

P e l l F r i s c h m a n n

Barnham Eastergate Westergate, Strategic
Site

A29 Design Statement

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1 Introduction to the Scheme

1.1 Background

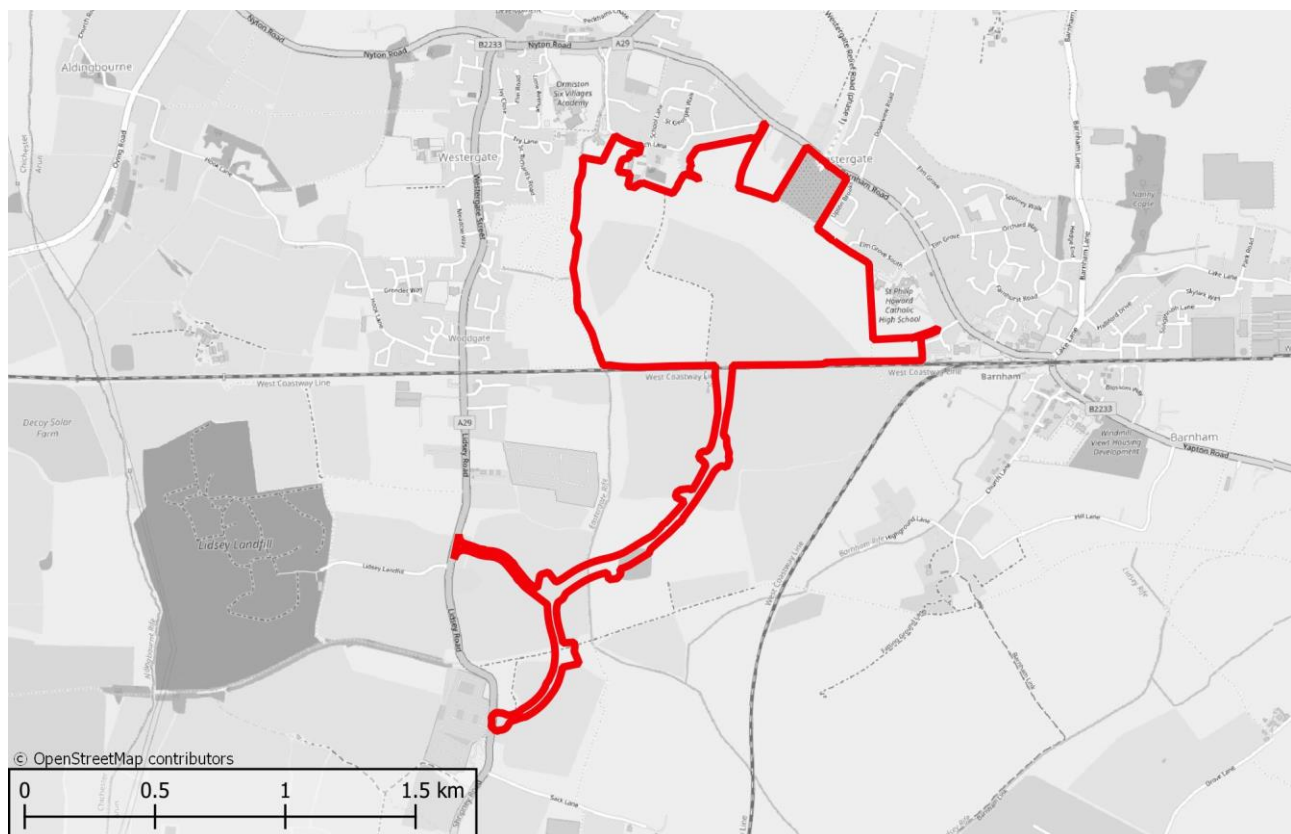
Pell Frischmann has been commissioned by CC Projects, Ashmarden Ltd and Hanbury (PM) Ltd (promoting the site together as 'The Southern Consortium') to provide transport planning and highways consultancy services in connection with Outline planning permission (with all matters reserved except for the A29 realignment) for the demolition of existing structures and mixed use development to provide residential dwellings (Use Class C3), care home/senior living accommodation (Use Classes C2/C3), flexible retail and community floorspace (Use Classes E/F2/sui generis), a primary school, plus associated open space, landscaping, drainage and all other associated ancillary works; and realignment of the A29 and early connection to existing A29, including construction of a new road carriageway, junctions and associated infrastructure

In support of the planning application Pell Frischmann have prepared this Design Statement to confirm the Design Standards used and applied throughout the design.

