

717.061 Erosion Control Blankets Shall consist of a machine produced rolled blanket of biodegradable organic fibers, evenly distributed over the entire area of blanket, of a consistent thickness, sewn into a biodegradable mesh on the top and bottom surface using a cotton blend thread. The blanket shall remain in place when subject to shear stress of 7.57 kg/m<sup>2</sup> [1.55 lb/ft<sup>2</sup>]. The blanket shall remain intact until grass is established. See Section 618.10 - Seeding, Maintenance and Acceptance.

717.063 Ground Anchors Shall consist of metal staples or biodegradable stakes as recommended by the manufacturer of the erosion control blanket to be used.

717.07 Herbicide The herbicide shall be an approved chemical registered in the State of Maine for the required treatment.

717.09 Peat Humus Organic Humus shall be an organic substance meeting the following:

Minimum organic matter shall be 35% as determined by loss on ignition.

Particle size shall be 100% less than 25 mm [1 in].

Soluble salts shall be less than 4.0 mmhos/cm.

pH shall be between 4.5 and 8.0.

Material shall be Stable ( >5) as measured by the Dewar Self Heating Test

Organic humus may be a natural peat from sedge, sphagnum or reed origin, or a compost from source separated materials that may include leaf and yard trimmings, food scrapes, food processing residues, manure and other agricultural residuals, or biosolids. Organic humus shall contain no visible admixture of refuse or other physical contaminants or any material toxic to plant growth.

## SECTION 718 - TRAFFIC SIGNALS MATERIAL

### 718.01 Vehicular Signal Indications

a. Vehicular signal heads for traffic signals and flashing beacons shall conform to or exceed the current edition of the ITE "Standard for Adjustable Face Vehicle Traffic Control Signal Heads". Each housing section shall be complete with a one-piece, hinged door mounting for the lens and other parts of the optical system, watertight gaskets, and

simple door-locking device. The optical system shall be mounted so that the various parts may be swung open for ready access or removal. The sections shall be interchangeable and constructed so that sections can be removed or added.

There shall be a round opening in the top and bottom of each head to receive 38 mm [1½ in] supporting pipe frame. All parts of the housing, including the doors and end plates shall be of die cast aluminum free from flaws, cracks, blow holes or other imperfections or polycarbonate.

All exposed bolts, screws, hinge pins, and door-locking devices shall be stainless steel. All interior screws and fittings shall be stainless steel or approved nonferrous, corrosion-resistant material.

All gaskets, including door, optical assembly, exclusive of lampholder gaskets, shall be of neoprene. Lampholder gaskets shall be of a material unaffected by heat.

All light emitting diode optical assemblies shall be wired so that a white wire will be connected to the ground and black or colored wire to the terminal of the LED optical assembly. The wires shall in turn be connected to the terminal block mounted inside at the back of the housing. The terminal block shall have sufficient screw type terminals to terminate all field wires and lamp wires with separate screws. The terminals to which field wires are attached shall be permanently identified or the wiring shall be color coded to facilitate fieldwork. Each LED assembly shall be provided with a removable visor hood unless tunnel hoods or louvered hoods are specified on the plans. Hoods for 200 mm [8 in] sections shall be 175 mm [7 in] long, hoods for 300 mm [12 in] sections shall be 240 mm [9½ in] long.

All heads to be modified shall be retrofitted with light emitting diode optical assemblies for all colors.

When 2 or more vehicular signal heads or a combination of vehicular signal heads and pedestrian signal heads are installed on 1 pole, only 1 conduit riser shall be used. The signal heads shall not be connected together by the use of liquid tight flexible metal conduit and terminal fittings.

All new vehicular signal faces installed at any one intersection shall be of the same make and type.

LED optical assemblies for the 200 mm [8 in] units shall be 650-lumen minimum initial output, 120 volt, 100,000 hour rated life, clear traffic signal lamps. Lamps for the 300 mm [12 in] units shall be 1900-lumen minimum initial output, 120 volt, 100,000 hour rated life.

The intensity and distribution of light from each illuminated signal LED optical assembly shall conform to the latest revisions of the ITE "Standard for Adjustable Face Vehicle Traffic Control Signal Heads", and the "Standard for Traffic Signal LED".

b. Programmed Visibility Vehicular Indications The programmed visibility traffic signal vehicular indication shall optically determine the visibility zone of indication without the use of hoods or louvers. The projected signal may be visible or selectively veiled anywhere within 15° of the optical axis.

