

FED. RD. DIVISION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

49  
73

LAKE COUNTY  
LAK - 306 - 4.74

QUANTITY CALCULATIONS  
BY: \_\_\_\_\_ DATE \_\_\_\_\_  
CHKD: \_\_\_\_\_ DATE \_\_\_\_\_  
COLPETZER - WOODS CONSULTANTS

# GENERAL NOTES

Traffic Control Standard Construction Drawings

References to Supplemental Specifications 857, 858, 859, 957, 958 and 959 on the Traffic Control Standard Construction Drawings in these plans shall be considered to read as respective references to Items 630, 631, 632, 730, 731 and 732.

MAINTENANCE OF NEW TRAFFIC SIGNAL

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF EACH TRAFFIC SIGNAL HE HAS IN PART OR FULLY CONSTRUCTED UNTIL SUCH TIME AS THE TESTING REQUIREMENTS ARE SATISFIED, AND THE SIGNAL INSTALLATION IS COMPLETE AND ACCEPTED BY THE ENGINEER.

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS. HE SHALL PROVIDE THE CITY AND THE ENGINEER SUCH ADDRESSES AND PHONE NUMBERS WHERE HIS MAINTENANCE FORCES ARE LOCATED. THE CONTRACTOR SHALL PROVIDE ONE OR MORE PERSONS TO RECEIVE ALL CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MAY BE USED TO PERFORM OTHER DUTIES AS LONG AS PROMPT ATTENTION IS GIVEN TO TROUBLE CALLS. ALL LAMP OUTAGES, CABLE OUTAGES, ELECTRICAL FAULTS, EQUIPMENT MALFUNCTIONS, AND MISALIGNED SIGNAL HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN FOUR HOURS AFTER THE CONTRACTOR IS NOTIFIED OF THE OUTAGE.

IN THE EVENT NEW SIGNALS ARE DAMAGED PRIOR TO ACCEPTANCE, ALL DAMAGED EQUIPMENT, EXCEPT POLES AND CONTROL EQUIPMENT, SHALL BE REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN EIGHT HOURS AFTER THE CONTRACTOR'S NOTIFICATION OF THE OUTAGE.

NONE OF THE ABOVE SHALL BE CONSTRUED AS COLLECTIVE OR CONSECUTIVE OUTAGE TIME PERIODS AT ANY ONE LOCATION. THAT IS WHERE MORE THAN ONE OUTAGE OCCURS AT ANY ONE LOCATION, THE ALLOTTED TIME LIMIT SHALL BE FOR THE WORST SINGLE OUTAGE.

WHERE THE CONTRACTOR HAS FAILED TO OR CANNOT RESPOND TO AN OUTAGE OR SIGNAL EQUIPMENT AT LOCATIONS WITHIN HIS RESPONSIBILITY, WITHIN PERIODS AS SPECIFIED ABOVE, THE ENGINEER MAY INVOKE THE PROVISIONS OF ITEM 105.15 AND ANY SUBSEQUENT BILLINGS TO THE STATE FROM THE CITY OF WILLOUGHBY AND OR THE CITY OF KIRTLAND FOR POLICE SERVICES AND MAINTENANCE BY CITY FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF ITEM 105.15.

THE CONTRACTOR SHALL PROVIDE MAINTENANCE SERVICE IN ONE OR MORE OF THE FOLLOWING MANNERS:

1. 7:00 A.M. TO 7:00 P.M. WITH THE CITY PROVIDING COVERAGE FROM 7:00 P.M. TO 7:00 A.M. AT THE CONTRACTOR'S EXPENSE, AS PREVIOUSLY PROVIDED HEREIN.
2. 24 HOUR SERVICE BY THE CONTRACTOR.
3. COMPLETE CITY MAINTENANCE AT THE CONTRACTOR'S EXPENSE, AS PREVIOUSLY PROVIDED HEREIN.

THE CONTRACTOR SHALL INDICATE THE MANNER IN WHICH HE PROPOSES TO PROVIDE THE ABOVE SERVICE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE TRAFFIC SIGNAL COMPONENTS REQUIRED TO BE HANDLED DURING THE CONSTRUCTION OF AND/OR REVISIONS TO THE SIGNAL SYSTEMS.

