C. MULTICONDUCTOR CABLE:

1. GENERAL: ALL CONDUCTOR CABLE FOR INTERSECTION SIGNALIZATION AND INTERCONNECTION SHALL BE NO. 14 AMERICAN WIRE GAUGE MULTICONDUCTOR CABLE FOR OPERATION ON A 600 VOLT MAXIMUM, AND SUITABLE FOR USE AT CONDUCTOR TEMERATURES NOT EXCEEDING 167 DEGREES FAHRENHEIT. MATERIAL, CONSTRUCTION, AND TESTS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE LATEST EDITION OF THE INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION, INC. SPECIFICATION 19–1 FOR POLYETHYLENE– INSULATED, POLYVINYL CHLORIDE JACKETED SIGNAL CABLE.

2. ALTERNATE: AS AN ACCEPTABLE ALTERNATE THE CONTRACTOR MAY USE MULTICONDUCTOR, STRANDED CABLE MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION STANDARD S–61–402 "THERMOPLASTIC INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY" AND AS FOLLOWS:

a. STRANDING: CONDUCTORS SHALL BE STRANDED, ANNEALED UNCOATED COPPER OR ANNEALED COATED COPPER. COPPER WIRE BEFORE INSULATING OR STRANDING SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) B33 "SPECIFICATION FOR TINNED SOFT OR ANNEALED COPPER WIRE FOR ELECTRICAL PURPOSES" (FOR COATED WIRE) OR ASTM B3 "SPECIFICATION FOR SOFT OR ANNEALED COPPER WIRE" (FOR UNCOATED WIRE). STRANDING SHALL BE CLASS b, IN ACCORDANCE WITH THE LATEST EDITION OF ASTM B8 "SPECIFICATION FOR CONCENTRIC–LAY–STRANDED COPPER CONDUCTORS, HARD, MEDIUM–HARD, OR SOFT".

b. INSULATION: INSULATION FOR THE INDIVIDUAL CONDUCTORS SHALL CONSIST OF A 20 MIL THICKNESS OF POLYETHYLENE AND AN INSULATION COVERING OF POLYVINYL CHLORIDE COMPOUND WITH A 10 MIL THICKNESS.

i. POLYETHYLENE: THE POLYETHYLENE INSULATION SHALL MEET THE REQUIREMENTS OF PARAGRAPH 3.9 OF THE LATEST EDITION OF THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION STANDARD S–61–402 "THERMOPLASTIC INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY" BEFORE APPLICATION TO THE CONDUCTOR, AND PARAGRAPH 3.91 AFTER APPLICATION TO THE CONDUCTOR.

ii. POLYVINYL CHLORIDE: THE POLYVINYL CHLORIDE INSULATION COVERING SHALL MEET THE REQUIREMENTS OF PARAGRAPH 4.3.1 OF THE LATEST EDITION OF THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION STANDARD S–61–402 "THERMOPLASTIC INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY".

c. JACKET: THE OVERALL CABLE JACKET SHALL CONSIST OF A POLYVINYL CHLORIDE COMPOUND WHICH WILL PROVIDE A TOUGH HEAT, MOISTURE, OZONE, AND FLAME RESISTANT COVERING MEETING THE REQUIREMENTS OF PARAGRAPH 4.3.1 OF THE LATEST EDITION OF THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION STANDARD S–61–402 "THERMOPLASTIC INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY".

d. JACKET THICKNESS: THE OVERALL JACKET THICKNESS SHALL BE IN ACCORDANCE WITH TABLE 18, PART 4 OF THE LATEST EDITION OF THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION STANDARD S–61–402 "THERMOPLASTIC INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY".

D. DETECTOR LOOP WIRE

1. GENERAL: THE CONDUCTOR SHALL BE SOFT DRAWN COPPER WIRE WITH CLASS C STRANDING PER THE LATEST EDITION OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS SPECIFICATION B8 "SPECIFICATION FOR SOFT ANNEALED COPPER WIRE". THE WIRES SHALL HAVE POLYVINYL CHLORIDE INSULATION PER UNDERWRITERS' LABORATORY SUBJECT 83 FOR THHN AT 194 DEGREES FAHRENHEIT, THWN AT 167 DEGREES FAHRENHEIT AND A POLYAMIDE NYLON ARMOR JACKET.

