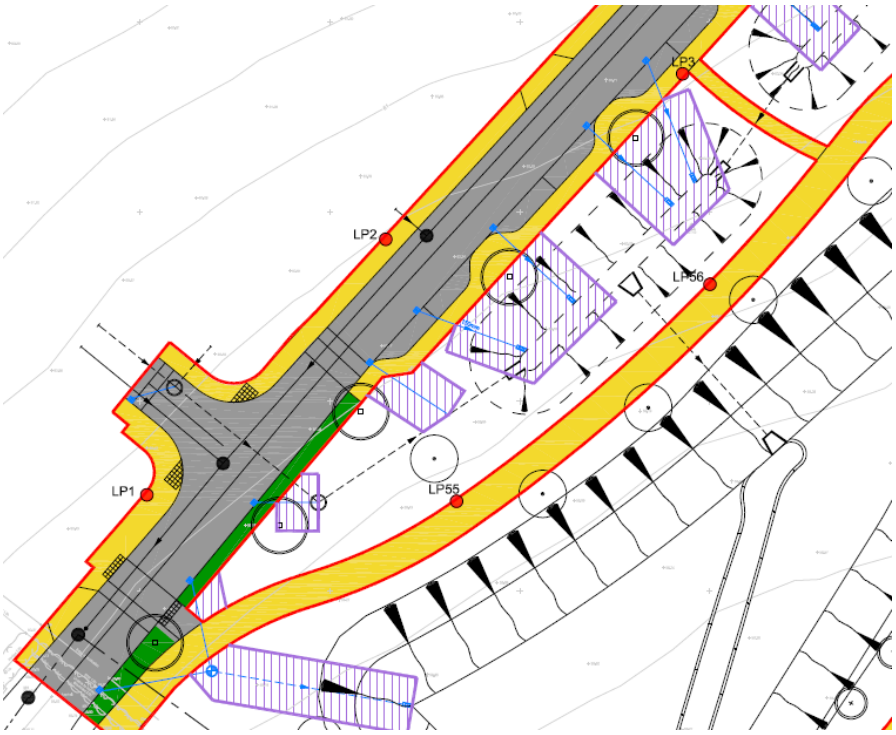
Suffolk County Council

SCC Development Design Manual



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000 Introduction

000.1 Introduction

This document supersedes the Suffolk County Council's (SCC) Specification for Estate Roads 2007. For new estate roads, It should be read in conjunction with Suffolk Design Street Guide 2022. For link roads and s278 applications, Design Manual for Roads and Bridges (DMRB) and Manual for Streets (MfS) and other appropriate national guidance are also to be used.

Where discrepancies occur between documents, the SCC guidance shall take precedence unless otherwise agreed with the authority.

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.

The SCC Development Design Manual is supported by Development Management (DM) Construction Drawings and DM Construction Specification.

All SCC's development design and specification documents have been produced specifically for residential developments and advice should be sought from the authority regarding the design and specification of highways within retail or industrial sites or heavily trafficked link roads.

In principle, works on the existing public highway will be approved and delivered via a Highways Act 1980 section 278 agreements whilst adoption of new roads through section 38 of the same act. The SCC Development Design Manual is, for ease of use, split into a number of sections, based on the series within 'Specification for Highway Works' (SHW) published by The Stationery Office as Volume 1 of the Manual of Contract Documents for Highway Works).

000.2 Pre-Design Considerations

The Design of developments are to be to this Manual (which is based on the 'Specification for Highway Works' (SHW) published by The Stationery Office as Volume 1 of the Manual of Contract Documents for Highway Works). All applicants should be familiar with the following documents-

- Relevant British Standards
- Disability Discrimination Act 1995
- Suffolk Streets Design,
- Suffolk Development Construction Specification
- Development Management Standard Drawings
- SCC Guidance for s278 Agreements – Application
- SCC Guidance for s38 Agreements – Application
- SCC Guidance for s278 Agreements – Construction
- SCC Guidance for s38 Agreements – Construction

Applicants should note outline planning permission must be obtained from the Local Planning Authority (LPA) and designs comply with the relevant planning conditions. Any discrepancies or errors in the planning permission affecting design of the highway works should be brought to the attention of SCC and the LPA as soon as possible.

000.3 Checklist

The checklist has been provided to help guide the applicant regarding what documents and drawings are required to be submitted with the s278 and s38 application. If elements of the submission are missing, this will prolong the design checking significantly as the details have

to be revisited to review how additional information submitted later in the check may impact on other elements of the design.

Document	Description
Application Form	Ensure all the boxes are completed (completed and sent in Word format)
Site Clearance	Include any trees and hedges
Land Drainage Consent	Works affecting ditches or watercourses
Land Registry Titles	(copies of Land Registry Titles, including plans)
Tender costs	Costed Bill of Quantities
Soils and Pavement test results	Test data to support design assumptions, including location plan
Earthworks design reports	calculations and specifications for any earthworks design
Pavement design	calculations and specifications for any pavement design
Surface finish drawings	areas of surfacing, plane and inlays, regulating etc.
Tree Reports	Include any relevant permission and preservation orders
Cross sections	On complex designs, indicating existing and proposed levels, vertical elements etc.

Drawing	Description
S278 coloured plan	Elements coloured as shown in guidance
Engineering drawings	including kerbing details
Setting out drawings	showing chainages and widths
Drainage design drawings	showing gullies and include contours
DMRB design	Any deviation to DMRB requirements highlighted
S104 drawing	Surface water design to be adopted by Water Authority
Statutory Undertakers drawing	Existing and proposed diversion routes
Private utilities	Plan and S50 license
Construction details	Detailed cross sections included
Street lighting and or traffic signal check	Relevant permission from SCC Street Lighting and or Traffic Signal Teams
Long sections	indicating existing and proposed levels, vertical elements etc.

