

FED RD DIVISION	STATE	PROJECT	FISCAL YEAR
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WILLOUGHBY CITY SIGNALS, LAKE COUNTY
LAK 20/84/640

GENERAL NOTES

TIMING

IT SHALL BE POSSIBLE TO SET UP A SEPARATE AND DISTINCT PROGRAM OF INTERVAL TIMING ON EACH DIAL UNIT.

IT SHALL BE POSSIBLE, WHEN SPECIFIED, TO TRANSFER OPERATION FROM ONE DIAL TO ANOTHER, AND/OR ONE SPLIT TO ANOTHER, REMOTELY OR AUTOMATICALLY. AUTOMATIC TRANSFER SHALL BE ACCOMPLISHED THROUGH THE USE OF WEEKLY PROGRAMMER AND TIME SWITCH.

THE COORDINATING UNIT SHALL BE SO ARRANGED THAT THE TRANSFER OF THE INTERVAL TIMING FROM ONE DIAL UNIT TO ANOTHER AND/OR ONE SPLIT TO ANOTHER MAY BE ACCOMPLISHED AT THE BEGINNING OF THE MAIN STREET GREEN INTERVAL OR ANY OTHER CHOSEN INTERVAL.

THE SWITCHING FROM ONE DIAL TO ANOTHER AND/OR ONE SPLIT TO ANOTHER, SHALL BE ACCOMPLISHED THROUGH THE USE OF ELECTRICALLY LATCHED RELAYS.

DESIGN

DIAL UNIT

EACH DIAL UNIT SHALL BE PLUG-CONNECTED AND SHALL BE SO CONSTRUCTED THAT IT MAY BE INSTALLED OR REMOVED WITHOUT THE USE OF TOOLS.

THE TIMING DIAL OF EACH DIAL UNIT SHALL BE DRIVEN BY A SELF-STARTING SEALED, SYNCHRONOUS MOTOR REQUIRING NO LUBRICATION. THIS MOTOR SHALL HAVE AMPLE TORQUE TO DRIVE THE DIAL AT CONSTANT SPEEDS UNDER ALL NORMAL OPERATING CONDITIONS.

ON THE FRONT OF EACH TIMING DIAL THERE SHALL BE CALIBRATED SCALE FOR THE SETTING OF EACH FUNCTION SUCH AS YIELD AND FORCE-OFF. THE DIAL SHALL AT ALL TIMES SHOW A VISUAL INDICATION OF THE PERCENTAGE OF THE TIME CYCLE ALLOCATED TO EACH INTERVAL.

EACH DIAL SHALL BE EQUIPPED WITH COLOR CODED KEYS WHICH SHALL SNAP IN AND OUT EASILY WITHOUT TOOLS AND SHALL BE SELF-LOCKING.

THE DIAL SHALL BE EQUIPPED WITH AN EASILY REMOVABLE TIME CYCLE GEAR, AVAILABLE 30-120 SECONDS IN 5 SECOND STEPS.

EACH DIAL UNIT SHALL HAVE A VISUAL INDICATION OF THE TIME CYCLE SET ON THE DIAL.

EACH DIAL UNIT SHALL BE EQUIPPED WITH A FIVE CONTACT BLOCK WIRED FOR THE FOLLOWING FUNCTION: THREE RESET CONTACTS, ONE SPLIT AND ONE INTERLOCK (YIELD).

IF SPECIFIED, EACH DIAL UNIT SHALL BE EQUIPPED WITH A SEVEN CONTACT BLOCK WIRED FOR THE FOLLOWING FUNCTIONS: THREE RESET CONTACTS, ONE SPLIT, ONE INTERLOCK (YIELD) AND TWO CONTACTS THAT MAY BE USED AS REQUIRED (ADDITIONAL SPLITS AND/OR RESETS).

OFFSET INTERRUPTER

THE OFFSET INTERRUPTER SHALL BE IDENTICAL IN ALL RESPECTS, AND INTERCHANGEABLE WITH THE MASTER DIAL COORDINATING UNIT WITH THE EXCEPTION OF THE PROGRAMMING JUMPERS.

THE INTERRUPTER SHALL BE A THREE DIAL UNIT CAPABLE OF SUPPLYING THREE DIFFERENT CYCLE LENGTHS.

THE INTERRUPTER DIALS SHALL BE EQUIPPED WITH CYCLE GEARS GIVING IT A CYCLE LENGTH FIVE SECONDS FASTER THAN THE CORRESPONDING MASTER AND SECONDARY DIALS IN THE SYSTEM. THE FOUR RESET KEYS ON EACH INTERRUPTER DIAL SHALL BE PLACED TO DIVIDE THE CYCLE INTO FOUR EQUAL PARTS.

INTERRUPTER DIAL TRANSFER SHALL BE ACCOMPLISHED BY THE SIGNALS FROM THE MASTER COORDINATING UNITS.