The signal head shall be adjustable to various angles between 9° above and below horizontal. No indication shall result from external illumination and each indication shall be illuminated separately. 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.

The illumination lamp shall be a nominal 150 watt, 115 volt AC, 3 prong, sealed beamed type, having an integral reflector and an average rated life of 6,000 hours. A dimming device shall be provided to reduce the candela at each signal head for nighttime operation to approximately 15% of the candlepower for daytime operation.

A circular reflector with a specular inner surface shall mate the lamp to a diffusing element.

An internal imaging surface shall be provided to permit an effective veiling system to be applied as determined by the desired visibility zone. The Contractor shall notify the Resident 48 hours prior to the application of the veiling system. The optical limited-diffuser shall be provided with positive indexing means and shall be composed of heat resistant glass.

The objective lens shall be a high resolution planar incremental lens thermetically sealed within a flat laminate of weather resistant acrylic. The lens outline shall be symmetrical. Lens colors shall conform to the latest ITE transmittance and chromaticity

standards.

The signal shall be housed in cast aluminum, conforming to the latest ITE alloy and tensile requirements. Each section shall have a sun visor. The cast aluminum shall have a chromate preparatory treatment before the application of green or yellow baked enamel prime and finish. The lens cover and the interior of the case shall be flat black. Hinge and latch pins shall be stainless steel. All access openings shall be sealed with weather resistant rubber gaskets.

The lamp fixture housing shall be readily accessible and lamp replacement shall not require special tools nor necessitate major disassembly.

Electrical connections between the case and lamp holder shall be an interlock assembly that disconnects the lamp holder when open. Number 16 wire shall be used to connect the lamp receptacle to the signal head terminal.

The signal head shall be capable of being mounted to standard 38 mm [1½ in] fittings as a signal head section, as a multiple section face or in combination with other signal heads.

The signal section shall be provided with a rigid connection that permits tilting from at least 9° above or below the horizontal while maintaining a common vertical line through couplers and conduit. No special tools should be needed for servicing or mounting.

718.02 Pedestrian Signal Indications The pedestrian traffic control signal heads shall conform to the ITE, "Standard for Adjustable Face Pedestrian Signal Heads", latest Edition. The housing shall be dust and moisture proof and corrosion resistant and shall provide easy access to all components. All pedestrian signal heads shall have a sun visor.

All pedestrian traffic control signal heads of the incandescent type shall be as outlined in the above Standard. All new pedestrian signal faces installed at any one intersection shall be of the same make and type.

The "Don't Walk" and "Walk" indications shall be separate heads and the "Don't Walk" indication shall appear directly over the "Walk" indication. The "Walk" message shall be lunar white and the "Don't Walk" message shall be Portland orange.

Head sizes shall be standard nominal 250 mm [9 in] in minimum dimension unless otherwise specified.

LED optical assemblies for 225 mm [9 in] units shall be 650-lumen minimum initial output, 120-volt, 100,000 hour rated life.

LED optical assemblies for 300 mm [12 in] units shall be 1,900-lumen minimum initial output, 120-volt, 100,000 hour rated life.

When 2 or more pedestrian signal heads are installed on 1 wood pole, only 1 conduit riser shall be used. The pedestrian signal heads shall not be connected by the use of liquid tight flexible metal conduit.

Pedestrian signal heads, which use fiber optic bundles to form the message, shall achieve the color of the messages by filters between the light source and the optical bundles. The legends shall be 125 mm [5 in] minimum in height with a 16 mm [ $\bullet$  in] stroke. The housing materials shall conform to the requirements for conventional pedestrian signal housings. The message shall be illuminated by a light source designed to operate on a 120-volt source and shall be rated for 100,000 hour average life. The flashing message shall be accomplished by use of a solid-state flasher required for conventional pedestrian signal indications.

718.03 Signal Mounting All trunnions, brackets, and suspensions used for assembling and mounting signal control faces shall be entirely weather tight. The inside area of the cross section of the tubular arms shall not be less than the inside area of 38 mm [1½ in] IPS pipe to permit the signal control wires or cable to be inserted through them.

After final adjustment, all vehicular and pedestrian signal heads, regardless of mounting arrangement, shall be fastened by a positive locking device acceptable to the Resident. This device shall prevent any deviation from the position set, but shall allow for readjustment of the signal head later in the same installation or in another installation without the necessity of damaging any part of the signal head.

