***ADD THE FOLLOWING SECTION TO DIVISION II – CONSTRUCTION DETAILS***

### SECTION 670 – UTILITY CONDUITS

**DESCRIPTION**

**670.01.01 GENERAL**

A. The Contractor shall provide all labor, materials, equipment, transportation and services required to install the utility conduits and related items as shown on the plans and in the specifications.

B. All materials furnished and used shall conform to the provisions in Section 106.

1. The materials shall be manufactured, handled and used in a manner to insure completed work in accordance with the plans, specifications, Special Provisions, Cox Communications Specifications and NV Energy Specifications.
2. In the event of a conflict, the Cox Communications Specifications and NV Energy Specifications shall govern as applicable.

**670.01.02 REGULATIONS AND CODES**

A. Nothing described in these specifications or indicated on the plans shall be construed to permit work not conforming to the most stringent of applicable codes and regulations. When plans or specifications call for materials or construction of better quality or larger size than required by codes, laws, rules or regulations, the plans and specifications shall take precedence.

B. All electrical equipment shall conform to the standards of the National Electrical Manufacturers Association (NEMA), and listed by Underwriters' Laboratories, Inc. (UL), or the Electronic Industries Association (EIA), wherever applicable. In addition to the requirements of the plans, the specifications, the Special Provisions and the Supplemental Specifications, all materials and workmanship shall conform to the requirements of the National Electrical Code; the National Electrical Safety Code (NESC); Standards of the American Society for Testing and Materials (ASTM); American National Standards Institute (ANSI) manuals; International Municipal Signal Association (IMSA) cable specifications; Institute of Electronic and Electrical Engineers (IEEE); Rural Electrification Association (REA); Nevada Occupational Safety and Hazard Act (NOSHA); National Board of Fire Underwriters (NBFU); Federal Specifications (FS), the Uniform Standard Drawings; and any local ordinance which may apply.

**670.01.03 EQUIPMENT LIST AND DRAWINGS**

A. Unless otherwise permitted in writing by the Engineer, the Contractor shall within fifteen (15) days following approval of the contract, submit to the Engineer for approval, a list of equipment and materials which he proposes to install.

1. The list shall be complete as to name of manufacturer, size, and identifying number of each item.
2. The list shall be supplemented by such other data as may be required, including scale drawings of cabinets showing location and spacing of shelves, terminal blocks and equipment, including dimensioning.

**MATERIALS**

**670.02.01 CONDUIT**

A. Underground conductors will be installed in conduit by the respective utility companies unless otherwise specified in the Special Provisions or on the drawings.

1. Conduit shall be listed by the Underwriters' Laboratories Inc., and shall bear the U.L. label on each length.
2. PVC SCH. 40 U.L. approved conduit shall be used unless otherwise noted.

B. The conduit sizes and types to be used will be indicated on the plans, or specified in the Special Provisions.

1. The Contractor may, at his own expense, use larger size conduit.
2. Where used, it shall be for the entire length of the run from outlet to outlet with no reducing couplings permitted.

C. Where conduit is to be placed in an open trench, excluding roadway sections, the trench shall be excavated to four (4) inches below the invert grade of the conduit and properly backfilled with sand.

1. A cradle shall be shaped in the bedding to cushion and support the conduit.
2. Backfill material of sand shall be used for the first six (6) inches over the top of the conduit.

D. Where there is existing sidewalk, the conduit shall be run in the street next to the concrete gutter.

1. Trenching for the installation of conduit shall only be 4-1/2 inches wide.
2. The curb and gutter shall neither be cut nor damaged.

**670.02.02 EXPANSION FITTINGS**

A. Expansion fittings, as detailed on the plans, shall be installed where the conduit crosses an expansion joint in the structure.

1. Each expansion fitting shall be provided with a bonding.
2. Expansion fittings shall be used where they exit a structure.

**670.02.03 PULL BOXES**

A. Pull boxes shall be precast reinforced concrete or composite boxes of the sizes and details shown on the plans and standard drawings.

1. Reinforcement shall be 3/4 inch (19 millimeters) mesh, No. 20 U.S. gage, hardware cloth or bar reinforcement.
2. Either steel composite or cast iron lids shall be used.