2. CABLE REQUIREMENTS: IN ADDITION, THE CABLE SHALL MEET THE FOLLOWING REQUIREMENTS:

WIRE SIZE: NO. 14 AMERICAN WIRE GAUGE (STRANDED)

INSULATION THICKNESS: 0.015 INCH

JACKET THICKNESS: 0.004 INCH

NOMINAL OUTSIDE DIAMETER: 0.12 INCH

CONDUCTOR COLOR CODE: BLACK

SUGGESTED WORKING VOLTAGE: 600 VOLTS

3. TUBING THE THHN LOOP WIRE SHALL BE INSERTED INTO POLYVINYL CHLORIDE OR POLYETHYLENE TUBING PRIOR TO INSTALLATION (ONE THHN WIRE PER SECTION OF TUBING). THE TUBING SHALL HAVE A NOMINAL 3/16 INCH INSIDE DIAMETER, A NOMINAL WALL THICKNESS OF 1/32 INCH AND SHALL BE CONTINUOUS.

E. SHIELDED DETECTOR LEAD–IN CABLE

1. GENERAL: THE CONDUCTOR AND DRAIN WIRES SHALL BE TINNED COPPER WIRES. THE CONDUCTORS SHALL BE SHIELDED BY A LAYER OF ALUMINUM BONDED TO POLYESTER FILM. ALL WIRES SHALL HAVE POLYETHYLENE INSULATION AND A JACKET OF VINYL. IN ADDITION, THE CABLE SHALL MEET THE FOLLOWING REQUIREMENTS:

WIRE SIZE: NO.14 (19 x 29) AMERICAN WIRE GAUGE (STRANDED)

DRAIN WIRE: NO.18 AMERICAN WIRE GAUGE (STRANDED)

INSULATION THICKNESS: 0.025 INCH

JACKET THICKNESS: 0.030 INCH

NOMINAL OUTSIDE DIAMETER: 0.274

CONDUCTOR COLOR CODE: BLACK & CLEAR

SHIELD COVERAGE: 100 PERCENT

NOMINAL CAPACITANCE BETWEEN CONDUCTORS: 24 PICOFARADS PER FOOT

NOMINAL CAPACITANCE BETWEEN ONE CONDUCTOR AND THE OTHER CONDUCTOR CONNECTED TO SHIELD: 47 PICOFARADS PER FOOT

SUGGESTED WORKING VOLTAGE: 600 VOLTS

2. ALTERNATE: AS AN ACCEPTABLE ALTERNATIVE, THE SHIELDED DETECTOR LEAD–IN ELECTRICAL CABLE SHALL MEET THE LATEST EDITION OF THE INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION, INC. SPECIFICATION #50–2 FOR LEAD–IN CABLE.

F. LEAD–IN WIRE

1. CONDUCTOR: POWER LEAD–IN WIRE FOR INTERSECTION SIGNALIZATION SHALL BE NO. 6 AMERICAN WIRE GUAGE SINGLE CONDUCTOR CABLE FOR OPERATION ON A 600 VOLT MAXIMUM, AND SUITABLE FOR USE AT CONDUCTOR TEMPERATURES NOT EXCEEDING 165 DEGREES FAHRENHEIT. MATERIAL, CONSTRUCTION, AND TESTS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE LATEST EDITION OF THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION STANDARD S–66–524 "CROSS–LINKED–THERMOSETTING–POLYETHYLENE–INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY".

2. COPPER WIRE: CONDUCTORS SHALL BE STRANDED, ANNEALED COATED COPPER. COPPER WIRE, BEFORE INSULATING OR STRANDING, SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARD B33 "SPECIFICATION FOR TINNED SOFT OR ANNEALED COPPER WIRE FOR ELECTRICAL PURPOSES" (COATED WIRE). STRANDING SHALL BE CLASS B, IN ACCORDANCE WITH THE LATEST EDITION OF ASTM B8 "SPECIFICATION FOR CONCENTRIC–LAY–STRANDED COPPER CONDUCTORS, HARD, MEDIUM–HARD, OR SOFT".

