

Special Specification 6428

AT&T Telecommunication System



1. DESCRIPTION

Furnish installation of all facilities belonging to AT&T-Texas (AT&T). The Contractor and approved Subcontractors must 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. Definitions.

1.1.1. **Bellcore Practices.** 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 Bellcore 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 Bellcore Practices.

1.1.2. **Cable and Fiber.** Cable denotes copper cable and Fiber denotes fiber optic cable. The Contractor must obtain cable prints from AT&T for information on type and size of Cable and Fiber to be placed. Cable and Fiber may be aerial, buried or underground.

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

1.1.4. **Split Duct.** PVC piping material must 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.

1.1.5. **Conduit Structure (Duct Bank).** Groups of conduits arranged in tiers and encased as specified on the plans, or as directed.

1.1.6. **Underground.** Refers to facilities housed inside conduit. This excludes facilities placed directly in the ground which are referred to as buried facilities.

2. MATERIALS

AT&T must furnish all materials required for installing telecommunication system complete in place, such as pipe, fittings, cable, fiber, pre-cast manholes, markers, etc. Contractor must be responsible for providing all other material not directly identified to be the responsibility of AT&T on the design plans.

2.1. Procurement of Materials.

All materials proposed for AT&T within this project must be provided by AT&T.

Cables that are greater than 3,000 pair must be requested at least 40 days before required delivery date. Fiber and smaller cables must be requested at least 30 days before required delivery date.

Contractor must install cable within 60 calendar days after receipt of cable.

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

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

If special order items have been identified on the plan set, these items must be requested at least 60 days before required delivery.

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

- 2.2. **Backfill.** All backfill must be in accordance with Item 400, "Excavation and Backfill for Structures."
- 2.2.1. **Bedding.** All bedding must 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 specified on the plans, or as directed.
- 2.2.2. **Cement Stabilized Backfill.** All cement-stabilized backfill must be in accordance with Item 400, "Excavation and Backfill for Structures." Cement-stabilized backfill must be used to fill trench from top of bedding to bottom of subgrade whenever an excavation is under and within 10 ft. of a roadway.
- 2.2.3. **Original Material Backfill (Type A).** Type A backfill must 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 must be equivalent to original material or better, free of debris, compacted 90%-95% standard proctor density in 8 in. lifts.
- 2.3. **Encasement.**
- 2.3.1. **Concrete Encasement.** All concrete encasement material must be in accordance with Item 421, "Hydraulic Cement Concrete." Class B concrete must be utilized for encasement of conduits wherever plans indicate concrete encasement.
- 2.3.2. **Steel Encasement.** Steel encasement must be of enough diameter to encase the conduits, must 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.
- 2.3.3. **HDPE Encasement.** HDPE encasement must be of enough diameter to encase the conduits, must 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 must have a minimum SDR 11 wall thickness.
- 2.3.4. **Foundation.** All concrete foundations must be in in accordance with Item 416, "Drilled Shaft Foundations" and Item 420, "Concrete Structures." Class A concrete must be utilized for foundations wherever plans indicate foundation.
- 2.4. **Manholes and Handholes.**
- 2.4.1. **Pre-cast manholes and handholes.** All pre-cast manholes and handholes must be provided by AT&T.
- 2.4.2. **Cast-in-place manholes and handholes.** All materials used for cast-in-place manholes and handholes must be in accordance with Bellcore Practices Section 622-505-210. Hydraulic cement with a nominal compressive strength of 4,000 psi in accordance with ASTM C150 must be used. Rebar must be deformed steel bars having a 60,000 psi yield strength in accordance with ASTM A615.

