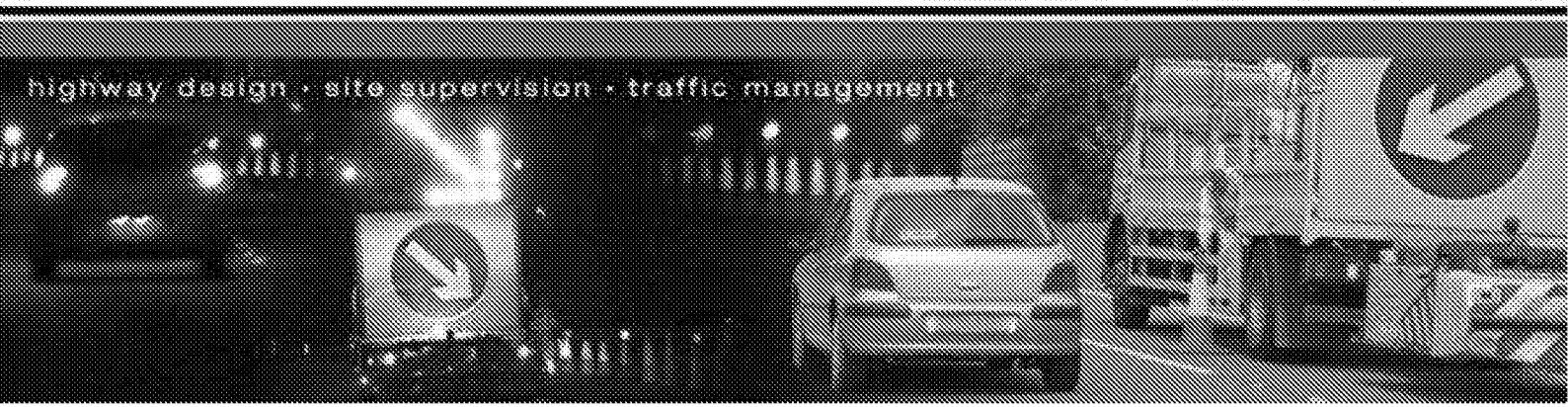




wilbar associates ltd
HIGHWAY CONSULTANTS



Proposed Development

Hooks Lane/ Pagham Road (Ref: P/6/17/OUT)

Review of Road Safety Audit Process

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CONTACT:

Duncan Driver

[REDACTED]

Woodbrooke Farm,
Toat Lane, Pulborough,
West Sussex, RH20 1BX

[REDACTED]

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1. INTRODUCTION

- 1.1** This report summarises a review of the Road Safety Audit (RSA) process for a proposed new development adjacent to Hook Lane and Pagham Road, north of Pagham in West Sussex (Local Planning Authority reference: P/6/17/OUT).
- 1.2** A Road Safety Audit is a formal systematic independent assessment of the potential road safety problems associated with a road scheme. Road safety audits have been demonstrated to be a successful preventative tool for use on new road schemes. The audit is not a technical check but primarily to report on the following questions: “Who can be hurt in a collision on this part of the highway, and how might that happen?” followed by: “What can be done to reduce the potential for that collision, or to limit its consequences?” [Road Safety Audit – IHT 2008]..
- 1.3** This review assesses whether the RSA was undertaken correctly and if there are any outstanding road safety issues that need to be considered.

1.4 If applicable references are made to following documents:

- 'DMRB' refers to Design Manual for Roads and Bridges which can be found on line at: <http://www.standardsforhighways.co.uk/> .
- Any reference to Manual for Streets (MfS) can be found on line at: <https://www.gov.uk/government/publications/manual-for-streets>
- Any reference to Department for Transport (DfT) sign numbers will generally refer to the signs in the 'Traffic Signs Manual (TSM)' which can be found on line at: <https://www.gov.uk/government/publications/traffic-signs-manual> or Traffic Signs Regulations and General Directions 2016 (TSR&GD16).
- Any reference to Local Transport Notes (LTN) can be found on line at: <https://www.gov.uk/government/collections/local-transport-notes> .
- Any reference to Traffic Advisory Leaflets (TAL) can be found on line at: <https://www.gov.uk/government/collections/traffic-advisory-leaflets> .
- Guidance on tactile paving standards can be found on line at: <https://www.gov.uk/government/publications/guidance-on-the-use-of-tactile-paving-surfaces>

