

A. NEW EQUIPMENT

1. ALL SIGNAL HEADS MOUNTED ON SPAN WIRES SHALL HAVE 12" POLYCARBONATE SECTIONS, ALL HOUSINGS SHALL BE FEDERAL YELLOW WITH FLAT BLACK DOORS AND VISORS. ALL SPAN WIRE MOUNTED TRAFFIC SIGNALS SHALL HAVE DISCONNECT HANGERS WITH NON-ALUMINUM OR STAINLESS STEEL BUSHED BALANCE ADJUSTER FITTINGS. TRAFFIC SIGNAL HEADS MOUNTED ON THE CANTILEVER ARM SHALL BE OPTICALLY PROGRAMMABLE WITH 12" LENSES. THEY SHALL BE PROGRAMMED SO THAT THE SIGNAL INDICATIONS ARE VISIBLE ONLY TO VEHICLES APPROACHING THE INTERSECTION ON BERLIN STREET AND ARE NOT VISIBLE TO VEHICLES ON RIVER STREET. THE CANTILEVER MOUNTED SIGNALS SHALL BE FIXED MOUNTED WITH AN ADJUSTABLE TYPE BRACKET AND A TERMINAL COMPARTMENT FOR THE SIGNAL WIRING.
2. TRAFFIC SIGNAL CONTROLLER & CABINET. EACH UNIT SHALL BE A VEHICLE, AND WHERE APPLICABLE, PEDESTRIAN ACTUATED SOLID STATE CONTROLLER CAPABLE OF PRODUCING THE TIMING AND PRE-EMPTION AS SHOWN ON THE PLANS. ALL CONTROLLERS SHALL HAVE A MINIMUM OF 8 PHASES. EACH PHASE (USED OR UNUSED) SHALL HAVE A LOAD SWITCH AND ALL NECESSARY FLASH TRANSFER RELAYS. EACH INSTALLATION SHALL INCLUDE TIME CLOCK(S) WITH BATTERY BACKUP, 12 CHANNEL CONFLICT MONITOR WITH STOP TIMING FUNCTION, LED DISPLAY LOAD SWITCHES (INPUT SIDE), REMOTE FLASHER, VEHICLE DETECTOR AMPLIFIERS, SURGE PROTECTION, LAMP RECEPTACLE AND CONVENIENCE OUTLET WITH GROUND FAULT INTERRUPTION. ALL CONTROLLERS SHALL HAVE DUAL MAXIMUM CAPABILITIES AND TIME BASE COORDINATION WHICH SHALL PROVIDE FOUR CYCLE LENGTHS WITH MULTIPLE PROGRAMS PER CYCLE. EACH SYSTEM SHALL BE GROUND MOUNTED IN A PREWIRED NEMA CABINET WITH A POLICE DOOR HAVING STANDARD SWITCHES (MAIN ON/OFF, SIGNAL ON/OFF, AND FLASH). THERE SHALL BE A WATER PROOF PLASTIC ENVELOPE ATTACHED TO THE CABINET INTERIOR FOR STORAGE OF THE CONTROLLER MANUAL AND PLAN SHEETS. ALL CONTROLLERS SHALL BE "CONDUIT" BRAND, MODEL ASC-800D. THE CONTROLLER SHALL BE EQUIPPED WITH AN ISOLATION MODULE, WIRING HARNESS, AND FOUR ISOLATION