

Date: 20 May 2021
Your Ref: NYM/2020/1018/FL
Our Ref: 006/2020/02

Mark Hill
North York Moors National Park Authority
The Old Vicarage
Bondgate
Helmsley
York
North Yorkshire
YO62 5BP

NYMNP

20/05/2021

Dear Mark

PROPOSED REVISIONS: Full/detailed planning for a 150 space visitor car park, vehicular bridge, and other ancillary infrastructure (pay stations, electric vehicle charging points, CCTV poles and cycle stands/storage) and a small section of pedestrian route/footpath on 0.59 hectares (1.47 acres) of land on the former timber yard, East Row, Sandsend (Planning Application Ref: NYM/2020/1018/FL)

I am writing to you, to formally submit revisions to the planning application (ref: NYM/2020/1018) for the development of a 150 space visitor car park, vehicular bridge, and other ancillary infrastructure (pay stations, electric vehicle charging points, CCTV poles and cycle stands/storage) and a small section of vehicular access/footpath on 0.59 hectares (1.47 acres) of land on the former timber yard, East Row, Sandsend.

The revisions are proposed to address concerns raised by the Highway Authority in respect of potential pedestrian and vehicular conflicts at the proposed car park access on the north side of the A174 Road Bridge. The revisions also address comments from some local residents in Scarborough Borough Council's administrative area concerned about increased pedestrian activity on the western part of the private road/public footpath on the south side of the beck.

The revisions propose:

- the relocation of the footbridge closer to the A174 road bridge (in Scarborough Borough Council's administrative area);
- the removal of the formal pedestrian route linking the car park with the private road on the south side of the beck (part in NYMNP Authority area and part in Scarborough Borough Council's administration area) and its replacement with a segregated footway adjacent to the main vehicular access from the car park to the relocated pedestrian footbridge on the north side of the beck (part in NYMNP Authority area and part in Scarborough Borough Council's administration area);
- the relocation of the pay stations to the eastern side of the main vehicular access adjacent to the footway (in NYMNP area); and
- pedestrian improvements at the section of private road from the footbridge to the existing footway on the A174 south of the Beck (in Scarborough Borough Council's area).

Signage will be provided to direct pedestrians from the proposed visitor car park along the footway on the southern side of the vehicular access over the beck at the vehicular/pedestrian bridge and then adjacent to the access road on the north side of the beck to the new footbridge and then back across the beck to the south side to access the beach by either crossing the A174 on the southern side of the road bridge and along the footpath to the beach ramp on the south side of the beck (north side of the A174); or across the existing pedestrian footbridge over to the north side of the beck to access the beach north of the beck. Pedestrians will be discouraged from using the vehicular access onto the A174 at the north side of the bridge. Pedestrians will also be discouraged from using the existing track on the south side of the beck by signage and the existing gate



PROPOSED REVISIONS: Full/detailed planning for a 150 space visitor car park, vehicular bridge, and other ancillary infrastructure (pay stations, electric vehicle charging points, CCTV poles and cycle stands/storage) and a small section of pedestrian route/footpath on 0.59 hectares (1.47 acres) of land on the former timber yard, East Row, Sandsend

remaining closed, although this route will be available for emergency use only should it ever be required, for instance in the event that the vehicular/pedestrian bridge is blocked.

This proposed revision provides a convenient alternative to crossing the beck without using the existing footpath on the western side of the A174 road bridge, which has been a point of vehicle and pedestrian conflict in the past and provides the opportunity to remove the footway on the western side of the road bridge. The revised TA proposes that pedestrian use of the A174 road bridge could be prohibited as there are pedestrian options either side of the road bridge.

The car park, vehicular bridge, ancillary infrastructure and a small section of access road/pedestrian route/footpath are within the NYMNP administrative area and are the subject of this planning application.

The main access road and junction onto the public highway; pedestrian route/footpaths and proposed footbridge is within the Scarborough Borough Council administrative area and subject of a separate revised planning application submitted at the same time to Scarborough Borough Council.

Revised documents and plans submitted in support of the planning application revisions relevant to the NYMNP consist of:

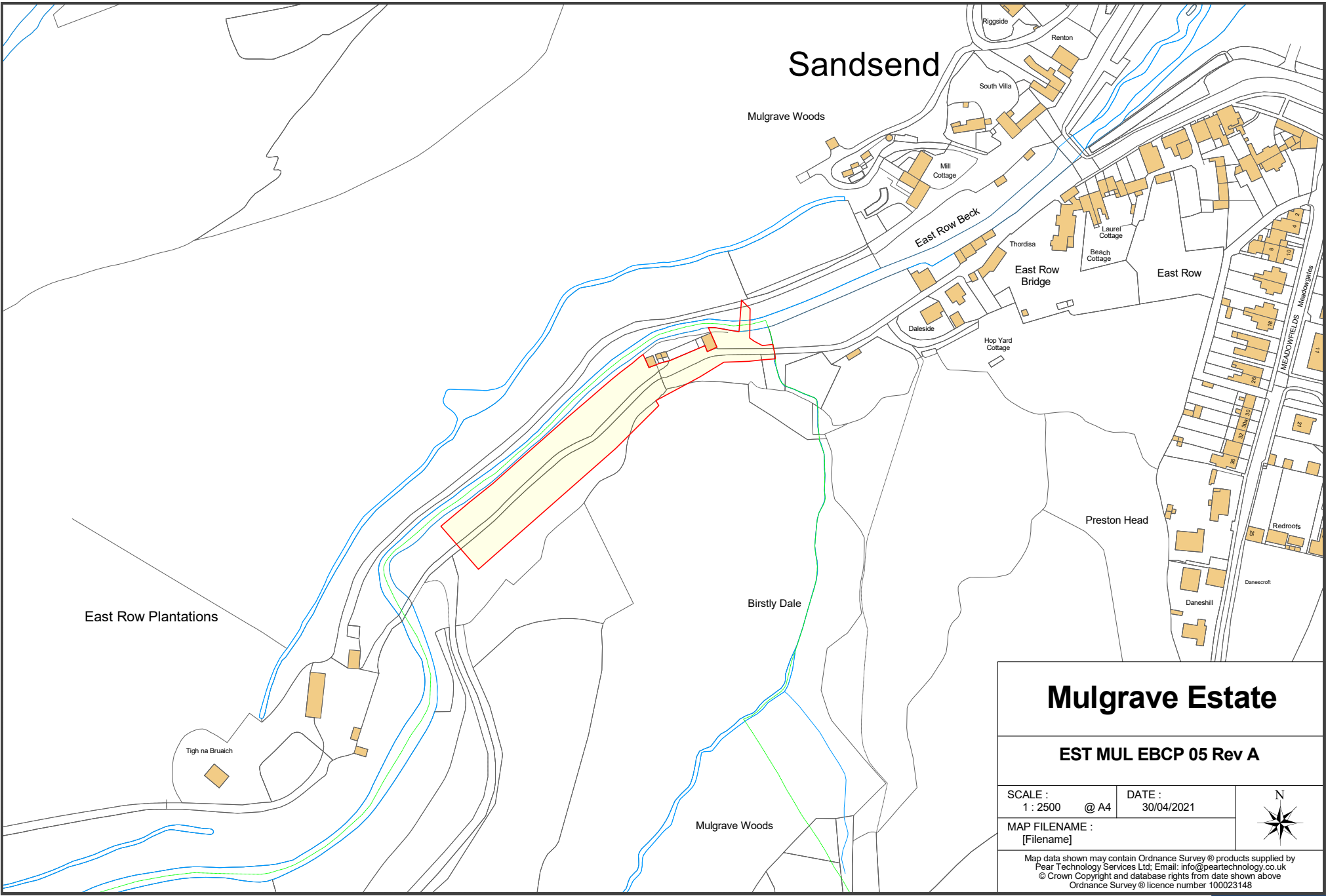
- Site Location Plans (1:2500) -; EST/MUL/EBCP/05 Rev A (NYMNP Only) and EST/MUL/EBCP/06 Rev A (combined NYMNP& Scarborough);
- Red Line as Existing Plan (1:1250) - EST/MUL/EBCP/08 Rev A (NYMNP only);
- Project Masterplan and Landscape Plan (entire scheme) (1:1000) – Ref: ESBSK19 Rev A;
- Block Plans (proposed) Proposed Car Park and Bridge Layout (NYMNP) (1:500) - Ref: EBSK20 Rev A;
- Bridge's Proposed Site Layout – Ref: A470-001-P5;
- Vehicular/pedestrian Bridge details – Ref: A0470_010_P4; and
- Transport Assessment Addendum (ref: 11613-003-01).