2. DEVELOPMENT PROPOSALS

- 2.1** The development covers 17.5 hectares and proposes construction of up to 300 no. new homes, care home of up to 80No. beds, D1 uses of up to 4000sqm including a 2 form entry Primary School, formation of new means of access onto Hook Lane & Pagham Road, new pedestrian & cycle links, the laying out of open space, new strategic landscaping, habitat creation, drainage features & associated ground works & infrastructure.
- 2.2** The site proposes vehicular access from Hook Lane and Pagham Road along a central spine road with pedestrian accesses being provided onto Hook Lane and Pagham Road. The application when originally submitted proposed three accesses, with the southernmost access onto Hook Lane serving the potential primary school. However, this southernmost access has been removed from the proposal. Therefore, the application now proposes two accesses to the site with priority junctions proposed to the east (onto Hook Lane) and the west (onto Pagham Road).
- 2.3** The vehicular accesses proposed will measure 6m in width reducing to 5.5m as it enters the site. The 6m wide access is sufficient to allow two large vehicles to pass and re-pass and is in accordance with the advice contained within manual for streets. The junction radii have been designed to accommodate the swept path of the largest vehicle which will enter the site on a regular basis (large refuse vehicle). The proposal also includes the provision of formal bus layby on Pagham Road near the Hook Lane junction.
- 2.5** The application originally proposed a right turn lane for the Pagham Road access. However, it was identified within the initial Stage One Road Safety Audit (RSA) that the right turn lane could be used for overtaking and this was therefore changed to a priority junction with the agreement of West Sussex County Council (WSCC) Local Highway Authority (LHA).

- 2.6** The revised vehicular access arrangements have been deemed acceptable by WSCC although it has been identified that the non-motorised accesses remain as an outstanding matter. However, it has been advised by WSCC that this matter (non-motorised accesses) should be resolved via an appropriately worded condition. This would secure extension of the proposed footway along Hook Lane further northward to join the footway proposed under P/134/16/OUT as shown on drawing JNY8840/09D.
- 2.7** A Cumulative Transport Assessment (CTA) has been prepared in support of this application and it has been prepared collaboratively with those (CTA's) submitted in support of planning applications P/134/16/OUT, P/140/16/OUT and P/6/17/OUT. The scope of the CTA has been the subject of discussion and agreement with the Local Highway Authority (LHA). For those junctions where mitigation is required, the proposed works or contributions are considered by WSCC LHA as acceptable in mitigating the severe residual cumulative impacts of the development. An assessment of this analysis has not been included in this review.
- 2.8** As part of the Transport Assessment submitted for this proposal an analysis of the existing road traffic collision data in the surrounding road network was also undertaken. The conclusion from the TA collision analysis is summarised as follows: *"The review of the collision data indicates that there are no common patterns of collisions occurring that may be due to the characteristics of the local highway network. The causation factors are primarily carelessness on behalf of the drivers and / or pedestrians, indicating that the local highway network has no pre-existing inherent deficiencies. As such it is considered that the proposed development will not adversely affect the levels of incidents occurring in this area."*

