SOUTH DUBLIN COUNTY COUNCIL

Traffic Management Centre
Roads (Traffic and Transportation) Department

TECHNICAL SPECIFICATION 1
SDCC-TS-01
TRAFFIC SIGNAL CONTROLLERS

REQUIREMENTS FOR THE DESIGN AND INSTALLATION OF
TRAFFIC CONTROL EQUIPMENT
FOR SOUTH DUBLIN COUNTY COUNCIL

Issue 5
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TRAFFIC MANAGEMENT CENTRE
ROADS (TRAFFIC AND TRANSPORTATION) DEPARTMENT
SOUTH DUBLIN COUNTY COUNCIL
COUNTY HALL
TALLAGHT
DUBLIN 24

1. TRAFFIC JUNCTION CONTROLLERS

1.1 All traffic signal junction controllers are to comply with the requirements of the latest edition of the British Highways Agency Specification TR2500 (formerly TR0141C and this technical specification).

1.2 All controllers shall be installed in accordance with South Dublin County Council's standard detail SDCC/SD/03. In addition, controllers shall be configured according to the '141' Traffic Signal Specification Forms supplied by the Council, or in the case of schemes designed by Third Parties, by the Engineer. In such cares the "141" forms shall be subject to approval by the Council, such approval to be obtained in writing. Where a conflict arises between specifications, the Council shall determine which shall prevail.

1.3 Traffic signal controllers shall be supplied in a robust weather proof galvanised steel case complete with high security lock and three keys, and shall incorporate a flush-mounted barrel-type key switch for police to switch off/on signals, complete with three keys. The cabinet shall be supplied complete with steel frame or other suitable means for embedding into concrete and shall be fitted with a door stay.

1.4 The controller shall be sited at a location which provides the best possible view of traffic on all approaches to the installation. This location to be agreed in advance with the Council.

1.5 The controller shall be fitted with an RS232 port compatible with a hand held terminal for the monitoring and alteration of timings, CLF plans, etc. as specified in clause 1.10(c) & 1.10(d) of this specification. It shall include an integrated cableless linking facility and shall provide all the stages of control required for the junction.

1.6 The controller shall be adjusted if necessary to suit the site installation but the circuits needed for full operation shall remain within the controller.

1.7 The controller must be capable of operating in the following modes:

a) Cableless linking facility (CLF);
b) Fixed Time;
c) Semi-vehicle actuated;
d) Fully vehicle actuated;
e) Manually controlled;
f) Hurry Call;
g) Bus Priority; and
h) UTC.
i) MOVA version 5 or above

1.8 Solar switch to be fitted to installation for dimming of signals during the hours of darkness. The dimming voltage shall be 160V ± 5%. If ELV or LV heads are to be used dimming shall be pro-rata. It should be noted that ELV heads may only be used in the context of a full ELV installation.

1.9 Controllers shall be supplied with an UTC interface to ensure future flexibility.

1.10 Controllers must be capable of meeting the following requirements:

(a) The lights shall appear in the following order:
Red - Red Amber - Green - Amber
(The red amber shall remain dormant until required by the Council.)

(b) Starting sequence to be agreed with the Council. On "switch on" any conflicting movements or stages shall close to red prior to any green signals appearing.

(c) The following shall be capable of adjustment on site with a hand held terminal.
(i) All Phase Timings
(ii) Vehicle Maximum Green Periods.
(iii) Time table and calendar details
(iv) Plan Details
(v) Clock

The following timings shall be capable of simple adjustment at site:
(i) Minimum Green
(ii) Vehicle Extension Time
(iii) Maximum Green
(iv) Variable inter-green

(d) The controller shall revert to a stage if a maximum green change is made from that stage. If no demand, there shall be an automatic reversion to main road or other defined stage.

(e) The fault log and fault history shall be accessible from the hand held terminal.

(f) A detector fault shall, if specified, lead to permanent demands for that stage / phase. All detectors shall be monitored for both detector permanently active and detector permanently inactive fault conditions. All detector faults and their fault status shall be logged in the controller fault log and this fault log entry shall be time and date stamped

(g) Safety timings (amber and all red) should be held in a non volatile memory i.e. PROM, Conflict monitoring to be integral to controller and
red lamp and all other lamp monitoring to be standard on controller.

(h) The controller shall ensure that either green - green or green - amber conflicts will not occur. Any two red lamps out to traffic on one phase shall be treated in the same manner as a conflict.

(i) The controller shall be capable of providing the stages in any order as called by the detectors.

(j) Provision shall be made for checking of the operation of the detectors.

(k) The controller shall, in the event of a conflict (including red lamps out), switch off all lamps on the affected stream and only the affected stream unless otherwise required by the council.

1.11 The chassis of controller is to be capable of accommodating additional racks, boards etc. as required by future expansion or additions to the controller. In particular, space shall be left for the installation outstation equipment required for remote monitoring and CCTV interaction.

1.12 The controller case and its electrical earth wire shall be connected to ground via an embedded conductor ½" O.D. nominal planted into the ground. Wiring (16mm square nominal) to conductor shall be insulated and in accordance with BS6761. The earth rod and connecting earth wire shall be visible within the controller case.

