Suffolk County Council

Construction Specification for Developments Highway Works

S278 and s38 agreements

INDEX

A. Foreword

1. The Specification has been prepared to provide guidance to all Developers carrying out adoptable highway works in Suffolk. It sets out Suffolk County Council's (SCC) local requirements for the adoptable works where these may differ from any national standards. It shall be read in conjunction with the various British & European Standards and also Highways England's Specification for Highway Works (SHW), Manual of Contract Documents For Highway Works (MCHW) and Design Manual for Roads and Bridges (DMRB).

2. SCC is committed to the adoption of all residential estate roads that have been constructed in accordance with this Construction Specification. For all developers requesting SCC to adopt their roads, it is incumbent on them to fully co-operate with SCC staff. Failure to comply with the construction specification will result in the road not being adopted. It should be noted that sections within this Construction Specification have been underlined in order to stress important critical points such as legal obligations.

3. We recommend Developers ensure that the engineering details have technical acceptance prior to start of works. Works undertaken by the Developer without approved drawings will be wholly at their own risk and the Highway Authority reserves the right to require suitable testing of any such works to be undertaken at the cost of the Developer. The number, location and types of tests will be decided by the Highway Authority. If any of the tests fail the Highway Authority reserves the right to require that the development be reconstructed.

4. As previously mentioned in SCC Guidance for s38 Agreements (Construction), a Pre-Start meeting is essential with the Technical Acceptance and Inspecting Engineers in attendance at critical times. It is the responsibility of the Developer/Consultant to organise, arrange attendance, chair, and take minutes of the meeting. This is normally once the Development has received Technical Acceptance.

5. For s278 and s38 schemes, a Supervision Management Plan is required which will set out the level of resource, Health and Safety compliance, communication and record keeping required. An independent supervising Engineer & Clerk of Works will be provided and funded by the Developer. This will a requirement within the s278 and s38 agreements.

Series 000 – Introduction

6. The developer shall take all necessary steps to avoid creating a nuisance from fumes, dust and vibration from the works. The burning of trees, hedges, timbers, etc. shall not be permitted on site. Foliage and vegetation shall be either taken off site or shred them prior to disposal.

7. Effective measures must be taken by the Developer to prevent any undesirable material from being deposited on the highway from a vehicle. This may include sufficient lengths of hardened areas provided within the site to help ensure construction vehicle tyres are kept clean so stopping undesirable material from being deposited on the highway, also the installation of sufficient wheel washing facilities, pressure washing including manual means.

8. Existing roads and footways and any new roads and footways which are being used by traffic shall be kept clean of all dirt, mud or any other materials dropped from plant vehicles' tyres or tracks which are being used in connection with the works. The attention of the Developer and any contractor/subcontractor is drawn to Sections 148 and 149 of the Highways Act 1980. Dust should also be kept to a minimum by the use of water spray tankers if required.

9. The Developer shall take all necessary measures to prevent dust arising from the works causing nuisance to traffic and property.

10. The Developer/Contractor shall ensure that all existing highway drains, gullies and ditches, roadside and other, in the vicinity of the Site are kept clear of any undesirable material likely to impede the free flow of water therein. Similarly, all highway drainage systems provided as part of the new adoptable estate road works shall be kept free from any undesirable material likely to impede the free flow of water therein.

11. The existing public highway and any highway dedicated under a Road Adoption Agreement shall NOT be used as sites for stockpiling and storing plant, materials or equipment unless a licence under s171 has been given by the Licencing Team. The use of the existing publicly maintainable highway by plant and machinery is likely to result in extraordinary damage and the Developer/Contractor shall be liable for the cost of reinstatement, under Section 59 of the Highways Act 1980 if any damage has been caused to the highway.

12. Failure to comply with any of the above will result in closure of access from the site to the public highway and recovery of associated cost incurred by the local authority for remedial measures.

13. Where designs are not to the above documents, departures from the guidance or standards are to be highlighted on drawings and/or documents supplied with the s278 and s38 submissions.

14. Digital photographs in jpeg format (minimum 1024 x 768mm resolution) are to be taken by the developer before construction showing the complete frontage and surface of the existing public highway including the entrance to the site and any areas affected by future visibility splays at the junction(s) of the new estate road(s) with the existing public

highway network. Such photographs will be used as evidence in circumstances where damage to or encroachment upon the public highway has occurred in connection with the works.

15. The developer is responsible for the reinstatement of any damage caused to the existing public highway, as a result of work carried out to the development. This will include damaged kerbing, any surface degradation of the carriageway, and permanent reinstatement of utility trenches associated with the works.

16. The developer is reminded parking of all vehicles associated with the development (contractors, sub-contractors, deliveries etc) shall be restricted to the site compound areas. Parking on any length of the public highway (including hard shoulders), in public car parks and in lay-bys are not be permitted.

17. Highway Tree protection - The following items are to be considered when working adjacent to highway trees:
    a. Any specialist arboriculture work involving trees shall only be undertaken by an experienced specialist firm.
    b. No highway trees are to be felled or be subject to surgery without prior approval
    c. No materials shall be stored within 5m or fires lit within 50m of any tree canopies.
    d. The area of land beneath tree canopies is not to be used for parking or running vehicles.
    e. During the excavation great care shall be taken to minimise damage to retained roots, including the bark around the roots Any roots greater than 25mm diameter shall be retained and worked around. Where clumps of smaller roots (including fibrous roots) are found these shall also be retained.
    f. Roots with a diameter in excess of 25mm must not be severed without the advice of the an arboriculturist.
    g. Care must be taken to ensure that the moisture content of the backfill is sufficient to avoid any drying out of the roots. Backfill material and method around roots to be agreed with the arboriculturist.

18. Access to frontages is to be maintained at all times. The Contractor is to liaise with frontage occupiers when works interfere with access points.

19. Developers should be aware that temporary access works required as part of the construction phase may require planning permission and that it should not be assumed such works will be covered by the Road Adoption Agreement.

20. Working Hours - Any restriction imposed on the working hours or the timing of particular operations as a result of noise/vibration considerations as set out by the District Council and in the Construction Management Plan.

21. Liaison and Public Relations - the developer is to contact the County Councillor, District Councillor and Parish Council prior to commencement of the works (this includes compound setup, start of s278 works that may affect the highway and other phasing of works). Advance warning temporary road signs are to be erected at least 2 weeks in advance of highways works. In addition to this, the Developer is required to:

22. letter-drop to all properties within 250m of the development in order to inform residents of the nature of the operations, the duration and the proposed working hours. The letter shall also provide a contact telephone number for use in the event of a query or complaint. A copy of the letter shall be provided to the Overseeing Organisation for approval.

23. The Contractor shall also inform affected properties of the date/time and details of any specific operations that cause specific disruption (e.g. limited access to/from properties).

24. The contact number given in any letter-drops shall be manned during all working hours.

25. Copies of any letters issued by letter-drop shall be given to the Overseeing Organisation.

26. Developers and their designers are reminded that fire hydrants are required within developments; 90m spacing and marked with a plate.

Supervision Management

27. For s278 and s38 schemes, a Supervision Management Plan (SMP) is required which will set out the level of resource, Health and Safety compliance, communication and record keeping required. An independent supervising Engineer & Clerk of Works will be provided and funded by the developer. The expected level of resource will be as follows –

Resource level	Hours per week
Director	1
Principle Engineer	4
Senior Engineer	5
Engineer	20
Assistant Engineer	5
Clerk of Works	40

28. Desk space for two people in a separate office area with secure file storage and plan storage shall be made available.

29. On large sites, a 4x4 vehicle will be available for use of SCC staff on request from the contractor.

30. The Supervising Engineer shall check for compliance with design and specification at each stage of construction and record the checks. Any noncompliance shall be notified

to the contractor at the earliest opportunity and rectified by the contractor. If for any reason it is decided to deviate from the agreed design, then the Supervising Engineer shall initiate the Change Control Process.

31. The testing regime shall comprise of the following and shall be compatible with the testing detailed in this document and the Construction Specification.

32. Technical Approval Team's comments will make comments in respect to layout, testing, drainage, earthworks, pavement, kerbs, traffic signs and lighting. It should not be assumed that a 'no comment' implies that SCC have assessed / approved other elements of the drawings. It is the Consultant's responsibility to ensure that the Specification for S38 Works are in accordance with SCC's Design and Specification.

33. Planning permissions for developments that include new roads, frequently incorporate pre-commencement conditions in respect of aspects of that development. Such conditions must be complied and discharged prior to commencement.

34. Technical Agreement will not be given in respect of new estate roads until relevant pre-commencement conditions have been discharged by the Local Planning Authority and evidence of such discharge has been provided to the Engineer. Failure to comply with this requirement may jeopardise the future adoption of the road.

35. For schemes that require works within the highway, a NRSWA permit (Road Space Booking) must be applied for. Occupation of the highway can NOT be booked prior to the sealing of the agreement.