RELAYS FOR EMERGENCY VEHICLE PRE-EMPTION. REFER TO THE PRE-EMPTION NOTES FOR ADDITIONAL DETAILS. THE CONTROLLERS/TBC SHALL BE SHIPPED FROM THE FACTORY WITH THE EPROM "MEMORY CHIP" PRE-PROGRAMMED WITH THE SETTINGS AS SHOWN ON THE PLANS AND A REPRESENTATIVE OF THE MANUFACTURER SHALL BE ON THE PROJECT SITE FOR TURN-ON OF THE UNITS. IN ADDITION TO EQUIPMENT FURNISHED TO PROVIDE A FUNCTIONAL SIGNAL SYSTEM, THE CONTRACTOR SHALL SUPPLY THE FOLLOWING SPARE PARTS: ONE LOAD SWITCH, ONE TRANSFER RELAY AND ONE EPROM MEMORY MODULE PER INTERSECTION. THIS EQUIPMENT MAY BE USED DURING THE CONSTRUCTION PERIOD TO REPLACE MALFUNCTIONING EQUIPMENT BUT MUST BE REPLACED AND MAINTAINED IN THE CABINET PRIOR TO COMPLETION. THE CONTROLLER CABINET(S) SHALL HAVE A POLISHED ALUMINUM NATURAL FINISH AND BE PROVIDED WITH A #2 LOCK, A PADLOCK (MASTER WITH #3220 KEY) AND A STANDARD POLICE DOOR LOCK. EACH LOCK SHALL HAVE 2 KEYS. EACH CABINET SHALL INCLUDE A 120V 60W FAN/THERMOSTAT. THE CABINET DOOR SHALL BE SUPPLIED WITH TEST SWITCHES FOR EACH PHASE. TBC SHALL BE PROGRAMMED SO AS TO AUTOMATICALLY ADJUST FOR DAYLIGHT SAVINGS TIME CHANGES.
3. ALL NEW EQUIPMENT SHALL MEET OR EXCEED NEMA STANDARDS AND IMSA OR ITE SPECIFICATIONS, WHERE APPLICABLE.
4. THE ELECTRIC CABLE SHALL BE LASHED ON THE SPAN WIRE.
5. STRANDED WIRE SHALL BE USED FOR ALL UNSUPPORTED AND SPAN WIRE SUPPORTED WIRE.
6. THE POWER SOURCE FOR THE NEW TRAFFIC SIGNAL CONTROLLER AND RELATED EQUIPMENT SHALL BE FROM THE UTILITY POLE TO BE PLACED IN THE TRAFFIC ISLAND AT STATION 120 + 69 (+/-). THE CONTRACTOR SHALL PROVIDE THE WEATHERHEAD, CONDUIT WIRE, ETC. NECESSARY TO EXTEND POWER TO THE GROUND MOUNTED CONTROLLER.
7. STEEL STRAIN POLES SHALL BE DESIGNED USING THE LATEST REVISION OF AASHTO'S "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS". STRAIN POLES SHALL BE BACKRACKED, POLE DIAMETER, HEIGHT, YIELD STRENGTH AND GAGE SHALL BE STAMPED ON THE POLE BASE PLATE OR ON AN ATTACHED METAL TAG.

