowered into the trench. Any defective, damaged, or unsound material will be repaired or replaced as directed. Should damaged materials be placed, the Contractor will furnish at the Contractor's expense all labor and materials required for removing and replacing the defective material. 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. The cost and replacement of broken materials will be at the expense of the Contractor.
- 2.10. **Protective Concrete Cap.** All materials will be provided by the Contractor and will conform to Item 421, "Hydraulic Cement Concrete" and Item 440, "Reinforcement for Concrete." Class "A" concrete will be used unless otherwise noted.
- 2.11. **Aerial Installation.** AT&T will furnish all anchors, guys, strand, U-guard, standoff brackets, and miscellaneous hardware will be provided by AT&T.

3. CONSTRUCTION

- 3.1. **General Requirements.** All work performed by the Contractor and Subcontractor must adhere to AT&T regional guidelines, AT&T APEX, Department requirements, and the latest editions of both the Bellcore Telcordia Practices and National Electric Safety Code (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 TxDOT.

AT&T will provide all right of way and utility adjustments needed for performance of work on sites not owned or to be acquired by TxDOT. If AT&T is the owner of any part of the project site, AT&T will permit TxDOT or its authorized representative access to the site to perform any activities required to execute the work.

The Contractor and Subcontractor must follow the more stringent requirements whenever the items listed above vary amongst each other.

In the event that discrepancies exist between the above items and any applicable legal and/or 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 AT&T. All personnel must be familiar with Buried Plant Precautions AT&T Apex 620-000-228. Buried Plant: Precautions and Maintenance to Existing Systems, BR 629-100-010 Paragraph 1 before beginning work on any buried facilities Contractor. The Subcontractor that installs the underground telephone system must be an approved AT&T Contractor in good standing with AT&T.

- 3.2. **Safety.** The Contractor will at all time exercise reasonable precautions for the safety of workers and the public, and will 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. Temporary facilities will be places in accordance with the Texas Manual on Uniform Traffic Control devices (MUTCD).

- 3.3. **Inspection.** All AT&T facilities will be inspected by the Engineer under the supervision of TxDOT 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 State.

AT&T will provide inspection services for the construction, notify TxDOT and the Contractor of defects and deficiencies in the work, and observe actions of the contractor to correct such defects and deficiencies.

AT&T will prepare and submit both a certificate of substantial completion and a list of observed items requiring completion or correction for the relocations and adjustments to the Engineer for concurrence.

- 3.4. **Warranty Agreement.** A warranty agreement between AT&T and Contractor must be executed to cover this item of work. The cost of the warranty agreement is subsidiary to this item of work. The warranty agreement includes the requirement of a maintenance bond for not less than 10% of this item's cost for a one-year warranty period beginning after final completion. AT&T will assume responsibility for the maintenance of the existing and completed water and wastewater facilities during and upon completion of the construction contract.

- 3.5. **Slotted Manholes.** All manholes proposed as pre-cast slotted will not be ordered until Contractor has verified field conditions are adequate for placement. Otherwise, manhole will be cast in place.

- 3.6. **Cable/Fiber Splicing.**

All splicing involved in this project will be performed by AT&T.

Cables will be installed in stages to allow enough working room inside new manholes for splicing. Before installing any cables, Contractor will discuss cable installation order and phases with the AT&T Manager-Construction Contract Coordinator. Approved AT&T contractors will obtain contact information prior any installation directly for AT&T. AT&T will identify the maximum number of cables allowed to be installed at one time for each individual manhole.

Trench Excavation. Trench excavation and backfilling as required to complete the underground telecommunication system installation will be performed in accordance with Item 400, "Excavation and Backfill for Structures," as outlined herein, as shown on the plans and as directed. Blasting to perform the excavation will not be allowed unless authorized in the plans or in writing by the Engineer.

