SOUTH DUBLIN COUNTY COUNCIL

Traffic Management Centre
Roads (Traffic and Transportation) Department

TECHNICAL SPECIFICATION 4
SDCC-TS-04
SIGNAL INSTALLATION REQUIREMENTS

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

Issue 8
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TRAFFIC MANAGEMENT CENTRE
ROADS (TRAFFIC AND TRANSPORTATION) DEPARTMENT
SOUTH DUBLIN COUNTY COUNCIL
COUNTY HALL
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1. GENERAL REQUIREMENTS

1.1 The works shall be carried out and all materials and equipment shall comply with current relevant Irish specifications. https://www.trafficsigns.ie/tsm-cur

1.2 Installation shall comply with the requirements of the DETR Local Transport Note (LTN) 1/98, The Installation of Traffic Signals and Associated Equipment and any contract documents prepared by South Dublin County Council for the Scheme. Where the requirements of this document exceed the requirements of LTN 1/98 and the contract documents, this document shall take precedence.

1.3 Traffic signal pole positions shall be marked out on site and agreed with SDCC Traffic Management Centre and the Resident Engineer prior to installation commencing.

1.4 Equipment provided shall meet the requirements of TRG 1068 (Electro Magnetic Compatibility Tests).

1.5 All new Installation must be ELV Traffic Lights and Controllers.

2. CONTROLLER, POWER SUPPLY AND TELEPHONE CIRCUITS

2.1 Controllers shall be installed in accordance with the Standard Detail SDCC/SD/01 and shall contain a UTC interface & all equipment to connect to SDCC IPSUM CITY. **All controllers shall be connected to SDCC Ipsum City AFMS on Switch on Date**.

2.2 Dimming shall be operated by a photoelectric cell and normally operate at 160 volts. The solar cell shall be carefully sited to avoid street lighting or overshadowing that would be detrimental to normal operation. If 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.

2.3 Power, the supply of which shall be arranged by the Engineer, shall be un-metered, single phase with protection against overcurrent and short circuit terminated in a Haldo pillar (or agreed equivalent) located in the proximity of the controller in an agreed position, and ducting shall be installed between the pillar and the controller. The supply shall be 230 volts (+/- 6 percent), 50Hz (+/- 1 percent), 30amp minimum. Actual power supply requirements shall be confirmed by the Contractor taking into account the number of heads, length of cable runs etc.

2.4 All metal framework, casing, base units etc, must be earthed in accordance with the latest version of the National Rules for Electrical Installations. The current standard is I.S 10101:2020. and the equipment must comply with Electro-Technical Council of Ireland (ETCI) requirements.

2.5 It is not acceptable to source ‘Mains Supply’ from Public Lighting (PL) poles, but on occasion with the prior agreement from the council, for the purpose of a ‘temporary supply’, it may be acceptable on a short term bases to do so and under such circumstances the following should be observed:

Temporary supplies taken from PL poles should have adequate fusing and isolation at both ends

of the circuit path. On the PL poles side, a HRC fuse carrier unit (or equivalent) should be installed to protect the circuit and to act as a form of isolation. Cable and fuse sizing should be chosen to reflect the existing wiring of the PL pole. Supply cables leaving the PL pole to temporarily service other applications should have the same conductor diameter as the PL supply conductor. In circumstances where it is required to reduce the diameter of the temporary supply cable leaving the PL pole the use of an appropriate fused unit should be employed to correctly step down the cable conductor diameter and associated current rating.

On the user end of the circuit path (traffic controller cabinet/CCTV cabinet/mini pillar), properly rates fused protection should be employed to protect against over current and act as a form of isolation (Lucy Triton or equivalent). All13Amp sockets installed in the unit should be protected with the use of a Residual Circuit Device (RCD).

2.6 When connecting to 'Mini Pillars' there should be two separate and distinct sections, the ESB supply side and the consumer side. The ESB supply side should incorporate a suitably rated main fuse unit along with an isolator unit (supplied and fitted by the ESB). The consumer side should incorporate a fused unit isolator (Lucy Triton or equivalent), the proper fusing convention and cable sizing should be adhered to. Glands, grommets and shrouds should always be used to maintain the IP rating of the electrical equipment.