718.04 Vehicular Loop Detectors Vehicle detectors shall consist of wire loops and self-contained detection equipment capable of registering independently the presence or passage of any vehicle passing over the loop at any speed up to 110 km/hr [70 mph] and at any temperature between -37°C and +74°C [-35°F and 165°F]. Each loop detector shall contain

its own integral power supply and shall operate between 95 VAC and 135 VAC. The input power shall be protected by fuse or resettable circuit breaker.

The detector amplifiers shall be self-tuning, solid state construction except for the output relay. Printed circuit design shall allow the components to be removed and replaced without permanent damage to the printed circuit boards or tracks.

Detector amplifiers installed in a common cabinet shall have a frequency difference and shall not interfere with the operation of other detector amplifiers installed in the same cabinet.

All input and output circuits for each amplifier shall enter by a single connector provided with a threaded shell. All controls, indicator lights, meters, fuseholders, circuit breakers and connectors shall be mounted on the front panel of the detector amplifier. All controls shall be adjustable without the use of tools and the controls shall be clearly and permanently identified.

The detector unit shall show a visible indication of vehicle calls. After a power interruption, the units shall return to normal operation within 30 seconds. If any vehicle stops over a portion of the loop registering a call, the detector shall be capable of detecting additional vehicles traversing the loop after approximately 15 seconds.

Detectors shall detect vehicles by lanes of traffic and shall not detect traffic moving away from the intersection when properly positioned in normal travel lanes. Detection must be positive and not erratic under all actual operating conditions with the exception of storm damage to the detector.

All detectors shall be capable of detecting all four-wheeled vehicles for all lengths of lead-in up to 230 m [750 ft] for single detection loops and for a combined lead-in length of 230 m [750 ft] in the case of multiple loops.

Detector loop wire shall be number 14 THWN stranded wire, moisture and heat resistant. Lead-in cable shall conform to the detector manufacturer's recommendations. The wire shall be encapsulated in vinyl tubing over its entire length.

No damage shall occur in the detector if the pavement loop or lead-in becomes short-circuited.

718.05 Microwave Detectors Microwave detectors shall work on an operational frequency of 10.525 GHZ. The detection method shall be microwave with adjustable patterns with a response time of 165 milliseconds and an adjustable hold time of 0.5 to 5 seconds. It shall be powered from 10 VAC to 24 VAC. All contacts shall be form C, 5 amp rated. The detector shall have a fail-safe microprocessor circuit so that if the unit fails it will place the controller in recall on the apparent phase.

718.06 Pedestrian Detectors Pedestrian push button detectors shall be weatherproof and constructed to eliminate the possibility of electrical shock in all weather conditions.

The pedestrian push button switch shall be a phenolic enclosed precision snap-acting type, switching unit, single-pole, double-throw, with screw type terminals, rated 15 amperes at 125 volts, AC and shall have the following characteristics:

- a. The switching unit shall have a stainless steel plunger actuator and shall be provided with U-frame to permit recessed mounting in push button housing.
- b. Where a pedestrian push button is attached to a pole, the housing shall be shaped to fit the curvature of the pole and secured to provide a rigid installation. When required, saddles shall be provided to make a neat fit.

718.07 Controllers All controllers shall be solid state menu driven keyboard units meeting NEMA standards and capable of operating in fixed time, semi-actuated and actuated modes or as designated on the plans. Controller shall have a programably "EE prom" chip with an internal real-time clock/calendar capable of daily, weekly, and yearly events time programming. The controller shall be designed to provide the number of intervals shown on the plans without any auxiliary equipment. Solid state controllers shall be provided with conflict monitors as specified in Section 718.11.

All equipment inputs, outputs, and terminals shall be identified by the phase designations shown on the plans.

The reliability of the equipment shall be demonstrated by test performance that will confirm that the controller unit, fully wired cabinet, and auxiliary equipment meet the operational and functional requirements of the plans and specifications.

The Contractor shall be responsible for providing all information describing the operation of the equipment necessary to facilitate the completion of the tests. All schematic wiring diagrams of the controllers and auxiliary equipment, all cabinet diagrams and all operation manuals shall be submitted to the Resident at the time the controllers are delivered for testing. These diagrams shall show in detail all circuits and parts. Such parts shown thereon shall be identified by name or number and in such a manner as to be readily interpreted.