Trenches for Cable/Fiber, Conduit and Conduit Structure must also comply with the following requirements:

Width of Trenches will be in conformance with Telcordia and AT&T APEX Practices

Depth of Trenches will be in conformance with Telcordia and AT&T APEX Practices

Grade of Trenches will be in conformance with Telcordia and AT&T APEX Practices

- 3.7. **Manhole and Handhole Excavations.** The width and depth of excavation for manholes and handholes will be determined by the lines and grades as established on the plans, dimensions of the manholes and handholes, manhole and handhole orientation, as described in Article 400.4 of Item 400, "Excavation and Backfill for Structures" or as approved.

- 3.8. **Classification of Excavations.** No classification of excavated materials will be delineated. Excavation and trench work will include the removal and subsequent handling of all materials excavated in accordance with Item 400, "Excavation and Backfill for Structures."

- 3.9. **Excavation Below Grade.** Any part of the bottom of the trench excavated below the limits specified in Depth of Trenches" above will be corrected with approved material and compacted in a manner as described in Article 400.3 of Item 400, "Excavation and Backfill for Structures" and as directed.
- 3.10. **Protections and Restoration of Underground Structures and Facilities.**
- 3.10.1. **Facilities other than AT&T's.** Contractor will protect and restore underground structures in accordance with Bellcore Practices Section SW622-020-901, Paragraphs 11.01-11.04.
- 3.10.2. **AT&T Facilities.** The Contractor will adjust and support existing telephone conduit wherever indicated on plans in accordance with Bellcore Practices Section 622-300-300 "Main Conduit Restoration and Rearrangement."
- 3.11. **Trench Excavation Protection.** All trench excavation protection will be accomplished in accordance with Telcordia and AT&T APEX Practices.
- 3.12. **Backfill.** All backfill and backfill operations will be in accordance with Item 400, "Excavation and Backfill for Structures," as described herein and as directed. Where, in the opinion of the Engineer, it is necessary to maintain traffic across a trench, the Contractor will install temporary metal bridges as necessary to facilitate the movement of traffic.
- 3.13. **Foundation.** All foundation installations will be in accordance with Item 422.4.2. "Forms."
- 3.14. **Remote Terminal.** All telecommunication installations at remote terminal sites will be in accordance with Telcordia and AT&T APEX. Site preparation for new remote terminal installations will be in accordance with Item 100 "Preparing Right of Way." Landscaping for new remote terminal sites will be in accordance with Item 193 "Landscape Establishment".
- 3.15. **VRAD.** All telecommunication installations at VRAD sites will be in accordance with Bellcore Practices. Site preparation for new VRAD installations will be in accordance with Item 100 "Preparing Right of Way." Landscaping for new remote terminal sites will be in accordance with Item 193 "Landscape Establishment".
- 3.16. **Serving Area Interface (SAI).** All telecommunication installations at SAI sites will be in accordance with Bellcore Practices. Site preparation for new SAI installations will be in accordance with Item 100 "Preparing Right of Way." Landscaping for new SAI sites will be in accordance with Item 193 "Landscape Establishment".
- 3.17. **Pavement.** The Contractor will remove pavement and surfaces as part of the trench excavation in accordance with Item 400, "Excavation and Backfill for Structures." The removal and restoration of pavement and surfaces will be based upon the minimum trench width as described in "Width of Trenches" plus 2-in. on each side of the trench.
- 3.18. **Concrete Surfaces.** All removal of concrete surfaces (sidewalks, driveways, etc.) will be performed in accordance with Item 104, "Removing Concrete."
- 3.19. **Boring.** Installation of casing pipe and conduit(s) by bore will be in conformance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." Bore spacer will be installed in accordance with manufacturer's guidelines.
- 3.20. **Directional Boring.** Installation of casing pipe and conduit(s) by horizontal directional drill will be in conformance with the North American Society of Trenchless Technology (NASTT), "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."
- 3.21. **Manholes and Handholes.** Manholes and handholes will be of the size and type as shown on the plans. All manholes and handholes will be set 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 or as approved by AT&T. Handholes will be placed in line with final grade except where noted otherwise on the plans or as approved by AT&T.