THE INTERRUPTER UNIT SHALL BE EQUIPPED WITH INDICATING LIGHTS FOR CYCLE, OFFSET AND/OR SPLIT FUNCTIONS IN EFFECT AND INCLUDE TEST SWITCHES TO DETERMINE CYCLE AND/OR SPLIT CALLED FOR BY THE MASTER.

THE INTERRUPTER UNIT SHALL BE PLUG CONNECTED TO THE CONTROLLER PANEL.

DIAL UNITS USED IN THE INTERRUPTER SHALL BE IDENTICAL TO AND INTERCHANGEABLE WITH THE DIAL UNITS OF THE MASTER COORDINATING UNITS.

WEEKLY PROGRAMMER AND TIME SWITCH

THE PROGRAMMER SHALL BE USED TO PROGRAM UP TO TEN FUNCTIONS AT TWELVE DAILY INTERVALS.

THE PROGRAMMER SHALL BE AN ELECTRONICALLY CONTROLLED, SOLENOID OPERATED DEVICE USED IN CONJUNCTION WITH A TIME SWITCH TO CLOSE TEN MINIATURE SWITCHES.

THE CYLINDRICAL DIAL ON THE FACE OF THE PROGRAMMER SHALL HAVE 84 EQUALLY SPACED SLOTS DIVIDED INTO 12 DAILY INTERVALS FOR EACH OF THE SEVEN DAYS OF THE WEEK.

SNAP-IN TYPE KEYS, EACH WITH 10 BREAK-OFF TABS SHALL BE PLACED INTO THE SLOTS. EACH KEY SHALL BE CAPABLE OF PROGRAMMING UP TO 10 DAILY FUNCTIONS.

A RECESSED 18 POINT MULTI-POLE PLUG SHALL BE MOUNTED ON THE FRONT OF THE FRAME WHICH WILL ELECTRICALLY CONNECT THE SWITCHES TO THE REAR PANEL THROUGH A MULTI-POLE RECEPTACLE AND COLOR CODED WIRING HARNESS.

A TIME SWITCH SHALL BE USED TO ENERGIZE THE ROTARY TYPE SOLENOID IN THE PROGRAM UNIT.

THE TIME SWITCH SHALL CONTAIN 96 2-POSITION KEYS IN 15 MINUTE INCREMENTS.

THE KEYS SHALL BE PERMANENTLY RETAINED IN THE OUTER RIM OF THE DIAL ON THE FRONT OF THE TIME SWITCH.

THE KEYS SHALL ACTUATE THE SWITCH ARM OF THE TIME SWITCH SENDING AN IMPULSE TO THE SOLENOID OF THE PROGRAM UNIT AND, IN TURN, CAUSING THE DRUM OF THE PROGRAM UNIT TO MOVE ONE POSITION.

PANEL LIGHTS AND SWITCHES

THE MASTER CONTROLLER SHALL CONTAIN A PANEL OF INDICATING LIGHTS AND TOGGLE SWITCHES.

THE PANEL LIGHTS SHALL BE NEON LAMPS OF SUFFICIENT SIZE TO PROPERLY ILLUMINATE A RED COLOR SCREEN AND PROVIDE A CLEAR INDICATION EVEN IN BRIGHT SUNLIGHT.

THE INDICATING LIGHTS SHALL BE USED FOR ALL THE FUNCTIONS CALLED FOR BY THE MASTER, DIAL, OFFSET AND SPLIT IN EFFECT.

EACH OF THE INDICATING LIGHTS SHALL BE PROPERLY MARKED WITH A SILK SCREENED OR ANODIZED IDENTIFICATION PLATE MOUNTED DIRECTLY BENEATH THE LIGHT.

THE TOGGLE SWITCHES SHALL BE DOUBLE POLE, DOUBLE THROW, MAINTAINED CONTACT AND SHALL BE LOCATED ON THE PANEL DIRECTLY BENEATH THE CORRESPONDING PILOT LIGHT.

THE TOGGLE SWITCHES SHALL BE USED TO OVERRIDE THE AUTOMATIC FUNCTIONS OF THE MASTER CONTROLLER OR TO MANUALLY SELECT PROGRAM FUNCTIONS.

THE PANEL LIGHTS AND SWITCHES SHALL BE LOCATED IN THE UPPER MOST PORTION OF THE CONTROLLER CABINET AND SHALL BE OF A NEAT AND CLEAN-CUT APPEARANCE.

CABINET

THE MASTER CONTROLLER AND ALL ASSOCIATED ELECTRICAL COMPONENTS SHALL BE HOUSED IN A FREE STANDING CABINET RACK.

THE RACK FRAME SHALL BE WELDED INTO A SOLID UNIT MADE OF 14 GAUGE COLD ROLLED STEEL CHANNELS.