000.4 Pre-Start Considerations

The Construction (Design and Management) Regulations 2015 (CDM) are to be adhered to on all S38 schemes. For avoidance of doubt, the Developer is the “Client” in terms of the CDM Regulations. In all Submissions, the CDM Client shall -

- appoint a Principal Designer who has the appropriate skills, knowledge and experience to fulfil their duties under CDM. The Design Consultant should be retained for the construction and the maintenance period to address any issues that arise during the construction or the Stage 3 Road Safety Audit.

- appoint a Principal Contractor's skills, knowledge and experience are required. Confirmation that the HSE has been formally
- notify HSE by way of an 'F10' Notice will be required of the works.
- If ground investigation or other intrusive processes are required at an early stage of a construction project which meets the criteria for notification, then the ground investigation will require Part 3 of the Regulations to be applied (regardless of whether this small package meets the HSE notification criteria itself).
- SCC requires a copy of The Health and Safety File and as-built drawings at the end of the project.
- A Quality Report/File is also required prior to issue of Part 1 certificate. This report is to include all the test results, surveys (including dip records) and material certificates, sampling records etc.

100 - Preliminaries

100.1 Site Survey

The Developer shall, prior to implementation of the development, submit to the Council for its approval a Highway Condition Survey, which will identify the current condition of the Highway in the vicinity of the site to include:

- A plan which identifies the area covered by the survey.
- A survey of existing drainage system if being utilised by design.
- A written report detailing the current condition of the roads and footways in the vicinity of the site.
- A list of Highway defects, prior to implementation of the development, including specific photographs, identifying the individual defects.
- Data obtained from pavement coring, trial pits or other form of ground investigation[1] .
- A photographic overview of the roads and footways in the vicinity of the site.
- An estimate of the size, types, numbers and route of construction traffic expected to service the site, during the development period.

1: It is the applicant's responsibility to identify any contamination within the limits of the highway works, including screening for coal tar in bituminous materials

Any damage to the highway following the construction of the development, the Developer shall secure and agree the repairs with the inspecting engineer, in line with the Councils specification and rectify any damage caused to the highway during the period of the development.

At SCC's discretion the condition survey may include all or parts of the access route approved in any Construction Traffic Management Plan.

Traffic Management (TM) – all TM layouts must comply with the following:

- Chapter 8 of the Traffic Signs Manual (TSM) and any amendments thereto.
- New Roads and Street Works Act 1991
- Safety at Street Works and Road Works: A Code of Practice, produced by the Department for Transport.

100.2 Trail Holes, Cores and Pits

Trial holes or pits shall be carried to establish pavement thicknesses of the existing road. The location and dimensions of trial holes and cores along with the depths of different types of materials, are to be recorded, and these details reported to the Engineer. The cores of the existing carriageway are required and measured in accordance with BS EN 12697-36 : 2003 Clause 4.1. Cores & Testing of Existing Surfacing Material Cores shall be a minimum of 100mm nominal diameter The cores shall penetrate the full depth of bound materials and where full depth reconstruction is required undertake inspection and testing of the sub base, capping and sub grade as required to design the pavement.

100.3 Testing

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 starting on site is imperative. Inspecting Engineers will not attend site until the design of the roads and footways (using the test results) have been completed and technical accepted.

- 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.

100.4 Traffic Management

All A, B and C classified roads are traffic sensitive and those sections of the highway are likely to create unacceptable delays and disruption to road users at key times of the day. Delays to traffic on these roads must be kept to a minimum and 2-way traffic is to be maintained whenever possible. Early Stakeholder Involvement with Technical Approval and Construction Teams is encouraged for all works such that the appropriate people are able to discuss specific site requirements, methods of working and TM proposals. This process should identify those parties that need to be consulted about the works/traffic management e.g. passenger transport school travel, affected businesses etc.

The proposed TM shall allow for the requirements of vehicular, pedestrian (including suitable measures to ensure access for persons with different disabilities e.g. visually, hearing and mobility impaired), cycle and equestrian traffic.

All TM shall allow for access by emergency vehicles at all times during the Works. There may be an occasion (e.g. when a bridge is proposed to be demolished under a road closure) where physical constraints make emergency access impossible and consultation with the emergency services is required about alternative routes. Where traffic is required to run on temporary and / or milled surfaces appropriate safety measures must be included in the traffic management proposals submitted with the application.

If temporary traffic orders are required, the applicant must allow sufficient time to obtain these from the LHA. A minimum of 12 weeks should be allowed for this.

100.4 Licences, Consents and other Approvals

Hoarding, scaffolding Highway Licences – licences are required to place hoarding, scaffold or skips on the highway. The term highway includes footpaths, cycleways, verges, and roads. It is an offence under the Highways Act 1980 to place a hoarding/scaffolding on or over the highway without first obtaining a licence from Suffolk County Council (SCC) as the Highway Authority. It is the applicant's responsibility to obtain these from the LHA. Failure to obtain the required licence could result in legal action being taken by SCC.

Note, this licence is not included in the Minor Works licence or s278 agreements.

It is the applicant's responsibility to obtain any other consents or approvals from third parties, for example drainage consent to work on watercourses managed by the Lead Local Flood Authority.

200 - Site Clearance

200.1 General

Site Clearance proposals must be submitted for approval as part of the initial technical highway design submission, particularly where the site is situated entirely or partly within the public highway. During the works the Developer must record any street furniture, plant or equipment or Council assets removed from or relocated within the highway.

200.2 Trees and vegetation

Where tree branches obstruct a public highway, public right of way, footpath, entrance to property or open space with public access, the minimum clearances of tree canopy is

- 2.4 metres over pedestrian accesses
- 3 metres over cycleways and bridleways
- 5.2 metres over road carriageways

Under section one of the wildlife and the countryside Act of 1981, it is an offence to intentionally take, destroy, or damage the nest of all wild birds. Timing of the working on trees, tree felling, and vegetation clearance should be considerate to avoid nesting season (breeding season for nesting birds is 1st March to 1st September). If works are required during the nesting season, a qualified arboriculturist or ecologist is to inspect the vegetation for active nests. If there are any present, the works cannot commence.

