TRAFFIC CONTROL NOTES

CALC. BY: DATE:	LAKE COUNTY LAK-20-2.70	OHIO
CHKD. BY: DATE:		FHWA REGION 5
		FEDERAL PROJECT

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A. AN EPSON FX-850 DOT MATRIX PRINTER OR AN OKIDATA ML380 DOT MATRIX PRINTER OR AN APPROVED EQUAL.

B. 14 INCH SVGA COLOR MONITOR.

C. A 2400 EXTERNAL MODEM.

D. A POWER LINE FILTER, VOLTAGE SURGE PROTECTOR AND A FUSE PROTECTED MULTI-SERVICE OUTLET WITH AT LEAST SIX POSITIONS.

E. ALL NECESSARY CABLES AND ACCESSORIES NEEDED TO MAKE THE SYSTEM OPERATE ACCORDING TO THESE SPECIFICATIONS.

F. PHONE DROP SHALL BE PROVIDED BY THE CITY OF WILLOUGHBY.

2. ONE 486SX PORTABLE LAPTOP MICROCOMPUTER WITH 60MB HARD DISK DRIVE, 1.44MB INTERNAL 3.5 INCH FLOPPY DISK DRIVE, 2MB RAM MEMORY AND 2400 BAUD INTERNAL MODEM WITH CARRYING CASE.

   A. AN EPSON FX-850 DOT MATRIX PRINTER OR AN OKIDATA ML380 DOT MATRIX PRINTER OR AN APPROVED EQUAL.

3. THE GRAPHICS SHALL DISPLAY IN COLOR, THE VEHICULAR SIGNALS, PEDESTRIAN SIGNALS AND DETECTOR ACTUATION. EACH INTERSECTION IN ANY OF THE SUBSYSTEMS SHALL BE CAPABLE OF VIEWING ONE INTERSECTION AT A TIME. THE INTERSECTION LAYOUT SHALL BE GRAPHICALLY CONSTRUCTED BY THE USER USING PREDETERMINED SHAPES (EG: "T" INTERSECTION). ALSO IT SHALL BE POSSIBLE TO DISPLAY THE STATUS OF A COMPLETE SUBSYSTEM AT ONE TIME ON THE MONITOR. THE NAME AND SIGNAL STATUS (G-Y-R) OF EACH INTERSECTION SHALL BE DISPLAYED. THE SUBSYSTEM NETWORK SHALL BE CAPABLE OF BEING CONFIGURED IN ANY USER DEFINED GRID.

4. UPON COMMAND FROM THE CENTRAL OFFICE FACILITY, IT SHALL BE POSSIBLE TO DOWNLOAD ALL STORED SETTING ON THE DATA DISK FOR INTERSECTION CONTROLLER TIMING AS WELL AS COORDINATION SETTINGS AND TIME OF DAY PLANS. IT SHALL BE POSSIBLE TO DOWNLOAD ALL SETTINGS TO ALL INTERSECTIONS IN A SUBSYSTEM OR SELECT ANY/ALL PARAMETERS TO ANY INDIVIDUAL INTERSECTION. ALSO, UPON COMMAND IT SHALL BE POSSIBLE TO UPLOAD ALL THE INFORMATION MENTIONED ABOVE FROM EACH LOCAL INTERSECTION TO THE CENTRAL FACILITY.

   IT SHALL ALSO BE POSSIBLE TO DOWNLOAD/UPLOAD ALL MASTER SETTINGS BETWEEN THE CENTRAL AND MASTER. UPON COMMAND FROM THE LOCAL CONTROLLER IT SHALL BE POSSIBLE TO DOWNLOAD ALL CONTROLLER TIMING AND COORDINATION SETTINGS FROM THE CENTRAL.

   UPON COMMAND FROM THE ON-STREET MASTER IT SHALL BE POSSIBLE TO DOWNLOAD ALL MASTER SETTINGS FROM THE CENTRAL.