- 2.5. **Defective or Damaged Material.** All materials must be inspected for defects before being lowered into the trench. Any defective, damaged, or unsound material must be repaired or replaced as directed. Should damaged materials be placed, the Contractor must 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 determined by the Engineer that the entire length was damaged. The cost and replacement of broken materials will be at the expense of the Contractor.
- 2.6. **Protective Concrete Cap.** All materials must be provided by the Contractor and must be in accordance with Item 421, "Hydraulic Cement Concrete" and Item 440, "Reinforcement for Concrete." Class "A" concrete must be used unless otherwise noted.
- 2.7. **Aerial Installation.** All poles, anchors, guys, strand, U-guard, standoff brackets, and miscellaneous hardware must 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, Department requirements, and the latest editions of both the Bellcore Practices and National Electric Safety Code (NESC).
- 3.1.1. The Subcontractor that installs the underground telephone system must be an approved AT&T Contractor in good standing with AT&T.
- 3.1.2. The Contractor and Subcontractor must follow the more stringent requirements whenever the items listed above vary amongst each other.
- 3.1.3. If discrepancies exist between the above items and any applicable legal 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 and Maintenance to Existing Systems, BR 629-100-010 Paragraph 1 before beginning work on any buried facilities.
- 3.2. **Slotted Manholes.** All manholes proposed as pre-cast slotted must not be ordered until Contractor has verified field conditions are adequate for placement. Otherwise, manhole must be cast in place.
- 3.3. **Cable/Fiber Splicing.**
- 3.3.1. **Coordination with AT&T.**
- 3.3.1.1. All splicing involved in this project must be performed by AT&T.
- 3.3.1.2. Cables must be installed in stages to allow enough working room inside new manholes for splicing. Before installing any cables, Contractor must discuss cable installation order and phases with AT&T Manager-Construction Contract Coordinator shown on the General Notes. AT&T must identify the maximum number of cables allowed to be installed at one time for each individual manhole.
- 3.4. **Trench Excavation.** Trench excavation and backfilling as required to complete the underground telecommunication system installation must be performed in accordance with Item 400, "Excavation and Backfill for Structures," as outlined in this Specification, as shown on the plans and as directed. Blasting to perform the excavation must not be allowed unless authorized on the plans or in writing by the Engineer.
- 3.4.1. Trenches for cable or fiber, conduit, and conduit structure must also comply with the following requirements:
- 3.4.1.1. Width of Trenches must be in accordance with Bellcore Practices Section 622-020-901 Paragraph 11.20

- 3.4.1.2. Depth of Trenches must be in accordance with Bellcore Practices Section 622-020-901 Paragraph 11.21
- 3.4.1.3. Grade of Trenches must be in accordance with Bellcore Practices Section 622-020-901 Paragraph 11.22
- 3.5. **Manhole and Handhole Excavations.** The width and depth of excavation for manholes and handholes must be determined by the lines and grades as established on the plans, dimensions of the manholes and handholes, manhole and handhole orientation, in accordance with Item 400, "Excavation and Backfill for Structures" or as approved.
- 3.6. **Classification of Excavations.** No classification of excavated materials must be delineated. Excavation and trench work must include the removal and subsequent handling of all materials excavated in accordance with Item 400, "Excavation and Backfill for Structures."
- 3.7. **Excavation Below Grade.** Any part of the bottom of the trench excavated below the limits specified in Section 3.4.1.2., "Depth of Trenches," must be corrected with approved material and compacted in a manner in accordance with Item 400, "Excavation and Backfill for Structures" and as directed.
- 3.8. **Protections and Restoration of Underground Structures and Facilities.**
- 3.8.1. **Facilities other than AT&T's.** Contractor must protect and restore underground structures in accordance with Bellcore Practices Section SW622-020-901, Paragraphs 11.01-11.04.
- 3.8.2. **AT&T Facilities.** Contractor must adjust and support existing telephone conduit wherever indicated on plans in accordance with Bellcore Practices Section 622-300-300 "Main Conduit Restoration and Rearrangement."
- 3.8.3. **Trench Excavation Protection.** All trench excavation protection must be accomplished in accordance with Bell System Practice Section 622-020-901.
- 3.8.4. **Backfill.** All backfill and backfill operations must be in accordance with Item 400, "Excavation and Backfill for Structures," as described in this Specification and as directed. Where, as determined by the Engineer, it is necessary to maintain traffic across a trench, Contractor must install temporary metal bridges as necessary to facilitate the movement of traffic.
- 3.8.5. **Foundation.** All foundation installations must be in accordance with Item 420, "Concrete Substructures."
- 3.9. **Remote Terminal.** All telecommunication installations at remote terminal sites must be in accordance with Bellcore Practices. Site preparation for new remote terminal installations must be in accordance with Item 100, "Preparing of Right of Way." Landscaping for new remote terminal sites must be in accordance with Item 193, "Landscape Establishment."
- 3.10. **VRAD.** All telecommunication installations at VRAD sites must be in accordance with Bellcore Practices. Site preparation for new VRAD installations must be in accordance with Item 100, "Preparing of Right of Way." Landscaping for new remote terminal sites must be in accordance with Item 193, "Landscape Establishment".
- 3.11. **Serving Area Interface (SAI).** All telecommunication installations at SAI sites must be in accordance with Bellcore Practices. Site preparation for new SAI installations must be in accordance with Item 100, "Preparing of Right of Way." Landscaping for new SAI sites must be in accordance with Item 193, "Landscape Establishment."
- 3.12. **Pavement.** Contractor must 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 must be based upon the minimum trench width as described in Section 3.4.1.2., "Width of Trenches" plus 2 in. on each side of the trench.