2.7 In situations where the source of the incoming ESB supply is taken off an overhead power line it is acceptable to have the ESB side of the power circuit located on the ESB pole itself provided that suitable IP exterior rated equipment is used and it is placed at an adequate distance up the pole (5-7 metres). The correct SWA glands and PVC sleeves/shrouds should be used. The Consumer side of the power circuit should be located in the mini pillar as normal.

2.8 Low Voltage and Extra Low Voltage cabling should be kept separate and segregated and not run in the same circuit path or overlap within controllers and cabinets.

2.9 The permanent power connection point shall be connected to a permanent ESB supply with corresponding ESB MPRN (Metre Point Registration Number). Permanent power supplies from public lighting columns will not be acceptable under any circumstances.

2.10 A consumer earth terminal shall be supplied. This terminal shall be located adjacent to the mains "cut out".

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

2.12 The following should be noted:

a) An agreed communications circuit shall be terminated in the controller case; and
b) ducting from the controller case to the nearest communications chamber shall be provided. The location of the communications chamber shall be agreed on site with the Engineer.

3. STREET FURNITURE

3.1 Traffic signal heads shall be LED based and fitted with backing boards and appropriate hoods. Any heads mounted at a height greater than 2.1m above ground level (measured to the underside of the head) shall utilise LED technology traffic signal heads (with approved lamp monitoring facilities) and all related electrical equipment shall be housed within an appropriate sized midi pillar at the base of the pole. Within the midi pillar all electrical connections shall be made off within an appropriately IP rated PVC enclosure. Correct glands and shrouds should be employed to maintain the integrity of the IP rating of the enclosure.

Other Signals require SDCC approval.

3.2 Poles:

a) shall be galvanised with a grey plastic coated sleeve;

b) shall be installed so that the pole is not less than 800 mm from the nearest kerb face and no part of any head fixed to the pole shall be within 500mm of the nearest kerb face; and

c) cranked poles may only be used by agreement.

d) Other poles require SDCC approval

3.3 PRISMA DAPS push button units shall be used unless advised otherwise by the Council. Audible devices shall be used when appropriate but tactile devices shall always be utilised. Other push buttons require SDCC approval

3.4 Poles carrying push buttons shall be installed 0.5m from the white lines of the crossing to allow pedestrians and cyclists to easily reach the push buttons.

3.5 Pole caps shall be grey coloured and securely fixed to the pole using a bolt or other mechanism. Pole caps shall not protrude above the top of correctly installed pedestrian or traffic signals heads.

3.6 Smartmicro will be used on all new installations for virtual detection loops. Each unit will be set up for full data collection and connected to the SDCC IPSUM cloud. Smartmicro will not replace physical loops, and traffic detection loops in the road will continue to be installed.

4. SPECIFICATION FOR ALUMINIUM TRAFFIC SIGNAL POLES

4.1 All poles shall comply with BS EN12899 including Guidance Notes PD 6547 and where specified by the Roads Authority's Representative with the requirements of The Highways Agency Department Standard Design of Minor Structures CD354. Where there is a requirement for Passive Safety then the documents EN12767:2019 should be considered.

4.2 The design of the poles will consider the wind loading factors as stated in EN12899. Plus, the Administrative Area is a factor included for consideration as part of the locality as described in PD6547 Table A.1.

4.3 4m signal poles shall have the following base diameter; 114mm at the root section, tapering outwards above ground to 120mm.

6m HD and Raise and lower poles will have a base diameter of 165mm

4.4 Poles shall be manufactured from a 6000 series Aluminium alloy to the following specification:
- Alloy to be used: EN AW - 6060 Temper: T66

4.5 Poles shall be extruded in one piece to form a continuously stepped parallel tube or conical shape having no welds or joins within the construction. This excludes bracket fabrication.

4.6 Poles should be reinforced at door level by a CE certified welded press stressed reinforcement profile according to EN-40-3-3 item 5.6 that fits snugly into column tube and contributes to the strength of the column for both tension and torsion.

