

CASS COUNTY PUBLIC RADIO COMMUNICATIONS PROJECT

(Brian Zastoupil)

SUGGESTED MOTION:

Move to approve Change Order No. 9 in the amount of \$80,600 for design and installation requirements associated with antenna system locations on water tanks in Fargo; network design quote in the amount of \$140,193.38 for Non-Motorola expense; and 45th Street Water Tank quote in the amount of \$26,683.98 for antenna system location requirements and additional engineering work outside the contract scope.

Change Order/Quote Requests

Change Order CO9

Summary-Additional expenses due to stringent requirements for antenna system location on water tanks

Quote-\$80,600 (This is a reduced amount via negotiations!)

Description-These costs are associated with stringent design and installation requirements per city and city engineering firm (3rd party).

The communications project contract did include costs for quantity one each construction, structural, and mechanical drawings/design. Unfortunately, initial designs were rejected by site owner/engineering firm. Multiple designs were developed and rejected until site designs were developed which parties mutually agreed upon.

One of the owner requirements was to have antennas color match the tank color. Initial review per site owner representative allowed factory antenna color. After installation of antennas, site owner requested the antennas be painted to match water tank color. Since the antennas were already installed, this change required antennas to be removed, painted and reinstalled. (Costs for removal, painting and reinstallation)

Network Design quote

Summary-Supply and install enhanced network design equipment

Quote-\$ 140,193.38

Description- The contract network design was designed around Layer 2 architecture. (Device to Device). The project has funding allocated for connectivity (Fiber and associated hardware) (Non Motorola budget)

Since contract signing, ARMER has developed a network design which they will eventually migrate to. ND S1RN will be constructed utilizing Layer 3 architecture. Layer 3 has inherent self-healing design, greater flexibility and future proofs communication network design.

If adoption of Layer 3 is deferred during the system buildout, Layer 3 will eventually need to be adopted at some future date. (Incurring a future capital expenditure)

If approved this quote is approved by Cass Commission, it is the recommendation of the Cass County Project Manager that the quote be funded via the non-Motorola project budget (Connectivity line item)

45th Street Water Tank

Summary-Additional expenses due to stringent requirements for antenna system location on water tanks and additional work outside out contract scope

Quote- \$26,683.98

Description-
Additional engineering was tank and corral

Additional entry ports were installed on tank for additional antenna cables. Due to site owner requirements, this work required welding and welding inspection (To ensure structural integrity and compliance.)

To meet owner and structural requirements, antenna system mounting and installation within tanks required specialized mounting system.

Site grounding enhancements were required. This task will improve the resiliency of site hardware. (In the event of a lightning strike)

The antennas needed to be painted to meet owner requirements.

Based upon quote review, it my recommendation Cass County Commissioners approve the above change orders/quotes.

Thanks in advance

Brian Zastoupil
Radio Systems Coordinator

**32nd & 64th Ave WT LMR Antenna Mounts
64th Ave WT Cable Management System
32nd & 64th Ave WT Antenna Removal/Reinstallation Quote**

Line #	Qty	APC	Nomenclature	Item Description	Unit Sale Price	Total Sale Price
32nd & 64th Ave WT LMR Antenna Mounts						
1	1	306	LMR Antenna Mounts	SGS services to run an analysis on the existing mount structure (Rail) for new design Mount Design/Services/Materials to install (2) antenna mount modifications per SGS_1919566.1.2 (Rev 1) _SITE_64th Ave WT_MDD_3-30-2020. Includes welding, sand blasting, painting and coating on new antenna mount steel and miscellance hanger hardware.	\$52,547.88	\$52,547.88
64th Ave WT Cable Management System						
2	1	306	Cable Management System	Design/Services/Materials to install new Cable Management System. Includes Cable Management drawings, rebar scanning, unistrut and coax hanger brackets vertically up concrete wall of tank.	\$20,988.39	\$20,988.39
32nd Ave WT LMR Antenna Removal/Reinstall for Painting						
3	1	306	Remove/Reinstall LMR Ant	Includes crew remobilization, remove the two antennas, reinstall the two antennas and performing new baseline antenna sweeps.	\$3,531.86	\$3,531.86
64th Ave WT LMR Antenna Removal/Reinstall for Painting						
4	1	306	Remove/Reinstall LMR Ant	Includes crew remobilization, remove the two antennas, reinstall the two antennas and performing new baseline antenna sweeps.	\$3,531.86	\$3,531.86
5	1	208	PM	PM Admin Services		
Total Sale Price						\$80,600.00