3. BACKGROUND TO RSA PROCEDURES

- 3.1** It is important to ensure that the road safety implications of all Highway Improvement Schemes are fully considered for all users on the local highway network. The Road Safety Audit (RSA) procedure has been developed to ensure that operational road safety experience is applied during the design and construction process in order that the number and severity of collisions is kept to a minimum. Road Safety Auditors identify and address problem areas using the experience gained from highway design, road safety engineering, collision analysis and road safety related research (DMRB HD1915-Amended May 2017).
- 3.2** The highway authority responsible for the local highway network will be the 'Overseeing Organisation' which in this case is WSCC LHA. There are a number of Stages for Road Safety Audits. Stage 1 Road Safety Audits will be undertaken at the completion of preliminary design, and for developer-led Highway Improvement Schemes, before planning consent is applied for.
- 3.3** It is usual for developer led schemes that the Overseeing Organisation agrees a road safety audit brief prior to undertaking the Audit. The RSA brief sets out the instructions to the RSA Team defining the scope and details of the Highway Improvement Scheme to be audited, including sufficient information for the RSA to be undertaken.
- 3.4** The RSA Team works together on all aspects of the Audit, independent of the Design Team and approved for a particular RSA by the Project Sponsor on behalf of the Overseeing Organisation. The RSA Team shall comprise a minimum of two persons (a Team Leader and Team Member). The individuals within the RSA Team may be drawn from the Design Organisation or from other organisations.

3.5 The RSA Team produce a report describing the road safety related problems identified and the recommended solutions to those problems.

Recommendations made in the RSA Report that impact on the highway network must be either incorporated into the design, included within the constructed scheme or dealt with by means of Exception Report(s) to the satisfaction of the Overseeing Organisation prior to planning consent being given.

4. RSA UNDERTAKEN ON DEVELOPMENT PROPOSALS

4.1 A Stage 1 RSA was undertaken on the proposed changes to Pagham Road and Hook Lane for this development in June 2016. The RSA Team was undertaken by two suitably qualified Auditors appointed by the Developers Design Team. They are independent of the Design Team.

4.2 The brief for the road safety audit included the following documents as set out in the RSA report:-

- 1) JNY8840-01 Rev A Proposed Access Arrangements and Traffic Calming Sheet 1 of 3
- 2) JNY8840-02 Rev A Proposed Access Arrangements and Traffic Calming Sheet 2 of 3
- 3) JNY8840-03 Rev A Proposed Access Arrangements and Traffic Calming Sheet 3 of 3

These drawings included the junction access with the public highway but the internal road layout or development masterplan was not listed.

4.3 The RSA team also undertook two separate reviews following changes to the revised location for the northern most access road junction illustrated on 'Drawing No. JNY8840-3 Rev C' in December 2016 and 'Drawing No. JNY8840-12 - Proposed Access Arrangement Pagham Road' in March 2017.

4.4 The issues raised by the RSA have been set out in Table 1 for clarity. In addition the Auditors raised additional issues as part of the review of these design changes. This is also included in Table 1.

Table 1: Issues raised as part of the Stage 1 RSA (June 2016)

Issues Raised	Recommendation:
Problem 2.1.1: The scheme proposals indicate that there will be significantly revised road layout associated with the overall scheme proposals. Drainage proposals have not been submitted for the stage 1 Road Safety Audit for the proposed highway works and, concern arises that the new/modified system of drainage will need to be installed to suit the proposed highway works and to enhance the operational road safety of the overall scheme proposals. This is particularly relevant considering the proposed vertical traffic calming features that are to be incorporated into the overall scheme proposals. Concern arises that the lack of drainage could create areas of surface water ponding which could result in a potential slide hazard for vehicles, whereby there could be a very slight increased risk of loss of control collisions occurring during wet and subsequent cold/ freezing weather conditions. In addition, areas of potential surface water ponding in the vicinity of pedestrian crossing areas, could present a slip or trip hazard for pedestrians during wet and subsequent cold/freezing weather conditions, with the resultant potential risk that personal injury could be sustained by pedestrians.	At the detailed design stage of the project, a new or modified drainage installation that will be required to suit the proposed highway works should be submitted to the Audit Team for review and assessment.
Problem 2.2.1: The scheme proposals indicate that a ghosted right-turn facility is proposed on Pagham Road in conjunction with the extension of the existing 30mph speed limit. Concern arises that the proposed layout may result in the potential that an impatient westbound driver may be tempted to utilise the ghosted right-turn facility area to overtake a slower moving vehicle. This practice could result in an increased risk of westbound vehicular traffic being in conflict with motorists waiting in the ghosted right-turn facility, whereby head-on vehicular conflicts could occur.	To negate the potential for impatient drivers to overtake utilising the ghosted right-turn facility area within the centre of the Pagham Road carriageway, small traffic islands should be provided on the westbound approach.