- 3.21.1. **Pre-Cast Manholes.** All pre-cast manholes and handholes will be installed according Telcordia Practices, "Precast Concrete Manholes, 38Y Types, Installation."
- 3.21.2. **Cast-In-Place Manholes.** All cast in place manholes will be constructed in accordance with Telcordia and AT&T APEX Practices, "Concrete Manholes, Cast in Place Construction"
- 3.22. **Conduit and Conduit Structures.**
- 3.22.1. **General Requirements.** Contractor will start work at a tie-in point, unless otherwise indicated on the plans or approved by the Engineer. The work area will be maintained in a neat and orderly fashion.
- 3.22.2. **Duct Bank.** Contractor will refer to Telcordia and AT&T APEX "C Plastic PVC & C Polypropylene Direct Buried in Soil Main Conduit" for placing the conduit, including construction of curves, sweeps, and grade changes. Contractor is not to use short radius 90 degree turns. This Item will cover requirements for mandreling, installing mule tape in each installed duct, and plugging all installed ducts at each end. Contractor to provide mule tape.
- 3.22.3. **Defective or Damaged Material.** All materials will be inspected for defects before being lowered into the trench. Any defective, damaged, or unsound material will be repaired or replaced 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. 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.
- 3.23. **Buried/Underground Cables.**
- 3.23.1. **Installation.** Unless plans specify otherwise, AT&T will install cables per Telcordia and AT&T APEX Practices
- 3.23.2. **Cable Racking.** Racking of cables will be in accordance with Telcordia and AT&T APEX Practices
- 3.24. **Aerial.**
- Before starting any aerial cable placing operations, all personnel must be familiar with the Bellcore practices in the 620, 621, and 627 Divisions.
- Before placing or setting any poles, anchors, or guys all personnel must be familiar with Bellcore practices in the 620, 621, and 627 Divisions and to the most current National Electric Code guidelines and safety practices.
- 3.25. **Marker Posts.** Posts identifying AT&T facility locations will be placed in accordance with AT&T standards at a maximum spacing of 500 linear feet along installation. Posts will also be installed at handholes, manholes, street crossings, and changes in direction of AT&T facilities and as approved by the Engineer.
- 3.26. **Installing Manholes over Existing Conduit and Cables.** Contractor will refer to Telcordia and AT&T APEX Bellcore Practices 622-300-205 "Special Construction" and 622-300-300 "Main Conduit Restoration and Rearrangement" when constructing manholes over existing conduit and cables.
- 3.27. **Adjusting Existing Manholes.** All manhole frame and covers will be adjusted in accordance with Item 479, "Adjusting Manholes and Inlets."
- 3.28. **Removing Existing Facilities.** All abandoned telephone facilities, including manholes, conduit, cables, VRAD, SAI, pedestals, etc., to be removed will be accomplished in accordance with Item 496, "Removing

Structures." An AT&T approved contractor will remove all existing cables and conduit as necessary for the installation of the new facility and for the connectivity between existing and new facilities; however, an AT&T approved contractor is not required to perform any other AT&T removals once the existing facility is abandoned in place.

- 3.29. **Protective Concrete Cap.** Concrete caps will be constructed above existing telecommunication facilities at locations specified and to the dimensions detailed on the plans in conformance with Item 421, "Hydraulic Cement Concrete."
- 3.30. **Adjust Existing Ducts and Cables.** Contractor will refer to Telcordia and AT&T APEX Practices and procedures when adjusting existing conduits and cables in place. Contractor will not perform any adjustments without prior notice to AT&T. The Contractor must allow for AT&T's inspection.

Contractor is responsible for the delivery of all materials furnished by AT&T at the location noted on the plans.