If trees in or adjacent to the scheme are subject to a Tree Preservation Order this should be clearly shown on the plans submitted. It is the applicant's responsibility to obtain any permissions to work on protected trees. Where protection is required, the LHA shall be included in discussions with the LHA to ensure this does not compromise acceptable design of the highway works.

Consideration should also be given to location and restrictions appropriate to Roadside Nature Reserves and areas designated as SSSI's. For further information go to the following links

Suffolk's Roadside Nature Reserves interactive map - Suffolk County Council

Sites of Special Scientific Interest (England) - data.gov.uk

local-sites.jpg (2479×1753) (suffolk.gov.uk)

Almost all hedges are owned by the adjacent property owner. Where cutting of vegetation in domestic premises is required the Contractor shall seek the permission of the occupier.

Highway Trees - the Council's approval must be sought prior to any clearance of highway trees and must be in accordance with the Planning Approval to avoid damage to any protected features.

If a highway tree is to be removed for s278, a Capital Asset Value for Amenity Trees (CAVAT) assessment by independent arboriculturist is required to determine the tree's amenity value. Please note, the sums can be £50,000 for a single tree. Any tree that is felled must be replaced with 3 No. new trees of an appropriate species and will need to be maintained by the developer for 5 years. Contact ecology@suffolk.gov.uk to discuss any landscaping proposals that could mitigate the removal of the trees. Go to Series 3000 for further information and Biodiversity Net Gain. Any landscaping within the highway will require a 5 year maintenance period to ensure the trees are well established.

As highlighted in SHW, refer to Clause 202 where tree and hedging roots are removed fully and filled with acceptable material.

200.3 Hazardous Materials

Treatment and disposal of hazardous materials encountered in site clearance shall comply with relevant legislation and any other health and safety measures. Any hazardous material shall be recorded in the site health and safety file together with the measures taken to remove this hazard.

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.

200.4 Removal of Road Markings

For s278 where there is a requirement for the removal of road markings, method of removal to be hydroblast. If the area/amount is high, then we will require the area to be resurfaced as removal does damage the surface.

Series 300 – Fencing

300.1 General

Fencing marking the boundary of the public highway is generally located immediately beyond the boundary in private land. Whilst the fencing is not within the publicly maintainable highway, it shall be designed to a specification agreed with SCC. SCDs are available for suitable fences.

When not required for demarcating boundaries, fencing should be only proposed where it has not been possible to provide designs than mitigate any hazards. For example, drainage lagoons designed to SCC's SuDs guidance should not require fencing.

Fencing, gates, stiles or other obstructions (such as doors and windows) must not be placed across the highway, including all public rights of way.

Series 400 –Road Restraint Systems

400.1 General

It is the designers responsibility to assess the risks within the design using either

- DMRB CD377
- RoSPA guidance TD 19/06

SCC expects risks to be designed out, so vehicle restrain systems are not relied on.
Copies of the risk assessment shall be submitted for technical approval together with the design and specification of any restrain systems.
Plans for road restrain systems shall include the location of any underground statutory apparatus, drainage or structures.

Series 500 – Drainage & Ducting

500.1 General

Suffolk County Council is a Lead Local Flood Authority (LLFA) as defined in the Flood and Water Management Act 2010. Written Ministerial Statement (HCWS161) has come into force which requires the provision of Sustainable Drainage Systems (SuDS) for all developments unless demonstrated to be inappropriate.

Only systems that exclusively drain the highway will be considered for adoption by SCC. Separate systems will be required for dwellings, private land and private roads or footways. Combined surface water systems may be eligible for adoption by the water authority subject to the agreements under S104 of the Water Industries Act 1991. In this case written confirmation of this will be required prior to any S38 or S278 agreement being approved.

Where the developer intends to use an existing highway drain, they will be responsible for investigating the suitability of this system. Only drainage of existing or proposed adoptable highway will be permitted. Connection of private systems to highway drainage systems will not be considered (supersedes 6.8.3 of the Design Guide).

Where either sole highway or combined surface water systems drain to watercourses the developer will identify the maximum discharge rate and undertake a robust flood risk assessment of the downstream including the capacity of any structures to accept floods to the satisfaction of the Local Lead Floods Authority. The developer will provide details of the proposed discharge rates with supporting evidence to any planning application.
Unless agreed otherwise with the LHA and LLFA

Developers must incorporate appropriate SuDS in the highway drainage proposals for approval by SCC. Criteria to determine the form of drainage appropriate to any particular situation, as well as requirements for the design, construction, operation and maintenance of SuDS will need to be agreed in writing. Please Note, whilst the Council promotes the use of SuDS on new developments. Note, permeable paving will not be adopted by SCC and we reserve the right not to adopt crate systems.

SCC only allow pumped networks as a last resort. Where these are necessary SCC will require a 24hr 100 years plus Climate Change (CC) storm capacity for the system in the case of pump(s) failure + duty/standby arrangement.

Wherever possible drainage shall be designed to avoid risks to health and safety, for example creating features that are confined spaces (ie Confined Spaces Regulations 1997).

500.2 Design Criteria

The key design criteria is a design for a 1 in 30 year storm contained within system, 100 year plus climate change (depending on development) resulting in no flooding to properties in or adjacent to the site/land.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable and if infiltration is not achievable, to a surface water body such as water course or lagoon is required.

However, these benefits need to be balanced against the future maintenance costs.

It is the Highways Authorities preference that surface water drainage beyond the highway boundary shall be adopted and maintained by (in order of preference)

- District or Borough Council (in Public Open Space)
- Water Authority (Anglian Water)
- Highways Authority (drainage of public highway only)

- Internal Drainage Board
- Management Company (In this case details should be included as planning condition or by land charge)

Adoption and future maintenance agreements shall be developed using the Model agreements for sustainable water management systems CIRIA C625. This document provides model agreements for two specific scenarios for implementation and maintenance of SUDS through either;

- the planning process, either as a planning obligation under Section 106 of the Town and Country Planning Act 1990 or as a condition attached to planning permission
- or two or more parties (outside of the requirements for planning permission), ie private SUDS model agreement private SUDS model agreement

500.3 Geotechnical Information

The applicant shall submit all geotechnical test data with the application, specifically infiltration testing to support the drainage design. Infiltration testing shall be to BRE365 at a depth relative to the proposed asset. The location of the test shall be included on plans showing the relationship with drainage elements and all depths shall relate to a datum.

