

Information Relating to Technical Review, Contract Preparation, Tendering and Construction Supervision of S278 Highway Improvements in Warwickshire

WORK TO BE UNDERTAKEN BY THE DEVELOPER AND THE DEVELOPER'S DESIGNER

2.1. Preamble

- 2.1.1 The following sections describe, in detail, the information and products required by WCC (Warwickshire County Council) to complete the technical review. Failure to provide these, in the format requested, may result in Technical Approval not being granted. If the developer intends to commission a design consultant, WCC recommends that the consultant be provided with a copy of the following pages so that the design consultant is fully aware of the requirements (including their format). An extract of this document without the fee information can be provided on request.
- 2.1.2 The developer's designers shall undertake and be responsible for:
- all design and/or redesign work; and
 - the supply of Construction Package Order Call Off Contract (POCOC) information (including NEC3 ECC Contract Data Part one information, Site Information and Works Information).
- 2.1.3 Designers should follow the guidance provided in this section when indicated after using the flow chart in Part 1 Figure 1.2 to determine the appropriate design standards for their improvement. WCC expect that for most improvements the design shall be in accordance with the DMRB (produced and maintained by National Highways). The most recent version of WCC's Highway Construction Details (HCD) can be found at www.warwickshire.gov.uk/highwayconstruction. The standards current at the time of commencing the design work shall apply.

2.1.4 Prior to the commencement of the technical review phase, the developer's designer shall submit for the WCC's consideration a list of the design (or pre-design) elements (as applicable and as identified in the table below), along with:

- the corresponding design element data (calculation sheets, computer aided design inputs/outputs, drawings, written specifications, etc as applicable); and
- the corresponding design standards and/or specifications which have been applied to the design or the proposed Works Information for the Construction POCOC.

The list shall be accompanied by details of any proposed Departures from the Relevant Design Standards. Designs are expected to comply with the technical standards set out in the Relevant Design Standards or Specifications (either general or specific to the Section 278 scheme). These Relevant Design Standards or Specifications will have been notified in advance by WCC's Technical Review Phase Team. Departures from the Relevant Design Standards are only likely to be accepted in exceptional circumstances. Where Departures from the Relevant Design Standards are proposed, a formal application to have them approved will be required stating:

- the design standards to which the Departure(s) relate(s);
- the precise details of the Departure(s); and
- the justification for the Departure(s) including any mitigation.

The application shall be in the form of a report containing all the information needed to assess it. For further information on Departures from Standards, see *Annexures 2.3 and 2.4*.

2.1.5 The developer's designer shall submit one complete set of design drawings and any other design documentation in an electronic format and the Design Certificate for review (at the end of this document). The Design Certificate shall be signed by the developer's designer(s). If any modifications are required, the developer's designer will be notified, and the relevant drawings and documents will be re-submitted for a further review. The revised and signed Design Certificate shall also be submitted for review. **This process shall be repeated until WCC has no further comment to make on the complete package of work undertaken by the developer's designer.**

FOR THE AVOIDANCE OF DOUBT, THE TECHNICAL REVIEW PHASE WILL NOT COMMENCE UNTIL ALL OF THE ITEMS LISTED HAVE BEEN PROVIDED.

2.2 Check List of Design (or Pre-Design) Elements

Item	Design (or Pre-design) Element	Tick to confirm inclusion
1.	Location plan with geographic coordinates of the central point of the works	
2.	Topographical survey data relating to the site for the Construction POCOC	
3.	Ground investigation data relating to the site for the Construction POCOC	
4.	Ecological data and further measures relating to the site for the Construction POCOC	
5.	Archaeological data and further measures relating to the site for the Construction POCOC	
6.	Landscape measures relating to the site for the Construction POCOC	
7.	Highway geometry (horizontal and vertical alignments) relating to new carriageway, footway and cycleway layouts. Plans to include chainages and level information	
8.	Existing and proposed highway boundary information	
9.	Road restraint systems	
10.	Highway drainage (including connections to public sewers and other outfall arrangements)	
11.	Earthworks	
12.	Road pavements	
13.	Kerbs, footways and other paved areas	
14.	Traffic signs and road markings	
15.	Traffic signals and controlled crossings	
16.	Street lighting (columns, lamps and electrical work etc)	

2.2 Check List of Design (or Pre-Design) Elements

Item	Design (or Pre-design) Element	Tick to confirm inclusion
17.	Structures (culverts, headwalls and retaining structures etc) and confirmation of whether Approval in Principle (AIP) will be required	
18.	The identification of existing and proposed service apparatus including details of diversionary works that may be required and copies of correspondence with the statutory undertaker companies	
19.	Interface with contiguous schemes (e.g., Section 38 estate roads)	
20.	Road Safety Audit Stage 2 (RSA2) and designer's Responses	
21.	Highway Maintenance Audit Responses (where available)	
22.	Cycle Audit Responses (where available)	
23.	Consultation responses (local residents, landowners and other stakeholders) (where available)	
24.	Identification of any Permanent Traffic Regulation Orders, Speed Limit Orders, Highways to be Stopped Up or Diverted etc	
25.	Letter of appointment of the Principal Designer	
26.	Letter of appointment of the designer	
27.	Application form to enter into a Section 278 Agreement including copy of planning consent and title plan	
28.	Copy of the design in AutoCAD	
29.	Land Registry Plans confirming ownership	

Notes on Design (or Pre-design Elements)

- 2.2.1 **Topographical survey data:** Coordinates shall be to the National Grid; levels shall be relative to Ordnance Survey datum. The presentation of survey data shall include the position of survey stations (each of which shall be labelled and annotated to show the corresponding coordinates and level data). Accuracy shall be as follows:

Feature	Tolerances	
	Vertical	Horizontal
Buildings and highway structures	±0.004m	±0.008m
Highway surfaces and other hard surfaces	±0.010m	±0.020m
All other surfaces	±0.025m	±0.020m

- 2.2.2 **Ground investigation data:** As a minimum, data shall be obtained which:

- identifies the general condition of the ground and the CBR of the ground at formation level for proposed new carriageways (this data will enable the developer's designers to determine the thickness of lower sub-base and/or more appropriate measures if saturated ground or CBRs below 1.5% are encountered);
- identifies the position of service apparatus in relation to proposed new carriageways (this data will enable the developer's designers to determine the extent of service diversions and/or service protection in advance of the construction phase and avoid unplanned delays during the construction phase); and
- identifies suitable gradients for cutting slopes.