The controller shall be delivered with all documentation manuals as per Section 643.17 to the Maine Facility, US Route 2, Palmyra, Maine, mailing address RFD Box 421, Pittsfield, Maine, 04967, with all internal connections made and ready for testing. The test will be performed under simulated field loads or manufacturer's design loads, whichever are greater. Testing will be performed by the Department.

The Contractor shall allow 21 days for the testing of each controller, commencing on the day the controller is delivered to the test site, exclusive of the number of days necessary for the Contractor to respond to defect notices and the number of days the Contractor requires to correct the defective equipment.

The test shall consist of not less than five days of continuous, satisfactory operation. If unsatisfactory performance of the controller develops during the test, the Contractor shall remove the defective equipment for repair within five working days after notification, correct the deficiency and the controller shall be retested, until the 5 days of continuous satisfactory operation are obtained. If repeated failures occur, the entire controller may be rejected, requiring the Contractor to submit a new controller for testing. Delays to the contract resulting from unsatisfactory test performance due to continued equipment failure will not be considered as a valid reason to justify extension of the contract time.

The Contractor will be notified when testing of the traffic signal equipment has been completed. It shall be their responsibility to transport the equipment to the work site.

Each traffic controller unit, flasher and all other current interrupting devices shall be equipped with a suitable radio interference suppressor installed at the input power point. Interference suppressors shall be designed to minimize interference in both broadcast and aircraft frequencies. Suppressors shall be designed for 125% of the total connected load and shall meet standards of the UL and the EIA.

The type of controller, auxiliary equipment and other operational features shall be as noted on the plans.

All equipment, except pedestrian push buttons, shall be designed to operate on 120 volt, 60 hertz. Operation shall be satisfactory at voltages from 105 to 130. The voltage for pedestrian push buttons shall not exceed 18 volts.

a. Auxiliary Functions All controllers shall be capable of providing flashing operation of the signal lights, as indicated on the plans. Transfer from flashing operation or to flashing operation shall conform to the MUTCD. The clock for auxiliary functions shall be a solid state time clock or module.

If noted on the plans, preempt circuits shall be provided for emergency vehicles and/or railroad crossings. The clearance and preempt indications shall be as noted on the plans. Preempt circuits shall function during stop and go and flashing operation unless otherwise noted. The duration of clearance and preempt intervals shall be adjustable over the range noted on the plans and shall be labeled according to function. The railroad preempt circuit shall be designed to operate as a fail-safe loop through a normally made contact on the railroad's control relay in the railroad's control cabinet. Railroad preemption shall have precedence over all preemption intervals for other purposes.

Actuated vehicle phases and actuated pedestrian phases shall be served in that interval of the cycle indicated on the plans. Time for an actuated interval shall be taken from the non-actuated phase(s) as noted on the plans.

Automatic transfer to or from flashing operation shall conform to the MUTCD. Manual advance of the intervals by use of hand cord control shall cause the controller to advance to the next programmed interval only upon pulse signal from the hand cord circuit, interval timing shall hold the interval for the minimum programmed amber and red clearance intervals.

b. Solid State Controllers The controller unit shall be enclosed in a sheet metal case with protective painted finish, designed to permit easy access to the interior and removal of printed circuit boards and modules without the use of special tools. All program controls, fuses, and indicator lights shall be mounted on the front panel and shall be clearly and permanently labeled. Modules of unlike function shall be

mechanically keyed or electrically interlocked to prevent placement in the wrong location. Each module shall be identified with the symbol shown on the plans with an embossed, color contrasting, plastic label. All components shall be marked for identification compatible with the maintenance manual for the controller unit, including components mounted on printed circuit boards.

When on manual operation, all phases shall be called regardless of vehicle detection and the controller shall be advanced upon pulse from the hand cord circuit, except yellow and red clearance intervals shall be timed for the duration programmed.

An exclusive pedestrian phase shall not extend or recycle until a vehicle phase has been serviced. When on manual operation, all phases shall be called regardless of vehicle detection and the controller shall be advanced upon pulse from the hand cord circuit except yellow and red clearance intervals shall be timed for the duration programmed. Automatic transfer from or to flashing operation shall conform to the MUTCD.

Pedestrian phases shall not be extended by actuations, during the walk or clearance interval. Actuations during the clearance intervals shall be placed in memory.