500.4 General Design Notes

- The pedestrian routes within a new development must be taken into consideration when designing swale layout. It is unacceptable for a pedestrian or cyclist to have to travel more than 5m off the desire line because of a swale. There also needs to be sufficient dropped areas on a road for pedestrians to cross safely and not have to travel far ‘out of their way’.
- Highway surface water drains shall be laid in straight lines at uniform gradients between manholes.
- Where an outfall, drain, ditch or pipe will discharge into an existing drain or pipe or watercourse not maintainable by the Local Highway Authority, written evidence of the consent of the authority or owner responsible for the existing drain, to such discharge shall be provided to the Engineer by the developer as part of any application
- Provision may be required to filter any drainage water prior to discharge into an existing drain, pipe or watercourse where pollution of the drain, pipe or watercourse may occur, or at those sites deemed especially sensitive by the Engineer.
- No highway surface water outfall drain shall pass below any building.
- Where an outfall drain or pipe unavoidably passes through land which will ultimately be conveyed to a house purchaser or which will otherwise remain undedicated as highway, a 3m wide (minimum) easement will be required giving the Highway Authority right of access at all times for repair and maintenance purposes.
- The spacing between catchpit chambers shall not exceed 75m.
- Where attenuation devices are required, these shall not include moving parts as far as practical and must be located in an easily assessable place.
- No planting of trees shall be permitted within 5m of sub surface drains (soakaway, under drained swales) or pipes, gullies, manholes or catchpits.
- Developers and their designers are reminded that fire hydrants are required within developments; 90m spacing and marked with a plate.

500.5 Advice from Environment Agency

- Infiltration sustainable drainage systems (SuDS) such as soakaways, unsealed porous pavement systems or infiltration basins shall only be used where it can be demonstrated that they will not pose a risk to the water environment.
- Infiltration SuDS have the potential to provide mobilise pollutants and must not be constructed in contaminated ground. They would only be acceptable if a site investigation showed the presence of no significant contamination.
- Only clean water from roofs can be directly discharged to any soakaway or watercourse. Systems for the discharge of surface water from associated hard-standing, roads and impermeable vehicle parking areas shall incorporate appropriate pollution prevention measures and a suitable number of SuDS treatment train components appropriate to the environmental sensitivity of the receiving waters.
- The maximum acceptable depth for infiltration SuDS is 2.0m below existing ground level, with a minimum of 1.2 m clearance between the base of infiltration SuDS and peak seasonal groundwater levels.
- Deep bore and other deep soakaway systems are not appropriate in areas where groundwater constitutes a significant resource (that is where aquifer yield may support or already supports abstraction).
- SuDS should be constructed in line with good practice and guidance documents which include the SuDS Manual (CIRIA C753, 2015) and the Susdrain website.
- For further information on our requirements with regard to SuDS see the Groundwater Protection Position Statements (2017), in particular Position Statements G1 and G9 – G13 available at: https://www.gov.uk/government/publications/groundwater-protection-position-statements

500.6 Commuted Sums for Drainage Items

Commuted sums will calculated by estimating the costs of replacing and maintaining the asset. They are required for the following items if to be adopted by SCC -

- attenuation ponds when they are for highway water only.
- a downstream defender (when a swale is on a steep gradient, a defender will be required as the pollutants and debris will not have a chance to be filtered in the swale)
- Soakaways
- Pumps and associated apparatus
- Rain gardens – at present, these are being used as part of a trial drainage system in a development.

500.7 Ditches

Applicants are reminded if the proposal requires works being carried out to an existing ordinary watercourse or the piping of a ditch, whether temporary or permanent, then consent will be required from Suffolk County Council's Flood and Water Management team before those works can commence. Application forms are available from the SCC website: https://www.suffolk.gov.uk/roads-and-transport/flooding-and-drainage/working-on-a-watercourse/
If carriageway or footway adjacent to

500.8 Chambers and Catchpits

The maximum spacing between catchpit chambers is 75m.

In areas of high risk, e.g. outside schools, on approaches to traffic signals, roundabouts, crossings and junction bellmouths, or other areas where a high skid resistant surface is specified, manhole covers shall have a minimum PSV of 70.

500.9 Soakaways

Where soakaways are to be considered, it will be at the discretion and approval of SCC.. The Developer is to note that a commuted sum will be charged for each soakaway installed.

Only soakaways which form part of the highway drainage system will be permitted within land (open space, verges or landscaped areas) intended to be adopted as public highway, public open space or where agreed with the highways authority within open space managed by the developer or management company. In the latter case conditions may be requested by the highway's authority. Those jointly draining surface water from dwellings or privately owned land will expect to be adopted Anglian Water or maintained by the developer and such combined systems will not be adopted by the Highways Authority nor permitted within any land offered for adoption as public highway. Generally, geocellular storage systems will not be considered within highways drainage systems offered for adoption although they may be considered when geological conditions render traditional soakaways impractical (e.g. unstable ground conditions or high water tables).

All soakaways draining the public highway shall be within the proposed highway limits or in public open space maintained by District or Borough Councils. Soakaways will not be considered in paved areas and shall be located a minimum 5m from the metalled highway or buildings.

The minimum diameter shall be 1200mm. If more than one soakaway is planned, they are to be linked by a 225mm diameter pipe. If soakaways are greater than 2m deep, Environment Agency approval is required.

The design of all soakaways intended for adoption by the highways authority must be approved in writing before construction. Failure to do so may result in refusal by the highways authority to adopt the drainage system or the highway infrastructure. Standard details are included in the Highway Design Manual for Estate Roads.