   IT SHALL BE POSSIBLE TO COMPARE AN UPLOADED LOCAL INTERSECTION DATA BASE WITH A PREVIOUSLY DEVELOPED DATA BASE STORED IN THE CENTRAL OFFICE MONITOR'S MEMORY. DIFFERENCES IN THE DATA BASES SHALL BE REPORTED.

5. THE ON-STREET MASTER SHALL ATTEMPT TO CONTACT THE CENTRAL OFFICE WHENEVER A SYSTEM MONITORED CONDITION OCCURS WHICH IS PROGRAMMED FOR IMMEDIATE REPORT. IF THE ON-STREET MASTER PROGRAM IS ON LINE IN THE CENTRAL OFFICE MONITOR, THE FAILURE REPORT WILL BE DISPLAYED ON THE CRT AND ALSO HARD-COPIED BY THE PRINTER. THE ON-STREET MASTER WILL CONTINUE TO CONTACT THE CENTRAL OFFICE MONITOR AT REGULAR INTERVALS UNTIL THE PROGRAM IS BROUGHT ON LINE AND THE MESSAGE IS TRANSMITTED.

6. UPON COMMAND FROM THE CENTRAL OFFICE FACILITY IT SHALL BE POSSIBLE TO DOWNLOAD MANUAL COMMANDS THAT WILL AFFECT THE FOLLOWING:

   A. OVERRIDE PATTERN SELECTED BY MASTER
   B. PLACE ENTIRE SYSTEM IN FREE OR FLASH
   C. PLACE AN INTERSECTION IN FREE
   D. PLACE AN INTERSECTION IN FLASH
   E. PLACE SYSTEM IN TIME-OF-DAY MODE

7. UPON COMMAND FROM THE CENTRAL OFFICE FACILITY IT SHALL BE POSSIBLE TO RETRIEVE THE FOLLOWING LOG REPORTS:

   A. PATTERN CHANGES
   B. LOCAL INTERSECTION FAILURES
   C. SENSOR FAILURE
   D. VOLUME, OCCUPANCY AND SPEED

8. IT SHALL BE POSSIBLE TO SPECIFY THE TIME AND DATE FOR AUTOMATIC TRANSMISSION OF ANY COMBINATION ON ALL THE LOGS SPECIFIED IN 6.

9. THE CENTRAL OFFICE FACILITY SHALL BE SUPPLIED WITH THE OFF-LINE PROGRAMS PASSER II-90 AND TRANSYT 7F, AS DEVELOPED BY MCTRANS FOR TRAFFIC SIGNAL PROGRESSION ANALYSIS AND SIGNAL OPERATION OPTIMIZATION ANALYSIS FOR SINGLE INTERSECTIONS. ALL PROGRAMS SHALL OPERATE ON PC DOS OR MS DOS. ONE (1) COPY OF SOFTWARE AND DOCUMENTATION SHALL BE SUPPLIED. THE CENTRAL OFFICE MONITOR SHALL BE CAPABLE OF THE FOLLOWING:

   A. ALL OFF-LINE PROGRAMS AND "CLOSED LOOP" SYSTEM SOFTWARE SHALL BE IMPLEMENTED THROUGH A COLOR MENU DRIVEN SYSTEM.
   B. ALL OFF-LINE PROGRAMS AND "CLOSED LOOP" SOFTWARE SHALL BE STORED ON THE HARD DISK UNDER SEPARATE SUBDIRECTORIES. THERE SHALL ALSO BE SEPARATE SUBDIRECTORIES FOR DATA FILES FOR EACH OF OFF-LINE PROGRAMS AND "CLOSED LOOP" SOFTWARE.

