# 700 STREET LIGHTING AND ILLUMINATED TRAFFIC SIGNS/BOLLARDS

## 701 INTRODUCTION

1. This Specification details the requirements to be met for an installation to be of an adoptable standard and covers the design, supply, erection, wiring, testing, painting, inspection and commissioning of street lighting and illuminated traffic sign/bollard units as described hereafter. ***It is essential that Developers consult with the Engineer regarding likely street lighting requirements at an early stage in the design of the development.***

2. For this Section (700 - Street lighting and illuminated traffic signs/bollards) of the Specification only, all references to the Engineer shall mean the Engineer's appointed representative who shall be the Council's Engineer – Street Lighting.

3. The Engineer will decide on the lighting provision for the development or areas of the development.

4. Street lighting must comply with Dorset Council's Street lighting and Illuminated Signs Policy - in particular the zoning system (the zone into which a development falls will be decided by the Engineer) the following is an extract from the policy:

> *Environmental Zone 1*
> *World Heritage site, Areas of Outstanding Natural Beauty, Sites of Special Scientific Importance and other Dark Sky Areas or Reserves - these are areas that currently have very low population densities and no, or intermittent, lighting.*
>
> *Villages and settlements within this zone will generally only be provided with lighting when it is requested and funded by the Town or Parish Council, with support from the residents and interest groups. Such lighting will be limited to strategic locations such as telephone boxes, bus stops etc.*
>
> *Apart from designated traffic routes all other lights may be operational for just part of the night, when levels of highway use are at their highest. Statutory and safety requirements may require that some lights remain in operation all night.*
>
> *Lighting will generally only be installed outside of villages and settlements where there is a night-time safety issue that cannot be resolved by other means.*
>
> *Careful design will ensure that, where possible, rural locations are not urbanised by the provision of a lighting scheme. Luminaries should be well controlled and restrict the upward light ratio to 0% with a Correlated Colour Temperature (CCT) which should ideally not exceed 3000K.*

*Environmental Zone 2*
*Areas of Low District Brightness (Rural locations outside Zone 1), these are areas that have low / medium population densities and some roads already lit.*

*Villages and settlements within this zone may not currently be lit and if they are, may not be lit to the current or an historic standard. Any new lighting schemes will be provided in accordance with the relevant current minimum standard applicable to the type and use of the highway.*

*Apart from designated traffic routes all other lights may be operational for just part of the night, when levels of highway use are at their highest. Statutory and safety requirements may require that some lights remain in operation all night.*

*Roads between villages and settlements in this zone will generally only be provided with lighting where there is a known safety issue during the hours of darkness that cannot be solved by other means.*

*Luminaries should be well controlled and restrict the upward light ratio to 0% with a CCT which should ideally not exceed 3000K.*

*Environmental Zone 3*
*Areas of Medium District Brightness (Urban Location), these are areas that have medium / high population densities with most roads already lit.*

*Generally, within an urban location all highways will be lit in accordance with the current or an historic standard, applicable to the type and category of the highway.*

*Apart from designated traffic routes all other lights may be operational for just part of the night, when levels of highway use are at their highest. Statutory and safety requirements may require that some lights remain in operation all night.*

*In areas of special environmental interest, dark landscape and ecologically sensitive areas such as parks and woodlands, individual assessments will be carried out.*

*Luminaries should be well controlled and restrict the upward light ratio to a maximum of 2.5% with a CCT which should ideally not exceed 4500K.*

*Environmental Zone 4*
*Areas of High Brightness (Urban centres with high usage during the hours of darkness), these are areas that have high population densities where all roads should be lit to a current or an historic lighting standard, applicable to the type and category of the highway.*

*In urban centres with high vehicle or pedestrian use during hours of darkness, carefully designed lighting will not only provide adequate illumination for the motorist but also provide an interesting and attractive ambience for pedestrians. Luminaries should normally be well controlled and restrict the upward light ratio to a maximum of 15%, whilst also allowing illumination of building facades and with a CCT which should ideally not exceed 4500K.*

***For full details of the Council's policy on Street Lighting and Illuminated Signs, the Developer is referred to the Street Lighting page of the Dorset Council's website www.dorsetcouncil.gov.uk***

## 702 GENERAL

1. All work and design relating to the installation of street lighting and illuminated traffic sign equipment shall be in accordance with:

   a) Good Industry Practice;

   b) All relevant Codes of Practice, including Department of Transport Advice Notes and Technical Memoranda;

   c) All relevant Legislation (including, but not limited to, the Health and Safety at Work Act, Traffic Management Act, the Electricity at Work Regulations, the Highways Act, the New Roads and Street Works Act, Road Traffic Acts, the Traffic Signs Regulations, the Data Protection Act and the Human Rights Act);

   d) All relevant national policies relating to street lighting including, but not limited to the ILP and UK Lighting Board Codes of Practice;

   e) All relevant Authority Policies and standing orders, including the Corporate Improvement Plan, the Local Transport Plan, the Equal Opportunities Policy, the Race Relations Policy and the Financial Regulations;

   f) The rules and regulations of the Electricity Network Operator (henceforth referred to as the ENO) or any equivalent and/or successor guidance/legislation from time to time.

2. The Developer's Street Lighting Contractor (henceforth referred to as the Contractor) shall be registered under a nationally recognised Quality Assurance Scheme accredited in accordance with the requirements of the current BS EN ISO 9001 with a scope of registration which includes for the design, installation, cabling/trenching and maintenance of highway electrical equipment.

3. The Contractor shall be registered under the Highway Electrical Registration Scheme (HERS) with a scope of registration which includes for the design, installation, cabling/trenching and maintenance of highway electrical equipment. All operational staff employed must have a valid HERS registration card to prove their competency.

4. The Contractor shall employ only competent personnel and ensure that all operatives are, at a minimum, trained in accordance with and/or in relation to:

   a) National Highway Sector Scheme 8;

   b) Engineering Authority recommendation G39/1;

   c) Health and Safety at Work Act, 1974;

   d) New Roads and Street Works Act 1991;

   or any equivalent and/or successor qualifications/Legislation from time to time.

5. The Developer will be responsible for the integrity, security and safety of the system installed and shall maintain the equipment in accordance with the design parameters, statutory law and all relevant codes of practice until the whole works are adopted by the Council. However, routine maintenance and energy charges may be accepted upon commissioning by the DNO and the satisfactory inspection by the Engineer. This may happen prior to, but without prejudice to, the formal adoption process.

6. Supplies provided to electrical equipment and lighting units for a third party shall not be connected to the Council's dedicated supply.

7. No existing Lighting Unit shall be switched on or off, dismantled, re-sited, replaced or removed without prior approval of the Engineer.

8. Before any building on the development is occupied, all lighting columns must be installed, and the ENO services paid for each one.

**703 DESIGN**

1. Street lighting shall be designed in accordance with, but not limited to:

   a) BS5489 and BS EN 13201;

   b) BS7671 IEE Wiring Regulations - Requirements for Electrical Installations;

   c) Dorset Council's policy on street lighting and Illuminated Signs.

2. The street lighting scheme shall either be designed by the Engineer (at no additional cost to the Section 38 Developer) or by the Developer, in which case it shall be subject to the approval of the Engineer.

3. The Engineer reserves the right to specify the manufacturer/catalogue number for any or all the equipment to be installed. This will be based upon the exact design requirements for an individual development, compatibility with existing equipment and the minimisation of energy/maintenance liabilities.

4. The equipment shall be of a type and scale that is in keeping with the immediate environment minimising light pollution and compliant with Dorset Council's Street Lighting and Illuminated Signs Policy. It will seek to minimise the whole life running and maintenance costs.

5. Extensions to existing systems will generally be carried out using equipment similar to that on adjacent streets. However, in the case of a Developer-designed scheme it is highly recommended that this is checked with the Engineer at the outset.

6. Street lighting designs, which incorporate equipment of a non-preferred type (for aesthetic and/or planning reasons), shall only be permitted subject to payment of a commuted sum by the Developer. The sum will usually be based upon the difference in cost between the proposed scheme and a standard scheme - based on the current replacement cost of the equipment and the energy and maintenance costs accumulated over the equipment's projected life-span (further details should be obtained from the Engineer Development Team).

