



Project Centre

Broad Oak AHB Level Crossing

Level Crossing Risk Assessment Report

**Prepared by
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BS408/001/D420.2

Revision F

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Project Centre

Broad Oak AHB Level Crossing


Level Crossing Risk Assessment Report

BS408/001/D420.2

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CONTENTS

EXECUTIVE SUMMARY

NOTICE

- 1. INTRODUCTION TO THE LEVEL CROSSING RISK ASSESSMENT PROCESS**
- 2. DESCRIPTION OF SITE**
- 3. RISK ASSESSMENT AND RECOMMENDATIONS**

APPENDICES

- A. SOURCES OF INFORMATION**
- B. SUMMARY OF ALCRM SCORES**
- C. WORKSHOP DATES AND PARTICIPANTS**
- D. WORKSHOP PARTICIPANTS SIGNATURES**

TABLE OF ABBREVIATIONS

AHB	Automatic Half Barrier
ALCRM	The All Level Crossing Risk Model
CCTV	Closed Circuit Television
FWI	Fatalities and Weighted Injuries
GRD	Guidance Reference Document
HGV	Heavy Goods Vehicle
LC / LX	Level Crossing
MCB-CCTV	Manually Controlled Barriers with Closed Circuit Television
MCB-OD	Manually Controlled Barriers with Obstacle Detection
MSL	Miniature Stop Light
MWL	Miniature Warning Light
RSSB	Rail Safety and Standards Board
RTL	Road Traffic Lights
SMIS	Safety Management Intelligence System
YN/YO	Up Near Side / Up Off Side
ZN/ZO	Down Near Side / Down Off Side

EXECUTIVE SUMMARY

RSK Business Solutions Ltd was commissioned by Amey to carry out a suitable and sufficient risk assessment for Broad Oak Level Crossing. Railway Group Guidance GI/RT7611 Issue N° 1, Section C1.2 specifically requires that a suitable and sufficient level crossing risk assessment shall be undertaken wherever there is a change likely to affect the risk to users of a level crossing. The future development in the area of Broad Oak Level Crossing therefore required a suitable and sufficient level crossing risk assessment to be carried out to ensure that the planned development work would not impinge on the level crossing safety.

This report summarises the level crossing risk assessment process for Broad Oak Level Crossing, located near the town of Sturry, near Canterbury in Kent.

The proposed development in the area of Sturry involves the construction of ~3000 new homes, and additional school, and other associated buildings. This project will also involve the construction of a new road running parallel to the railway and an additional bridge over the railway. Additionally multiple redesign options for the adjacent junction have been proposed. Traffic modelling has therefore been carried out to estimate the impact of the development on the use of the crossing, the conclusions of which can be seen document 661439 “Transport Impact Study, Sturry and Broad Oak Level Crossings” provided by RSK. The proposed master plan for the redevelopment of the area is shown in Figure 1.1 (Level Crossing circled in blue), and the draft local plan is shown in Figure 1.2 (both figures supplied by Kent County Council)

Currently Broad Oak Level Crossing is of AHB type controlled from Canterbury West Signal Box. The crossing is near an industrial estate between the city of Canterbury and the village of Sturry

RSK Business Solution's risk assessment process for the suitable and sufficient level crossing risk assessment for Broad Oak Level crossing followed the following procedure:

1. Site Visit and Hazard Identification
2. Evaluation of nine day census information and traffic modelling of future use
3. Analysis of information pertinent to the level crossing, including SMIS event Data
4. Specification and review of assessments of crossing type options using ALCRM, based on best available information, both current and in the future
5. Options and Risk Control Workshop
6. Further Blocking Back Study required due to concerns raised during the Workshop
7. Further Meeting to discuss post workshop updates
8. Conclusions and Recommendations

The Level Crossing Workshop was held at Cottons Centre, Tooley Street, London SE1 2QG on 20th September 2017 and the Further Post - Workshop update meeting was also held at the Cottons Centre on 22nd March 2018. Following the Level Crossing Workshop and the Post-Workshop Meeting, a further Options and Risk Control Workshop was held via Microsoft Teams on 11th September 2023.

The recommendations from the Options and Risk Control Workshop are listed below. They have been superseded by the recommendations from the second workshop, and have been retained for information only:

Broad Oak Level Crossing (AHB):

The Workshop recommended a review of the proposed relocation of the feeder road and to consider costs and impact to the delivery.

The Workshop recommended a review of the potential cost and programme impact for a second bridge crossing and closure of Broad Oak Level Crossing.

The Workshop recommended an investigation into potential dual funding routes for closing the level crossing.

The Workshop recommended that a further blocking back study of Broad Oak Level Crossing is carried out due to the concerns regarding the narrowing of the road on the north side increasing the blocking back risk.

The Workshop recommended a review of potential options and costs for widening the road on approach to the crossing

The Workshop also recommended the ALCRM is recalculated with the blocking back issue removed to see the impact on the risk score.

Post-Workshop Addendum 1

Further to the Options and Risk Control Workshop, a further blocking back and barrier activity study at Broad Oak Level Crossing was commissioned. Full details of the blocking back and barrier activity survey can be found in the Blocking Back and Barrier Activity Nine Day Census Report, Document number BS026/046/D221.

Subsequent to the blocking back and barrier activity study, a further risk assessment meeting with Network Rail representatives was convened to review the risks raised, and to review further post workshop updates

The recommendations and comments of the further risk assessment meeting are summarised below:

Broad Oak Level Crossing (AHB):

The Meeting reviewed the recommendations from the first workshop, and made the following specific comments.

Previous Recommendations and Meeting Comments

- The Workshop recommended a review of the proposed relocation of the feeder road and to consider costs and impact to the delivery.

Post Workshop Meeting Comments: At the meeting, it was confirmed Kent County Council reviewed the proposed relocation and determined it was not feasible with the project timescales.

- The Workshop therefore recommended a review of the potential cost and programme impact for a second bridge crossing and closure of Broad Oak Level Crossing.

Post Workshop Meeting Comments: At the meeting it was confirmed that Kent County Council reviewed the option of closure of Broad Oak Level Crossing and construction of a

second bridge as part of the initial feasibility stage, however it was not recommended at that stage.

- The Workshop recommended an investigation into potential dual funding routes for closing the level crossing.

Post Workshop Meeting Comments: The Meeting were informed that a response from Network Rail on potential dual funding route had not been received and will be confirmed depending on the outcome from the next workshop.

- The Workshop recommended that a further blocking back study of Broad Oak Level Crossing is carried out.

Post Workshop Meeting Comments: The Meeting were advised that the blocking back survey had been carried out, and were advised of the findings.

- The Workshop recommended a review of potential options and costs for widening the road on approach to the crossing.

Post Workshop Meeting Comments: The Meeting were advised that the review of potential options and costs had been completed and were advised of the outcome.

- The Workshop also recommended the ALCRM is recalculated with the blocking back issue removed to see the impact on the risk score.

Post Workshop Meeting Comments: The Meeting were advised that the ALCRM model does not quantitatively account for the risk from blocking back, however the blocking back was assessed qualitatively and identified as a significant risk which would be removed.

The Meeting agreed that the blocking back on the north side which was identified at the first workshop would be resolved by the planned road widening.

The Meeting recommended a review of the details of the planned works to the roundabout on the south side of the crossing, with a view to assessing the potential impact on the blocking back risk.

The Meeting recommended that the planned phases of construction were confirmed, specifically to review if there would be any increase in use of the crossing prior to the completion of the proposed road bridge.

The Network Rail representatives at the meeting recommended a review of the closure of Broad Oak Level Crossing without provision of a second bridge, with a view to confirming the reasons this option was not taken forward. Additionally the meeting recommended a review of if this option is still possible at this stage if other road plans remain the same.

Post-Workshop Addendum 2

Subsequent to the initial Options and Risk Control Workshop and a further Risk Assessment Workshop held by RSK Business Solutions for Amey, an additional change at Broad Oak AHB Level Crossing required a review of the crossing's risk assessment. Specifically, the Sturry Link Road viaduct is proposed to be completed by 2025 in the areas adjacent to the crossing.

The project convened an additional Workshop, held on 11th September 2023 to discuss this change. A full list of Workshop attendees can be found in Appendix C. The notes and discussions taken on the day of the additional Workshop can be found in Appendix E. The Workshop agreed that option 1, retaining the current AHB arrangement at the crossing, was the preferred option and that option 2, closing the crossing, was the second preferred option. The Workshop agreed that these options are preferred provided the following recommendations are implemented:

- The Workshop were notified by Kent County Council that the widening proposal for the North approach to Broad Oak Level Crossing has not been formally accepted by Network Rail, although planning consent was granted in September 2021. The Workshop noted that Kent County Council are to provide a copy of the latest interim widening proposal to Network Rail for approval.
- The Workshop discussed the access to the construction site south of the crossing and the vehicles that would access the site. The Workshop noted that access would only be a right turn into the construction site and a left turn out of the site, and so no additional traffic is expected to traverse the crossing and increase the risk of blocking back over the crossing. However, large, low and slow vehicles that use the access may cause blocking back issues if additional traffic is blocked from entering the site. The Workshop recommended, once a construction site contractor has been appointed, collaboration with Network Rail is required to manage access to the site and manage the potential increased risk of blocking back. The Workshop further recommended that a traffic management plan is required for access to the site and across Broad Oak Level Crossing.