10. THE CONTRACTOR SHALL SUPPLY TRAINING FOR CITY DESIGNATED PERSONAL. THE TRAINING SHALL INCLUDE OPERATION OF THE CENTRAL COMPUTER AND FIELD EQUIPMENT, MAINTENANCE OF ALL FIELD EQUIPMENT AND ASSISTANCE IN SYSTEM PARAMETER DEVELOPMENT. THE TRAINING PROGRAM SHALL BE AS FOLLOWS:

    LOCAL CONTROL EQUIPMENT CONSTRUCTION TRAINING SHALL CONSIST OF AT LEAST EIGHT (8) HOURS OF INSTRUCTION FOR UP TO FIVE PERSONS. TRAINING SESSIONS WILL BE HELD IN CITY PROVIDED FACILITIES. TRAINING WILL INCLUDE THOROUGH FAMILIARIZATION WITH THE FOLLOWING FIELD EQUIPMENT:

    A. LOCAL CONTROLLERS
    B. INTERSECTION MULTIPLEX AND TELEMETRY AND MODEM UNITS
    C. CONTROLLER ACCESSORIES AND AUXILIARY EQUIPMENT

    THE COURSES SHALL ALSO COVER GENERAL FIELD MAINTENANCE AND TROUBLE-SHOOTING PROCEDURES AND TESTING PROCEDURES, AS WELL AS THE PROPER USE OF SYSTEM MAINTENANCE ACCESSORIES TO CHECK THE ABOVE LISTED COMPONENTS.

    TRAFFIC RESPONSIVE MASTER CONTROLLER TRAINING SHALL CONSIST OF AT LEAST EIGHT (8) HOURS OF INSTRUCTION FOR UP TO FIVE CITY DESIGNATED PERSONS. TRAINING SESSIONS SHALL BE HELD AT THE SYSTEM SUPPLIER'S FACILITIES AND SHALL BE HELD IN CONJUNCTION WITH THE BENCH MARK TEST.

    CENTRAL SOFTWARE TRAINING SHALL INCLUDE ALL ITEMS NECESSARY TO SET UP THE MONITORING OF INTERSECTION CONTROLLERS. THERE SHALL BE 24-HOURS OF TRAINING FOR UP TO FIVE (5) PERSONS. IT SHALL ALSO INCLUDE INSTRUCTION IN METHODS OF PREPARING TIMING SETTINGS, CHOOSING SYSTEM AND INTERSECTION PARAMETERS, LOADING TIMING PLANS AND OTHER PARAMETERS, INCLUDING TRAFFIC RESPONSIVE OPERATION, AND OTHER FUNCTIONS WHICH WILL BE NECESSARY TO IMPLEMENT AND FINE TUNE SYSTEM OPERATION.

    FINALLY, IT SHALL INCLUDE GENERAL MAINTENANCE AND TROUBLE SHOOTING PROCEDURES FOR THE MASTER CONTROL DEVICE.

    MAINTENANCE TRAINING (FIELD EQUIPMENT) SHALL CONSIST OF AT LEAST EIGHT (8) HOURS OF INSTRUCTION FOR UP TO FIVE (5) PERSONS. TRAINING SESSIONS SHALL BE HELD IN CITY FACILITIES. IT SHALL COVER MAINTENANCE AND TROUBLE SHOOTING TECHNIQUES FOR ALL FIELD EQUIPMENT AND THE USE OF SYSTEM MAINTENANCE ACCESSORIES.

    MAINTENANCE TRAINING (COMPUTER AND PERIPHERALS) SHALL CONSIST OF AT LEAST EIGHT (8) HOURS OF INSTRUCTION AT A SITE SELECTED BY THE SYSTEM SUPPLIER FOR UP TO FIVE (5) CITY DESIGNATED PERSONS. IT SHALL COVER DETAILED PROCEDURES FOR MAINTAINING AND TROUBLE SHOOTING THE MASTER CPU, MASTER COMMUNICATIONS DEVICES, AND MASTER PERIPHERAL EQUIPMENT. THE TRAINING SHALL COVER BOTH PRESENTATION OF RECOMMENDED PROCEDURES, AS WELL AS "HANDS ON" DEMONSTRATIONS OF METHODS TO ISOLATE, DETERMINE AND CORRECT EQUIPMENT MALFUNCTIONS.