7. For an Engineer-designed street lighting scheme the Developer shall provide 1:500 plans of the development, where possible in the form of computerised drawings of a *.dwg format.

8. The Engineer's design will include plans of the development indicating the number of units and their locations with a reference number. A comprehensive equipment specification will also be provided on the plan. The Engineer's design should be incorporated into the Developer's own plans and re-submitted to the Engineer for approval. Following satisfactory checking of the revised plans the Engineer shall issue a Street Lighting Design Certificate, valid for three years from its issue date. If construction is likely to take longer than this a phased project should be considered to prevent this time limit being exceeded.

9. Developer-designed schemes shall consist of 1:500 scheme plans, which identify the location of all proposed lighting units with a reference number and any existing units within 100 metres of the development. The plans shall also include a comprehensive equipment specification (including manufacturer's catalogue and reference number). In the case of adjustable luminaires their settings shall be detailed. Photometric calculations shall be provided in the form of a comprehensive Lighting Reality software report or a similar industry approved software report. The report should clearly demonstrate that the proposed lighting scheme complies with the required lighting levels, the current edition of BS5489 and BS EN 13201and Dorset Council's street lighting and Illuminated Signs Policy.

10. Upon satisfactory checking of a Developer-designed scheme the Engineer shall issue a Design Certificate which shall be valid for three years from its issue date. If construction is likely to take longer than this a phased project should be considered to prevent this time limit being exceeded.

11. The Developer shall not energise any lighting scheme which does not have a valid design or check certificate to confirm compliance with the current edition of BS5489, BS EN 13201 and Dorset Council's Street Lighting and Illuminated Signs Policy.

12. Any variation in the location of the lighting units or the type of equipment proposed by the Developer shall require written agreement from the Engineer.

13. Failure to install street lighting as certified will result in the Council's refusal to adopt the lighting units.

14. Where the use of brackets attached to buildings is proposed (primarily in mews courts, courtyards or residential squares) then appropriate easements shall be provided to the Council and included in property deeds, prior to the dwellings being sold.

15. The Developer is to ensure that all homeowners are aware of the location of all proposed street lighting equipment.

16. Where alterations to existing lighting units are to be made the Developer will be responsible for all consultation with existing residents.

17. Any equipment installed prior to the design certificate issue date will not be considered for adoption and must be replaced, except where a written agreement is given by the Engineer – with a maximum of ten years old for the structural elements e.g. column, wall bracket etc.

## 704 ELECTRICITY SERVICE CABLES AND CONNECTIONS

1. The Council does not permit the use of service connections, which will not be in the continuous ownership of the DNO (Distribution Network Operator).

2. The DNO's electricity cables and connections are not included in the scope of this Specification and the DNO should be consulted directly.

3. IDNO (Independent Distribution Network Operator) service connections may only be permitted when the individual IDNO has entered into a service level agreement with Dorset Council.

## 705 CABLE DUCTING

1. The ENO's cable ducting is not included in the scope of this Specification and the ENO should be consulted directly.

## 706 LIGHTING COLUMNS, SIGN POSTS AND BRACKETS

1. Lighting columns shall comply with all relevant standards, legislation, codes of practice, and industry good practice. In particular, but not limited to, lighting columns shall comply with BS EN 40.

2. The column and/or sign post manufacturer shall be registered under a nationally recognised Quality Assurance Scheme accredited in accordance with the requirements of the current BS EN ISO 9001.

3. All columns will be designed to include for a fifty years' fatigue calculation.

4. All columns will be designed with life calculations based on a once-in-fifty-year wind speed and a minimum design for fifty-year corrosion protection.

5. The BS EN 40 data sheets and relevant calculations shall be provided to the Engineer for all columns, to demonstrate that the column design is compliant.

6. If columns with brackets have been agreed with the Engineer, at the point of intersection of shaft and bracket, the cross section of the bracket will equal that of the shaft, and the design of the connection will be such as to prevent the ingress of moisture into the shaft.

7. The assembly of the column shaft and bracket will incorporate a mechanical location system to prevent rotation, in addition to high tensile socket headed securing screws. The bracket will be designed to enable it to be fitted in any one of 4 x 90° positions relative to the door opening.

8. Each column will be provided with a single door, and all door openings will be a minimum of 500mm x 100mm and/or adequate to permit access to all equipment mounted on the backboard. The door opening shall be free from irregularities and burrs. Doors will have a suitable earthing lug on their internal face and fitted with a substantial and positive triangular-headed securing device. The head of the Tri-Screw shall be M8 in size.

9. An earth terminal will be provided in the base compartment and on the door. In each case it will comprise of a brass or stainless-steel bolt, size M8, complete with nuts and washers.

10. A suitable baseboard will be provided in the base compartment of size not less than the door opening for the fixing of electrical equipment. The cable entry slot will be situated on the same face as the door and will be not less than 150mm x 60mm.

11. All columns (including bracket) and sign posts (including the planted root section) will be coated with a manufacturer applied system, which also provides additional protection against corrosion but without the requirement for routine maintenance or re-application. The particular specification is available upon request.

12. The finish colour to all lighting columns (including bracket) and sign posts will be Dorset Council's standard Grey to BS4800:10 A 07 or the equivalent Ral colour 7042. Alternative colours can be considered on specific application to the Engineer and will be subject to a commuted sum.

13. To comply with Dorset Council's Street Lighting and Illuminated Signs Policy the maximum column height to be used is set out in Table 700/1.

**TABLE 700/1 Maximum Column Heights**

| Location | Maximum Column Height (in metres) | |
|---|---|---|
| | Residential Roads | Traffic Routes |
| Zone 1 | 5m | 8m |
| Zone 2 | 5m (6m on cycle routes) | 8m |
| Zone 3 | 6m | 10m |
| Zone 4 | 5m (6m on shared pedestrian and vehicle routes) | 8m |

*Note: Zone 1 - World Heritage site, Areas of Outstanding Natural Beauty, Sites of Special Scientific Importance and other Dark Areas;*
*Zone 2 - Areas of Low District Brightness (Rural locations outside Zone 1);*
*Zone 3 - Areas of Medium District Brightness (Urban Location);*
*Zone 4 - Areas of High Brightness (Urban centres with high usage during the hours of darkness).*

If engineering difficulties are experienced at the design stage due to column height restrictions, then further enquiries should be made to the Engineer.

14. Design of all columns shall include for a sign of 5 kg x 0.6m$^2$ x 1.8 shape coefficient mounted 2500mm above ground level and eccentrically 300mm.

15. Columns mounted on footways, which do not have adequate structural capacity or a clear access width of at least 2.500m, shall be of a hinged type approved by the Engineer. Footway bollard lighting shall only be used with the prior approval of the Engineer - its use is only likely to be acceptable in exceptional circumstances and would only be permitted subject to payment of a commuted sum by the Developer. Further details should be obtained from the Engineer Development Team.

16. All columns and brackets supplied must be manufactured by a company registered under the Quality Assurance scheme ISO 9001. The Developer must supply to the Engineer a copy of the appropriate registration documentation prior to any purchases or the erection of any lighting columns and brackets.

17. All lighting column/bracket combinations manufactured by the same manufacturer shall carry a unique identification mark which indicates the name of the manufacturer, the year of production and other design information to enable details of the column and bracket to be determined throughout its design life. The unique identification mark shall be clearly visible after erection of the column. Brackets supplied by a different manufacturer from the column shall be identified separately within the base as above.

18. Columns shall be designed to be capable of accepting lanterns with the minimum parameters in Table 700/2.

**TABLE 700/2 Lantern Mounting Heights and Weights**

| Mounting Height (m) | Lantern Weight (Kg) | Lantern Windage Area ($m^2$) |
|---|---|---|
| 5m post top | 7.5 | 0.1 |
| 6m post top | 7.5 | 0.1 |
| 8m post top | 11.5 | 0.1 |
| 10m post top | 11.5 | 0.1 |

*Note: Where lanterns are greater in weight and/or windage area than those stated in the table above, then the Developer shall ensure the column is suitably designed. As stated in Clause 706(4), BS EN 40 data sheets and relevant calculations shall be provided to the Engineer, to demonstrate that the column design is compliant.*

## 707 STEEL LIGHTING COLUMNS, SIGNS AND BRACKETS

1. All steel columns and sign posts shall comply with all relevant standards, legislation, codes of practice and Industry good practice. In particular, but not limited to, BS EN 40.