- The Workshop discussed the Option Selection for Broad Oak AHB Level Crossing and the associated ALCRM scores and option benefits. The Workshop were informed that the Level Crossing Manager is to provide an update on the status of the RLSE cameras at Broad Oak Level Crossing. The Workshop recommended Network Rail to engage stakeholders to upgrade Broad Oak Level Crossing in the future, although the Workshop noted there is no compelling business case based on the current benefit cost ratios.

NOTICE

This report was prepared by RSK Business Solutions Ltd for Project Centre. The conclusions are the result of the exercise of our reasonable professional judgement, based in part upon materials and information provided to us by Amey, Kent County Council and Project Centre. Use of this report by any third party for whatever purposes should not, and does not absolve such third party from using due diligence in verifying the report's contents.

Any use which a third party makes of this report, or any reliance on it, or decisions to be made based upon it, are the sole responsibility of such a third party. RSK Business Solutions Ltd accepts no duty of care or liability of any kind whatsoever to any such third party, and no responsibility for damages, if any, suffered by any third party as a result of decisions made, or not made, or actions taken or not taken, based upon this report.

It should be noted that this report captures the recommendations based upon the design, and anticipated mode of operation, identified at the time of the risk assessment and the stage of the project development. It is not intended that this report be updated as the design is progressed, but moreover that the design is progressed as a result of this report. Any subsequent changes to or development of the design should be assessed as necessary and reported as required with reference back to this report.

1.0 INTRODUCTION TO THE LEVEL CROSSING RISK ASSESSMENT PROCESS

1.1 Background

RSK Business Solutions Ltd was commissioned by Project Centre to carry out a suitable and sufficient risk assessment for Broad Oak Level Crossing. Railway Group Guidance GI/RT7611 Issue N° 1, Section C1.2 specifically requires that a suitable and sufficient level crossing risk assessment shall be undertaken wherever there is a change likely to affect the risk to users of a level crossing. The future development in the area of Broad Oak Level Crossing therefore required a suitable and sufficient level crossing risk assessment to be carried out to ensure that the planned development work would not impinge on the level crossing safety.

1.2 Planned Changes Likely to Affect Risk at Broad Oak Level Crossing

The proposed development in the area of Sturry involves the construction of 3000 new homes, and additional school, and other associated buildings. This project will also involve the construction of a new road running parallel to the railway and an additional bridge over the railway. Traffic modelling has therefore been carried out to estimate the impact of the development on the use of the crossing, the conclusions of which can be seen document 661439 “Transport Impact Study, Sturry and Broad Oak Level Crossings” provided by RSK. The proposed master plan for the redevelopment of the area is shown in Figure 1.1 (Level Crossing circled in blue), and the draft local plan is shown in Figure 1.2 (both figures supplied by Kent County Council)

Currently Broad Oak Level Crossing is of AHB type controlled from Canterbury West. The crossing is near an industrial estate between the city of Canterbury and the village of Sturry

1.3 Suitable and Sufficient Level Crossing Risk Assessment

RSK Business Solution's risk assessment process for the suitable and sufficient level crossing risk assessment for Broad Oak Level crossing followed the following procedure:

1. Site Visit and Hazard Identification
2. Evaluation of nine day census information and traffic modelling of future use
3. Analysis of information pertinent to the level crossing, including SMIS event Data
4. Specification and review of assessments of crossing type options using ALCRM, based on best available information, both current and in the future
5. Options and Risk Control Workshop
6. Further Blocking Back Study required due to concerns raised during the Workshop
7. Further Meeting to discuss post workshop updates
8. Conclusions and Recommendations



Figure 1-1- Master Plan for Development at Sturry



Figure 1-2 - Sturry Development Plan

2.0 DESCRIPTION OF SITE

Post-Workshop Addendum 2

Subsequent to the previous level crossing site visit being completed, RSK Business Solutions was commissioned by Project Centre to carry out a nine-day traffic and pedestrian census survey and a site visit and hazard identified at Broad Oak Automatic Half Barrier (AHB) Level Crossing. The site visit and hazard identification were carried out on Friday 12th May 2023. The latest site images are presented in Appendix F.

2.1 Current Level Crossing Details and Environment

Currently Broad Oak Level Crossing is of AHB type controlled from Canterbury West. The crossing is near an industrial estate between the city of Canterbury and the village of Sturry

The crossing has two half width road barriers and four RTL's which are not fitted with extended hoods to reduce the sun impact. However they are LED type. Surveillance cameras are fitted to the crossing and there are two emergency telephones at the YO and ZO corners.

There are marked footways on both sides of the crossing. There is a pavement on the off side of the road on approach to the crossing on the south side of the crossing. This meets the marked footway on the east side of the crossing. There are no footpaths on the north side of the crossing. There is lighting on the north side of the crossing.

The line through the crossing is a 3rd rail electrified line.

The Barrier machines are guarded.

Broad Oak Level Crossing is located in a predominantly rural area, between the City of Canterbury and the Village of Sturry. There is a large industrial estate nearby and a smaller adjacent industrial estate adjacent.

Figures 2.1 and 2.2 shown the configuration of the crossing, from the south and north approach respectively and Table 2.1 summarises the level crossing details. Figure 2.3 is a map to show the location of Broad Oak Level Crossing and Figure 2.4 is an extract from the sectional appendix for

the area of the level crossing. Figure 2.5 shows the environmentally significant sites in the local area (Crossing circled in blue).



Figure 2-1 - Current Crossing Arrangement at Broad Oak (South Approach)



Figure 2-2 - Current Crossing Arrangement at Broad Oak (North Approach)

