TRAFFIC CONTROLLER SPECIFICATION, CITY OF AKRON, OHIO 2007-07-05

TRAFFIC CONTROLLER SPECIFICATION, CITY OF AKRON, OHIO ITEM 633 CONTROLLER

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AN ACTUATED, SOLID STATE DIGITAL MICROPROCESSOR TYPE TRAFFIC CONTROLLER WITH MENU DRIVEN PROMPTS, INTERNAL TBC, FSK TELEMETRY MODULE FOR CLOSED LOOP COMMUNICATIONS AND ALL OTHER ACCESSORIES THAT ARE REQUIRED TO MAKE THE CONTROLLER COMPLETELY FUNCTIONAL AND OPERATIONAL AS SHOWN IN THE PLANS.

THE CONTROLLER UNIT SHALL BE AN ECONOLITE ASC3-2100 AS MANUFACTURED BY ECONOLITE CONTROL PRODUCTS OF ANAHEIM, CA.

THE PROVISIONS OF ITEMS 633 AND 733 SHALL FURTHER INCLUDE THE FOLLOWING:

THE CONTROLLER ASSEMBLY SHALL INCLUDE A NEMA TS2 TYPE 2 CONTROLLER UNIT AND A NEMA TS2 TYPE 16 MALFUNCTION MANAGEMENT UNIT COMPLETE IN A NEMA TS1 CABINET ASSEMBLY.

THE CONTROLLER UNIT AND CABINET SHALL CONFORM TO ODOT SPECIFICATIONS 633 AND 733 AND SHALL HAVE THE FOLLOWING FEATURES:

1. LOAD SWITCHES AND FLASH TRANSFER RELAYS SHALL BE SUPPLIED IN SUFFICIENT QUANTITY TO PERFORM THE OPERATION AS SHOWN IN THE PLANS. THE LOAD SWITCHES SHALL PROVIDE INDICATORS ON BOTH THE INPUTS AND OUTPUTS OF EACH CIRCUIT.

   A. FOUR (4) PHASE CABINETS SHALL INCLUDE AN 8 POSITION NEMA TS1 BACK PANEL WITH A FULL COMPLIMENT OF LOAD SWITCHES (8), FLASHER (1), AND FLASH TRANSFER RELAYS (3).
   B. EIGHT (8) PHASE CABINETS SHALL INCLUDE A 12 POSITION NEMA TS1 BACK PANEL WITH A FULL COMPLIMENT OF LOAD SWITCHES (12), FLASHER (1) AND FLASH TRANSFER RELAYS (4).

2. THE CONTROLLER UNIT SHALL BE 16 PHASE FULLY ACTUATED AND SHALL MEET ALL REQUIREMENTS FOR A NEMA TS2 TYPE 2 INCLUDING SDLC (PORT1), RS-232 (PORT 2), AND FSK (PORT 3) PORTS. ADDITIONAL MANUFACTURE SPECIFIC "D" CONNECTORS, 10/100 ETHERNET PORT AND REMOVABLE DATAKEY SHALL BE INCLUDED. ADDITIONAL FEATURES SHALL BE AS FOLLOWS:

