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**TCF DEWSBURY, RING ROAD
WESTGATE/ MILL STREET WEST &
WEBSTER HILL – HECKMONDWIKE BUS
HUB SCHEME**

**Stage 2 Road Safety Audit
Client: Kirklees Council**

20/09/2023

Quality Management

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TCF Dewsbury, Ring Road Westgate / Mill Street West & Webster Hill – Heckmondwike Bus Hub Scheme

Stage 2 Road Safety Audit

20/09/2023

Overseeing Organisation

Kirklees Council

Client

Kirklees Council

Design Organisation

WSP

Road Safety Audit Team Organisation

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1 Introduction

- 1.1.1 This report results from a Stage 2 Road Safety Audit carried out on the Transforming Cities Fund (TCF) Dewsbury Ring Road Westgate / Mill Street West & Webster Hill – Heckmondwike Bus Station scheme. This is at the request of Roger Hammond, Project Manager, Major Projects, Kirklees Council (Overseeing Organisation).
- 1.1.2 The terms of reference of the Road Safety Audit are as described in DMRB GG 119. The Road Safety Audit Team has examined and reported only on the road safety implications in the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.
- 1.1.3 The Road Safety Audit Team membership, approved by Roger Hammond, Project Manager, Major Projects, Kirklees Council (Overseeing Organisation), consisted of:
- | | |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Team Leader | Mark Hedley, IEng, MCIHT, MSoRSA, FIHE, RegRSA(IHE)
Certificate of Competency in Road Safety Audit gained in Nov 2013
Partner, Road Safety Initiatives LLP |
| Team Member | Alan Bawn, BSc (Hons), CEng, MICE
Consultant, Road Safety Initiatives LLP |
- 1.1.4 The Road Safety Audit was undertaken in accordance with the Road Safety Audit Brief provided by Dean Barker, Highway Safety Team, Kirklees Council and approved Roger Hammond, Project Manager, Major Projects, Kirklees Council. The Road Safety Audit comprised an examination of the documents provided and listed in **Appendix A**.
- 1.1.5 The Road Safety Audit Team visited the site together on Tuesday 5 September 2023 between 12:50 and 13:20 hours. It was sunny, and the road surfaces were dry at the time of the site visit. During the site visit, traffic flows were moderate. No cyclists and many pedestrians were observed.
- 1.1.6 Matters which the Terms of Reference exclude from this report, but which the Road Safety Audit Team wishes to draw to the attention of the Overseeing Organisation, will be supplied in a separate document in the covering email to this Road Safety Audit Report.
- 1.1.7 All Road Safety problems are referenced to the design drawings and the locations have been indicated on the plans supplied with the Road Safety Audit Brief in **Appendix B**.
- 1.1.8 This Road Safety Audit will review the road safety aspects of the proposed improvements to the existing Heckmondwike bus hub scheme. The following scheme proposals was taken directly from the Road Safety Audit Brief –
- *Provide improved pedestrian footway facilities by means of widening the eastern footway.*
 - *Maintain existing pedestrian footway facilities on the west side of S George Street, reducing width to 2.2m*
 - *Provide improved pedestrian footway facilities by means of widening the northern footway by the removal of S George St northern two 15-minute parking bays and two disabled parking bays.*
 - *Realignment of tactile paving at controlled crossing facilities of S George Street.*
 - *Realignment of tactile paving at uncontrolled crossing facilities of Royle Fold.*

- *Maintain existing circular one-way system through scheme.*
- *Maintain access to local businesses within the scheme. Priority given to pedestrians by means of continuous footway across the access.*
- *The existing speed limit for the scheme area will not change.*
- *Existing prohibition of waiting and loading for the scheme to be reinstated to new alignment as per TSRGD, Schedule 7, Part 4, diagram 1018.1 and diagram 1020.1.*
- *Cycle access to the bus hub from Northgate via jug handle cycle track at footway level, dismounting and walking to the bus hub and/or to the covered cycle storage via a 2.7m wide pedestrian controlled crossing facilities, S George Street.*
- *Cycle access to the bus hub from A638 is via an advisory cycle lane on Royle Fold and a jug handle cycle track at footway level. Cyclists are to dismount and walk their bicycle to the bus hub and/or to the covered cycle store located to the northeast of the bus hub.*
- *Cyclists exiting from the bus hub by walking their bicycle to jug handle to the southeast via the contraflow cycle lane on Royle F*