THIS ITEM SHALL BE CONSIDERED A SUBSIDIARY WORK ITEM AND THE COST SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE VARIOUS ITEMS MAKING UP THE SIGNAL SYSTEM.

632-POWER SUPPLY FOR TRAFFIC SIGNALS

ELECTRIC POWER SHALL BE OBTAINED FROM THE CLEVELAND ELECTRIC ILLUMINATING COMPANY, ILLUMINATING BUILDING, 55 PUBLIC SQUARE, CLEVELAND, OHIO 44114, 216-623-1350 AT THE LOCATION INDICATED ON THE PLANS. POWER SUPPLIED SHALL BE 115 VOLTS.

632-VEHICULAR SIGNAL HEADS, 3 SECTION, 12 INCH LENS, ONE WAY POLYCARBONATE, AS PER PLAN.

SECTION 732.01 SPECIFICATIONS IS MODIFIED FOR THIS PROJECT AS FOLLOWS:

- A) SIGNAL HEADS AND VISORS SHALL BE CONSTRUCTED WITH POLYCARBONATE PLASTIC.
- B) PLASTIC LENSES MAY BE USED. THEY SHALL BE ULTRAVIOLET STABILIZED, WEATHER AND IMPACT RESISTANT AND HEAT RESISTANT SO THAT OPERATION DOES NOT CAUSE CRAZING, CRACKING, DEFORMATION, COLOR CHANGE OR OTHER CHANGES IN PHYSICAL PROPERTIES.

843-SPECIAL MASTER CONTROL, TRAFFIC ADJUSTED COMPUTER, SOLID STATE DIGITAL, MICROPROCESSOR DESIGN, WITH CABINET

THE MASTER CONTROL FURNISHED AND INSTALLED BY THE CONTRACTOR FOR THIS PROJECT SHALL CONFORM TO CURRENT APPLICABLE SECTIONS OF SUPPLEMENTAL SPECIFICATIONS 843.

THE MASTER COMPUTER SHALL BE SOLID STATE DIGITAL MICROPROCESSOR DEVICE CAPABLE OF RECEIVING DATA FROM A MINIMUM OF TEN (10) SAMPLING DETECTORS, PROCESSING THIS DATA AND AUTOMATICALLY BY MEANS OF EXTERNAL PROGRAMMING, CHOOSE COMBINATIONS OF CYCLE LENGTH, OFFSET, AND SPLIT FOR THE SIGNAL SYSTEM TO BEST FACILITATE THE FLOW OF TRAFFIC. THE OUTPUT FROM THE MASTER SHALL BE PROVIDED TO A MASTER COORDINATION UNIT. THE MASTER COORDINATION UNIT SHALL SUPERVISE THE OPERATION (VIA THE INTERCONNECT CABLE) OF ALL SECONDARY COORDINATION UNITS ON THE SYSTEM.

AMPLIFIERS FOR SAMPLING DETECTORS SHALL TRANSMIT DATA VIA THE SIX (6) PAIR INTERCONNECT CABLE. THESE AMPLIFIERS WILL BE PLACED IN THE MASTER OR LOCAL CONTROLLER CABINET NEAREST THE SAMPLING LOOPS. SPACE AND TERMINALS SHALL BE PROVIDED IN THE MASTER CABINET FOR AT LEAST FOUR (4) AMPLIFIERS. DETECTOR DATA FROM AMPLIFIER RELAY CLOSURES SHALL BE PRE-PROCESSED AS NECESSARY AND ISOLATED. BY MEANS OF RELAYS, OPTICAL COUPLERS OR SIMILAR DEVICES AS NECESSARY TO ASSURE ACCURATE DATA AND TO PROTECT THE MASTER CONTROLLER.