3. INSULATION: INSULATION SHALL CONSIST OF CROSS–LINKED THERMOSETTING POLYETHYLENE, MEETING THE REQUIREMENTS OF COLUMN A OF THE INSULATED POWER CABLE ENGINEERS' ASSOCIATION AND LISTED BY UNDERWRITERS' LABORATORY AS TYPE U.S.E. RHW–165 DEGREES FAHRENHEIT.

G. LIGHTING AND SECONDARY CABLE: SEE VIII "LUMINAIRES AND LAMPS".

H. VIDEO CAMERA CABLE

1. VIDEO CABLE OPTION 1 SHALL BE: #16AWG 3/c – 1000 FOOT ROLL. ANY SURPLUS WIRE REMAINING FROM THE ROLL SHALL BE RETURNED TO THE CITY.

2. VIDEO CABLE OPTION 2 SHALL BE: ETHERNET CABLE GENERAL – ANY ETHERNET CABLE RUN OUTSIDE OF THE TRAFFIC CABINET SHALL BE ENVIRONMENTALLY HARDENED, SHIELDED, OUTDOOR RATED 350 MHZ CATEGORY 5E CABLE. THE CABLE SHALL BE RISER RATED, 24 AWG SOLID COPPER, HAVE POLYOLEFIN INSULATION, UV AND OIL RESISTANT PVC JACKET. PAIR 1 SHALL BE BLUE, WHITE/BLUE, PAIR 2 SHALL BE ORANGE, WHITE/ORANGE, PAIR 3 SHALL BE GREEN, WHITE/GREEN AND PAIR 4 SHALL BE BROWN, WHITE/BROWN. THE OPERATING TEMPERATURE SHALL BE FROM –40* C TO +70* C. THE CABLE SHALL CONFORM TO THE FOLLOWING STANDARDS: ISO/IEC 11801 CATEGORY 5E, NEMA WC 63, AND ANSI/TIA/EIA 568–B.2 CATEGORY 5E. THE CABLE SHALL BE WITHOUT SPLICING OR JOINTS FOR ANY SINGLE RUN. THE CONTRACTOR SHALL OBTAIN INSTRUCTIONS FROM THE MANUFACTURER ABOUT ALTERNATE ARCHITECTURE WHEN LENGTH OF A SINGLE RUN OF CAT 5E CABLE EXCEEDS 320 FEET. CONTRACTOR TO PROVIDE 1000 FOOT ROLL, ANY SURPLUS SHALL BE RETURNED TO CITY.

RJ–45 CONNECTOR – THE RJ–45 PLUG CONNECTORS SHALL BE USED AT BOTH THE CAMERA AND CABINET ENDS. THE SUPPLIER OF THE VIDEO DETECTION SYSTEMS SHALL APPROVE THE CATEGORY 5E CABLE, RJ–45 CONNECTOR AND CRIMPING TOOL AND THE MANUFACTURER'S INSTRUCTIONS MUST BE FOLLOWED TO INSURE PROPER CONNECTION.

III. TRAFFIC SIGNAL HEADS

A. GENERAL

1. SIGNAL HEAD MOUNTING

a. INSTALLATION: SIGNAL HEADS SHALL NOT BE INSTALLED AT ANY INTERSECTION UNTIL ALL OTHER SIGNAL EQUIPMENT, INCLUDING THE CONTROLLER, IS IN PLACE AND READY FOR OPERATION AT THAT INTERSECTION, EXCEPT THAT THE SIGNAL HEADS MAY BE MOUNTED IF THE FACES ARE NOT DIRECTED TOWARD TRAFFIC OR IF THE FACES ARE COMPLETELY COVERED. IN NO CASE SHALL THE HEADS BE INSTALLED MORE THAN 10 DAYS PRIOR TO THE SIGNAL TURN–ON. THE ENGINEER SHALL DIRECT THE FINAL POSITIONING OF THE SIGNAL HEADS FOR OPTIMUM VISIBILITY. VERTICAL BRACKET AND PEDESTAL MOUNTED TRAFFIC SIGNAL HEADS SHALL BE INSTALLED AT A HEIGHT OF 10 FEET FROM THE BASE OF POLE TO THE BOTTOM OF SIGNAL HEAD UNLESS OTHERWISE SPECIFIED IN THE PLANS. MAST ARM MOUNTED SIGNAL HEADS SHALL BE INSTALLED AT A HEIGHT OF 15 TO 19 FEET FROM THE PAVEMENT TO THE BOTTOM OF SIGNAL HEAD.