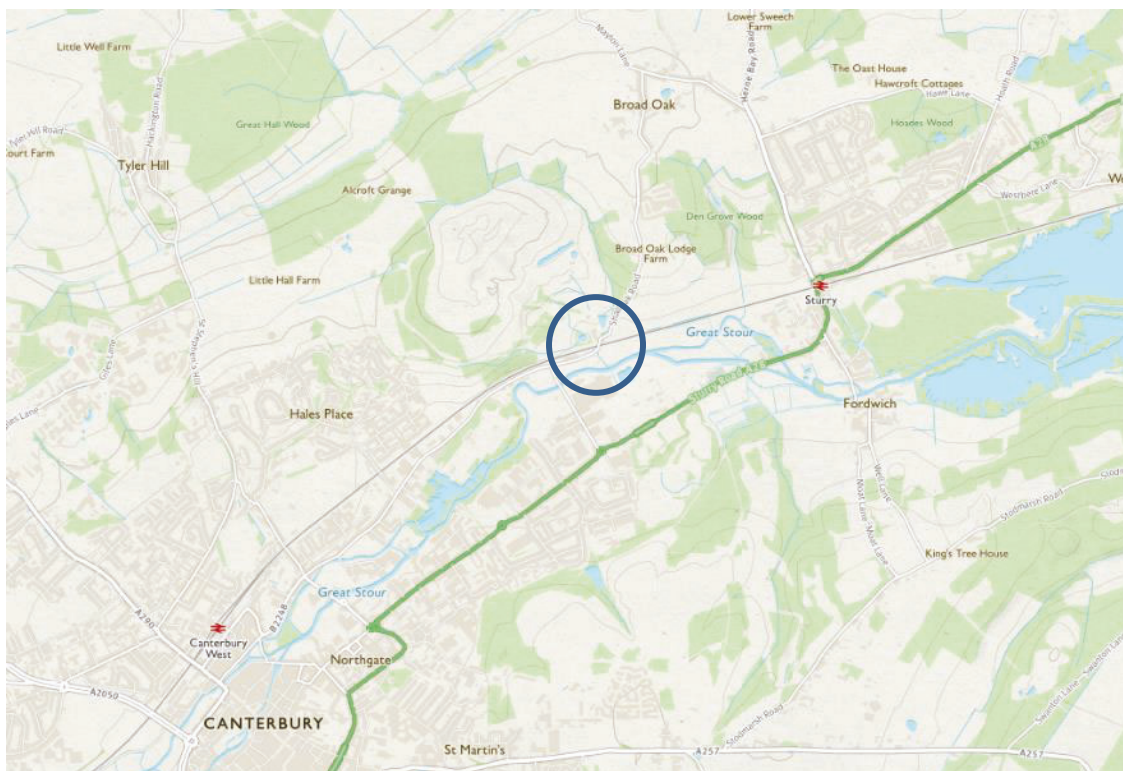


Figure 2-3 - General Area of Broad Oak Level Crossing

Project Centre

Broad Oak AHB Level Crossing

Level Crossing Risk Assessment

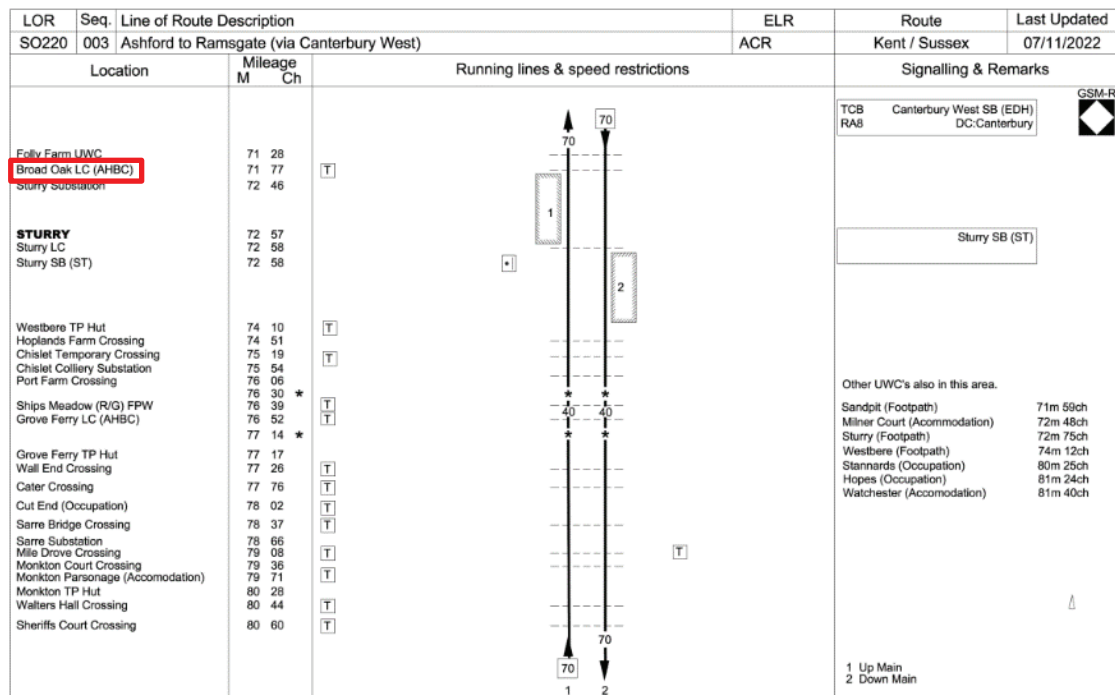


Figure 2-4 - Sectional Appendix Covering Broad Oak Level Crossing

Level Crossing Name	Broad Oak Level Crossing
Level Crossing type	AHB
ELR and Mileage	ACR, 721m 77ch
Status	Public Road
Number of Running lines	2
Permissible Speed Over Crossing	70mph (Up and Down)
OS Grid Reference	TR165600
Post Code	CT2 7QH
Local Authority	Kent County Council
Supervising Signal Box	Canterbury West
Electrification and Type	Lines are 3 rd Rail Electrified

Table 2-1 - Current Level Crossing Details

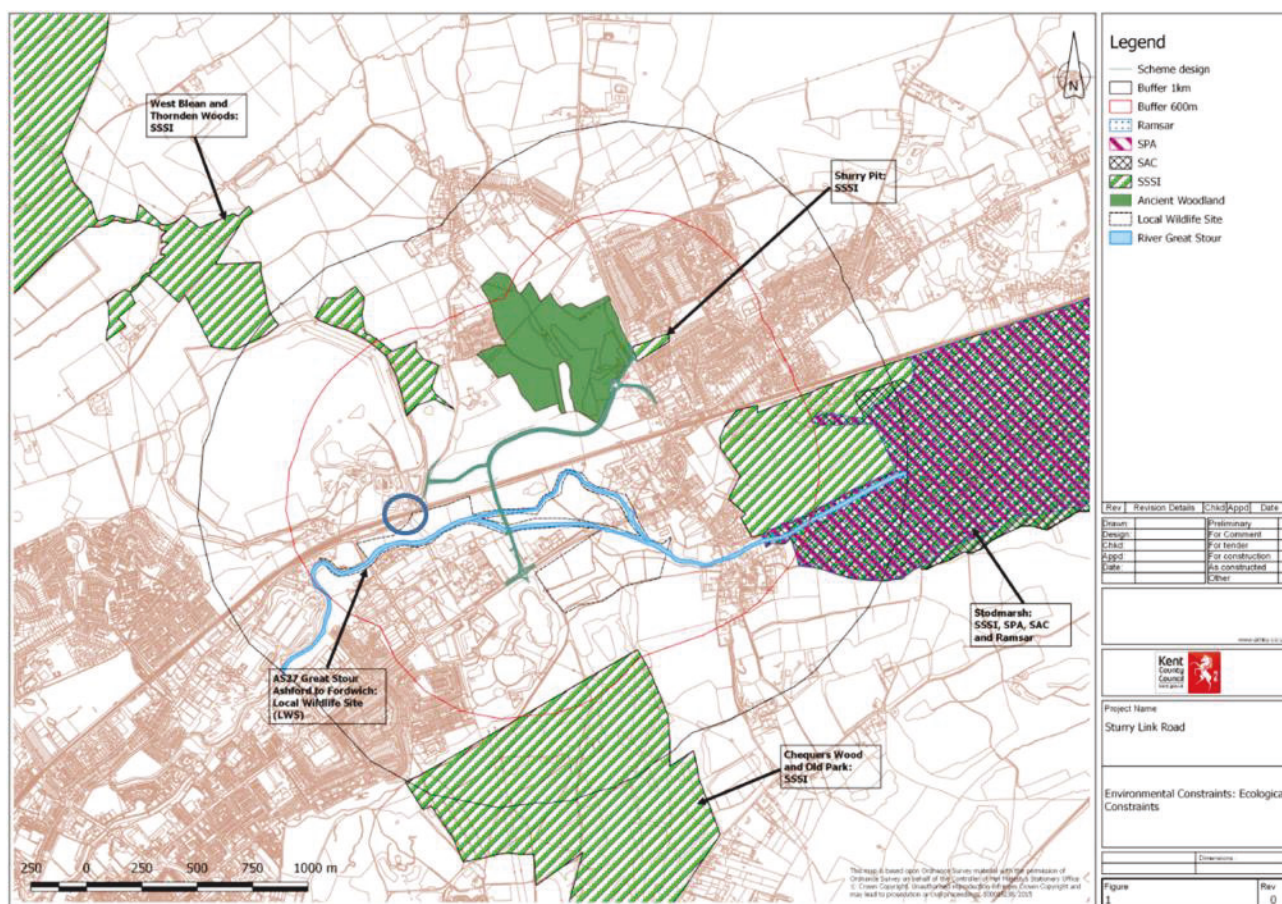


Figure 2-5 - Environmentally Significant Sites

2.2 Footpath Approaches

There is a marked footway on both sides of the crossing, however they are only met by pavement at the YO corner, and there is no tactile paving at the meeting point. On the north side of the crossing there is a narrow pavement to the adjacent house. There are no pavements on the West side of the crossing. Both footways are the full length of the crossing. Figure 2.6 shows the East side foot crossing and Figures 2.7 and 2.8 shows the crossing on the west side. The meeting point of the footway to the road is slightly uneven in the YO corner, and there is some loose material (Figure 2.6).

A summary of the issues identified are presented in Table 2.



Figure 2-6 - Footway over Crossing (East Side)



Figure 2-7 - Footway over Crossing (West Side) - Note No Adjoining Footpath at ZO Corner



Figure 2-8 - No Adjoining Footway at YN Corner

Issue	
Skew	Slight Skew
Deck	Rubber Panels
Footway Markings	Footways Marked
Textured Pavement	Not Fitted
Footway Slip Hazards	Uneven Approach to crossing at YO corner

Table 2-2 Summary of Issues Identified for Footpath Approaches

2.3 Road Approaches

The approach speed is 60mph (national speed limit for a single carriageway road) in both directions. The following key features of the approach are shown in Figure 2.9 and detailed below. Both approaches have limited sighting of the crossing due to the curvature of the road, covered in points 2 and 5 below:

1. Car parts dealership and car dealership adjacent. Both RTL's obscured from the junction with the main road (Figure 2.10)

2. Visibility of the crossing RTL's obscured by curve of road on approach to crossing. First sighting of YO corner RTL at 84m (Figure 2.11). Medium and Close approaches are shown in Figures 2.12 and 2.13
3. Farm track on approach to the crossing. Possibly used regularly. YN RTL is perpendicular to junction and therefore not visible (Figure 2.14). YO RTL currently visible but may be obscured by vegetation (Figure 2.15)
4. Junction of industrial estate road and Broad Oak Road. Left turn for vehicles after crossing the crossing. Used by HGV's for the Viridor Plant. Good visibility of the crossing (Figure 2.16). Mirror fitted to junction to help with visibility for vehicles joining Broad Oak Road from industrial estate. (Figure 2.17)
5. Visibility of the crossing RTL's obscured by house and curvature of road on approach to the crossing. First sighting of ZO corner RTL at 41m (Figure 2.18). Approach before shown in Figure 2.19 and close approach shown in Figure 2.20.
6. House driveway potential right turn after crossing (Figure 2.21)
7. Adjacent industrial area includes Viridor plant and other industry requiring access for large vehicles.