I trust that this is everything you require to consult on the revisions and to inform the Authority's consideration of the proposal. Please do contact me if you require any additional information, please do contact me.

Yours sincerely

John Long BA (hons) DipTP, MRTPI
Director
Encl.

Sandsend



Mulgrave Estate

EST MUL EBCP 05 Rev A

SCALE :
1 : 2500 @ A4

DATE :
30/04/2021



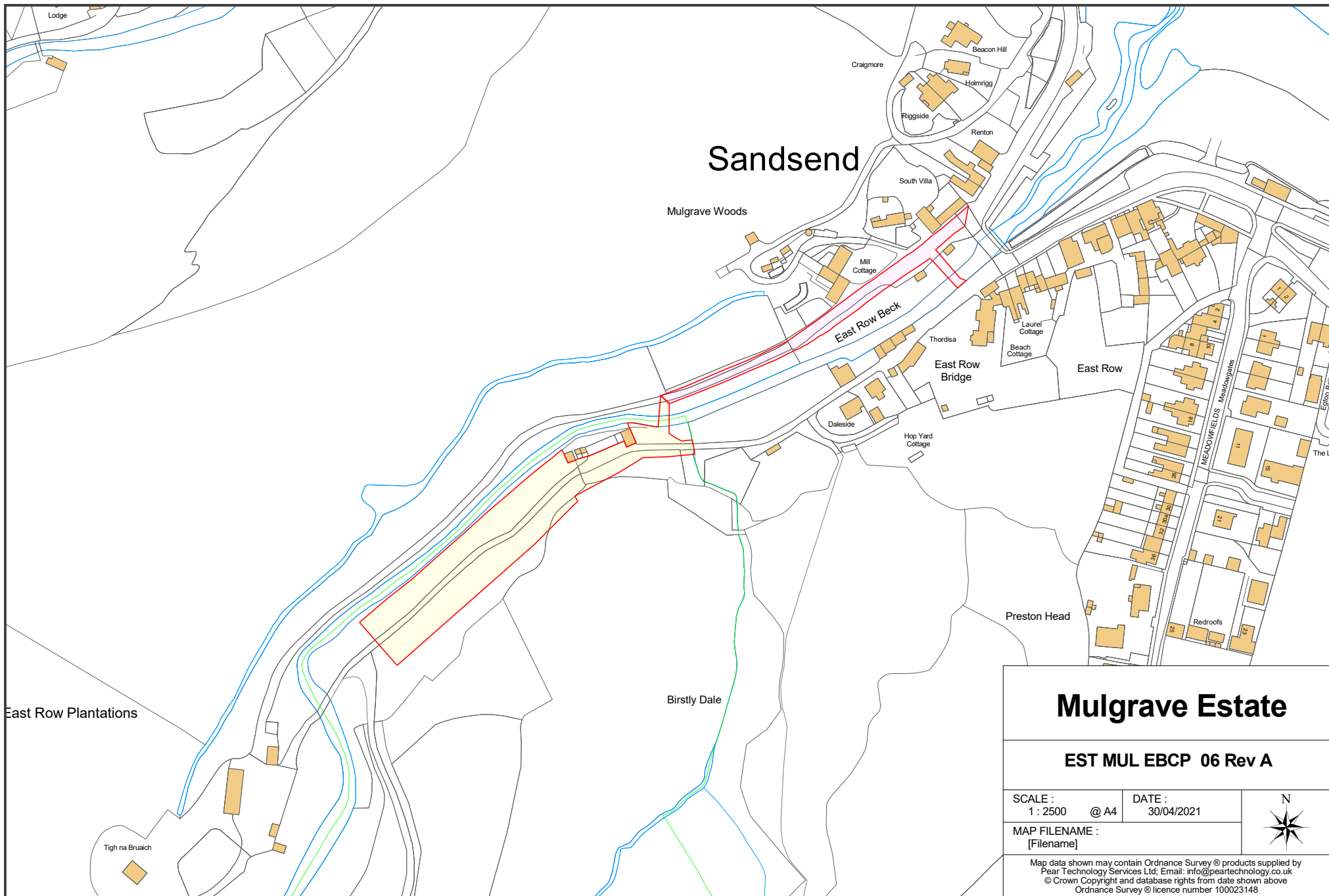
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NYMNP

20/05/2021



Sandsend

Mulgrave Estate

EST MUL EBCP 06 Rev A

SCALE :
1 : 2500 @ A4

DATE :
30/04/2021



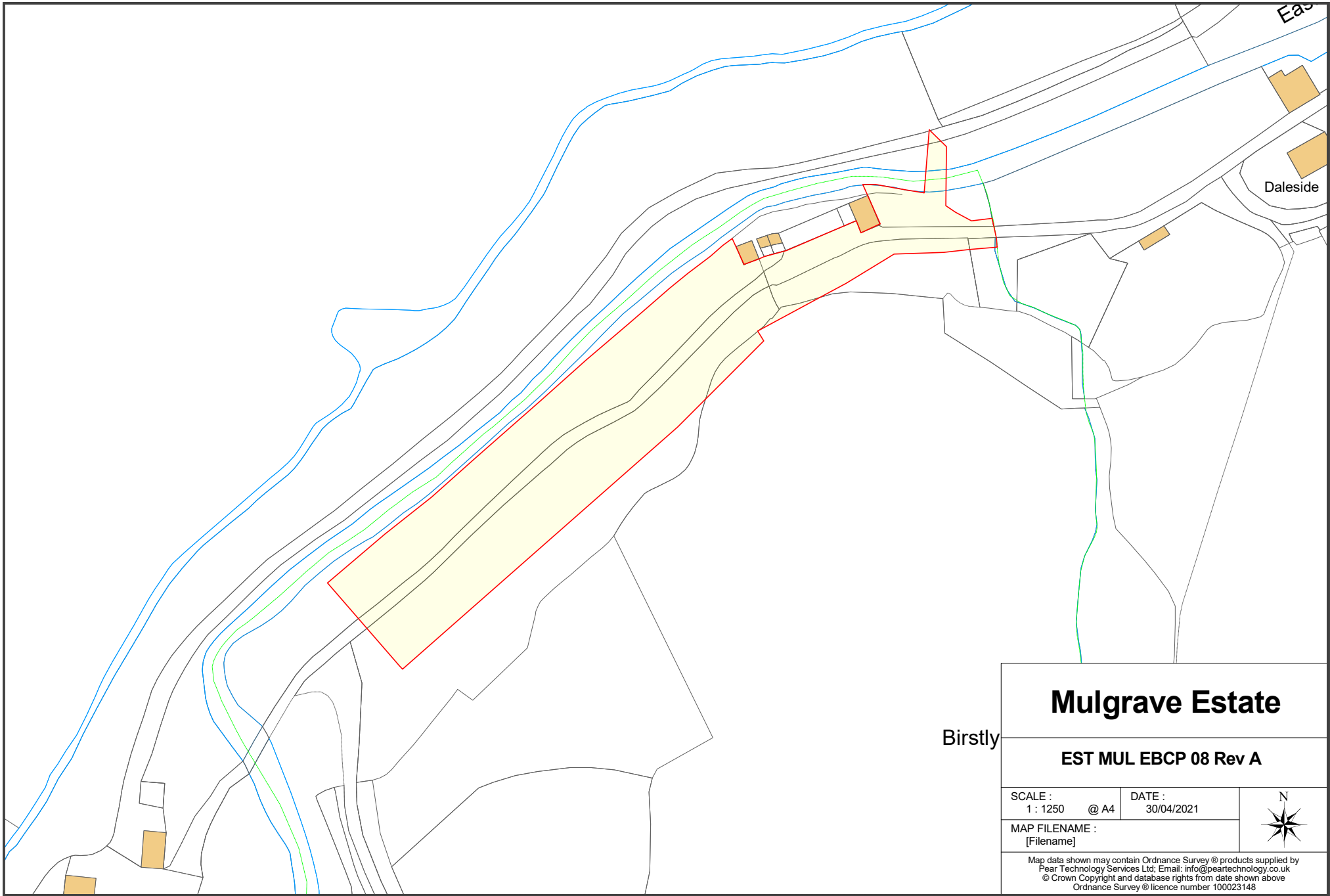
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20/05/2021