Any additional requirements relating to ground investigation data will be notified by WCC's Technical Review Phase Team.

- 2.2.3 **Ecological data and further measures:** In addition to any requirements imposed by the planning authority in connection with the planning permission for the main development, ecological data specific to the site for the Section 278 Scheme shall be obtained from WCC's Landscape, Ecology and Historic Environment team (LEHE). LEHE will advise on the need or otherwise for further measures such as habitat surveys, construction phase constraints or measures to mitigate the impact on nearby ecology.

- 2.2.4 **Archaeological data and further measures:** In addition to any requirements imposed by the planning authority in connection with the planning permission for the main development, archaeological data specific to the site for the Section 278 or Scheme shall be obtained from WCC's Landscape, Ecology and Historic Environment team (LEHE). LEHE will advise on the need for further measures such as archaeological field work, construction phase constraints or measures to mitigate the impact on archaeology.
- 2.2.5 **Landscape measures:** In addition to any requirements imposed by the planning authority in connection with the planning permission for the main development, the necessary landscape measures specific to the Site for the Section 278 Scheme shall be obtained from WCC's Landscape, Ecology and Historic Environment team (LEHE). LEHE will advise on any specific planting or seeding and any associated planting maintenance to be included in the Construction POCOC.
- 2.2.6 **Highway geometry:** Unless otherwise agreed in advance with WCC's Technical Review Phase Team, highway geometry shall be determined in accordance with the relevant technical directives (and technical advice) in the Design Manual for Roads and Bridges (DMRB). For the Construction POCOC Works Information, the following shall apply.
- The presentation of horizontal alignments (in plan) shall include appropriate feature labels, chainage points and corresponding annotation. The design alignment data for each chainage point on a particular feature shall include coordinates, level information, bearing information and horizontal radius information.
 - Vertical alignments shall be presented in longitudinal section format and shall be accompanied by tabulated data showing chainages, levels, longitudinal gradients, super-elevations, vertical curvature (including K values) and corresponding horizontal curvature. The tabulated data shall demonstrate that the Relevant Design Standards and Specifications (insofar as they relate to geometric design standards) have been achieved.
 - Both the horizontal and vertical alignments shall be presented so as to demonstrate that the stopping sight distances, and any other visibility criteria, have been achieved.

Although not required for the Construction POCOC Works Information, the technical review submission shall include carriageway plans with annotated contours superimposed upon them to show the position of any unavoidable flat or low areas/spots and demonstrate that there are no irregular carriageway profiles or shapes.

- 2.2.7 **Highway boundary:** For the Construction POCOC Works Information, the highway boundary shall be established in the manner set out in WCC's Highway Construction Details (700 Series) Volume 1: H701.1 and H702.1 (or as otherwise agreed in advance with WCC's Technical Review Phase Team).
- 2.2.8 **Road restraint systems:** The need or otherwise for road restraint systems shall be determined in accordance with the relevant technical directives in the DMRB. For the Construction POCOC Works Information, the performance data for road restraint systems shall be determined for insertion into the relevant Numbered Appendices to the Specification for Highway Works (SHW).
- 2.2.9 **Highway drainage systems:** Highway drainage systems and associated infrastructure shall generally be designed and determined in accordance with the relevant technical directives in the DMRB or other industry standards. The design shall incorporate industry standard methods which have been approved in advance by WCC or, in the case of Public Sewers, by the sewer authority responsible for adoption, and, for the Construction POCOC Works Information, the specifications set out in the SHW. However, the following principles or stipulations shall apply (whether they constitute an alternative to the DMRB design standard or the SHW provisions, or act as supplementary information to either).

Location	Design Storm Frequency
For sites with average ground slopes greater than 1%	1 in 1 year
For sites with average ground slopes of 1% or less	1 in 2 years
For sites where the consequences of flooding are severe	1 in 5 years
For sections of drain situated beneath carriageway	1 in 10 years

Catchment Areas	Levels of Impermeability
Paved areas (carriageways, footways cycleways etc.)	100%
Plan areas of earthworks side slopes (cutting and embankment)	40%
Verges	20%
Meadows and agricultural land	15%
Woodland	10%