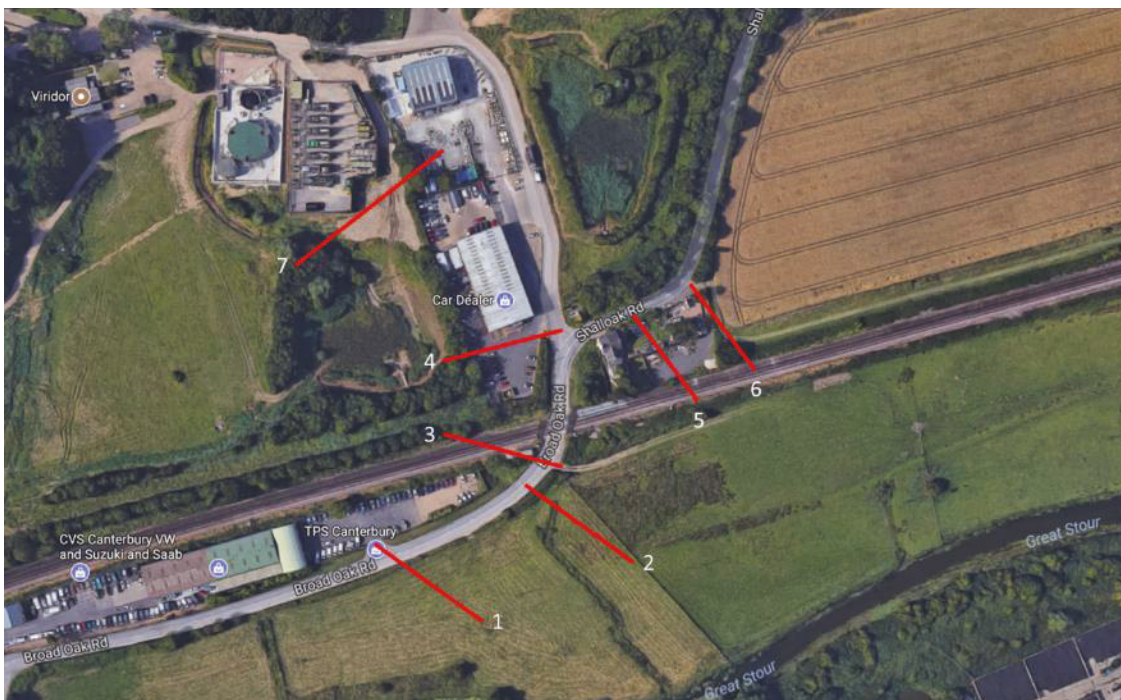


Figure 2-9 - Key Features on Approaches to the Crossing



Figure 2-10 - View from Junction of Car Parts Dealership and Broad Oak Road



Figure 2-11 - First Sighting of YO Corner RTL



Figure 2-12 - Medium Approach to Crossing



Figure 2-13 - Close Approach to Crossing



Figure 2-14 - Poor View of YN RTL from Farm Track



Figure 2-15 - View of YO RTL from Farm Track. Currently Visible but may be Obscured by Vegetation



Figure 2-16 - View of Crossing from Industrial Estate



Figure 2-17 - Mirror Fitted to Junction of Industrial Estate with Broad Oak Road



Figure 2-18 - First Sighting of ZO RTL on South Approach



Figure 2-19 - Approach to Level Crossing from North Side



Figure 2-20 - Close Approach to Level Crossing from North



Figure 2-21 - Driveway to Houses Adjacent to Crossing

The road approach from the South is slightly rising to the crossing, and from the north there is a steep gradient (10% maximum) before the s-bend on approach to the crossing (Figure 2.22)



Figure 2-22 - Gradient before S-bend on Approach to Level Crossing

From the south the backdrop of the signals is trees and a house. From the north the backdrop is fairly open. The Crossings are currently provided with LED RTL's but are not provided with extended hoods to mitigate the impact of the low sun. Figure 2.23 shows the calculation from the SunCalc application which has been used to identify the line of the sun and sunset on the shortest and longest days of the year. The thin orange curve is the sun trajectory on the day selected and the yellow area is the variation of the sun trajectories over the year. The closer a point is to the centre the higher the sun above the horizon. The yellow line shows the direction of the sunrise, the dark orange line shows the direction of sunset



Figure 2-23 - SunCalc Diagrams

Road Markings - The hash markings on the crossing itself are faded on the rubber panels (Figure 2.24). Additionally the road markings are faded on approach to the crossing form the south side (Figure 2.25) and slightly faded on the approach to the crossing from the north side (Figure 2.26 - 2.28)



Figure 2-24 - Faded Hash Markings on Crossing



Figure 2-25 - Faded Road Marking on South Approach to Crossing



Figure 2-26 - Faded Road Markings on Close Approach to Crossing (North Side)



Figure 2-27 - Faded Road Markings on North Approach to Crossing



Figure 2-28 - Faded Road Markings on North Approach to Crossing (2)

The warning signs on the south approach are clearly visible (Figure 2.29). However the Warning Sign on the North Approach is partially hidden by vegetation (Figure 2.30)



Figure 2-29 - Warning Sign on South Approach



Figure 2-30 - Obscuration of Warning Sign on North Approach

Immediately after the crossing on the north side, the road enters and S-Bend and narrows. The road is too narrow for large vehicles to pass potentially causing a blocking back issue (Figures 2.31 and 2.32)



Figure 2-31 - Narrowing of Road Immediately after Crossing on North Side



Figure 2-32 - Narrowing of Road Immediately after Crossing on North Side (Approach)

No other significant features were noted regarding the road approaches to the crossing, and a summary of the issues identified is provided in Table 2.3

Issue	
Skew	Slight
Deck	Rubber Panels
Visibility and Condition of Warning signs	North Approach Warning sign obscured by vegetation
Sighting of RTL's	Obscuration of both RTL's by curve of the road in both directions
Road Markings	South side approach road markings faded, Hash markings faded, North side approach road markings faded
Impact of Low Sun	No issue identified
Nearby industry of Farms	Nearby industrial estate requiring large vehicles
Gradient and condition of road on approach	Rising Gradient for South approach. Significant declining gradient before S-bend on North Approach
Red Light Safety Equipment	Not Fitted. Surveillance cameras fitted to crossing
Any further observations	Road narrows immediately after crossing on the north side, potential blocking back issue for large vehicles

Table 2-3 - Summary of Issues Identified for Road Approaches

2.4 Current Crossing Usage

A nine day census was carried out by Tracsis between 11th March 2017 and 19th March 2017, between the hours of 00:00 and 24:00. Table 2.4 summarises the results from the survey

Road Vehicle Frequency	Busiest Day	9007
	Busiest 15 minute period	296
	Average Weekday	8891
Pedestrian Frequency	Busiest Day	58
	Busiest 15 minute period	8
	Average Weekday	41
Overall Crossing Use (Vehicles and Pedestrians)	Busiest Day	9033
	Busiest 15 minute period	298
	Average Weekday	8933
Train Frequency	Busiest Day	96
	Average Weekday	95
	Saturday	81
	Sunday	71

Table 2-4 Summary of Results from Nine Day Census

A breakdown of the vehicle, pedestrian and train usage is provided in Tables 2.5-2.7. It can be seen that there was no usage of the crossing by Elderly people, impaired people, wheelchairs, pushchairs or mobility scooters.

Vehicles		Car	Lgv	Mcl	Hgv	Tractor & Trailer	Bus	Horse Rider	Pcl	Herded Animals & Horses	Large / Slow Vehicle	Total
Saturday 11-03-17		6422	466	52	42	0	15	0	11	0	0	7008
Sunday 12-03-17		4759	281	46	10	0	0	0	13	0	0	5109
Monday 13-03-17		7569	898	69	172	1	16	0	15	0	30	8770
Tuesday 14-03-17		7648	891	71	200	4	15	0	18	0	31	8878
Wednesday 15-03-17		7671	824	68	245	1	15	0	13	0	44	8881
Thursday 16-03-17		7638	927	74	207	2	18	0	19	0	37	8922
Friday 17-03-17		7806	862	60	204	2	16	0	16	0	41	9007
Saturday 18-03-17		6722	447	55	38	1	15	2	28	0	4	7312
Sunday 19-03-17		4975	252	27	27	0	0	0	19	0	0	5300
Totals		61210	5848	522	1145	11	110	2	152	0	187	69187

Table 2-5 - Vehicle Usage of the Crossing

Project Centre
Broad Oak AHB Level Crossing
Level Crossing Risk Assessment

Pedestrians	Adult	Accompanied Child	Unaccompanied Child	Elderly	Impaired	Wheel-chair	Pushchair / Pram*	Mobility Scooter	Railway Personnel	Total
Saturday 11-03-17	9	0	0	0	0	0	0	0	0	9
Sunday 12-03-17	11	0	0	0	0	0	0	0	0	11
Monday 13-03-17	46	0	0	0	0	0	0	0	0	46
Tuesday 14-03-17	38	0	0	0	0	0	0	0	0	38
Wednesday 15-03-17	39	0	0	0	0	0	0	0	0	39
Thursday 16-03-17	47	0	0	0	0	0	0	0	11	58
Friday 17-03-17	26	0	0	0	0	0	0	0	0	26
Saturday 18-03-17	12	0	0	0	0	0	0	0	0	12
Sunday 19-03-17	11	0	0	0	0	0	0	0	0	11
Totals	239	0	0	0	0	0	0	0	11	250

Table 2-6 - Pedestrian Usage of the Crossing

Trains	Eastbound	Westbound	Train Totals
Saturday 11-03-17	41	41	82
Sunday 12-03-17	37	32	69
Monday 13-03-17	49	47	96
Tuesday 14-03-17	46	46	92
Wednesday 15-03-17	49	47	96
Thursday 16-03-17	49	46	95
Friday 17-03-17	50	45	95
Saturday 18-03-17	39	41	80
Sunday 19-03-17	38	35	73
Totals	398	380	778

Table 2-7 - Trains Using the Crossing

Post-Workshop Addendum 1

Blocking Back Study

Further to the Options and Risk Control Workshop, a further blocking back and barrier activity study at Broad Oak Level Crossing was commissioned. Full details of the blocking back and barrier activity survey can be found in the Blocking Back and Barrier Activity Nine Day Census Report, Document number BS026/046/D221. The key findings of this survey are summarised below:

RSK Business Solutions Ltd was commissioned by Amey to carry out a nine-day blocking back census of Broad Oak Level Crossing to assess the risk associated with the current road layout

either side of the crossing, particularly the road narrowing north of the crossing. The data collected will be used to assess the risk profile for the Broad Oak Level Crossing.

