BOSTON TRANSPORTATION DEPARTMENT

Specification for Fiberoptic/Copper Communication Interface

April 4, 2003

General

The purpose of this device (unit) is to allow for reliable 2 way transmission of communication from the Boston Transportation Department Central Computer to and from local Remote Communication units at traffic signal controllers over a link of two (2) single mode fibers. A single shelf mounted interface unit shall convert sixteen (16) full duplex copper communication channels where each channel is capable of handling communications for eight remote communication units at local controllers to fiber optic signal using a laser type transmission system with a range of 25KM at a nominal 1300NM operational wave length.

The fiberoptic/copper communication's interface used at each location shall be identical shelf mounted units.

The optical receiver and transmitter shall each be coupled to a single mode fiber using ST type connectors. Copper input/output load impedance shall be 600 ohms balanced. Each of the sixteen copper channels (2 twisted pair per channel) shall be connected via RJ11 type connectors located on the fiberoptic/copper communications interface. The contractor shall supply twisted pair cables terminated with RJ11 connectors wired to appropriate modem line tip/ring pairs on the control cabinet's R-66 interconnect terminal block. A permanent label shall be attached to cable at each RJ11 connector to identify BTD modem number.

The unit shall be designed to operate from an external 24VDC power supply to be plug connected to the traffic control cabinet's external 24VDC power supply as specified by NEMA TS-2. The unit shall be designed to operate over a temperature range of -20 C to +70 C and humidity up to 95 percent non condensing. If the unit is located where low temperature will be less than -20 C, an appropriate heating device, thermostatically controlled, shall be provided within the traffic control cabinet.

The optical receiver/transmitter shall meet the following requirements: Min. Receiver Sensitivity -32dbm; Dynamic Range at 25KM of 20db and SNR at -25 dbm input of 52db. The optical transmitter shall obtain a minimum coupled power of -12dbm.

The copper I/0 shall meet the following requirements: input load impedance 600 ohms balanced, output load impedance 600 ohms balanced and signal to noise ratio (SNR) at -30dbm input of 50db.

Maximum enclosure dimensions for unit shall be 300mm x 300mm x 200mm..

Three (3) schematics and 3 operating/maintenance manuals shall be supplied for each fiberoptic/copper communications interface. The manual(s) shall include a complete parts list. The parts list shall include a cross reference to at least one other manufacturer's name and part number for each item. The manual(s) shall include detailed theory of operation and trouble shooting procedures.

The vendor shall guarantee the fiberoptic/copper interface for a period of 2 years from the date of delivery. All defects due to faulty parts, assembly or design shall be repaired at the vendor's expense.

Maintenance Training

The contractor shall provide instructional time and furnish all materials and services necessary to train experienced City maintenance personnel in the maintenance and repair, to the component level, of the following systems equipment and approximate duration:

Fiber Optic System 8 hours

Training sessions shall be conducted at the facilities in Boston. Eight (8) hours of training during periods to be approved by the Boston Transportation Department Director of Operations shall be provided for up to 10 trainees.

Training sessions shall only take place after all syllabi and proposed instructor(s) are submitted and approved by the Boston Transportation Department Engineer.