1.1.9 The objective of the scheme is to improve the existing Heckmondwike bus hub and the following was taken directly from the Road Safety Audit Brief:

“The current Heckmondwike bus hub lacks interchange facilities for patronage and bus services are currently over capacity for the site during peak periods. The scheme creates an attractive gateway into Heckmondwike providing an active travel interchange within a safe environment for bus patronage and additional stands to accommodate the increase in bus services as well as encourage the use of more sustainable modes of transport. The scheme will also provide driver facilities and improve the environment for local businesses and residents.”

1.1.10 The Road Safety Audit Team was not informed of any strategic decision made and agreed by the Overseeing Organisation.

1.1.11 The Road Safety Audit Team was not informed that there are Departures from Standards.

2 Items Raised at previous Road Safety Audits

2.1.1 The road safety implications of the proposed TCF Dewsbury Ring Road Westgate / Mill Street West & Webster Hill – Heckmondwike Bus Station scheme were the subject of a Stage 1 Road Safety Audit by Road Safety Initiatives LLP in June 2021.

2.1.2 The items raised at the Stage 1 Road Safety Audit are detailed in the table below:

St 1 RSA Item	Stage 1 Road Safety Audit Problem and Recommendation (June 2021)	Stage 1 RSA Design Organisation Response (15 June 2021)	Stage 2 RSA Comment
1	<p>Problem</p> <p>Currently pedestrians can cross in relative safety between the footway bordering the north-eastern side of South George Street and the footway bordering its south-western side (i.e., to/from the periphery of the bus station), only having to consider traffic moving in one direction around the one-way system. However, under the proposed layout there would be no footway routes around the northern periphery of the station. To mitigate for this, the proposals include guardrail along much of the outer verge of South George Street to block pedestrian crossing desire lines to and from the bus station. However, due to the retention of four existing parking bays there would be gaps in the rails where pedestrians could freely walk through. The proposed carriageway area of the bus station adjoining the parking bays would be extremely hazardous for pedestrians to negotiate, with buses manoeuvring in multiple directions, including reversing. There would be a high risk of pedestrians being injured if they attempted to walk through this area.</p> <p>It also seems highly likely that significant numbers of pedestrian will want to execute these movements. Most passengers using the bus station living in areas to the north of the site would be likely to walk via George Street. Also, pedestrians heading to and from some retail destinations south of the site may also choose to take a direct path through the centre of the bus station.</p> <p>Recommendation</p> <p>The parking bays should be removed, and the guardrail made continuous across the entire north-eastern section of South George Street.</p>	<p>Designer's Response</p> <p>The revised Proposed Site Plan (20233-SGP-HEK-ZZ-DR-A-021001 P8) shows that the four parking bays to the north of the site have been removed and replaced with a raised planted area, as part of the landscape strategy for the site. A continuous guardrail (1100mm high) is now proposed between the dentist car park and eastern edge of the proposed raised planted area. A continuous guardrail is also proposed along the eastern side of the site on Royle Fold between the dentist car park and the pedestrian crossing at the entrance to Royle Fold, with the footway widened to retain the effective width.</p> <p>The proposed raised planted area to the north extends west towards the footway on South George Street and there is a separate landscaped area located along the western side of the site between the crossing point for the drivers route to the layover bay and the signal-controlled crossing point. There is also an additional landscaped island between South George Street and the bus apron that will discourage pedestrian movements. The drivers route to the layover bay has a 1200mm high railing coded access gate, along with a retaining wall either side of the gate to discourage pedestrian movements.</p> <p>In combination these proposals will direct pedestrian movements to the perimeter of the site and prevent pedestrians taking a direct path through the centre of the bus station.</p> <p>RSA Team Comments</p> <p>Accepted, problem closed at Stage 1. However, during detailed design care will need to be taken to ensure that adequate visibility splays are provided where drivers cross George Street when leaving the bus hub, after passing through the security gate. The crossing point is on the apex of a bend – the Design Response mentions planting, railings, and a retaining wall here, all of which could inhibit visibility and increase the risk of vehicles colliding with crossing drivers.</p>	<p>Landscaping, guardrail and gate proposed therefore Problem 1 is resolved.</p>