Table 1: Issues raised as part of the Stage 1 RSA (June 2016) Continued

Issues Raised	Recommendation:
Problem 2.4.1: At this Stage 1 Road Safety Audit, the scheme proposals indicate that tactile paving is to be provided at a number of locations throughout the proposed highway works to accommodate and assist pedestrian movements. However, there are a number of locations, in areas where raised traffic calming features are proposed, where tactile paving appear to have been omitted. Whilst this may be a detailed omission at this preliminary design stage, concern arises that this situation could result in a slight detriment to the operational safety for pedestrians, particularly for those pedestrians who may be blind or visually impaired.	To accommodate anticipated pedestrian movements across junctions throughout the proposed highway works, dropped kerbs and tactile paving should be provided, as appropriate, at the detailed design stage across all side junctions. In areas where raised traffic calming features are proposed, tactile paving will still need to be provided to assist pedestrians who may be blind or visually impaired. The tactile paving should be located and aligned such that it is on the pedestrian desire lines where possible in-line with DETR Guidance on the Use of Tactile.
Problem 2.4.2: The scheme proposals indicate that 3 No. pedestrian access points are proposed along the northern side of Hook Lane to/from the development site. However, at this Stage 1 Road Safety Audit, crossing facilities appear to have been omitted entirely Hook Lane to access the pedestrian access points from the footway on the southern side of Hook Lane. Whilst this may be a drafting error at this detailed stage of design, concern arises that this situation could result in a slight detriment to the operational safety for pedestrians, whereby injudicious crossing manoeuvres may be attempted, particularly for those pedestrians who may be blind or visually impaired.	To accommodate anticipated pedestrian movements across Hook Lane to access the proposed pedestrian access points on its northern side, tactile paving onto the proposed flat top facilities should be provided, as appropriate, along Hook Lane. The tactile paving should be located and aligned such that it is on the pedestrian desire lines where possible in-line with DETR Guidance on the Use of Tactile Paving
Problem 2.4.3: At this Stage 1 Road Safety Audit, the scheme proposals indicate that 3 No. pedestrian access points are proposed along the northern side of Hook Lane to/from the development site. The site visit has established that at the 3 No. locations the existing public footway on the northern side of Hook Lane is very narrow. Concern arises that this situation could result in a very slight increased risk of conflicts occurring between pedestrians exiting the development site and those that may be on the existing footway or more importantly of pedestrians stepping straight into the Hook Lane carriageway.	At the design stage of the project, suitable and adequate intervisibility zones should be provided to enable pedestrians to clearly see any passing pedestrians. Associated localised footway vegetation clearance/widening should also be undertaken at these locations in conjunction with Item 2.4.2.