- Industry standard geographical factors (relevant to the location of the site) shall be applied.
- The minimum pipe velocity shall be 0.75ms^{-1} and the maximum pipe velocity shall be 4.0ms^{-1} . At the point where a pipe discharges into a water course, the maximum discharge velocity shall be 1.5ms^{-1} .
- Pipe roughness values (k_s) shall be 0.6mm in all cases, regardless of pipe material.
- Design submissions shall include any necessary site investigation reports, calculations, computer inputs and outputs (as necessary), diagrams, catchment areas and their ground contours and shall show the locations, types, sizes, gradients etc of all pipes, chambers, gullies, rodding eyes and any other proposed drainage infrastructure in plan and in section (as appropriate).
- Design calculations shall include for any existing flows in the highway drainage systems and any residual outflow (from the adjacent development) into the existing or proposed highway drainage system.
- Where public sewers are to be constructed or highway drainage systems are to connect into Public Sewers, the design standards of the sewer authority responsible for adoption shall apply.
- Written confirmation and supporting documentation shall be supplied to demonstrate that any necessary third-party authority (sewer authority, Environment Agency, Flood Risk Management authority etc.) approvals are in place. These will be required for connection to existing public sewers and discharging into watercourses.
- Drain runs (except formation drains) shall be straight or on a curve of not less than 200m radius. Formation drains or minor filter drains (i.e., those not collecting run-off from gullies) shall be laid straight or on a curve of not less than 50m.
- Where the carriageway channel has a radius of less than 200m either:
 - a) a combined surface water/filter drain shall be laid (straight or on a curve of not less than 200m) and the lower sub-base shall be extended to the edge of the drain; or
 - b) a surface water drain shall be laid (straight or on a curve of not less than 200m) to collect run-off from gullies and a formation drain shall be laid parallel to the carriageway channel to collect ground water.
- No drain run between chambers or between a rodding eye and a chamber shall exceed 90m.
- Pipes connecting to highway drainage chambers shall be designed to have level soffits.

- Drains shall only be situated beneath carriageways if they are required to cross carriageways. The crossing shall be on the line of the shortest practical route.
- Filter drains or combined filter and surface water drains shall not be situated beneath paved areas such as carriageways, footways, cycleways or accesses.
- For roads on embankment, the main carrier drain shall be a combined surface water/filter drain laid at the foot of the embankment. The lower and upper sub-base shall be extended to the side slopes of the embankment as shown on WCC's Highway Construction Details (700 Series) Volume 1: A701.1 (or as otherwise agreed in advance with WCC's Technical Review Phase Team).
- Pipe, bedding, backfill and trench specification details shall be in accordance with WCC's Highway Construction Details (700 Series) Volume 1: F701.1, F702.1 and F702.2 (as appropriate).
- For the Construction POCOC Works Information, Pipe Group details for SHW Numbered Appendix 5/1 shall be presented in the format shown in Annex 1 to the Notes for Guidance on WCC's Highway Construction Details (700 Series) Volume 1.
- Chambers for highway drains shall be catchpits (Type 71 or 73) as appropriate, in accordance with WCC's Highway Construction Details (700 Series) Volume 1: F703.1 and F703.2 unless otherwise agreed in advance with WCC's Technical Review Phase Team. The following chamber diameters shall apply:

Diameter of largest pipe connected (mm)	Chamber section diameter (mm)
150 – 225	1050
300	1200
375 – 450	1350
500 – 700	1500
750 – 900	1800

- Chambers for highway drainage systems (i.e., catchpits) must always be situated at the downstream end of a filter drain, where the continuation of the drain run downstream is a surface water drain.

- The Relevant Design Standards or Specifications for chambers for public sewers are those prescribed by the sewer authority responsible for adoption. Chambers for public sewers are likely to be manholes.
- Rodding eyes shall be installed at the head of all highway drainage systems.
- Where road gullies are proposed, gully spacings shall be determined in accordance with the relevant technical directives in the DMRB. Gullies shall be in accordance with WCC's Highway Construction Details (700 Series) Volume 1: F704.1.
- Where a proprietary kerbdrain system is proposed, approval to proceed with the proprietary system shall be obtained in advance from WCC's Technical Review Phase Team. Once approval has been given, the hydraulic performance of the proposed proprietary system shall be demonstrated by applying the manufacturer's design processes.
- Where a proposed highway drainage system is to include an inlet from a ditch and/or an outfall into a watercourse, the headwalls shall only be in accordance with Warwickshire County Council's Highway Construction Details (700 Series) Volume 1: F705.1 if the height of the headwall (from pipe invert level to top of parapet/coping) is no greater than 1.2m. In circumstances where the height is greater than 1.2m, headwalls will need to be designed as an earth retaining structure and the requirements for structures shall apply.
- **For technical approval to be granted the developer's designers must demonstrate to the satisfaction of WCC's Technical Review Phase Team that the proposed highway drainage system:**
 - **meets the Relevant Design Standards or Specifications;**
 - **outfalls into an existing, working drainage system (highway drainage system, watercourse or public sewer) which has sufficient reserve capacity to cope with the total additional volume of run-off and its associated peak flow rate; and**
 - **is legally entitled to outfall into the existing drainage system. Evidence of the necessary agreements being in place under the Water Industry Act, Highways Act or any other relevant Act of Parliament shall be supplied to demonstrate that the legal requirements have been satisfied.**

2.2.10 **Earthworks:** Earthworks shall generally be designed and determined in accordance with the relevant technical directives in the DMRB and the specifications set out in the SHW. However, the following principles or stipulations shall apply (whether they constitute an alternative to the DMRB design standard or the SHW provisions or act as supplementary information to either).

- Cross sections shall comply with Warwickshire County Council's Highway Construction Details (700 Series) Volume 1: A701.1, A701.2 and A701.3 (as appropriate) (or as otherwise agreed in advance with WCC's Technical Review Phase Team). Cross sections shall incorporate the requirements of Warwickshire County Council's Highway Construction Details (700 Series) Volume 1: B701.1 and B701.2 (as appropriate).
- Cutting and embankment slope gradients shall be suitable for the soils encountered or the fill material proposed (refer to paragraph 6.2 (Ground investigation data) and note that acceptable general fill materials are limited to SHW material Classes 1A, 2A, 2B or 2C).
- In circumstances where the CBR at formation is less than 1.5% (refer to paragraph 6.2), a geotextile solution may be preferable to an increased thickness of lower sub-base. Geotextiles and any associated measures shall be designed in accordance with the relevant technical directives in the DMRB. For the Construction POCOC Works Information, the performance data for geotextiles shall be determined for insertion into the relevant Numbered Appendices to the SHW. Refer also to paragraph 6.11 (Road pavements).