Mulgrave Estate

EST MUL EBCP 08 Rev A

SCALE :
1 : 1250 @ A4

DATE :
30/04/2021



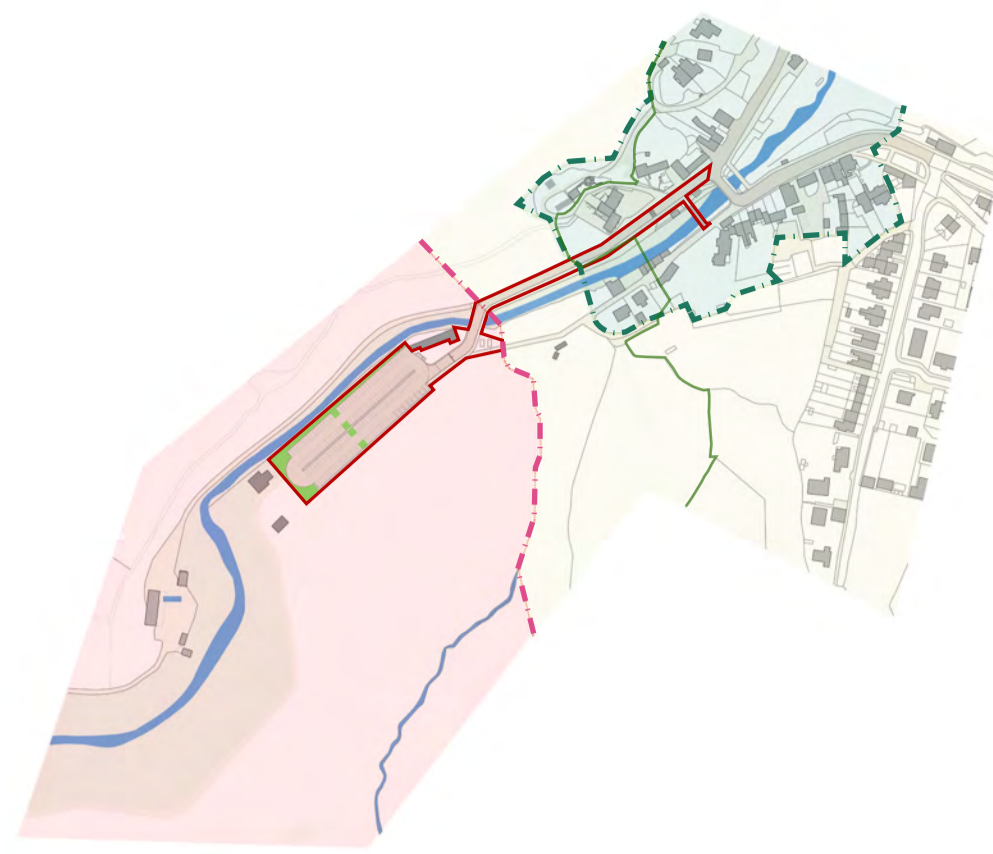
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NYMNPA

20/05/2021

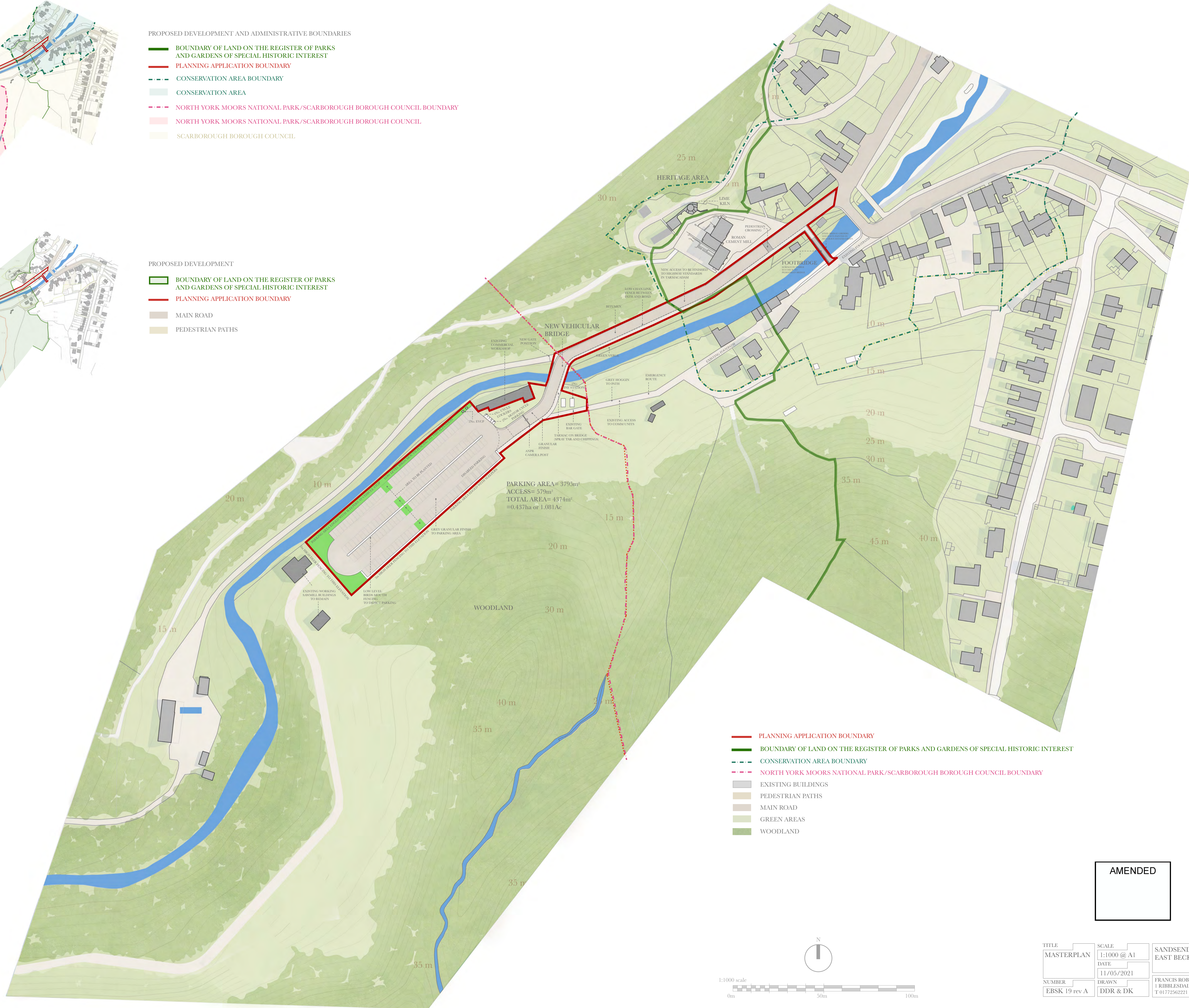


PROPOSED DEVELOPMENT AND ADMINISTRATIVE BOUNDARIES

- BOUNDARY OF LAND ON THE REGISTER OF PARKS AND GARDENS OF SPECIAL HISTORIC INTEREST
- PLANNING APPLICATION BOUNDARY
- - - CONSERVATION AREA BOUNDARY
- CONSERVATION AREA
- - - NORTH YORK MOORS NATIONAL PARK/SCARBOROUGH BOROUGH COUNCIL BOUNDARY
- NORTH YORK MOORS NATIONAL PARK/SCARBOROUGH BOROUGH COUNCIL
- SCARBOROUGH BOROUGH COUNCIL

PROPOSED DEVELOPMENT

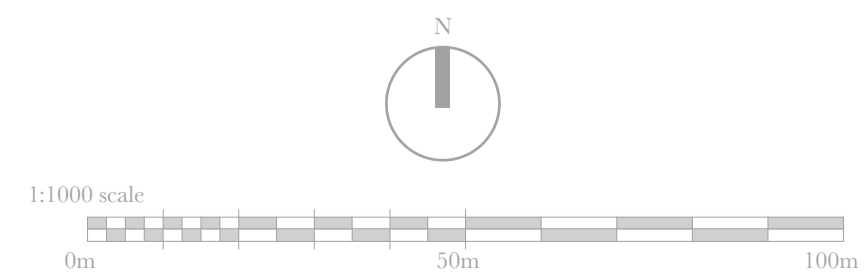
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- PLANNING APPLICATION BOUNDARY
- MAIN ROAD
- PEDESTRIAN PATHS