   A. THE LCD DISPLAY SHALL BE ALPHANUMERIC AND INCLUDE 16 LINES BY 40 CHARACTERS WITH BACK-LIGHTING AND MULTIPLE LEVELS OF CONTRAST AND A HEATER FOR CONTINUED OPERATION DURING EXTENDED PERIODS BELOW 0° F.
   B. ALL DATA SHALL BE STORED ON AN EASILY REMOVABLE FRONT PANEL MOUNTED DATAKEY CAPABLE OF STORING A MINIMUM 265KB OF DATA.
   C. THE CONTROLLER SHALL HAVE THE ABILITY TO ASSIGN INPUT OR OUTPUT FUNCTION TO ANY INPUT OR OUTPUT PIN RESPECTIVELY.
   D. THE CONTROLLER SHALL BE CAPABLE OF AN ADDITIONAL 16 STANDARD OVERLAPS BY ASSIGNING EACH PHASE OUTPUT TO AN OVERLAP.
   E. THE CONTROLLER SHALL INCLUDE "TIME-OF-DAY" AND "COORDINATION" CAPABILITIES.
   F. THE CONTROLLER SHALL INCLUDE "PREEMPTION" CAPABILITIES INCLUDING 10 RAILROAD, FIRE AND EMERGENCY VEHICLE HIGH-PRIORITY PREEMPTORS. THE CONTROLLER SHALL ALSO BE CAPABLE OF 4 LOW-PRIORITY "BUS-PREEMPTORS".
   G. THE CONTROLLER SHALL BE PROGRAMMABLE TO ALLOW FOR FLASHING "DON'T WALK" THROUGH THE YELLOW SIGNAL PHASE.

3. THE NEMA TS2 TYPE 16 MALFUNCTION MANAGEMENT UNIT SHALL BE PROVIDED WITH AN LCD DISPLAY, AN ETHERNET PORT AND EXTENDED MONITORING IN ACCORDANCE WITH 733.03, PART A. SECTION C. THE CABINET SHALL BE WIRED FOR APPROACH MONITORING. AN SDLC CABLE ASSEMBLY AND TWO RS-485 SDLC CABLES SHALL BE PROVIDED. THE CABLES SHALL CONNECT PORT 1 OF THE CONTROLLER TO PORT 1 OF THE MMU. THIS WILL ENABLE THE ADVANCED ERROR CHECKING, REPORTING AND LOGGING FEATURES AS DEFINED BY NEMA. THE MMU SHALL PASS ALL TESTS AS PERFORMED BY AN AUTOMATIC MONITOR TESTER. TEST RESULTS SHALL BE PRINTED AND SUPPLIED WITH EACH CABINET.

4. THE FOLLOWING SWITCHES SHALL BE ACCESSIBLE VIA THE POLICE PANEL:
   A. SIGNAL ON/OFF
   B. FLASH CONTROL
   C. AUTOMATIC/MANUAL TRANSFER
   D. MANUAL PUSH-BUTTON AND 10' COILED HAND CORD

5. THE FOLLOWING SWITCHES SHALL BE MOUNTED ON A TECHNICIANS SWITCH PANEL ON THE INSIDE OF THE MAIN CABINET DOOR:
   A. STOP TIME ON/OFF
   B. FLASH CONTROL
   C. TIMER POWER ON/OFF
   D. DETECTOR TEST, MOMENTARY PUSH-BUTTON

6. THE MAINTENANCE PANEL AND POLICE PANEL SHALL BE INSTALLED AS A COMPLETE AND INDEPENDENT ASSEMBLY. A SINGLE MULTI PIN CONNECTOR ASSEMBLY SHALL BE USED TO INTERFACE TO THE MAIN BACK PANEL. DIRECT WIRING FROM THE BACK PANEL TO THE MAINTENANCE/POLICE PANEL WILL NOT BE ALLOWED.

   THE MAINTENANCE/POLICE PANEL ASSEMBLY SHALL BE EASILY REPLACED WITHOUT HAVING TO DISTURB ANY OTHER WIRING IN THE CABINET. THE MAINTENANCE PANEL SHALL BE HINGED WITH A STAINLESS STEEL HINGE TO THE POLICE PANEL TO ALLOW EASY ACCESS TO THE WIRING WITHIN THE ASSEMBLY.

7. A LED STYLE CABINET LAMP KIT SHALL BE PROVIDED. THE LAMP KIT SHALL ILLUMINATE THE ENTIRE CABINET ASSEMBLY AND INCLUDE TWO (2) FIXTURES. 1 MOUNTED ON THE FAN PLATE A SECOND MOUNTED BELOW THE TIMER SHELF TO ILLUMINATE THE LOAD BAY AREA. THE LED LAMP KIT SHALL INCLUDE A DOOR ACTIVATED PUSH-BUTTON.