2. All steel columns and sign posts will be hot dip galvanised to comply with the requirements of BS EN 1461.

3. The root of the column/signpost shall be protected by the application of a non-bituminous based system, to both the internal and external surfaces, applied to a minimum of 250mm above finished ground level externally and 50mm internally. This should provide additional protection against corrosion but without the requirement for routine maintenance or re-application. The particular specification is available upon request.

4. All steel columns and sign posts shall be finished to the requirements indicated in Clause 706(11 and 12) of this Specification.

## 708 ALUMINIUM LIGHTING COLUMNS, SIGN POSTS AND BRACKETS

1. When permitted or specified by the Engineer, Lighting columns and sign posts shall be manufactured in aluminium and shall comply with all relevant standards, legislation, codes of practice and Industry good practice. In particular, but not limited to, aluminium lighting columns shall comply with BS EN 40.

## 709 HERITAGE/VICTORIAN STYLE COLUMNS

1. When permitted or specified by the Engineer, Heritage/Victorian style columns shall be constructed using a cast iron base with cast iron decorations for a traditional effect, (including base, chamfer & shaft rings and ladder bar) and a steel shaft. It shall include a stainless steel or

galvanised steel frog. Both the column and frog shall be finished to the requirements indicated in Clause 706 (11) of this Specification. The colour to be approved by the Engineer on an individual scheme basis.

2. Heritage/Victorian columns shall comply with all relevant standards, legislation, codes of practice and Industry good practice.

3. Variations in height may be permitted in exceptional cases if this will ensure greater compatibility with building heights. However, mounting heights shall be a minimum of 4.000m.

4. Standard columns shall not be enhanced by the use of embellishment kits comprising base section, chamfer ring, shaft ring and ladder arms.

## 710 PASSIVELY SAFE COLUMNS AND SIGN POSTS

1. Based on the Institute of Lighting Professionals Technical Report No 30, a risk assessment approach should be adopted to determine where passively safe equipment is required.

2. Passively safe lighting columns and/or sign posts shall comply with all relevant standards, legislation, codes of practice and Industry good practice. In particular, but not limited to, BS EN 12767 and BS EN 40.

3. A certificate of conformity should be provided for all passively safe products to demonstrate compliance with BS EN 12767, BSEN40 and is subject to approval of the Engineer. Further details of suitable equipment are available on request.

## 711 FOUNDATIONS

1. Foundations for standard, planted root, columns shall be as described in Clause 714 and as shown in the Standard Detail Drawings 810-1, 810-2, and 810-3 except where unusual ground conditions are encountered or where flange plated columns are necessary. In such circumstances the Developer must produce designs for both columns and their foundations - to the approval of the Engineer.

2. The foundation details given in Clause 714 and the Standard Detail Drawings 810-1, 810-2, and 810-3 are for general guidance and are likely to suit the majority of installations. It is the Developer's responsibility to check the foundation dimensions are satisfactory for each column and details should be submitted to the Engineer for approval.

3. Planting depths shall be in accordance with the design but not less than as recommended by the column manufacturer.

## SITING OF ROAD LIGHTING POINTS AND ILLUMINATED TRAFFIC SIGNS/BOLLARDS

1. Columns shall be positioned in the locations shown on the approved scheme plan for which an Engineer's Design/Check Certificate has been provided and must be positioned in land to be dedicated to the highway. They must not be placed within areas designated for driver or pedestrian visibility.

2. Where columns are shown adjacent to the carriageway or parking areas, the minimum clearance from the edge of carriageway to face of column depends on the design speed of the road and the recommended horizontal clearances set out in BS5489 shall be achieved or subject to agreement with the Engineer.

3. Columns associated with footway lighting shall generally be placed within the first 150mm of the metalled edge of the footway against the rear edging kerbs.

4. Where it is necessary to locate columns beyond the limit of the proposed highway then an easement will be required in favour of the Council, in respect of each installation. The easement shall be clearly identified on the drawing.

5. Where lighting equipment is to be erected in the adoptable footway (running alongside the adoptable carriageway) the column shall be placed in the footway at the rear against the edging kerbs. For further details refer to the Standard Detail Drawing 810-1, column installation located in highway footway/margin. Where footways are reduced in width then the clearances between the column and the edge of carriageway must be approved by the Engineer.

6. Where lighting equipment is to be erected in the adoptable highway verge (where no adoptable footway alongside carriageway exists) then the column's concrete foundation shall be extended 50mm above the finished ground level. The concrete surface shall be float finished to slope away from the unit finishing at ground level to form a watershed. For further details refer to the Standard Detail Drawing 810-2, column installation located in highway soft landscaped verge. Clearances between the column and the edge of carriageway must meet the requirements set out in clause 712 (2) of this specification.

7. Where lighting equipment is to be erected outside the area of the adoptable highway in a soft-verge/landscaped area then a 1.000m² concrete plinth shall be formed, with clean straight edges, around the equipment with the unit in the centre as a minimum requirement. This plinth shall then extend on one side only to the adoptable footway or carriageway, whichever is the shorter distance, maintaining a width of 1.000m, to enable access to the unit. The concrete plinth shall be ST5 concrete, 100mm thick minimum and formed so as to be flush with the finished ground level. The concrete surface shall be float finished to slope away from the unit and the centre-line of the plinth at an angle 1:25 to prevent water collecting or pooling. The plinth may be constructed of a footway material, similar to nearby surfaces, where agreed with the Engineer. For further details refer to the Standard Detail Drawing 810-3, column installation located outside the adoptable highway in a verge/landscaped area.

8. Landscape planting of bushes or trees shall not be permitted in the immediate vicinity of columns which, in the opinion of the Engineer, might affect either the lighting design levels or access to the column base.

9. The minimum recommended clearances from edge of carriageway to the face of column, as set out in Table 1 of BS5489, must be achieved. The set-back of lighting columns and sign-posts should be sufficient to allow the free

passage of people on a footway and additionally the national guidance on the inclusive mobility covering horizontal widths on footpaths must also be achieved.

10. The siting of illuminated traffic signs must comply with the traffic signs regulations and relevant sections of the traffic signs manuals. The minimum clearance from the edge of carriageway to any part of the sign should be 450mm. Where possible, signs to be erected in the adoptable footway (running alongside the adoptable carriageway) should be placed in the footway at the rear against the edging kerbs and if necessary, an off-set bracket installed.

## 712 HANDLING, TRANSPORT AND ERECTION

1. Lighting columns and brackets shall be handled, transported and stored in such a way as to avoid any structural damage or damage to the surface protection system. Any damage incurred shall be made good in such a way that the structural performance and durability of the item is in no way reduced.

2. Lighting columns and brackets shall be stored clear of the ground in such a way that contact with cement, groundwater, soil or ash or other deleterious material is prevented and that water does not accumulate on any surfaces or inside sections. Suitable packing shall be placed between the columns to allow a free passage of air and dispersion of water.

3. All rivets, bolts, nuts, washers, screws, small plates and small articles generally shall be suitably packed and identified. All such items shall be stored under cover.

4. Columns shall be installed in accordance with the manufacturer’s recommendations.

5. The position of the column gear door, in relation to the kerb line, shall be such a way that any operative working in the gear compartment faces oncoming traffic, unless agreed otherwise with the Engineer.

6. Wall mounted lighting brackets and fixtures shall be fixed in accordance with the manufacture's instructions after confirming the structural suitability of the wall, see also Clause 716(3).

7. Hinged columns must be sited so as to enable the column to be raised and lowered for maintenance purposes without encountering obstruction and without entering or overhanging either the carriageway or private land.

8. Columns shall be erected using a hydraulic hoist (Hiab, or similar) and strop.

9. Column and bracket installation shall be completed before the luminaire is fitted.

10. Lamps shall not be fitted into luminaires until columns, brackets and signposts have been erected and the luminaires have been installed to the satisfaction of the Engineer.

