

**Material Specification for
Traffic Signal Head**

Table of Contents

TTS 808.210.01	SCOPE	2
TTS 808.210.02	REFERENCES	2
TTS 808.210.03	DEFINITIONS – Not Used.....	2
TTS 808.210.04	DESIGN AND SUBMISSION REQUIREMENTS.....	2
TTS 808.210.04.01	Signal Heads	2
TTS 808.210.04.02	Submission Requirements	3
TTS 808.210.05	MATERIALS.....	3
TTS 808.210.05.01	General.....	3
TTS 808.210.05.02	Signal Head Housing	4
TTS 808.210.05.03	Visors.....	4
TTS 808.210.05.04	Wiring	4
TTS 808.210.05.05	Backboards.....	5
TTS 808.210.05.06	Paint	5
TTS 808.210.05.07	Reinforcing Plate.....	5
TTS 808.210.05.08	Bird Plug	5
TTS 808.210.05.09	Hardware	5
TTS 808.210.06	EQUIPMENT – Not Used	5
TTS 808.210.07	PRODUCTION.....	5
TTS 808.210.07.01	General.....	5
TTS 808.210.07.02	Assembly	6
TTS 808.210.07.03	Marking.....	6
TTS 808.210.07.04	Packaging and Shipment	6
TTS 808.210.08	QUALITY ASSURANCE.....	7
TTS 808.210.08.01	Warranty	7
TTS 808.210.09	OWNER PURCHASE OF MATERIAL.....	7
TTS 808.210.09.01	Measurement and Payment	7

TTS 808.210.01 SCOPE

This specification covers the requirements for polycarbonate vehicle signal and pedestrian signal heads and associated components and accessories.

TTS 808.210.02 REFERENCES

This specification refers to the following standards, specifications, or publications:

Canadian Standards Association

C22.2 No. 127 Equipment and Lead Wires

Institute of Transportation Engineers

ST-017B Equipment and Material Standards of the Institute of Transportation Engineers

US Federal Standard 595 Paint Colors

Color Yellow 595a-33538

TTS 808.210.03 DEFINITIONS – Not Used

TTS 808.210.04 DESIGN AND SUBMISSION REQUIREMENTS

TTS 808.210.04.01 Signal Heads

For the purposes of design, the signal heads shall be assumed to be supported as shown in Table 1 below.

Table 1: Signal head support

Head size and type	Applicable mounting arrangement			
	Rubber cushion head hanger	Two point mounting	Plumizer	Universal mounting assembly
300 mm/200 mm/200 mm highway head	XX	X	XX	X
300 mm pedestrian signal head	X	XX	XX	X
300 mm/300 mm/300 mm special highway head	X	X	XX	X
300 mm/300 mm/300 mm/300 mm special highway head	X	XX	XX	X
300 mm/300 mm/300 mm/300 mm special highway head	X	XX	XX	X
200 mm/ 200 mm all black transit head	X	XX	XX	X
Back-to-back head	X	XX	XX	X

Predominant mounting type shown in Bold **XX**.

TTS 808.210.04.02 Submission Requirements

Specification sheets for vehicle signal and pedestrian signal heads and accessories shall be submitted to the Contract Administrator for review and acceptance by the City.

Two samples of each type of assembled component shall be submitted for review and potential destructive testing at no extra cost to the City. Such testing shall be done by the Contractor and witnessed by the Contract Administrator to determine conformance with the design requirements of this specification. The samples of the assembly will be retained by the City. This testing and evaluation shall be within 30 Working Days from the date of receipt of the samples.

If samples are required to be resubmitted due to failure or rejection.

TTS 808.210.05 MATERIALS

TTS 808.210.05.01 General

Signal heads, components and accessories shall be according to ITE Publication No. ST-017B. All signal heads shall be supplied without lamps.

All vehicle signal heads shall be designed to withstand maximum wind loading according to ITE Publication No. ST-017B.

TTS 808.210.05.02 Signal Head Housing

The signal head housing shall be one-piece moulded polycarbonate body and left hinged door assembly. The signal head housing shall be one piece of material with sides, top and bottom integrally cast or moulded with ribbing to ensure sufficient strength. The signal head housing shall be constructed with two integrally moulded hinges for door attachment on the left side. The housing shall be constructed with internally moulded latch screw slot for stainless steel captive bolts with wing nuts on the right side or other approved locking mechanism.

The door assembly shall have separate sets of stainless steel screws for LED module and visor attachment.

The individual signal housings shall be self-aligning when installed together.

The top section of the signal housing shall be provided with serration around a 50 mm opening to allow setting of the signal head in 5° increments over a full 360° of rotation.

The top and bottom of the housing shall have an opening to accommodate standard 38 mm internal diameter pipe brackets.

The signal head shall be moulded, ultraviolet and heat stabilized, flame retardant resin, and, excluding the pedestrian signal head door, shall be yellow according to Color Yellow 595a-33538.

Pedestrian signal head door shall be black in colour.

The design of pedestrian signal head housing should allow upside down installation to allow the signal head door to swing from left to right.

TTS 808.210.05.03 Visors

The Contractor shall provide each lens with a removable polycarbonate visor of the cowl (cap), tunnel, full-circle or louver type as indicated in the Contract.

The visor for pedestrian signal heads shall be square cowl type with open bottom.

The visor shall be moulded polycarbonate with minimum thickness of 2 mm.