8. THE CABINET SHALL BE ALUMINUM, WITH A NATURAL SATIN FINISH OF THE REQUIRED SIZE TO INCLUDE ALL EQUIPMENT, UNLESS SPECIFIED OTHERWISE, AND SHALL COMPLY WITH THE REQUIREMENTS OF 733.03.

   A. EIGHT (8) PHASE CABINETS SHALL BE A MINIMUM OF 55"Hx44"Wx26"D UNLESS OTHERWISE SPECIFIED
   B. EIGHT (8) PHASE CABINETS WITH BATTERY BACK-UP SYSTEMS SHALL BE DOUBLE DOOR CABINETS MEASURING 55"Hx60"Wx26"D, INCLUDE A SEPERATE AND ISOLATED COMPARTMENT FOR THE UPS EQUIPMENT UNLESS OTHERWISE SPECIFIED.

9. THE CONTRACTOR SHALL FURNISH, FOR APPROVAL, TWO CABINET PLANS SHOWING COMPONENT LAYOUT, AND A COPY IN AUTO CAD FORMAT. IN ADDITION AN OPERATION MANUAL SHALL BE INCLUDED THAT PROVIDES INFORMATION REQUIRED FOR INSTALLATION, OPERATION AND MAINTENANCE OF THE CONTROLLER.

10. THE MAIN POWER SURGE PROTECTOR SHALL BE PLUG-IN TYPE, INCLUDE A FAILURE INDICATOR AND A SET OF DRY CONTACTS TO INDICATE THE UNIT HAS FAILED. THE UNIT SHALL BE AN EDCO MODEL SHA1250, OR EQUAL, INCLUDING BASE. THE FAIL CONTACTS OF THE SURGE PROTECTOR SHALL BE WIRED TO AN ALARM INPUT FOR REPORTING A FAILED DEVICE TO A CENTRAL COMPUTER.