## 713 INSTALLATION OF PLANTED COLUMNS AND SIGN POSTS

1. Columns shall be erected in accordance with the Code of Practice issued by the Highway Electrical Association (HEA), the Institution of Lighting Professionals (ILP) and as recommended by the manufacturer.

2. The following Specification sub-clauses (3) to (6), below, and that shown in the Standard Detail Drawings 810-1, 810-2, and 810-3 is given for general guidance and is likely to suit the majority of installations. It is the Developer's responsibility to check the foundation dimensions are satisfactory for each column and details should be submitted to the Engineer for approval.

3. Each hole for columns shall be dug by hand to the required planting depth (alternative excavation methods are to be submitted in writing to the Engineer for consideration). A 75mm thick layer of concrete mix ST2 shall be placed and compacted in the bottom of the excavation up to the base of the column. The hole shall be dug large enough for ease of erection and to enable 150mm minimum thickness (300mm for columns installed in the verge) of concrete to completely surround the column.

4. Following installation of the hockey stick or flexible duct connection the remaining area of the cable entry slot shall be temporarily plugged as necessary in order to prevent any ingress of concrete or filling material during the concreting and back-filling operations.

5. The hole, into which the column is placed, shall be backfilled with concrete to the required level (dependant on finished surface required).

6. Concrete back-fill shall be mix ST5, well compacted by vibration over the full planting depth of the column.

## 714 ILLUMINATED TRAFFIC SIGNS AND BOLLARDS

1. Warning, Regulatory, Direction and Informatory Signs shall be strictly in accordance with the current “Traffic Signs Regulations and General Directions” and the relevant Chapters of the “Traffic Signs Manual”.

2. Construction and materials must comply with the requirements of BSEN 12899 – Fixed, vertical road traffic signs (including the national annex).

3. The signs shall be faced with retro reflective material to a minimum performance class RA2 with a manufacturer’s warranty of at least 10 years and a certificate of conformity to BSEN 12899. The actual performance class selected should be included in the equipment specification for subsequent approval by the Engineer.

4. The signs shall be mounted on either straight posts or large base posts when the sign is required to be lit. Generally, the straight posts shall be standard 76mm O/D and the large base shall be 140mm O/D with the shaft at 76mm. However, it may be necessary to increase the diameter of the post to accommodate larger sign plates. It is the responsibility of the Developer to ensure the sign post has been designed to accommodate the required sign plates and the Developer must provide design details including a check certificate and suitable scale drawings - to the approval of the Engineer.

5. Sign posts shall be manufactured in steel or when permitted or specified by the Engineer manufactured in aluminium, as specified in clause 707 (1-4) and 708 (1).

6. External surfaces of steel traffic sign posts shall be hot dip galvanised to comply with the requirements of BS EN 1461 and finished in the same manner as specified in Clause 706(10) and Clause 706(11).

7. Standard stainless steel fixing clips designed exclusively for the specific use of traffic signs shall be used to attach the sign plate to the post.

8. When a sign is required to be lit, an external sign light unit shall be used which complies with the relevant standards. It shall be cast in LM6M aluminium, acid cleaned, chromate primed and polyester powder-coated 'Aircraft Grey' with a suitable fixing bracket. The colour finish shall be factory applied; it is not acceptable to modify the appearance of the canopy by applying further paint systems on site. Any variation in the canopy colour should be agreed with the Engineer and included in the equipment specification on the agreed drawing. The housing shall incorporate a 3mm polycarbonate lens allowing easy access via a single tamper-proof bolt to all internal parts, whilst providing a weatherproof assembly to IP54. The gear tray shall be separate to the lens and easily removable via a plug and socket. The light source shall be long life LED's mounted on the gear tray with an IP67 electronic driver. A miniature one-part electronic photo cell shall be fitted in accordance with Clause 721 of this Specification.

9. Generally, all new traffic bollard installations, subject to a risk assessment, will be installed without illumination. Early consultation with the Engineer is advised.

10. Where it has been determined that lit bollards are required the equipment specification shall be obtained from the Engineer.

11. Particular attention must be made by the Developer to the independent means of isolation for illuminated traffic signs and bollards located on traffic islands or roundabouts, this is a requirement of the ENO and they should be consulted with directly for more details.

## 715 WALL-MOUNTED LUMINAIRES/EQUIPMENT

1. Wall-mounted lighting will only be approved in exceptional circumstances. Early consultation with the Engineer on proposals for wall-mounted equipment is essential. Approval is unlikely to be given for equipment proposed for locations where there is a risk of impact from high-sided vehicles.

2. Whenever any street lighting or illuminated traffic sign equipment is to be erected on buildings, an agreed form of easement shall be included in the conveyance documents, and the Council's copy passed to the Engineer prior to adoption.

3. Calculations shall be submitted to the Engineer to demonstrate the structural adequacy of the wall to accommodate the loading from the proposed equipment.

4. All wall-mounted luminaires shall be serviced from a separate ENO service control box unless otherwise agreed with the Engineer. The control box shall be situated a minimum of 800mm and a maximum of 1500mm above ground, with safe access.

5. Service control boxes shall be of a size to accommodate the ENO's cut-out, isolator and earth marshalling block and be of minimum dimensions 220x170x90mm and maximum dimensions 315x220x160mm. The box shall contain a securely fixed backboard made of non-hygroscopic wood.

6. The position of the photo-electric cell shall be such that overhanging eaves of the property or other obstructions shall not cause the light source to be switched on prematurely.

7. Two forms of wall-mounted equipment installation are permitted. These are Surface Installation and Integrated Installation. Prior approval of Integrated Installation by the Engineer is essential and will be subject to the submission of drawings detailing the service boxes and cable ducting to be built into the wall.

8. Surface Installation shall be galvanised or stainless-steel ENO service control box surface mounted on the wall in a suitably inconspicuous position. The ENO will normally clip their suitably protected service supply cable neatly on the outside of the wall. The interconnecting cables between the ENO service control box and the luminaire shall be contained in galvanised or stainless-steel conduit fixed to the wall unless Heavy Duty Mineral Insulated cable is used. Conduits shall be fixed at not less than 250mm from each end, together with intermediate fixings at no more than 1.000m intervals. All clips/cleats shall be fastened with stainless steel screws and plastic plugs.

9. Notwithstanding the approval requirements of sub-clause (7), above, for Integrated Installation only stainless-steel service boxes shall be used. These may be painted for cosmetic reasons or "dulled" by shot/grit blasting. An ENO service box of limiting dimensions as stated in sub-clause (5), above, shall be recessed into the outer leaf of the wall with the ENO service cable located in a suitable duct/conduit to the requirements of the ENO fixed to the inner face of the outer leaf of the wall and connecting into its base. The interconnecting cables between the ENO service control box and the luminaire shall be contained in 25mm conduit fixed to the inner face of the outer leaf of the wall and terminating in a suitably sized stainless steel unit connection box as close to the luminaire as practicable. The Engineer shall be invited to inspect the conduit prior to wiring and witness the wiring. The short interconnecting cable between the unit connection box and the luminaire shall be as sub-clause (8), above. All cable entries shall be sealed with suitable cable glands with all materials complying with a minimum of IP54. The Developer shall be responsible for providing suitable cavity trays for integrated wall boxes.

10. All wall brackets will be constructed from steel and hot dip galvanised to comply with the requirements of BS EN 1461. Other materials should be submitted to the Engineer for approval.

11. All wall brackets will be coated with a manufacturer applied system, which also provides additional protection against corrosion but without the

requirement for routine maintenance or re-application. The particular specification is available upon request.

## POLE BRACKET LUMINAIRES (MOUNTED ON WOODEN POLES)

1. All pole brackets will be constructed from steel and hot dipped galvanised to comply with the requirements of BS EN 1461. No additional protection system is required.

2. The actual pole bracket manufacturer to be specified should be included in the specification for subsequent approval by the Engineer.

## LUMINAIRES (STREET LIGHTING LANTERNS)

1. Luminaires must comply with the requirements of Dorset Council's street lighting and illuminated signs policy. All luminaires must have a minimum IP rating of IP66 (optical compartment) and IP66 (gear compartment). Any luminaire proposed with an IP rating less than these values should be submitted to the Engineer for approval.