THE DETECTOR DATA SHALL BE PROCESSED BY THE MASTER TO PRODUCE A MEASUREMENT OF VOLUME RATE OF FLOW (AVERAGED OVER A PRESET PERIOD OF ONE (1) TO EIGHT (8) MINUTES) AND OCCUPANCY AVERAGED OVER A SIMILAR PERIOD FOR NORTHBOUND, SOUTHBOUND S.R. 306 AND EASTBOUND, WESTBOUND CROSS STREET. THE RESULTANT DATA FOR NORTHBOUND AND SOUTHBOUND SHALL BE COMPARED TO DETERMINE THE PROPER OFFSET PREFERENCE (I.E. AVERAGE, NORTHBOUND, SOUTHBOUND) WHICH WILL BE IMPLEMENTED BY THE MASTER COORDINATOR. OFFSETS WILL BE SELECTABLE IN PERCENT OF CYCLE LENGTH (0 TO 99 PERCENT). SIMULTANEOUSLY THE HIGHER OF THE NORTHBOUND AND SOUTHBOUND DATA SHALL BE UTILIZED TO CHOOSE ONE OF THREE (3) POSSIBLE CYCLE LENGTHS OR FREE OPERATION. ALSO, THE HIGHER OF THE NORTHBOUND AND SOUTHBOUND DATA SHALL BE COMPARED TO THE HIGHER OF THE EASTBOUND AND WESTBOUND MAJOR CROSS STREET VOLUME RATE OF FLOW TO DETERMINE PROPER SPLIT PREFERENCE (I.E., AVERAGE, MAIN, CROSS) WHICH WILL BE IMPLEMENTED BY THE MASTER COORDINATOR.

IT SHALL BE POSSIBLE TO SET ON THE MASTER A MINIMUM OF FOUR (4) LEVELS OF TRAFFIC FLOW OR FLOW RATIOS AT WHICH THE CHANGES OF CYCLE LENGTH, OFFSET, OR SPLIT IS TO OCCUR. EACH LEVEL SETTING SHALL UTILIZE TWO (2) VALUES (OR HAVE A BUILT-IN HYSTERISIS) APPROPRIATELY SEPARATED TO PREVENT OSCILLATION BETWEEN ADJACENT CYCLE LENGTHS, OFFSETS OR SPLITS.

AN EXTERNAL DISPLAY AND HARD COPY STRIP PRINTER SHALL BE PROVIDED TO SHOW THE FOLLOWING:

FOR INTERSECTION CONTROLLER:

1. MODE OF OPERATION (COORDINATED OR FREE)
2. PATTERN IN ACTUAL OPERATION (CYCLE, OFFSET, SPLIT FLASH-FREE)

FOR MASTER CONTROLLER

1. VOLUME AND OCCUPANCY LEVELS
2. PATTERN IN EFFECT (CYCLE, OFFSET, SPLIT, FLASH-FREE)
3. TIME OF DAY, DAY OF WEEK ENTRY IN EFFECT
4. CYCLE TIME

THE MASTER COMPUTER SHALL BE CAPABLE OF TIME OF DAY/DAY OF WEEK CONTROL INITIATING FLASH-FREE OR COORDINATED OPERATION FOR SPECIFIED INTERSECTIONS. THE MODE FOR TIME OF DAY/DAY OF WEEK SHALL ADDITIONALLY BE TRAFFIC RESPONSIVE. TIME BASE FOR TIME OF DAY/DAY OF WEEK WILL BE PROVIDED BY THE 60Hz LINE FREQUENCY DURING NORMAL OPERATION AND WILL BE AUTOMATICALLY UPDATED AFTER A POWER OUTAGE BY REFERENCING A BATTERY POWERED DOWN TIME ACCUMULATOR. THE TIME OF DAY/DAY OF WEEK PROGRAMS SHALL BE SETTABLE TO THE DAY AND MINUTE AND THE MASTER SHALL BE CAPABLE OF A MINIMUM OF 84 PROGRAM CHANGES PER WEEK.

THE MASTER COMPUTER SHALL BE CAPABLE OF MANUALLY OVER-RIDING ALL SYSTEM FUNCTIONS INCLUDING:

1. FLASH-FREE
2. CYCLE
3. OFFSET
4. SPLIT

MANUAL OVERRIDE SHALL BE BY CLEARLY MARKED SWITCHES OR AN INPUT DEVICE LOCATED WITHIN THE MASTER CABINET.