1.2 Scope and Objective of the Report

The objective of this report is to provide West Sussex County Council (WSCC) and Arun District Council (ADC) with confirmation of the design principals of the proposed southern section of the A29. Below is a strategic site location plan.

Figure 1.1: Strategic site location plan

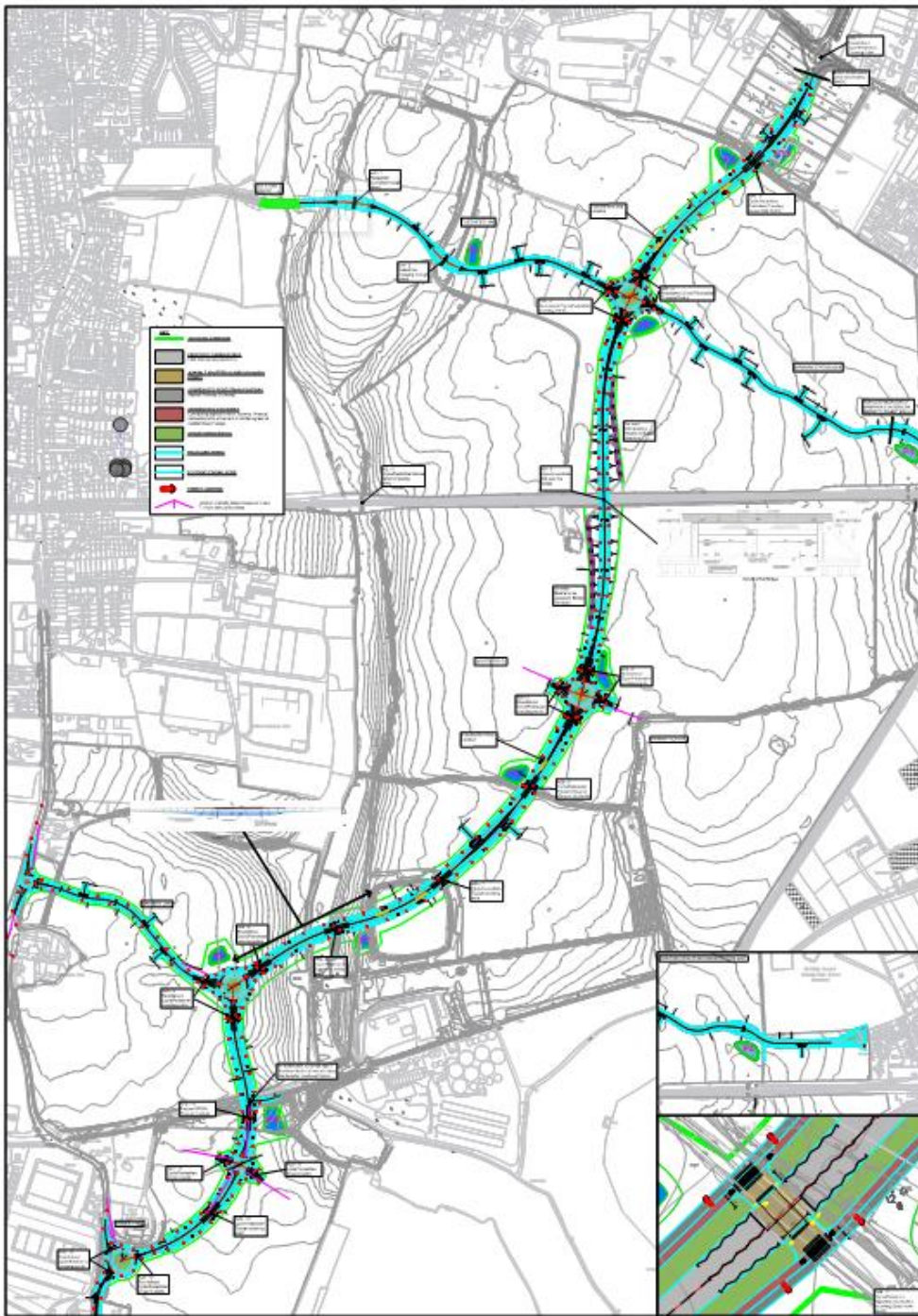


2 Extent of works

The proposed extent of the A29 realignment is shown on Pell Frischmann drawings A13394-PF-ZZ-XX-DR-CD-00100 to A13394-PF-ZZ-XX-DR-CD-00107 contained within Appendix A. This extends from the roundabout being introduced on the Barnham Road as part of the first section of the A29 realignment being delivered by WSCC. At the southern end of the realigned A29 it provides a proposed roundabout on Lidsey Road, south of the Lidsey bends. In addition to the A29 we are including the Hanbury Link located at the southern end of the realigned A29.