2.2.11 **Road pavements:** Road pavements shall be designed generally in accordance with WCC's current version of the County Road Construction Strategy (the Relevant Design Standards or Specifications). The methods to be used are described in Part 1 of the Strategy with the following exceptions or additional requirements:

- In Part 1: Section 2, the Strategy refers to 'W sub-base' being laid at a thickness of 600mm in circumstances where $CBR < 2.0\%$ (Lias clay). However, where $CBR < 1.5\%$, other measures, such as geotextiles and additional formation drainage, shall be investigated and proposed as an alternative to 600mm thick lower sub-base. The other measures shall be certified as suitable for the specific conditions by an experienced geotechnical engineer whose credentials have been approved in advance by WCC's Technical Review Phase Team. Refer also to paragraph 6.10 (Earthworks).
- Where areas of existing carriageway are to be overlaid or where existing layers are to be planed out and replaced, the design shall comply with the requirements for construction joints and regulating courses set out in Warwickshire County Council's Highway Construction Details (700 Series) Volume 1: B705.1 and B705.2.

- Where lengths of existing carriageway are to be 'strip-widened', the existing surface course (adjacent to new full carriageway construction) shall be planed out and new surface course shall be laid so that the longitudinal joint in the surface course follows the line of the nearest linear longitudinal road marking (carriageway centreline or lane marking) which lies over existing road construction. In circumstances where the longitudinal joint for the 'strip widened' surface course would naturally lie within the existing half of the resultant carriageway (i.e., beyond the centreline), new surface course shall be laid over the full width of carriageway. This will allow those areas of carriageway which are frequently tracked by vehicles to remain free from longitudinal joints, a common source of potholes.

2.2.12 **Kerbs, footways and other paved areas:** Footway and cycleway construction shall be determined in accordance with the vehicle trafficking principles set out in Warwickshire County Council's Highway Construction Details (700 Series) Volume 1: B704.1 or B704.5 (as applicable). Access construction shall be determined in accordance with the intended use principles set out in Warwickshire County Council's Highway Construction Details (700 Series) Volume 1: B704.2. Where a proprietary kerbdrain system is proposed, the crushing strength of kerbdrain units shall be sufficient to withstand 40 tonne HGV accidental wheel loading.

2.2.13 **Traffic signs and road markings:** Traffic signs and road markings shall be designed generally in accordance with the current version of the Traffic Signs Regulations and General Directions along with any supporting national standards (the Relevant Design Standards or Specifications) with the following exceptions or additional requirements.

- Occasionally, for site-specific or other local reasons, WCC departs from or relaxes the requirements of the Traffic Signs Regulations and General Directions. In such circumstances, WCC's Technical Review Phase Team will notify the developer's designers of the departures or relaxations which will be imposed. Notification will be given after the geometric design has been finalised and before the traffic sign design commences. Notification can also be given upon the request of the developer's designers. For the avoidance of doubt, any departures or relaxations imposed by WCC are a part of the Relevant Design Standards or Specifications. Any non-compliant proposal on the part of the developer's designers will need to be treated as a Departure from Relevant Design Standards.
- For the Construction POCOC Works Information, information shall be supplied in a format suitable for inclusion in SHW Numbered Appendices 12/1, 12/3 and 14/5. Information for Appendix 14/5 shall include details of the electrical connections and disconnections for illuminated traffic signs and shall identify the organisation which will be responsible for undertaking this work.

2.2.14 **Traffic signals and controlled crossings:** In circumstances where Warwickshire County Council's Traffic Control and Information Systems (TCIS) team is designing on behalf of the developer's designers, the service will include the technical approval of the design for traffic signals and controlled crossings and the supply of the Construction POCOC Works Information. In all other circumstances, WCC's Technical Review Phase Team will notify the developer's designers (upon request) of the Relevant Design Standards or Specifications relating to the design of traffic signals and controlled crossings.

For the Construction POCOC Works Information, information shall be supplied in a format suitable for inclusion in SHW Numbered Appendix 12/5. Information for Appendix 12/5 shall include details of the electrical and telecommunication connections to the traffic signal controller and shall identify the organisation which will be responsible for undertaking this work.

2.2.15 **Street lighting:** In circumstances where Warwickshire County Council's Street Lighting team is designing on behalf of the developer's designers, the service will include the technical approval of the design for street lighting and the supply of the Construction POCOC Works Information. In all other circumstances, WCC's Technical Review Phase Team will notify the developer's designers (upon request) of the Relevant Design Standards or Specifications relating to the design of street lighting. The following additional requirements shall also apply:

- Street lighting design proposals shall be accompanied by lighting contour plans, which shall identify the level of lighting achieved within the new highway layout.
- For the Construction POCOC Works Information, information shall be supplied in a format suitable for inclusion in SHW Numbered Appendices 13/1, 14/2 and 14/4. Appendix 14/4 shall include details of the electrical connections and disconnections and shall identify the organisation which will be responsible for undertaking this work.

2.2.16 **Structures:** Minor structures may need to undergo an AIP process. WCC's Technical Review Phase Team will notify the developer's designers of the AIP process upon request. Minor structures (except headwall types shown on Warwickshire County Council's Highway Construction Details (700 Series) Volume 1: F705.1) shall be designed in accordance with the relevant technical directives in the DMRB and, for the Construction POCOC Works Information, the specifications set out in the SHW. Details for all minor structures shall be supplied in a format suitable for inclusion in SHW Numbered Appendices 17/1 to 17/5, 20/1 and 24/1 (as applicable).