2. The luminaire optic system shall be capable of limiting the upward light to the correct ratio, as defined by the Engineer for the applicable development zone.

3. Luminaires, for single arm outreach bracket mounting, shall be designed to prevent ingress of water along the mounting spigot. The mounting spigot will be arranged to allow the luminaire to follow the profile alignment of the bracket arm without any offset or deviation. The luminaire will be securely fixed to the outreach bracket by screw-threaded bolts or grub screws clamping onto the spigot arm. All lantern fixings are to be torque set as per manufacturer's instructions. In some cases, the luminaire must be installed with the optical system horizontal. The bracket arm or spigots chosen shall be compatible with this requirement.

4. Luminaires shall be fitted with a PECU NEMA socket located in the canopy. Alternatively, where appropriate and to the satisfaction of the Engineer a miniature one-part electronic photo cell may be fitted in the canopy.

5. Luminaires shall be fitted with integral control gear and have a fuse holder adjacent to the terminal block with a cartridge fuse protecting each set of control gear. The terminal block provided for connection of the internal wiring shall facilitate maintenance, quick replacement and easy disconnection of individual components.

6. Luminaires shall have a smooth UV stabilised GRP or die-cast LM6 aluminium canopy with die-cast aluminium spigot suitable for the column bracket being used. Generally, the canopy colour should match the colour of the column, with the standard colour being Grey BS4800: 10 A 07 or equivalent RAL colour 7042. The colour finish shall be factory applied; it is not acceptable to modify the appearance of the canopy by applying further paint systems on site. Any variation in the canopy colour should be agreed with the Engineer and included in the equipment specification on the agreed drawing.

7. Luminaires shall have either a toughened flat glass panel, a toughened glass shallow bowl or a polycarbonate deep bowl unless otherwise agreed with the Engineer (see also sub-clause (2)).

8. Luminaires shall be firmly fixed to the top of the column or bracket arm to minimise the possibility of wind rotation or falling in the event of the column being subject to impact. There shall be no gap between the lantern and the shoulder of any bracket arm.

9. All equipment shall be designed and de-rated for operation at maximum 30°C ambient temperature and between 50 - 100% relative humidity with a temperature of 70°C in direct sunlight with a high content of ultra-violet rays. The equipment shall be able to withstand full load operation when exposed to the sun, dust, corrosive agents, vermin and the like.

10. The component parts of each electrical system or piece of equipment shall be the latest standard product of a single manufacture.

11. All components shall be capable of being re-cycled at the end of their life and coded with the international symbol for re-cycling.

12. Post top luminaires shall comply generally with the above stated requirements as applicable. In addition or otherwise, the photometric distribution will be symmetrical. The luminaire spigot mounting will be compatible to the column spigot. The vandal resistant bowl will not be a clear acrylic but will be of a diffusing material. All luminaires shall have the control gear integral.

13. Where the use of Heritage/Victorian style luminaires has been agreed, the optics shall be of “pot optics” style or other high efficiency pattern and the bowl shall be a one piece moulded unit of polycarbonate or other equally vandal resistant material by prior approval of the Engineer.

14. All fixing components such as latches, clips, toggles, nuts, bolts, washers and the like shall be of stainless steel.

15. Some lantern manufactures have shields or louvers purposely designed to help reduce light trespass. On request from the Developer the Engineer can carry out an assessment and advise the Developer if it will be appropriate to fit a manufacturers own shield or louver to help reduce a light trespass problem. A manufacturer’s own shield or louvers should not be fitted until written permission has been obtained from the Engineer.

16. The installation of a fabricated lantern shield, louver or masking of the lantern bowl is not permitted.

## 716 LIGHT SOURCE

1. All light sources shall comply with:

   a) good Industry Practice;

   b) all relevant Codes of Practice, including Advice Notes and Technical Memoranda;

c) all relevant Legislation and standards;

d) all relevant national policies relating to street lighting including, but not limited to, the ILP and UK Lighting Board Codes of Practice;

e) all relevant Authority Policies and standing orders.

2. LED's should be the light source used in all situations throughout Dorset. LED's used in street lighting applications must have a minimum of 24-year design life for output. All LED's must be neutral white with a colour temperature range from 3000K to 4500K, dependant on the location of the apparatus. The colour temperature to be used should be agreed with the Engineer.

3. The tables below set out the minimum Ra value required for a specific road to comply with Dorset Council's street lighting and illuminated signs policy.

**TABLE 700/3 Minimum Light source Ra Values for Zones 1, 2, and 3**

| **Environmental Zones 1, 2, and 3** | |
|---|---|
| **Lighting Situation** | **Minimum Ra Value** |
| Traffic Route | 60 |
| Residential Road, Town or Village Centre | 60 (80 in high crime areas) |

**TABLE 700/4 Minimum Light source Ra Values for Zones 4 Only**

| **Environmental Zone 4** | |
|---|---|
| **Lighting Situation** | **Minimum Ra Value** |
| Traffic Route | 60 |
| Residential Road | 60 (80 in high crime areas) |
| Town Centre | 80 |

## 717 ELECTRICAL CONTROL GEAR

4. All control gear shall be electronic wherever possible and components shall comply with:

a) good Industry Practice;

b) all relevant Codes of Practice, including Advice Notes and Technical Memoranda;

c) all relevant Legislation and standards;

d) all relevant national policies relating to street lighting including, but not limited to the ILP and UK Lighting Board Codes of Practice;

e) all relevant Authority Policies and standing orders.

**PHOTO-ELECTRIC CONTROL UNITS (PECUs)**

1. All photoelectric switches and sockets shall comply with:

   a) good Industry Practice;

   b) all relevant Codes of Practice, including Advice Notes and Technical Memoranda;

   c) all relevant Legislation and standards;

   d) all relevant national policies relating to street lighting including, but not limited to, the ILP and UK Lighting Board Codes of Practice;

   e) all relevant Authority Policies and standing orders.

2. Photocells shall be either a one part electronic or one-part miniature electronic and designed for either all-night or part-night lighting as specified by the Engineer.

3. Switching regimes

   Streetlights - All night, Switch Regime 808, Dusk to Dawn (35 lux switch on/18 lux switch off)

   Streetlights - Part Night, Switch Regime 762, Dusk to 24:00/5:30 to Dawn GMT (35 lux switch on/18 lux switch off)

   Illuminated traffic signs – All night, Switch Regime 808, Dusk to Dawn (35 lux switch on 18 lux switch off)

   Illuminated bollards – All night, Switch Regime 100, Dusk to Dawn (Infra-Red Photocell)

**718 TIME SWITCHES**

1. Time switches shall not be used unless agreed by the Engineer.

**719 WIRING**

1. The provision and installation of the whole wiring system shall be in accordance with the current BS7671 IEE Wiring Regulations - Requirements for Electrical Installations, the ILP Code of Practice for Electrical Safety in Highway Electrical Operations, all other relevant standards and as specified below.

2. Wiring between the terminal block in the lantern and the components in the base of the column shall be a 3-core flexible cable and comply with BSEN50565 and cable flexibility class 5. Conductor cores should be identified as follows:

a) Phase – Brown

b) Neutral – Blue

c) Earth – Green/Yellow

3. All wiring within the base compartment shall comply with BS6004 and cable flexibility class 1 or 2.

4. The final connection between equipment mounted in column base compartments (and ENO wall service boxes) and the cut-out shall be made using PVC insulated/PVC sheathed cable to BS6004 with the relevant cross-sectional area to comply with the current BS7671 IEE Wiring Regulations and all relevant national policies relating to street lighting including, but not limited to the ILP and UK Lighting Board Codes of Practice. Sufficient length shall be allowed for final connection between the isolator and the service cut-out by ENO personnel.

5. All cables shall be correctly colour-coded throughout their length.

6. All cables shall be one-piece construction. Joints or connectors will NOT be permitted.

7. Unsupported lengths of cable shall be kept to a minimum and shall not be allowed to come into contact with components by their freedom of movement. Where there is more than one cable, they shall be secured together at 1.000m intervals throughout the unsupported length. Vertical cables within posts or columns shall be adequately supported along their length at the top of the cable run.