- PLANNING APPLICATION BOUNDARY
- BOUNDARY OF LAND ON THE REGISTER OF PARKS AND GARDENS OF SPECIAL HISTORIC INTEREST
- - - CONSERVATION AREA BOUNDARY
- - - NORTH YORK MOORS NATIONAL PARK/SCARBOROUGH BOROUGH COUNCIL BOUNDARY
- EXISTING BUILDINGS
- PEDESTRIAN PATHS
- MAIN ROAD
- GREEN AREAS
- WOODLAND

AMENDED

NYMNP
20/05/2021



TITLE	SCALE	SANDESEND EAST BECK DEVELOPMENT
MASTERPLAN	1:1000 @ A1	
NUMBER	DATE	
EBSK 19 rev A	11/05/2021	
	DRAWN	FRANCIS ROBERTS ARCHITECTS 1 RIBBLESDALE PLACE, PRESTON PR1 3NA T 0177262221 E architects@francisroberts.com
	DDR & DK	

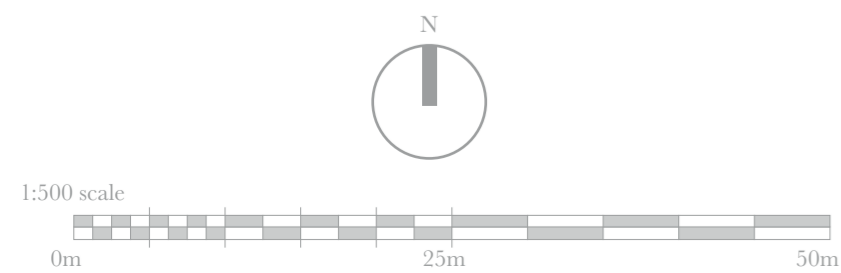


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DEVELOPMENT AREA:
5483.25m²
(0.54ha or 1.36Ac)

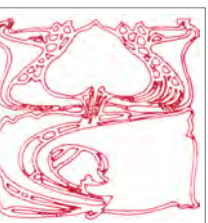
- PLANNING APPLICATION BOUNDARY
- PART OF PROPOSAL WITHIN NORTH YORK MOORS NATIONAL PARK AREA, SUBJECT TO SEPARATE PLANNING APPLICATION
- NORTH YORK MOORS NATIONAL PARK/ SCARBOROUGH BOROUGH COUNCIL BOUNDARY
- EXISTING BUILDINGS
- PEDESTRIAN PATHS
- MAIN ROAD
- GREEN AREAS
- WOODLAND

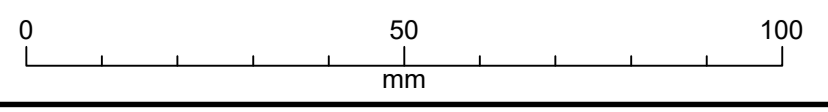
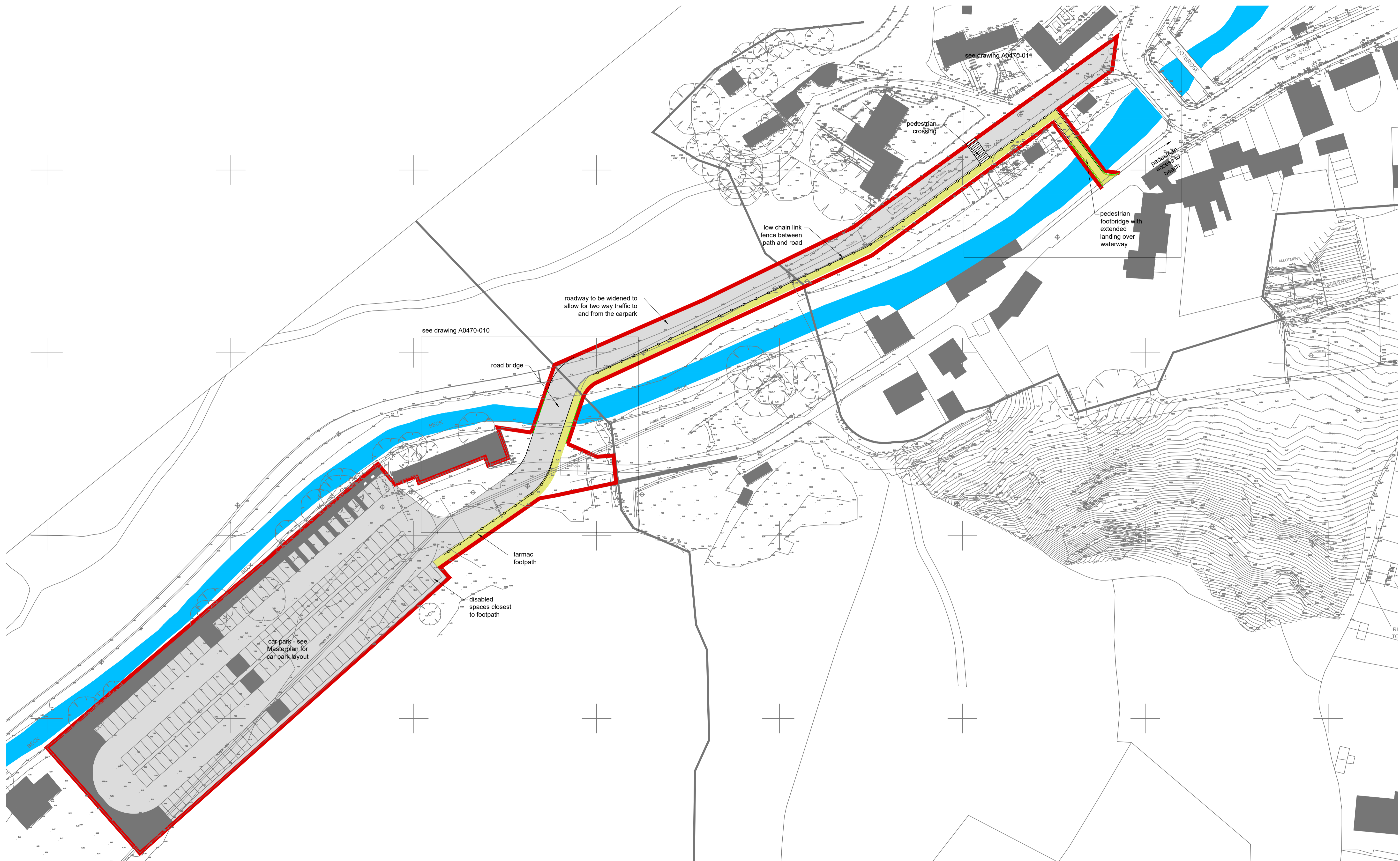


AMENDED

NYMNPA
20/05/2021


TITLE MASTERPLAN PARKING AND BRIDGE	SCALE 1:500 @ A2	SANDESEND EAST BECK DEVELOPMENT
NUMBER EBSK 20 rev A	DATE 11 05 2021	
	DRAWN DDR & DK	FRANCIS ROBERTS ARCHITECTS 1 RIBBLESDALE PLACE, PRESTON PR1 3NA T 01772562221 E at @francisroberts.com