1.13 A corrosion preventative material (denso tape) shall be applied at the point of connection between the earth rod, earth rod clamp and earth conductor cable.

1.14 A distance of 2 metres minimum shall be observed when installing adjacent ESB mini pillars, traffic/CCTV mini pillars, traffic/CCTV cabinets.

1.15 Separate earth rods (electrodes) should be installed into mini pillars, traffic control cabinets and cabinets housing CCTV equipment. This practice should be carried out regardless of the distance between the two units as each unit is classed as a separated stand alone entity with different end users.

1.16 Earth rods should be driven within the unit and not on the soil exterior to the unit.

1.17 An earth bar connection block should be fitted to an internal wall of the traffic controller cabinets and CCTV cabinets. The main conductive earth cable from the earth rod should be terminated at this point and other earth bound connections (metallic doors, metallic frames) should terminated at this point.

1.18 A minimum of one twin 13 amp electricity socket, RCD, or equivalent shall be provided within the controller case.

1.19 Indicator lamps shall be of such intensity that they can be seen lit in sunlight. Indicator lamps, detector test lamps, detector packs and controls associated with particular traffic streams or direction of traffic shall be neatly marked giving direction of traffic served. Cable sockets and plug in components shall be neatly and clearly marked to indicate their function and/or to what they are connected.

Information Provided/Required

1.20 The following documentation shall be provided with the controller.

a) Maintenance manual
b) User and facilities manual
c) Installation manual
d) Site schematic drawing
e) Warranty including conditions of warranty

1.21 A complete controller schedule shall be supplied with the controller. This shall contain full details of the controller configuration for the junction concerned. It shall be suitably bound in a durable cover. This shall be kept in a special shelf or receptacle fitted to the controller cabinet. Two further unbound copies of the schedule shall be provided.

1.22 Suitable diagrams, not subject to fading with age, shall be displayed in a prominent position inside the controller housing. A diagram shall give the details of the stages of the particular location and identify and give the purpose of vehicle detectors.

1.23 A hardback service notebook in a plastic covering shall be provided with each controller.

Bus Detection System

1.24 Controllers shall support a selected bus detection system compatible with that used by South Dublin County Council.

Pedestrian Facilities

1.25 All controllers shall be capable of supporting an existing pedestrian phase or future pedestrian phase with the following characteristics.

a) Pedestrian heads in traffic signal installations shall be three aspect, namely red man, amber man and green man;
b) The electrical supply to push button units shall be not greater than 50 volts AC or 50 Volts DC;.
c) In general, the PRISMA DAPS push button units shall be used unless advised otherwise by the Council;
d) If applicable, the "wait" sign shall light and remain illuminated during the preset time and extended time. The wait panel shall be made of an unbreakable material; and
e) Provision shall be made for providing an audible signal where this is required.

Note: Push button units which are designed to facilitate visually impaired persons or disabled persons and which operate in a different manner to that described above may be considered by the Council.

Remote Monitoring

1.26 The controller shall be fitted with all necessary equipment for remote monitoring, compatible with the system in use in the Council's Traffic Management Centre. Remote monitoring shall be capable of two-way communication with the Traffic Management Centre via fibre switch. A GSM modem may be permitted in areas without fibre communications.

2. PEDESTRIAN SIGNAL CONTROLLERS

2.1 Pedestrian signal controllers are to be supplied in a robust weatherproof case complete with high security lock and three keys. The cabinet shall be supplied complete with steel frame or other suitable means for embedding into concrete and shall be fitted with a door stay.

2.2 The controller shall be sited at a location which provides the best possible view of traffic on all approaches to the installation. This location to be agreed with the Council.

2.3 The controller shall be capable of operating under the following conditions:

a) Fixed time. and
b) Vehicle actuated.

2.4 The pedestrian phase shall come into operation on push button demand after a pre-set time of 8 seconds has expired provided that:-

a) The interval between vehicles exceeds the pre-set extension time of 4 seconds; or
b) The vehicle maximum time of 20 seconds has expired

The "Wait Sign" shall light and remain illuminated during the pre-set time and extended time.

2.5 The controller shall be adjusted if necessary to suit the site installation but the circuits needed for full operation shall remain within the controller.

2.6 Controllers must be capable of meeting the following requirements:

(a) Starting sequence to be agreed with the Council. On "switch on" the signals shall commence with a minimum of a four second "all red" period, or flashing amber is permitted as an alternative.

(b) The following shall be capable of adjustment on site with a hand held terminal.

(i) All Phase Timings
(ii) Vehicle Maximum Greens.
(iii) Time table, Clock and calendar details
(iv) Plan Details
(v) Controller Fault Log and Historic Fault Log.

(c) The controller shall be capable of implementing a mains linking system.

(d) Safety timings (amber and all red) should be set in a non-volatile memory i.e. PROM. Conflict monitoring shall be integral to all controllers.