8. Wiring shall generally be housed inside columns, wall brackets and posts. Where this is not possible, wiring shall either be housed in galvanised or stainless-steel conduit which shall be waterproof and smooth internally or be Heavy Duty Mineral Insulated Cable.

## 720 EARTHING

1. All electrical installations shall be earthed in accordance with the current BS7671 IEE Wiring Regulations - Requirements for Electrical Installations and the ILP code of practice for Electrical Safety in Highway Electrical Operations.

2. All bolted connections throughout the earthing system shall be stainless steel, brass or silicon bronze.

3. All main, supplementary and equipotential conductors shall comply with BS6004, and be coloured green/yellow with the relevant cross-sectional area to comply with the current BS7671 IEE Wiring Regulations and all relevant national policies relating to street lighting including, but not limited to the ILP and UK Lighting Board Codes of Practice. All earth conductors should comply with cable flexibility class 2, except for ‘door bondings’ which should comply with class 5 (refer to (8) and (9) below). Where bolted connections are required, these conductors shall be terminated in

accordance with manufacturers' instructions in correctly sized purpose made lugs.

4. A circuit protective conductor shall connect the earth terminal on each luminaire to the main earth terminal associated with the service cut-out unit.

5. A separate supplementary bonding conductor shall connect all metal enclosures of all electrical components to the main earth terminal with the relevant cross-sectional area to comply with the current BS7671 IEE Wiring Regulations and all relevant national policies relating to street lighting including, but not limited to the ILP and UK Lighting Board Codes of Practice.

6. All materials used throughout the "Earthing" installations shall be strictly in accordance with the current BS7671 IEE Wiring Regulations - Requirements for Electrical Installations and all relevant national policies relating to street lighting including, but not limited to the ILP and UK Lighting Board Codes of Practice.

7. An earth-marshalling block shall be provided in each lighting unit and clearly labelled 'SAFETY ELECTRICAL CONNECTION DO NOT REMOVE'.

8. All extraneous conductive parts, as described in BS7671, and including doors to feeder pillars, lighting columns and lit sign units, shall be bonded to the main earth marshalling block using an equipotential bonding conductor with the relevant cross-sectional area to comply with the current BS7671 IEE Wiring Regulations and all relevant national policies relating to street lighting including, but not limited to the ILP and UK Lighting Board Codes of Practice. Earth electrodes shall be installed where necessary.

9. The earth cable between the door and column shall comply with BS6004. The cable shall be flexible and comply with cable flexibility class 5 to withstand the forces of repeated flexing when removing and re-fitting the column door. The cable shall be of a suitable length to allow the door to be placed flat on the ground during maintenance.

## 721 ISOLATORS

1. In all electrical apparatus a means of isolation shall be provided. A lockable safety isolator shall be interposed electrically between the outgoing side of the ENO's cut-out and the control gear.

2. It shall be of all insulated moulded surface pattern, double pole, 32 amp rating, clearly marked 'on' and 'off' and incorporate a BS88 fuse or MCB of the correct rating. The cover must be held by a screw and incorporate a drip-proof cable exit channel.

3. The location of the isolator and other control gear etc on the backboard shall allow adequate space below it for the ENO's cut-out to be mounted. The door should fit flush to the column with the lock operating freely.

## 722 INSPECTION AND TESTING TO BE CARRIED OUT BY THE CONTRACTOR

5. The completed installation shall be inspected and tested by a competent person to the satisfaction of the Engineer and in accordance with the applicable sections of the current edition of BS7671, IEE Wiring Regulations - Requirements for Electrical Installations.

6. A valid electrical installation certificate shall be provided in accordance with the current edition of BS7671 IEE Wiring Regulations. The certificate shall be completed, in full by a competent person or persons in respect of the design, construction, and inspection and testing of the work. The certificate shall also include a valid date in respect of the design, construction, and inspection and testing of the work.

7. The equipment numbers on the Electrical Installation Certificate should relate to the equipment reference numbers on the scheme drawing to allow for cross referencing by the Engineer.

## 723 UNIT NUMBERING/LABELLING

1. Each lighting point and illuminated traffic sign/bollard will be numbered on site by the Council's PFI Street Lighting Service Provider following the Engineer's acceptance of the equipment from the developer.

2. Suitable hazardous electricity warning notices for street furniture Ref HSE/1 in premium grade adhesive PVC, shall be affixed to the installation, where appropriate.

## 724 SITE RECORDS

1. In accordance with the requirements of the Electricity at Work Regulations the Developer shall, on the completion of the electrical work and prior to adoption, provide a set of as-installed drawings or transparencies showing as a minimum the position and identification mark (including luminaire type, modification status, lamp setting, lamp type and serial numbers) of equipment requiring electrical connections, ducts, underground cables and joints and the type and depth and cables. The Developer shall also supply a valid electrical installation certificate for all the units included in the scheme.

## 725 COMMISSIONING

1. Following equipment installation and Contractor-inspection, each lighting unit and illuminated traffic sign/bollard shall be notified to the ENO for servicing, testing and energising on the ENO's approved 'Notice of completion of unmetered electrical installation' form, obtained from the ENO. The form shall be accompanied by a plan clearly showing the location of the completed units within the overall development. The form shall be completed in ink by the person responsible for the installation and authorised to sign on the Contractor's or Developer's behalf for the accuracy of such information contained thereon. These forms have a legal significance under the Electricity at Work Regulations and will not be accepted unless signed by an electrically qualified person.

2. Upon satisfactory inspection of the lighting units by the ENO, they shall be energised but the cost of electrical energy and any maintenance requirements will be the responsibility of the Developer. It is not until the Engineer's inspection has been carried out and the units are accepted that

costs for electrical energy and maintenance of the installation will be met by the Council.

3. Only the ENO or its approved representative shall energise any lighting unit for the first time.

## 726 ENGINEER'S INSPECTION

1. When the lighting units have been commissioned the Developer shall make a request to the Engineer to accept the street lighting. This request must be accompanied by an accurate as-built drawing (matching the design certificate), a completed inventory update form as shown in appendix 1 (available electronically on request) and a valid electrical installation certificate, completed in full with all the relevant sections signed by the Contractor's representative. The electrical installation certificates should include a unit reference number that matches the reference number marked on the 'As Built' drawing.

2. Electrical installation certificates are valid for six years and must have a minimum of five years residual life from the date of acceptance of the equipment.

3. Where applicable evidence should be provided of the maintenance carried out on the apparatus.

4. The Engineer will verify that the service connections are in the appropriate ownership.

5. The units will be jointly inspected by the Engineer and Dorset Council's Service Provider and if defects are found the Developer will be notified including a list of the defects to be rectified; any further defects, how so ever caused after this inspection, remain the developer's risk.

6. If no defects are found and a Section 38 Agreement is in place the Developer will be notified of acceptance of the units for routine maintenance and energy charges.

**Dorset Council PFI Operational Inventory Print**

1. Unit Owner
2. Road name
3. Location
4. Position
5. Town name or number
6. Unique road identifier. Unit ID: Generated when new gazetteer is uploaded
7. Lighting standard
8. Compliance certificate date

APPARATUS DATA

9. Unique apparatus identity number
10. Ordnance Survey positional data – Easting. Unit ID: To be completed when raised onto Mayrise

10. Ordnance Survey positional data – Northing. Unit ID:  To be completed when raised onto Mayrise

11. Unit type

(Column / Sign) - Manufacturer / Model / Height

12. Lighting column / illuminated traffic sign post manufacturer
13. Lighting column / illuminated traffic sign post cross-section shape
14. Lighting column / illuminated traffic sign post mounting height
15. Lighting column / illuminated traffic sign post material
16. Lighting column / illuminated traffic sign post protective coating
17. Lighting column / illuminated traffic sign post fixing
18. Lighting column / illuminated traffic sign post root protection
19. Lighting column / illuminated traffic sign post flange base - Yes / No
20. Date unit commissioning
21. G39 - Yes / No
22. Painted - Yes / No
23. Paint Colour
24. Hoist
25. Dates Column installed
26. Bracket type - Manufacturer / Model
27. Bracket fixing - Internal / External / Post top
28. Number of brackets
29. Bracket projection
30. Date Bracket installed

