

ANNEX B

DESIGN GUIDANCE AND DESIGN SUBMISSION

As a guide, on receipt of a complete submission, a minimum of eight weeks should be allowed for the technical audit and acceptance of S.278 works highway design submissions. However, this is dependent on the scope and complexity of the works, the quality of the submission and timely provision of responses to issues raised.

Detailed Design – Guidance

The design is to be in accordance with the Highways and Flood Authority's [Design Standards and Departures for Highway Schemes - Improvements Maintenance and Developments](#) which is available on its website. LCC standard details drawings (available on the LCC website) are to be used in all cases, except where the agreed design standard permits the use of other details.

The level of detail required for consideration of technical acceptance will depend on the scope, complexity, value and location of the proposed works. To avoid potential abortive work and delaying technical acceptance, the design submission should include all relevant information from the list below, together with other supporting drawings, documents and calculations.

The standards current at the time designs are prepared are to be used. Designs submitted for acceptance more than six months after design completion may be rejected if the Highway Authority considers that the standards are no longer applicable.

Requirements for the design and construction of highway structures (i.e. over 600mm clear span or retained height) are provided in the LCC document *Small Highway Structures Design Guide*. There is a requirement to obtain the appropriate Technical Approval for the structure in advance of construction. This is dependent upon the type of structure, and may include the need for Approval In Principal, a Design Certificate and a Check Certificate.

General Details to be submitted:

- Brief description of the development and intended S.278A works;
- Schedule of all drawings and documents submitted in the package;
- S278 Limits Drawings (maximum size A3) for binding into the Agreement:
 - Site location clearly showing the site in relation to its surroundings, at a suitable scale (1:1250/1:2500), with a six figure Ordnance Survey grid reference.
 - General layout of the S278 works showing existing highway boundaries and the limits of the permanent S278 works (inclusive of suitable working space and reasonable traffic safety and management measures, but excluding temporary diversion routes outside the limits of the permanent S.278 works). To a suitable scale (1:500/1:200) with the limits bounded in a thick red line and any land to be transferred for highway purposes coloured blue and also bounded with a thick red line.
- Land Interest/Transfer Drawing - at a suitable scale (1:1250/1:500/1:200), showing land to be transferred coloured pink and bounded with a thick red line and showing a six figure Ordnance Survey grid reference. It is also to show the quantity of land to be transferred in square metres and current owner details. Maximum size A3 for binding into the Agreement;
- A 3D topographical survey of the S.278A site, containing existing level information;
- Constraints on the design and how dealt with (e.g. Traffic Regulation Orders, Tree Preservation Orders, Services / Statutory Undertakers, Environmental Assessments and Surveys etc.);
- Documented solutions to issues identified through any Transport Assessment and Travel Plan, e.g. public transport infrastructure, traffic calming, pedestrian requirements;
- Intended method of dealing with existing Rights of Way;
- Details of special materials, e.g. required in conservation areas, street furniture;
- Existing traffic flows and speeds (Annual Average Daily Traffic Flows and 85th percentile speed);
- Design speed for each highway link;

- Designers risk assessments and CDM pre-construction information;
- Where projects are notifiable under CDM, a copy of the issued F10 form;
- Works construction cost estimate based on detailed Bill of Materials or Activity Schedule;
- Actual or estimated cost of diversion or protection of services / statutory undertakers' equipment;
- Stage 2 Safety audit report, design team response and exception report;
- Programme for the development, including milestones in relation to the S278 Works Construction programme (such as road space booking, latest dates for diversion of services, S.58 etc.); and
- S278 Works Construction programme, which must include the main stages of construction, traffic management changes and compliance with road space booking restrictions.

Design Details to be submitted:

Full list of design and construction standards used;

Completed forms for any relaxations or departures from standards;

Appropriately scaled drawings and supplementary details showing:

- General arrangement (incorporating site location plan), showing extent of site, temporary accesses, details at tie-ins to existing highway etc;
- Site clearance details, including a key of items to be removed and any necessary schedules etc;
- Fencing, noise and environmental barriers (plan, construction and foundation details);
- Safety fencing (plan, construction and foundation details);
- Drainage details:
 - Layout, showing existing and proposed: pipe runs (with sizes, gradients, diameters, depths, cover, backfill), manhole and gully, sizes, inverts positions and details, outfall details, backfill details, unique numbering of pipes / gullies and chambers;
 - Layout and all details of Sustainable Drainage Systems (SuDS);
 - Drainage/hydraulic design calculations, calculations/data for gully spacings, discharge calculation at outfalls etc;
 - Full drainage schedule with unique numbering, all relevant details and adopting body;
 - Details of any attenuation, retention storage with supporting calculations and information on any mechanical items, e.g. hydrobrakes or pumps;
 - Details of any petrol interceptors;
 - Contour plans showing existing and proposed;
 - Proof of consent to discharge;
 - S.104 Agreement;
 - CCTV videos of any existing drainage used as connection/outfall;
- Earthworks details, with embankment/cutting construction and materials, verge treatments etc;
- Carriageway and footway construction, indicating areas and details of different constructions, areas of planing / inlay / overlay / reconstruction, detail and adequacy at interface with existing highway construction, trench reinstatements etc. NB Evidence of adequacy of construction (e.g. cores of existing construction / pavement calculations / reference to traffic volume and type) must be submitted;
- Kerbing, edging and channel details; including areas of over-break and reinstatement of surrounding carriageway and footway construction etc;
- Traffic signs and road markings; including schedules of new traffic signs and road markings;
- Landscaping; planting strategy (areas, species, density, specifications), preparation works and soil types, details and cost of maintenance regime (horticultural management plans etc);
- Road lighting and illuminated signs (including street lighting design calculations);
- Electrical works; ducts, service chambers, underground cables (including calculations and details of protective devices), position of feeder pillars and schematic cable diagrams etc;
- Structures details:
 - Drawings showing positions, orientation and all construction details;