Furthermore Pell Frischmann drawings A13394-PF-ZZ-XX-DR-CD-00108 to A13394-PF-ZZ-XX-DR-CD-00109 include the proposed layouts for East West Link and Barnham Station Link, both of which set out the outline principals of this connection only and will be subject to further review alongside any parcel design development.

Figure 2.1 – Extents of the scheme



3 Topographical Survey and Background Information

To develop the A29 Design the site was topographically surveyed in 2019 finalised in 2020.

4 Design Criteria

4.1 Design Standards

Design Standards are summarised in the table below and include documentation, standards and scheme-specific instruction from WSCC as part of the Strategic Meetings.

Design Speed and principals of road design	These were discussed and determined as part of the Strategic Delivery Group Meeting, specifically the meeting on 13 February 2020, copy of minutes provided in Appendix B
Design Standards	- TD 109 Highway Link Design. - CD116 Design of Priority Junctions. - CD123 Geometric Design of at-grade priority and signal-controlled junctions - TA 15/81 Pedestrian Facilities at Signal Installations. - TA91/05 Provision for Non-motorised Users - LTN 2/95 The Design of Pedestrian Crossings. - LTN 1/20 Cycle Infrastructure Design - Manual for Streets (MfS).
Specific Design Detail shown on submitted drawings	- A29 Road Width 7.3m single carriageway (kerbed) - Swale/verge nominal width 5.0m - A29 Cycleway width 2.0m - A29 Footway width 2.0m - Hanbury Link Road width 6.0m single carriageway - Hanbury Link combined footway/cycleway width 3.0m - All tactile paving to be 'buff' for uncontrolled and 'Red' for controlled - Full-height kerb upstand = 125mm (except at crossings). - Kerb = detail to be agreed - Traffic Signals and Lighting Columns to be combined where applicable (for WSCC to confirm).
Design Speed	- A29 = 30mph (CD 109 - 60kph) - Hanbury Link = 20mph - East/West Link (likely speed) = 20mph - Barnham Station Link (likely speed) = 20mph - Lidsey roundabout north of Hanbury Link and South of Lidsey Rife speed to be reduced to 30mph
Stopping Sight Distance	- For A29 in accordance with DMRB 90m is required, we have shown that 90m can be achieved at approach to main roundabouts - For priority Junctions 43m is shown in accordance with MfS - For 20mph roads = 25m (MfS) - For Hanbury Link for priority Junctions 25m is shown in accordance with MfS
Horizontal Geometry	For the A29 as shown in Appendix C CD 109 geometry applies, where the horizontal radii is below 720m preceding and succeeding transitions have been introduced.
Vertical Geometry	- Minimum channel (longitudinal) grade of 0.5% as per DMRB CD109 applies. - Standard crossfall has been applied where horizontal radii is in excess of (Minimum R with adverse camber and without transitions* 720m) - Where a reduced radius applies the corresponding superelevation will be applied and the vertical transition applied over the horizontal transition length.
Footways/ Cycleway	Footway/Cycleway crossfalls to be a standard 2.5% scheme but lie between the limits as those defined in HD39/01/ LTN 1/20.

Roundabout Junctions	On A29 Roundabouts have been designed in accordance with CD 116, Normal Roundabout.
Priority Junction Radii and Visibility	- A29 All Priority Junctions have 10m radii and 90m x 2.4m visibility to comply with CD 123 - E/W Link, Banham Link and Hanbury Link all priority junctions have 6m radii and comply with MfS splays 43m x 2.4m.
Junction Restrictions	On the A29 all priority junctions to have a central reserve treatment in accordance with CD 123 Section 6 (1:20 taper), however this does not allow for right turns it will ensure left in left out movement only can be achieved. This will need to be further reinforced by traffic signs.
Crossings	- For the Green Link a 4.8m wide signal-controlled crossing is proposed. - Standalone crossings have been shown as signal controlled in line with the recent comments from WSCC (July 2021) - Crossings on the approach to the intermediate roundabouts have are maintained as zebra crossings in line with CD 119 Geometric design of roundabouts (Table 8.1.3 Suggested pedestrian crossing facilities on roundabouts where the approach roads have a speed limit of 40 mph or less)
Vehicle Tracking	Vehicle tracking has been undertaken with a 16.5m articulated vehicle in all highway areas accessible to general traffic.

