

PAYMENT FOR ITEM 625 "LOOP DETECTOR PAVEMENT CUTTING" WILL BE MADE AT THE CONTRACT UNIT PRICE PER LINEAL FOOT FOR SAW CUTTING AND TREATMENT INCLUDING JOINT SEALER.

CONTROLLER SPECIFICATION

- A. ALL CONTROLLERS AND RELATED SPECIAL EQUIPMENT SPECIFIED, SHALL BE THAT MANUFACTURED BY ONE OF THE FOLLOWING MANUFACTURERS OR AN APPROVED EQUAL.

EAGLE SIGNAL CO., DIVISION OF GULF AND WESTERN CORP., DAVENPORT, IOWA.
CROUSE-HINDS COMPANY, SYRACUSE, NEW YORK

THE MODULAR CONTROLLER SHALL BE COMPLETE, INSTALLED, OPERATING SOLID STATE UNITS OF MODULAR DESIGN AND CONSTRUCTION AND SHALL CONSIST OF THE BASIC CONTROLLER ASSEMBLIES SPECIFIED AND ALL AUXILIARY EQUIPMENT.

THE MODULAR CONTROLLER SHALL BE SO CONSTRUCTED THAT EACH PHASE OF TRAFFIC MOVEMENT IS CONTROLLED BY ONE OR MORE SEPARATE MODULAR UNITS HAVING THE CHARACTERISTICS HEREIN SPECIFIED, EXCEPT THAT THE NON-ACTUATED PHASE MAY BE PART OF ONE OF THE ACTUATED PHASE MODULES. EACH OF THE SAID PHASE MODULES SHALL BE INTERCHANGEABLE TO THE EXTENT THAT IT MAY BE USED IN PLACE OF ANOTHER MODULE TO PROVIDE ADEQUATE CONTROL OF TRAFFIC FOR A PHASE, WHILE THE OTHER MODULE IS BEING REPAIRED.

B. AUXILIARY EQUIPMENT

1. THIS EQUIPMENT MUST BE COMPATIBLE WITH THE CONTROLLER USED AND IT SHALL BE GUARANTEED BY THE MANUFACTURER OF THE AUXILIARY EQUIPMENT.
2. THIS EQUIPMENT SUCH AS COORDINATION UNITS, SPECIAL RELAYS, TIMERS, OVERLAP DEVICES, CONNECTING CABLE, AND ALL ACCESSORIES NECESSARY TO PRODUCE THE OPERATING CHARACTERISTICS SHOWN ON THE DRAWINGS AND CALLED FOR HEREIN SHALL BE FURNISHED AS A PART OF THE CONTROLLERS. THIS AUXILIARY EQUIPMENT SHALL BE MANUFACTURED OR FURNISHED BY THE MANUFACTURER OF THE CONTROLLER AND SHALL BE COMPOSED OF STANDARD UNITS AND/OR ASSEMBLIES OF STANDARD COMPONENTS TO THE EXTENT THAT THEY EXIST. WHERE SPECIAL EQUIPMENT IS NECESSARY, IT SHALL BE MANUFACTURED TO THE SAME OR HIGHER SPECIFICATIONS THAN THOSE EMPLOYED IN THE MANUFACTURE OF COMPARABLE STANDARD UNITS.

C. CONTROLLER FEATURES

ALL CONTROLLERS SHALL COME FROM THE FACTORY WITH THE FOLLOWING EQUIPMENT AND FEATURES.

1. ALL NECESSARY RELAYS FOR THE CONTROL OF POWER TO THE TRAFFIC SIGNALS; IN MODULAR CONTROLLERS, ALL SIGNAL LAMP ELECTRICAL LOADS SHALL BE CARRIED ON SIGNAL RELAYS WHICH ARE SEPARATE FROM AND NOT LOCATED WITHIN THE CONTROLLER. THE RELAYS SHALL BE INTERCONNECTED TO PREVENT THE DISPLAY OF CONFLICTING GREENS ALONE.
2. MODULAR CONTROLLERS SHALL BE ADAPTABLE TO DUAL MAXIMUM INTERNAL TIMING AND REMOTE SELECTION OF MAXIMUM.
3. A SEPARATE FLASHING UNIT WHICH SHALL OPERATE INDEPENDENTLY OF THE CONTROLLER. THE FLASHING UNIT SHALL BE EQUIPPED WITH A RADIO INTERFERENCE FILTER.

D. TYPES OF MODULAR CONTROLLERS

THESE CONTROLLERS SHALL BE MADE UP OF THE REQUIRED NUMBERS AND TYPES

OF CONTROL MODULES AND OTHER FEATURES TO PRODUCE THE OPERATION REQUIRED IN THE PLANS AND SPECIFICATIONS. EACH CONTROLLER MODULE, COMBINED WITH ADDITIONAL MODULES AND A POWER SUPPLY, SHALL PROVIDE FULL OR SEMI-ACTUATED CONTROL FOR THE NUMBER OF PHASES OR TRAFFIC MOVEMENTS SHOWN ON THE PLANS AND/OR SPECIFIED HEREIN.