B. REMOVAL OF EXISTING OR REUSE OF SALVAGED EQUIPMENT

1. ALL REMOVED AND NOT REUSED EQUIPMENT (HEADS, CONTROLLERS, CABINETS, POLES, ETC.) SHALL BE DELIVERED TO THE MONTEPELIER PUBLIC WORKS FACILITY. REMOVAL OF EQUIPMENT SHALL INCLUDE REMOVAL OF CONCRETE BASES AND BACKFILL OF THE HOLES. ANY REMOVED MATERIAL NOT DESIRED BY THE CITY SHALL BE DISPOSED OF BY THE CONTRACTOR, WHERE APPLICABLE. EQUIPMENT THAT IS DAMAGED BY THE CONTRACTOR DURING REMOVAL SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE STATE AND CITY, AT THE CONTRACTOR'S EXPENSE.
2. ALL COSTS ASSOCIATED WITH THE REMOVAL OF THE EXISTING SIGNAL SYSTEM SHALL BE CONSIDERED INCLUDED IN THIS UNIT BID PRICE OF THE NEW SIGNAL SYSTEM.

C. SIGNAL OPERATION

1. SIGNAL TIMING SHOWN ON THE PLANS MAY REQUIRE FINE TUNING IN THE FIELD BASED ON TRAFFIC OBSERVATION.
2. FULL OPERATION SHALL NOT BE INITIATED EXCEPT IN THE PRESENCE OF THE TRAFFIC AND SAFETY ENGINEER OR HIS DESIGNATED REPRESENTATIVE.
3. THE TRAFFIC SIGNALS SHALL NOT OPERATE WITHOUT THE PAVEMENT MARKINGS AND SIGNAL RELATED SIGNING IN PLACE.
4. ALL SIGNALS SHALL DWELL ON THE MAIN STREET THRU MOVEMENT (PHASE A) UNLESS OTHERWISE NOTED.

D. PULLBOXES AND JUNCTION BOXES

1. STANDARD SIZE PULLBOXES AND JUNCTION BOXES ARE DETAILED ON STANDARD SHEET E-173. MINIMUM JUNCTION BOX SIZE SHALL BE 18" X 12" X 12", (A X B X C), OR LARGER AS REQUIRED BY THE ELECTRICAL CODE.

D. PULLBOXES AND JUNCTION BOXES (CONT.)

2. STANDARD SIZE PULLBOXES PLACED IN THE ROADWAY SHOULDER OR SIDEWALK SHALL HAVE STEEL COVERS OF A MINIMUM THICKNESS OF 1/2" AND SHALL MEET ASTM A-36. THESE COVERS SHALL BE HELD IN PLACE WITH 3/8" DIA. STAINLESS STEEL PENTA-HEAD BOLTS. THE COVER SHALL BE APPROPRIATELY MACHINED SO THAT THE BOLT HEADS ARE FLUSH WITH COVER. TWO PENTA-HEAD SOCKETS SHALL BE PROVIDED TO THE CITY.
3. THE DESIGN OF THE DOUBLE PULLBOXES, DENOTED AS PULLBOX 2 AND PULLBOX 3, IS INCLUDED ON THE PLANS. REFER TO THE DETAIL FOR SPECIFIC MATERIAL AND DIMENSIONAL REQUIREMENTS.
4. ALL SPLICES IN PULLBOXES/JUNCTION BOXES SHALL BE SOLDERED AND SEALED IN A WATERPROOF EPOXY SPLICE KIT. EACH SPLICE SHALL BE IN A SEPERATE SPLICE KIT.

E. TRAFFIC SIGNAL CONDUIT

1. ALL UNDERGROUND TRAFFIC SIGNAL CONDUIT SHALL BE NON-METALLIC, EXCEPT AS NOTED ON THE PLANS. ALL EXPOSED CONDUIT (POLE RISERS) SHALL BE SCHEDULE 80 PVC, OR AS NOTED.
2. MINIMUM CONDUIT SIZES SHALL BE:
 - A) 1-1/2" FOR LOOP LEAD-INS
 - B) 2" FOR ALL OTHERS, EXCEPT AS NOTED FOR LOOP 8 AND LEAD-IN. SEE CHART ON STD E-172 FOR CONDUIT FILL LIMITS.
3. WHEN CONDUIT IS PLACED BELOW THE ROADWAY OR ACROSS SIDE ROADS, IT SHALL BE PLACED IN A PVC SLEEVE, SIZE AS SHOWN ON THE PLANS (8" MINIMUM).
4. THE MINIMUM DEPTH BELOW THE ROADWAY SURFACE FOR THE PLACEMENT OF SLEEVES FOR THE PLACEMENT OF SLEEVES AND CONDUIT SHALL BE 3 FEET.
5. SIX INCH WIDE YELLOW PLASTIC MARKING TAPE SHALL BE PLACED IN THE EXCAVATED TRENCH 6 TO 12 INCHES BELOW THE FINISHED GRADE FOR ALL CONDUIT AND SLEEVE RUNS EXCEPT THOSE JACKED UNDER THE ROADWAY.
6. THE SLEEVES SHOWN AS 10" PVC ARE TO BE PAID AS ITEM 625.10. SLEEVE FOR UTILITIES (MODIFIED) 10" P.V.C., THE ITEM IS MODIFIED SUCH THAT THE UNIT BID PRICE SHALL INCLUDE ALL COSTS ASSOCIATED WITH PROVIDING THE SLEEVE AND PLACEMENT OF THE SLEEVE IN AN EXCAVATED TRENCH. THE COST OF EXCAVATING AND BACKFILLING THE TRENCH SHALL BE CONSIDERED TO BE A PART OF THE UNIT BID PRICE FOR THE SMALLER CONDUITS WHICH ARE PLACED WITHIN THE LARGER SLEEVE. WHENEVER THE TERM "SLEEVE" IS NOTED FOR TRAFFIC SIGNAL WORK ON THE PLANS, THE ABOVE NOTE(S) SHALL APPLY.
7. CONDUIT USED FOR POLE RISERS SHALL BE PAID AT THE UNIT BID PRICE PER LINEAL FOOT OF CONDUIT.