For major structures, such as bridges, the developer's designers shall contact WCC's Bridge Design team for advice on how to proceed with the design process.

2.2.17 **Diversion or protection of service apparatus:** Design proposals shall demonstrate that the relevant Statutory Undertakers (or licensees under Section 50 of the New Roads and Street Works Act 1991) have been consulted to determine:

- the approximate position of potentially affected service apparatus; and
- the need or otherwise to protect or divert it.

Design proposals shall also demonstrate that where the position of potentially affected service apparatus is uncertain (as a result of ambiguous Statutory Undertaker or licensee records), site investigation work has been undertaken to confirm the position of potentially affected apparatus (refer also to paragraph 6.2 (Ground investigation data)).

Once the extent of protection or diversion work has been established, Works Information for the Construction POCOC shall be supplied in a format suitable for inclusion in SHW Numbered Appendix 1/16. Any need for advance works or advance ordering of materials and supplies (to enable the protection or diversion of apparatus) shall be identified. The developer must provide written evidence that all statutory undertakers works have been paid for in advance of award of contract

2.2.18 **Interface with contiguous schemes:** In circumstances where a s.278 Scheme is contiguous with another scheme being designed by others (for example a s.38 estate road scheme which is the continuation of a road forming part of the s.278 Scheme) the details of the interface between the two schemes shall be agreed in advance with WCC's Technical Review Phase Team and the other designers. The details will include the coordinates, levels and bearings of each linear highway design feature at the interface.

2.2.19 **Road Safety Audit Stage 2 (RSA2) Designers' Responses:** If WCC's Road Safety Team is undertaking the RSA2, WCC's Technical Review Phase Team will be able to facilitate communications between auditors and designers. Otherwise, the developer's designers shall submit the RSA2 and designers' Response to WCC's Technical Review Phase Team for review by WCC's Road Safety Team.

2.2.20 **Highway Maintenance Audit Responses:** Before the Construction POCOC Works Information is finalised, highway drainage and road pavement proposals shall be submitted by WCC's Technical Review Phase Team to WCC's Highway Maintenance Locality Officer for a Highway Maintenance Audit. Highway drainage and road

pavement specifications shall be discussed with the Locality Officer and mutually acceptable specifications will be notified to the developer's designer.

- 2.2.21 **Cycle Audit Responses:** Before the Construction POCOC Works Information is finalised, scheme layout proposals shall be submitted by WCC's Technical Review Phase Team to WCC's Cycle Officer for a Cycle Audit. Mutually acceptable provisions for cyclists shall be discussed with the Cycle Officer and notified to the developer's designers.
- 2.2.22 **Consultation responses:** The consultation of local residents and other local stakeholders will be undertaken by WCC's Technical Review Phase Team. However, the developer's designers shall be responsible for supplying the technical information needed for the for consultee responses. Designs and associated Construction POCOC Works Information may need to be amended as a result of consultation.
- 2.2.23 **Permanent Traffic Regulation Orders (TROs) etc:** All necessary highway TROs, Speed Limit Orders, Highways to be Stopped Up or Diverted etc shall be identified by the developer's designers. Once identified, the developer's designers shall provide the plans and consultation drawings necessary to commission WCC's Traffic and Road Safety Group to process the orders on the developer's behalf. For the avoidance of doubt, 'highway' includes all footpaths, bridleways and byways.
- 2.2.24 **Principal Designer role under CDM 2015:** If the developer's designers are to undertake the CDM 2015 Principal Designer role, the expectation (subject to agreement between the developer and WCC's Technical Review Phase Team) is that the appointment will be made for the full duration of the project (i.e., from commencement of the design phase through to completion of the construction phase). The consequences of changes to the Construction POCOC Works Information, which stem from changes to the design, will need to be overseen by the Principal Designer throughout the construction phase. Pre-construction Information shall be supplied to WCC's Technical Review Phase Team so that it may be appended to the Construction POCOC documentation supplied to tendering contractors.
- 2.2.25 **Designer role under CDM 2015:** The designer's Risk Assessment shall be submitted to the Principal Designer for inclusion in the Pre-construction Information. During the construction phase, designs may need to be amended to allow for changes to the Works Information under the Construction POCOC. The need for such amendments is often the result of unforeseen physical conditions. **Redesign work during the construction phase is the responsibility of the developer's designers.**

2.3 Design Products

2.3.1 One complete set of the package of drawings and any other documentation, including that required for Contract Data Part one and the Works Information for the Construction POCOC, shall be submitted in an electronic format for technical review. This shall be accompanied by a completed Design Certificate (in the form set out on page 26). The Design Certificate shall be signed by the lead designer acting on behalf of the developer's designers. WCC's Technical Review Phase Team will advise the developer's designers of the lead reviewer's contact details. If any modifications are required, the developer will be notified, and the relevant drawings and documents will need to be amended accordingly and re-submitted for a further review. A revised and signed Design Certificate shall accompany the submission. **This process will be repeated until WCC's Technical Review Phase Team have no further comment to make on the complete package of work undertaken by the developer's designers.**

2.3.2 **Scheme-specific technical review, tender and contract drawings:** All drawings supplied, whether they be for technical review purposes, for final issue as tender drawings or for changes to the Construction POCOC Works Information during the construction phase, shall be supplied in PDF format. Unless otherwise agreed in advance with WCC's Technical Review Phase Team, drawings shall be produced for printing onto A1 sized sheets. The information shown on scheme-specific technical review, tender and contract drawings shall be organised generally in accordance with the various 'series' of the SHW. Separate drawings or separate sets of drawings shall be provided for:

- General Arrangement;
- Setting Out and Site Clearance (Series 200);
- Fencing and Road Restraint Systems (Series 300 and 400 respectively);
- Drainage and Service Ducts (Series 500);
- Earthworks (Series 600);
- Road Pavements (Series 700, 800 and 900);
- Kerbs, Footways and Paved Areas (Series 1100);
- Traffic Signs and Road Markings (Series 1200 and 1900);

- Traffic Signals and Controlled Crossings (Series 1200 and 1900);
- Street Lighting (Series 1300, 1400 and 1900);
- Structures (Series 1600, 1700, 1800, 1900, 2000, 2100, 2300, 2400, and 2500 as necessary);
- Miscellaneous (Series 2600);
- Landscape and Ecology (Series 3000);
- Longitudinal Sections;
- Cross Sections;
- Existing and Proposed Service Apparatus (Locations and Types) and, where applicable;
- Land Dedication (for the Section 278 Agreement).
- 'Other' (for the Section 278 Agreement).

2.3.3 The titles of drawings shall be as stated in the bullets above. However, for simple schemes where the detail needed to be shown on the drawings is limited, information may be merged onto fewer drawings. In such cases, the revised titles of drawings shall reflect the content of the drawings. Approval to merge information must be sought in advance from WCC's Technical Review Phase Team. Approval will only be granted for proposals which demonstrate a logical grouping of information.

2.3.4 Where two or more drawings are required to cover the extent of the Section 278 Scheme, annotated 'cut lines' shall be used to identify the common points on the different drawings.

2.3.5 Where two or more drawings (forming a set) are required to cover all the information for a particular drawing title (e.g., Road Pavements), the title shall be extended to include the phrase "Sheet X of Y" (as appropriate) and the 'key' identifying the features shown shall be the same for all drawings within the set.

2.3.6 Unless otherwise agreed in advance with WCC's Technical Review Phase Team, the scale of all drawings showing information in plan shall be 1:500. However, where desirable, details of particular features may be

shown in separate boxes at a suitably larger scale. In such cases the box shall clearly indicate the larger scale, which shall be one of the standard scales for technical drawings. Unless otherwise agreed in advance with WCC's Technical Review Phase Team, longitudinal sections and cross sections shall be produced at the following scales:

- longitudinal sections (1:500 horizontally and 1:100 vertically); and
- cross sections (1:100 horizontally and 1:50 vertically).

2.3.7 **Title-specific drawing content:** The following table identifies certain content of drawings, identified by drawing title. It is not meant to provide a comprehensive list of the information required for each drawing; it is meant to ensure that certain information is shown on the appropriate drawing. Unless otherwise agreed in advance with WCC's Technical Review Phase Team, these principles shall be followed.

Drawing Title	Content
General Arrangement	<p>This drawing (or set) should show the proposed works in plan at ground level; buried features should not be shown. It should not be used for pricing and therefore it should not include specification details. Appropriate features include:</p> <ul style="list-style-type: none"> • new highway layout superimposed upon existing ('new' should be easily distinguished from 'existing' either by colour or by 'line weight'); • new fencing and road restraint systems; • new carriageway extent (i.e., the extent of new carriageway surfacing); • new refuges and new traffic calming features (humps, speed tables, chicanes etc.); • new footways and cycleways (cycleways shall be identified as either segregated or unsegregated); • new tactile paving; • new road markings; and • new traffic signals and controlled crossings (the type of crossing shall be shown).
Setting Out and Site Clearance	<p>This drawing (or set) should identify the positions of survey stations or permanent ground markers (PGMs) which will enable the contractor to set out the works. Each survey station or PGM shall be uniquely referenced. A table should be provided on the drawing which gives the National Grid coordinates and level (relative to the relevant Ordnance Survey datum) for each of the uniquely referenced survey stations and PGMs.</p>

Drawing Title	Content
	<p>Setting out details of the carriageway alignment shall include easting, northing, levels and radii of curves. All crown-lines should be shown on this drawing.</p> <p>The drawing (or set) should also identify the 'site' (as defined by the NEC3 ECC conditions of contract) as the area to be cleared. The contract requires the '<i>boundaries of the site</i>' to be identified in the Contract Data. When compiling the Contract Data Part one, WCC's Technical Review Phase Team will make reference to this drawing so the key on the drawing should use the term 'Boundary(ies) of the Site' to identify the closed line(s) which identify the area(s) to be cleared. Everything above ground level within the <i>boundary of the site</i> will be removed unless marked to 'remain' be 'preserved' or to be 'taken up or down'. Any demolition or special treatment shall be identified in the appropriate Numbered Appendices.</p>
Fencing and Road Restraint Systems	<p>This drawing (or set) should include all fences, gates, stiles, safety barriers and guard railing. If hedges are to be included as boundary features but no other planting is required, the new hedges and associated details may be shown on this drawing. In such instances, the drawing title should be amended to include reference to hedges.</p>
Drainage and Service Ducts	<p>This drawing (or set) should include all new drainage infrastructure: pipes, chambers, gullies, rodding eyes, headwalls, ditch works, attenuation systems, SuDS and the like, which should all be numerically referenced. Outfalls and connections with the existing drainage infrastructure should be clearly marked. Drawings submitted for technical review purposes shall also show finished road level contours so that gully positions and/or 'kerbdrain' outfalls can be checked.</p> <p>The drawing should also include a chamber schedule and pipe schedule. The chamber schedule should include the type of chamber, size of chamber (internal diameter), depth (ground level to top of base slab), the cover level and the grade of cover and frame. The pipe schedule should include for each length of pipe, the Pipe Group (as defined in Numbered Appendix 5/1), the length of pipe and the size of pipe (internal diameter). Upstream and downstream pipe invert levels should either be put on the plan or on the pipe schedule.</p>
Earthworks	<p>This drawing (or set) should identify zones of excavation and fill. Excavation zones shall be based on the profile of acceptable and unacceptable material Class U1A. Excavation of Class 5A, U1B or U2 material should be treated separately. Zones of excavation in Hard Material should be identified and the type of Hard Material (natural stone, concrete, bitumen-bound material etc.) should be clearly marked. Fill zones should be identified by material class</p>