2	<p>Problem</p> <p>The scheme proposes an unorthodox and potentially hazardous layout and manoeuvring system for buses (it is assumed) to maximise capacity.</p> <p>The layout would necessitate buses reversing from the front of the bays and turning, before turning again and leaving the site forwards. These manoeuvres would be difficult to execute safely, and drivers would need to see clearly in all directions across the rear/sides of their vehicles. Looking at the vehicle swept path movements provided for audit, it seems highly likely that this system could only operate safely if only one bus were permitted to execute an exit manoeuvre at any given time, and only then if no other buses were entering the site at the same time.</p> <p>Whilst it is acknowledged that cameras would be provided, it is not clear how far these could mitigate safety concerns. The VDUs proposed at the front of the bays may only be clearly visible to bus drivers when they commence reversing (depending upon size and drivers' sight), and without restrictions on conflicting movements in place, they would only be of limited benefit. The further back buses reversed, the less visible the screens would be, and the most hazardous conflicts would occur towards the rear of the parallel bays where other buses entered the site.</p> <p>Recommendation</p> <p>Safe methods of operation and associated safety measures should form an integral part of the detailed design process and submitted for audit at RSA Stage 2. This could include strict site operating methods supported by appropriate driver education, training and sign-up, preventing more than one bus leaving the site at any given time. This could be supported by technology, for example, live vehicle detection used to feed a red/green 'traffic light' system incorporated into the VDUs, informing drivers when it was safe to commence reversing. Furthermore, a conventional traffic signal arrangement could be linked to this system, with buses (and other traffic) held on a red light at the north-eastern end of Royle Fold, to prevent them entering the site whilst other buses were reversing.</p>	<p>Designer's Response 2</p> <p>The revised Proposed Site Plan (20233-SGP-HEK-ZZ-DR-A-021001 P8) shows a reversing camera system will be installed at each Drive-In Reverse-Out (DIRO) stand so drivers can view what's behind them as they reverse. This comprises a reversing camera screen at the front of each stand and reversing cameras located at the rear of the layover bay.</p> <p>All drivers will follow appropriate operating procedures, including those set out in 'Guidance for the safe design and operation of bus stations and interchanges' (2011). The guidance includes the following operating procedures relating to reversing vehicles from a DIRO stand:</p> <ul style="list-style-type: none"> □ Drivers of vehicles reversing from any part of the bus station, other than a stand, should give way to drivers of those vehicles reversing from a stand. When moving in a straight line and two buses attempt to reverse simultaneously the vehicle on the right is given priority to avoid simultaneous movements. □ Where conflict may arise between vehicles, the driver of the vehicle at the rear should yield and leave sufficient space for the vehicle in front. □ Drivers should look for vehicles which are about to or have started moving and give them priority. Similarly, any person on the bus station carriageway should also be given priority. □ When approaching the required stand, check it is clear and proceed via the drive through lane. Do not cut across the rear of other stands. Remain in the drive through lane until you reach the turning point for the stand, whilst watching for pedestrians and reversing vehicles. Turn into the stand. Approach the stand slowing to avoid late braking and align the vehicle tight and square to the kerb. □ Reversing the bus when clear, should be reversed straight from the departure stands, the vehicle wheels be positioned so reversing movement can only be in a straight line. Scan both rear view mirrors and any reversing camera monitor and any reversing aid. The driver should reverse until the rear of the vehicle is at the edge of the line marking the running lane if available. The forward manoeuvre can then be commenced, so that the bus can proceed and immediately re-join the drive through lane; and □ Reversing aids and audio alarms should be used. <p>Based on the above, all buses entering the bus stands would be required to give to reversing bus before they enter the bus apron from South George Street. There is sufficient stacking space for a minimum of three buses that could wait on South George Street / Royle Fold if a platoon of buses arrives while buses in the bus stands are reversing. If two buses attempted to reverse simultaneously, then the vehicle on the right would be given priority to avoid simultaneous movements.