THE MASTER COORDINATOR MAY EITHER BE AN INTEGRAL PART OF THE MASTER CONTROL UNIT OR A SEPERATE DEVICE HOUSED IN THE MASTER CABINET. IT SHALL MEET THE GENERAL REQUIREMENTS OF 843 FOR A THREE (3) CYCLE LENGTH THREE (3) OFFSET PER CYCLE COORDINATOR, WITH PROVISION FOR THREE (3) SPLITS AND BE FULLY COMPATIBLE WITH THE SECONDARY COORDINATORS PROVIDED AS PART OF THE INDIVIDUAL CONTROLLERS. IT SHALL BE OF SOLID STATE DIGITAL DESIGN.

A WEATHERPROOF CABINET, FOR MOUNTING ON A CONCRETE FOUNDATION, SHALL BE PROVIDED TO HOUSE ALL MASTER CONTROL EQUIPMENT. IT SHALL CONFORM TO 843.10 AND INCLUDE A FAN, CONVENIENCE OUTLET AND A 120 VOLT 150 WATT LAMP RECEPTACLE.

843-CONTROLLER FULL-ACTUATED, 3-PHASE, SOLID STATE DIGITAL, MICRO-PROCESSOR, WITH CABINET, AS PER PLAN

IN ADDITION TO 843 THE CONTROLLER SHALL BE IN ACCORDANCE WITH N.E.M.A. STANDARD TS-1-1976 AND ITS LATEST REVISIONS.

MANUAL CONTROL SWITCHES AND CORDS ARE REQUIRED.

LOAD SWITCHES, FLASHER AND CONFLICT MONITOR SHALL CONFORM TO THE LATEST REVISION OF N.E.M.A. TS-1-1976.

THE CONTROLLER CABINET SHALL BE BASE MOUNTED. CONTROLLER CABINET SIZE SHALL COMPLY TO THE REQUIREMENTS OF 843. THE CONTROLLER HARNESS LENGTH SHALL BE SUFFICIENT TO REACH ANY POINT WITHIN THE SPACE PROVIDED FOR THE CONTROLLER.

CONTROLLER CABINETS AND TERMINAL CABINETS SHALL BE PAINTED WHITE, INSIDE AND OUT. THE CONTROLLER CABINETS SHALL BE EQUIPPED WITH A POWER SWITCH AND CONVENIENCE 3 WIRE DUPLEX OUTLET AND A STANDARD LAMP SOCKET WITH LAMP.

PAYMENT FOR ITEM 843 CONTROLLER FULL-ACTUATED, 3-PHASE, SOLID STATE DIGITAL, MICRO-PROCESSOR, WITH CABINET, AS PER PLAN WILL BE AT THE CONTRACT BID PRICE PER EACH COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS TESTED AND ACCEPTED.

843-COORDINATOR, SECONDARY

COORDINATION UNITS FURNISHED AND INSTALLED BY THE CONTRACTOR FOR THIS PROJECT SHALL CONFORM TO THE CURRENT APPLICABLE SECTIONS OF SUPPLEMENTAL SPECIFICATIONS 843 AND SHALL BE OF THE SOLID STATE DIGITAL DESIGN.

EACH COORDINATOR PROVIDED SHALL ACCEPT SUPERVISORY INFORMATION FROM THE MASTER DESCRIBED ABOVE AND ON THE BASIS OF THAT INFORMATION, TIME THE PROPER CYCLE LENGTH AND ESTABLISH THE PROPER OFFSET AND SPLIT BY GOVERNING THE FUNCTIONS OF EACH LOCAL CONTROLLER. EACH UNIT SHALL UTILIZE A COMBINATION OF A MINIMUM OF THREE (3) BACKGROUND CYCLES, THREE (3) OFFSETS PER CYCLE, THREE (3) SPLITS PER CYCLE, ONE (1) PERMISSIVE PERIOD, PHASE RELATED FORCE-OFFS AND ALSO ALLOW FREE OPERATION WHEN COMMANDED BY THE MASTER CONTROL. THE COORDINATOR SHALL BE COMPATIBLE WITH THE MASTER COORDINATOR LOCATED IN THE MASTER CONTROL.