An aluminium reinforcement profile shall consist of an extruded profile and shall be inserted around the door opening. This profile will be robot welded using an inert gas (MiG) to the back of the column together with the mounting rail.This reinforcement profile should give a 5+ reinforcement rating.

4.7 Door opening size is to be 500 x 85mm and to be situated 1400mm from ground level to the bottom of the door. All doors shall be flush finish to the outside diameter of the column and shall be complete with two sliding door locks situated at each end (top & bottom) of the door. The lock shall be constructed from an aluminum cast piece Alloy GD-AlMg9, with a stainless steel M8 threaded bolt complete with triangular lock head and a stainless-steel L profile bar that secures the door in place. The lock shall include a stainless-steel spring and a stainless-steel plate to prevent the ingress of water and dirt into the column void through the mechanism thus creating a (IP44) seal.

4.8 The column shall be fitted with an extruded Aluminium channel rail

4.9 Stainless Steel Earthing terminals shall be provided on the signal pole body in the door aperture area and the inside of the column door, size M8 set bolts complete with Stainless steel washers and nuts (two of each).

4.10 Root Section:

Option 1 – (retention socket) 4-6m poles-114mm base diameter - Installation into 115mm retention socket Poles with 165mm base diameter – installation in 168mm retention sockets (900mm deep)

Option 2 – Direct planted- (non-standard, factory order only) with 150x75mm cable entry slots, two layers of anti- chemical tape and ground level protector

4.11 Column Finish: Poles powder coated to RAL 7037 Grey or RAL9005 Black

4.12 The pole shall display a means of identification by way of a sticker above the door and comply with CE and (EN12899) And form part of a Quality assured Process e.g. ISO 9001.Information Displayed includes: -CE mark, article Number, order number and date of Manufacture.

4.13 The pole shall incorporate an integrated invisible hinge mechanism with access through a door. This shall be available in 4 different folds down positions as required. The Hinge shall incorporate a spring type cable protector. The Hinge locking bolts shall be captive when unscrewed to avoid them falling into the base compartment but shall be able to be replaced for maintenance purposes. The bolt heads shall be Allen-key head type M10. The column style shall be available in either conical or stepped cylindrical versions.

4.14 Packing: Columns shall be adequately packed and crated during transport and storage to prevent damage to their finish.

4.15 Storage: Unpacked columns must not be stored directly on the ground that may cause abrasions or scoring to their surface. Where lifting equipment is required, fabric or other non-abrasive straps should be used. The packaging shall be left in place to protect against surface damage as long as possible. Columns stored outside shall always be stored without a plastic sleeve or cover to avoid staining.

5. CABLING

5.1 LV (low voltage) and ELV (extra low voltage) cabling shall be steel wire armored color coded except for detector feeder cables that shall be unarmored single pair. The armoring shall be utilised as the Earth Continuity Conductor and shall have adequate conductivity.

5.2 At least 4 spare cores at the pole cap shall be provided for each LV cable run and each ELV cable run to push buttons .

5.3 Joints shall not be permitted for LV cabling or ELV cable runs to push buttons.

5.4 All cables shall be laid in ducts and LV and ELV shall be segregated into different cables.

5.5 All cables (LV and ELV) shall be clearly labelled at the controller and in chambers using indelible ink on plastic labels securely fixed to the cable to indicate their function in

sufficient detail to allow future maintenance and modification.

5.6 Separate neutrals shall be utilised for signaling, regulatory signs and push buttons.

5.7 Unused cable cores at the controller shall be connected to earth at the controller end only.

5.8 Unused cable cores between poles shall be connected to earth at one pole only.

5.9 Earthing shall be in accordance with Irish Standard I.S 10101:2000

5.10 Traffic signal cables shall not pass through ducts or chambers used by any other service other services shall not utilise traffic signal ducts.

5.11 The nearside primary on each approach shall be cabled back to the controller separately from any other signal head. The traffic signal heads showing to any one stop line shall not be fed by the same cable.