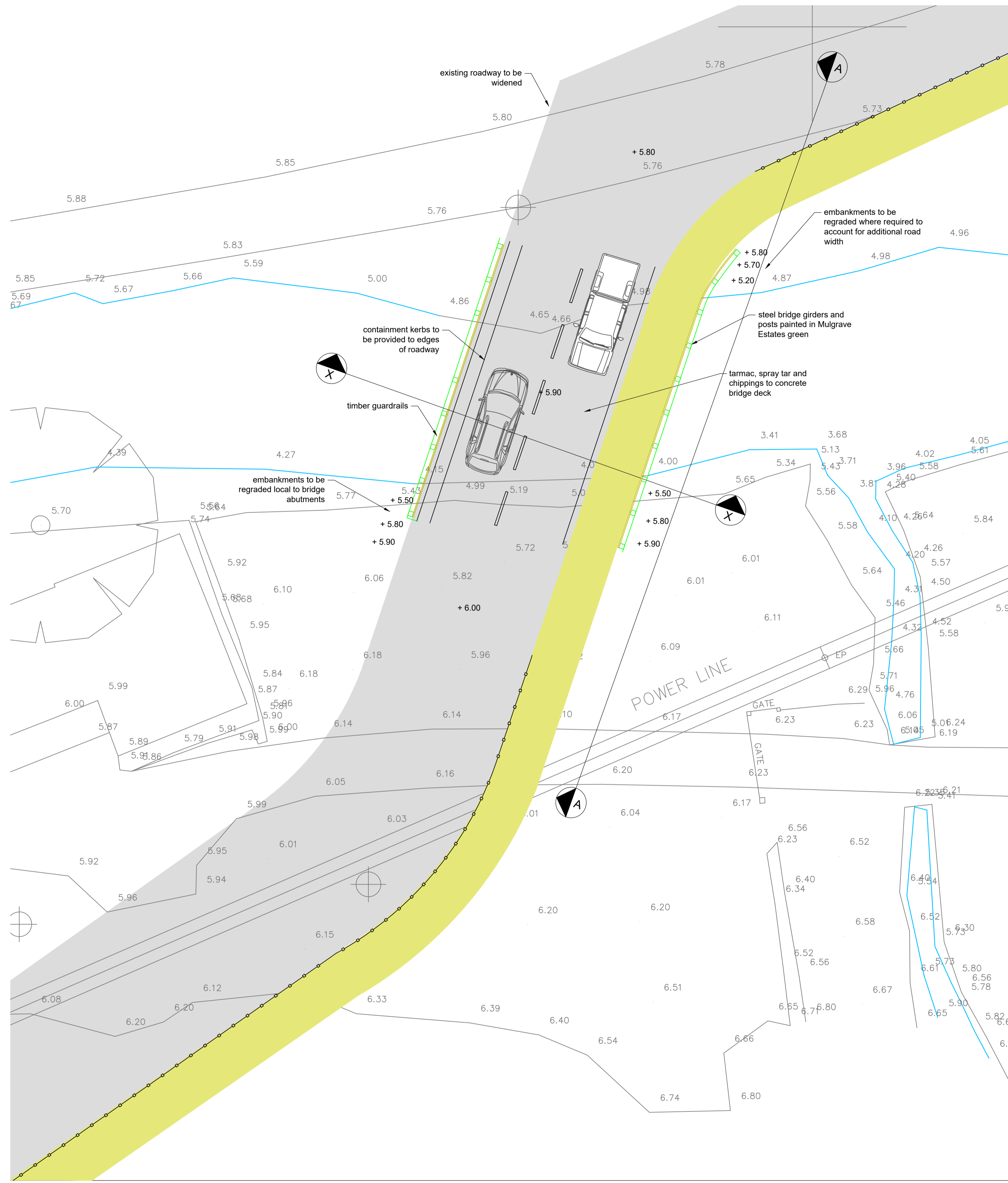




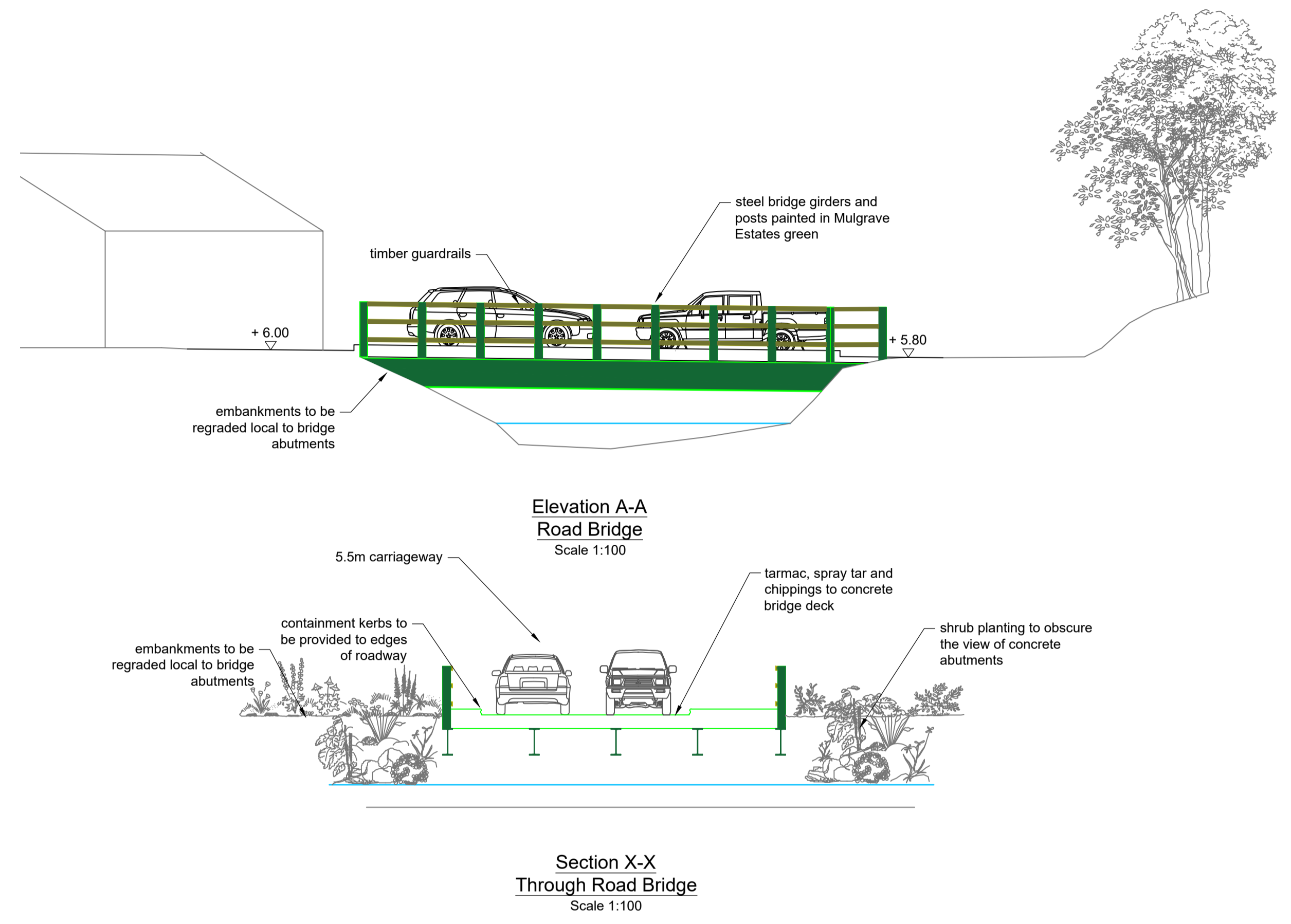
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NYMNP
20/05/2021

Status Planning		01904 379 510 27 Moorcroft Rd York YO24 2RQ admin@ridgeconsulting.co.uk			
Project Mulgrave Estates Bridges to East Row Beck Carpark, Sandsend					
Drawing Title Proposed Site Layout					
Issue date 16.10.20	Drawn NR	Check MP	App. NR	Size A1	Rev. P5
Drawing no. A0470 - 001					

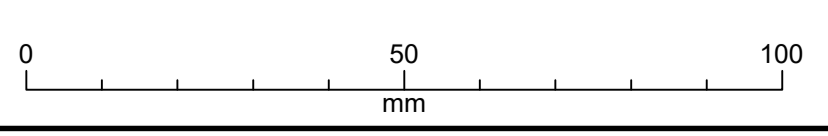


Plan Road Bridge
Scale 1:100



Elevation A-A
Road Bridge
Scale 1:100

Section X-X
Through Road Bridge
Scale 1:100



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NYMNPA
20/05/2021

Status Planning		01904 379 510 Project Mulgrave Estates Bridges to East Row Beck Carpark, Sandstead			
Project		RIDGE CONSULTING ENGINEERS			
Drawing Title Road Bridge Proposed Plans & Elevations		Issue date 16.10.20	Drawn NR	Check MP	App. NR
Drawing no. A0470 - 010		Size A1	Rev. P4		

Prepared on behalf of

The Mulgrave Estate

**Proposed Car Park
The Mulgrave Estate
Sandsend**

Transport Assessment Addendum

Acknowledgements:

National Geographic Society Interactive MapMaker has been used to create figures within this report.

Accident data has been obtained from www.crashmap.co.uk

Disclaimer

The methodology adopted and the sources of information used by Sanderson Associates (Consulting Engineers) Ltd in providing its services are outlined within this Report.

Any information provided by third parties and referred to herein has not been checked or verified by Sanderson Associates (Consulting Engineers) Ltd, unless otherwise expressly stated within this report.