500.10 Gullies

Positive drainage such as gullies are only used where SuDS cannot be achieved. If used, gullies shall be spaced to appropriate design. Twin gullies should always be placed at the bottom of sag curves.

Gully positions shall be set out to ensure they are clear of vehicular accesses and pedestrian crossing points. Where a new access (either dropped kerbs or new bell mouth) is formed consideration must be taken to the relocation of existing gullies and any requirement for additional highway drainage.

Cycle friendly gully grates are to be used on Primary, Secondary and Tertiary routes and pedestrian gully grates in shared surface roads and footways.

It is preferred gullies connect directly into manholes. If this is not possible, they shall be connected to the main pipe by 45 degree oblique angled junction or saddled at an oblique angle and surrounded by ST2 concrete mix.

Gullies should be sited upstream of the tangent point at road junctions so that surface water in the channel does not flow across the junction and upstream of pedestrian crossings. Care must be taken to avoid ponding near the mid-point of radius kerbs. Where the road is super-

elevated, you should site a gully just before the point where the adverse camber is removed to prevent water in the upstream channel flowing across the carriageway.

Each gully shall have its own lateral connection to the surface water drainage system. No gully connections shall have bends more than 30 deg. with a maximum length of 12m. If the connection is to a catchpit, 20m is permitted. A maximum of two gullies is allowed on one carrier drain connection. Concrete and polypropylene linear type channel drainage to be avoided.

Catch pits or chute gullies are to be avoided and can only be used, on the existing highway where there is insufficient depth to install a pot and they must not connect to another catch pit. Weir gullies should only be used in exceptional circumstances, and on the existing highway, where there are statutory plant diversions required to install a gully pot and/or where the outlet pipe is directly towards the sewer.

The minimum pipe diameter for adoptable highway drains, other than gully connections, is 225mm. Single gully connections to be 150mm diameter.

500.11 Covers and Grating

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

When manholes are located in carriageways, the cover is not to be within the vehicle wheel tracks and located to ensure future traffic management during maintenance operations are safe.

500.12 Linear Drainage; Kerb, Slot and Channel Drains

Linear drainage is only permitted by SCC in exceptional circumstances where other options are not practical. The Applicant should notify SCC of such a requirement prior to submitting an application.

500.13 Headwalls

Precast concrete units are to be used for headwalls and concrete bag walls may be permitted in rural locations or within swales.

500.14 Ducting

The colours for ducting associated with highway assets are as follows –

- UKPN or DNO supply for street lighting, lit signs and traffic signal controller – 100mm dia minimum, colour black
- Traffic Signals – connections from controller to equipment – 100mm dia. Minimum colour orange (marked traffic signals)
- Private street lighting (bollards, signs and columns in islands **only**) – 100mm dia. Minimum colour orange (marked street lighting)

500.15 Swales

- SCC will adopt swales if they are only taking highway surface water. The designs are to be the latest advice from SFA.
- Swale drainage system are to be designed by a competent hydraulics engineer.
- The swales are designed so that special machinery is not required to undertake maintenance.
- swales and filter strips to be planted to enhance biodiversity.

- Planting in the swale or filter strip stabilises the slopes, reduce erosion and slow water flows to aid sedimentation, as well as to provide some nutrient take up.

500.16 Drainage Crate (Modular Cellular) Systems

- SCC will only adopt this type of drainage infrastructure if there is no other drainage option available.
- We may consider crate systems for highway drainage if this would not present us with a significantly increased maintenance liability when compared with other drainage systems. The crate systems need to be designed so they are cleaned easily, accessed for maintenance purposes, and can be drained down in the event of a blockage or failure.
- The systems are to be designed by a competent structural and hydraulics engineer and structural calculations will be required to show the anticipated loading. A checking fee may be required if SCC Structures Team deem it necessary.
- Infiltration systems must be located outside of the carriageway.
- Crate drainage systems will be subject to a commuted sum payment.

500.17 Rain Gardens

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

Series 600 - Earthworks

600.1 Ground Investigation

Details of ground investigation shall be provided with the application. Information shall include:

- Site plan showing location, depth and reference of test locations
- Classification of soils within the site (trial pit and borehole logs)
- Details of groundwater levels
- Location and extent of contamination, hazardous material and made ground
- Geotechnical and chemical test results for soil and water
- Factual and / or interpretive reports

600.2 Geotechnical Testing for Design

The 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. for that test. Drilling and engineering reports shall be third party quality assured. Testing to be completed in the centreline of each road at 30m intervals. Note, reduced intervals may be required if the ground conditions are not consistent. The following information is required -

- Water table height
- A plan showing exact locations of tests
- soil classification
- chemical testing (sulphate / chloride)
- soil strength (CBR)
- Anticipated design formation level CBR values used for design shall be the lesser of:
    - CBR value at natural moisture content measured insitu (BS 1377:1990:Pt.9) or in the laboratory (BS 1377:1990:Pt.4) and
    - Equilibrium CBR value anticipated beneath the completed pavement as described in TRRL Laboratory Report 1132 “The structural design of bituminous roads”, 1984.
    - Laboratory tests for CBR may be carried out on undisturbed samples recovered from formation level or on samples recompacted to the anticipated density below the completed pavement. The CBR determination shall be carried out on both ends of the sample. Where the results differ by more than 10% from the mean, the CBR value shall be calculated as follows:
    - CBR = 0.75 CBRbottom + 0.25 CBRtop.
      If there is a large difference between each test, then additional tests between are required.

- Additional testing may be required for design of slopes and areas of fill or as directed by the LHA.

(Note The subgrade assessment and requirements are as shown in CD225. Design subgrade surface modulus – soaked CBR for granular and Subgrade surface modulus – plate test LWD, ensuring the site is not water logged).

600.3 Weak Foundations and Ground Improvement

On subgrades of poorly graded sand or with CBR of less than 5%, a geotextile separator shall be laid on the full width of the compacted subgrade prior to spreading the sub-base.