(e) The controller shall ensure that either ‘green – green’ or ‘green – amber’ conflicts will not occur. A facility for red lamp monitoring shall be provided. Any two red signals out in same direction to traffic shall be treated in the same manner as a conflict. The controller shall switch off in the event of a

(i) Green to green conflict
(ii) Failure of two red vehicle signals to illuminate on one approach.

(f) For Toucan crossings, the lights facing vehicular traffic shall appear in the following order:
Red - Green - Amber

At Pelican crossings the lights facing vehicular traffic shall appear in the following order :
Red - Flashing Amber - Green - Amber

Flashing amber to vehicular traffic shall commence a minimum of 2 seconds after flashing green man to pedestrians is displayed. This shall be adjustable with a hand held terminal.

(g) For Toucan crossings, the light sequence for pedestrians and cyclists shall be "Full Green" and "Green Cycle" followed by "Amber Man" and then "Red Man".

For Pelican crossings the light sequence for pedestrians shall be :
Green Man - Flashing Green Man - Red Man.

(h) A detector fault shall lead to permanent demands for that stage / Phase. All detectors shall be monitored for both detector permanently active and detector permanently inactive fault conditions. All detector faults and their fault state / status shall be logged in the Controller fault log and this Fault Log entry shall be time and date stamped.

(i) Provision shall be made for providing an audible signal. These shall be capable of being controlled by the controller timetable such that the audio signal can be switched off at night. The relevant timetable entries shall be adjustable from the hand held terminal.

2.7 Controller shall allow for dimming of signals during hours of darkness. A Solar switch shall be fitted. The dimming voltage shall be 160V ± 5%. If LV or ELV heads are to be used dimming shall be pro-rata. It should be noted that ELV heads may only be used in the context of a full ELV installation.

2.8 Stage lamps or similar indicator lamps will be required. Indicator lamps shall be of such intensity that they can be seen lit in sunlight.

2.9 Indicator lamps, detector test lamps, detector packs and controls associated with a particular traffic stream or direction shall be neatly marked giving direction of traffic served. Cable sockets and plug components shall be neatly and clearly marked to indicated their function and/or to what they are connected.

2.10 Provision shall be made for checking the operation of detectors.

2.11 Chassis of controller to be capable of accommodating additional racks, boards etc. as required by future expansion or additions to the controller.

2.12 The controller case and its electrical earth wire shall be connected to ground via an embedded conductor ½" O.D. nominal planted into the ground. Wiring (16mm square nominal) to conductor shall be insulated and in accordance with BS6761.The earth road and the connecting earth wire shall be visible within the controller cabinet.

2.13 Indicator lamps, detector test lamps, detector packs and controls associated with particular traffic streams or direction of traffic shall be neatly marked giving direction of traffic served.

Cable sockets and plug in components shall be neatly and clearly marked to indicate their function and/or to what they are connected.

Information Provided/Required

2.14 As indicated above, controllers shall be configured according to the '141' Traffic Signal Specification Forms provided by the Council or by the Engineer as appropriate.

2.15 The following documentation shall be provided with the controller.

(i) Maintenance manual
(ii) User and facilities manual
(iii) Installation manual
(iv) Site schematic drawing
(v) Warranty including conditions of warranty

2.16 A complete controller schedule shall be supplied with the controller. This shall contain full details of the controller configuration for the facility. It shall be suitably bound in a durable cover. This shall be kept in a special shelf or receptacle fitted to the controller cabinet. Two further unbound copies shall also be provided.

2.17 Suitable diagrams, not subject to fading with age, shall be displayed in a prominent position inside the controller housing. A diagram, on the inside of the main door, shall give the details of the stages of the particular location and identify and give the purpose of vehicle detectors.

2.18 A hardback service notebook in a plastic covering shall be provided with each controller.

Pedestrian Facilities

2.19 All controllers shall have the following characteristics.

a) The electrical supply to push button units shall be not greater than 50 AC or 50 Volts DC ;
b) In general, the PRISMA DAPS push button units shall be used unless advised otherwise by the Council;
c) If applicable, the "wait" sign shall light and remain illuminated during the preset time and extended time. The "wait" sign shall light and remain illuminated until the Green Man appears, the light shall appear if demanded during the pedestrian clearance period or Vehicle green Period. The wait panel shall be made of an unbreakable material; and
d) Provision shall be made for providing an audible signal where this is required.

Note: Push button units which are designed to facilitate visually impaired persons or disabled persons and which operate in a different manner to that described above, may be considered by the Council.

Remote Monitoring

2.20 The controller shall be fitted with all necessary equipment for remote monitoring, compatible with the system in use in the Council's Traffic Management Centre. The remote monitoring shall be capable of two-way communication with the Traffic Management Centre.

3 ADDITIONAL INFORMATION

3.1 Additional information or clarification may be obtained from:

Traffic Management Centre
Land Use, Planning and Transportation Department
South Dublin County Council
County Hall,
Town Centre,
Tallaght,
Dublin 24

Tel: +353 (0) 1 46 26 826
Fax: +353 (0) 1 46 26 826

Email: tmc@sdublincoco.ie