F. VEHICLE LOOP DETECTORS

1. LOOP DETAILS ARE FOUND ON STANDARD SHEET E-172.
2. THE GRANITE STREET LOOP IS AN EXISTING PULSE LOOP MOUNTED UNDER THE BRIDGE IN 1/2 INCH PVC AND GALVANIZED STEEL CONDUIT. THE EXISTING LOOP SHALL BE RETAINED AND THE FOLLOWING WORK DONE:
 - A) THE EXISTING STEEL CONDUIT WHICH RUNS ALONG THE GRANITE BLOCK ABUTMENT AND WINGWALL SHALL BE SECURED EVERY FOUR FEET TO THE STONE BY DRILLING AND USING LAGS AND CONDUIT CLIPS, OR BY AN ALTERNATE METHOD APPROVED BY THE ENGINEER.
 - B) AT THE POINT WHERE THE EXISTING CONDUIT LEAVES THE WINGWALL, IT SHALL BE BROUGHT UNDER GROUND AND INTO A JUNCTION BOX FOR THE PURPOSE OF SPLICING THE EXISTING LOOP WIRES TO A NEW LEAD-IN WIRE. IN ORDER TO ACCOMPLISH THE ABOVE WORK, ADDITIONAL GALVANIZED STEEL CONDUITS, FITTINGS, COUPLINGS, ETC. MAY BE REQUIRED. CARE SHALL BE TAKEN TO INSURE THAT THE EXISTING LOOP WIRES ARE NOT DAMAGED DURING THIS PROCEDURE.
 - C) THE NEW LEAD-IN SHALL BE PLACED IN 1-INCH GALVANIZED STEEL CONDUIT AND SHALL RUN FROM THE NEW JUNCTION BOX (UB) UNDERGROUND TO THE EXISTING WOOD STRAIN POLE (SP2), UP THE POLE TO AN APPROPRIATE WEATHERHEAD. THE COST OF THE WORK NOTED IN A,B, AND C ABOVE SHALL BE CONSIDERED A PART OF THE TRAFFIC SIGNAL UNIT BID PRICE, EXCEPT FOR THE JUNCTION BOX AND 1-INCH GALVANIZED STEEL CONDUIT WHICH ARE PAID UNDER THEIR OWN BID PRICES.
- G) FIBEROPTIC "NO TURN ON RED" SIGN. THE CONTRACTOR SHALL SUPPLY A FIBEROPTIC "NO TURN ON RED" SIGN WITH A MINIMUM OUTSIDE DIMENSION OF 30 INCHES BY 30 INCHES AND IT SHALL MEET THE REQUIREMENTS OUTLINED IN THE SPECIAL PROVISIONS. THIS SIGN SHALL OPERATE THROUGH THE TRAFFIC SIGNAL CONTROLLER AND BE ACTIVATED AS SHOWN ON THE PLANS. THE COST FOR THIS SIGN AND ITS INSTALLATION, INCLUDING ALL INCIDENTALS SHALL BE CONSIDERED A PART OF THE TRAFFIC SIGNAL SYSTEM.