31. Number of luminaires

(Luminaire) - Full Description

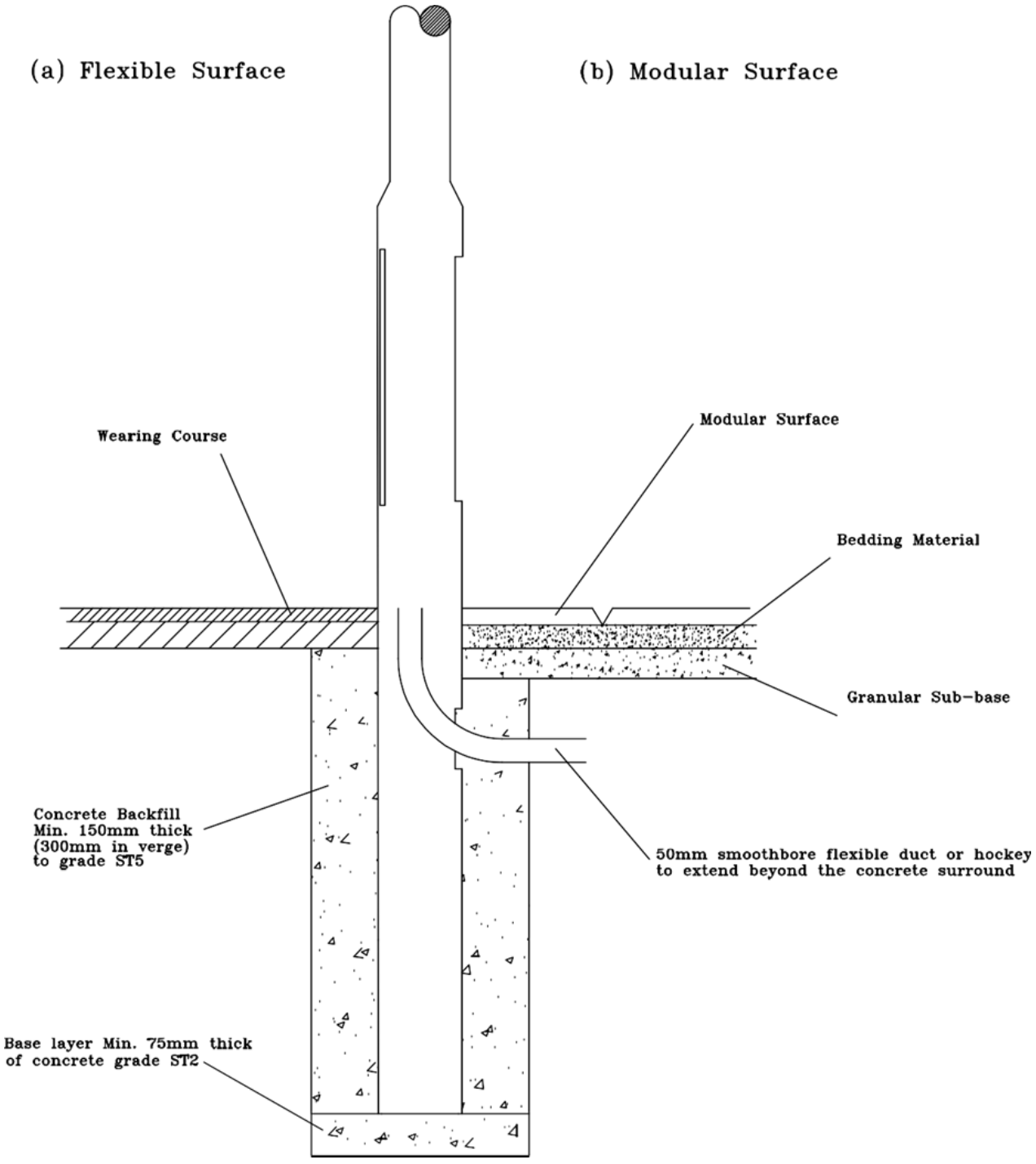
32. Luminaire manufacturer
33. Luminaire model reference
34. Luminaire distribution and profile - (EG - Flat Glass / Shallow Bowl)
35. Luminaire setting
36. Luminaire Inclination
37. Luminaire Entry - Post top / Side Entry / Top entry / Universal
38. Luminaire ingress protection (IP Rating)
39. Date Luminaire installed
40. Lamp type - (EG - Son T / CDO / LED)
41. Lamp wattage
42. Lamp control gear type (EG - Conventional / Electronic)
43. Total circuit wattage
44. Lamp charge code (Energy Code)
45. Number of lamps per luminaire
46. Date Lamp installed
47. Control type - Full Description
48. Switching regimes codes
49. Control location
50. Date Control installed
51. Service owner
52. Number of outgoing circuits at the supply points
53. Traffic sign illumination - Internal / External
54. Traffic sign diagram number (if fitted)
55. Traffic sign category (if fitted)
56. Attachment / traffic sign size (if fitted)
57. Number of approved attachments (if fitted)
58. Type of approved attachment (if fitted)
59. Trans-illuminated traffic bollard body manufacturer
60. Trans-illuminated traffic bollard body material
61. Trans-illuminated traffic bollard body type
62. Trans-illuminated traffic bollard base manufacturer
63. Trans-illuminated traffic bollard base material
64. Trans-illuminated traffic bollard base type
65. Feeder pillar body manufacturer
66. Feeder pillar body material

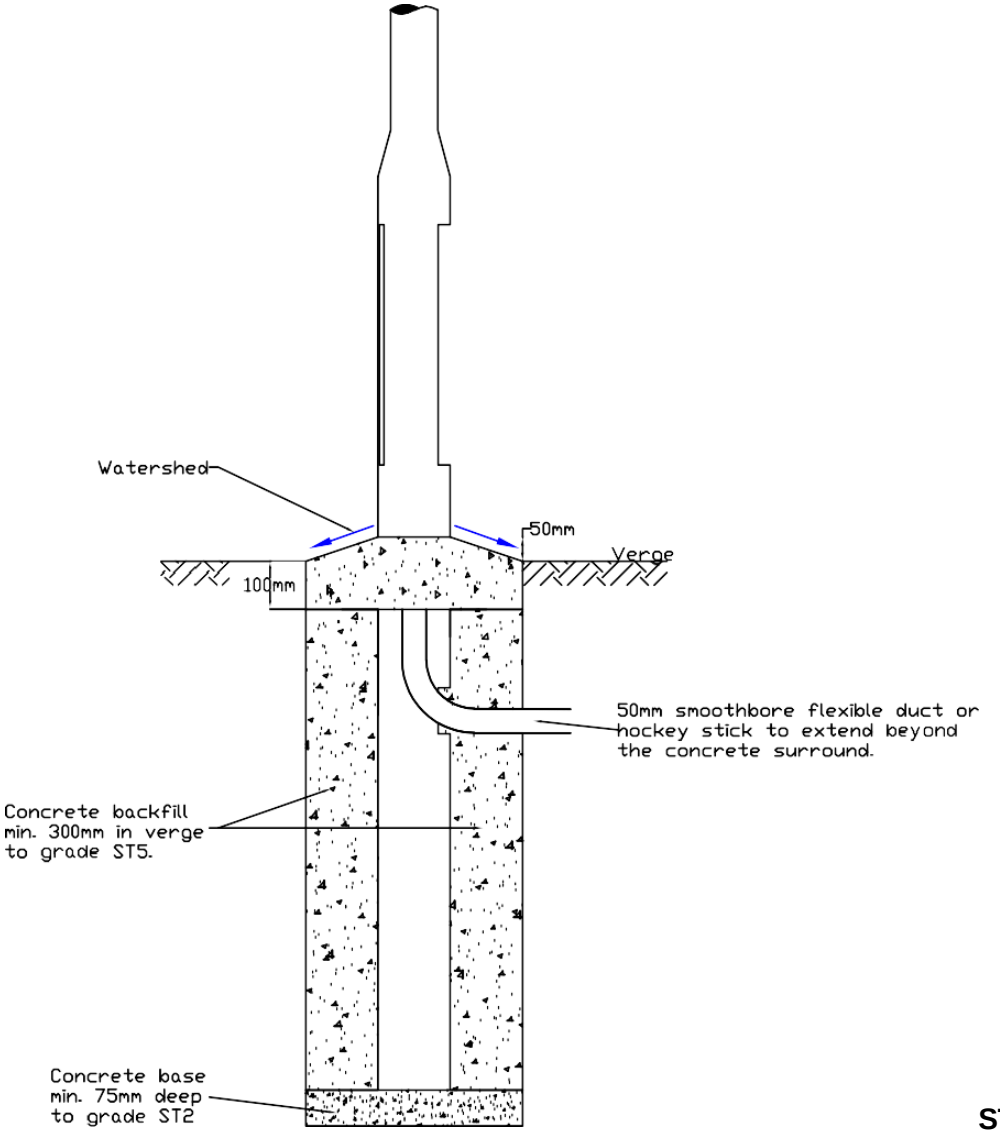
67. Feeder pillar body protection
68. Number of phases
69. Isolator rating - Full Description (Make / Model)
70. Number of outgoing circuits
71. Outgoing circuit protection device rating
72. Ground conditions
73. Salting of road
74. Road environment
75. Environment situation
76. Wind exposure
77. Designed for fatigue
78. Traffic flow
79. Traffic speed
80. On a bridge
81. Traffic disruption caused by failure
82. Pedestrian density
83. Date of last cyclic maintenance visit
84. Date of last lamp replacement
85. Date of last re-application of protective coating
86. Date of last structure inspection and condition level
87. Structure inspection and condition level
88. Structural test certificate reference no.
89. Date of last electrical test and test results
90. Electrical test certificate reference no.
91. Capacitors - Full Description if installed
92. Capacitor installed Date
93. Earth CSA
94. Circuit CSA
95. Earthing Type