4. MEASUREMENT

- 4.1. **Trench Excavation and Backfill.** This Item will not be measured for payment but will be considered subsidiary to the buried facility installed in the trench.
- 4.2. **Trench Excavation Protection.** Trench Excavation protection will be measured by the plan footage. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2, "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantity are required.
- 4.3. **Concrete Surfaces.** The removal of concrete curb, sidewalk, driveway, medians and/or islands required to be removed and replaced due to underground telephone system construction will not be measured separately but will be considered subsidiary to the structure installed.
- 4.4. **Cut and Restore Pavement.** Cutting and restoring pavement will not be measured for payment, but will be considered subsidiary to the Item installed in the trench.
- 4.5. **Concrete Encasement.** This Item will not be measured for payment, but will be considered subsidiary to the Item installed in the trench. AT&T requires 4 or more pipe DUCT package to be concrete encased (2 sac).
- 4.6. **Foundation.** This Item will not be measured for payment, but will be considered subsidiary to the Item installed.
- 4.7. **Remote Terminal.** This Item will be measured by each site installed, complete in place. This is a plans quantity measurement Item. All labor and equipment required for building the remote terminal including, but not limited to the installation of all telecommunication facilities into the remote terminal, placing the cabinet, installing mounting brackets, preparing the site, building the foundation, landscaping, re-grading, erosion control, traffic control, establishing electrical service and connectivity, transfer switches, grounding, and driveways will be considered incidental to this Item.
- 4.8. **VRAD.** This Item will be measured by each site installed, complete in place. This is a plans quantity measurement Item. This price will be full compensation for all labor, tools and equipment required for building the VRAD including, but not limited to the installation of all telecommunication facilities and power into the VRAD, meter can, electrical conduits and telecom conduits, bonding and grounding, the stub between the VRAD and SAI, placing the cabinet, installing mounting brackets and shelves, preparing the site, building the foundation, Helix Pile, Earth Anchor, etc., and landscaping, re-grading, erosion control, traffic control, establishing electrical service and connectivity, grounding, driveways, coordinating and installing transfer switches and furnishing and installing all non-telecommunication system materials.

- 4.9. **Serving Area Interface (SAI).** This Item will be measured by each site installed, complete in place. This is a plans quantity measurement Item. All labor and equipment required for building the SAI including, but not limited to the installation of all telecommunication facilities into the SAI, placing the equipment, placing the hardware, installing mounting brackets, preparing the site, building the foundation, landscaping, re-grading, erosion control, traffic control, grounding, and driveways will be considered incidental to this Item.
- 4.10. **Manholes and Handholes.** Manholes and handholes will be measured by each size and type installed, complete in place. Neck, rings, frames and covers will not be measured for payment, but will be considered subsidiary to the structure installed.
- 4.11. **Conduit, Split Duct, and Conduit Structures (Duct Banks).** Conduit will be measured by the linear foot for the various types and sizes of conduit structures shown on the plans. This is a plans quantity measurement Item. Excavation, furnishing and placing backfill, removing and replacing pavement structure, sod, riprap, curbs or other surface, furnishing and installing all piping, fittings, sweeps, bends, repair couplings, split couplings, adaptors, ground box/manhole/handhole termination kits, pre-assembled split repair kits, lubrication access fittings, expansion joints, concrete and underground mylar conduit marking tape, mule tape, and all labor, tools, equipment and incidentals will not be measured for payment but will be considered subsidiary to the conduit structure installed. Mandreling will not be paid for separately, but will be considered subsidiary to the conduit installation.
- The lengths of duct bank will be measured along the duct between the outside faces of manholes or handholes or other connected facility as shown on the plans.
- Where the installation involves connection to an existing conduit, the measurement will be made from the point of connection to the existing conduit.
- 4.12. **Cable/Fiber.** Copper cable and fiber optic cable will be measured by the linear foot as shown on the plans complete in place, including rodding and pulling, and installation of pedestals, risers and marker posts. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2, "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantity are required.
- 4.13. **Markers.** Markers will not be measured directly but will be considered subsidiary to the cable/fiber installed.
- 4.14. **Boring.** "Directional Bore" and "Jack and Bore" will be measured by the plan linear footage for the type and size shown on the plans. Casings and galvanized iron pipe will not be measured directly but considered subsidiary to the bore installation. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2, "Plans Quantity Measurement."
- 4.15. **Installing Manhole Over Existing Conduit.** This Item will not be measured directly, but will be considered subsidiary to the manhole measurement.
- 4.16. **Adjust Existing Manhole.** This Item will be measured per each manhole adjusted. Trench excavation on the outside of the manhole will not be measured but will be considered subsidiary to this Item.
- 4.17. **Adjust Existing Pedestal.** This Item will be measured per each pedestal adjusted. Trench excavation on the outside of the pedestal will not be measured but will be considered subsidiary to this Item.
- 4.18. **Remove Existing Facilities.**
- 4.18.1. **Conduit.** Existing conduit removed wherever indicated on the plans will be measured by the linear foot. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2, "Plans Quantity Measurement."