- Independent of the formal Technical Approval all calculations, drawings, details, and specifications relevant to the structure;
- Proposals for key stage inspections by the Highways and Flood Authority;
- Services / statutory undertakers (showing any existing and proposed alterations/protection measures/diversions etc);
- Vertical Sections with suitable exaggerated vertical scales, showing boundaries of sections and contours with flow arrows:
 - Cross sections indicating existing and proposed levels and profile;
 - Longitudinal sections showing proposed centreline and channels in relation to existing levels, with proposed gradients, k values for sag and crest curves and a horizontal schematic indicating curve radii, transitions, gradient etc;
- Swept turning paths for appropriate vehicles around proposed junctions and highway scheme;
- Accommodation works; details of alterations to fencing, accesses, driveways etc (Details of consultations and agreements with landowners also to be submitted);
- Easement and way-leave layouts required for future maintenance purposes (e.g. for drainage outside the highway limits);
- Temporary traffic management measures, road closures and diversion routes (suitable for local, freight and public service vehicles) with temporary signing layouts;
- Junction Details for each junction:
 - 1:500/1:200 scale layout plan/drawings, using a topographical survey of the site, showing proposed spot levels, channels, crown lines and contours;
 - Identification and segregation details of suitable routes through / across the junction for pedestrians and cyclists;
 - Turning flow data for existing, generated and forecast for AM and PM peaks periods;
 - For Priority Junctions:
 - Design checklist showing geometric compliance with the design standard agreed with Highway Authority (e.g. DMRB (Vol.6) 'TD 42 – Geometric Design of Major/Minor Priority Junctions' and 'TD 41 – Geometric Design of Vehicular access to All-Purpose Trunk Roads');
 - Traffic reserve capacity calculations for the AM and PM peak periods using the latest version of PICADY;
 - Justification of the chosen specific layout;
 - For Roundabouts:
 - Design checklist showing geometric compliance with design standard agreed with Highway Authority (e.g. DMRB (Vol.6) TD 16 – Geometric Design of Roundabouts);
 - Traffic reserve capacity calculations for the AM and PM peak periods using the latest version of ARCADY;
 - Drawings showing deflection and visibility;
 - For Traffic Signal Junctions:
 - Layout plan/drawings to include details and locations of signal heads, poles, feeder pillars, control boxes, ducting layouts etc;
 - Design checklist showing geometric compliance with design standard agreed with the Highways and Flood Authority (e.g. DMRB (Vol.6) 'TD 50 – The Geometric Layout of Signal Controlled Junctions and Signalised Roundabouts');
 - Traffic reserve capacity calculations for the AM and PM peak periods using the latest version of LINSIG or TRANSYT (where appropriate);
- Pedestrian Crossing details for each facility:
 - 1:500/1:200 scale layout plan/drawings, using a topographical survey of the site, showing signal heads, pole position, feeder pillar, control box, ducting layouts etc;
 - Design checklist to ensure compliance with design standard agreed with Highway Authority or the following standards/guidance:
 - Traffic Advisory Leaflet (TAL) – 01/02 The Installation of Puffin Crossings;
 - TAL – 04/98 Toucan Crossing Development;

- TAL – 10/93 “Toucan” An unsegregated Crossing for Pedestrians and Cyclists;
- Statutory Instruments No.2400 – Road Traffic – The Zebra, Pelican and Puffin Pedestrian Crossing Regulations & General Directions 1997;
- Local Transport Note 2/95 – The Design of Pedestrian Crossings;
- Design Manual for Roads and Bridges (DMRB) Vol. 8 – TA 05/05;
- DMRB Vol. 6 – TA 86 Layout at Large Signal Controlled Crossings;
- DMRB Vol. 8 – TD 35 MOVA Traffic Control;
- DMRB Vol. 8 – TA 12 Signals on High Speed Roads;
- DMRB Vol. 8 – TA 16 General Principles of Control by Signals; and
- DMRB Vol. 8 – TA 68 Assessment & Design of Pedestrian Crossings

NOTE: It is the Developers responsibility to prepare and implement a Communications Plan in relation to all public relations for the scheme.

Updated 03/04/17