B. Pull boxes for structure installation shall conform to the dimensions and locations shown on the plans. Boxes or vaults formed in concrete shall have metal frames and covers with wording inscribed on the covers as shown on the plans.

C. All metal parts shall be hot‑dip galvanized and shall conform to the applicable portions of ASTM Designation A 153, after fabrication.

1. Gasket surfaces shall form a true plane.
2. Gaskets shall be one piece neoprene 1/8 inch (3 millimeters) thick, and shall cover the contact surface between the frame and cover.

D. No. 3-1/2, No. 5, and No. 7 pull boxes shall comply with applicable portions of the USS, USD, and plans.

1. The interior of pull boxes shall be void of any other materials except conduit risers and necessary pull strings.
2. All excess materials shall be removed to promote drainage.
3. The cost of supplying and installing new pull boxes or adjusting existing pull boxes to finished grade shall be considered as incidental to the work and no additional compensation shall be allowed.

E. All pull boxes shall have steel covers and shall be grounded in accordance with standard drawing 709.

1. All pull box lids shall be stamped to identify the type of utility in accordance with the applicable utility company standards to identify their use.
2. Any voltage over 600 shall be inscribed "HIGH VOLTAGE."

**CONSTRUCTION**

**670.03.01 MAINTAINING EXISTING AND TEMPORARY UTILITY SYSTEMS**

A. The owner or owning utility will continue operation and maintenance of existing electrical facilities.

B. Where damage is caused by the Contractor's operations, the Contractor shall, at his expense, repair or replace damaged facilities promptly in accordance with these specifications. Should the Contractor fail to perform the required repairs or replacements, the cost of performing such repairs or replacements will be deducted from any monies due or to become due the Contractor.

C. The exact location of existing conduits and pull boxes shall be ascertained by the Contractor before using equipment that may damage such facilities or interfere with any system.

D. These provisions will not relieve the Contractor in any manner of his responsibilities as provided in Subsection 107.11, “Responsibility for Damage”, and Subsection 107.16, "Contractor's Responsibility for the Work and Materials".

E. The data indicated on the plans and in these specifications is as exact as could be secured, but its absolute accuracy is not guaranteed. Exact locations, distances, levels, and other conditions will be governed by unforeseen obstacles in the field.

F. The Contractor shall use the plans and these specifications for guidance, and secure the Engineer's approval for all changes of location or scope of work. The Engineer should be consulted regarding the exact locations of pullboxes, poles and cabinets.

G. It shall be the Contractor's responsibility to coordinate all work required by this contract with all affected utility companies.

**670.02.03 EXCAVATING AND BACKFILLING**

A. Excavations required for the installation of conduit, manholes, pullboxes and other facilities, shall be performed in such a manner as to cause the least possible damage to the streets, sidewalks, and other improvements.

1. Excavations shall not be larger than necessary for the proper installation of conduit, electrical facilities and foundations.
2. Excavating shall not be performed until immediately before installation of conduit, facilities, and foundations.

B. The material from the excavation shall be placed in a position where the least disruption and obstruction to vehicular and pedestrian traffic will be realized and the least interference with surface drainage will occur.

C. Surplus excavated material shall be removed and disposed of by the Contractor outside of the right‑of‑way.

D. At the end of each day's work, and at other times when construction operations are suspended, equipment and other obstructions shall be removed from the right‑of‑way.

E. Structural excavation and backfill shall conform to the requirements of Section 206, Structure Excavation and 207, Structure Backfill.

F. Trench excavations shall be backfilled in conformance with the requirements of Section 208, Trench Excavation and Backfill, and with the applicable utility company specifications and requirements.

G. Backfilled excavations shall be kept well filled and maintained in a smooth and well‑drained condition, until permanent resurfacing is completed as specified in Subsection 208.03.05, Cutting and Restoring Street Surfacing.

H. Unless otherwise specified in the Special Provisions, excavation in the street right-of-way shall be performed in such a manner that not more than one lane of traffic is restricted in either direction at any time, unless otherwise approved by the Engineer.