b. BRACKET MOUNTING: BRACKET–MOUNTED SIGNAL HEADS, AS SHOWN ON THE PLAN, SHALL BE SUPPORTED BY MOUNTING BRACKETS CONSISTING OF WATERTIGHT ASSEMBLIES OF 1–1/2 INCH DURABLE POLYCARBONATE. MOUNTING BRACKETS SHALL BE YELLOW. THE DIMENSIONS OF MOUNTING BRACKETS SHALL BE AS REQUIRED TO PROVIDE PROPER SIGNAL HEAD ALIGNMENT. EACH BRACKET SHALL HAVE 72 TOOTH SERRATIONS TO ASSURE A POSITIVE LOCK WITH THE SIGNAL HEAD AND ALLOW POSITIONING OF THE TRAFFIC SIGNAL HEADS IN INCREMENTS OF 5 DEGREES. ALL MEMBERS SHALL BE EITHER PLUMB OR LEVEL, SYMMETRICALLY ARRANGED, AND SECURELY ASSEMBLED. MOUNTING BRACKETS SHALL BE ATTACHED TO THE POLE WITH A STAINLESS STEEL BANDING. CONSTRUCTION SHALL BE SUCH THAT ALL CONDUCTORS ARE CONCEALED WITHIN THE ASSEMBLY.

c. MAST–ARM MOUNTING: MAST–ARM SIGNAL HEAD ASSEMBLIES SHALL BE RIGID MOUNTED. THE ASSEMBLY SHALL CONSIST OF BOTH TOP AND BOTTOM BRACKETS AND BE EASILY AND COMPLETELY ADJUSTABLE IN BOTH HORIZONTAL AND VERTICAL PLANES. THE TOP AND BOTTOM BRACKETS SHALL HAVE 72 TOOTH SERRATIONS CAST INTO THE ARM TO ASSURE A POSITIVE LOCK WITH THE SIGNAL HOUSING. THE MAST ARM SIGNAL BRACKET SHALL BE CONSTRUCTED OF A HIGH STRENGTH ALUMINUM. IT SHALL HAVE A MINIMUM OPENING OF 1–1/2 INCHES TO COMPLETELY ENCLOSE THE SIGNAL WIRING. THE BRACKET SHALL ACCOMMODATE THE NUMBER AND SIZE OF SIGNAL HEADS AS SHOWN ON THE PLAN. IT SHALL BE ATTACHED TO THE SIZE AND SHAPE OF THE MAST ARM SUPPLIED BY MEANS OF STAINLESS STEEL BANDS.

2. BACKPLATES: WHERE SHOWN ON THE PLAN, 5 INCH BACKPLATES SHALL BE FURNISHED AND ATTACHED TO THE SIGNAL FACES TO PROVIDE A DARK BACKGROUND FOR SIGNAL INDICATIONS. BACKPLATES SHALL BE CONSTRUCTED OF DURABLE PLASTIC ABLE TO WITHSTAND A 100 MILES PER HOUR WIND.

B. VEHICLE TRAFFIC SIGNAL HEADS

1. ASSEMBLY: EACH SIGNAL HEAD SHALL BE A WATERTIGHT ASSEMBLY OF THREE OR MORE SIGNAL FACES OF THE EXPANSIBLE, ADJUSTABLE, LED TYPE, TOGETHER WITH ALL BRACKETS AND FITTINGS NECESSARY FOR PROPER MOUNTING WITH THE TYPE OF SIGNAL SUPPORT DESIGNATED ON THE PLAN. EACH SIGNAL FACE SHALL CONSIST OF THREE OR MORE SIGNAL SECTIONS, RIGIDLY AND SECURELY FASTENED TOGETHER, POSITIVELY POSITIONED TO CONTROL THE MOVEMENT OF ONE DIRECTION OF TRAFFIC. EACH SIGNAL SECTION SHALL BE SELF–CONTAINED ASSEMBLY CONSISTING OF AN OPTICAL UNIT WITH HOUSING, HOUSING DOOR, AND VISOR. TIE RODS SHALL NOT BE USED TO FASTEN SIGNAL SECTION TOGETHER TO FORM A SIGNAL FACE. ALL SIGNAL HEADS ON A PROJECT SHALL BE THE PRODUCT OF ONE MANUFACTURER, EXCEPT FOR PROGRAMMED HEADS. TERMINAL BLOCKS OF SUITABLE SIZE SHALL BE PLACED IN THE MIDDLE SECTION OF THE SIGNAL HEAD.

