



Conduit/Fiber Placement Project Addendum #2:

Added the FPS Admin Map (IS_Fiber_FPS-Admin.pdf) file and the updated specifications (Specifications-Update.pdf) file.

This would also add these details to the original RFP content:

Route #5 (Alternate #1)	
8 th Ave S (4 th St to Hawthorne Elementary School)	
12 SM Fiber Optic Cable	1,910'
2" HDPE Conduit (Trace Wire Incidental)	1,035'
Fiber Splices	8
450 FOSC Splice Enclosure	0
Concrete Polymer Vault	1



FUTURE FARGO
PUBLIC SCHOOLS

- ① F&I NEW 2" ORANGE HDPE DUCT, 12SM FIBER AND NEW ORANGE #12 COPPER-CLAD HDPE LOCATE CABLE, APPROXIMATELY 1035'
- ② F&I NEW CONCRETE POLYMER FIBER VAULT. LEAVE 300' OF THE 12SM FIBER COILED IN VAULT.
- ③ EXISTING PVC PULL BOX INSTALL NEW 2" CONDUIT INTO IT, AND LEAVE 50' OF FIBER SLACK.
- ④ EXISTING FIBER CONDUIT INSTALL NEW 12SM FIBER INTO IT, APPROXIMATELY 375'
- ⑤ EXISTING FIBER VAULT INSTALL NEW 12SM FIBER INTO IT, AND LEAVE 150' OF FIBER SLACK.

Approximate qualities:

- 1910' 12SM FIBER OPTIC CABLE
- 1035' 2" HDPE CONDUIT (TRACE WIRE INCIDENTAL)
- 8EA FIBER SPLICES
- 1EA CONCRETE POLYMER VAULTS



REVISIONS	①
SEAL	
Fargo Public School - New Location	
DESIGN BY: JAR	CHECKED BY: ALC
DRAWN BY: JAR	DATE PLOT: 03/01/2018
CITY OF FARGO	SECTION NO.
	160
	SHEET NO.
	5

PULL BOX METAL FRAME AND COVER

Install PVC Box

1. Pull boxes shall be PVC with metal frames and covers, and shall conform to the details included in the plans.
2. Pull boxes in backcasted areas shall have the top of the box level with the final grade and sloped to match the slope of the final grade and sloped to match the slope of the final grade at all 4 quadrants. Pull boxes in concrete area shall be set with the top of the box flush with the final grade at all 4 quadrants.
3. All PVC pull boxes installed in concrete areas shall have a bell end on the bottom of the pull box to prevent frost heaving, and a cover with a lip at bottom to cover heaving.
4. All conduits shall extend into pull box a MAXIMUM of 5".

Install Fiber Concrete Polymer Vault

1. This shall include the cost to supply and install a concrete polymer pull box. The size shall be 30" x 48" x 48" deep, with no base. The cover will be 1 3/4" thick, secured with stainless steel bolts, and have a logo of "Traffic Signals". The base and cover shall be made from a concrete polymer and sustain a minimum test load of 12,000#. Color shall be gray. Pull box shall be a PD-style enclosure that has a 1-degree flare to prevent frost heave.
2. Two feet of crushed rock shall be installed for drainage below the pull box and will extend 6" beyond the outside edge of pull box. The top of box shall be at final grade and sloped to match the slope of the final grade at all 4 quadrants. The concrete pad shall be 8" thick, reinforced with 6" x 6" x 10 GA welded wire fabric and shall be incidental to the price bid for "58" Pull Box Polymer Vault". All conduit entrances shall be a minimum of 24" from top of box. All conduits shall extend into pull box a MAXIMUM of 5".