36. Ground investigation covering the line of all the roads to be adopted shall be provided.

Series 100 – Preliminaries

101. Appropriate and approved traffic signs in accordance with the Traffic Signs Manual giving warning of the condition of the highway and/or any potential hazard must be exhibited.

102. Whenever the safe execution of the works requires it, the developer shall be responsible for the provision and maintenance of Temporary Traffic Management measures in accordance with Chapter 8 of the Traffic Signs Manual.

103. Where such Temporary Traffic Management affects directly or indirectly the existing highway maintainable at the public expense, the proposed scheme of Temporary Traffic Management shall be submitted to and approved by the Engineer before it is implemented.

104. An experienced supervisor employed by the developer, with a competency in roadworks and trench reinstatement and to whom instructions can be given, shall be present on the site during the construction phases of the estate roads.

105. Horizontal and Vertical Alignment - log of the levels relative to O.D. shall be available on site and kept for inspection by the inspecting engineer. The measurements and levels shall be made by a qualified Engineer and approved by the Inspecting Engineer. Submission of records are required and shall indicate –

106. grid of points with not more than 10m between any two longitudinal stations or 2m between any two traverse stations, except where the Inspecting Engineer shall direct that a closer spacing be used to cater for abnormal vertical curvature.

107. the design level of each station.

108. the achieved level at the station measured to an accuracy of ±5mm.

109. the difference between the design level and the achieved level.

110. certification that levels between stations were not more than ±5mm from a ‘straight bone’ line and followed by a smooth curve where the general levels or the area indicated a curve.

- certificate that the levels had not been adjusted since the taking of readings.
- the name, signature and qualifications of the person who recorded the levels.
- Testing – the developer is reminded adequate testing is required during the phases of construction as outlined in SHW and CD225.
- In-situ testing and laboratory testing shall be carried out by a laboratory holding N.A.M.A.S. (National Accreditation of Measurement and Sampling) issued by U.K.A.S. Drilling and engineering reports shall be third party quality assured.
- Any costs incurred in respect of sampling/testing shall be at the expense of the developer.
- Notice of 48 hours is to be given of all tests to provide opportunity for testing to be witnessed by the SCC Engineer.

- As part of the provision of samples and testing undertaken, a daily record of samples of materials taken to be kept. Records shall be in sufficient detail to record the nature and the source of goods and materials, and shall identify the locations and means of selection and sampling. A copy of the daily record shall be provided on the next working day for retention and use by SCC.
- If the developer fails to carry out testing to the required frequency, or to supply the results thereof in a correct and timely manner, SCC may carry out tests considered necessary to determine the acceptability of the works/materials and shall recover these costs thereof from the Developer.
- The developer is reminded testing of the sub-soil to determine soil classification and it’s properties (cohesion, susceptibility to frost heave etc) prior to start of works is imperative.

Series 200 Site Clearance

201. Where derelict sites, landfill areas, soft ground, buried structures are a featured in the development area, special design measures will be necessary. Such items within the area of the highway shall be removed or made safe in an approved manner. Impervious structures, slabs, hardstanding areas etc, which are permitted to remain shall have holes to full depth made at uniform spacings to allow free drainage such that the total area of perforation shall not be less than 10% of the impervious area to be drained.

202. All disused ducts, soil and surface water drains shall be removed from the highway.

203. The contractor is reminded movement and/or disposal of any hazardous or contaminated materials or ground must be completed in accordance with legislative requirements. Following detailed tests on any contaminated land, specific risk assessments are to be written by the laboratory outlining how the hazards are to be managed during construction to protect the workforce, visitors and general public.

204. Where soils or other materials need to be imported onto site, suitable and sufficient checks should be made to ensure the source is traceable and the material is suitable for the intended use. If unexpected contamination is revealed on site, works should cease on that part of the site and advice sought from appropriate and competent persons e.g. Environmental Health and/or the Environment Agency. Measures should be employed on site to prevent contamination e.g. from spillage of fuels/oils associated with vehicles or generators etc

205. All trees, hedges and undergrowth within the boundaries of the new road shall be taken down, grubbed-up and removed from site. Particular care must be taken to ensure all tree stumps and roots are removed and any holes left shall be filled with an acceptable material.

Series 300 Fencing

301. Where roads are in cutting or on embankment, fencing may be required to delineate the highway boundary.

302. At some locations highway boundary marker posts may be required to delineate the highway boundary.

Series 400 Road Restraint Systems

406. Vehicle Restrain Systems (VRS) shall conform to the SHW series.

407. All certification and testing results are to be supplied to the Engineer within 2 weeks of installation.

408. If the new system is to be linked to an existing unit the Contractor shall ensure that the proposed system is compatible and does not conflict or reduce the effectiveness of the existing.

409. The Developer shall submit drawings of the proposed system including, post sizes, foundations, results of Push Tests, etc. to the SCC for Approval prior to Commencement on site.

410. The preferred foundation for posts is concrete with sockets. Driven posts can be used with the approval of SCC.

Series 500 Drainage & Service Ducts

Subgrade Drainage

501. It is of vital importance to keep water out of the subbase, capping and subgrade, both during construction and during the service life of the pavement.

502. Where required, adequate subgrade drainage shall be provided to ensure the water level is not within 300mm of the formation level. Where the water table is high, subgrade drainage to be used. These would be placed below the bottom of the subbase, (or capping if utilised). Any subgrade drain pipes must connect to an approved outfall.

Pipes

503. Pipes shall be laid to constant gradients between the pipe invert levels stated in the schedules and on the layout plans.

504. All pipes and fittings are to carry the relevant BS number and be kitemarked. Pipes may be either rigid or flexible and shall be to the current issue of the British Standard and as in Table 5.1 of the Specification of Highway Works.

505. Drainage carrier pipes must be a minimum diameter of 225mm.

506. Pipe strength calculations are to be provided if requested.

507. All adoptable highway surface water drainage systems shall be surveyed using closed circuit television (colour) with viewing and video recording facilities, subject to the discretion of the Engineer.

508. Where cover to pipes is less than 1.2m in carriageway and vehicular crossings and 0.9m in footways and verges, rigid pipes shall be laid with a bed and surround of Mix ST4 as Drawing No DM-500-07 Type Z. Note, plastic pipes can not be used in these situations.

509. With spigot and socket pipes sufficient clearance must be allowed for any sockets to avoid point loads on the pipes.

Excavation

510. Trenches shall be excavated to a method of working and trench support complying with the current legislation and Codes of Practice.

511. Control of water into the excavation shall be sufficient to prevent standing water in the trench works. trenches and other excavations dry and at all times free from subsoil water and surface water. Water must not be pumped into any stream, sewer or highway drain.

512. The trench bottom is to be completed to a smooth grade and of no greater depth than is necessary to achieve the depth of bedding specified. All soft spots in the trench bottom are to be removed and filled with approved compacted material before the pipe bedding material is laid.

Connections to existing Sewers and Drains

513. No drain, duct or service discovered during the course of construction shall be blocked off or diverted without the consent of the Inspecting Engineer or the appropriate District Council or other Statutory Authority as required.

514. New gullies should not be connected to an existing gully run where they increase the surface water run off area and/or the distance is greater than 5m. Longer distances require a new direct connection.

Bedding & Surround

515. Pipes shall be bedded according to Development Management Standard Drawings.

516. The material for bed and surround shall be well compacted beneath and to the sides of the pipes to the dimensions shown on the standard drawings

517. For bed type A, the concrete shall be Mix ST4.

518. Backfilling and compaction shall not take place until the concrete has achieved its 7 days strength.

Drainage Testing

519. Joints shall be water tight and the Inspecting Engineer may require an air test in sections such that a 100mm head of water has not dropped more than 25mm after a period of 5 minutes.

520. Drains passing this test must retain the air until at least 0.5m of backfill has been placed and compacted.

521. Drains failing to pass the air test shall have the defects made good and be re-tested.

522. The Inspecting Engineer may ask for a CCTV survey with interpretation by a trained operative and a copy of the video tape recording (in colour) supplied to the Inspecting Engineer. All costs for such shall be borne in full by the Developer.

Backfilling & Compaction

523. When granular ‘as-raised’ material is proposed for backfilling of trenches, appropriate laboratory testing of the material is required to ensure it is acceptable.

524. Special care shall be taken to fill and compact voids left by the removal of trench support or shuttering.

525. Where Trenches are excavated beneath the carriageway (proposed or existing), compaction testing should be carried out to confirm that the material is compacted throughout its entire depth at 20m intervals.

526. Where trench backfill is greater than 200mm below formation level, compaction is tested by using DPSH method as measured in accordance with BS 1377 Part 9 Cl. 3.2 (1990). Minimum 1 per pipe run (maximum 25m spacing) and 1 per chamber surround. Use formular as below –

N = 3 + D where:

N = Minimum number of blows to achieve 100mm penetration

D = Depth of test in metres

Filter Drains and Subsoil Drains

527. Filter drains shall be laid to the bed/backfill Type H or M of the Standard Drawing DM-500-07 with the addition of any filter membrane.