    FOLLOW-UP COMPUTER OPERATION TRAINING SHALL CONSIST OF AT LEAST EIGHT (8) HOURS OF TRAINING FOR UP TO FIVE (5) CITY DESIGNATED PERSONS. IT SHALL BE HELD DURING THE 180 DAY GUARANTEE PERIOD AND IN CITY SUPPLIED FACILITIES. IT SHALL INCORPORATE A MANAGERIAL OVERVIEW OF THE SYSTEM AND SYSTEM OPERATION PROCEDURES TO FULLY FAMILIARIZE CITY PERSONAL WITH THE DAY-TO-DAY OPERATION OF THE SYSTEM.

    THE CONTRACTOR SHALL PROVIDE ALL COURSE MATERIALS FOR ALL TRAINING SESSIONS, INCLUDING OPERATION MANUALS, REPAIR MANUALS, TEST EQUIPMENT, DEMONSTRATION MATERIALS, AND OTHER MATERIALS FOR DEVICES TO ASSURE A USEFUL SESSION. INSTRUCTORS SHALL BE KNOWLEDGEABLE ON THE OPERATION OF THE SYSTEM PROVIDED AND BE CAPABLE OF EFFICIENTLY AND ACCURATELY PRESENTING THIS KNOWLEDGE TO THE TRAINEES.

    THE COSTS OF THE TRAINING, INCLUDING COURSE MATERIALS, TRAVEL OR SUBSISTENCE AND RELATED COSTS, SHALL BE ENTIRELY BORNE BY THE CONTRACTOR. COSTS SHALL BE INCIDENTAL TO THE UNIT PRICES BID FOR THE VARIOUS ITEMS OF EQUIPMENT UNDER THE CONTRACT.

11. BENCH MARK TESTING WILL BE ACCOMPLISHED AT THE SYSTEM SUPPLIER'S FACILITIES IN CONJUNCTION WITH THE TRAINING COURSE. THE PURPOSE OF BENCH MARK TESTING IS TO DEMONSTRATE THE CAPABILITIES OF THE SYSTEM WHICH THE SUPPLIER INTENDS TO FURNISH. THE COMPUTER, PERIPHERAL DEVICES AND ELEMENTS UTILIZED FOR THE TESTS NEED NOT BE THE SPECIFIC ITEMS WHICH WILL BE INSTALLED IN THE CITY BUT SHALL BE OF THE SAME TYPE, MODEL AND CAPACITY. (USE OF THE ACTUAL EQUIPMENT TO BE INSTALLED IN THE CITY IS PREFERRED.) BENCH MARK TESTING SHALL INCLUDE THE FOLLOWING:

    A. LOAD AND OPERATE A BENCH MARK PROGRAM ON THE COMPUTER, UTILIZING ALL PERIPHERAL DEVICES AND AT LEAST TWO ACTUATED (FOUR PHASE MINIMUM) INTERSECTION CONTROLLERS. THE BENCH MARK PROGRAM SHALL CONTAIN PARAMETERS FOR AT LEAST 15 LOCAL INTERSECTIONS, AT LEAST 10 SENSOR INPUTS WITH THE ABILITY TO SIMULATE FIELD VOLUME AND OCCUPANCY DETECTOR DATA, AND SHALL OPERATE WITH AT LEAST 3 ZONES OF CONTROL.

    B. THE BENCH MARK TESTS SHALL EXERCISE ALL FEATURES OF THE HARDWARE, SOFTWARE, COMMUNICATIONS SYSTEMS AND LOCAL CONTROLLERS AND SHALL BE A MINIMUM OF 48 HOURS OF CONTINUOUS OPERATION.

    THE TESTING SHALL BE ARRANGED AT A TIME MUTUALLY AGREEABLE TO THE CITY AND CONTRACTOR. THE COURSE SHALL COVER FAMILIARIZATION AND OPERATIONAL TRAINING IN THE USE OF THE SYSTEM. THE TRAINING SHALL BE BASED UPON (HANDS-ON) OPERATION OF THE MASTER PERIPHERALS, COMMUNICATIONS DEVICES AND LOCAL CONTROLLERS.