This report was checked and approved on the 20th May 2021 and the Report is therefore valid on this date, circumstances, regulations and professional standards do change which could subsequently affect the validity of this Report.

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Report Ref:	11613/003/02		
Author:	Brett Littlewood		
Checked & Approved:	Karen Smith MIHE	Date:	20 th May 2021

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Appendices

APPENDIX A

NYCC Consultation Response

APPENDIX B

Audit Brief

Stage 1 Road Safety Audit

APPENDIX C

Designer's Response

APPENDIX D

ATC Data

APPENDIX E

Junctions 9 modelling output

APPENDIX F

Drawing 11613-003 Rev A

APPENDIX G

Revised Masterplan – ESK 19 Rev A

APPENDIX H

Drawing 11613-006

1 Introduction

1.1 Sanderson Associates (Consulting Engineers) Ltd has been appointed by The Mulgrave Estate to advise on traffic and transportation issues surrounding their development proposals within their estate on land off the A174, Sandsend.

1.2 The proposal comprises the development of a 150 space surface level car park with improvements to the existing site access on to the A174 adjacent to East Row Bridge. Details of the proposal have been submitted to the local planning authority, Scarborough Borough Council (SBC), under planning ref: 20/02831/FL.

1.3 A Transport Assessment report (ref: 11613-001-02) was prepared by Sanderson's to support the application, addressing key transport issues including:

- the local highway network
- the access arrangements to the proposed development
- the proposed development and its operational facilities
- the impact of the development on the local highway network in terms of highway safety
- accessibility of the site in relation to sustainable transport and local facilities

1.4 North Yorkshire County Council (NYCC) in their role as the local highway authority have reviewed the information provided a consultation response dated 16th February 2021. A full copy of NYCC's comments is included at **Appendix A** and the relevant points are extracted below:

"The principle highway concern about this application is trying to keep pedestrians from crossing the A174 at the north-west corner of the existing road bridge. The designer has explored various options to try and accommodate pedestrians here but the different options were not deemed to be safe for pedestrians or were too severe on the restrictions for the vehicles using the A174.

For the full planning application, the Highway authority would require the Transport Statement to include new traffic that would be generated by the proposals. Although the proposals at this stage, are purely for the parking area, it is still reasonable that this will attract some new traffic to the area. The details should include a capacity assessment for the junction, accounting for the summer peak traffic flows, an element of new traffic generated by the proposals and the current traffic patterns over the bridge, ie. informal give way in operation.

A visibility splay should be shown for drivers waiting to turn right, off the A174 into the development and whether this requires any work to the railings on the bridge to improve the current vision splay.

The pedestrian and cycle desire lines from the development site to the A174 needs to be shown and an audit on these routes identifying any improvements required. These may include new surfacing, protection from falling at heights, signage to encourage particular routes and signage to discourage other routes.

A Stage 1 Road Safety audit of the proposed junction layout and operation will be required given that the access is likely to serve a major development, is on a principle road network and is in close proximity to an existing bridge that has below standard road alignment with narrow footways.”

- 1.5 Further to the Highways comments received, the applicant has given consideration to alternative arrangements to accommodate pedestrian movement to and from the site including the upgrading of the private road along the south side of the beck to provide a dedicated pedestrian route between the car park and the A174 at the southern side of East Row Bridge, and the provision of an additional pedestrian footbridge in relative proximity to East Row Bridge which would serve benefit to future users of the site as well as existing movements associated with the café and retail units served by the site access.
- 1.6 This report is an Addendum to the original Transport Assessment and seeks to address the comments raised by the local highway authority and confirm the revised development proposals and pedestrian access strategy.

2 Stage 1 Road Safety Audit

2.1 A Stage 1 Road Safety Audit (RSA) of the junction layout and operation proposed as part of the original planning submission has been conducted on 1st March 2021. The audit also considered the potential of using the private road (owned by the Mulgrave Estate) on the south side of the beck as a dedicated pedestrian route. A copy of the Audit Brief and Stage 1 RSA and is included at **Appendix B**.

2.2 To summarise, the Audit raised no highways safety issues with the proposed vehicle access. Items raised by the Audit Team included:

- Clarification required as to whether the existing café / retail parking arrangements would be retained, and if so, in what form (1.1);
- Condition of existing private road currently unsuitable for pedestrian use and would require appropriate improvements in terms of surfacing, drainage, signage and levels / gradients (1.2);
- Absence of pedestrian infrastructure linking the private road with existing pedestrian facilities along the A174. Appropriate improvements should be provided including dropped kerbs and tactile paving in the private road / A174 junction area (1.3);
- The ability of the internal vehicle bridge to accommodate two-way vehicle flows (1.4);
- Absence of a clear pedestrian route between the car park and the proposed footway along the access road / dedicated pedestrian route along the private road (1.5);
- Clarification as to whether the site would remain open during periods of maintenance on the vehicle bridge (1.6);

2.3 Detailed responses to each item are included within the Designer's Response at **Appendix C**.

3 Traffic Impact

- 3.1 NYCC have requested that a capacity assessment be undertaken of the proposed site access junction which accounts for an element of 'new' traffic generated by the proposed car park, as well seasonal fluctuations in background traffic flows.
- 3.2 Chapter 6 of the original Transport Assessment contained a trip generation assessment which predicted the profile and volume of arrivals and departures to / from the site, based on parking ticket sales data provided by SBC.
- 3.3 The assessment, which robustly assumed that the proposed car park operated at full capacity, would generate a maximum of 69 vehicle movements two-way (~1 vehicle movement per minute) during the weekend peak period of 12:30 – 13:30. Trip generations at all other times of the week would be below this level. The full breakdown of vehicle trips is presented below, for reference:

Transport Assessment Table 6.2 – Predicted Vehicle Trips

Time Period		Weekday Ave			Weekend Ave		
Start	End	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
00:00	09:30	6	0	6	13	0	13
09:30	10:00	6	0	6	11	0	11
10:00	10:30	11	0	11	15	0	15
10:30	11:00	14	0	14	20	0	20
11:00	11:30	14	6	20	20	13	33
11:30	12:00	14	6	20	18	11	29
12:00	12:30	13	11	24	17	15	32
12:30	13:00	11	14	25	15	20	35
13:00	13:30	11	14	25	14	20	34
13:30	14:00	9	14	23	14	18	32
14:00	14:30	9	13	22	14	17	31
14:30	15:00	9	11	20	13	15	28
15:00	15:30	8	11	18	11	14	25
15:30	16:00	6	9	15	9	14	23
16:00	16:30	5	9	14	8	14	22
16:30	17:00	3	9	12	5	13	18
17:00	17:30	2	8	10	2	11	13
17:30	23:59	0	15	15	2	24	26

- 3.4 A junction capacity assessment of the proposed site access junction with the A174 has been undertaken using the PICADY module of TRL’s ‘Junction 9’ junction modelling software.
- 3.5 In order to provide a robust assessment, the proposed development flows (presented in the previous table) are all added as ‘new’ traffic to the junction. In reality, a material proportion of vehicles using the car park would already be passing the site on their way to existing parking facilities within Sandsend.
- 3.6 The base traffic input into the junction model has been taken from Automatic Traffic Count (ATC) data collected in November 2017 which recorded the flow of traffic over East Row Bridge. A copy of the ATC data is included at **Appendix D**, for reference.
- 3.7 To account for traffic growth since the survey year of 2017, to the application year of 2021 and a design year of 2026, growth factors have been calculated using the TemPRO database for the weekday AM and PM, and Saturday peak periods. These factors are summarised below:

Table 1 – TemPRO factors

	2017 - 2021	2017 - 2026
AM	1.0263	1.0287
PM	1.0230	1.0252
Saturday	1.0228	1.0264

- 3.8 With regards to distribution, the proposed development flows have been assigned in line with the existing northbound / southbound traffic flow proportions recorded at East Row Bridge.
- 3.9 To account for seasonal fluctuations in traffic flows, a sensitivity test has also been conducted whereby we have multiplied the base traffic flows by a factor of 3. This is considered to be robust.
- 3.10 The junction modelling results are summarised within the following table, whilst the full Junctions 9 outputs are included at **Appendix E**.