11. THE FOLLOWING LIST OF FEATURES SHALL BE INCORPORATED INTO THE CABINET AND TERMINALS FACILITY:

   A. THE FIELD TERMINALS FOR SIGNAL HOOKUP SHALL BE MOUNTED TO A PANEL AND ANGLED AT 45° FOR EASE OF INSTALLATION AND MAINTENANCE. THE BACKBOARD SHALL BE MOUNTED AT LEAST 6" ABOVE THE BASE OF THE CABINET. NO WIRES LUGGED OR OTHERWISE, SHALL BE PERMITTED ON THE SIGNAL HOOKUP SIDE OF THE FIELD TERMINAL BLOCKS.
   B. WIRE CONNECTIONS TO THE BACK PANEL SHALL BE MADE WITH CRIMP TERMINALS AND THREADED FASTENERS. QUICK-CONNECT TERMINALS ARE NOT ACCEPTABLE. SOLDER CONNECTIONS MAY BE USED ON THE BACKSIDE OF A PANEL THAT UTILIZES FEED THRU STYLE TERMINAL BLOCKS. PRINTED CIRCUIT BOARDS SHALL NOT BE USED AS ANY PART OF THE MAIN BACK PANEL ASSEMBLY.
   C. ALL WIRES FASTENED TO THE LOAD SWITCH, FLASHER AND FLASH TRANSFER RELAY SOCKETS SHALL BE SOLDERED IN PLACE. A GOOD MECHANICAL CONNECTION MUST BE MADE PRIOR TO SOLDERING.
   D. THE BACK PANEL SHALL BE PROVIDED WITH A UNITIZED SELF-LEVELING/SELF ADJUSTING HINGED MOUNTING MECHANISM TO ALLOW EASY ACCESS TO ALL WIRING ON THE REAR PANEL. THE BACK PANEL SHALL SLIDE ONTO THE HINGE SUPPORT BRACKETS AND BE SECURED IN THE CABINET WITH STAINLESS STEEL MOUNTING HARDWARE SECURELY FASTENED AT NO MORE THAN TWO (2) POINTS. COMPLETE REMOVAL AND REPLACEMENT OF THE MAIN BACK PANEL ASSEMBLY SHALL BE ACCOMPLISHED WITH THE USE OF SIMPLE HAND TOOLS.
   E. THE BACK PANEL SHALL BE DESIGNED SUCH THAT IT CAN BE EASILY REMOVED AND REPLACED WITHIN THE CABINET. CONNECTORS SHALL BE USED TO CONNECT ALL SIDE PANELS TO THE BACK PANEL INCLUDING THE DETECTOR PANEL, MAINTENANCE/POLICE PANEL, CABINET FAN PLATE AND ANY AUXILIARY PANEL. THE MAIN BACK PANEL ASSEMBLY SHALL BE EASILY REMOVED AND REPLACED WITHOUT REMOVING OR REWIRING ANY OF THE SIDEWALL MOUNTED PANELS.
   F. ALL WIRING OF HARNESSES AND INTER-PANEL WIRING, INCLUDING WIRING TO THE POLICE PANEL SHALL BE PROTECTED WITH A NYLON MESH OR "SNAKE SKIN". ANY EXPOSED WIRES, OR THE USE OF CABLE TIES TO HOLD THE WIRE BUNDLES TOGETHER SHALL NOT BE ALLOWED.
   G. ALL BACK PANEL TERMINALS AND COMPONENTS SHALL HAVE SILK-SCREENED TERMINAL/SOCKET FUNCTION IDENTIFICATION LABELS SUCH AS AC COM, PHASE 3 GREEN, ETC. SILK-SCREENED TERMINAL REFERENCE NUMBERS SHALL ALSO BE PROVIDED. LOAD SWITCH FIELD TERMINALS SHALL BE LABELED WITH THE LOAD SWITCH NUMBER, COLOR AND TERMINAL REFERENCE NUMBER.
   H. ALL WIRING FOR PEDESTRIAN OUTPUTS AND OVERLAPS SHALL BE BROUGHT TO TERMINALS ON THE FRONT OF THE BACKBOARD FOR EASY MODIFICATION.
   I. ALL SWITCHES SHALL BE IDENTIFIED WITH PERMANENT TYPE LABELS. THE USE OF PLASTIC MARKING TAPE OR "CROY" TYPE TAPE IS NOT ACCEPTABLE.
   J. ALL MAIN POWER PANEL DEVICES SHALL BE AFFIXED TO THE LOWER RIGHT PORTION OF THE MAIN PANEL, INCLUDING ALL CIRCUIT BREAKERS, LINE FILTERS AND LOAD RELAYS. AS AN ALTERNATE, A SEPARATE POWER PANEL MOUNTED TO THE RIGHT SIDE WALL OF THE CABINET WILL BE PERMITTED.
   K. ALL EQUIPMENT HARNASSES SHALL BE ATTACHEDTO THE UNDERSIDE OF THE FIELD TERMINATION FOR LOOPS, AND PEDESTRIAN PUSH BUTTONS SHALL BE ON THE LEFT SIDEWALL. THE TERMINAL BLOCK FOR THESE ITEMS SHALL BE MOUNTED VERTICALLY. TERMINATING OF FIELD WIRES OVER TOP OF OTHER TERMINAL BLOCKS SHALL NOT BE ALLOWED.
   L. SHELVES WITH APPROPRIATE CABLE TIE MOUNTING BLOCKS, FOR EASE OF MAINTENANCE, ALL HARNASSES SHALL BE OF SUFFICIENT LENGTH TO PLACE THE EQUIPMENT ON TOP OF THE CABINET AND BE OPERATIONAL.