5 Specific Design Aspects

The realigned A29 principals follow the agreed discussions with WSCC during the strategic meetings this includes routing and speed limits which have informed design speed.

5.1 Horizontal and Vertical Alignments

Horizontal Alignment

The horizontal alignment of kerblines has been fixed through the early discussions with WSCC. Comments were received from WSCC in March 2021 and July 2021, responses have been provided and are included in Appendix E of this report. The revised horizontal alignment drawings A13394-PF-ZZ-XX-DR-CD-00100 to A13394-PF-ZZ-XX-DR-CD-00107 have been issued with this report.

In general, the horizontal alignment respects the existing topography of the land wherever possible, but this is slightly complicated by the need to maintain a minimum longitudinal gradient in accordance with DMRB CD109.

Two bridge structures are proposed along the Alignment:

- Bridge across the Network Rail East West Line shown on PF drawing 13394-PEF-ZZ-XX-M2-S-000001. In line with chapter 5 of CD109 Highway Link Design the desirable maximum gradient is 6% the maximum gradient shown on our design is 5%. Parapet height is 1.8m. A meeting has been held with Network Rail and the principals of the design accepted.
- Bridge across Lidsey Rife shown on PF drawing A13394-A29-BR-LR-001. The specific flood level is currently being discussed with the Environment Agency.

In accordance with CD109 Note on Page 16 immediate approaches to a junction are defined for roundabouts, those lengths of carriageway on the approach to the roundabout between a point 1.5 times the desirable minimum stopping sight distance from the give way line and the give way line itself (this is noted on the drawing included in Appendix C)

Vertical Alignment

The vertical alignment design is currently being finalised but will align with the following principals. These will be issued ASAP:

- Minimum channel (longitudinal) grade of 0.5% as per DMRB CD109 applies.
- The A29 will follow the principals of CD109. Standard crossfall has been applied where horizontal radii is in excess of (Minimum R with adverse camber and without transitions* 720m) where this is not achieved superelevation will be applied
- For the E/W Link, Barnham Station and Hanbury Link MfS design applies with 2.5% gradient.

5.2 Drainage Proposals

The highway drainage design will be carried out in line with “Adoptable Highway Drainage and Sustainable Drainage Systems: Guidance for Developers” (Version 3, March 2019) document prepared by West Sussex County Council.

Latest drainage proposals are presented on drawings series A13394-PEF-ZZ-XX-DR-CD-0501 to A13394-PEF-ZZ-XX-DR-CD-0509 contained within Appendix A.

The overall drainage design intends to provide a restricted discharge rate equivalent to a greenfield QBAR rate for all return periods up to and including the 100 year+20%. This equates to approximately 3.8 l/s/ha. Where a

defined catchment results in pro-rata discharge rate of less than 3l/s, a rate of 3l/s is applied as this is considered the lowest achievable rate without increasing the risk of flooding from a blockage.

For all catchments, a positive outfall to a watercourse has been proposed as the primary means of discharge. Groundwater monitoring carried out across the site has identified elevated Winter groundwater levels which are unlikely to provide a suitable freeboard or unsaturated zone between the base of drainage features and the maximum groundwater level. This follows the drainage hierarchy established in the SuDS Manual and other guidance documents.

The drainage proposals intend to drain the main carriageway via gullies at regular centres along the road. Each gully will connect to the adjacent swales on each side of the carriageway, which will convey runoff to an attenuation feature within each defined catchment that will balance the additional runoff volume prior to being discharged at the allowable rate.

Where crossings and junctions bisect the swales, connectivity will be retained via a short piped section. Piped drainage will also be required at several of the key roundabout junctions where swales are not provided parallel to the main carriageway.

The use of both swales and attenuation features provide at least two stages of a SuDS treatment train, providing suitable treatment to runoff.