528. The backfill material shall be Type A or Type B, which shall be well graded (except Type B which shall be uniformly graded) and comply with Table 5.8 in SFHW.

Catchpits / Chambers

529. When excavating for chambers, ensure sufficient width is provided to allow compaction of surround to the chamber (minimum 500mm).

530. Catchpits are to be placed where Maximum distance between catchpits is 75m.

Soakaways

531. Soakaways to be a minimum distance of 5m clear of the highway edge (back of footway or service strip).

Gully Pots and Connections

532. When excavating for gully pots, ensure sufficient width is provided to allow compaction of surround to the chamber (minimum 200mm).

533. Gully pots are to be precast, trapped with a rodding eye and fixed chain stopper. Insitu uPVC pots used as formers are NOT acceptable.

534. Care should be taken during installing to ensure that when the grate and frame is fitted it is centrally positioned over the gully pot. The misalignment of gully pots from the kerbline by more than 50mm is not acceptable and the gully frame must be tight up against the kerb face in order to prevent water over-running.

535. The length of any gully connection shall not exceed 12m.

Covers and Grating and Frames

536. All covers to be appropriately marked for each service (SW for surface water, FW for foul water, TS for traffic signals etc)

537. All covers and grating to be marked with the appropriate Kite-marking.

538. Cover and gratings in carriageway and footway shall be to BSEN124:1994 Class D400, be silent in use, and have a minimum frame depth of 150mm. All manhole tops shall be clearly marked on the upper surface with the maker's name/logo, EN124, the appropriate loading class and mark of the certifying body.

539. The developer shall enable satisfactory construction and completion of base and binder course materials around frames, manholes and catchpits shall be left at cover slab level until completion of the binder course layer. The cover slab openings shall be protected with steel road plates and paving machine allowed to run through without interference. Gully tops may be set at binder course level prior to the laying of base and binder course. Method of laying BS594987.

540. All covers and gratings in the carriageway shall be placed after completion of the binder layer and shall remain at binder level (inclusive of gullies) unless the surface course is to be laid within the following 3 days, in which case such covers shall be raised to finished levels.

541. Gully gratings and frames must be positioned with grating bars not parallel to the kerb to facilitate safe cycling. The orientation of the gully hinge to be to direction of traffic flow.

542. Gully tops shall incorporate a captive hinge arrangement to prevent removal and theft. Double-triangular gratings are NOT permitted.

543. The Developer shall use specifically designed ironwork which permits blockwork and its laying course to be laid up to the frame of the gully grate or manhole cover. No trimming of blocks shall be permitted other than those vertical cuts necessary to achieve the laying pattern.

544. The frames are to be supported by brickwork laid as the Drawing, in a header pattern and with any corbelling not more than 25mm per course.

545. Gully gratings in Tertiary and Shared Surface Roads shall be of a ‘pedestrian friendly’ design and meet the strength requirements.

546. If adjusting or replacing statutory undertakers covers, gratings and frame, permissions are required from the owners and must be to their specification.

547. Covers shall be bedded on a resin mortar in accordance with the recommendations set out in the Highway Agency Guidance Note HA104/2 on between 2 and 4 courses of Class B engineering brickwork laid 225mm header pattern. Precast concrete cover seating rings (or composite units) may be used instead of brickwork.

Headwalls

548. All pipe inlets or outlets to or from open watercourses must be provided with a headwall incorporating any necessary apron, scour baffle, handrails or other works.

549. All headwall designs are to be submitted for approval and must be site specific.

550. Headwalls for outfalls in attenuation ponds are to be the same gradient as the pond.

Service Ducts

551. Pipes for service ducts shall be GREY for British Telecom and BLACK for lighting and electricity services and laid so that no concrete or debris is able to enter the duct.

552. Any ducts and/or cables installed for private apparatus (viz. apparatus that is not the responsibility of a Statutory Undertaker) must be licensed by the County Council prior to adoption. Application for the licence must be made by the Company owning the apparatus.

553. Service ducts for private streetlighting (to islands) or traffic/pelican signal installations shall be ORANGE in colour, constructed from a low density polythene material with the wording STREET LIGHTING or TRAFFIC SIGNALS as appropriate stamped at one metre intervals along the length of the duct.

Drainage Crate (Modular Cellular) Systems

554. We reserve the right not to adopt crate systems. The systems are to be installed to manufacturers specification.

555. The inspecting engineer is to be in attendance when crate drainage systems are installed.

Swales

556. Grass cutting should not be carried out when the swale or filter strip is wet.

557. Planting to be completed so it can establish quickly and water does not flow in swales until the vegetation is established.

Rain Gardens

558. Rain gardens are on trial on a development site and may be considered for future developments.

Series 600 Earthworks

Materials

601. Excavation to formation level shall not take place until the design has received technical acceptance from SCC Engineer. The developer will be constructing at risk.

602. The stated definitions of earthworks materials apply to this and the other Clauses of the Specification in which reference is made to the following defined materials:

- Topsoil - shall mean the top layer of soil that can support vegetation
- Suitable Material - to be in accordance with the approved Specification
- Unsuitable Material - shall comprise:
- Material from swamps, marshes and bogs, peat, logs, stumps and perishable material. Materials susceptible to spontaneous combustion. Material in a frozen condition. Clay of liquid limit exceeding 90 and/or plasticity index exceeding 65, materials giving a moisture content greater than the maximum permitted.
- Materials in a frozen condition if otherwise suitable maybe suitable when unfrozen.

603. Any fill material used within 500mm of concrete structures or cement bound materials shall have a soluble sulphate content not exceeding 1.9g per litre when tested in 14 accordance with Test 10 of BS 1377, unless special precautions to the approval of the Engineer's Representative are taken to protect the concrete or cement bound materials.

604. Where the excavation reveals a combination of suitable and unsuitable materials the Developer is advised to carry out the excavation in such a manner that the suitable materials are excavated separately for use in the Works without contamination by the unsuitable materials.

605. Capping Material - All capping materials must comply with and be laid in accordance with Series 600 (SHW).

606. The developer shall only employ that plant which is appropriate to the soils that are to be handled. Care shall be taken to maintain the nature of the material so that when it is placed and compacted it remains in accordance with the Specification.

607. Materials are grouped as follows:

- 'cohesive soil' includes clays and marls with up to 20 percent of gravel or rock and having a moisture content not less than the level of the plastic limit (determined in accordance with BS 1377 test No 3) minus 4; also chalk having a saturation moisture content of 20 percent or greater.*
- 'well graded granular and dry cohesive soils' includes clays and marls with up to 20 percent of gravel * or rock and having a moisture content not less than the level of the plastic limit, (determined in accordance with BS 1377 test No 3), minus 4, well graded sands and gravels with a uniformity coefficient exceeding 10 and chalk having a saturation moisture content of 15 – 20 per cent.

- 'uniformly graded material' includes sand and gravels with a uniformity coefficient of 10 or less and all silts and pulverised fuel ashes. Any soil containing 80 per cent or more of material in the particle size range 0.06 - 0.002mm will be regarded as silt for this purpose.

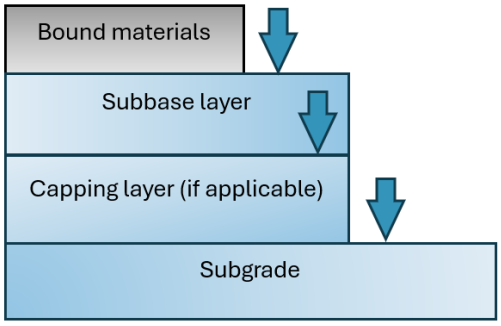
608. SCC may request additional testing and trail areas for earthworks/drainage excavations of significance such as 2m deep sewers, geogrid design, stabilised subgrade etc. This will be requested at pre-start meetings.

609. The developer is reminded that the design soaked or equilibrium CBR for each road for adoption is required. If the CBRs are not agreed before works start, the road likely not to be adopted. As outlined in the Design Manual.

610. The Developer is required to demonstrate that the construction of the pavement is carried out as specified. The Developer shall demonstrate this with the relevant levels of testing and can demonstrate that they have achieved satisfactory results. In addition, the developer shall supply or make available the results to SCC.

611. Intervals of LWD testing to be in each lane at 10m intervals, alternating (starting at CH10). At least 5 tests shall be carried out for each foundation/capping/subbase area.

612. LWD tests are required on top of the subgrade, capping layer and top of subbase (These tests are also required adjacent to chambers and gullies). Locations of tests are shown below –



- For subgrade and capping (if applicable), minimum 50mpa (equivalent 5%CBR) required. (this is to match the design CBR)
- For top of subbase, minimum 50mpa with rolling average 80mpa (over 5 readings)

Filling of Existing Watercourses

613. Where watercourses are encountered which are to be discontinued or diverted from the sites of carriageways, footways or other works, the original channels shall be cleared of all vegetable growths and soft deposits. Existing sloped areas are to excavated benched 300mm steps at trench reinstatement prior to infill.