L3/MPLS Network Option 1 Quote

Line #	Qty	APC	Nomenclature	Item Description	Unit Sale Price	Total Sale Price
Option 1 - Dual SAR-As						
1	3	708	DSMW3HE11473BE	MOTOROLA 7705 SAR-A BUNDLE - REDUNDANT	\$5,593.00	\$16,779.00
2	4	708	DSMW3HE11473BG	MOTOROLA 7705 SAR-A BUNDLE - REDUNDANT + T1	\$6,293.00	\$25,172.00
3	4	708	DSMW3HE05837BA	7705 AC POWER CONVERTER PIGTAIL - O-RING	\$127.40	\$509.60
4	4	708	DSMW3HE05838AA	250W 120/240V AC POWER CONVERTER	\$421.40	\$1,685.60
5	2	708	DSMW3HE03401AA	IPD SYNCHRONIZATION Y- CABLE	\$73.50	\$147.00
6	2	708	DSMW3DB05850AA	SYNCH CABLE, 1M	\$16.80	\$33.60
7	1	708	DSMW3HE11473BF	MOTOROLA 7705 SAR-A BUNDLE - SIMPLEX	\$2,800.00	\$2,800.00
8	1	708	DSMW3HE11473BH	MOTOROLA 7705 SAR-A BUNDLE - SIMPLEX + T1	\$3,150.00	\$3,150.00
9	1	708	DSMW3HE05837BA	7705 AC POWER CONVERTER PIGTAIL - O-RING	\$127.40	\$127.40
10	1	708	DSMW3HE05838AA	250W 120/240V AC POWER CONVERTER	\$421.40	\$421.40
11	1	708	DSMW3HE03401AA	IPD SYNCHRONIZATION Y- CABLE	\$73.50	\$73.50
12	1	708	DSMW3DB05850AA	SYNCH CABLE, 1M	\$34.29	\$34.29
13	2	487	DQCQEQS7701	TRA 19"EQUIP RACK SHELF	\$102.86	\$205.71
14	30	207	DS219601	BRKR 15A 1P CR15 SNAPAK	\$41.43	\$1,242.86
15	1	207	DS219593	BREAKER DISTRIBUTION PANEL -/+ 24/48,	\$1,515.71	\$1,515.71
16	30		3HE00867AA-HN	Hummingbird Networks Brand Compatible/Replacement for Alcatel Lucent/Nokia 1000Base-EX SFP 1310nm 40KM DDM SMF LC Optical Transceiver	\$84.29	\$2,528.57
Equipment Total						\$56,426.24
Services						
17	1		Services	Includes: Project Administration application requirements consultation, network transport design, eq cold install and reconfiguration NMS intergration services, field interation, testing and cutover, system documentation Aviat L3 Upgrde Services		
Services Total						\$83,767.14
Total Sale Price						\$140,193.38

Notes:

- For Layer 3 equipment, the post-warranty coverage is a direct contract between Nokia and customer.
- Assumes DC power is available at all the Microwave and 45th St WT sites. AC power only at City Hall
- Assumes rack space is available for the new network equipment
- Assumes connectivity between the Prime Site routers and the Core routers will still be Layer 2
- Assumes the customer will provide 10Mhz clocking at the SAR for the T1 devices migrating to the MPLS equipment
Regarding the 10Mhz, the minimum is one source. That clocking traffic can be transported over fiber from Site to Site. It is not recommended for that clock traffic to travel over more than 3 sites. In the case for Cass, placing one source, should be sufficient since all the locations requesting clocking are within one to two hops. Also, one source is going to be okay as long as we can distribute the 10Mhz signal (via coax) to the two SARs at that location. In case one SAR reboots, the other SAR can still provide clocking
- It will be assumed that the quantity and type of fiber will be provided at each of the following locations:

101	32nd
- 2 Ethernet fiber stands to City Hall	- 2 Ethernet fiber stands to City Hall
	- 1 T1 fiber strand going to RRRDC
45th	64th
- 2 Ethernet fiber strands to City Hall	- 2 Ethernet fiber stands to City Hall
- 1 T1 fiber strand going to RRRDC	- 1 T1 fiber stand going to RRRDC
City Hall	RRRDC
- 2 Ethernet fiber strands to 101	- 2 Ethernet fiber strands to City Hall
- 2 Ethernet fiber strands to RRRDC	- 1 T1 fiber stand going to 64th
- 2 Ethernet fiber strands to 64th	- 1 T1 fiber strand going to 32nd
- 2 Ethernet fiber strands to 32nd	- 1 T1 fiber strand going to 45th
- 2 Ethernet fiber strands to 45th	

45th ST WT Extra Site Work

Line #	Qty	APC	Nomenclature	Item Description	Unit Sale Price	Total Sale Price	Item Specific Notes
1	1	306	A&E Extras	Corral Analysis, Corral Mod Design Drawings and the Analysis/Design drawings for the New Entry Ports at the bottom of the Tank.	\$3,606.27	\$3,606.27	This includes all Engineering for the Tank and New Corral. This does not include the initial Tank/Corral SA, as that was covered in the original SOW.
2	1	306	Fabrication Extras	Two new Entry Ports were cut in and welded at the bottom of the Tank for the three New Coax Runs. Weld caps on both ends of new Antenna Mast Pipes	\$7,446.86	\$7,446.86	This includes Time, Materials and Post MOD/Weld Inspection
3	1	306	Cable Management Solution	Magnet Mounts to install New Coax Runs from Entry ports, to New Antennas and Magnet Mapping Design Drawings	\$6,417.42	\$6,417.42	Same style of Magnets that were used at 32nd Ave WT and 64th Ave WT. This is a metal Tower, so more magnets were needed, than the other two sites. (Magnets will not be used in the dry tube, per KLM. Any remaining magnets will be left on site)
4	1	306	Additional Grounding	New Shelter Ground Ring (Per R56 Standards) to include two new busbars and all exterior Shelter Grounding (Ground Rods, Exothermic Welding/Mechanical connections, Shelter corners, Hood Vents, Awnings, AC, Gen Exhaust, Ice Bridge, etc...)	\$6,938.72	\$6,938.72	Grounding at Base of Tower and Shelter. All Trenching will need to be hand dug, due to natural gas lines and tree roots, that occupy the area, where the ground ring is to be installed. This does not include private locates, as that is covered in the original SOW
5	1	306	Antenna Painting	Field Paint new CC807-11 Antennas, Mast Pipes and Coax	\$2,274.72	\$2,274.72	Antennas would have matched original WT color. The color was changed to white during the refurb. Antenna's now need to be painted PER KLM
Total Sale Price						\$26,683.98	