## 800 STANDARD DETAILS

| Drawing Number | Title |
|---|---|
| 810-1 | Lighting Column Installation (located in highway footway/margin) |
| 810-2 | Lighting Column Installation (located in highway soft landscaped verge) |
| 810-3 | Lighting Column Installation (located in verge beyond the highway) |

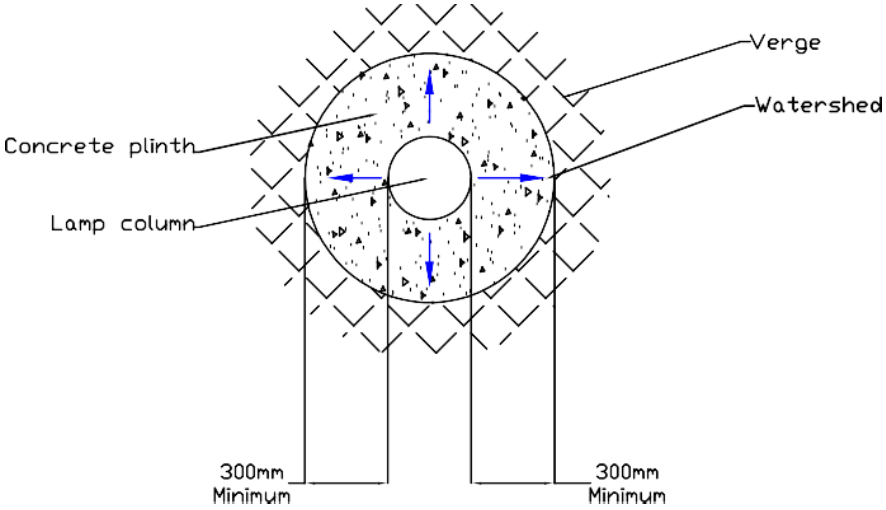
## STANDARD DETAIL DRAWING 810-1 (Indicative drawing not to scale)

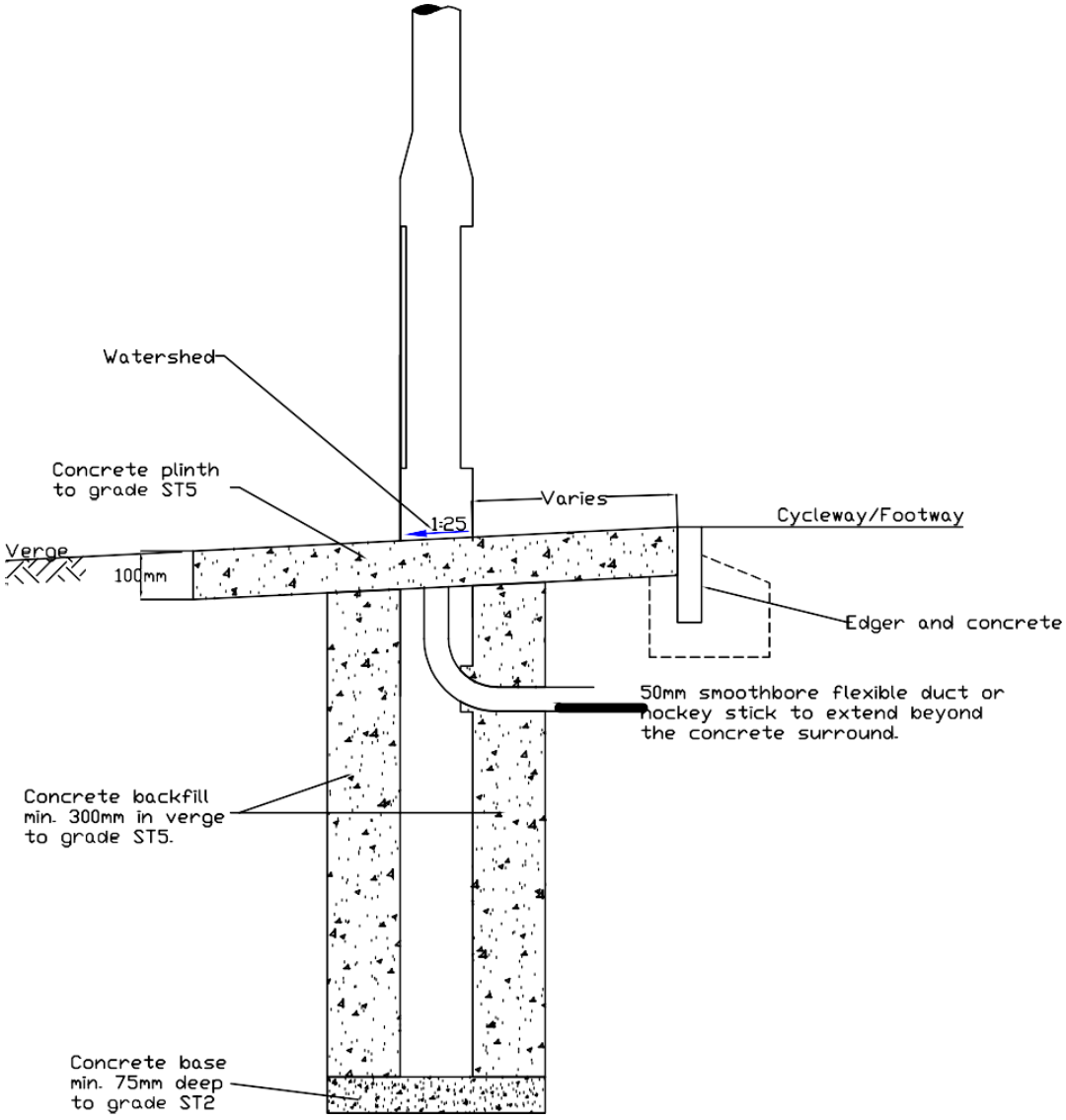



Watershed
50mm
Verge
100mm
50mm smoothbore flexible duct or hockey stick to extend beyond the concrete surround.
Concrete backfill min. 300mm in verge to grade ST5.
Concrete base min. 75mm deep to grade ST2

**STANDARD**

## DETAIL DRAWING 810-2 (Indicative drawing not to scale)




Watershed
Concrete plinth
to grade ST5
Varies
1:25
Cycleway/Footway
Verge
100mm
Edger and concrete
50mm smoothbore flexible duct or
hockey stick to extend beyond
the concrete surround.
Concrete backfill
min. 300mm in verge
to grade ST5.
Concrete base
min. 75mm deep
to grade ST2

## STANDARD DETAIL DRAWING 810-3 (Indicative drawing not to scale)