THE SIDES OF THE RACK SHALL HAVE CHANNEL BRACES WITH A DOUBLE ROW OF PERFORATIONS TO WHICH ADJUSTABLE VERTICAL MOUNTING RAILS ARE FASTENED.

THE RAILS SHALL SUPPORT, IN ADDITION TO STANDARD 19" PANELS, ALL NECESSARY SHELVES AND BRACKETS REQUIRED TO MOUNT ALL THE TIMING EQUIPMENT AND ACCESSORIES.

A HINGED REAR DOOR SHALL BE PROVIDED PERMITTING COMPLETE ACCESS TO THE INTERIOR OF THE CABINET.

THE STANDARD FINISH SHALL BE A SMOOTH BAKED ENAMEL OVER A PRIME FINISH.

ALL INTERNAL WIRING SHALL BE PLACED INTO WIRE RACEWAYS AND ALL TERMINATIONS MADE ON TERMINAL STRIPS.

ALL FIELD TERMINALS SHALL BE PERMANENTLY IDENTIFIED.

RELAYS THAT MAY BE USED TO PROVIDE ANY FEATURES OF THE MASTER CONTROL SYSTEM SHALL BE SOCKET OR JACK MOUNTED.

ALL WIRING OF THE TERMINALS SHALL BE 105° C STRANDED, WITH POLYVINYL CHLORIDE (PVC) INSULATION, WIRING SHALL BE OF ADEQUATE CURRENT CARRYING CAPACITY.

PAYMENT FOR ITEM 625 - TRAFFIC RESPONSIVE MASTER CONTROLLER WILL BE MADE AT THE CONTRACT UNIT PRICE COMPLETELY INSTALLED, TESTED, & OPERATING AS SPECIFIED INCLUDING WIRING TO THE INTERCONNECTION.

614 MAINTENANCE OF EXISTING SIGNAL INSTALLATIONS

THE EXISTING TRAFFIC SIGNALS SHALL BE KEPT IN OPERATION UNTIL THE NEW SIGNAL IS OPERATIONAL. IF EXISTING ITEMS ARE TO BE INCORPORATED INTO THE NEW SIGNAL, SUCH ITEMS SHALL NOT BE REINSTATED UNTIL ALL OTHER NEW WORK WHICH CAN BE DONE PRIOR TO THE RELOCATION WORK IS COMPLETED. AT THIS TIME, THE EXISTING SIGNAL MAY BE TURNED OFF. WHEN NOT IN OPERATION, SIGNAL HEADS SHALL BE BAGGED. WHEN NO SIGNAL IS IN OPERATION AT THE LOCATION, TRAFFIC SHALL BE MAINTAINED THROUGH THE USE OF STOP SIGNS.

SIGNAL CONTROL OF THE INTERSECTION SHALL NOT BE INTERRUPTED DURING THE HOURS OF 7:00 AM TO 9:00 AM AND 3:00 PM TO 6:00 PM ON WEEKDAYS. SIGNALS SHALL BE INOPERATIVE NO LONGER THAN SIX (6) HOURS. SIGNALS AT SCHOOL CROSSINGS SHALL BE KEPT CLEAR AND OPERATING DURING THE OPENING AND CLOSING HOURS OF SCHOOLS.

PAYMENT WILL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 MAINTENANCE OF TRAFFIC.

625 10 CHANNEL REMOTE CONTROL SYSTEM

THIS SYSTEM SHOWN IN THE ATTACHED BLOCK DIAGRAM IS DESIGNED TO BE USED FOR TRAFFIC CONTROL. THE MAXIMUM NUMBER OF DECODER STATIONS TO BE DRIVEN FROM ONE ENCODER STATION IS 20.

THIS SYSTEM CONTAINS ALL SOLID STATE CIRCUITRY. CONTACTLESS RESONANT REEDS ARE USED IN THE ENCODERS AND DECODERS TO PROVIDE FREQUENCY SELECTION. BECAUSE THE REED DOES NOT HAVE MECHANICAL CONTACTS ITS LIFE IS UNLIMITED.

ENCODER STATION

THE ENCODER STATION IS AN AM TONE TRANSMITTING STATION WITH A TEN ENCODER MODULES, ONE POWER SUPPLY AND ONE AMPLIFIER. EACH ENCODER MODULE CONSISTS OF A COMPLETE OSCILLATOR WITH A BUILT IN RESONANT REED STABILIZER. EACH ENCODER IS DESIGNED TO RUN CONTINUOUSLY AND IS CONNECTED TO THE TRANSMISSION LINE BY MEANS OF A SWITCH OR RELAY. EACH ENCODER OUTPUT RELAY IS ENERGIZED ONLY WHEN THE PROPER FREQUENCY TONE IS TO BE PRESENT ON THE LINE. EACH MODULE WHEN INDIVIDUALLY KEYPED PROVIDES ONE CONTROL FUNCTION.