6. APPROVAL

6.1 Equipment shall be type approved to appropriate EU Or UK DETR/HA Specifications

6.2 Controllers shall be type approved to the latest edition of TR 2210 (formerly TR0141C) OR EU Equivalent

7. TESTING

7.1 The following tests shall be undertaken and copies of appropriate test certificates supplied to the Engineer on completion of the relevant tests:

a. factory acceptance tests of the controller.
b. On site electrical tests, in accordance with the current standard is I.S 10101:2020 (Requirements for Electrical Installations) including earth continuity, insulation resistance test, polarity check, earth loop impedance test and (if fitted) RCBO test;
c. loop and loop feeder cable tests; and
d. site acceptance test of the complete installation.

7.2 An ‘Earth Fault Loop Impedance Test’ should be carried out to establish whether the ‘Neutralising Link’ has been placed in the circuit path prior to the consumer supply point. If resistance readings indicate that the neutralising link has been omitted, then the neutralising link should be put in place to ensure that electrical circuit equipment (MCB/RCD trip times) response characteristics are maintained.

7.3 The Engineer, and others as the Engineer may consider necessary, shall witness all tests. In the event of the failure of tests necessitating re-testing, the Contractor shall meet all reasonable time and travel and subsistence costs incurred by the Engineer or others attending the retest.

7.4 Commissioning and switching on will not take place until:

a) All tests are completed to the satisfaction of the Engineer and a Completion Certificate as prescribed in the contract documents is issued;

b) all works are completed; and

c) the final safety audit (if required) is satisfactorily completed

7.5 The Engineer may allow minor works that do not affect safety to be completed after switch on.

8. MAINTENANCE

8.1 The traffic signal equipment will be maintained by the installation Contractor after switch on until a fault free period of 30 days is achieved. The maintenance shall be undertaken in accordance with relevant South Dublin County Council maintenance performance requirements.

8.2 After the Council's maintenance Contractor takes over maintenance the installation Contractor shall provide a one-year return to base warranty service.

9. TUNING

9.1 The Engineer shall, within three months of switch on, tune the operation of the timings and timing plans.

9.2 The Contractor shall allow for incorporating any adjustments in an updated controller EPROM and installation in the controller within 2 weeks of receiving the necessary information. Revised controller specification forms and if necessary updated drawings shall also be reissued prior to installation of the new EPROM.

10. DUCTING AND CHAMBERS

10.1 All installations shall be fully ducted using a spinal ducting system connecting between chambers located in verges/footpath (but not located in tactile paving). Poles, other equipment and loops shall be connected to the spinal chambers in an agreed manner. Where there are two or more signal installations on the same scheme they shall be linked by 2 no ducts.

10.2 All legs of traffic signal installations shall have duct crossings, ie so that a duct 'ring' is achieved.

10.3 The number of ducts between chambers in the spinal system shall not be less than three in carriageway and two elsewhere. The actual number shall be shown on the appropriate

drawings. In any case sufficient ducts shall be provided to allow complete re-cabling of the junction while the signals remain fully operational.

10.4 Ducts in carriageway shall be installed at 750mm deep and 450mm deep elsewhere.

10.5 A 50mm red 'hockey stick' duct shall be installed from the ESB mini pillar to the traffic/CCTV mini pillar. An additional 50mm red 'hockey stick' duct shall be installed from the nearest public lighting column to the traffic/CCTV mini pillar.

10.6 Ducts shall be:

a) 100mm diameter medium/high density smooth internal bore polyethylene, minimum wall thickness 5mm (+/- 0.1mm) coloured orange with the words "Traffic Signals" printed in 9mm high white lettering along the outside at intervals not exceeding 1 metre;
b) impact resistant, impervious to water and sufficiently flexible to accommodate undulations in the trench; and
c) when installed shall be properly jointed or sleeved to provide a continuous smooth internal bore with the printed words "Traffic Signals" uppermost.

10.7 A single, securely fixed, polypropylene draw wire shall be left in every duct after installation of the cabling.

10.8 Duct chambers shall be Cooper Clarke or agreed equivalent:

a) spinal chambers shall not be less than 600 by 600mm (nominal);
b) chambers with integral pole foundations shall be 300 by 300mm or 450 by 450mm (nominal); and
c) chambers for loop tails shall be not less than 300mm by 300mm (nominal) but loop tails may be run into spinal chambers and chambers with integral pole foundations when appropriate.