H) GENERAL

- 1) ALL ELECTRICAL WORK AND MATERIALS SHALL BE SUBJECT TO INSPECTION AND APPROVAL OF THE STATE ELECTRICAL INSPECTOR. ALL WORK MUST MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
- 2) AFTER PROJECT ACCEPTANCE, THE TRAFFIC SIGNAL INSTALLATION(S) SHALL BECOME THE PROPERTY AND RESPONSIBILITY OF THE CITY OF MONTEPELIER.
- 3) THE CONTRACTOR SHALL ACQUIRE ALL NECESSARY PERMITS AND MAKE ALL NECESSARY ARRANGEMENTS WITH THE UTILITY COMPANY TO PROVIDE A PERMANENT POWER SUPPLY TO THE SIGNAL AND RELATED EQUIPMENT.
- 4) A METAL PLAQUE LISTING OWNERSHIP AND EMERGENCY PHONE NUMBERS SHALL BE ATTACHED TO THE OUTSIDE OF THE CONTROLLER CABINET.
- 5) THE REQUIRED 30 DAY TEST PERIOD FOR THE SIGNAL EQUIPMENT SHALL NOT BEGIN UNTIL ALL CONSTRUCTION IS COMPLETE AND ALL PAPERWORK HAS BEEN DONE TO THE SATISFACTION OF THE AGENCY.

I) FIRE PRE-EMPTION EQUIPMENT NOTES:

- 1) THE FIRE PRE-EMPTION EQUIPMENT WILL CONSIST OF DTMF-3-DIGIT-ENCODER/DECODER. THE ACTUATION WILL BE FROM A PROGRAMMABLE MICROPHONE MOUNTED IN THE VEHICLES (AMBULANCE OR FIRE TRUCKS) AS DETERMINED BY THE CITY. THE METHOD OF TRANSMITTAL WILL BE BY RADIO FREQUENCY. THE CITY WILL BE RESPONSIBLE TO PROVIDE AND INSTALL THE EQUIPMENT IN THEIR VEHICLES.
- 2) THE FIRE PRE-EMPTION RECEIVER WILL BE SUPPLIED BY THE CITY AND INSTALLED IN THE TRAFFIC SIGNAL CONTROLLER CABINET BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE WHATEVER MATERIALS ARE NECESSARY TO SUPPLY POWER TO THE RECEIVER AND TO RELAY THE MOMENTARY CLOSURE OF THE CONTACTS OUT THE BACK OF THE RECEIVER TO THE CONTROLLER TO INDICATE THE BEGINNING OF THE PRE-EMPTION SEQUENCE.
- 3) IT SHALL BE THE RESPONSIBILITY OF THE CITY TO TROUBLE SHOOT AND REPLACE ANY DEFECTIVE PRE-EMPTION EQUIPMENT SUPPLIED BY THEM. THE CONTRACTOR SHALL BE RESPONSIBLE TO TROUBLE SHOOT AND REPLACE OR REPAIR ANY OR THE FIRE PRE-EMPTION EQUIPMENT IN THE CONTROLLER CABINET, EXCEPT THE RECEIVER SUPPLIED BY THE CITY.
- 4) A TEST RUN OF THE FIRE PRE-EMPTION EQUIPMENT SHALL BE CONDUCTED PRIOR TO ACCEPTANCE OF THE SIGNAL SYSTEM IN THE PRESENCE OF THE RESIDENT ENGINEER AND CITY OFFICIALS.