Fiber Optic Cable

1. The fiber optic cable shall be dual window single-mode fiber with a maximum attenuation of 0.4 db/km at 1310 wavelength and maximum attenuation of 0.3 db/km at 1550 wavelength and shall meet or exceed Ethernet transmission standard IEEE 802.3ae.
2. Fiber cable construction shall be loose tube gel-filled color-coding per TIA/EIA 598B standards. The Central Strength member shall contain no metallic conductors. The overall strength member shall be aramid fiber yarn or fiberglass, the inner jacket shall be black UV and moisture resistant PE. The outer jacket shall be black UV and moisture resistant PE with sequential meter markings.
3. The item "Communication Cable" will be measured by the linear foot. The quantity measured will be paid for at the contract price and shall be full compensation for all labor, equipment, and material necessary to complete the installation of the communication cable.
4. Fiber optic cable insulation shall have a maximum tensile load of 600 lbs. for installation and 200 lbs. for in-service load. The minimum bend radius shall be 20XOD for installation and 10XOD for in-service.

Handling of Cable

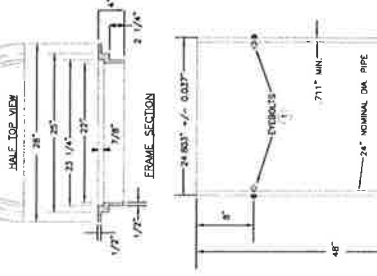
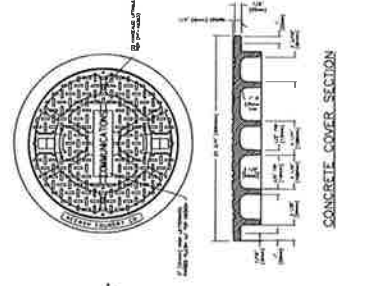
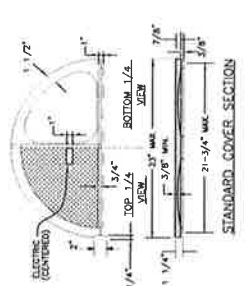
1. Cables or inner duct shall be carefully inspected by the Contractor during placement operation to be certain that the fiber optic cable and inner duct are free from damage before placement.
2. Bends of small radii and twists that might damage cable or wire shall be avoided. During the placement operation, fiber optic cable shall not be bent in a radius less than 20 times the outside diameter of the cable.
3. Care is to be exercised during the placing operation to feed the cable into the inner duct loosely and at no tension. Equipment and construction methods shall be such as to assure compliance with this requirement. The Contractor shall furnish competent supervision at all times at the site of cable placing operations to assure compliance with this requirement.
4. Every instance of damaged cable or wire obtained at any time whether prior to installation, occurring during construction, or discovered by test of observation subsequent to installation in place, shall be immediately called to the attention of the Engineer. The method of repair or correction of such damages shall be in accordance with the written instructions of the Engineer. The Contractor shall promptly repair such damage or make such corrections in accordance with such written instruction of the Engineer. Minor damage to the outer jacket of the cable or wire observed prior to or occurring during construction shall be repaired in accordance with TUS Splicing Standard Bulletin 753F-401 (P-2).
5. The Contractor shall use a break-away swivel reel for 600 lb break load for pulling all fiber optic cables.

Miscellaneous Specifications

1. The Contractor shall include an ORANGE No. 12 Copper Class Trace Wire with HDPE insulation, rated at a minimum 250 LB of breaking load, running the full length and parallel to each communication cable installed in conduits as a trace wire. This is not a separate bid item. The cost shall be included in the price bid for communication cable. The trace wire shall be labeled with the inscription address that it connects to. If the distance is too long to have a trace wire unspliced then the Contractor may splice the trace wire with a DuraTrace connector part #319710, or 318601.
2. The Contractor shall provide 30' of slack cable in each pull box and 150' slack for each cable at the cabinet pull box where termination or splicing will occur or 85' of slack if the fiber cable is completely out and is the end of the fiber run. The Contractor shall remove 10' of each cable end that was used to pull cable prior to installing the required amount of slack to be left in the pull box. Contractor is required to contact the Engineer in the field to discuss all footages left in pull boxes and what is needed for splicing before pulling in fiber and cutting it.