10.9 Chamber lids shall be occasionally run over unless otherwise required by the County Council.

11. DUCTED IMPACT RESISTANT RETENTION SOCKET

11.1 Retention Sockets tops must be constructed from a suitable structural grade cast steel (IS EN 10340:2007), ductile iron (IS EN 1563:2018) or impact tested fabrication which has been approved by an independent accredited test house.

11.2 Retention Sockets must be capable of withstanding high-speed vehicle impact forces to steel posts with a wall thickness of 6mm. Retention Sockets must be able to withstand this impact without any structural support to the top 80mm of the unit. A valid impact test must result in a post deflection greater than 30 degrees. All sockets must be impact tested. Test data and independent certification must be available to substantiate claims for sockets and foundations.

11.3 Posts must be positively secured into the Retention Sockets and be able to adequately withstand the maximum turning moment expected over the products design life

11.4 All fixings which secure posts in place must be housed below ground ensuring no risk of damage, vandalism

11.5 The Retention Socket will not require the use of any specialised or non-standard tools in its operation except where additional security features are specified.

11.6 Retention Socket Pedestrian plugs and lids must be tested to the loading requirements of EN124 - B125 (12.5 tonne) loading.

11.7 Where feasible pedestrian plugs must be able to be stored within the Socket to enable rapid deployment in the case of an emergency

11.8 Retention Sockets must have the ability to be reduced in depth on site easily.

11.9 Where electrical connection is required Retention Sockets must be supplied with a bottom entry bend that can swivel 360 degrees. The bend must have the ability to utilise the full bore 100 mm diameters for easy cable entry. The bend must be compact, allowing the post to rest no further than 220mm above the foundation base. Ducts must be able to be inserted a min of 75mm into the bend and be mechanically fixed to ensure no displacement occurs during backfill.

11.10 All operating components must be easily serviceable on site without removing the socket.

11.11 The Retention Socket must be capable of accommodating graded surfaces in paved area such as those at pedestrian crossing.

11.12 Retention Sockets supplied must have the ability to operate with an associated lifting mechanism which enables poles to be lifted and lowered in and out of the Retention Socket and remove the necessity for working at heights. This must be capable of operating without the requirement for carriageway closures / TM.

11.13 Suppliers of Retention Sockets must be able to supply EN40 & BD94/14 foundation design calculations for all sizes and depths of retention sockets supplied.

11.14 An impact resistant Retention Socket must clearly display in a permanent manner the brand of the manufacturers as well as contact details on a surface visible when installed.

11.15 The manufacturer of the Retention Socket must operate a certified quality management system such as ISO9001 or equivalent. This certificate should make reference to the design and manufacture of infrastructural products for roads and street furniture.

12. MISCELLANEOUS

12.1 **All heads shall be bagged until switch-on** and appropriate temporary signing shall be installed and maintained until three months after switch on when they shall be removed.

12.2 Two copies of the as-built drawings (including layout, heads, cabling (including core allocations

and spare cores) and staging) at 1:200 scale shall be handed over prior to take-over. Drawings shall also be provided electronically in an agreed format and/or on paper.

12.3 One controller User Manual suitable for installation, operation and maintenance shall be provided and two sets of controller keys shall be provided, per site.

12.4 A site logbook of a type agreed with the Engineer shall be provided and this shall be stored together with one of the supplied controller specifications and one set of drawings in a waterproof wallet fixed inside.

12.5 **The Contractor shall deliver the following spare equipment to SDCC as part of the handover package, or during the week of the Site Acceptance Test (SAT). All spare equipment provided must be brand new, unused, and fully compatible with the make and model of the installed controller and junction infrastructure.**

Items:

- 1no Processor / CPU Card
  1no Lamp Card
- 1no 3 aspect signal head RAG complete
- 1no 3 aspect signal head RmAmGm complete
  1no Red optic + Amber optic + Green Optic
  1no Pedestrian Push Button
- 1no 4m Traffic Pole

13. ADDITIONAL INFORMATION

Additional information or clarification may be obtained from:

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

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