5. Opinion of Probable Construction Cost

Prime Controls worked with our local distribution partners Graybar and Reynolds to obtain pricing for the different PLC Systems and developed pricing for all options described in section 4 of this report. Pricing is presented in the tables below:

Item		Material Cost	Install Cost	Total Cost
SCADA Server		$17,000	$5,025	$22,025
PLC Hardware		$48,230	$26,307	$74,537
Cellular Modem		$18,200	$27,300	$45,500
Panel Material		$73,782	$40,580	$114,361
HMI Software		$26,000	$45,500	$71,500
Detailed design		$32,500	$0	$32,500
Demolition		$14,950	$0	$14,950
Misc Materials		$13,650	$0	$13,650
Subtotal		**$244,312**	**$144,712**	**$389,024**
Contingency	20%	$48,862	$28,942	$77,805
Total		**$293,174**	**$173,654**	**$466,829**

Table 10: Option 1 – Opinion of Probable Construction Cost

Item		Material Cost	Install Cost	Total Cost
PLC Hardware		$48,230	$26,307	$74,537
Cellular Modem		$18,200	$27,300	$45,500
Panel Material		$5,270	$2,899	$8,169
HMI Software		$19,500	$45,500	$65,000
Detailed design		$32,500	$0	$32,500
Demolition		$7,800	$0	$7,800
Misc Materials		$9,100	$0	$9,100
Subtotal		**$140,600**	**$102,006**	**$242,606**
Contingency	20%	$28,120	$20,401	$48,521
Total		**$168,720**	**$122,407**	**$291,127**

Table 11: Option 2 – Opinion of Probable Construction Cost

Item		Material Cost	Install Cost	Total Cost
PLC Hardware		$48,230	$26,307	$74,537
Cellular Modem		$18,200	$27,300	$45,500
Panel Material		$73,782	$40,580	$114,361
HMI Software		$0	$0	$0
Detailed design		$32,500	$0	$32,500
Demolition		$14,950	$0	$14,950
Misc Materials		$13,650	$0	$13,650
Subtotal		**$201,312**	**$94,187**	**$295,499**
Contingency	20%	$40,262	$18,837	$59,099
Total		**$241,574**	**$113,024**	**$354,598**

Table 12: Option 3 – Opinion of Probable Construction Cost

Item		Material Cost	Install Cost	Total Cost
PLC Hardware		$48,230	$26,307	$74,537
Cellular Modem		$18,200	$27,300	$45,500
Panel Material		$5,270	$2,899	$8,169
HMI Software		$0	$0	$0
Detailed design		$32,500	$0	$32,500
Demolition		$7,800	$0	$7,800
Misc Materials		$9,100	$0	$9,100
Subtotal		**$121,100**	**$56,506**	**$177,606**
Contingency	20%	$24,220	$11,301	$35,521
Total		**$145,320**	**$67,807**	**$213,127**

Table 13: Option 4 – Opinion of Probable Construction Cost

6. Conclusion

Several options were investigated to upgrade Forney's SCADA system. A solution including upgrading existing PLCs, and existing SCADA HMI software was found to provide the highest reliability, scalability while minimizing cost and ensuring minimum service interruption during project construction. Option 1 addresses the immediate concerns with the overall SCADA system while providing the ability to perform a parallel install to ensure little to no downtime for operations. This option also allows for future expansion and has the greatest network resiliency.