   M. THE CABINET SHALL BE WIRED READY FOR USE IN A "CLOSED LOOP SYSTEM". MEANING A 6 PAIR SYSTEM, RADIO, OR FIBER OPTIC SYSTEM CAN BE INSTALLED WITH A MINIMUM OF FIELD WIRING.
   N. A COLOR-CODED WIRING SYSTEM SHALL BE USED THROUGHOUT THE WIRING OF THE CABINET. THE WIRING COLOR-CODE SHALL BE AS FOLLOWS:
      a) CONTROLLER UNIT - BLUE 22 GAUGE
      b) MMU- VIOLET 22 GAUGE
      c) RED LOAD SWITCH OUTPUT - RED 16 GAUGE
      d) YELLOW LOAD SWITCH OUTPUT -YELLOW 16 GAUGE
      e) GREEN LOAD SWITCH OUTPUT - BROWN 16 GAUGE
      f) AC LINE POWER - BLACK VARIES*
      g) AC NEUTRAL - WHITE VARIES*
      h) EARTH GROUND - GREEN VARIES*
      i) LOGIC GROUND -GRAY 22 GAUGE
      j) FLASH PROGRAMMING - ORANGE 16 GAUGE
      *SIZED APPROPRIATELY TO HANDLE THE VARYING CURRENT REQUIREMENTS

12. A DETECTOR TERMINATION PANEL SHALL BE INSTALLED AND MOUNTED ON THE LEFT-SIDE WALL OF THE CABINET. A SINGLE MULTI-PIN CONNECTOR SHALL BE USED TO INTERFACE THE DETECTOR PANEL TO THE MAIN BACK PANEL. DIRECT WIRING FROM THE MAIN BACK PANEL TO THE DETECTOR PANEL WILL NOT BE ALLOWED, EXCEPT FOR THE AC SERVICE TO THE PANEL.
   A. ALL LOOP DETECTOR HARNESSES SHALL INCLUDE AN APPROPRIATE 10-PIN LOCKING TYPE CONNECTOR TO PLUG INTO THE DETECTOR TERMINATION PANEL. THE LOOP HARNESS SHALL LOCK INTO A MATING CONNECTOR ON THE DETECTOR TERMINATION PANEL.
   B. THE PANEL SHALL BE PROVIDED WITH PROVISIONS AND FULLY WIRED FOR A MINIMUM OF EIGHT (8) LOOP DETECTORS INCLUDING CONNECTORS AND LOOP TERMINATION BLOCKS. CONNECTORIZED PLUG-IN STYLE LOOP DETECTOR HARNESSES SHALL BE PROVIDED IN SUFFICIENT QUANTITY TO PERFORM THE REQUIRED SEQUENCE.
   C. THE DETECTOR TERMINATION PANEL SHALL BE FULLY PROGRAMMABLE. ALL DETECTOR FUNCTIONS SHALL BE PROGRAMMABLE ON THE DETECTOR PANEL INCLUDING PHASE CALLS, DELAY DEFEAT AND DETECTOR COUNT OUTPUTS.
   D. TERMINATION POINTS SHALL BE PROVIDED FOR FOUR (4) PEDESTRIAN PUSHBUTTONS.
   E. PROVISIONS FOR INTERFACING SYSTEM DETECTORS AND ADDITIONAL DETECTOR INPUTS SHALL BE INCLUDED ON THE PANEL.
   F. THE DETECTOR TERMINATION PANEL SHALL ALLOW FOR EASY EXPANSION. ADDITIONAL DETECTORS TERMINATION PANELS SHALL BE ADDED BY MEANS OF A SINGLE CONNECTING HARNESS ASSEMBLY THAT INCLUDES ALL FUNCTIONS AS REQUIRED TO ACHIEVE THE DESIRED SEQUENCE AND OPERATION INCLUDING PHASE CALLS, PHASE GREENS AND AUXILIARY SYSTEM FUNCTIONS.
   G. ALL LOOP DETECTOR HARNESSES SHALL BE TAGGED WITH A WHITE CIRCULAR PLASTIC TAG, AND SHALL IDENTIFY, WITH PERMANENT MARKER, THE LOOP NUMBER, DIRECTION OF TRAVEL AND DESIGNATE THE LANE FOR WHICH THE LOOP IS PLACED. IT SHALL ALSO INCLUDE ANY NOMENCLATURE AS SHOWN ON THE DRAWINGS USED FOR IDENTIFICATION OF THE HARNESS.
   H. LOOP DETECTOR AMPLIFIERS SHALL BE DIGITAL, AUTOMATIC SELF-TUNING AND HAVE AN INDUCTANCE TUNING RANGE OF 10-2000 MICRO HENRIES. A SINGLE CHANNEL LOOP DETECTOR AMPLIFIER WITH SEPARATE DELAY AND EXTENSION TIMERS, SYSTEM COUNT OUTPUT AND LCD DISPLAY SHALL BE SUPPLIED FOR EACH LOOP. LOOP AMPLIFIERS SHALL BE INDIVIDUAL UNITS FOR SHELF MOUNT, NOT RACK MOUNT TYPE AND SHALL BEPROVIDED IN QUANTITIESAS NEEDED TO PERFORM THE SEQUENCE AND OPERATION AS SHOWN ANS AS INDICATED IN THE PLANS.
   I. A MINIMUM OF EIGHT (8) EDCO SRA-6LC SURGE PROTECTION DEVICES SHALL BE SUPPLIED AND TERMINATED ON THE DETECTOR TERMINATION PANEL I FOR EACH LOOP INPUT.