625 MULTI-PHASE SEMI-TRAFFIC ACTUATED SIGNAL CONTROLLER, BY TYPE

THE CONTROLLER MODULES SHALL BE DESIGNED TO PROVIDE THE FOLLOWING OPERATING REQUIREMENTS:

1. THE GREEN TIME FOR EACH NONACTUATED PHASE SHALL BE A GUARANTEED MINIMUM.
2. YELLOW AND ALL RED CLEARANCE INTERVALS SHALL BE PROVIDED FOR ALL PHASES.
3. THE CONTROLLER SHALL REST ON PHASE A GREEN (EAST 305 STREET) IN THE ABSENCE OF A CALL ON ANY OF THE OPPOSING PHASES.
4. AFTER A POWER FAILURE OF MORE THAN FIVE (5) SECONDS OPERATION SHALL BEGIN IN PHASE A YELLOW WITH CALLS ENTERED AUTOMATICALLY ON ALL PHASES.
5. THE GREEN TIME FOR EACH ACTUATED PHASE SHALL BE COMPRISED OF A MINIMUM INITIAL INTERVAL PLUS A UNIT EXTENSION INTERVAL.
6. VEHICLE RECALL SWITCHES SHALL BE PROVIDED WHICH MAY BE USED TO RETURN THE RIGHT-OF-WAY TO ANY PHASE FOR THE TIMING OF AT LEAST A MINIMUM INITIAL AND ONE UNIT EXTENSION INTERVAL REGARDLESS OF THE ABSENCE OF DETECTOR ACTUATION.
7. A MEMORY FEATURE SHALL BE PROVIDED TO GUARANTEE THE RETURN OF THE RIGHT-OF-WAY TO THE ACTUATED PHASE SHOULD IT TIME OUT BEFORE ALL CALLS CAN BE ACCOMMODATED.
8. AN ON-OFF SWITCH SHALL BE PROVIDED TO DISABLE THE MEMORY FEATURE TO ENABLE PRESENCE DETECTION. THIS SWITCH SHALL BE MOUNTED ON THE MODULE OR THE TERMINAL FACILITIES IN ACCORDANCE WITH THE CONTROLLER MANUFACTURER'S RECOMMENDATIONS. IF THIS SWITCH IS MOUNTED ON THE MODULE, THE SWITCH ITSELF, OR A PILOT LIGHT, SHALL BE MOUNTED ON THE FRONT PANEL OF THE MODULE TO INDICATE THE MODE WHICH IS IN EFFECT.
9. EACH CONTROLLER SHALL BE COORDINATED BY A MULTI-DIAL BACKGROUND CYCLE COORDINATION UNIT EQUIPPED WITH TWO(2) DIALS INITIALLY. EACH DIAL OF THE COORDINATION UNIT SHALL HAVE THREE (3) OFFSETS ASSOCIATED WITH IT. THE UNITS SHALL BE CAPABLE OF OPERATING IN THE MANNER SHOWN IN THE PLAN.

AT THE LAKELAND BOULEVARD INTERSECTION, THE COORDINATION UNIT SHALL OPERATE AS THE MASTER UNIT AND SHALL ALSO CONTAIN A TIME CLOCK TO SUPERVISE THE CHOICE OF DIAL UNITS. THE CLOCK SHALL BE ELECTRICALLY POWERED AND SHALL HAVE AN ADDITIONAL SPRING DRIVEN TIMING MECHANISM WHICH SHALL, IN THE EVENT OF A POWER FAILURE OF UP TO TEN (10) HOURS DURATION, OPERATE THE CLOCK. THIS SPRING MECHANISM SHALL BE AUTOMATICALLY REWOUND UPON THE RESUMPTION OF POWER TO THE CONTROLLER.

AT THE NORTH MARGINAL ROAD INTERSECTION, THE COORDINATION UNIT SHALL OPERATE AS A SECONDARY UNIT AND RESPOND TO COMMANDS FROM THE MASTER UNIT.

TIMING

THE CONTROLLER MODULES SHALL BE DESIGNED TO PROVIDE THE FOLLOWING TIMING CONTROL:

1. SELECTIVE TIMINGS SHALL BE INDIVIDUALLY ADJUSTABLE BY MEANS OF DIRECT READING, INDICATION TYPE KNOBS, MOUNTED ON THE FRONT PANEL OF THE CONTROLLER MODULE. ADJUSTING THE DURATION OF ONE TIMING SHALL NOT AFFECT THE DURATION OF ANY OTHER.
2. THE LENGTH OF ANY INTERVAL SHALL NOT CHANGE BY MORE THAN \pm FIVE PERCENT DUE TO CHANGES OF \pm TEN PERCENT OCCURRING IN THE POWER SUPPLY VOLTAGE OR DUE TO ANY CHANGE IN THE OUTSIDE TEMPERATURE BETWEEN THE LIMITS OF $+130^{\circ}$ F. AND -30° F.