614. If in the course of construction of roadworks any springs are discovered, where possible these should be connected to the stormwater system provided for the new roads with the prior approval of the adopting authority.

Excavation in Cutting

615. To protect the formation level, excavation shall be completed to 300mm above this level. The final 300mm of excavation shall be carried out as part of the road works construction.

616. The Contractor shall adopt the method described in Clause 613.11(i) of the Specification. Any overbreak in cuttings shall be blinded with a regulating layer of subbase. The formation shall be regulated to the tolerances given in Clause 616. On embankments the Contractor shall adopt the method described in Clause 613.12 (i) of the Specification for the construction of capping.

Capping

617. On sites where groundwater levels are within 600mm of the formation level, sub-soil drainage shall be installed and connected to the positive surface water drainage system. The design of sub soil drainage shall be included within the application together with supporting design data.

618. Capping - capping in pavements shall normally be Class 6F2, 6F3 or 6F5 material, complying with the requirements of Table 6/1 contained in Appendix 6/1.

619. Capping shall be 350mm to 600mm thick and will extend to the adjacent footways. If there are no footways, the capping shall extend beyond the channel by the depth of capping plus 150mm (ie. If capping is 350mm deep, the extent beyond the channel line is 500mm).

Sub-formation and formation

620. The sub-formation and formation shall have the same longitudinal gradient and cross fall as the finished pavement. However at flat areas of transition the sub-formation shall be so constructed as to provide falls of 1v: 100h towards the edge of carriageway.

621. A geotextile separator shall be laid on the full width of the compacted subgrade prior to spreading the sub-base.

Construction of Fills

622. Fills shall be constructed from naturally occurring, or approved manufactured, granular material and shall have the properties and compacted to the requirements in SHW.

623. All materials used in the works shall comply with the appropriate British Standard/ EN Specification, and / or the current edition of the Department of Environment, Transport and the Regions, Specification for Highway Works and any supplements, except where otherwise specified herein, and in force at the time of the Road Adoption Agreement. Note: This requirement also applies to installation and workmanship.

624. The materials shall be subject to the approval of the Engineer and samples and testing certificates shall be submitted for approval where necessary.

625. Free access shall be granted to the Engineer and their representatives for sampling and testing throughout the course of the works.

626. Formation – the Formation shall be assessed by determining the long-term equilibrium value of stiffness modulus Sm, as shown in The design Specification. At the start of construction, the formation shall be checked to ensure that it is at or above the Design CBR (long term value reported in Surface modulus) which was determined at design stage. Where this falls below this at construction (short term Value), a foundation redesign will be required. Where the value is higher than the long-term design value, the long-term value SHALL be used.

627. When new embankments, cuttings and reinforced soil structures are required for highways, full earthworks designs are required to be included in the technical acceptance. These works are to be supervised by N.A.M.A.S. accredited laboratory

Geogrid/Geotextile

628. Strengthening of capping or subbase is permitted subject a design and guarantee by the manufacturer and agreed with SCC before technical acceptance. This form of reinforcement is NOT accepted in shared surface roads or within roads where services (other than sewer) are within the carriageway.

Topsoil

629. At least two weeks before the commencement of topsoil stripping, all areas are to be treated with weed killer.

630. Stockpiling of stripped and imported topsoil shall not exceed 1.0m high and shall be treated with a suitable herbicide at appropriate intervals to prevent the seeding of weeds.

631. Wherever possible existing topsoil shall be re-used on site and to be tested to ensure it is Class 5A. Otherwise, imported topsoil Class 5B is required.

632. topsoil shall be spread 150mm thick.

633. Grass seeding shall be as described in Appendix 30/5.

634. Weed control as shown in Appendix 30/2.

Series 700, 800 & 900 Pavements

701. For pavement design, see SCC Design Specification.

702. The Developer is required to demonstrate that the construction of the pavement is carried out as specified. The Developer shall demonstrate this with the relevant levels of testing and they have achieved satisfactory results. In addition, the developer shall supply or make available the results to the Highway Authority. To which BS

Testing

703. Tolerance in Surface Levels of Carriageway Pavement Courses

TABLE 7.1	
Carriageway surface	0 to + 6mm
binder course (upper level)	- 6mm to + 6mm
base (upper level)	- 10mm to + 10mm
Sub-base (upper level)	- 10mm to + 10mm
Formation	- 40 mm to 0

Subbase

704. Formation Level - If the surface is too high it shall be re-trimmed and re-compacted. If the surface is too low the deficiency shall be corrected by the addition of fresh suitable material of the same classification laid and compacted to specification.

705. Compaction of sub-base materials should be carried out to Clause 802 of the Specification for Highway Works. Note, Clause 802 states that “compaction of unbound mixtures shall be carried out by a method specified in Table 8/4, unless the Contractor demonstrates at site trials that a state of compaction achieved by an alternative method is equivalent to or better than that using the specified method.

706. Records shall be kept demonstrating compliance (the ground works contractor is to clarify before works begins how they will achieve this)

707. Testing shall be carried out at the developers cost and measured to prove the pavement is satisfactorily constructed to the foundation design class. Where the use of stabilised materials is used.

Pavement

708. Base - where the courses consist of cement treated material, the method of correction will depend on the period which has elapsed between detection of the error and the time of mixing of the material. If this is less than two hours, the surface shall be scarified to a depth of not less than 50mm supplemented with freshly mixed material as necessary and re-compacted all to specification. If the period is two hours or more the full depth of the layer shall be removed from the pavement and replaced to specification. In either case the area treated shall be not less than 5m long by 2m

wide. For areas corrected, within seven days of laying, no construction traffic or compaction plant shall use the surrounding satisfactory areas.

709. Coated macadam or asphalt bases shall have the full depth of the top layer removed and be replaced with fresh material laid and compacted to specification. Any area so treated shall be at least 5m long and not less than one lane wide.

710. Binder Course and Surface Courses - These shall have the full depth of the layer removed and replaced with fresh material laid and compacted to specification.

711. Where the surface level of a Binder course or surface course is too high or too low, the area rectified shall be at least 5m or 15m long respectively and not less than one lane wide.

712. Where the number of surface irregularities exceeds the limits in Table 8/1 the area to be rectified shall be 200m or 50m long, as appropriate, and not less than one lane wide, or such less length to be determined by the Director as necessary to make the surface regularity conform with limits.

713. Carriageway channels shall be formed free of chippings over a width of 200mm to a true and even gradient of not flatter than 1 in 125. On block paved surfacing, the gradient shall be not flatter than 1 in 80.

714. Where a minimum fall of 1 in 125 cannot be achieved, precast concrete channel blocks, 250mm x 125mm to BS 7263, shall be provided for gradients between 1 in 125 and 1 in 200.

715. Gradients flatter than 1 in 200 will not be permitted.

Phasing of works

716. Any new estate road, where it joins the existing County Road, shall have its bellmouth, footpaths and visibility splays constructed to finished surfacing levels prior to any other works taking place on the site in accordance with Planning Conditions for the Development.

717. The existing carriageway shall be cut back to a clean vertical edge, receiving hot applied 50 pen. Bitumen, and the pavement constructed up to that edge.

718. The surface course shall be overlapped by 100mm to 150mm with the vertical joint receiving hot applied 50 pen. bitumen. With joint over banded, 40mm wide, 3mm thick maximum of skid resistant rubberised bitumen.

Use of Surfaces by Construction Traffic

719. Where surfaces are to be trafficked during construction they shall be constructed to top of binder course level.

720. Construction traffic shall be allowed to run over the construction layers only after the periods in the following table have elapsed:

LAYER DESCRIPTION	PERIOD
Cement bound materials in flexible pavement	7 frost free days from laying*
Bituminous material	Sufficient time to allow hardening as the BS for material
Unbound materials	N.A
*Where the Developer can demonstrate that a pavement will reach its 7 day specified strength in less than 7 days, the pavement may be trafficked once the 7 days strength has been obtained.	

721. Before placing any layer of pavement, the preceding layer shall be clean and free from contamination. If unbound materials become contaminated, they shall be cleaned, scarified and recompacted to the approval of the Director before the succeeding layer is placed.

722. Sub-base, concrete base course and bituminous base course shall not be used by construction traffic except for that traffic required to construct the next layer. If the Developer requires to traffic base course with plant for any other purpose, then the Developer shall increase by 20mm the design thickness of the base course at his own expense and this shall be clearly indicated on the approved drawings and detailed in the programme of works to be furnished.