</p> <p>Based on the operational procedures set out above, it is considered that the manoeuvres within the bus station could be completed in a safe manner, which would avoid conflict movements being undertaken simultaneously.</p> <p>RSA Team Comments 2</p> <p>Accepted, problem closed at Stage 1. However, during detailed design care will need to be taken to ensure that adequate visibility is maintained across the planting area / retaining walls located between Royle Fold and the hub. Drivers entering the hub will have to execute a sharp turn to the left from Royle Fold (potentially through 180°) and should be able to see across the planted area to any buses reversing along the southeastern-most stand, when approaching the junction. This would minimise the risk of collisions at the north-eastern limit of the stand with those turning into the hub.</p>	<p>Vehicle safety measures and operational procedures mitigate concerns therefore Problem 2 is resolved.</p>
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3	<p>Problem</p> <p>The proposed layout includes cycle parking alongside the main building. It is not clear how cyclists could safely access this parking area.</p> <p>The parking area could only be accessed from the wider area via footways, and currently there are no off-carriageway cycle routes around the periphery of the site which could be linked to it. Cyclists attempting access could only do so by riding through pedestrian-only footways and/or crossings in contravention of the law, placing themselves and pedestrians at risk.</p> <p>Furthermore, within the site itself, the location of the cycle parking would only be accessible by travelling along the front of the building between the main waiting and retail areas, and the bus stands. Passengers would be walking across this route constantly, and if cyclists elected to ride along it, cycle-pedestrian conflict potential would be very high. Cyclists would be highly unlikely to dismount and walk, even if instructed to do so by signing / order.</p> <p>There are also no links to the parking area for any cyclists arriving here on-carriageway. If cyclists attempted to travel with buses on-carriageway, it would be inherently dangerous.</p> <p>It was also noted that the door into the Drivers WC swings out close to the end cycle stand, which could prove hazardous if cyclists were there at the same time as someone emerged with no line of sight (assuming the door will have to opaque for a WC).</p> <p>Recommendation</p> <p>If cycle parking is to be provided as part of the proposed facilities, then safe access to it must also be provided. Currently there are no facilities proposed for cyclists other than the parking area, and therefore the RSA Team cannot offer specific recommendations that could alleviate the safety concerns. The Designers should fully consider proposals for cycle access and provide details via the Design Response for the RSA Team to consider and comment upon.</p>	<p>Designer's Response</p> <p>The revised Proposed Site Plan (20233-SGP-HEK-ZZ-DR-A-021001 P8) shows the proposed cycle parking will replace the existing cycle parking and result in one additional stand, increasing the number of Sheffield stands from 5 to 6. There are no proposed changes to the cycle network in the vicinity of the site either as part of the proposed scheme or complementary A638 TCF schemes.</p> <p>Cyclists would be required to dismount and walk with their cycle, which is a continuation of the existing arrangements. There are no recorded collisions in the vicinity of the site involving cyclists and the scheme is not anticipated to result in a significant increase in cycle movements. It is considered that there are no significant changes to how the site is currently accessed by cyclists.