Fiber Optic Cable Testing

1. The Contractor shall test all terminated fibers at both ends with an OTDR tester and light meter, recording the results on a City of Fargo Fiber Test Report Form and providing a computer printout from the OTDR of each fiber tested. If multi-mode fiber tests at 850 NM and 1300 NM are not within the City of Fargo standards of 5 dB loss for each ST connector at the bulkhead, 2 dB loss for each fusion splice, and 1 dB loss per 100 feet for 1300 NM and 1 dB loss per 650 NM and 1 dB loss per 100 feet for 850 NM of fiber being tested, then the Contractor shall repair/replace and the Contractor shall re-test the fiber with City personnel present. If single-mode fiber tests at 1310 NM and 1550 NM are not within the City of Fargo standards of 5 dB loss for each ST connector at the bulkhead, 2 dB loss for each fusion splice, 1 dB loss per 600 feet for 1310 NM and 1 dB loss per 750 feet for 1550 NM of fiber being tested, then the Contractor shall repair/replace and the Contractor shall re-test the fiber with City personnel present. All fiber shall be tested at each end. Any terminated fiber run that doesn't meet the testing tolerances specified shall be repaired/replaced by the Contractor. If any connectors or fusion splices fail, the Contractor shall repair the connection. If a fiber cable is damaged or broke between connections the Contractor shall replace the entire cable between connections.
2. Single mode fiber when tested shall be allowed the following tolerances: 1 dB per 600' (1310nm), 1 dB per 750' (1550nm) of fiber, 2 dB for each fusion splice, 5 dB for each ST connector, and 5 dB for each end that is bare fiber tested.
3. All fiber optic cable that is removed shall be tested by the Contractor and documented after it is removed and placed on a wire spool. All existing fiber optic cable will be considered good and meeting City of Fargo tolerance Specifications. If the existing fiber tested doesn't fall within the tolerance of the specification, then the Contractor shall replace the fiber optic cable with a new one. The Contractor may test the existing cable before it is removed with an OTDR or light meter and provide a computer printout of the testing results to the City of Fargo, to ensure that the existing cable is good and meets specification tolerances.
4. When all terminations are complete, the City of Fargo must inspect all splices inside the TCO FOSC enclosures before the fiber optic communications system can be put into use. Contractor must set up a time to have the cases inspected. Contractor must open splice cases and show all splices and fiber tubes inside the TCO splice case to the Engineer in the field. All fiber tubes shall be labeled inside the splice enclosure.



- NOTES:
1. ALL CASTINGS ARE GRAY IRON AS PER
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 3. ALL PULL BOXES IN CONCRETE SHALL USE JDT HDPE BOX, NEEHAW FOUNDRY R-1733 CASTING AND COVER (OR APPROVE EQUAL)
 4. ALL COVERS SHALL HAVE "ELECTRIC" ON THEM.

INSTALLATION NOTES:

1. TWO STAINLESS/GALVANIZED TYPE 2 SHOULDER EYEBOLTS, 3/8" DIA. X 1 1/4" SHANK LENGTH, WITH HEX NUTS AT 180° APART (FOR LIFTING HANDHOLES AND SUPPORTING ELECTRICAL CABLES)
2. PLACE COMPACTED 2'-0" AGGREGATE (DRAIN BED/DEEP ROCK) BELOW BOTTOM OF HANDHOLE, TO THE SATISFACTION OF THE ENGINEER.
3. CONDUIT HOLES DIAMETER LOCATED IN THE BARREL SECTION ARE SIZED NO LARGER THAN THE CONDUIT OUTSIDE DIAMETER USED.
4. AFTER HANDHOLE AND CONDUIT INSTALLATION, SEAL ALL INSIDE WALLS WATER TIGHT TO THE SATISFACTION OF THE ENGINEER.
5. THE P.V.C. PIPE COMPLES WITH ASTM F69791-1.
6. ALL CONDUITS SHALL EXTEND A MAXIMUM OF 3" INTO PULL BOX.

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REVISIONS	10
SEAL	
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DATE: 03/07/2018	
SHEET NO.	160
SHEET NO.	6



Specifications/Details