Drawing Title	Content
	<p>unless General Fill is to be used, in which case the relevant zones should be identified as General Fill. Zones of topsoil should also be shown. If seeding and/or turfing are to be included but no planting is required, the seeding and/or turfing details may be shown on this drawing. If shown, the drawing title should be amended to include reference to seeding and/or turfing. The details of geotextiles (if used) should also be included.</p>
Road Pavements	<p>This drawing (or set) should identify areas of full carriageway construction, areas of carriageway overlay and associated regulating material and areas where the existing surface course is to be planed out and replaced. Areas of carriageway overlay and associated regulating material should be identified separately for:</p> <ul style="list-style-type: none"> • full surface course overlay with fine regulating; • full surface course overlay with binder course regulating; • full surface course and full binder course overlay with base regulating; and • full construction of all bituminous layers with additional upper sub-base material. <p>The drawing (or set) should also identify areas of existing carriageway to be broken up or perforated to allow full construction or near full construction where overlay solutions would be too expensive. Drawings submitted for technical review purposes shall also show isopachyte contours so that the different limits of overlay and associated regulating material can be checked.</p>
Kerbs, Footways and Paved Areas	<p>This drawing (or set) should identify the locations, types and sizes of kerbs (including special kerbs such as transition kerbs and dropped kerbs), edgings, channel blocks, combined drainage and kerb blocks and any other type of paved area edge restraint. This drawing (or set) should also identify all 'off-carriageway' paved areas such as footways and cycleways (including their construction details). Paved areas in flexible construction should refer to the relevant type given in WCC's HCDs (700 Series) Vol 1: B704.1 or B704.2. Details of block paving or flag paving should identify the locations, types, sizes, colours, laying patterns, bedding details and edge restraint arrangements for the paving.</p>
Traffic Signs and Road Markings	<p>This drawing (or set) should identify the locations, type and sizes of signs, poles and foundations. The detail should include the design of the sign face including material specification, x-heights and lighting requirements. Sign details may take the form of a 'sign schedule'.</p>
Traffic Signals and	<p>This drawing (or set) should identify the layout and arrangements for traffic signals and controlled crossing facilities. The detail should include:</p>

Drawing Title	Content
Controlled Crossings	<ul style="list-style-type: none"> • the locations and types of signal controllers; • the locations of traffic signal poles and signal heads, pedestrian aspects, push-button units, on-crossing detectors, kerbside detectors, microwave vehicle detectors, detection loops and any other equipment necessary for the operation of the facility or facilities; • all road markings within and around the facility or facilities and the referenced positions of all traffic signs (including bollards) within and around the facility or facilities. Road marking and traffic sign reference details should match those shown on the Traffic Signs and Road Markings drawing(s); • ducting layouts, NAL sockets, footing/foundation details for equipment, access chambers, crossing-specific kerbing arrangements and tactile paving; and • all pedestrian guard railing within and around the facility or facilities. This should match the information shown on the Fencing and Road Restraint Systems drawing(s).
Street Lighting	<p>This drawing (or set) should identify both existing and proposed positions of street lighting columns and illuminated signs and bollards. The drawing (or set) should include a 'Key' which:</p> <ul style="list-style-type: none"> • indicates the different types of street furniture and their specification; • for street lighting columns includes details that identify <ul style="list-style-type: none"> - the height of the column, - column features or type (hinged etc.), - lantern model, and - lamp wattage; • indicates cable positions and features; and • indicates duct positions and features. <p>All proposed streetlights should be numbered 001 upwards and prefixing with a 'P' (e.g., P001, P002 etc.). The same will apply to all proposed illuminated signs and bollards which must be numbered from 001 upwards and prefixed with a 'PS' (e.g., PS001, PS002 etc.). Only equipment that is acceptable to WCC's Street Lighting team should be shown on the drawing (or set). Equipment specifications must therefore be agreed with WCC's Street Lighting team prior to the proposals being submitted for technical review. Lighting levels should be indicated in either lux or Cd/m² depending on the road type. The lighting levels and other considerations on the drawing (or set) should comply with BS5489 and BS EN 13201 (British/European Standards for Road Lighting).</p>