2. HOUSING: THE HOUSING FOR EACH SIGNAL SECTION SHALL BE MADE OF A DURABLE POLYCARBONATE. IT SHALL BE CLEAN, SMOOTH, AND FREE FROM FLAWS, CRACKS, BLOWHOLES, AND OTHER IMPERFECTIONS. THE HOUSING SHALL BE YELLOW WITH BLACK DOORS. IT SHALL BE DESIGNED AS A SELF–CONTAINED UNIT FOR SEPARATE MOUNTING OR INCLUSION IN A SIGNAL FACE CONTAINING THREE OR MORE SIGNAL SECTIONS RIGIDLY AND SECURELY FASTENED TOGETHER. IT SHALL BE EQUIPPED WITH ROUND OPENINGS IN THE TOP AND BOTTOM AND SHALL HAVE 72 TOOTH SERRATIONS TO ASSURE A POSITIVE LOCK BETWEEN SIGNAL HEADS AND BRACKETS AND ALLOW POSITIONING OF THE TRAFFIC SIGNAL HEADS IN INCREMENTS OF 5 DEGREES. THE DOORS SHALL BE SUITABLY HINGED AND HELD SECURELY TO THE BODY OF THE HOUSING BY SIMPLE STAINLESS STEEL LOCKING DEVICES. ALL OTHER DOOR PARTS SUCH AS HINGE PINS, LENS CLIPS, SCREWS, ETC. SHALL ALSO BE OF STAINLESS STEEL MATERIAL. A NEOPRENE OR SILICONE GASKET SHALL BE USED BETWEEN THE LENS AND THE REFLECTORS TO EXCLUDE DUST AND MOISTURE.

3. VISORS: THE VISORS FOR EACH SIGNAL SECTION SHALL BE A DURABLE POLYCARBONATE NOT LESS THAN 0.05 INCH (NO. 18 U.S. GAUGE) IN THICKNESS. IT SHALL BE DESIGNED TO FIT TIGHTLY AGAINST THE DOOR BY MEANS OF FOUR FASTENING SCREWS AND SHALL NOT PERMIT ANY PERCEPTIBLE FILTRATION OF LIGHT BETWEEN IT AND THE HOUSING DOOR. VISORS SHALL BE AT LEAST 9–1/2 INCHES LONG FOR ALL 12 INCH DIAMETER SIGNALS, SHALL ANGLE SLIGHTLY DOWNWARD, AND SHALL BE OF THE TUNNEL TYPE. THE OPTICAL UNIT AND VISOR SHALL BE DESIGNED AS A WHOLE AS TO ELIMINATE OUTSIDE RAYS FROM ENTERING THE UNIT FROM ABOVE THE HORIZONTAL. ALL VISORS SHALL BE BLACK.

4. WIRING: WIRING FOR EACH LAMP RECEPTACLE SHALL BE PROVIDED BY COLOR CODED NO. 18 GAUGE LEAD WIRES WITH POLYVINYL CHLORIDE INSULATION AND A NYLON JACKET. WIRES SHALL BE SUFFICIENT LENGTH TO EXTEND TO THE TERMINAL BLOCK WITH THE DOOR FULLY OPEN WITHOUT SPLICING.

C. ONE SECTION PEDESTRIAN TRAFFIC SIGNAL HEAD WITH COUNTDOWN DISPLAY:

MUST MEET OR EXCEED CURRENT ITE STANDARDS. MUST MEET OR EXCEED 2009 MUTCD.