Warm Mix Materials

723. Warm Mix Bituminous Materials are NOT suitable for:

- Surface course materials requiring addition of pre coated chippings (ie HRA surface course) as listed below.
- Areas to be laid by hand.
- Part loads
- Laying in adverse weather conditions

724. The use of Warm Mix Asphalt/bituminous materials are permitted within residential estate roads in Suffolk subject to the caveats set out below:

- Materials shall only be manufactured with Straight Run Penetration Grade bitumen’s.
- All material shall be designed, manufactured, transported and laid in accordance with the relevant SHW clauses (specifically clause 908), PD6691, BS594981 or manufacturers specification as appropriate.
- Particular attention shall be given to ambient weather conditions.
- Delivery and laying records which must be provided to the Overseeing Authority.
- During the period November to March inclusive, warm mix bituminous materials shall only be permitted with the written approval of the Inspecting Engineer.

- For the purposes of traceability, the mixture designation shall include a reference to the use of warm mix technologies e.g AC20 bin HDM 40/60 "W"

Joints

725. For new pavement construction, all longitudinal joints in all layers shall be situated outside wheel track zones. Where an existing road pavement is resurfaced, joints in the surface course shall coincide with either the lane edge, the lane marking, or the middle of a traffic lane, whichever is appropriate. Joints shall not coincide with the wheel path.

726. If materials are not laid the same day or laid adjacent to existing surfacing, joints are to be treated with hot bitumen 50 pen. material.

Block Paving

727. Concrete blocks shall comply with the requirements of BS 7533. Concrete blocks shall be a minimum 80mm thick for use in carriageways, footways, footpaths and cycle tracks.

728. The minimum polished stone value (PSV) of any product shall be 55 unless specified otherwise.

729. Block surfacing shall be laid in a 45° or 90° herringbone pattern with two stretcher courses adjacent to kerbs and a single stretcher course around ironwork unless directed otherwise by the inspecting engineer.

730. The laying course material shall comply with the requirements of BS 7533 and detailed in MCHW, Pavement Design CD239.

731. The surface course shall be compacted by use of appropriate equipment in order to ensure the filling of the lower portion of the block to block joint by the laying course material. Two or three passes of the compacting equipment will normally be required to achieve this condition. Compaction shall follow block laying as soon as possible but shall not be carried out within one metre of the laying face. Apart from this edge strip no area of paving shall be left un-compacted at the completion of the day’s work. JOINT FILLING After compaction of the surface course, dry silver sand shall be spread over the surface and brushed into the joints. The blocked surface shall then be vibrated as before in order to encourage the filling of the upper part of the block to block joint by the surface applied sand. Top filling and final compaction shall be completed as soon as practicable after laying and in any case prior to the termination of work on that day.

1100 Kerbs, Footways, Cycleways and Paved Areas

Kerbing

1101. All kerbing to be to current British Standards and shall be butt jointed to the line and levels shown on the approved drawings or to any revised line or level approved by the SCC engineer. Kerbs shall be laid with the top and front faces flush and within ±6mm of the design levels.

1102. Purpose-made Radius Kerbs shall be used where any radius is 12m or less.

1103. Where kerbs meet at right angles the quadrants, or internal and external specially made right angle kerbs are required.

1104. Kerb face upstand are shown in table below -

Road Classification/location	**Kerb upstand**
Primary	125mm
Secondary	100mm
Tertiary	100mm
Shared Surface	25mm
Vehicular access	25mm
Pedestrian crossing (with or without tactile paving)	6mm – 12mm
Bus stops	165mm

1105. Purpose made kerbs shall be used for transitions between kerb types and heights.

1106. Where the spacing of adjoining vehicular crossings would result in less than two kerbs of 100mm face between them, then these kerbs shall also be 125mm x 150mm bullnose kerbs and the intervening footway constructed to vehicular crossing standards.

1107. where kerb face is 125mm and needs to reduce to a dropped crossing point (6mm) double droppers are to be used to ensure the gradient is no great than 1:12.

1108. Where excessive access falls may result, the concrete rear edging kerbs, where agreed, the kerb face can be reduced to 75mm to maintain the crossfall of 1 in 36 towards the carriageway.

1109. The construction of base course and surfacing shall not be permitted without the kerbing having been laid first.

1110. On completion of construction, if there are 4 or more damaged kerbs out of 10, then all kerbs within that length are to be replaced.

1111. Temporary kerbs for construction period - method of replacing temporary edge restraint is to be as DM1100/08 and agreed with the Inspecting Engineer.

1112. Footways, Vehicular Crossings and Cycleways

1113. All trenches for services within footways and maintenance strips with regard to excavation and filling, compaction etc., are to be as specified in Series 600

1114. Where the subgrade is poor quality and capping layer is required under the carriageway, footways are to have the same thickness of capping.

1115. Prior to occupation of developments, all footways adjacent occupied premises are to be constructed to binder course.

1116. All pipes, ducts, utilities apparatus, lighting columns and street furniture shall be installed prior to the surface course being laid.

1117. All covers in footway shall be set at binder course level and only raised to finished levels immediately prior to the surface course being laid. All covers, including single stop-cock covers, shall NOT be sited within vehicular accesses or the ramped/tactile area of pedestrian crossings.

1118. The formation shall be cleared of all topsoil and weed growth, levelled, shaped and compacted to enable the full construction depth to be achieved.

1119. On footways wider than 2m, the footway surfacing to be machine laid.

1120. A weed control fabric shall be placed over the footway/cycleway sub-base. This to be a thermally-bonded non-woven fabric with 300mm overlaps , laid with an overlap and pinned to the sub-base in accordance with the manufacturer's recommendations.

- Pore size to be sufficiently small to retard weed growth.
- Weight to be in excess of 100 g /sq m
- Tensile strength – in excess of 7 kN / m
- Elongation at peak strength, less than 40%
- CBR puncture resistance in excess of 1000 N.
  The type of material to be included on drawing.

1121. where a footway does not abut onto a kerb or boundary wall, an edge restraint of 50mm x 150mm precast concrete edging kerb shall be used. The footway surfacing shall be finished flush with the top of the edging kerbs although raised edgings may be required for drainage purposes on some independent routes.

1122. Block pavers 80mm thick and laid in 45 degree herringbone pattern strictly in accordance with the relevant section of this specification.

1123. Tactile paving – minimum width of cuts of slabs are to be a third of it's original width (400mm slab, minimum cut is 130mm.)

1124. Tolerance in surface levels of footway and vehicular crossing pavement courses -

Surface course	Flush to kerb
Binder course	6mm to + 6mm
Sub-base	- 30mm to + 10mm
Formation/Capping	- 20mm to 0

1200 – Traffic Signs and Road Markings

Sign Posts

1201. Traffic Sign posts are to be galvansied and appropriate diameter to sign design. Tubular steel posts shall comply with BS 6323 and shall be manufactured from steel complying with the requirements of BS 5360 Grade 43A. They shall also comply with the requirements of BS EN 12899-1. Galvanising shall be by an approved hot-dip process in accordance with BS EN ISO 1461.

1202. Please note that sign post should not be painted unless in a town centre or conservation areas and are specified on the scheme plans.

1203. For lit signs, 5m street lighting columns are to used and cut down to appropriate height for signs (specification as 1300)

1204. The mounting height for signs within the footway shall be 2.1 metres, and 2.4 metres within any cycleway and 2.7 by equestrian areas.

1205. Posts shall have base plates and topped with an Aircraft Grey coloured watertight cap

1206. All posts shall be erected plumb and where three or more posts are provided for any one sign, the faces of the posts shall be lined up.

1207. Additional stub post(s) and brackets which may be required to offset sign plates shall be of the same construction and finish and be designed and manufactured for the specific requirements.

1208. Passive Safe Sign Posts shall be designed in accordance with BS EN 12767 and shall meet the requirements for the speed class, energy absorbing category and occupant safety levels.

Signs

1209. The finish shall be CLASS RA 2 retro-reflective material or MICRO-PRISMATIC (Diamond Grade type or similar) retro-reflective material with a warranted life of not less than ten years and shall fulfil the requirements BS EN12899-1.

1210. Signs shall be stiffened such that post fixings may be positioned at any point across the width of the sign without the need for drilling of the stiffening to permit erection onto posts of unspecified spacing.

1211. Plate signs not exceeding 1200mm x 2400mm shall be made of single sheet.

1212. he whole of the back surface of the signs shall be covered with 693 Aircraft grey nonreflective plastic sheeting, powder coating or stove enamel. For special areas such as town centres and conservation areas if agreed by the Overseeing Organisation, please acquire the colour specification from the local council.

1213. The sign plates or planks shall not be fixed until three days after concreting of the posts.

1214. Traffic signs mounted on posts shall be erected to have their face plumb, and be orientated in relation to the carriageway in accordance with Chapter 1 of the Traffic Signs Manual.

1215. All traffic sign assemblies (including back and front of the sign face, posts, lighting units and external and internal surfaces of traffic bollards) shall be cleaned in accordance with the requirements of the Traffic Signs Manual and the materials manufacturer's recommendations immediately prior to commissioning.