13. PROVIDE AN ETHERNET COMMUNICATIONS MODULE FOR THE CONTROLLER THAT FULLY SUPPORTS AN IEEE 802.3 COMPLIANT GIGABIT ETHERNET AUTO SENSING PORT FOR ADVANCED SYSTEMS COMMUNICATIONS. THE ETHERNET PORT SHALL PROVIDE AN UPSTREAM CONNECTION TO OTHER ETHERNET DEVICES IN THE CABINET. AN INDUSTRY STANDARD RJ-45 TYPE CONNECTOR SHALL BE INCLUDED THAT SUPPORTS A SIMPLE CAT5E PATCH CABLE INTERFACE. THE ETHERNET PORT SHALL BE FACTORY PRE-CONFIGURED WITH A UNIQUE PRIVATE IP ADDRESS AND CLASS B SUBNET MASK.

14. A SYSTEMS INTERFACE PANEL SHALL BE MOUNTED ON THE LEFT SIDEWALL, ABOVE THE DETECTOR TERMINATION PANEL(S). TERMINAL BLOCKS SHALL BE FEED-THRU TYPE AND MOUNTED VERTICALLY. ALL SYSTEMS FUNCTIONS OF THE CONTROLLER SHALL BE TERMINATED ON A SINGLE PANEL. AT A MINIMUM, THE SYSTEMS PANELS SHALL INCLUDE TERMINATION POINTS FOR 16 ADDITIONAL DETECTOR INPUTS, 6 PREEMPT INPUTS, 6 PREEMPT OUTPUTS AND 4 SPECIAL FUNCTION OUTPUTS. THE SYSTEMS INTERFACE PANEL SHALL CONNECT TO THE MAIN BACK PANEL ASSEMBLY AND THE DETECTOR PANEL WITH THE USE OF MULTI-PIN CONNECTORS. DIRECT WIRING FROM THE MAIN BACK PANEL TO THE CLOSED LOOP SYSTEMS INTERFACE PANEL WILL NOT BE ALLOWED.

DATE	REVISIONS
08/2007	UPGRADED CONTROLLER SPEC
09/12/08	UPGRADED SPECIFICATIONS

DATE 08-2007
CHECKED NKS
REDRAWN RAC
SCALE: NONE

TRAFFIC CONTROLLER SPECIFICATION NOTES

CITY OF AKRON TYPICALS

CITY OF AKRON
DEPARTMENT OF PUBLIC SAFETY/SERVICE
TRAFFIC ENGINEERING DIVISION