The minimum Californian Bearing Ratio (CBR is 2.0% CBR). Where a sub-grade has a lower CBR it is considered unsuitable support for a pavement foundation and the Developer will be expected to carry out measures to accommodate the poor ground conditions, these measures shall be approved by the Engineer prior to commencement.

Typical options are :

- Capping layer using type 6F1, 6F2, 6F3 or 6F4 as appropriate. (See Table 6.1 for details).
- Soil Stabilization using cement and or lime. Design should be carried out using the principles in Clause 614/615 or 643 in the Manual of Contract Documents for Highway Works.
- Geogrid/geotextile strengthening of capping or subbase is permitted subject a design and guarantee by the manufacturer and agreed with SCC before technical acceptance.
- If the CBR results shows different engineering measures for the site, the minimum length of each type of construction is the entire length of road. If the road is a long primary or secondary road, the minimum distance is 100m.

600.4 Capping

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.

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.

Capping shall be 350mm to 600mm thick. 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).

In cuttings 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.

600.4 Groundwater

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 and calculations.

600.5 Embankments

When new embankments, cuttings and reinforced soil structures are required for highways, full earthworks designs are required to be included in the technical acceptance.

Series 700, 800 & 900 - Pavements

700.1 Subbase & Capping

Road pavement upper layers are subject to design methods and criteria that have been published in CD225 Design for new pavement foundations and CD226 Design for new pavement construction.

Subbase and capping design for all categories shown in Table 7.1

Table 7.1						
CBR% (Soaked)	0.5	1	2	3	4	5+
Type 1 Subbase thickness	240mm	240mm	240mm	350mm	320mm	270mm
Capping thickness	600mm	500mm	450mm	X	X	X

(note Type 1 subbase is as specified in SHW Clause 803)

Where sub-grade is frost susceptible, the sub-base depth shall be increased to provide a minimum construction depth of 450mm.

700.2 Pavement Construction Design

Table 7.2 shows minimum layer thicknesses for residential streets. Heavily trafficked roads such as link roads, industrial estate roads carrying more than 1msa over their design life will require specific designs for approval by SCC.

Material details are included within the SCC Construction Specification.

Where the applicant proposes to lower the level of an existing road, cycleway or footway surface they shall provide sufficient investigation and test data to confirm that the remaining pavement construction exceeds the thicknesses shown in Table 7.2 and is sound in all respects If this cannot be proven the pavement will require full reconstruction.

Vehicle crossings over existing footways and cycleways will require reconstruction to the appropriate carriageway construction.

Table 7.2				
	Primary Streets	Secondary Streets	Tertiary Streets	Shared-use Streets
	HRA 40/60	HRA 40/60	HRA 40/60	Blocks on AC
Blocks				80
Sand bed				30
Surfacing 35/14	50	50	50	
Binder 50/20	50	50	50	50
Base 60/32	150	130	100	80
Total	**250**	**230**	**200**	**240**

NOTE - Permeable pavements are NOT permitted in the public highway

Where changes are made to the existing highway that significantly increase the risk, for example new junctions, zebra crossings or traffic signals, the design shall include resurfacing to the appropriate PSV (see Table 7.3) unless test data can be provided to show that the in-service performance of the surfacing exceeds the relevant investigatory level.

Warm Mix Materials - 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
- 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 Overseeing Authority
- For the purposes of traceability, the mixture designation shall include a reference to the use of warm mix technologies.

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

Refer to construction specification for further information on Warm Mix Asphalt.

PSV requirements

Table 7.3

	Less than 30mph	Less than 40mph		More than 40mph	
	Block paving (equivalent)	Hot Rolled Asphalt	Stone Mastic Asphalt	Hot Rolled Asphalt	Thin Surface Course
Single carriageway, generally free flowing on a relatively straight line	53	55	55	53	55
Roundabout circulation area	58	50	50	55	55
Approach to Pedestrian crossing and other high risk sites	60	68	68	68	68
Approach to major and minor junctions where frequent and sudden breaking occurs	58	58	55	58	55
Bends 500m radius and above	58	58	55	58	55

700.3 S278 Surfacing

For s278, on existing roads that are classified, pavement design is to be to DMRB. Surfacing can be thin surface course material.

Where block paving is proposed, where possible, it is to be laid over an existing surfacing.

Where a new access meets the existing road, the entire width of the existing road will require resurfacing from tangent point to tangent point of the new junction radii.

New surfacing (plane and inlay to traffic signals etc) and not High Friction Surfacing, existing conditions permitting. High friction surfacing is not permitted – plane and inlay with surface course materials provide a more cost effective solution in the longer term.

Levels – overlay existing carriageway and do not plane more than 40mm for tie-in.

Coloured surfacing may be permitted for specific road safety reasons such as speed reduction or highlighting pedestrian or cycle lanes at busy junctions. SCC's advice should be sought before including such material in a design.

Where permitted the acceptable colours are:

- Grey/Buff: traffic calming measures such as gateways
- Green: Cycle lanes on the carriageway
- Red: is only acceptable in rare circumstances when agreed with SCC.

Series 1100 – Kerbs, Footways, Cycleways and Paved Areas

1100.1 Kerbing

Acceptable kerb faces heights are:

- Principal Roads - kerb upstand of 125mm reducing to 25mm for vehicular accesses, 165mm at bus stops, with 6mm for pedestrian/cycle crossings and 0-6mm adjacent to swales. Where lengths of road include traffic calming measures (ramps and tables), kerb height to be 100mm.
- Secondary Roads and Tertiary – kerb upstand of 100mm reducing to 25mm for vehicular accesses with 6 to 12mm for pedestrian/cycle crossings with tactile paving 165mm at bus stops and 0-6mm adjacent to swales.
- Shared Surface Roads - 25mm shall be maintained and 0mm adjacent to swales.
- Where segregation of footways and cycleways is provided the minimum upstand shall be 65mm and full batter kerbs shall be used.

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

Where adjoining grassed private curtilages or other land not part of the highway for adoption, the back edge of verge shall be marked by 150mm x 50mm edging kerbs set flush with the ground to mark the highway boundary.