1216. The cleaning shall be carried out in the manner described in Chapter 12 of the Traffic Signs Manual.

1217. All New Road Layout signs to be removed 3 months after commissioning of the s278. A sticker is required on the back showing the date for removal.

1218. Street Name Plates – these are as specified by the Local District/Borough Council and to be erected as shown in the standard drawing.

Bollards & Hazard Marker Posts

1219. Bollards types to be agreed at design stage and installed to manufacturers specification.

Road Markings

1220. Markings shall be white or yellow continuous or intermittent lines, words, figures, arrows or symbols shall conform to the requirements of the current Traffic Signs Regulations and General Directions.

1221. The road surface to appropriately prepared, cleaned, swept prior to application and shall be firmly bonded to the underlying surface

1222. Unless otherwise specified, all white markings shall be reflectorised by incorporation into the road marking material and to the wet surface of the marking of either solid glass beads to BSEN 1423 and BSEN 1424 or equivalent materials.

1223. Where a marking is required to be laid on top or partially on top of an existing marking, the combined total thickness shall not exceed 6mm as detailed in current Traffic Signs Regulations and General Directions, and any superseded marking shall be either permanently removed or totally covered by the new marking.

1224. Temporary road markings as prefabricated reflectorised material shall be required for temporary diversions of traffic.

1225. Temporary road marking material as black prefabricated material shall be used for temporary covering of existing road markings unless agreed with SCC.

1300 Street Lighting

General

1301. All lighting column installation works will need to be carried out by a Suffolk County Council approved street lighting contractor and should be in line with Suffolk County Council's current street lighting design guide and specification.

1302. Do not adjust any of the lighting column positions without first consulting Suffolk County Council's street lighting department.

1303. It is strongly advised that the positions of the proposed lighting columns are marked at an early stage using stakes or piping/ducting of a similar diameter to that of the lighting column base.

1304. If columns are planted in verges, ensure area around columns is short grass variety.

Lighting Columns

1305. The definitions in BS EN 40-1 shall apply. Specifically, the nominal height is the distance from ground level to the luminaire spigot entry position.

1306. Columns shall be of fixed shaft design except in the following situations where hinged columns shall be supplied:

- where the column cannot be safely accessed for maintenance by a MEWP vehicle,
- on traffic islands or roundabouts (5m and 6m),
- where there may be conflict with overhead power cables (G39/1 specification of Electricity Council Engineers recommendations), or
- where specified by The Client

1307. All Columns (including fixed shaft and hinged) shall have a single diameter shaft to be manufactured from plain tubular steel complying with BS EN 40-5 and Design Manual for Roads and Bridges CD 354 issued by National Highways unless otherwise specified.

1308. The columns shall be of circular cross section. Circumference joints shall be of the sleeve type and restricted to points where the column is designed with reduced diameters. Joints shall not be allowed between designed points of reduced diameters.

1309. All steel lighting columns shall be supplied hot dipped galvanised in accordance with BS EN ISO 1461. All steel columns shall be coated internally and externally on the part of the column intended to enter the ground and for 250 mm above ground level with a glass flake root protection consisting of two pack epoxy glass flake protective coating, on top of the galvanising in black or grey colour.

1310. Columns shall facilitate post top mounting of lanterns, unless otherwise specified and shall be provided with a single door opening. Columns will have weatherproof door cover to the base compartment fitted with the same pattern of Tamperproof tri-key

lock the head of which shall be completely recessed on closure; the doors shall be interchangeable between columns of same type without adaptation and 10 keys per 1000 columns supplied shall be provided to the Client by the Contractor upon receipt of delivery of columns to the Contractor's respective depot.

1311. Compartment in the base of the column to be smooth and free from irregularities and burrs to accommodate the fuse cut-out assembly and secondary isolation. The opening to the base compartment shall afford easy access to the equipment. No equipment shall protrude through the opening in the column. Door openings on single arm columns shall be as Table 1.

1312. Columns to have a baseboard manufactured from material which is substantially non-hygroscopic and rot-resistant, of not less than 15 mm thickness and suitable size, fixed securely in the base compartment of each column to accommodate all control equipment with adequate space left at the bottom for cable termination and service cut-out's in accordance with SCC Standard Construction Drawings.

1313. Columns to have a tapped stud, set-screw and shakeproof washer to be used as an earthing terminal which shall be so positioned as to be easily accessible from the door opening. The screw, shakeproof washers and nut shall be made of non-corrodible metal.

1314. Hinged columns will as standard:

- be base hinged and shall contain a built-in hinge mechanism that raises the upper base and shaft section vertically clear of the lower base section. When the column is lowered it shall be operated by way of a compression spring or hydraulic device. When the column is in the upright position it will be secured with an internal tamper proof bolt.
- be positioned so that lowering of the column is not impeded, for example by static objects or items such as foliage and that when in the lowered position for maintenance, the column does not block the footway, footpath or protrude over a carriageway.
- Contain a separate maintenance door and be a minimum of 600mm above ground level and have an earth terminal affixed to the base and the door. A captive length of flexible conduit should protect the internal wiring cables from accidental pinching between the column base and shaft sections
- Mid hinged columns will be specified on any task order raised by the Client and generally will be specified where limited space is available to safely lower a base hinged column

Each column and bracket shall carry a unique permanent identification mark to show the manufacturer and year of production as a minimum and bracket data sheet reference number.

Bracket Arms

1315. Bracket arms shall not be used on 5 or 6 metre lighting columns unless it can be proven that their use will improve the lighting design by reducing the number of required lighting units or is specified by the Client accordingly.

1316. Bracket Arms where specified shall:-

- Provide the projection as shown on the approved drawing.
- Be measured from the centre of the column to the spigot of the lantern.
- Be tubular in cross-section
- Be of the "webbed gusset" stiffener type for all mounting heights
- The fixing of the bracket to the column shall be over a reduced diameter spigot to maintain the smooth parallel line between the column and bracket arm.

The Contractor shall ensure that columns and brackets are suitable for the Luminaires offered and of a style acceptable to the Client.

1317. All bracket arms shall be supplied hot dipped galvanised in accordance with BS EN ISO 1461.

1318. Decorative / Heritage bracket arms shall be of the Scroll type and suitable for the column shaft onto which they will be mounted.

1319. The securing arrangement of the bracket arms to the column shall be positive to ensure that the arms cannot rotate when fixed.

1320. All welds used in the manufacture of these arms shall be shop welds in accordance with BS EN 40-5.

Road and Street Lighting Lanterns

1321. Luminaires shall be designed for external street lighting and shall have an LED light source unless specified by the Client and be supplied complete in all respects.

1322. LED Luminaires where specified shall be designed for LED light sources only. Luminaries originally designed to be used with conventional light sources and subsequently modified or updated to accommodate LED light sources will not be accepted

1323. Luminaires shall be freely available for sale on the UK market

1324. Luminaires will generally have a colour temperature of 3000K in residential areas and 4000K on main roads unless specified by the Client.

1325. Luminaires shall comply with all legislation and relevant British Standards. All certification required to prove compliance with these requirements is to already be in existence and shall be made available for review immediately upon request by the Client.

1326. Luminaires shall be CE marked or UKCA marked. For all luminaires a Declaration of Conformity should be supplied detailing compliance.

1327. The luminaires shall be tested and approved by an independent 3rd party ENEC (European Norms Electrical Certification) national Certification Body and awarded the ENEC mark.

1328. The luminaires shall be designed, manufactured and tested in accordance with the essential requirements of BS EN 60598-2-3:2003+A1:2011 Luminaires - Particular requirements - Luminaires for road and street lighting.

1329. EMC Voltage fluctuations and flicker - The luminaires shall be designed, manufactured and tested in accordance with the essential requirements of BS EN 61000-3-3:2013+A1:2019 Electromagnetic compatibility (EMC) Limits.

1330. The luminaires shall be designed, manufactured and tested in accordance with the essential requirements of BS EN 62471:2008 Photobiological safety of lamps and lamp systems. It is the Client's expectation that CE marked products are declared based on current versions of all appropriate regulations and standards. Therefore, a Photobiological Safety Categorisation of RG1 / RG2 will be accepted where the luminaire is installed at a greater distance to the general public than the permitted safe distance.

1331. Luminaires shall be recyclable in accordance with the latest Waste Electrical and Electronic Equipment (WEEE) Regulations and the tendered rates must include the manufacturer's WEEE levy.

1332. The luminaires shall be designed, manufactured and tested in accordance with the requirements of BS EN 60529: 1992+A2:2013 Degrees of protection provided by enclosures (IP Code) and shall have protection against water ingress and particle ingress which meets a rating of at least IP66 for the optical compartment and IP65 for the driver compartment.

1333. The luminaires shall have an anti-condensation / hydrophobic and oleophobic vent feature that maintains IP rating while preventing condensation.