Drawing Title	Content
	<p>All electric connections for street lighting and illuminated signs shall be made via the Distribution Network Operator Mains Cable, with the exception of illuminated equipment situated, for example, on a refuge, splitter island, or roundabout. Such equipment should obtain its electricity supply via a suitably sized private cable embossed with "Warwickshire County Council Street Lighting" from an adjacent streetlight using XLPE/SWA/XLPE cable with copper conductors. All private cable routes and ducts should be shown on the drawing (or set). All proposals relating to electrical terminations, cable runs etc, should comply with the current edition of the IEE Wiring Regulations, WCC's Street Lighting Standard Details and the current working practises of the Distribution Network Operator.</p>
Structures	The content of this drawing (or set) should be agreed in advance with WCC's Technical Review Phase Team.
Longitudinal Sections	This drawing (or set) should show the master alignments in relation to existing ground profiles beneath them. The annotation boxes should identify chainages at 10m intervals with corresponding levels. Horizontal and vertical curvature should also be shown in relation to a chainage range.
Cross Sections	This drawing (or set) should show the proposed ground profile, the existing ground profile and the earthworks outline over the full extent of the works (determined from interfacing) at each 10m interval along each master alignment. The annotation box for each section should identify the master alignment string which is used as datum, the chainage of the section, the offset distance from the datum for each interface string (topographical and design data) and the corresponding level at each interface point.
Landscape and Ecology	This drawing (or set) should identify all planting, seeding, turving and ecological work, together with any planting maintenance requirements which might best be identified on drawings.
Existing and Propose Service Apparatus (Locations and Types)	<p>This drawing (or set) should show apparatus within the Site Boundary as follows:</p> <ul style="list-style-type: none"> • for existing apparatus - the location and type of all service apparatus (including chambers) as it will be on the starting date for the Construction POCOC (it should therefore consider any advance diversionary works associated with the s.278 Scheme); and • for proposed apparatus - the location and type of all service apparatus (including chambers) to be installed during the contract period for the Construction POCOC. This information should match the information given in Numbered Appendix 1/16.

Drawing Title	Content
Land Dedication	Where applicable, this drawing (or set) should show the land owned by the developer which will be dedicated to Warwickshire County Council (as local highway authority) for highway use under a Section 278 Agreement. The plan area of the land to be dedicated should be shaded pink and edged in red line. The area shaded pink should consider the full requirement for the Section 278 Scheme, including the extent of associated earthworks and visibility splays.
Miscellaneous	Where applicable, this drawing (or set) should identify all works which are not covered by the other drawing titles listed. Items to consider include, but are not limited to: <ul style="list-style-type: none"> • any proposals which would be subject to agreement under Section 50 of the New Roads and Street Works Act 1991; • accommodation works; and • other legal requirements such as those relating to rights of access to land to allow for future maintenance • plans suitable for pre-construction notification to residents, businesses etc (should be size and format easy to read).

All drawings showing the scheme layout, except for the General Arrangement and Land Dedication drawings, should show the following:

- Safety, Health and Environmental (SHE) information in the form of a 'SHE Box' recommended under CDM 2015 (via implied reference to the ACoP under the previous 2007 Regulations); and
- chainages for each of the master alignment strings.

Each master alignment string shall be annotated to show the string label and chainage interval value.

2.4. Construction POCOC Procurement and Construction Phases

2.4.1 **Documents:** For the Construction POCOC, documents will be prepared by WCC's Technical Review Phase Team for the purpose of procuring the Section 278 works under an NEC3 Engineering and Construction Contract (ECC) or an NEC3 Term Service Contract (TSC). Where ECC is used, the main Option will be Option A (for priced contracts). The Construction POCOC Works Information will be in accordance with the Specification for Highway Works (SHW). The Construction POCOC, which will supplement WCC's overarching Construction Framework

Contract, will be accompanied with CDM 2015 Pre-construction Information as Annexure 1 to the Construction POCOC. The contents of the documents will be as follows

- Construction POCOC
 - Form of Agreement,
 - Schedule A: Contract Data Specific to the Work Package,
 - Schedule B: Site Information and Works Information Specific to the Work Package,
 - Schedule C: Quotation Information, and
 - Enclosure 1: Documents Relating to the Package Order; and
- Construction POCOC Annexure 1
 - Construction (Design and Management) Regulations 2015 (CDM 2015): Pre-construction Information and Acceptance of the Construction Phase Plan.

2.4.2 The developer's designers shall provide all the information necessary to complete Contract Data Part One, the Site Information, the Numbered Appendices to the SHW (forming a part of the Works Information), any other Works Information and the designer's Risk Assessment for the Pre-construction Information. If the developer's designers are also the Principal Designer under CDM 2015, they shall also provide all the other information necessary to complete the Pre-construction Information.

2.4.3 Where TSC is used, the contract procurement documents will take the form of a Task Order (TO) and associated documents. WCC's Technical Review Phase Team will compile the TO and associated documents, including the CDM 2015 Pre-construction Information and Acceptance of the Construction Phase Plan.

2.4.4 **Procurement phase responsibilities:** During the Construction POCOC procurement phase, the developer's designers shall:

- provide WCC's Technical Review Phase Team with information concerning the design or the Construction POCOC Works Information which will enable WCC's Technical Review Phase Team to respond to tender enquiries; and
- provide WCC's Technical Review Phase Team with revised Construction POCOC Works Information (including revised drawings and revised information for the Numbered Appendices as necessary), to allow WCC's Technical Review Phase Team to review the revisions and, if appropriate, provide tender amendments in the form of 'corrigenda' and/or 'addenda'.

2.4.5 **Construction phase responsibilities:** During the Construction POCOC construction phase, the developer's designers shall provide WCC's Technical Review Phase Team with revised Construction POCOC Works Information (including revised drawings and revised information for the Numbered Appendices as necessary), to allow WCC's Construction Phase Team to review the revisions and, if appropriate, issue the information to the NEC3 Project Manager.

DESIGN CERTIFICATE – sample format

We: the designers

Address:
.....

certify that all reasonable professional skill and care has been used in the preparation and checking of the design for

Scheme title
.....

I confirm we have prepared the design shown on the following drawings and documents:

Number / Ref	Revision	Title

continue drawing and document references overleaf as necessary

Signed

Name (Lead designer)

Date

To be completed by Warwickshire County Council

This Certificate is:

- a) received*
- b) received with comments as follows*
- c) returned marked 'comments as follows'*

* delete as appropriate

Signed

Name (Technical Review Lead)

Date

Number / Ref	Revision	Title

Number / Ref	Revision	Title