718.08 Controller Cabinet The traffic signal control equipment shall be enclosed within a dust and moisture-proof aluminum or stainless steel housing with an auxiliary door in door feature. The door hinge pins shall be made of stainless steel. The cabinet shall be installed with the back toward the nearest line of traffic unless otherwise directed by the Resident.

The controller cabinet shall be of sufficient size to accommodate all control equipment including temperature control equipment. It shall be designed to be attached to the type of pole indicated in the contract plans. If attached to a traffic signal post, it shall be integral with the post giving the appearance of the signal post passing directly through the cabinet. If the controller cabinet is to be ground mounted, details of the installation will be shown on the plans. Piano type hinges on controller cabinet doors shall be fabricated of stainless steel with a stainless steel hinge pin.

All manual control switches, push button control, flashing switch, signal switch and any other specified switches shall be located to be accessible within the outside door, without exposing the controller mechanism.

The flashing mechanism for flashing beacon installations must be enclosed within a

dust and moisture proof aluminum cabinet with a hinged door.

The flasher cabinet shall be of sufficient size to accommodate a 2 circuit solid state flashing mechanism and other necessary equipment. It shall be designed to attach to the type of pole indicated in the contract plans. The flasher cabinet shall be vented to prevent excessive heat build-up.

The locks for the door of the flasher cabinet shall be the type shown on the plans. Two keys shall be furnished with each control lock.

All cabinets housing solid-state traffic signal control equipment shall be provided with a thermostatically controlled ventilating fan and throwaway glass fiber air filters. The electric fan shall have ball or roller bearings and shall have a capacity of 2.8 m<sup>3</sup> [100 ft<sup>3</sup>] per minute. The ventilating system shall be designed to prevent the entrance of rain, snow, dust, and insects. The fan and vents shall be arranged in such a manner that the air intake is at the cabinet bottom and the exhaust is at the cabinet top. The filter shall be firmly held in place such that cracks and openings are eliminated to ensure that all air is filtered. The fan shall be thermostatically controlled with an adjustable upper limit of 38°C to 60°C [100°F to 140°F] and a differential of not more than 5°C [10°F].

The locks for the switch compartment door of the controller cabinet shall be the type shown on the plans. The main door shall be a lock of the tumbler type. Two keys shall be furnished with each control lock.

All traffic signal controller cabinets shall be supplied with a convenience outlet, a standard 3-wire grounding duplex receptacle, 20 amp capacity and a lamp socket and 1900 lumen lamp.

A police panel shall be provided behind the auxiliary door and shall contain a switch to select "flash-automatic" function, "automatic-manual" function, "signals on-off" function and a manual control cord. Switch terminals on the rear of the main cabinet door shall be insulated so that no live posts are exposed. The "signal on-off" switch shall allow the signal indications to be de-energized, but power to all other control circuits shall not be disrupted. Switches shall be labeled and rated for load current. Traffic signal controller cabinet main doors over 0.55 m<sup>2</sup> [6 ft<sup>2</sup>] in area shall be provided with a stop to limit door opening to both 90° and 180° +/- 10°. The stop shall be provided with a catch that can be operated when the door reaches these 2 positions and will hold the door open securely until

released. Controller cabinets designated on the plans to be ground mounted shall have a pliable seal composed of caulking compound or mastic placed between the cabinet base and the concrete foundation to prevent dust and dirt from entering the cabinet. The bottom of the controller cabinet shall be mounted on an aluminum non-breakaway transformer base as shown on the plans.

The cabinet shall be supplied with sufficient shelf space for all control units. Receptacles for relays, shelf spaces below all removable control equipment, contactors, switches, fuses, circuit breakers and terminal blocks shall be identified with plastic labels embossed with the symbol used on the plans to indicate the related function.

718.09 Flasher The flasher shall be a two circuit solidstate device with no contact points or moving parts, producing between 50 and 60 flashes per minute with a 50% to 67% duty cycle. The flasher mechanism shall be mounted on a plug-in base with a plug-in mounting. The flasher relay shall energize the flasher and transfer signal light circuits from the controller unit to the flasher. The flasher shall be capable of breaking and carrying 10 amps on each circuit at 125 volts. All amber indications shall be on one circuit and all red indications shall be on the other circuit. The flasher shall be protected from lightning damage by a device intended for use with solid state equipment. The flashing mechanism shall be independent of the controller unit and shall remain in operation upon shutdown of the controller or removal of the controller unit from the cabinet. The pedestrian indications shall be flashed with a separate solid-state flasher.