Table 1: Issues raised as part of the Stage 1 RSA (June 2016) Continued

Issues Raised	Recommendation:
Problem 2.5.1 The scheme proposals indicate that there will be significantly revised road layout associated with the overall scheme proposals. Street Lighting improvement proposals have not been submitted for this Stage 1 Road Safety Audit for the proposed highway works and, concern arises that a new/modified system of street lighting will need to be installed to suit the proposed Highway Works and, to enhance the operational road safety of the overall scheme proposals during the hours of darkness. This is particularly relevant considering the proposed vertical traffic calming features that are to be incorporated into the overall scheme proposals.	At the detailed design stage of the project, a new or modified Street Lighting installation that will be required to suit the proposed highway works should be submitted to the Audit Team for review and assessment.
Problem 2.5.2 The scheme proposals indicate that there will be a significantly revised road layout, particularly along Hook Lane, associated with the overall scheme proposals. Signing proposals have not been submitted for this Stage 1 Road Safety Audit for the proposed highway works and, concern arises that new signing will need to be installed to suit the proposed Highway Works. This is particularly relevant considering the proposed vertical traffic calming features that are to be incorporated into the overall scheme proposals.	At the detailed design stage of the project, new signing that will be required to suit the proposed highway works should be added to the scheme proposals accordingly.
Additional issue raised in December 2016 following design review: It is unclear from the drawing provided whether the original flat-top hump feature that was proposed at this location will be relocated to where the access junction was originally proposed i.e. swapped over. The original scheme proposals included vertical traffic calming measures at regular intervals along the length of Hook Lane, which would likely achieve good speed compliance. The removal of a vertical traffic calming measure (in the vicinity of Lodsworth Road) would leave a length of carriageway where vehicular speeds could increase with the associated risk to pedestrians and other vulnerable road users.	It is recommended that if the proposed access road is relocated further north that a separate flat top hump should be added in the vicinity of Lodsworth Road to ensure that consistent speeds are achieved along Hook Lane.
Additional issue raised in March 2017 following design review: Drawing No. JNY8840-12 - Proposed Access Arrangement Pagham Road without Right Turn Lane The drawing indicates that at its northern extent that dropped kerbs and tactile paving is to be provided. Whilst this may be a drafting error at this preliminary design stage, the proposed dropped kerbs and tactile paving appear to be misaligned with the eastern dropped kerbs/tactile paving shown within the bus stop taper. Consequently, concern arises that this situation could result in a slight detriment to the operational safety for pedestrians, particularly for those pedestrians who may be blind or visually impaired.	It is recommended that the dropped kerbs and tactile paving should be located and aligned such that they are to the north of the bus layby and where possible in-line with DETR Guidance on the Use of Tactile Paving.

5. RSA – DESIGNERS RESPONSE

5.1 The Designers response to the issues raised is set out in Table 2.

5.2 The majority of issues are to be picked up as part of the detailed design. The only response which is unclear is in the issue identified with the tactile paving at the March 2017 review. Nevertheless this issue can be picked up as part of the detailed design process.

6. RSA – OVERSEEING ORGANISATION RESPONSE

- 6.1** WSCC LHA as the overseeing organisation reviewed the original Stage 1 RSA report and responded in February 2017. Their response to this review was as follows: *“The highway access details as submitted have been reviewed by way of an independent Stage One Road Safety Audit. Although this raises a number of problems, the majority of these are matters for the detailed design (drainage, signage, lighting, and tactile paving). The Audit raises a further problem in connection with the Pagham Road access and the possibility of vehicles overtaking using the right turning lane. As the LHA have requested that a priority junction without right turning lane is investigated, consideration of this problem would be held in abeyance agreement over the access form.”*
- 6.2** WSCC LHA responded again in April 2018 following changes to the design, and in particular with the removal of the right turn lane in Pagham Road. Their response to this review was as follows: *“... the revised design has been passed to the Safety Auditor who reviewed the original highway works designs. They have raised no safety problems with the revised scheme. The removal of the right turning lane also satisfies and overcomes a problem raised within the initial Stage One RSA (this being that the right turning lane may be used for overtaking). There are still other detailed matters raised by the Auditor that should be accounted for as part of the detailed design.”*

Table 2: Summary of Designers Response to RSA issues raised

Summary of Issue Raised	Response to recommendation.
Problem 2.1.1: Summary: Lack of drainage could result in potential surface water ponding issues with a resultant impact upon the operational safety of the proposed highway works.	Accept recommendation, at detail design the drainage for the proposed arrangement will be provided.
Problem 2.2.1: Summary: Reducing the potential for overtaking within the ghosted right-turn facility area, which could result in a potential increased risk of vehicular conflicts occurring.	<i>Following discussions with WSCC LHA the right turn lane at the junction has been removed and replaced with a priority junction. [Authors comment]</i>
Problem 2.4.1: Summary: Accommodating anticipated pedestrian desire lines throughout the proposed highway works.	Accept recommendation, tactile paving has been provided on the proposed access arrangement.
Problem 2.4.3: Summary: Potential lack of adequate and suitable inter-visibility could result in a very slight increased risk of conflicts occurring between pedestrians.	The proposed pedestrian accesses will be a minimum of 3m wide and as such it is considered that this is more than sufficient to provide adequate visibility for pedestrians. The appropriate visibility splays for pedestrians is identified on the proposed access plans.
Problem 2.5.1: Summary: Enhancing the conspicuity of the proposed highway works during the hours of darkness.	Accept recommendation, a street lighting design will be carried out as part of the detail design stage.
Problem 2.5.2: Summary: Enhancing the conspicuity of the proposed highway works	Accept recommendation, details of the required signage will be provided as part of the detail design stage.
Problem raised Dec 2016: Summary: It is unclear from the drawing provided whether the original flat-top hump feature that was proposed at this location will be relocated to where the access junction was originally proposed i.e. swapped over,	Agreed. The arrangement of the road humps has been saved as a separate plan to show the spacing of the proposed humps.
Problem raised March 2017: The proposed dropped kerbs and tactile paving appear to be misaligned with the eastern dropped kerbs/tactile paving shown within the bus stop taper	<i>Response appears to be outstanding [Authors comment]</i>