- 4.18.2. **Manholes and Handholes.** Manholes and/or handholes removed will be measured by the each as shown on the plans. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2, "Plans Quantity Measurement."
- 4.18.3. **Poles.** Existing poles removed will be measured by the each item. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2, "Plans Quantity Measurement." All other above ground appurtenances will be considered subsidiary to the conduit removal.
- 4.19. **Protective Concrete Cap.** This Item will be measured by the linear foot of concrete cap, complete-in-place.
- 4.20. **Adjust Existing Ducts/Cable.** This Item will be measured by the linear foot of adjustment complete-in-place.
- 4.21. **Pole Installation.** This item "Pole (Tele)" will be measured by the each item by size and type.
- 4.22. **Mobilization (ITEM 700S-MOBILIZATION).** Item will measured by the lump sum. Mobilization is calculated on the base bid only and will not be paid for separately on any additive alternate items added.
- 4.23. **Traffic Control.** Item will measured by the lump sum.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the Items hereinafter described. The prices will be full compensation for furnishing and hauling all materials; for all excavation and backfill; for trench excavation protection; dewatering, shaping and fine grading of trench; for cutting and restoring pavements; for boring or directional boring, steel or HDPE casing; for removing and replacing concrete surfaces; for placing, joining and racking of pipe and conduit structures; for manholes, for handholes, risers, rings and covers, for placement or adjustment of cable/fiber, pedestals, cabinets, VRAD, SAI, marker posts and for all other items of material, labor, equipment, tools; for all testing and incidentals necessary to complete the work in accordance with the plans and specifications.

- 5.1. **Trench Excavation and Backfill.** Payment for excavation and backfill for the installation of telephone facilities will not be paid for directly but will be considered part of the price bid for the specific Item installed.
- 5.2. **Trench Excavation Protection.** Payment for excavation protection for the installation of telephone facilities will be paid in accordance with Item 402, "Trench Excavation Protection".
- 5.3. **Pavement.** Payment for cutting and restoring pavement will not be paid for directly but will be considered part of the price bid for the specific structure installed.
- 5.4. **Concrete Encasement.** Payment for concrete encasement will not be paid for directly but will be considered part of the price bid for the specific Item installed.
- 5.5. **Foundation.** Payment for foundation will not be paid for directly but will be considered part of the price bid for the specific Item installed.
- 5.6. **VRAD.** Payment for VRAD installations will be made per each "VRAD (Tele)" complete in place as specified on the plans. This price will be full compensation for all labor, tools and equipment required for building the VRAD including, but not limited to the installation of all telecommunication facilities and power into the VRAD, meter can, electrical conduits and telecom conduits, bonding and grounding, the stub between the VRAD and SAI, placing the cabinet, installing mounting brackets and shelves, preparing the site, building the foundation, Helix Pile, Earth Anchor, etc., and landscaping, re-grading, erosion control, traffic control, establishing electrical service and connectivity, grounding, driveways, coordinating and installing transfer switches and furnishing and installing all non-telecommunication system materials.