3. THE PHASE CONTROLLER MODULE SHALL BE SO DESIGNED THAT TIMING OF INTERVALS NOT USED IN A SPECIFIC SEQUENCE ARRANGEMENT MAY BE ELIMINATED BY SETTING THE APPROPRIATE DIALS TO "0"
4. THE INTERVAL MAXIMUM TIMING OF EACH ACTUATED CONTROLLER MODULE SHALL BE CAPABLE OF RELINQUISHING CONTROL TO AN EXTERNAL MAXIMUM TIMER.

CONTROLLER CABINET

THE CABINET SHALL BE CLEAN-CUT IN DESIGN AND APPEARANCE AND SHALL CONFORM TO THE FOLLOWING:

IT SHALL BE MADE OF DIE CAST ALUMINUM ALLOY WITH A WALL THICKNESS OF APPROXIMATELY ONE-QUARTER INCH AND MINIMUM OF 18,000 PSI YIELD STRENGTH.
THE CABINET SHALL BE OF ADEQUATE SIZE TO HOUSE THE CONTROLLER AND ALL APPURTENANCES.

HINGED DOOR SHALL BE PROVIDED ON THE FRONT OF THE CABINET WHICH SHALL INCLUDE SUBSTANTIALLY THE FULL AREA OF THE FRONT OF THE CABINET.

ALL DOORS SHALL BE FULLY GASKETED WITH ELASTOMERIC GASKETING MATERIAL SO THAT WHEN CLOSED THEY SHALL FIT CLOSELY TO THE GASKETING MATERIAL, MAKING THE CABINET WEATHER RESISTANT AND DUST TIGHT. ONE POINT LATCHING SHALL BE PROVIDED FOR THIS PURPOSE.

THE DOOR SHALL BE PROVIDED WITH A LOCK COVERED BY A WEATHERPROOF TAB AND TWO KEYS. THERE SHALL BE AT LEAST ONE SINGLE POSITION BAR DOOR STOP AT 120° .

THE DOOR PINS SHALL BE GREASE-LUBRICATED AND FABRICATED OF A NON-CORRODING STEEL MATERIAL.

THE BOTTOM INTAKE VENTILATOR SHALL BE SCREENED AND MECHANICALLY BAFFLED TO PROTECT THE INTERIOR OF CABINET AGAINST INSECTS, RAIN AND THE INSERTION OF FOREIGN OBJECTS. VENTILATOR SHALL NOT PRESENT ANY OBJECTIONABLE PROTRUSION TO OUTER SURFACE OF CABINET.

THE CABINET SHALL CONTAIN TWO CAST METAL OR PLYWOOD (1/2") SHELVES FOR SUPPORT OF TRAFFIC SIGNAL CONTROL EQUIPMENT. THE SHELVES SHALL BE ADJUSTABLE ON A MINIMUM OF 1-1/2" CENTERS FROM A MINIMUM OF 10" FROM THE TOP OF THE CABINET TO THE BOTTOM OF THE CABINET.

CABINET SHALL BE EQUIPPED WITH VENTILATING FAN OF 15 CFM CAPACITY CONTROLLED BY A THERMOSTAT STARTING AT 120° F., AND STOPPING AT 100° F.

THE CABINET SHALL BE EQUIPPED WITH THE FOLLOWING EQUIPMENT:

- 1 EACH THYRECTOR (PROVIDING STEADY STATE INPUT VOLTAGE OF 150 RMS OR 210 PEAK, AND PROVIDING A MAXIMUM CURRENT OF 3 AMPS AT .001 SEC. PULSE AT 60 HZ). FOR LIGHTING PROTECTION OF TRAFFIC CONTROL EQUIPMENT FOR CONNECTING ACROSS THE LINE AFTER THE FUSE AND BEFORE FLASHER FILTERS, MOUNTED USING 150V MINIMUM BREAKDOWN INSULATED HOLLOW RIVIT USING #8 32 SCREW.
- 10 EACH 12 WIRE TERMINAL BLOCKS (PENN UNION #6012, MARATHON #6012 OR APPROVED EQUAL).
- 2 EACH 4 PDT 10 AMPERE 250 VOLT A.C. SWITCH (CUTLER-HAMMER #7693, CARLING ELECTRIC IL 253 OR APPROVED EQUAL).
- 1 EACH GROUND BUS BAR WITH 15 GROUND TERMINAL POINTS.

THE OUTGOING TRAFFIC CONTROL SIGNAL CIRCUITS SHALL BE OF THE SAME POLARITY AS THE LINE SIDE OF THE POWER SUPPLY; THE COMMON RETURN OF THE SIGNAL CIRCUIT SHALL BE OF THE SAME POLARITY AS THE GROUND SIDE OF THE POWER SUPPLY.