</p> <p>In relation to the major operators entrance and doors opening into the highway steel barriers are now proposed to guide pedestrian and cycle movements away from the opening of the door, which in turn, should ensure that no pedestrians or cyclists would be in the vicinity of the door when opened. This is also applicable to the Switch Room. Access to the Plant room is now by an inward opening door.</p> <p>RSA Team Comments</p> <p>In terms of RSA process, it is irrelevant that the problems relating to cyclists are considered no worse than the existing situation by the Designers.</p> <p>The hub is being completely re-built, and therefore the design should fully consider the safety of all users. Providing cycle stands formally encourages cyclists to enter the site, therefore as Highway Authority we must provide reasonable and safe means of access between the stands and the public highway. Under the current version of the proposals, cyclists attempting access could only do so by riding through pedestrian-only footways and/or crossings in contravention of the law, placing themselves and pedestrians at risk. Within the site itself, the cycle parking would only be accessible by travelling around the outer limit of the main building. Passengers would be walking around here constantly, and if cyclists elected to ride, cycle-pedestrian conflicts would occur. Cyclists would be highly unlikely to dismount and walk even if instructed to do so by signing / order, because of the distance between the stands and public highway.</p> <p>One option to consider would be to provide a cycle-only access/egress facility between Royle Fold and the hub at its south-eastern corner, immediately north of the existing pedestrian crossing of Royle Fold, and to then relocate the cycle stands just north of this, along the southeastern boundary of the hub. This would at least remove the desire for cyclists to ride between the stands and highway, and the conflicts that could create between them and passengers on foot. When leaving the hub, cyclists would have to use the one-way system around Royle Fold – South George Street. Although this would not be ideal, on balance volumes of buses should be relatively low, and mitigation could also be provided. An advisory cycle lane could be introduced around the inner limit of the one-way loop, feeding into a cycle advanced stop line / cycle holding area where South George Street meets Northgate at the traffic signals, to highlight the possibility of encountering cyclists to drivers. Note – drivers could legitimately encroach into the lane when no cyclists are present but should give-way to them when they are. The advisory lane would not, therefore, physically restrict the alignment as currently proposed.</p> <p>If cycle parking is to be promoted within the site, then either reasonable and safe means for access should be provided during detailed design (as above or otherwise), or if the current layout is retained, an Exceptions Report will be required before closing off</p>	<p>Problem 3 is considered to be resolved.</p>
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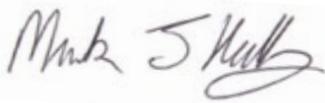
St 1 RSA Item	Stage 1 Road Safety Audit Problem and Recommendation (June 2021)	Stage 1 RSA Design Organisation Response (15 June 2021)	Stage 2 RSA Comment
		<p>Stage 1 and moving to Detailed Design. Alternatively, the cycle stands could be removed from the scheme.</p> <p>Designer's Response 3 (further)</p> <p>Having reviewed the current proposal further, the design team have concluded that there are no alternative suitable positions within the site for the cycle stands to be located. It has been agreed that signage stating for 'cyclists dismount' will be placed at entry points around the site, the exact location for the signs will be developed during the detailed design phase. Reviewing the options that you have proposed, it is felt that this may cause greater danger to occur. Those coming into Royle Fold will have to contend with buses entering the hub, motorists entering the dentist car park and HGVs entering the service yard. Furthermore, and more importantly, it would be hazardous for cyclists to traverse the outer loop of an active bus station, regardless of whether there would be an advisory cycle lane. As you outline, large buses, which will be the primary vehicular user of the station, can encroach into this lane and will do so due to turning movements, putting cyclists in danger and give a false sense of safety.</p>	