- 3.13. **Concrete Surfaces.** All removal of concrete surfaces (sidewalks, driveways, etc.) must be performed in accordance with Item 104, "Removing Concrete."
- 3.14. **Boring.** Installation of casing pipe and conduits by bore must be in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." Bore spacer must be installed in conformance with manufacturer's guidelines.
- 3.15. **Directional Boring.** Installation of casing pipe and conduits by horizontal directional drill must 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."
- 3.16. **Manholes and Handholes.** Manholes and handholes must be of the size and type as shown on the plans. All manholes and handholes must be set to the lines and grades as shown on the plans. Manholes must have a minimum 60 in. cover from finished grade to the top of the manhole box unless specified otherwise on the plans or as directed by AT&T. Handholes must be placed in line with final grade except where noted otherwise on the plans or as directed by AT&T.
- 3.16.1. **Pre-Cast Manholes.** All pre-cast manholes and handholes must be installed in accordance with Bellcore Practices Section 622-506-200, "Precast Concrete Manholes, 38Y Types, Installation."
- 3.16.2. **Cast-In-Place Manholes.** All cast in place manholes must be constructed in accordance with Bellcore Practices Section 622-505-210, "Concrete Manholes, Cast in Place Construction."
- 3.17. **Conduit and Conduit Structures.**
- 3.17.1. **General Requirements.** Contractor must start work at a tie-in point, unless otherwise indicated on the plans or as directed. The work area must be maintained in a neat and orderly fashion.
- 3.17.2. **Duct Bank.** Contractor must refer to Bellcore Practices Section 622-340-201SW "C Plastic PVC & C Polypropylene Direct Buried in Soil Main Conduit" for placing the conduit, including construction of curves, sweeps, and grade changes. This Item will cover requirements for mandreling, installing mule tape in each installed duct, and plugging all installed ducts at each end.
- 3.17.3. **Defective or Damaged Material.** All materials must be inspected for defects before being lowered into the trench. Any defective, damaged, or unsound material must be repaired or replaced as directed. Should damaged materials be placed, the Contractor must 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 determined by the Engineer that the entire length was damaged. The cost and replacement of broken materials will be at the expense of the Contractor.
- 3.18. **Cables.**
- 3.18.1. **Buried or Underground.**
- 3.18.1.1. **Installation.** Contractor must install cables in accordance with Bellcore Practices Section 628-200-208, "Placing Underground Cable."
- 3.18.1.2. **Cable Racking.** Racking of cables must be in accordance with Bellcore Practices Section 632-305-215, "Cable Racking, Cable Arrangements in Manholes" for up to 20 ducts.
- 3.18.2. **Aerial.**
- 3.18.2.1. Before starting any aerial cable placing operations, all personnel must be familiar with the Bellcore practices in the 620, 621, and 627 Divisions.

- 3.18.2.2. Before placing or setting 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.
- 3.19. **Marker Posts.** Posts identifying AT&T facility locations must be placed in conformance with AT&T standards at a maximum spacing of 500 ft. along installation. Posts must also be installed at handholes, manholes, street crossings, changes in direction of AT&T facilities and as directed.
- 3.20. **Installing Manholes over Existing Conduit and Cables.** Contractor must refer to Bellcore Practices 622-300-205 "Special Construction" and 622-300-300 "Main Conduit Restoration and Rearrangement" when constructing manholes over existing conduit and cables.
- 3.21. **Adjusting Existing Manholes.** All manhole frame and covers must be adjusted in accordance with Item 479, "Adjusting Manholes and Inlets."
- 3.22. **Removing Existing Facilities.** All abandoned telephone facilities, including manholes, conduit, cables, VRAD, SAI, pedestals, etc., to be removed must be accomplished in accordance with Item 496, "Removing Structures." An AT&T approved contractor as shown in Section 3.1.2., must 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.
- 3.23. **Protective Concrete Cap.** Concrete caps must be constructed above existing telecommunication facilities at locations specified and to the dimensions detailed on the plans in accordance with Item 421, "Hydraulic Cement Concrete."
- 3.24. **Lowering or Moving Existing Ducts and Cables.** Contractor must refer to Bellcore Practices and procedures when adjusting existing conduits and cables in place. Contractor must not perform any adjustments without prior notice to AT&T. The Contractor must allow for AT&T's inspection, if requested.
- 3.25. Contractor is responsible for hauling of cable and fiber material from AT&T storage facility; Contractor must coordinate this Item through AT&T Manager-Construction Contract Coordinator.