THE HOUSING SHALL BE POLYCARBONATE AND SHALL BE A "CLAMSHELL TYPE" HOUSING. THE HOUSING SHALL BE YELLOW IN COLOR. TWO EQUALLY SPACED MOUNTING LUGS SHALL BE INTERNALLY CAST INTO THE TOP AND BOTTOM, PERMITTING IT TO BE HINGED FROM EITHER DIRECTION. THE HOUSING SHALL HAVE A 72 TOOTH SERRATED BUSHING FOR USE WITH STANDARD SIGNAL HARDWARE. EACH BASE SHALL HAVE REINFORCING RIBS PROJECTING THE LOAD BEARING STRESS TO THE MOUNTING POINT.

THE DOOR SHALL BE CAST FROM ALUMINUM ALLOY. THE DOOR SHALL BE POWDER COATED AND BE BLACK IN COLOR.

THE VISOR SHALL BE A ONE PIECE INJECTION MOLDED FROM ULTRAVIOLET STABILIZED, FLAME RETARDANT, PERMANENTLY COLORED, BLACK POLYCARBONATE FORMED TO CREATE A SYSTEM EQUALLY SPACED DIAGONAL LOUVERS. THE VISOR SHALL BE ENCLOSED IN AN ALUMINUM MOUNTING FRAME THAT IS ATTACHED DIRECTLY TO THE DOOR WITH STAINLESS STEEL FASTENERS.

THE PEDESTRIAN SIGNAL HEAD SHALL BE CAPABLE OF DISPLAYING, BRIGHTLY AND UNIFORMLY, THE ALTERNATE MESSAGE SYMBOL FULL "HAND" IN PORTLAND ORANGE AND THE FULL "PERSON" IN WHITE WHILE BEING SUBJECT TO STRONG AMBIENT LIGHT CONDITIONS; THE MESSAGE SHALL "BLANKOUT" WHEN NOT ENERGIZED.

THE HAND AND PERSON SHALL BE NINE (9) INCHES HIGH.

THE OVERALL DIMENSIONS OF THE SIGNAL HEAD SHALL BE APPROXIMATELY 18–INCHES WIDE, 19–INCHES HIGH, AND 9–INCHES DEEP, INCLUDING HINGES, AND ALL COMPONENTS SHALL BE READILY ACCESSIBLE FROM THE FRONT.

THE COUNTDOWN TIMER SHALL COUNTDOWN THE DON'T WALK PHASE ONLY; THE WALK PHASE COUNTDOWN TIMER (IF PRESENT) SHALL BE DISABLED AT THE FACTORY.

THE LIGHT SOURCE FOR EACH INDICATION OF THE PEDESTRIAN HEAD SHALL BE A LIGHT EMITTING DIODE ARRAY MEETING ETL CERTIFICATION. THE LIGHT OUTPUT SHALL BE COMPARABLE TO THAT OF A STANDARD PEDESTRIAN SIGNAL ILLUMINATED BY A 90–WATT INCANDESCENT LAMP. THE MODULE SHALL OPERATE OVER A VOLTAGE RANGE OF 89 TO 135 VOLTS AC AND CONSUME LESS THAN 12 WATTS OF POWER. THE MODULE SHALL HAVE AN OPERATING TEMPERATURE RANGE OF AT LEAST –34C TO +74C.

THE MANUFACTURE SHALL WARRANT THE PEDESTRIAN ASSEMBLY AGAINST DEFECTS IN WORKMANSHIP AND MATERIAL FOR A PERIOD OF FIVE (5) YEARS AFTER DATE OF DELIVERY, AND SHALL BE ASSIGNED TO THE CITY OF TOPEKA.

D. L.E.D. SIGNAL LAMPS: THE RED, GREEN AND YELLOW BALL LAMPS SHALL ALMOST PERFECTLY APPROXIMATE, TO THE MOTORIST, THE APPEARANCE OF AN INCANDESCENT TRAFFIC SIGNAL.

THE LENS SHALL BE MADE OF UV STABILIZED PLASTIC. THE REAR COVER SHALL BE OF NON FLAMMABLE MATERIAL AND THE ENTIRE UNIT SHALL BE TOTALLY SEALED TO PRECLUDE THE ENTRANCE OF WATER, DUST OR OTHER CONTMINANTS.