I. All streets upon or within which any work is being done shall be kept open to all traffic by the Contractor, as specified in Subsection 104.04, Maintenance of Traffic, unless otherwise provided in the Special Provisions, or as approved by the Engineer.

J. Barricading shall conform to the latest edition of the Nevada Traffic Control Manual or as directed by the Engineer.

K. All trenches, conduit and backfill shall comply with applicable portions of the USS, USD, the contract drawings, applicable utility company specifications, and Section 208.

1. All trenching shall be deep enough to insure 24 inches of cover over the conduit, unless otherwise noted.
2. The backfill in street areas shall be Type II gravel compacted to 95% relative density unless otherwise noted. No trench shall be left open after hours without approval of the Engineer.

L. The Contractor shall not sawcut or disturb any concrete structures to remain in place.

1. Conduit locations on the plans are for reference only.
2. Actual locations are to be determined by the Engineer as to the most economical, and the location shall be approved by the Engineer.
3. As-built (Record) marked prints showing installed locations shall be given to the Engineer by the Contractor.

M. All conduit that is terminated, stubbed and capped for future use shall be marked by a "+" a minimum of 3 inches high and directly above the conduit, cut into the face of the curb, wall, concrete paving, etc., or otherwise marked for location.

N. Where conduit is to be placed in an open trench, excluding roadway sections, the trench shall be excavated to 4 inches below the invert grade of the conduit and properly backfilled with sand.

1. A cradle shall be shaped in the sand cushion to support the conduit.
2. Backfill material of sand shall be used for the first six (6) inches over the top of the conduit.

**670.03.03 REMOVING AND REPLACING IMPROVEMENTS:**

A. Improvements, such as sidewalks, curbs, gutters, Portland cement concrete and asphalt concrete pavement, bituminous surfacing, base material and other improvements removed, broken or damaged by the Contractor, shall be replaced or reconstructed in compliance with the applicable sections of these specifications.

B. Whenever a portion of a panel or slab of existing concrete sidewalk or driveway is broken or damaged, it shall be repaired in accordance with Subsection 202.03.02, Removal.

C. The outline of all areas to be removed in Portland cement concrete sidewalks and in pavements shall be cut to a minimum depth of 1‑1/2 inches with an abrasive type saw prior to removing the sidewalk and pavement material.

1. Cut for the remainder of the required depth may be made by any method satisfactory to the Engineer.
2. Cuts shall be neat and true with no shatter outside the removal area.

**670.03.04 CONDUIT INSTALLATION**

A. Taped or PVC coated steel conduit shall be used for all bends, unless otherwise approved by the affected utility company.

B. Conduit shall enter concrete pull boxes from the bottom and shall terminate two (2) inches inside the box wall and not less than two (2) inches nor more than four (4) inches above the bottom, and shall be sloped to facilitate pulling of conductors.

1. Conduit entering the bottom of a pull box shall be located near the end walls to leave the major portion of the box clear.
2. At all outlets, conduit shall enter from the direction of the run.

C. Existing underground conduit to be incorporated into a new system shall be cleaned by blowing out with compressed air, or by other methods required by the Engineer or the owning utility.

D. Conduit runs shown on the plans are for bidding purposes only and may be changed with the approval of the Engineer to avoid underground obstructions.

E. Trenching, conduit installation and backfill shall comply with these supplemental specifications, the Uniform Standard Specifications and Standard Details, and the applicable utility specifications and standards. In the event of a conflict, the utility specifications and standards shall govern.

**METHOD OF MEASUREMENT**

**670.04.01 MEASUREMENT**

The quantity of PULL BOX will be measured per each.

The quantity of MANHOLE will be measured per each.

The quantity of 48-INCH X 54-INCH CONCRETE TRANSFORMER PAD WITH BOLLARDS will be measured per each.

The quantity of [FILL IN ITEM DESCRIPTION] will be measured per [UNIT].

No direct measurement shall be made for [FILL IN ITEM DESCRIPTION].