1100.2 Dutch Kerbs

Dutch kerbs can be used on Tertiary roads where crossings are on footways over 2.5m wide (for shared footways or cycleways) and sufficient visibility for a vehicle to wait while pedestrians and cyclists cross the access to the vehicle is not blocking the footway. Locations to be agreed with SCC.

1100.3 Footways and paved areas

3.2 The formation of all footways shall be sterilised by spraying with total eradicator weedkiller comprising sodium chlorate solution or equivalent as approved by the Overseeing Organisation. The concentration of the solution shall be as recommended by the supplier but shall guarantee the complete destruction of seeds or roots held in the formation materials.

LTN1/20 outlines the need for planned routes so that the are coherent, direct, safe, comfortable and attractive. It also outlines maximum lengths of gradients in it's Table 5-8.

Concrete edging shall be used for footways and cycleways where kerbs are not present.

Minimum width of footways to be 2m, shared cycleways 3m and segregated 4m with delineation between the cycle and pedestrians.

As previously stated in Drainage section, The pedestrian routes within a new development must be taken into consideration when designing swale layout. It is unacceptable for a pedestrian or cyclist to have to travel more than 5m off the desire line because of a swale. There also needs to be sufficient dropped areas on a road for pedestrians to cross safely and not have to travel far 'out of their way'.

Crossfall Gradients - generally, footways and cycleways will drain to the carriageway , swale or verge. Where draining to the carriageway or swale the areas of footway / cycleway shall be included in the drainage calculations. Where draining to the verge the applicant will be required to demonstrate that the verge has a sufficient infiltration rate. In all other cases, and where crossfalls or low points require it positive drainage shall be installed.

1100.4 Maintenance strips

All maintenance strips are to be minimum 1m wide and to be block paved stretcher bond. Verges are not approved that are adjacent to dwellings. However, they can be used adjacent to public open spaces/landscaped areas.

1100.4 Pavers, Slabs and Granite Sets

All shared surface areas to be block paved, herringbone pattern.

Granite sets are permitted when used on ramps into shared surfaces.

Slabs shall not be permitted in areas used by motor vehicles in any circumstance. Where new accesses cross footways comprising slabs, these shall be removed and replaced with materials suitable such as block paving.

Series 1200 - Traffic Signs & Road Markings

1200.1 General

Traffic signs and road markings on roads to be adopted as public highway must conform to the current version of:

- Traffic Signs Regulations and General Directions" (TSRGD) 2016.
- The Traffic Signs Manual

1200.2 Traffic Signs

The mounting height for signs within the footway shall be 2.1 metres, and 2.4 metres within any cycleway.

Where the design speed for the road exceeds 40mph the applicant must provide risk assessments for signs in the application to demonstrate whether or not passive posts or other protection is required.

Signs to diagram 7014 "New Road Layout Ahead" (or signals, roundabout etc) are to be installed on all new s278 schemes and removed 3 months post completion.

1200.3 Street Name Plates

The developer must supply a site layout drawing identifying the location of street nameplates. These are to be installed at the back of footway/verge. The location of the street nameplates must be secured as either in adoptable highway or with an easement in any adjacent property deeds. Please note that it is the Developer's responsibility to supply and install street nameplates prior to the occupation of any properties.

Prior to adoption, temporary sign to be erected under street name plate stating the road is private (with agreement with the appropriate district/borough council).

NOTE – street naming is a Local District/Borough Council's function.

1200.4 Lit Signs

All signs that require lighting are to be erected on 5m lighting columns and cut to required height. Ensure these signs are included in the street lighting design.

1200.4 Road Marking

Road marking on existing highways shall match the existing characteristics such as line width unless otherwise agreed with SCC, road marking within new sites shall only be used where required for safety reasons or to clarify the road layout.

Primrose yellow is the default colour for yellow road markings in Suffolk.

Series 1300 - Street lighting

1300.1 General

The design of street lighting needs to consider the ecology of the area. We recommend the Ecology Report is supplied to the street lighting engineer prior to the design highlighting specific areas to be avoided.

All new street lighting columns are to be installed within the rear of the footway or within the rear of the maintenance strip unless otherwise indicated. Installation of columns outside of footways/maintenance strips or highway verges will not be accepted.

Where lighting columns are installed in shared surface road areas, the minimum width of maintenance strip is 1m. 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. This ensures adequate space for the lighting columns to be installed whilst not being blocked / impinged on by other services.

Where street lighting columns are to be installed in verge they shall be set back from the edge of the kerb / road surface so that the rear of the column is 1.0m minimum back from the kerb edge unless otherwise indicated.

No trees are to be planted within 5m of any new street lighting column to ensure blocking effect on lighting units is minimised.

If no lighting columns have been erected within 18 months of this lighting design being approved, the design should be re-submitted to Suffolk County Council's Street Lighting department for re-checking / re-approval.

No changes to the positions or specification of any lighting equipment shown on this approved street lighting drawing should be made without prior authorisation from the approving Suffolk County Council Officer Street Lighting Engineer.

The developer/consultant is reminded Zebra crossings and traffic signals are to include street lighting design. The street lighting engineer is to be informed of location and type of crossing, to ensure the lighting levels are to specification.

All lit signs are to be erected on a cut-down street lighting column (5m) and treated same as street lighting column.

1300.3 Electric Supply

All new street lighting columns and illuminated signs are to have DNO/IDNO Statutory Mains Electricity Supplies unless otherwise indicated.

Series 1500 -Traffic Signals

1500.1 General

New electricity feeder pillar to be installed next to new controller location. Connection between controller and feeder pillar is also to be installed. Signal equipment can only be installed when the UKPN DNO supply into the feeder pillar and be operational within 1 week of installation.

The Controller will be Extra Low Voltage (ELV), have 4G capability and the signal equipment will be ELV LED type. All signal equipment (Controller and Poles) will be coloured black. The controller operation mode will be MOVA with fall back to VA. The controller will be positioned at the back of the footway.