	AM			PM			Saturday		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2026 Base + Development								
Stream B-AC	0.0	0.00	0.00	0.0	8.17	0.05	0.1	8.14	0.07
Stream C-AB	0.0	5.43	0.02	0.0	5.52	0.02	0.0	5.46	0.02
	2026 Base + Development Sensitivity								
Stream B-AC	0.0	0.00	0.00	0.1	14.83	0.08	0.1	14.21	0.11
Stream C-AB	0.0	4.29	0.03	0.0	4.39	0.03	0.1	4.27	0.05

- 3.11 From the results summary table above, it is demonstrated that even in the sensitivity scenario, with base traffic flows multiplied by 3, the junction reaches a maximum RFC value of 0.11 (Stream B-AC, Saturday Peak).
- 3.12 The threshold of practical junction capacity is typically represented by an RFC value of 0.85, although, in theory, a junction would be considered to operate with capacity with RFC values up to 1.0.
- 3.13 The predicted maximum RFC of 0.11 therefore indicates that no material capacity issues are likely to arise at the junction as a result of the development.
- 3.14 It is acknowledged that due to the 'informal give way' operation of East Row Bridge, the modelling results presented above are not entirely representative of how the junction will operate, as the through traffic is not continually in free flow. However, it is not possible to accurately replicate this arrangement within the junction modelling parameters.
- 3.15 From observations made on site it is noted that the occurrence of vehicles giving way is sporadic and quite often two-way vehicle flow will continue over the bridge. Various factors appear to affect whether vehicles give-way or not, including driver personality (cautious / confident etc), the size of oncoming vehicles, timing of arrival.

Figure 1 – Example of two-way flow over East Row Bridge



3.16 In terms of the impact on vehicle flows in / out of the site access it is considered that;

- 'Left in' movements into the site access would be unrestricted with the exception of potential minor delay passing over East Row Bridge due to oncoming vehicles;
- 'Right in' vehicle movements would benefit from gaps in opposing traffic flow created by vehicles travelling over the bridge in the same direction (north to south). Furthermore, due to the slow speed of vehicles travelling around / over the bridge, vehicles turning into (and out of) the site access will be able to accept a smaller gap than they would normally be able to if approaching vehicle speeds were greater;
- 'Left out' vehicle movements would benefit from additional gaps created by vehicles travelling north to south over the bridge.
- 'Right out' vehicle movements will be able to 'platoon' with other vehicles travelling north to south over the bridge. Again, due to the slow vehicle speeds in proximity to the junction, vehicles will be able to accept smaller gaps than usual. It is also common, in slow speed situations, for drivers on the major arm of a junction to allow minor road traffic to emerge.

-
- 3.17 In summary it is considered that whilst the junction modelling parameters cannot be directly replicated, the assessment undertaken is robust due to the significant uplift applied to the traffic flows. It is also considered that the informal give-way operation of the junction is unlikely to have a significant adverse impact on the capacity of the site access as certain movements are likely to benefit from this arrangement as additional gaps would be created.

4 Visibility

- 4.1 NYCC have requested that a visibility splay be shown for drivers waiting to turn right, off the A174 into the development and to confirm whether this requires any work to the railings on the bridge to improve the current vision splay.
- 4.2 As described in Section 2.3 of the original Transport Assessment, in order to determine the existing 85th percentile wet weather speeds of vehicles approaching the site access from both directions; 2 N° Automatic Traffic Counters (ATCs) were installed by Road Data Services Ltd. The ATCs were positioned to the left (approximately 50m north) and to the right (on the centre of the bridge) of the site access.
- 4.3 The recorded 85th percentile wet weather speed of vehicles travelling over the bridge (approaching the access) was 14.7mph. Using Manual for Streets 2 calculations, this would require a visibility splay of 17.15m.
- 4.4 Drawing 11613-003 Rev A at **Appendix F** shows that a forward visibility splay of ~26m is available between a vehicle waiting to turn right into the access (positioned to allow two-way flow to be maintained) and an oncoming vehicle. It is therefore considered that sufficient forward visibility exists for vehicles turning right in to the site.
- 4.5 No comments were raised within the Stage 1 RSA regarding concerns over visibility for vehicles entering / exiting the site access.

5 Pedestrian Route Audit

5.1 With reference to the revised site masterplan (Ref: EBSK 19 Rev A East Beck Masterplan) included at **Appendix G**, this section of the report provides an audit of the revised pedestrian route proposals between the proposed car park and existing pedestrian infrastructure on the A174. The route will be considered in stages and will provide detail on signage, surfacing and protection as well as other relevant matters.

5.2 *Car Park*

5.2.1 The proposed 150 space car park will have a granular surfacing and has been designed to accommodate 2.4m x 4.8m parking bays with 6m aisle widths. There are no formal pedestrian routes within the car park, however, this is considered to be a typical arrangement within car parks, and, due to slow vehicle speeds is unlikely to result in any adverse impacts to pedestrian safety.

5.2.2 At the eastern end of the car park, adjacent the entry / exit barriers, a wide area of footway is proposed. At this location a zebra crossing facility is proposed, complete with dropped kerbs and tactile paving, directing pedestrians from the car park to a 2.0m wide footway proposed to run along the eastern flank of the vehicle-bridge / south side of the access road running parallel along the northern side of the beck.

5.3 *Access Road*

5.3.1 The footway will be surfaced with tarmac spray tar and chippings and 1.0m high bird-mouth fencing will be provided along the beck embankment to prevent falling from height, whilst 0.45m high chain-link fencing is proposed between the edge of footpath / edge of carriageway.

5.3.2 The carriageway width along the access road will be a minimum of 4.8m. This provides sufficient width to allow two-way vehicle flow and will reduce the likelihood of vehicles having to mount / travel close to the edge of the footway to pass oncoming traffic.

5.3.3 Signage will be present along the access road indicating an advisory 10mph speed limit and advising drivers to 'drive with caution' as pedestrians may be present within the carriageway.

5.4 Pedestrian Footbridge

5.4.1 A new pedestrian footbridge is proposed connecting the proposed access road on the north side of the beck to the private road on the south side. The footbridge is to be located ~25m south-west of the road-bridge.

5.4.2 'Wayfinder' signage will be present adjacent the footbridge directing all movement to Sandsend (beachfront etc.) over the bridge. Anyone wishing to access the existing café and retail units present in proximity to the A174 will be directed to cross the access road at an informal zebra crossing and continue their journey along a proposed footway along the northern side of the access road. At the entrance to the footbridge, the footway along the southern side of the access road will terminate and will be fenced off to prevent pedestrians continuing straight ahead to the road-bridge.

5.4.3 The location of the crossing point / footbridge is considered to benefit from sufficient separation from the A174 junction so that vehicles entering the site (particularly those turning left in) will have time to react to pedestrians crossing the road. Also, any vehicle queues that develop whilst pedestrians are crossing the access road are unlikely to extend back to the A174 and have any negative impact on the operation or safety of the access junction.

5.4.4 The footbridge itself will be a steel bridge surfaced in timber, 'eco-deck', or similar. The bridge will have a constant width of 2.0m, however, the southern extent of the bridge features a radius on the eastern side of the bridge to provide additional visibility to / from the north-east. A short section of pedestrian railing is proposed across the southern end of the footbridge to create deflection and to discourage pedestrians walking straight out without looking.

-
- 5.4.5 On the southern side of the footbridge, pedestrians will enter the private road ~25m from the junction with the A174. At this point pedestrians will be directed to cross the road to utilise a proposed delineated 1.7m wide footway which continues north-eastbound from the footbridge and ties in with existing footway provisions along the A174.
- 5.4.6 The proposed footway along the private road will reduce the effective carriageway width for vehicles to 'one-way' working only. Sufficient forward visibility is available from one end of the one-way section to the other to allow drivers to identify any oncoming vehicles and to make a decision whether to wait or proceed. There is also sufficient space for a south-westbound vehicle to enter the private road from the A174 and wait prior to the one-way section without obstructing the highway. The proposed footway arrangement is shown on drawing 11613-006 at **Appendix H**.
- 5.4.7 Signage will be present along the private road, advising vehicles to drive with caution and beware of pedestrians.
- 5.4.8 The private road serves only a small number of residential dwellings most of which are understood to be second homes rather than primary residences, and as such, vehicle along the private road are expected to be infrequent and the potential for conflict with pedestrians is minimal.

5.5 *Existing Infrastructure*

- 5.5.1 Beyond the private road junction with the A174, footways are present along both sides of the road. The footway along the southern side of the A174 is ~1.1m - 1.3m wide between the private road junction and 'The Hart Inn' public house, after which point it widens to ~1.5m until it reaches the end of the row of buildings. After the buildings the footway increases to ~3.0m wide as it continues around the bend in the road and along the seafront.