718.10 Program Selection The weekly program selection unit shall be capable of automatically supervising the operation of cycle 1, cycle 2, cycle 3, split 1, split 2, split 3, reset 1, reset 2, reset 3, and flashing operation. The weekly program selection unit shall allow selection and/or omission of these functions to be varied on a daily basis. The weekly program selection unit shall enable function transfers to be made as often as 15 minutes.

Solid state devices used to automatically select dial, reset and flashing modes shall meet the applicable functional requirements of mechanical devices. They shall maintain the preset program during power interruption and shall continue timing functions using a reserve power source.

718.11 Contacts and Relays All contacts used in connection with interval indications shall be of pure coin silver or its equivalent and shall be capable of breaking and carrying

at least 15 amperes at 120 volts AC. The Contractor is directed to arrange the internal wiring and number of circuits so that the contact rating is not exceeded.

All actuated controllers shall be equipped with external type signal light relays.

Relays shall not be used in connection with any automatic non-flashing red, yellow or green indication in installations having pre-timed electro-mechanical equipment, without the approval of the Resident.

Relays shall be designed for continuous duty. Relays shall be designed to operate at ambient temperatures from  $-35^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  [ $-30^{\circ}\text{F}$  to  $+158^{\circ}\text{F}$ ].

Each relay shall be mounted on a plug-in base with a plug-in mounting. Coils shall have a power consumption of 10 volt-amperes maximum and shall be designed for continuous duty on 120 volts, AC.

A leakage resistor, which shall permit current to pass through the relay coil if the contacts should remain closed after the coil circuit is opened, shall be installed with each external signal light relay to overcome residual magnetism effects.

All relays shall be of a rating sufficient to carry the electrical loads imposed upon them. A sufficient number shall be provided so that the total load is distributed among the various circuits in such a manner that the rating of each relay is 150% of the load.

The monitor unit shall be connected to the field terminals of the signal light circuit to provide protection against conflicting green, yellow or walk indications being simultaneously energized as a result of controller failure, relay or solid state switch failure, short circuited field wiring or other failures.

When a conflict is detected, the monitor unit shall cause the signal system to commence flashing operation; energize the stop-timing circuit of the controller while controller power shall remain on; lock-in flashing operation until manual actuation of the momentary contact reset push button; remove power from the signal light circuit; disable all functions of the "Flash-Automatic" and "Automatic Manual" switches in the police panel.

Each circuit of the solid state switching devices shall have a minimum rating of 1,000 watts for tungsten lamp load at 120 volts, AC. The solid state switching devices shall be

plug-in mounted to a base. Solid state switching devices shall be protected from transient voltages and lightning by components especially designed for use with solid state devices.

Circuit breakers shall be approved and listed by the UL. The operating mechanism shall be enclosed and shall be trip-free from operating handle under load and shall be trip-indicating. All circuit breakers shall be quick-make, quick-break on either automatic or manual operation. Contacts shall be silver alloy enclosed in an arc quenching chamber. Overload tripping of breakers shall not be influenced by an ambient temperature range of from -18°C to +70°C [0 to +158°F].

718.12 Conductors The number and size of conductors required in each cable is indicated on the plans. All conductors shall be stranded copper conductors. Multiconductor cables shall conform to the latest revisions of IMSA Specification Number 19-1 or 20-1. The service ground rod shall be 2400 mm by 16 mm [8 ft by • in] copperclad rod.

The service wiring shall be single conductor number 6 AWG THW stranded copper black insulated and number 6 AWG THW stranded copper white insulated rated 600 volts.

All circuits for the timer and each auxiliary control unit shall terminate in a multiple contact connector. Conductors shall be attached to all pins of the connector and cabled. Conductors of the cable, except spares, shall be fitted with terminal ends compatible with the terminal block and shall have identifying bands. The ends of all spare conductors shall be taped.

## SECTION 719 - SIGNING MATERIAL

719.01 Reflective Sheeting The reflective sheeting shall consist of a retro-reflective lens system having a smooth outer surface. The sheeting shall have a precoated adhesive on the back side, protected by an easily removable liner.

The reflective sheeting and its components shall conform to all the requirements of FHWA "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects", FP-92, Section 718.01. Engineering grade reflective sheeting shall meet the reflective intensity requirements for Type II sheeting as shown in Table 718-1, Section 718.01 - Vehicular Signal Indications, FP-92. High intensity reflective sheeting