Prior to approval from the SCC Traffic Signal Engineer, the following is required:

- The street light design is to be approved by SCC
- If there are changes to the speed limit, the traffic regulation order is to be in place prior to approval.

The Designer to include appropriate Appendices (5/2 & 12/5) outlining site requirements and specification and ensure these are provided to the contractor on site to meet the criteria.

A vehicle maintenance bay is required for each new signal facility. This bay is to be near the controller and within visibility of the signals. When a vehicle is parked in the bay, the vehicle is not to obscure the driver's visibility of the signals or pedestrians It must be safe for the maintenance vehicle to enter and leave the bay with appropriated dropped kerbing.

The stop line for any traffic signals not to be within 20m of a junction or roundabout.

MOVA loops to be minimum 25m from the stop line.

1500.1 Factory Acceptance test (FAT)

A FAT is required prior to installation and the signal designer is to attend.

1500.2 Installation and Completion

On completion of the installation a Site Acceptance Test (SAT) will be conducted with a representative from SCC Traffic Signals. The following documentation will be required:

- SAT form;
- Electrical test certificate;
- Take over certificate;

To complete the design package an as built drawing (including Acad file), controller configuration, detector configuration files and a validation report must be supplied to the SCC traffic signals team. The design drawings will include -

- a cable drawing and a staging drawing (if appropriate).
- Special requirements such as signs, louvres long cowls etc.
- Numbering of signal poles, starting with the pole closest to the controller and proceeding in a clockwise direction around the facility. Note, these poles to be numbered on site too.
- Signs and road markings associated with the signals
- Tactile pacing layout
- Surface treatment of carriageway 50 metres prior to the feature the surface should have a PSV 0.65
- Pedestrian studs marking crossing area (must be metal studs)

Series 1700 Structures

Any structure that is to be adopted by Suffolk County Council (SCC) as the Highway Authority must be designed and built to appropriate standards to ensure that it is fit for purpose, safe in use, and will not require undue maintenance during its life.

Similarly, any proposed structure that supports the Highway or may impact on the safe use of the Highway must be approved by the Highway Authority prior to construction.

The technical approval process for highways structures is managed within SCC by the Structures Team, who act as the Technical Approval Authority (TAA).

The classification of a structure is -

- A highway bridge or a culvert within the highway with a span more than 0.9m
- Retaining walls greater than 1.35m high

The developer and/or designer are strongly encouraged to have an early discussion with the TAA. This will have the benefit of clarifying the procedure for the developer / designer, giving the TAA an early indication of the nature of the proposal, and its likely acceptability.

The TAA will advise whether the fees for approvals and inspections will as a percentage of the works value at the rate for other highway works, or charged on an hourly rate. In the case of the latter, the TAA will give an initial estimate of the fee required, based on information supplied at this stage. (See 'Fees' below)

Approval in Principle (AIP) - The AIP is to ensure that adequate regard is paid to appropriate Codes of Practice, Design Standards, geotechnical implications, future maintenance, and Health & Safety Regulations. The AIP should be prepared and signed by suitably experienced persons.

The AIP process to be followed is based on CG 300, Technical Approval of Highway Structures (Highways Agency, Design Manual for Roads & Bridges, Volume 1). The submission must include:

- A preliminary General Arrangement Drawing, showing sufficient detail to give a good understanding of the proposals. This should include location, structural form, key dimensions and finishes.
- A schedule of the Design Documents that will be used in the preparation of the design
- Soils information, with an interpretative report, by a geotechnical engineer
- Demonstration that health & safety implications during construction, use, and maintenance have been properly considered.

The TAA will determine the checking category for the proposal. Determination will be based on the guidance in CG300, but may be modified to take into account other factors such as the experience of the designer. For avoidance of doubt, the designer/developer is to arrange for the check to the level agreed through the AIP. It is not the role of the TAA to carry out checks, although the TAA reserves the right to review the design to whatever level of detail is seen fit before accepting the design.

Design & Check Certification - design and check certificates to confirm that the design complies with the agreed AIP. The certificates should be signed by suitably experienced persons and be accompanied by:

- Design calculations (for record purposes only - these will not be checked by the TAA)
- Construction drawings
- Schedules and specification

Construction Compliance Certification and H&S file - to be provided to confirm that the works have been constructed in accordance with the accepted design and to provide information required for ongoing inspection, maintenance, and management of any adopted structure.

Commuted Sums - any structure which is to be adopted by SCC requires a commuted sum. This payment is a one-off contribution towards the future maintenance of the asset. The commuted sum will consider the cost of regular inspections, maintenance and or replacement.

Series 3000 Landscaping

Trees - The Developer shall be responsible for maintaining all planted trees for 5 years after planting trees, including watering in dry weather. The replacement of failures or unsatisfactory plants with similar species in the same manner as detailed above at a suitable season shall be the Developer's responsibility at its own expense.

Biodiversity Net Gain (BNG) is an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand.

Under the Environment Act 2021, all planning permissions granted in England (with a few exemptions) will have to deliver at least 10% biodiversity net gain from November 2023. BNG will be measured using Defra's biodiversity metric and habitats will need to be secured for at least 30 years. This sits alongside:

- a strengthened legal duty for public bodies to conserve and enhance biodiversity,
- new biodiversity reporting requirements for local authorities, and
- mandatory spatial strategies for nature: Local Nature Recovery Strategies or 'LNRS'.

As previously stated in Series 200 Site Clearance, any highway trees removed for a development must have the Council's approval prior to any clearance. If a highway tree is to be removed, a Capital Asset Value for Amenity Trees (CAVAT) assessment by independent arboriculturist is required to determine the tree's amenity value. Any tree that is felled must be replaced with 3 No. new trees of an appropriate species; this is an example of Biodiversity Net Gain. Any new trees will need to be maintained by the developer for 5 years.

Contact ecology@suffolk.gov.uk to discuss any landscaping proposals that could mitigate the removal of the trees.