The video footage collected over the nine-day period was then analysed and a survey of the use of the crossing completed in line with the specification provided and the requirements of Network Rail Specification GRD 007. The data analysis was quality checked by a separate resource to ensure accuracy.

The survey was to record any “Blocking Back” incidents, as requested in the specification and required by GRD 007.

The nine day survey was completed between 7th October 2017 and 15th October 2017.

Many blocking back incidents were recorded during the nine day survey of the level crossing, including 4 minutes 55 seconds involving a peak Category Red 1, and 31 seconds involving a peak Category Red 2. Reviewing blocking back data through the nine days showed recurring causes of incidents. Due to the large number of these incidents, a general overview of each cause is summarised on a day-by-day basis. Overall, the total blocking back time throughout the nine days for all recurring incidents is summarised below.

Cause						
Shalloak Road Narrowing	00:04:48	00:00:55	00:03:12	00:00:00	00:00:00	00:08:55
General Traffic Congestion (South)	00:10:53	00:08:01	00:02:50	00:00:21	00:00:00	00:22:05
Side Road	00:00:00	00:00:44	00:00:56	00:00:00	00:00:00	00:01:40
Total	00:15:41	00:09:40	00:06:58	00:00:21	00:00:00	00:32:40

Post-Workshop Addendum 2

Subsequent to the previous level crossing usage data being completed, RSK Business Solutions were commissioned by Project Centre to carry out a nine-day traffic and pedestrian census survey of Broad Oak Automatic Half Barrier (AHB) Level Crossing. This census was required to determine up-to-date information on the usage of the level crossing. A nine day census was carried out between 13th May 2023 and 21st May 2023.

The nine-day average pedestrian use recorded was 31 users per day, with a weekday average of 44 traverses per day and a weekend average of 14 traverses per day. The user types not

Project Centre Broad Oak AHB Level Crossing Level Crossing Risk Assessment

recorded over the census period were dog walkers with their dogs off lead, elderly users, mobility impaired users, wheelchair users, pushchair or pram users, mobility scooter users and railway personnel. The total pedestrian usage of the crossing over the census period can be seen in Table 2-8.

Table 2-8 – Total usage by pedestrians over the nine-day survey period.

		Adult	Accompanied Child	Unaccompanied Child	Dog Walker (Dog on a lead)	Dog Walker (Dog off lead)	Elderly	Mobility Impaired	Encumbered User	Cyclist Pushing Bike	Wheelchair	Pushchair/ Pram	Mobility Scooter	Railway Personnel	Total	Total Minus Railway Personnel
Saturday	13/05/2023	12	0	0	0	0	0	0	0	0	0	0	0	0	12	12
Sunday	14/05/2023	11	1	0	5	0	0	0	0	0	0	0	0	0	17	17
Monday	15/05/2023	33	0	0	1	0	0	0	0	0	0	0	0	0	34	34
Tuesday	16/05/2023	43	0	0	2	0	0	0	0	0	0	0	0	0	45	45
Wednesday	17/05/2023	38	0	0	4	0	0	0	0	0	0	0	0	0	42	42
Thursday	18/05/2023	51	0	4	0	0	0	0	0	0	0	0	0	0	55	55
Friday	19/05/2023	43	0	0	0	0	0	0	0	0	0	0	0	0	43	43
Saturday	20/05/2023	16	0	0	0	0	0	0	0	0	0	0	0	0	16	16
Sunday	21/05/2023	10	0	0	0	0	0	0	0	1	0	0	0	0	11	11
Total over 9 days		257	1	4	12	0	0	0	0	1	0	0	0	0	275	275
9 day Average		28.56	0.11	0.44	1.33	0	0	0	0	0.11	0	0	0	0	30.56	30.56
Weekday Average		41.6	0	0.8	1.4	0	0	0	0	0	0	0	0	0	43.8	43.8
Weekend Average		12.25	0.25	0	1.25	0	0	0	0	0.25	0	0	0	0	14	14

The nine-day average vehicle use recorded was 4095 vehicles per day, with a weekday average of 5240 vehicles per day and a weekend average of 2664 vehicles per day. The total vehicular usage of the crossing over the census period can be seen in Table 2-9.

Table 2-9 – Total usage by vehicles over the nine-day survey period.

		Car	Light Goods Vehicle	Motor Cycles	Pedal Cycles	Heavy Goods Vehicles	Tractor & Trailers	Bus	Horse Riders	Herded Animals & Horses	Large / Slow Vehicles	Total
Saturday	13/05/2023	1405	252	26	15	10	0	0	0	0	0	1708
Sunday	14/05/2023	1372	175	38	20	0	0	2	0	0	0	1607
Monday	15/05/2023	3529	683	45	16	182	0	0	0	0	0	4455
Tuesday	16/05/2023	4230	796	69	17	201	1	0	0	0	0	5314
Wednesday	17/05/2023	4291	789	77	11	175	1	3	0	0	0	5347
Thursday	18/05/2023	4295	854	65	21	199	0	1	0	0	0	5435
Friday	19/05/2023	4629	769	70	17	161	1	0	0	0	0	5647
Saturday	20/05/2023	3658	409	57	14	3	1	0	0	0	0	4142
Sunday	21/05/2023	2841	293	53	10	0	0	0	0	0	0	3197
Total over 9 days		30250	5020	500	141	931	4	6	0	0	0	36852
9 day Average		3361.11	557.78	55.56	15.67	103.44	0.44	0.67	0	0	0	4094.67
Weekday Average		4194.8	778.2	65.2	16.4	183.6	0.6	0.8	0	0	0	5239.6
Weekend Average		2319	282.25	43.5	14.75	3.25	0.25	0.5	0	0	0	2663.5

The usage data at the crossing can be further reviewed in the Broad Oak AHB Level Crossing Traffic & Pedestrian Nine Day Census Report (Document Reference: BS408/001/D320.2).

2.5 Rail Approaches and Usage

The level crossing is located on the Ashford to Ramsgate Line, and is used by 96 trains per day, from the traffic census. The crossing is monitored by the Canterbury West signal box. The line speed is 70mph in both directions over the level crossing. It was noted that a future capacity improvements scheme will increase the speed to 85mph.

The view of the rail approach to the East and West are shown in Figures 2.33 and 2.34. The line is straight in both directions.



Figure 2-33 - View of Rail Approach to the Crossing from the East



Figure 2-34 - View of Rail Approach to the Crossing from the West

Post-Workshop Addendum 2

Subsequent to the previous level crossing usage data being completed, RSK Business Solutions were commissioned by Project Centre to carry out a nine-day traffic and pedestrian census survey of Broad Oak Automatic Half Barrier (AHB) Level Crossing. Train movements were also recorded and documented.

The nine-day census recorded an average use of 69 trains per day, with a weekday average of 89 trains per day and a weekend average of 44 trains per day with the trains operating under usual conditions. The train usage data at the crossing can be further reviewed in the Broad Oak AHB Level Crossing Traffic & Pedestrian Nine Day Census Report (Document Reference: BS408/001/D320.2).

2.6 Incident and Near Miss History

Incident Data relating to level crossings was provided by RSSB for Broad Oak Level Crossing. It is recognised that not all incidents are reported into RSSB's SMIS database. Incident reporting is not entirely consistent and also SMIS primarily holds incident data rather than fault data.

There is a relatively high level of incidents for an AHB crossing. There was one fatality, inquest returned a verdict of suicide.

Classification	Incidents		
Train - striking road vehicle or gate at LC	1	0.10	
Train - striking or being struck	0	0.15	0.00
Non-rail vehicles (Including vehicle on the line)	4	1.55	
person - personal accident	0	0.28	0.00
Level Crossing/LC equipment - misuse/near misses	5	5.36	0.93
Near miss - train with person (not at LC)	0	0.01	0.00
Train - striking animal	0	0.07	0.00
Animals - On the line	2	0.11	
Person - trespass	9	0.12	
Person - vandalism	1	0.25	
Train - Signal passed at danger	0	0.05	0.00
Train - running over LC (When Unauthorised)	0	0.02	0.00
Irregular Working	0	0.24	0.00
Level Crossing Equipment Failure	11	9.38	
Signalling System - failure	0	0.11	0.00
Permanent way or works - failure	3	0.03	
All incidents	36	18.10	1.99

Post-Workshop Addendum 2

Subsequent to the initial Options and Risk Control Workshop and a further Risk Assessment Workshop held by RSK Business Solutions for Amey, an additional change at Broad Oak AHB Level Crossing required a review of the crossing's risk assessment. The project convened an additional Workshop, held on 11th September 2023 to discuss this change. Incident data relating to Broad Oak AHB Level Crossing was requested and summary of the incidents over the last 10

years, displayed in Table 2-10, was presented during the Option Selection Workshop on 11th September 2023.