Each visor shall be securely attached to the door by stainless steel screws.

Snap fit visors are not acceptable.

Inside colour of visor is to be flat black, outside is to be yellow to match the head housing.

TTS 808.210.05.04 Wiring

Wiring shall be according to CSA C22.2 No. 127.

TTS 808.210.05.05 Backboards

Flexible “poly” backboards shall be fabricated from high density polyethylene with a minimum thickness of 3 mm and the colour shall be impregnated throughout. All backboards shall be one-piece and shall project a minimum 125 mm width beyond the vehicle signal head housing. The backboards shall be predrilled to match the mounting holes of the vehicle signal heads. The backboards shall also have built-in adjustments to accommodate plumizer installations. Backboards shall be yellow both sides conforming to Color Yellow 595a-33538.

All backboards are supplied complete with 75 mm reflective sheeting border along the perimeter of the front of the backboard according to the manufacturer's recommendation. The 75 mm reflective sheeting shall be 3M Diamond Grade DG3 Reflective Sheeting Series 4000 and be guaranteed by the manufacturer to be free of material or workmanship defects for a period of three years from the date of installation of the back board.

TTS 808.210.05.06 Paint

Paint for inside of visors shall be flat black paint. Pedestrian signal head doors shall be black. Colour Yellow 595a-33538 (yellow) shall be used for vehicle signal and pedestrian signal head sections, bird plugs, backboards and outside surface of visor. Other than the inside of the visors, all non-metallic materials shall have the colour completely impregnated in the material.

TTS 808.210.05.07 Reinforcing Plate

The Contractor shall provide stainless steel reinforcing plate(s) as per the manufacturer's recommendation depending on the mounting arrangement specified for the head.

TTS 808.210.05.08 Bird Plug

Depending on the mounting arrangement specified for the head, The Contractor shall provide removable sealing device(s) (bird plugs) as required. Bird plugs may be flush mounting, two-piece round disc type design complete with bolt, nut and locking washer. Alternatively, bird plugs may be one piece round type complete with self-tapping screw. Friction fit bird plugs are not acceptable. The Contractor shall provide round rubber bird plug washers as required.

TTS 808.210.05.09 Hardware

All hinges, latching mechanisms, screws, retainer clips and washers shall be stainless steel. Screws used for visor attachment, backboard attachment, LED module retainer clips and bird plugs shall have Robertson type screw heads.

TTS 808.210.06 EQUIPMENT – Not Used

TTS 808.210.07 PRODUCTION

TTS 808.210.07.01 General

Sectional signal heads shall be supplied as indicated in the Contract. Where multiple sections are indicated, lenses shall be arranged in the following order commencing from the top to the bottom:

-
- 1) Red
 - 2) Amber
 - 3) Green
 - 4) Straight Through Green Arrow
 - 5) Left Turn Green Arrow
 - 6) Right Turn Green Arrow

Where any of the foregoing indications are not required, the order of arrangement shall be maintained by omitting those sections which are not required.

Pedestrian signal heads shall consist of two 300 mm sections suitable for 300 mm round LED modules. The Contractor shall provide standard square cowl visors. Lenses shall be arranged in the following order commencing from the top to the bottom:

- 1) Walk/Don't Walk Signal
- 2) Pedestrian Countdown Signal

Each section shall be comprised of a signal head housing and visor of the type indicated in the Contract. The individual signal housings shall be securely attached together to prevent separation.

TTS 808.210.07.02 Assembly

All components shall be factory assembled using mechanical devices conforming to the strength requirements of ITE Publication No. ST-017B.

TTS 808.210.07.03 Marking

Each signal head shall have identification marking showing the manufacturer's name and trade mark, and the date of manufacture.

TTS 808.210.07.04 Packaging and Shipment

All materials shall be shipped suitably packaged to avoid damage and to ensure that all parts are delivered as an entity.

Vehicle signal and pedestrian signal heads shall be shipped without visors attached. Vehicle signal heads are to be shipped with reinforcing plates installed. Bird plugs and bird plug washers may be packaged separately in cardboard cartons. Visors and backboards are to be packaged separately. Backboard screws may be packaged separately.

All packaging is to be marked to clearly indicate contents. Packaging containing plumizer mounted vehicle signal heads are to be clearly marked.

Delivery shall take place during normal business hours (8 a.m. to 4 p.m., Monday to Friday). Monthly and special-order deliveries shall take place as specified.

TTS 808.210.08 QUALITY ASSURANCE

TTS 808.210.08.01 Warranty

All equipment, excluding backboards, covered by this specification is to be guaranteed by the Supplier to be free of material or workmanship defects for a period of one (1) year from the date of installation by Toronto Transportation.

All backboards covered by this specification are to be guaranteed by the Supplier to be free of material or workmanship defects for a period of two (2) year from the date of installation by Toronto Transportation.

Any equipment which is proven to be defective in material or workmanship will be replaced or repaired by the Supplier at no extra cost to the City.

Warranty is for the equipment only and specifically excludes labour or sub-contracting charges.

TTS 808.210.09 OWNER PURCHASE OF MATERIAL

TTS 808.210.09.01 Measurement and Payment

For payment purposes, a count shall be made of the number of signal heads. All signal heads shall be complete with component and accessories and, when specified backboard.

Payment at the price specified in the purchasing order shall be for the supply of traffic signal heads delivered to the destination on the date and time specified.