- 5.7. **Remote Terminal.** Payment for remote terminal installations will be made per each "Remote Terminal (Tele)" complete in place as specified on the plans. This price will be full compensation for all labor, tools and equipment required for building the remote terminal including, but not limited to the installation of all telecommunication facilities into the remote terminal, placing the cabinet, installing mounting brackets, preparing the site, building the foundation, landscaping, re-grading, erosion control, traffic control, establishing electrical service and connectivity, grounding, driveways, coordinating and installing transfer switches and furnishing and installing all non-telecommunication system materials.
- 5.8. **Serving Area Interface (SAI).** Payment for SAI installations will be made per each "SAI (Tele)" complete in place as specified on the plans. This price will be full compensation for all labor, tools and equipment required for building the SAI including, but not limited to the installation of all telecommunication facilities into the SAI, placing the hardware, installing mounting brackets, preparing the site, building the foundation, landscaping, re-grading, erosion control, traffic control, grounding, and driveways.
- 5.9. **Manholes and Handholes.** Payment for manhole installations will be made by the each for "Manhole (Tele)" 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 handhole installations will be made by the each for "Handhole (Tele)" complete in place with all racking, bonding hardware, rings, bricks, frames, covers and joint sealing compound and will be as detailed on the plans.
- 5.10. **Conduit and Conduit Structures.** Payment for conduit installations will be made at the unit price bid for "Conduit (Tele)" and "Split Duct (Tele)" of the size and type of conduit specified. This price will be full compensation for installing conduit, excavating, furnishing and placing backfill, replacing pavement structure, sod, riprap, curbs or other surface; for furnishing and installing all fittings, sweeps, bends, repair couplings, split couplings, adaptors, ground box/manhole/handhole termination kits, pre-assembled split repair kits, lubrication access fittings, expansion joints, concrete and underground mylar conduit marking tape; and for all labor, tools, equipment and incidentals.
- 5.11. **Cable/Fiber.** Payment for cable/fiber installations will be made by the plan linear foot for "Cable UG (Tele)", "Fiber UG (Tele)", "Cable Aerial (Tele)", "Fiber Aerial (Tele)", "Cable Buried (Tele)", "Fiber Buried (Tele)", "Innerduct (Tele)", and "Air Hose (Tele)", "Air Pipe (Tele)" as specified on the plans, complete in place. This price will be full compensation for rodding and pulling, installing risers, pedestals, marker posts; excavating, furnishing and placing backfill, replacing pavement structure, sod, riprap, curbs or other surface; for furnishing and installing all fittings, air hose/pipe cabinets, sweeps, bends, repair couplings, adaptors, ground box/manhole termination kits, pre-assembled split repair kits, aerial risers, U-Guards, standoff brackets, lubrication access fittings, expansion joints, concrete and underground mylar conduit marking tape; and for all labor, tools, equipment and incidentals necessary to complete the work.
- 5.12. **Marker Posts.** Payment for this Item will not be made directly but will be considered incidental to the manhole installation.
- 5.13. **Boring.** Payment for this Item will be made at the unit price bid for "Jack and Bore" or "Directional Bore" of the length specified on the plans, complete-in-place. This will be full compensation for installing the bore, furnishing and installing the casing, pulling conduit, cable/fiber; excavating and supporting bore pits, furnishing and placing backfill, replacing pavement structure, sod, riprap, curbs or other surface; for furnishing all bore equipment, fluids, supplies, fittings, labor, tools, equipment and incidentals necessary to complete the work.
- 5.14. **Installation over Existing Facilities.** Payment for this Item will not be made directly, but will be considered incidental to the manhole installation.
- 5.15. **Adjust Existing Manhole.** Payment for this Item will be made by the each for "Adjust Manhole (Tele)."
- 5.16. **Remove Existing Facilities.** Payment for this Item will be made by the plan quantities for "Remove (Tele)" and "Remove Structure (Tele)" for the type of structure removed.

- 5.17. **Protective Concrete Cap.** Payment will be made at the unit price bid for "Concrete Cap (Tele)" of the concrete class and reinforcement specified.
- 5.18. **Adjust Existing Ducts/Cable.** Payment will be made at the unit price bid for "Adjust Exist Ducts/Cable (Tele)" of the length specified on the plans, complete in place.
- 5.19. **Pole Installation.** This item "Pole (Tele)" will be measured per each item by size and type.
- 5.20. **Mobilization.** Payment will be made at the unit price bid for "Mobilizing". Item will include and not be limited to the cost to mobilize and demobilize equipment to the project site, sediment control, construction staking, the cost of bonds and insurance, and all other incidental costs associated with this work.
- 5.21. **Traffic Control.** Payment will be made at the unit price bid for "Barricades, Signs and Traffic Handling". Item will include and not be limited to the Traffic control for the duration of the project, including all signage, temporary paving, cones, striping, buttons, detours, traffic phasing, and related items and appurtenances, complete in place.