It is recognised that not all incidents are reported into RSSB's SMIS database. Incident reporting is not entirely consistent and SMIS primarily holds incident data rather than fault data. Further comments on these events are available on the SMIS database.

Category	
Level crossing equipment failure	3
Non-rail vehicles on the line	3
Total	6

Table 2-10 - Incident category summary at Broad Oak Level Crossing

2.7 Predicted Future Usage

The proposed development in the area of Broad Oak Level Crossing involves the construction of 3000 new homes, and additional school, and other associated buildings. This project will also involve the construction of a new road running parallel to the railway and an additional bridge over the railway. Details of which can be seen in Figures 1.1 and 1.2.

Traffic modelling of the predicted usage of Broad Oak Level Crossing for all options has been modelled in document 661439 “Transport Impact Study, Sturry and Broad Oak Level Crossings” provided by RSK. It was noted that the traffic levels will decrease as an average over the 24 hour period. However, the traffic modelling found that traffic flows at Broad Oak are likely to significantly increase by approximately 30% based on peak time analysis. The modelling of the level crossing has indicated that, as a result of higher traffic flows, the predicted queues will extend significantly which may cause driver frustration and lead to a higher risk of driver violations. It was noted that the ALCRM risk engine cannot model peak time increases and looks at a 24 hour period only. However, the ALCRM was modelled with a 30% increase in order to inform the Workshop of the potential increase at peak times.

Post-Workshop Addendum 1

Further to the Options and Risk Control Workshop, a plan was produced to widen the carriageway on the north side of the crossing with a view to mitigating the blocking back issue identified. This plan is shown in Figure 2.35.

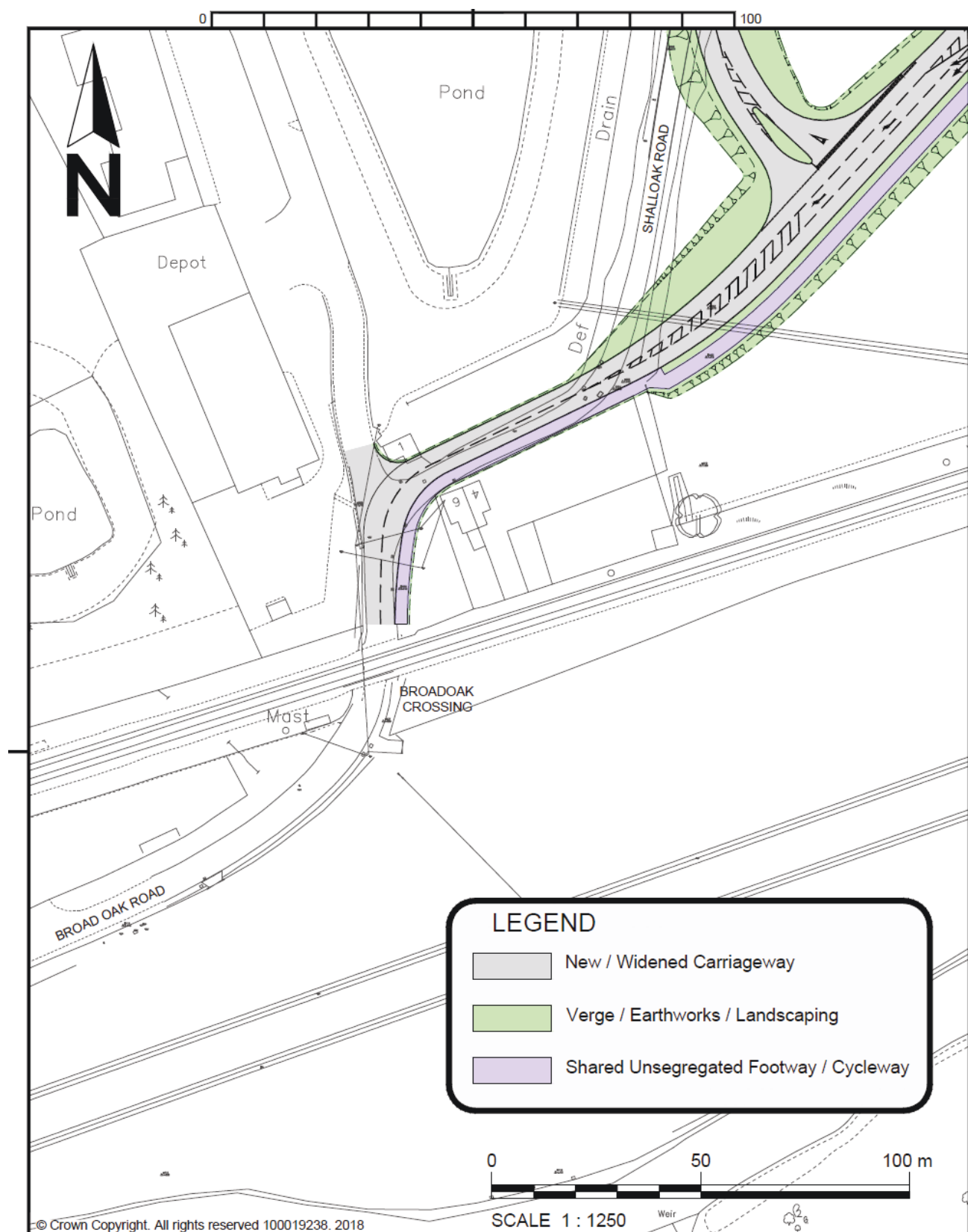


Figure 2-35 - Proposed Widening of the Carriageway to the North of Broad Oak Level Crossing

3.0 RISK ASSESSMENT AND RECOMMENDATIONS

3.1 Options and Risk Control Workshop

The Level Crossing Workshop was held at Cottons Centre, Tooley Street, London SE1 2QG on 20th September 2017, and a further follow up meeting was held with Network Rail representatives on 23rd March 2018. A further workshop will be held at a later date to confirm the final recommendations for the project.

The Workshop were advised that Broad Oak Level Crossing is an Automatic Half Barrier (AHB) crossing controlled by Canterbury West Signal Box. The existing crossing has been identified with an ALCRM Risk score of F2. This score indicated a very high collective risk score. The crossing has a history of deliberate misuse incidents and is now fitted with misuse cameras. There has been one fatality at the crossing which was attributed to suicide. There have been two significant recent near miss incidents, one of these incidents was reported in National press. The Workshop were advised that the traffic impact study, document 661439 "Transport Impact Study, Sturry and Broad Oak Level Crossings" provided by RSK, that traffic flows at Broad Oak are likely to significantly increase by approximately 30% based on peak time analysis. The modelling of the level crossing indicates that, as a result of higher traffic flows, the predicted queues will extend significantly which may cause driver frustration and lead to a higher risk of driver violations. However, it was noted that the overall average use for the crossing would decrease. It was noted that the ALCRM risk engine cannot model peak time increases and look at a 24 hour period only. However, the ALCRM was modelled with a 30% increase in order to inform the Workshop of the potential increase at peak times.

The ALCRM was re-run with this increase in peak time use and the risk stayed within the F2 Band, however, the overall risk score (calculated in FWI/yr) was increased by 22%. Concerns were raised with the increase at peak times and options for mitigation discussed

Option 1 - Review of the road layout in order to relocate the feeder road and discourage the use of the crossing as a cut through. The Workshop recommended a review of the proposed relocation of the feeder road and to consider costs and impact to the delivery.

Option 2 - Upgrade of the crossing to a full barrier (MCB-CCTV). The Workshop noted that this option would reduce the risk at the crossing by ~95%. However the workshop also noted that,

due to the resignalling works required the cost for this option is likely to be more than £3million. A Cost Benefit Analysis (CBA) was run and the CBA indicated that the safety benefit would not outweigh the cost of implementation with a negative NPV being given. This option was therefore not recommended by the Workshop.

Option 3 - The Workshop considered the closure of Broad Oak level Crossing and the provision of a second bridge road. The Workshop noted this was the ideal solution for mitigating the risk at the level crossing, however, it would mean a rework of currently proposed road layout and was likely to delay the delivery of the project significantly. It was also noted that due to the flood plain on the south side of the crossing the build cost would be significant. The Workshop noted that there may be funding from Network Rail available for this option due to the significant benefit to the railway. The Workshop therefore recommended a review of the potential cost and programme impact for a second bridge crossing and closure of Broad Oak Level Crossing. Additionally the Workshop recommended an investigation into potential dual funding routes for closing the level crossing.

Option 4 - The Workshop noted that one of the drivers within the ALCRM Risk Assessment was blocking back due to the narrowing of the road on either side of the crossing and the location of the industrial park close to the crossing. It was also noted that the crossing itself is sometimes used by cars/lorries as a passing point. The Workshop discussed widening the road on approach to the crossing was discussed as this may alleviate the blocking back issue and therefore reduce the risk. It was noted that the blocking back issue at the crossing was currently based on a 30 minute census and observation when onsite. The Workshop recommended a further blocking back study of Broad Oak Level Crossing, along with a review of potential options and costs for widening the road on approach to the crossing. The Workshop also recommended the ALCRM is recalculated with the blocking back issue removed to see the impact on the risk score.