3 Items raised at this Stage 2 Road Safety Audit

- 3.1.1 Following careful consideration of the information provided, together with the site visit, the Stage 2 Road Safety Audit Team was unable to identify any items of concern regarding the road safety of the scheme.

4 Audit Team Statement

We certify that this Road Safety Audit has been carried out in accordance with GG 119.

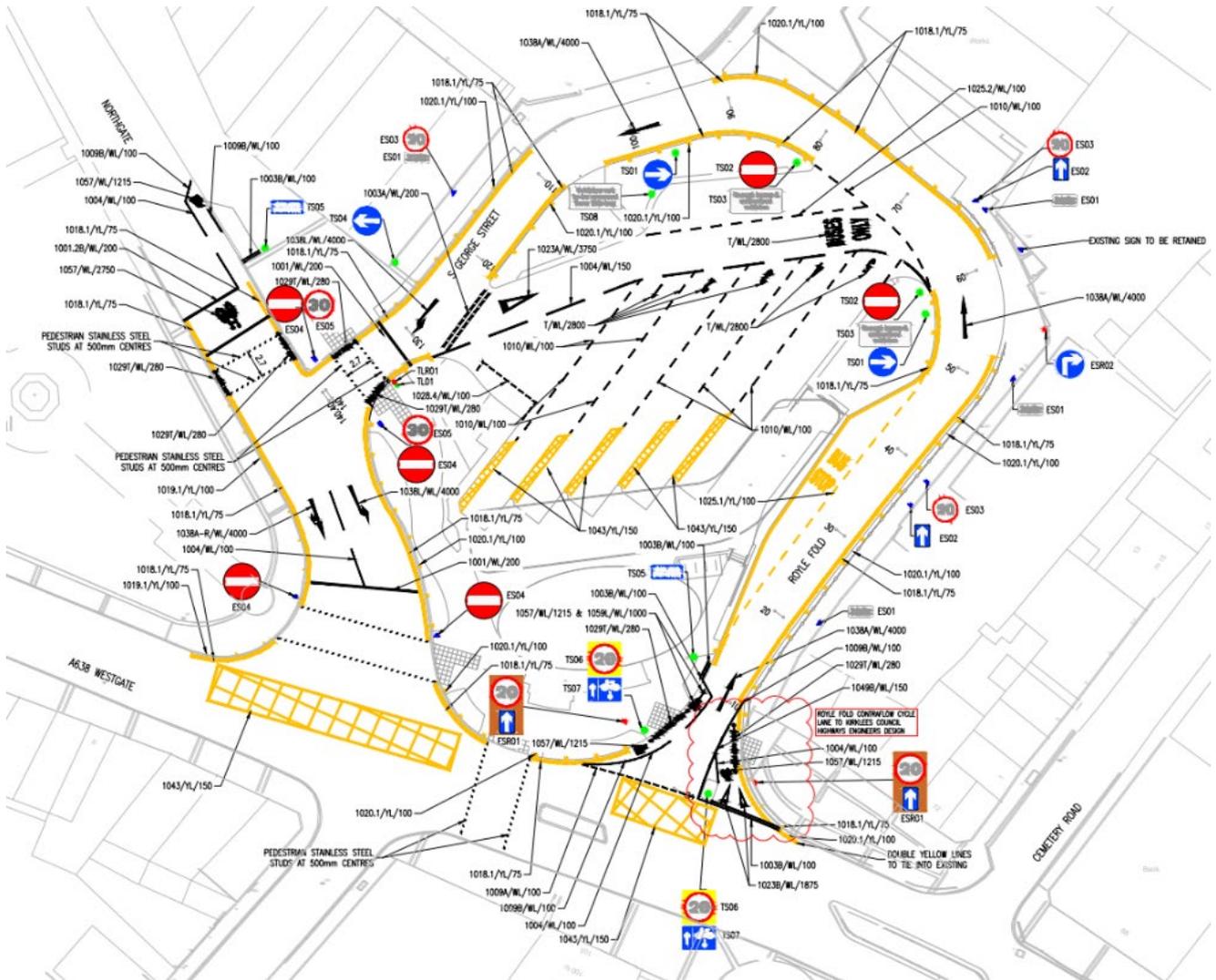
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Appendices, Figures and Tables

Appendix A: Scheme Documents Issued for Road Safety Audit

DRAWING/DOCUMENT REFERENCE	REV	TITLE
TCF-WSP-KIR-HECK-DR-CH-01	P06	Junction Intervisibility Zones and Forward Visibility
TCF-WSP-KIR-HECK-DR-CH-01_02	P05	Single Decker Buss Swept Path Analysis
TCF-WSP-KHBH-XXX-DR-LE-000001	P01	Landscape Design
TCF-WSP-KIR-HECK-DR-CH-0100	P01	General Arrangement
TCF-WSP-KIR-HECK-DR-CH-0200	P02	Site Clearance
TCF-WSP-KIR-HECK-DR-CH-0400	P01	Pedestrian Restraint Systems, Retaining Wall and Steps
TCF-WSP-KIR-HECK-DR-CH-0500	P03	Drainage
TCF-WSP-KIR-HECK-DR-CH-0700	P01	Pavements
TCF-WSP-KIR-HECK-DR-CH-0701	P02	Typical Cross Sections
TCF-WSP-KIR-HECK-DR-CH-0800	P01	Proposed Levels
TCF-WSP-KIR-HECK-DR-CH-1100	P01	Proposed Kerbs, Footways, Cycleways and Paved Areas
TCF-WSP-KIR-HECK-DR-CH-1200	P02	Traffic Signs and Road Markings
TCF-WSP-KIR-HECK-DR-CH-1210	P01	Traffic Signs Schedule
HBH-WSP-00-ZZ-DR-E-630001	P02	Electrical Services, External Areas, Enabling Works, Street Lighting Column Relocation Layout
20233-003 SGP-HEK-XX-DR-A-201001	P5	Proposed Site Plan
KC-25/65529-RSA2/Rev0	04/09/23	Stage 2 Road Safety Audit Brief

Appendix B: Location Plan



GENERAL

3.2.1 - Potential for signs to be struck by pedestrians.

3.2.2 - Dunford Road and Penistone Road– Sign Ref: S01, S02, S19, S20, S21, S22, S39, S40, S41, S42, S44, S45.



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