6.3 WSCC LHA requested a number of conditions in relation to the changes as follows:.

“Pagham Road Access: No use within that phase of the development served from the Pagham Road access shall be first occupied until such time as the vehicular, pedestrian accesses and bus stop lay by have been constructed in accordance with the details shown on drawing number JNY8840-12 Revision A and provided with visibility splays of 4.5 by 149 metres to the north and 152 metres to the south. Once provided the splays shall thereafter be maintained and kept free of all obstructions over a height of 0.6 metre above adjoining carriageway level or as otherwise agreed. Reason: In the interests of road safety.

Hook Lane Access: No use within that phase of the development served from the Hook Lane access shall be first occupied until such time as the vehicular and pedestrian accesses have been constructed in accordance with the details shown on drawing number JNY8840-09 Revision A and provided with visibility splays of 2.4 by 74 metres to the north and 77 metres to the south. Once provided the splays shall thereafter be maintained and kept free of all obstructions over a height of 0.6 metre above adjoining carriageway level or as otherwise agreed. Reason: In the interests of road safety.

Pedestrian Accesses: No part of the development shall be first occupied until plans and details of the proposed pedestrian and cyclist access points have been submitted to and approved in writing by the Local Planning Authority. The approved access points shall hereafter be constructed in accordance with a phasing plan or timetable as may be agreed with the Local Planning Authority. Reason: In the interests of road safety.

Access closure: No part of the development shall be first occupied until such time as the existing vehicular accesses onto Sefter Road and Pagham Road have been physically closed in accordance with plans and details submitted to and approved in writing by the Local Planning Authority. Reason: In the interests of road safety. “

7. CONCLUSION ON RSA PROCESS

- 7.1** The proposed junction access onto Pagham Road and Hook Lane as part of this development have been subject of a Stage 1 RSA in accordance with good practice for Highway Design. The proposed accesses and the Stage 1 RSA has been reviewed by the overseeing organisation WSCC LHA who have raised no objections to the development proposals subject to a number of planning conditions.
- 7.2** However having reviewed the documentation there are a number of issues surrounding the RSA process. The main identified issue surrounding the RSA process is in preparing a formal RSA brief. A formal brief was never strictly prepared and submitted for approval to the overseeing organisation. The details submitted to the RSA team were not entirely complete and did not appear to include the development proposals themselves, nor details on traffic movement.
- 7.3** Nevertheless with the subsequent reviews by the RSA team and the checks undertaken by WSCC LHA of the Transport Assessment, the designs submitted to the Local Planning Authority have no outstanding significant road safety risk which cannot be resolved as part of detailed design.
- 7.4** Further checks on road safety issues should be considered as part of a Stage 2 RSA on the detailed design. As a formal RSA brief was not submitted as part of Stage 1 it is recommended that a brief is submitted to WSCC LHA, the overseeing organisation, for approval prior to the undertaking of the stage 2 RSA. This should ensure the issues raised at Stage 1 RSA are adequately addressed within the final designs.

8. RECOMMENDATION

- 8.1** A Stage 2 Road Safety Audit be carried out on the detailed design prior to discharge of planning conditions on all the proposed highway works. A Stage 2 RSA brief should also be submitted to and approved by WSCC LHA, overseeing organisation, before this is carried out.