1334. The luminaire body/frame and canopy shall be made of a material suitable for the modern urban environment. The luminaire housing shall be constructed from die cast corrosion resistant marine grade aluminium alloy in accordance with: BS 1490 - LM6 (EN1706/EN AC-44100) and be powder coated conforming to appropriate European standards or equivalent and demonstrate the equivalent is equal or better than the stated standard. Where near field communications (NFC) forms part of the product specification the canopy material can be such as to allow signals to pass through the canopy.

1335. The luminaires shall be supplied painted grey to RAL 7035 or RAL 7040 (or similar approved) for all functional luminaires outside conservation areas. In conservation areas, they shall be supplied in black to RAL 9005 (or similar approved) finish as approved by the Client. Paint thickness shall be 100 microns or thicker.

1336. The luminaire shall have integral LED Driver that can easily be removed and replaced for maintenance. The Driver shall provide Dali dimming capability suitable to be operated via a mains powered CMS node. The design and quality of the luminaire shall allow for easy on-site maintenance activities of components (e.g., driver), the event of component failure or future upgrade. Any maintenance activities are not to compromise, in any way, water/dust ingress seals.

1337. The luminaires shall be designed, manufactured and tested in accordance with the requirements of BS EN 62262:2002 Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK Code) and shall meet a rating of at least IK08 for the whole luminaire (including the housing, gear canopy) or equivalent and demonstrate the equivalent is equal or better than the stated standard.

1338. Each luminaire shall be fitted with a 7-pin NEMA socket to accept a CMS unit. Alternatively where specified by the Client, and where appropriate to the luminaire type, an external Telensa antenna CMS node unit shall be factory fitted.

1339. The luminaires must be compatible with all major central management systems and in particular the Telensa system which is currently in operation throughout the county of Suffolk.

1340. Luminaires to have near field communication capability with capacity to increase driver current on site by a minimum of 20%.

1341. All luminaires shall have an agreed ELEXON un-metered supply charge code.

1342. The luminaires shall be suitable for connection to a single-phase electrical supply with a nominal voltage of: 230Vac + 10% to -6% at 50Hz

1343. Luminaires shall have a leading power factor ≥0.90 at the full operating power of the luminaire. In its lowest dimmed condition, the power factor shall be ≥0.85.

1344. Luminaires shall have options to fit or retrofit proprietary shields, which shall reduce unwanted light spill. The colour of the shields shall either be matt black, or match that of the luminaire. The luminaires must have a range of shields available to cover between 1 and 4 sides of the light engine simultaneously or individually.

1345. Luminaires shall include effective thermal management control suitable for use at an ambient temperature range of -20°C to +25°C without significant impact on performance.

1346. The closing catch, hinges, exposed screws and other fixings shall be manufactured from a corrosion resistant material and protected in a manner commensurate with the luminaire housing.

1347. When installed in a conservation area, luminaires shall be the same colour as adjacent decorative luminaires of the same type.

1348. When post-top mounted, functional luminaires shall be capable of being inclined at 0° or 5° whilst on site and when side-entry mounted, be capable of being inclined on site in the range +10° to -10°. The tilt angle settings shall be clearly marked on the spigot or luminaire and shall be clearly visible to ensure the correct angle can be set and checked easily.

1349. The luminaire shall be equipped with a labelling system which is visible on the outside of the luminaire, as well as on the box of the luminaire. The indelibly marked label shall include the date of manufacture, rated wattage and manufacturer’s name.

Luminaire Mounting

1350. It is the Contractor's responsibility to assess the correct mounting type for each asset to be replaced.

1351. The luminaire shall be suitable for all mounting options installed in Suffolk, typically, but not exclusively they will be mounted onto 34mm to 42mm side-entry spigots or post-top mounted onto 60mm to 76mm column spigots. A separate adaptor spigot will be acceptable.

1352. Fixing to the column or bracket shall be via two or more separate stainless-steel fixing bolts and care shall be taken to ensure that the torque setting of the bolts is as per the manufacturer's instructions.

1353. The Contractor shall ensure that all proposed replacement luminaires are of such weight and windage so as not to subject the associated column to a higher loading than could be reasonably expected of the existing installation, prior to luminaire replacement and in accordance with ILP PLG06.

CMS Nodes

1354. CMS nodes will be of the GPS 7-pin NEMA type unless otherwise specified by The Client. CMS nodes will be factory fitted where specified by The Client.

Photocells

1355. Wherever possible the Telensa CMS is to be used as standard, however where photocell control is specified on a Task Order they shall:

- be pre-set at the factory and not capable of adjustment on site
- shall switch on when the ambient dusk lighting has reached either 100, 70, 55, 35 or 20 LUX, as specified by the Client and on the corresponding Task Order.
- be one-part NEMA for street lighting luminaires as specified by the Client, and miniature for sign lighting units, and of compatible type unless otherwise specified;
- be capable of controlling the particular discharge lighting load of each individual circuit;
- 20mm miniature type to be used in luminaires where specified by the Client on any Works Order and where NEMA Socket cannot be installed.
- be provided with sealant rings to prevent dirt and moisture from entering into the photo-control unit and luminaire;
- be protected to IP67;
- be such that sensor drift shall be zero over four years and power consumption shall be 1.0 W or less;
- have a minimum guarantee of 12 years;
- have triac or relay switching; and

- have an operational temperature range of -20 ºC to + 80 ºC.

Tie Wraps / Identification Plates

1356. Tie wraps for fixing of identification plates will be UV stabilised and of the 'Belt' wrap around type, cut and trimmed with no sharp edges or protruding ends. En-Plate number plates will have sufficient space to accept up to 5no. letters / digits and contain the Client's Logo and freephone number for public reporting of faults / defects.

Illuminated Sign Posts

1357. Illuminated sign posts shall satisfy the same criteria regarding specification and installation as for street lighting columns item 1.0 and will be lighting columns reduced to the correct height on site as required. Where bare metal is present following cutting / drilling etc. bare metal to be treated immediately with suitable protection to match column protection.

1358. When determining the load on the signplate due to wind pressure, adherence to BS EN 12899-1 shall be used.

1359. All posts shall be complete with matching caps.

1360. All posts required to contain electrical terminations shall have a base compartment complete with access door and cable entry hole to the same specification as that for street lighting columns.

1361. Where support / straight posts are required (due to the size of the sign plate), they shall be:

- of suitable diameter,
- galvanised steel,
- protected against corrosion and painted in accordance with the specification for street lighting columns,
- installed with a top cap.

Sign Lighting Units Type A1 and B1

1362. All sign lighting units shall be supplied in accordance with latest requirements of the Traffic Signs Manual.

1363. All sign lights/brackets shall be post top anti rotational mounting, unless specified otherwise with an IP rating of IP54

1364. Lantern body and all lighting unit arms, brackets and fittings to be cast in LM6-M aluminium

1365. The luminaires shall be suitable for connection to a single-phase electrical supply with a nominal voltage of: 230Vac + 10% to -6% at 50Hz

1366. All lanterns shall be supplied complete with LEDs, electronic control gear, bracket arms and with 7-pin NEMA socket to accommodate the CMS GPS node(s), or integral to the sign lighting unit as per The Client's requirements.

1367. Sign lights to comply with BS EN 12899 Parts 1 and 2 to provide performance to E2 UE3 for 600mm and E2 UE2 for 750mm signs (Type A) and E3 UE3 for 900mm signs (Type B).

Pedestrian / Zebra Crossings

1368. Zebra crossing luminaires designated as zebra crossing luminaires shall meet the specification requirements for functional lanterns as per the Specification. In addition, Zebra crossing luminaires shall be "handed" such that the photometric distribution for a "left-handed" luminaire shall be predominantly to the left of the luminaire (when viewed from behind) and the photometric distribution for a "right-handed" luminaire shall be predominantly to the right.

1369. The vertical illuminance levels produced on the zebra crossing from the LED zebra crossing luminaires should be similar or higher than the levels produced by any zebra crossing luminaires being replaced

LED Belisha Beacon Globe Luminaires

1370. The belisha beacon globe luminaire shall meet the performance requirements of BS 8442 Miscellaneous road traffic signs and devices.

1371. The gallery shall be constructed from LM6 aluminium and polyester powder coated black to a minimum thickness of 80µm.

1372. The luminaire shall be pre-wired with 4 metres of supply cable and suitable for 230V single phase supply.

1373. The luminaire globe protector shall have a diameter between 300mm and 335mm, it shall be self-coloured, yellow, manufactured from rotationally moulded, UV stabilised polyethylene with a 2.5mm minimum wall thickness.

1374. The LED light unit shall incorporate a constant current driver and mains synchronised flasher control.

1375. The globe illumination shall be > 350 cd/m^2.

1376. The LED driver shall either be fully potted and have short circuit and thermal protection or internally sealed with insulation shrinkable sleeves with a fully sealed self-ballasted LED lamp unit conforming to EN 62560:2012, 62471:2008 and 62493:2010.

1377. The luminaires shall be manufactured and tested in accordance with the requirements of BS EN 60529: 1992+A2:2013 Degrees of protection provided by enclosures (IP Code) and shall meet IP54 minimum.