5.3 Crossings

Proposed crossing points are shown on the proposed General Arrangement drawings and in line with the proposed routes across the site as part of the emerging masterplan.

The 'Green Link' crossing is proposed as signalised as it will maintain a key principle is to create cycle/ pedestrian connection between Barnham and Eastergate through green infrastructure as well as linking existing and proposed development and community facilities.

Following the completion of a Technical Note - Pedestrian Crossing Assessment which is contained within Appendix F. This was based upon all other crossings, due to the expected Annual average daily traffic (AADT) being in excess of 15,000 (2038 flows) in accordance with TA 91/05 the crossings should be 'formal'. The guidance goes on to state that zebra crossings should be installed where 85 percentile speeds do not exceed 35mph. Signalised crossings could also be considered where 85 percentile speeds are not in excess of 50mph.

WSCC have via feedback received in July 2021 County guidance is that we would not accept zebra crossings on roads such as the new A29. Therefore, the design has been updated to reflect signalised crossings where they are independent of any features or integral to the approach of proposed junctions.

Zebra crossings however have been retained on the approach to the internal roundabouts. This is in line with CD 119 Geometric design of roundabouts (Table 8.1.3 Suggested pedestrian crossing facilities on roundabouts where the approach roads have a speed limit of 40 mph or less)

5.4 Junction Capacity

The operation of the junction has been tested using demand flows obtained from the WSCC CATM (updated for this planning application). The 2038 do something traffic flows (which includes the full build out of the allocated site) have been input into junction models and the results show that the roundabouts along the realigned A29 are all forecast to operate within capacity. The results from these models are shown in Tables 5.1 to 5.4, and further information will be included in the transport assessment submitted with the planning application.

Table 5.1: 2038 do something junction modelling results (Barnham Road/A29 Realignment)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A29 Realignment	0.45	0.8	0.59	1.4
Barnham Road (E)	0.60	1.5	0.69	2.2
Spine Road	0.77	3.4	0.50	1.0

Barnham Road (W)	0.19	0.2	0.31	0.4
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Table 5.2: 2038 do something junction modelling results (Realigned A29/E-W Link Roundabout)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Realigned A29 N	0.49	1.0	0.67	2.0
E Link	0.19	0.2	0.10	0.1
W Link	0.65	1.9	0.52	1.1
Realigned A29 S	0.16	0.2	0.12	0.1

Table 5.3: 2038 do something junction modelling results (Realigned A29/ Link to Woodgate Road)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Realigned A29 N	0.48	0.9	0.59	1.4
East Connection	0.22	0.3	0.11	0.1
Realigned A29 S	0.53	1.1	0.50	1.0
West Connection	0.08	0.1	0.06	0.1

Table 5.4: 2038 do something junction modelling results (Realigned A29/E-W Link to Lidsey Road – Hanbury Link)

	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Realigned A29 N	0.52	1.1	0.52	1.1
Realigned A29 S	0.49	1.0	0.55	1.2
West Connection	0.05	0.1	0.04	0.0

5.5 Road Safety Audit and Designers Response

We are in the process of undertaking a Road Safety Audit Stage 1. The audit brief is to be discussed and agreed with WSCC before it is undertaken.

Appendix A Design Drawings

Incl:

A29 Full Layout

General Arrangement Drawings A13394-PF-ZZ-XX-DR-CD-00100 to A13394-PF-ZZ-XX-DR-CD-00109

Geometric Design of the Proposed Junctions A13394-PF-ZZ-XX-DR-CD-00500 to A13394-PF-ZZ-XX-DR-CD-00505

A29 Drainage Design A13394-PF-ZZ-XX-DR-C-0501 to A13394-PF-ZZ-XX-DR-C-0510

Appendix B Strategic Delivery Group Meeting Minutes

Appendix C A29 Horizontal Geometry

Appendix D Proposed Bridges

Incl

Network Rail Front End Pack (issued to Network Rail)

Network Rail Bridge Options Report

Lidsey Rife Bridge Options Technical Note

Lidsey NR Bridge Structure Drawing 13394-PEF-ZZ-XX-M2-S-000001

Lidsey Rife crossing Drawing 13394-PEF-ZZ-XX-M2-S-000003

Appendix E Previous WSCC comments (March 2021 and July 2021)

Appendix F Pedestrian Crossing Assessment