**BASIS OF PAYMENT**

**670.05.01 PAYMENT**

The accepted quantity of PULL BOX will be paid for at the contract unit price of each shall include all materials, equipment and labor required including, but not limited to, excavation; bedding; compacted backfill; pull box and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer

The accepted quantity of MANHOLE will be paid for at the contract unit price of each and shall include all materials, equipment and labor required including, but not limited to, excavation; bedding; compacted backfill; manhole and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer.

The accepted quantity of 48-INCH X 54-INCH CONCRETE TRANSFORMER PAD WITH BOLLARDS will be paid for at the contract unit price of each and shall include all materials, equipment and labor required including, but not limited to, excavation; bedding; compacted backfill; five fixed 4-inch concrete bollards; concrete; reinforcing steel and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer.

The accepted quantity of [CONDUIT] will be paid for at the contract unit price of linear foot and shall and shall include all materials, equipment and labor required including, but not limited to, removal of pavement and the placing of the Permanent Patch; excavation; trenching; saw cutting; bedding; conduit; pullstrings; fittings; bends; stubouts; pole risers; compacted backfill; concrete encasement; connections to existing conduit; making all required tests and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer.

The accepted quantity of [FILL IN ITEM DESCRIPTION] will be paid for at the contract unit price of [UNIT] and shall include all materials, equipment and labor required including, but not limited to, [FILL IN] and all other items necessary to complete the work as shown on the Plans, as specified herein and as directed by the Engineer.

Unless otherwise provided in the Special Provisions, no payment will be made for [FILL IN ITEM DESCRIPTION] as such. The cost thereof shall be considered as included in the price bid for construction or installation of the items to which [FILL IN ITEM DESCRIPTION] is required.

Payment will be made under:

|  |  |  |
| --- | --- | --- |
| **ITEM NO.** | **ITEM DESCRIPTION** | **UOM** |
| 670.XXXX | PULL BOX | EA |
| 670.XXXX | MANHOLE | EA |
| 670.XXXX | 48-INCH X 54-INCH CONCRETE TRANSFORMER PAD WITH BOLLARDS | EA |
| 670.XXXX | SERIES 200 CATV PULL BOX 30" X 48" X 36" (COX COMMUNICATIONS) | EA |
| 670.XXXX | B-36 CATV PULL BOX 18"x 36"x 24" (COX COMMUNICATIONS) | EA |
| 670.XXXX | 17"x 30"x18" PULLBOX (NV ENERGY) | EA |
| 670.XXXX | 3'-0"x 7'-0"x 4'-0" PULL BOX (NV ENERGY) | EA |
| 670.XXXX | 5'-0"x 10'-6"x 7'-0" MANHOLE (NV ENERGY) | EA |
| 670.XXXX | 48"x 54" CONCRETE TRANSFORMER PAD WITH BOLLARDS | EA |
| 670.XXXX | 4-INCH UTILITY CONDUIT WITH TRENCH AND BACKFILL | LF |
| 670.XXXX | 1-2" CONDUIT WITH PULLSTRING | LF |
| 670.XXXX | 1-3" CONDUIT WITH PULLSTRING | LF |
| 670.XXXX | 1-4" CONDUIT WITH PULLSTRING | LF |
| 670.XXXX | 2-3" CONDUITS WITH PULLSTRINGS | LF |
| 670.XXXX | 3-6" CONDUITS WITH POLY. PULL TAPE | LF |
| 670.XXXX | 1-6" CONDUITS WITH POLY. PULL TAPE | LF |
| 670.XXXX | 2-6" CONDUITS WITH POLY. PULL TAPE | LF |
| 670.XXXX | 1-6" CONDUITS WITH POLY. PULL TAPE, 2-3" CONDUITS WITH PULLSTRING | LF |
| 670.XXXX | 3-6" CONDUITS WITH POLY. PULL TAPE, 2-3" CONDUITS WITH PULLSTRING | LF |
| 670.XXXX | 5-6" CONDUITS WITH POLY. PULL TAPE, 2-3" CONDUITS WITH PULLSTRING | LF |
| 670.XXXX | 9-6" CONDUITS WITH POLY. PULL TAPE, 2-3" CONDUITS WITH PULLSTRING | LF |

**END OF SECTION 670**