THE SELF–CONTAINED, REGULATED POWER SUPPLY SHALL ALLOW THE UNIT TO OPERATE OVER AN INPUT VOLTAGE RANGE BETWEEN 89 AND 135 VOLTS AC AND SHALL BE CONFIGURED IN AT LEAST 3 PARALLEL CIRCUITS FOR RELIABILITY. LIGHT OUTPUT SHALL BE COMPARABLE TO THAT PROVIDED BY A STANDARD, 12 INCH TRAFFIC SIGNAL LENS ILLUMINATED BY A 150 WATT INCANDESCENT LAMP. THE RED WAVE LENGTH SHALL BE 630 TO 660 NM.

THE MANUFACTURER SHALL WARRANT THE UNIT AGAINST DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF AT LEAST FIVE YEARS AFTER DATE OF SHIPMENT. THIS WARRANTY SHALL BE ASSIGNED TO THE MAINTAINING AGENCY.

E. PROGRAMMED VISIBILITY TRAFFIC SIGNAL HEADS

1. GENERAL: PROGRAMMED VISIBILITY TRAFFIC SIGNAL HEADS AND THE INSTALLATION THEREOF SHALL CONFORM TO THE PROVISIONS ABOVE, EXCEPT THE PROVISIONS ON OPTICAL UNITS AND VISORS SHALL NOT APPLY. THE PROGRAMMED VISIBILITY TRAFFIC SIGNAL HEADS SHALL BE CONSTRUCTED OF DIE CAST ALUMINUM.

2. VISIBILITY: THE VISIBILITY OF THE SIGNAL INDICATION SHALL BE ADJUSTABLE WITHIN THE SIGNAL HEAD TO FIT THE LANE OR LANES IN WHICH TRAFFIC IS TO BE CONTROLLED. DURING DAYLIGHT, THE SIGNAL INDICATIONS SHALL BE VISIBLE ONLY IN THOSE AREAS OR LANES DESIGNATED. DURING DUSK OR DARKNESS, A FAINT GLOW VISIBLE TO THE SIDE WILL BE PERMISSIBLE. EXTERNAL ILLUMINATION SHALL NOT CAUSE A SIGNAL INDICATION, NOR SHALL A SIGNAL INDICATION IN ONE SIGNAL SECTION CAUSE A SIGNAL INDICATION IN ANOTHER SIGNAL SECTION. EACH SECTION OF A SIGNAL FACE SHALL PROVIDE A NOMINAL 12 DIAMETER ROUND INDICATION OR ARROW INDICATION MEETING THE INSTITUTE OF TRANSPORTATION ENGINEERS' DIMENSIONS AS REQUIRED.

3. VISOR: EACH SECTION SHALL BE PROVIDED WITH A SHEET ALUMINUM SUN VISOR.

4. PROGRAMMING: THE INDICATION OF EACH SIGNAL HEAD, WHEN NOT PROGRAMMED, SHALL BE VISIBLE FROM ANYWHERE WITHIN 15 DEGREES OF THE OPTICAL AXIS. THE SIGNAL HEAD SHALL BE ABLE TO BE PRESET AT ANGLES BETWEEN 10 DEGREES ABOVE AND 10 DEGREES BELOW THE HORIZONTAL, AND SHALL BE PRESET AT 4 DEGREES (POST TOP) OR 8 DEGREES (OVERHEAD) BELOW THE HORIZONTAL.

NO.	DATE:	REVISION	BY:	APP'D
6	09–27–10	ADD POLYCARBONATE PED HEAD SPEC.	KAP	LGV
5	09–07–10	ADD COUNTDOWN DISPLAY HEAD SPEC.	KAP	LGV
4	04–23–10	ADD VIDEO CABLE OPTION 1 & 2	KAP	LGV
3	02–22–08	UPDATE STANDARDS	KAP	
2	02–20–06	UPDATE L.E.D. SIGNAL STANDARDS	CDR	
1	01–15–04	UPDATE STANDARDS	KAP	

DRAWN BY: K.PELTON

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STANDARD DETAILS

TRAFFIC SIGNAL SPECIFICATIONS

DATE:

PAGE: OF

DRAWING: DT–109

PROJ.