J) PEDESTRIAN SIGNALS

- 1) AN AUDIO UNIT SHALL BE MOUNTED ABOVE EACH PEDESTRIAN SIGNAL HEAD.
- 2) THE AUDIO UNITS SHALL REMAIN ACTIVE AND SHALL NOT BE DISCONNECTED FOR THIS INSTALLATION.
- 3) EACH PEDESTRIAN PUSH BUTTON UNIT SHALL BE PROVIDED WITH A 9" X 12" SIGN AS DETAILED ON STANDARD SHEET E-140. A PUSH BUTTON UNIT SHALL BE PROVIDED AT THE END OF EACH CROSSWALK.
- 4) THE ELECTRICAL WIRING FOR THE PEDESTRIAN SIGNALS AND PUSHBUTTON MOUNTED ON STRAIN POLE 2 (SP2), WHICH IS A WOODEN UTILITY POLE, SHALL BE IN 1 INCH DIAMETER OR LARGER, GALVANIZED STEEL CONDUIT. AN APPROPRIATE WEATHER HEAD SHALL BE PROVIDED AND ARRANGEMENTS SHALL BE MADE WITH THE UTILITY COMPANY WHEN THE TIME COMES FOR THIS WORK TO BE DONE.

K) TRAFFIC CONTROL TEMPORARY SIGNAL

- 1) THE EXISTING TRAFFIC SIGNAL, OR AN ACCEPTABLE TEMPORARY SIGNAL, SHALL REMAIN IN OPERATION DURING THE CONSTRUCTION PERIOD UNTIL THE NEW TRAFFIC SYSTEM IS IN PLACE AND READY TO OPERATE, WITH THE EXCEPTION OF THE STRINGING OF THE NEW SPAN WIRE. THE OLD SPAN WIRE SHALL BE REMOVED FROM THE WOODEN STRAIN POLE (SP2) PRIOR TO THE PLACEMENT OF THE NEW SPAN WIRE. DURING THE SHORT PERIOD WHEN NO SIGNAL IS OPERATIONAL, THE INTERSECTION SHALL BE CONTROLLED BY UNIFORMED TRAFFIC CONTROL OFFICERS.
- 2) THE CONTRACTOR SHALL SUBMIT TO THE RESIDENT ENGINEER FOR APPROVAL A TRAFFIC CONTROL PLAN WHICH DESCRIBES THE CONTRACTORS PROPOSAL TO ACCOMPLISH THE ABOVE REQUIREMENTS. THE CONTRACTOR MAY WISH TO CONSIDER THE FOLLOWING OPTIONS:
 - a) SCHEDULE THE WORK SUCH THAT THE EXISTING STEEL STRAIN POLE (STATION 120 + 07 RT) IS RETAINED UNTIL THE NEW STEEL STRAIN POLE IS IN PLACE AND THE CONCRETE CURED PROPERLY FOR LOADS TO BE APPLIED TO THAT POLE.
 - b) INSTALL A TEMPORARY WOODEN OR STEEL STRAIN POLE IN PROXIMITY TO THE EXISTING POLE, BUT OUTSIDE THE CONSTRUCTION AREA OF THE WALL.
 - c) MAKE ARRANGEMENTS WITH THE UTILITY COMPANY TO USE THE UTILITY POLE CURRENTLY AT STATION 11 + 98 RT AS A TEMPORARY STRAIN POLE. THIS POLE IS SCHEDULED FOR REMOVAL PRIOR TO THE START OF CONSTRUCTION.
- 3) SEE SHEET 141 FOR TEMPORARY LOOP REQUIREMENT.
- 4) THE COST OF THE ABOVE WORK, INCLUDING COMPLETE REMOVAL OF ANY TEMPORARY SIGNAL SYSTEM, IF APPLICABLE, SHALL BE CONSIDERED A PART OF THE NEW TRAFFIC SIGNAL BID PRICE.