1378. All luminaire fixings shall be stainless steel or similar corrosion resistant material.

1379. A full or half shroud shall be included as required on site. It shall be manufactured from 3mm black polycarbonate with stainless steel fittings or similar corrosion resistant material.

Mid Post LED Belisha Beacon Globe Luminaires

1380. Consist of a two piece construction of 335mm and coloured Yellow

1381. Beacon to be rotationally moulded and comprise UV stabilised low density polyethylene with a 2.5mm minimum wall thickness with vertical split line.

1382. Brackets to be:

- 76mm - Cast LM6M marine grade alloy with cast in stainless steel threaded inserts. Primed and polyester powder coated black. All fasteners stainless steel.
- 89/114mm - Fabricated 4mm stainless steel, Primed and polyester powder coated black. All fasteners stainless steel.

1383. Each half to be a sealed unit and independently illuminated using high power LED's mounted on a 2mm aluminium gear tray. Each half will have an integral driver circuit with mains synchronised flasher control and pre-wired with 4m drop lead fitted with IP56 connector.

1384. Globe illumination to be >350 cd/m2 operating at 230V ac with short circuit and thermal protection and supplied complete with fixing screws and pre-wired IP56 connector for connection to supplied drop lead.

Centre Island Beacon LED Luminaire

1385. Centre island beacons shall be to the same specification as LED Belisha Beacon Globe luminaires except for the following

1386. The luminaire globe protector shall have a diameter between 300mm and 335mm. It shall be self-coloured White and manufactured from rotationally moulded, UV stabilised low density polyethylene with a 2.5mm minimum wall thickness.

1387. There is no requirement for mains synchronised flasher control

Sub Fuses

1388. Sub fuses for cable terminations in columns and signs shall:

- Contain a double pole isolator incorporating a single fuse module and spare blanked way where supplying a single luminaire.

- Be capable of providing one, two or three separately fused upward circuits or one upward circuit and one or two dedicated double pole outgoing circuits
- Consist of a substantial moulded plastic enclosure with separate terminals for live and neutral conductors, incorporate a high breaking capacity fuse to BS 88 rated in accordance with the lamp manufacturer's recommendations. Configurations as detailed in the “Preferred Equipment List.
- Have test probe access terminals.
- Be drip proof and designed primarily for use in street lighting columns and be suitable for single or looped terminations of services.
- Have a terminal large enough to take the service cables specified in straight terminations
- For looped private services, or private single cables in excess of 6mm2 an appropriate gland box to be installed.
- Be securely fitted to the backboard by means of at least 2 No. Stainless steel screws. (Posi drive or Phillips).
- "Live" terminals shall be shrouded to I.P.2X.
- The isolator shall be capable of being locked in the "off" position

Adoption

1389. Only when the SCC is satisfied that all equipment has been installed and all issues resolved will the street lighting system be accepted for adoption.

1390. if the developer does not use SCC’s incumbent contractor for the installation of this lighting scheme, then the Telensa Telecells will be installed as part of the initial installation and the developer will incur the additional charge of £148 per unit indicated on the drawing, upon adoption.

1391. The record information (“as built” drawings) to be provided by the Contractor shall clearly show the position of all street lighting equipment, cabinets, cables, draw pits, ducts, and the like, as actually installed, together with all telephone cables, power cables and communication cables including cable sizes, and route, that cross or run within 5m of the line of a street lighting cable or duct.

1392. On completion of installation of all the street lighting (including lit signs and bollards) the following site records are required –

- Electronic “as-built” drawings with grid references to be submitted after installation.
- Columns schedule and connection type
- Column check certificates (as BD94/07) d
- Electrical test certificates
- Schedule of maintenance numbers fixed to lighting columns (and other street lighting equipment)
- List of remedial works completed i
- Operation and maintenance manuals to support the site records together with all user information manuals to operate the plant.
- Test certificates cross referenced to the apparatus identified on the “as built” drawings

1500 – Traffic Signals

1501. Ducting and access chamber layout is shown on the signal design drawing and shall be installed in accordance with the scheme drawings.

1502. All materials and design shall comply with Appendix 12/5 shown in the scheme details.

1503. The Contractor shall include the testing of the installation and leaving it in working order to the satisfaction of SCC Signals Engineer.

3000 Highway verges and landscaped areas for adoption.

3001. Verges, and visibility splays shall consist of a layer of top soil (Type 5B) 150mm in depth, free from weeds, coarse grass and stones, and levelled and raked to a fine tilth.

3002. Control operations for the injurious weed species as listed in Clause 3002.1 are to be carried out on a two month basis during the growing season.

3003. Total weed control by non-residual herbicide, for site preparation, on topsoil heaps or in planting beds to consist of one application every three months on all tree and shrub planted areas and amenity grassed areas.

3004. No water courses shall be identified for herbicide treatment.

3005. Selective control of broadleaved weeds using herbicide in verges, central reserves, planted areas and other grassed areas is to consist of one application every two months during the growing season.

3006. Weeding by spot treatment with herbicide is to be carried out on species as listed in the Package Order by one application every two months during the growing season.

3007. Arisings from weed control operations are to be removed. Dead weeds are to be removed within one month of herbicide treatment.Grass Seeding (including Wild Flowers

3008. Grass seeding shall be carried out during the periods stated in Clause 3005.1

3009. All areas to be grass seeded shall be reduced to a fine tilth as described in Clause 3005.2.

3010. All areas to be grass seeded shall be fertilised at a rate of spread not less than 35g/m2 . Proposed fertiliser and any other soil ameliorants shall be agreed with the Overseeing Organisation

3011. Grass seed mixtures are as following tables.

Narrow Road Verges		
Latin name	**Common name**	**% of Mix**
Festuca rubra	Corail strong creeping red fescue	40
Poa pratensis	Tetris smooth stalked meadow grass	20
Lolium perenne	Chewings fescue	12.5
Festuca rubra commutata	Joanna chewing's fescue	10
Lolium perenne	Zurich perennial rygrass	10
Agrostis castellana	Highland browntop bentgrass	5
Trifolium repens	Aberlasting small white clover	2.5

Wide verge and Embankments (outside visibility splay) Wildflowers & Grasses		
Agrimonia eupatoria	Agrimony	0.2
Anthyllis vulneraria	Kidney Vetch	0.2
Betonica officinalis	Betony	1.6
Carex flacca	Glaucous Sedge	0.8
Centurea scabiosa	Greater Knapweed	0.8
Chaerophyllum temulum	Rough Chervil	0.5
Daucus carota	Wild Carrot	1.6
Fililpendula vulgaris	Dropwort	0.9
Filipenula ulmaria	Meadowsweet	0.8
Galium verum	Lady's Bedstraw	0.2
Knautia arvensis	Field Scabious	1.3
Leontedon hispidus	Rough Hawkbit	0.8
Leucanthemum vulgare	Oxeye Daisy	0.8
Lotus corniculatus	Birdsfoot Trefoil	0.2
Malva moschata	Musk Mallow	1.6
Plantago lanceolata	Ribwort Plantain	1.2
Primula veris	Cowslip	0.3
Ranunculus acris	Meadow Buttercup	2.4
Rhinanthus minor	Yellow Rattle	1.6
Rumex acetosella	Sheep's Sorrel	0.3
Scabiosa columbaria	Small Scabious	1.3
Silene latifolia	White Campion	0.3
Trifolium pratense	Wild Red Clover	0.1
Agriostis capillaris	Common Bent	8
Cynosurus cristatus	Crested Dogstail	32
Festuca rubra	Red Fescue	24

Swales, Basins and Wet Grasslands		
Achillea millefolium	Yarrow	1
Agrimonia eupatoria	Agrimony	0.2
Angelica sylvestris	Wild Angelica	0.2
Centaurea nigra	Common Knapweed	2
Chaerophyllum temulum	Rough Chervil	0.3
Cruciata laevipes	Crosswort	3
Dipsacus fullonum	Wild Teasel	2
Filipendula ulmaria	Meadowsweet	5
Galium album - (Galium mollugo)	Hedge Bedstraw	2.6
Galium verum	Lady's Bedstraw	1
Leucanthemum vulgare	Oxeye Daisy - (Moon Daisy)	2
Lythrum salicaria	Purple Loosestrife	0.2
Malva moschata	Musk Mallow	0.2
Plantago lanceolata	Ribwort Plantain	0.1
Rumex acetosa	Common Sorrel	0.1
Silaum silaus	Pepper Saxifrage	0.1
Agrostis capillaris	Common Bent	10
Anthoxanthum odoratum	Sweet Vernal-grass (w)	3
Briza media	Quaking Grass (w)	6
Cynosurus cristatus	Crested Dogstail	26
Deschampsia cespitosa	Tufted Hair-grass (w)	2
Festuca rubra	Red Fescue	28
Schedonorus pratensis (Festuca pratensis)	Meadow Fescue	5