Summary of Recommendations:

The recommendations from the first workshop are listed below. They have been superseded by the recommendations from the second meeting, however have been retained for information.

- The Workshop recommended a review of the proposed relocation of the feeder road and to consider costs and impact to the delivery.
- The Workshop therefore recommended a review of the potential cost and programme impact for a second bridge crossing and closure of Broad Oak Level Crossing.
- The Workshop recommended an investigation into potential dual funding routes for closing the level crossing.
- The Workshop recommended that a further blocking back study of Broad Oak Level Crossing is carried out
- The Workshop recommended a review of potential options and costs for widening the road on approach to the crossing
- The Workshop also recommended the ALCRM is recalculated with the blocking back issue removed to see the impact on the risk score.

3.2 Post Workshop Updates

Post-Workshop Addendum 1

Further to the Options and Risk Control Workshop, a further blocking back and barrier activity study at Broad Oak Level Crossing was commissioned. Subsequent to the blocking back and barrier activity study, a further risk assessment meeting with Network Rail representatives was convened to review the risks raised, and to review further post workshop updates

The recommendations of the further risk assessment meeting are summarised below:

Broad Oak Level Crossing (AHB):

The Meeting reviewed the recommendations from the first workshop, and made the following specific comments.

Previous Recommendations and Meeting Comments

- The Workshop recommended a review of the proposed relocation of the feeder road and to consider costs and impact to the delivery.

Post Workshop Meeting Comments: At the meeting, it was confirmed Kent County Council reviewed the proposed relocation and determined it was not feasible with the project timescales.

- The Workshop therefore recommended a review of the potential cost and programme impact for a second bridge crossing and closure of Broad Oak Level Crossing.

Post Workshop Meeting Comments: At the meeting it was confirmed that Kent County Council reviewed the option of closure of Broad Oak Level Crossing and construction of a second bridge as part of the initial feasibility stage, however it was not recommended at that stage.

- The Workshop recommended an investigation into potential dual funding routes for closing the level crossing.

Post Workshop Meeting Comments: The Meeting were informed that a response from Network Rail on potential dual funding route had not been received and will be confirmed depending on the outcome from the next workshop.

- The Workshop recommended that a further blocking back study of Broad Oak Level Crossing is carried out.

Post Workshop Meeting Comments: The Meeting were advised that the blocking back survey had been carried out, and were advised of the findings. Further details are provided below.

- The Workshop recommended a review of potential options and costs for widening the road on approach to the crossing.

Post Workshop Meeting Comments: The Meeting were advised that the review of potential options and costs had been completed and were advised of the outcome. Further details are provided below.

- The Workshop also recommended the ALCRM is recalculated with the blocking back issue removed to see the impact on the risk score.

Post Workshop Meeting Comments: The Meeting were advised that the ALCRM model does not quantitatively account for the risk from blocking back, however the blocking back was assessed qualitatively and identified as a significant risk which would be removed.

The Meeting reviewed the proposed plan for widening the road to the north of Broad Oak Level Crossing, shown in Figure 2.35. It was noted that although not required by the new layout, the current 7.5 Tonne weight limit would be retained under the new plan, and this would be enforced by physical barriers at the opposite end of the road, at the proposed new roundabout. The Meeting agreed that the blocking back on the north side which was identified at the first workshop would be resolved by the planned road widening.

The Meeting also noted that during peak hours there is a potential for traffic to queue back from the roundabout situated on the south side of the crossing with a red zone blocking back incident being identified roughly once a day with current traffic. It was known that there were some planned changes to that roundabout which may alleviate the blocking back, however the details were not known at the time of the meeting. The Meeting therefore recommended a review of the details of the planned works to the roundabout on the south side of the crossing, with a view to assessing the planned impact on the blocking back risk.

The Meeting noted that the review is looking at the final road layout, with the houses in place at the end of the project. The Meeting noted that there will be potential differences in the interim, construction phases. The Meeting therefore recommended that the planned phases of construction were confirmed, specifically to review if there would be any increase in use of the crossing prior to the completion of the proposed road bridge.

The Meeting questioned whether the Level crossing could be closed with access to the Viridor facility being provided via the widened road on the north side if the 7.5T restriction could be lifted. The Meeting noted that the 7.5T restriction was only retained after the road widening due to the level crossing. The Meeting also noted that the option of closing and providing a second bridge was agreed to not be feasible, however, the meeting could not confirm if the project considered closure with the provision of a single road bridge. It was understood that closure of Broad Oak was an early aspiration for the project but the reasons for rejection were not known. The Meeting therefore recommended a review of the closure of Broad Oak Level Crossing without provision of a bridge, with a view to confirming the reasons this option was not taken forward. Additionally the meeting recommended a review of the option of closing Broad Oak Level Crossing, without providing a bridge, specifically if this option is still possible at this stage if other road plans remain the same.

Summary of Recommendations

- The Meeting recommended a review of the details of the planned works to the roundabout on the south side of the crossing, with a view to assessing the planned impact on the blocking back risk.
- The Meeting recommended that the planned phases of construction were confirmed, specifically to review if there would be any increase in use of the crossing prior to the completion of the proposed road bridge.
- The Network Rail representatives at the meeting recommended a review of the closure of Broad Oak Level Crossing without provision of a second bridge, with a view to confirming the reasons this option was not taken forward. Additionally the meeting recommended a review of if this option is still possible at this stage if other road plans remain the same.

Post-Workshop Addendum 2

Subsequent to the initial Options and Risk Control Workshop and a further Risk Assessment Workshop held by RSK Business Solutions for Amey, an additional change at Broad Oak AHB Level Crossing required a review of the crossing's risk assessment. Specifically, the Sturry Link Road viaduct is proposed to be completed by 2025 in the areas adjacent to the crossing.

The project convened an additional Workshop, held on 11th September 2023 to discuss this change. A full list of Workshop attendees can be found in Appendix C. The notes and discussions taken on the day of the additional Workshop can be found in Appendix E. However, the Workshop agreed that option 1, retaining the current AHB arrangement at the crossing, was the preferred option and that option 2, closing the crossing, was the second preferred option. The further Option Selection and Risk Assessment Workshop agreed that these options are preferred provided the following recommendations are implemented:

- The Workshop were notified by Kent County Council that the widening proposal for the North approach to Broad Oak Level Crossing has not been formally accepted by Network Rail, although planning consent was granted in September 2021. The Workshop noted that Kent County Council are to provide a copy of the latest interim widening proposal to Network Rail for approval.
- The Workshop discussed the access to the construction site south of the crossing and the vehicles that would access the site. The Workshop noted that access would only be a right turn into the construction site and a left turn out of the site, and so no additional traffic is expected to traverse the crossing and increase the risk of blocking back over the crossing. However, large, low and slow vehicles that use the access may cause blocking back issues if additional traffic is blocked from entering the site. The Workshop recommended once a construction site contractor has been appointed, collaboration with Network Rail is required to manage access to the site and manage the potential increased risk of blocking back. The Workshop further recommended that a traffic management plan is required for access to the site and across Broad Oak Level Crossing.
- The Workshop discussed the Option Selection for Broad Oak AHB Level Crossing and the associated ALCRM scores and option benefits. The Workshop were informed that the Level Crossing Manager is to provide an update on the status of the RLSE cameras at Broad Oak Level Crossing. The Workshop recommended Network Rail to engage stakeholders to upgrade Broad Oak Level Crossing in the future, although the Workshop noted there is no compelling business case based on the current benefit cost ratios.

Project Centre

Broad Oak AHB Level Crossing

Level Crossing Risk Assessment Report

APPENDICES

A. SOURCES OF INFORMATION

A1. Sources of Information

- The All Level Crossing Risk Model (ALCRM) has been used to estimate the risk of the level crossing for the various options
- Data and photos from site was collected on 15th May 2017 and 12th May 2023
- Original Traffic data contained within supplied Traffic census report document “3556-LON SITE 01 - Sturry Level Crossing”
- All site plans were and diagrams provided by Kent County Council via Amey
- Broad Oak AHB Level Crossing Traffic & Pedestrian Nine Day Census Report, BS408/001/D320.2 Revision A, June 2023, RSK Business Solutions

B. Summary of ALCRM Scores

Case	Crossing Type	ALCRM Ranking	FWI/Year	Percentage
Current Traffic Flows	AHB	F2	0.01429	N/A
30% Increase in Vehicle Traffic	AHB	F2	0.01743*	22%

*Note that ALCRM does not model peak time increases and uses a 24 hour average. The figures are indicative of the potential increase in risk at certain times of the day (peak hours). It was noted that the model was rerun with blocking back removed, and it gave no material difference in the risk score.

Post-Workshop Addendum 2

Subsequent to the initial Options and Risk Control Workshop and a further Risk Assessment Workshop held by RSK Business Solutions for Amey, an additional change at Broad Oak AHB Level Crossing required a review of the crossing's risk assessment. A summary of the ALCRM scores and Cost Benefit analysis that were presented during the Option Selection Workshop on 11th September 2023 are shown below.