L) CONTROLLER TRAINING COURSE

- 1) THE TRAFFIC SIGNAL CONTROLLER SUPPLIER WILL GIVE A TRAINING COURSE ON THE OPERATION AND MAINTENANCE OF THE CONTROLLER AND RELATED EQUIPMENT.
- 2) THE TRAINING COURSE SHALL CONSIST OF TWO 4-HOUR SESSIONS AT A TIME AND PLACE DESIGNATED BY THE CITY OF MONTEPELIER AND THE EQUIPMENT SUPPLIER, PRIOR TO ACCEPTANCE OF THE PROJECT.

I. THE MANUFACTURER SHALL SUBMIT, FOR APPROVAL, SHOP DRAWINGS FOR TRAFFIC SIGNAL EQUIPMENT. THE SUBMITTAL SHALL CONTAIN A MINIMUM OF THE FOLLOWING INFORMATION:

- A) TRAFFIC SIGNAL CONTROLLER. TYPE OF CONTROLLER, MANUFACTURER, MODEL, NUMBER OF PHASES AND FUNCTIONS, ASSURANCE OF CONFORMANCE TO THE LATEST NEMA STANDARDS, BENCH TESTING (MINIMUM OF 7 DAYS) WILL BE REQUIRED. COPIES OF THE TEST RESULTS SHALL BE SUBMITTED AS DISCUSSED IN THE STANDARD SPECS SECTION 752.06. THE TEST RESULTS SHALL CONTAIN THE BEGIN AND END TIME AND DATE, ALL CONTROLLER AND TIME-BASED COORDINATOR SETTINGS USED, A DIAGRAM OF THE INTERSECTION SHOWING CONTROLLER PHASING AND ITS RELATIONSHIP TO VEHICLE MOVEMENTS, EQUIPMENT SERIAL NUMBERS, SIGNATURE OF THE PERSON PERFORMING THE TEST AND SIGNATURE OF A WITNESS WHO SHALL BE EITHER A REGISTERED ELECTRICAL ENGINEER OR A LICENSED MASTER ELECTRICIAN.
- B) TRAFFIC SIGNAL HEADS. SIZE, MANUFACTURER, MODEL, LAMP WATTAGE, OPTICS, WIRING, HOUSING (MATERIAL AND COLOR), VISORS, AND BACK PLATES, IF REQUIRED, THE SIGNAL HEADS SHALL MEET THE LATEST ITE STANDARDS.
- C) TRAFFIC SIGNAL HEADS. SIZE, MANUFACTURER, ACCESSORIES, MATERIALS, AND FINISH.
- D) AUXILIARY EQUIPMENT (FLASHERS), VEHICLE DETECTOR(S), CONFLICT MONITOR, CLOCKS(S), ETC. MANUFACTURER, MODEL, FUNCTIONS, ASSURANCE OF CONFORMANCE TO THE LATEST NEMA STANDARDS, WHERE APPLICABLE.
- E) STRAIN POLES, PEDESTAL POSTS AND CANTILEVERS. 1. DIMENSIONS - POLE/POST HEIGHT, SPAN WIRE ATTACHMENT HEIGHT, POLE/POST DIAMETER (TOP AND BOTTOM), POLE GUAGE, HANDHOLE (SIZE AND LOCATION), BASE PLATE, BOLT CIRCLE, ANCHOR BOLT SIZE, 2. MATERIAL SPECIFICATIONS FOR EACH COMPONENT.

E) STRAIN POLES, PEDESTAL POSTS AND CANTILEVERS (CONT.)