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 on 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 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.
- 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 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. This is a plans quantity measurement Item. 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 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 termination kits, manhole termination kits, 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.
- 4.11.1. 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.
- 4.11.2. 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 and Fiber.** Copper cable and fiber optic cable will be measured by the 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 on 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 and fiber installed.
- 4.14. **Boring.** "Directional Bore" and "Jack and Bore" will be measured by the plan 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 on 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.** This Item "Remove (Tele)" will be measured by each item and type.
- 4.19. **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 on the proposal unless modified by Article 9.2., "Plans Quantity Measurement." All other above ground appurtenances will be considered subsidiary to the conduit removal.
- 4.20. **Protective Concrete Cap.** This Item will be measured by the foot of concrete cap, complete-in-place.
- 4.21. **Lowering or Moving Existing Ducts and Cables.** This Item will be measured by the foot of adjustment complete-in-place.
- 4.22. **Pole Installation.** This Item "Pole (Tele)" will be measured by the each item by size and type.
- 4.23. **Open Cut.** This Item "Open Cut" will be measured by the foot for of adjustment complete-in-place.
- 4.24.

5. PAYMENT

- 5.1. 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 as 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 (MH), for handholes (HH), risers, rings and covers, for placement or adjustment of cable and 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 conformance with the plans and specifications.
- 5.2. **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.
- 5.3. **Trench Excavation Protection.** Payment for excavation protection for the installation of telephone facilities will be paid in accordance with Item 402, "Trench Excavation Protection."
- 5.4. **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.
- 5.5. **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.
- 5.6. **Foundation.** Payment for foundation will not be paid for directly but will be considered part of the price bid for the specific Item installed.

- 5.7. **VRAD.** Payment for VRAD installations will be made per each "VRAD (Tele)" complete in place as specified on the plans, and per the AT&T's Technical Guidelines and M&P's. 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.
- 5.8. **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.
- 5.9. **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.
- 5.10. **Manholes and Handholes.** Payment for manhole installations will be made by the each for "Manhole (Tele)" and "AT&T MH (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)," and "AT&T HH (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.
- 5.11. **Conduit and Conduit Structures.** Payment for conduit installations will be made at the unit price bid for "Conduit (Tele)," "Conduit PVC-C Duct (Tele)," and "Split Duct (Tele)" of the size, type, and number of conduits, plugs, and fittings specified for installation. 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, plugs, adaptors, ground box termination kits, manhole termination kits, 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.
- 5.12. **Cable and Fiber.** Payment for cable and 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)," "Air Hose (Tele)," and "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 and pipe cabinets, sweeps, bends, repair couplings, adaptors, ground box termination kits, 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.
- 5.13. **Marker Posts.** Payment for this Item will not be made directly but will be considered incidental to the manhole, handhole, and cable installations.
- 5.14. **Pedestals.** Payment for this Item will not be made directly but will be considered incidental to the cable installation.

- 5.15. **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 or 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.
- 5.16. **Installation over Existing Facilities.** Payment for this Item will not be made directly, but will be considered incidental to the manhole installation.
- 5.17. **Adjust Existing Manhole.** Payment for this Item will be made by the each for “Adjust Manhole (Tele)” and “Adj Exist AT&T MH Frame and Cover (Tele).”
- 5.18. **Remove Existing Facilities.** Payment for this Item will be made by the plan quantities for “Remove (Tele),” “Remove Structure (Tele),” “Remove Struct MH (Tele),” “Remove Struct HH (Tele),” and “Remove Struct AT&T Cabinet (Tele),” “Remove Struct VRAD (Tele),” “Remove Struct SAI (Tele),” and “Remove Struct Pedestal (Tele)” for the type of structure removed.
- 5.19. **Protective Concrete Cap.** Payment will be made at the unit price bid for “Concrete Cap (Tele)” of the concrete class and reinforcement specified.
- 5.20. **Lowering or Moving Existing Ducts/Cable.** Payment will be made at the unit price bid for “Lowering or Moving Exist Ducts and Cable (Tele)” of the length specified on the plans, complete in place.
- 5.21. **Open Cut.** Payment will be made at the unit price bid for “Open Cut” of the length specified on the plans, complete in place.
- 5.22. **Pole Installation.** This Item “Pole (Tele)” will be measured per each item by size and type.