No	Option	Costs (Taken from the Southern Region CBA Guide 2020)	ALCRM Score	FWIs	Benefit Cost Ratio (25 years)
1	Current Arrangement	-	G3	0.005925319	N/A
2	Closure with diversion	£50,000 (To cover legal costs)	M13	0	26.871
3	Closure with a road bridge	£10,000,000 (For bridge construction on a major road)	M13	0	0.036
4	Upgrade to MCB- CCTV	£2,800,000	K6	0.000175318	0.002
5	Upgrade to MCB- OD	£4,000,000	K6	0.000194112	0.002

Case	Crossing Type	ALCRM Ranking	FWI/Year	Percentage Change from Today
Current Traffic Flows	AHB	G3	0.005925319	N/A
30% Increase in Vehicle Traffic	AHB	H1	0.090687366	1431%

The above calculations were the result of updated ALCRM modelling using the improved version of ALCRM which was rolled out in 2021. This was the first major overhaul of the risk tool that Network Rail [NR] use to model level crossing risk. ALCRM first went live in 2004 hence there

were significant changes in the algorithms that sit in the back of the tool - the new version models risk more accurately with an addition of nearly 20 years' worth of level crossing accident and incident statistics since it was first launched.

AHBs continue to be one of the highest risk types of crossings on the rail network [see extract below taken from NR's Enhancing Level Crossing Safety 2019 – 2029] – NR is currently working to phase this type of crossing out where it's located at a station, where there is high pedestrian use or where there are schools in the vicinity and the crossing is regularly used by school children.

The All Level Crossing Risk Model (ALCRM) identifies, as shown in figure 4 below, that while Automatic Half Barrier Crossings (AHBs) account for just 6 % of the total estate they hold 32 % of total modelled risk and 75 % of our level crossings require the user to make the decision on whether it is safe to cross.

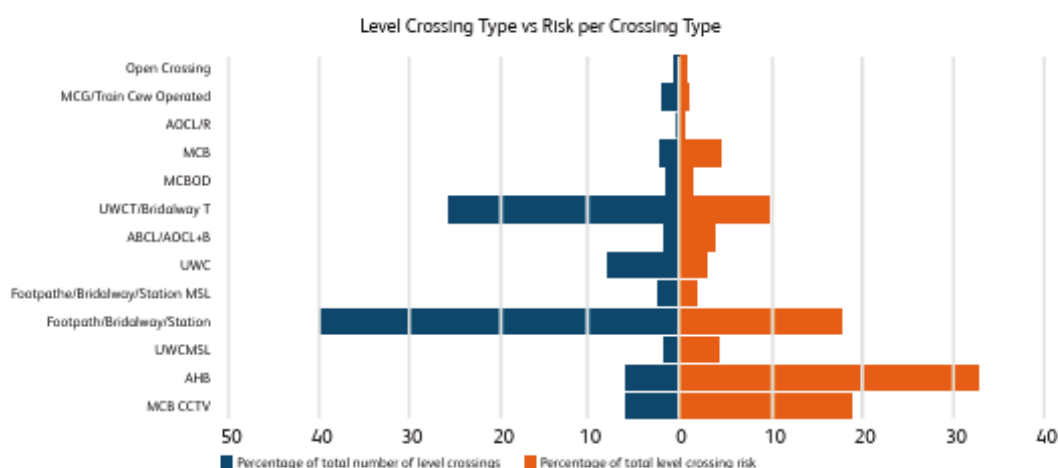


Figure 4: Level Crossing Type vs Risk per Crossing Type

[taken from Network Rail's Enhancing Level Crossing Safety 2019 – 2029]

As with all road crossings the highest risk is a collision between a vehicle and a train – consequently any increase in road traffic levels will increase the risk of a collision. An increase of 30% in road traffic is substantial and that reflects the significant change in the level of risk.

For reference the ALCRM Ranking and the FWI are linked – the higher the FWI the higher the ALCRM ranking, A1 being the highest risk down to the lowest - M13.

C. Workshop Dates and Participants

VENUE

^aCottons Centre, Tooley Street, London SE1 2QG

DATES

20/09/2017 & 22/03/2018

^bMicrosoft Teams

11/09/2023

Name	Company	Present on 31st January 2018^a	Present on 23rd March 2018^a	Present on 11th September 2023^b
M. Mortley	Amey	Y	N	N
P. Coleman	Network Rail	Y	N	N
D. Kane-Gil	Network Rail	Y	N	N
R. Angus	Network Rail	Y	N	N
T. Iddenden	Network Rail	Y	Y	N
R. Shelton	Kent County Council	Y	N	Y
L. Ward	Network Rail	N	Y	N
B. Osebor	Network Rail	N	Y	N
D. Bird	RSK Business Solutions	Y	Y	N
E. Neale	RSK Business Solutions	Y	Y	N
P. Sewart	RSK Business Solutions	N	N	Y
T. Clark	RSK Business Solutions	N	N	Y
J. Tumilty	Network Rail	N	N	Y
M. Slade	Network Rail	N	N	Y
C. Collins	Network Rail	N	N	Y
N. Wellington	Network Rail	N	N	Y
R. Fletcher	Network Rail	N	N	Y
P. Calvert	TOC Southeastern	N	N	Y
J. East	Project Centre	N	N	Y
S. Ramm	Kent County Council	N	N	Y

D. Workshop Participants Signatures



Sturry and Broad Oak Level Crossing Risk Assessment

Workshop 1

20/09/2017

<u>Name / Email</u>	<u>Company</u>	<u>Position</u>	<u>Signature</u>
M. MORTLEY Michael.Mortley@Amey.co.uk	Amey	Principal Engineer (Design)	
PAUL COLEMAN Paul.Coleman2@networkrail.co.uk		ROUTE LX MANAGER	
DAVID KANG-GIL	NR	SENIOR ASSET PROTECTION ENGINEER	
RICHARD ANGLICK	NR	SENIOR ASSET - SIGNALLING	
TREVOR IDDENDEN	NR	ASSET PROTECTION ENGINEER	T. Iddenden
Richard Shelton	RCC	Project Manager	
Danny Bird	RSK	Facilitator	DPL Bird
Elliot Noake	RSK	Recorder	

E. Additional Workshop Notes and Considerations

11th September 2023 Workshop notes

The Workshop were notified by Kent County Council that the widening proposal for the North approach to Broad Oak Level Crossing has not been formally accepted by Network Rail. The Workshop noted that Kent County Council are to provide a copy of the latest interim widening proposal to Network Rail for approval.

The Workshop noted that although the current timescale for the construction of the new viaduct bridge is 2025, the section towards Broad Oak is currently planned for the end of the development and is estimated to be complete approximately 2028.

The Workshop discussed the previous revision of the report (Document Reference: BS026/046/D420.2 Revision B) and no comments were made.

The Workshop discussed the access to the construction site south of the crossing and the vehicles that would access the site. The Workshop noted that access would only be a right turn into the construction site and a left turn out of the site, and so no additional traffic is expected to traverse the crossing and increase the risk of blocking back over the crossing. However, large, low and slow vehicles that use the access may cause blocking back issues if additional traffic is blocked from entering the site. The Workshop recommended once a construction site contractor has been appointed, collaboration with Network Rail is required to manage access to the site and manage the potential increased risk of blocking back. The Workshop further recommended that a traffic management plan is required for access to the site and across Broad Oak Level Crossing.

The Workshop discussed the latest census report provided by RSK Business Solutions (Document Reference: BS408/001/D320.2). The Workshop noted the number of HGVs traversing the crossing and considered that the 7.5T weight restriction of vehicles using Shalloak Road north of the crossing. The Workshop noted that although HGVs shouldn't use the crossing to access Shalloak Road, HGVs have been recorded entering and exiting the Valencia Waste Management Site north of the crossing.

The Workshop discussed the Option Selection for Broad Oak AHB Level Crossing and the associated ALCRM scores and option benefits. The Workshop were informed that the Level

Crossing Manager is to provide an update on the status of the RLSE cameras at Broad Oak Level Crossing. The Workshop recommended Network Rail to engage stakeholders to upgrade Broad Oak Level Crossing in the future, although the Workshop noted there is no compelling business case based on the current benefit cost ratios.

The Workshop agreed that option 1, retaining the current AHB arrangement at the crossing, was the preferred option and that option 2, closing the crossing, was the second preferred option.

F. Level Crossing Photographs Captured on 12th May 2023



Figure F-1 – Current arrangement at Broad Oak Level Crossing on the South approach (©Google Maps 2023). This image was taken in October 2022 by Google Maps.



Figure F-2 – Current arrangement at Broad Oak Level Crossing on the North approach (Down side)



Figure F-3 – Far approach from the Up side to Broad Oak Level Crossing



Figure F-4 – Access points on the South approach to the crossing



Figure F-5 – Far approach from the Down side on Shalloak Road to Broad Oak Level Crossing



Figure F-6 – Junction between Shalloak Road and Valencia Waste Management Site near the Down side approach to Broad Oak Level Crossing



Figure F-7 – Close approach from the Down side on Shalloak Road to Broad Oak Level Crossing



Figure F-8 – Railway in the Down direction from the Down side (©Google Maps 2023). This image was taken in October 2022 by Google Maps.



Figure F-9 – Railway in the Up direction from the Down side



Figure F-10 – Railway in the Down direction from the Up side



Figure F-11 – Railway in the Up direction from the Up side



Figure F-12 – Level crossing decking