3. ANCHOR BOLTS AND WASHERS SHALL BE AN AUSTENITIC GRADE OF STAINLESS STEEL CONFORMING TO THE CHEMISTRY OF ASTM A276 TYPE 304 WITH THE FOLLOWING PHYSICAL PROPERTIES:

a) TENSILE STRENGTH, minimum	80,000 psi
b) YIELD STRENGTH, minimum	55,000 psi
c) ELONGATION IN 2 INCHES, minimum	25%
d) ROCKWELL B HARDNESS, minimum	86
OR CHARPY V-NOTCH (AASHTO T243 USING H FREQUENCY OF TESTING), minimum	15 ft.-lbs. @ 40°F

 NUTS FOR THE ANCHOR BOLTS SHALL BE THE HEAVY HEX TYPE CONFORMING TO THE REQUIREMENTS OF ASTM A-194 GRADE 8.
4. WELDING INFORMATION FOR ALL WELDED CONNECTIONS (SEE SUBSECTION 506.10). THE FOLLOWING INFORMATION WILL BE REQUIRED FOR ALL WELDED JOINTS (ALUMINUM OR STEEL):
 - a) PROCEDURE SPECIFICATIONS PER AWS D11 APPENDIX E FORM E1
 - b) PROCESS AND PROCEDURE QUALIFICATION TESTS PER AWS D11 APPENDIX E FORM E2.
 - c) CERTIFICATE OF CONFORMANCE TO SPECIFICATIONS FOR FILLER MATERIAL WHEN USING ANY GMAW OR FCAW WELDING PROCESS THE FOLLOWING WILL ALSO BE REQUIRED:
 - 1) MANUFACTURER'S CERTIFICATE THAT THE GAS OR GAS MIXTURE IS SUITABLE FOR THE INTENDED APPLICATION AND MEETS THE DEW POINT REQUIREMENTS.
 - 2) REFERENCE - AASHTO MODIFICATION OF AWS D11 SEC. 4.18.
5. POLE/BASE PLATE STAMPING DETAIL.
6. SPECIAL FEATURES AS INDICATED ON THE PLANS SUCH AS FINISH OR COLOR.

II. THE MANUFACTURER SHALL SUBMIT, FOR APPROVAL, SHOP DRAWING FOR THE STREET LIGHT LUMINAIRE. THE SUBMITTAL SHALL CONTAIN, AT A MINIMUM, THE FOLLOWING INFORMATION:

- A) LUMINAIRES
 - 1) FIXTURES
 - a) VOLTAGE RATING
 - b) WATTAGE AND LAMP TYPE
 - c) BALLAST TYPE
 - d) PHOTO CELL
 - e) ANY OTHER FEATURES SPECIFIED ON THE PLANS SUCH AS FINISH, SPECIAL WIRE ACCESS, ETC..
 - 2) PHOTOMETRIC DATA
 - a) IES DISTRIBUTION TYPE
 - b) UTILIZATION CURVE
 - c) ISO-FOOTCANDLE CURVES
 - d) MOUNTING HEIGHT FACTOR
 - e) MAINTENANCE FACTOR
 - B) WIRING
 - 1) CONDUCTOR MATERIAL, INSULATION TYPE, VOLTAGE RATING, AND TEMPERATURE RATING, SHALL CONFORM TO THE NATIONAL ELECTRIC CODE USE AND SIZE AND BE COLOR CODED.
- III. IN I AND II ABOVE, THE INFORMATION SUPPLIED SHALL EITHER MATCH OR BE EQUIVALENT TO THE DETAILS SPECIFIED ON THE PLANS OR ON THE STD. SHEETS. IF EQUIVALENT, THE CONTRACTOR MAY BE ASKED TO SUPPLY PROOF OF EQUIVALENCY. COPIES OF CATALOGUE SHEETS ARE ACCEPTABLE IF ALL THE APPROPRIATE INFORMATION IS INCLUDED.

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DATE	REVISIONS	BY
2/87	ADDED PAVING POLICY	LKA
6/88	MAJOR REVISIONS	LKA
8/89	MODIFIED FOR MONTEPELIER PROJECT	DSP

PREPARED BY DSP DATE 08/89
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 DESIGN SUPERVISOR DAR DATE 08/89
 PROJ. MONTEPELIER M6400(7)

TRAFFIC SHEET NO. 140 OF 355 SHEETS