- 5.5.2 The footway along the northern side of the road (on the south-eastern side of East Row Bridge) is ~1.8m wide. The footway narrows and continues around the bend on to East Row Bridge, however, in 2017 a pedestrian footbridge was installed to provide a safer pedestrian route across the bridge. Fencing and bollards are sited at each end of the footbridge to prevent pedestrians walking over the vehicle bridge.
- 5.5.3 Between the footbridge and the existing bus stop located on the northern side of the carriageway a dropped kerb crossing with tactile paving has been installed, providing a formal crossing point for pedestrians.
- 5.5.4 The existing infrastructure surrounding the private road / A174 junction is pictured below:

Figure 2 – Photo of existing infrastructure in proximity to East Row Bridge



- 5.5.5 At present, a 0.8m hard margin is present along the south-western side of the road bridge which some pedestrians may utilise as a narrow footway provision. To discourage pedestrian movements across the road bridge pedestrian deterrent paving is proposed within the hard margin, as per the existing arrangement on the north side of the bridge which was implemented by the Council when the existing footbridge was installed.

Figure 3 – Photo of existing pedestrian deterrent paving



5.6 Other comments

- 5.6.1 It is acknowledged that some people who are visiting the existing café and retail units located in proximity to the site access may still choose to walk across the A174, despite the absence of any pedestrian facilities, and despite the provision of a new pedestrian footbridge, as pedestrians are inclined to take the most direct route between their current location and their intended destination. However, it is considered that the proposal includes practicable mitigation to reduce the need for pedestrians to cross the road at this location and provide a suitable alternative to link the site with existing pedestrian infrastructure.

6 Summary and Conclusions

- 6.1 Sanderson Associates (Consulting Engineers) Ltd has been appointed by The Mulgrave Estate to advise on traffic and transportation issues surrounding their development proposals within their estate on land off the A174, Sandsend.
- 6.2 The proposal comprises the development of a 150 space surface level car park with improvements to the existing site access on to the A174 adjacent to East Row Bridge. Details of the proposal have been submitted to the local planning authority, Scarborough Borough Council (SBC), under planning ref: 20/02831/FL.
- 6.3 This report is an Addendum to the original Transport Assessment and seeks to address comments raised by the local highway authority and confirm the revised development proposals and pedestrian access strategy.
- 6.4 At the request of the Council, a Stage 1 Road Safety Audit (RSA) of the proposed junction layout and operation has been conducted on 1st March 2021. The audit also considered the potential of using the private road (owned by the Mulgrave Estate) on the south side of the beck as a dedicated pedestrian route. The Audit raised no highways safety issues with the proposed vehicle access. Comments on the internal layout were provided and detailed responses to each item are included within the Designer's Response at Appendix C.
- 6.5 A detailed junction capacity assessment of the site access has been undertaken using Junctions 9 which indicates that, even allowing for seasonal fluctuations in traffic flows, the junction is likely to operate with significant reserve capacity and that the informal give-way operation of the junction (due to the geometries of East Row Bridge) is unlikely to have a significant adverse impact on the capacity of the site access as certain movements are likely to benefit from this arrangement as additional gaps would be created.
- 6.6 Based on the results of an ATC vehicle speed survey on East Row Bridge, it is considered that sufficient forward visibility exists for vehicles turning right in to the site, without any requirement for improvements of the existing bridge arrangement.

-
- 6.7 A pedestrian route audit has been undertaken to identify how people will travel on foot between the proposed car park, Sandsend and the existing commercial units located adjacent the site access. The audit includes details of proposed improvements including a new pedestrian footbridge and footway provisions along the north and south of the beck respectively which tie in with existing pedestrian infrastructure along the A174, as well as details of surfacing, protection from falling at heights, and signage to encourage particular routes and signage to discourage other routes.
- 6.8 The content of this Transport Assessment Addendum demonstrates that the residual cumulative impacts of the development on the road network would not be severe and, therefore, with reference to the National Planning Policy Framework it is considered that the proposal should therefore not be prevented on highways grounds.

APPENDIX A
NYCC Consultation Response

**NORTH YORKSHIRE COUNTY COUNCIL
BUSINESS and ENVIRONMENTAL SERVICES**



**LOCAL HIGHWAY AUTHORITY
PRE APPLICATION ADVICE**

Application No:	SBC20/02831/FL
Proposed Development:	Upgrade of existing junction onto A174 and widening of access road, installation at footpath and pedestrian footbridge
Location:	Existing Junction Onto A174 And Access Road/track At East Row, Sandsend
Applicant:	Mr Robert Childerhouse

CH Ref:		Case Officer:	Ged Lyth
Area Ref:	4/39/271	Tel:	
County Road No:		E-mail:	

To:	Scarborough Borough Council Town Hall SCARBOROUGH North Yorkshire YO11 2HG	Date:	16 February 2021
FAO:	Marcus Whitmore	Copies to:	

The National Park Boundary runs through the middle of the site so two applications have been received and I confirm the same response is being given to both.

The principle highway concern about this application is trying to keep pedestrians from crossing the A174 at the north west corner of the existing road bridge. The designer has explored various options to try and accommodate pedestrians here but the different options were not deemed to be safe for pedestrians or were too severe on the restrictions for the vehicles using the A174.

For the full planning application, the Highway authority would require the Transport Statement to include new traffic that would be generated by the proposals. Although the proposals at this stage, are purely for the parking area, it is still reasonable that this will attract some new traffic to the area. The details should include a capacity assessment for the junction, accounting for the summer peak traffic flows, an element of new traffic generated by the proposals and the current traffic patterns over the bridge, ie. informal give way in operation.

A visibility splay should be shown for drivers waiting to turn right, off the A174 into the development and whether this requires any work to the railings on the bridge to improve the current vision splay.

**LOCAL HIGHWAY AUTHORITY
CONSIDERATIONS and RECOMMENDATION**



Continuation sheet:

SBC20/02831/FL

Application No:

The pedestrian and cycle desire lines from the development site to the A174 needs to be shown and an audit on these routes identifying any improvements required. These may include new surfacing, protection from falling at heights, signage to encourage particular routes and signage to discourage other routes.

A Stage 1 Road Safety audit of the proposed junction layout and operation will be required given that the access is likely to serve a major development, is on a principle road network and is in close proximity to an existing bridge that has below standard road alignment with narrow footways.

Signed:

Ged Lyth

For Corporate Director for Business and Environmental Services

Issued by:

Whitby Highways Office
Discovery Way
Whitby
North Yorkshire
YO22 4PZ

APPENDIX B
Audit Brief
Stage 1 Road Safety Audit

Extract From Appendix C of GG119 - Road Safety Audit Brief

SA ref 11743

Table C.1 Project Summary

Date:	01.03.2021
Document reference:	11613-002-01
Prepared by:	Sanderson Associates (Consulting Engineers) Ltd
On behalf of:	The Mulgrave Estate
AUTHORSATION SHEET	
Project:	Proposed car park and improvements to existing site access on to the A174, Sandsend and pedestrian access
Report title:	Stage 1 Road Safety Audit
PREPARED BY:	
Name:	Simon Burkinshaw
Signed:	
Organisation:	Sanderson Associates (Consulting Engineers) Ltd
Date:	01.03.2021
I APPROVE THE RSA BRIEF AND INSTRUCT THE RSA TO TAKE PLACE ON BEHALF OF THE OVERSEEING ORGANISATION:	
Name:	
Signed:	
Organisation:	
Date:	

Table C.2 General Details

General Details				
Highway Scheme Name and Road Number:		Proposed car park and improvements to existing site access and pedestrian routes. A174, Sandsend. Approx. Post Code: YO21 3SU. Planning application reference: 14/00315/OT and 19/07608/RM.		
Type of Scheme:	Improvements to existing site access on to the A174 to serve new 150 space surface level car park and pedestrian access			
RSA Stage tick as appropriate.	1 ✓	2	3	4
Overseeing Organisation Details		Design organisation Details		
Highway Authority is: North Yorkshire County Council County Hall Northallerton North Yorkshire DL7 8AD		Sanderson Associates (Consulting Engineers) Ltd Sanderson House Jubilee Way Grange Moor Huddersfield WF4 4TD		
Police contact details		Maintaining agent contact details		
Not required		North Yorkshire County Council County Hall, Northallerton North Yorkshire DL7 8AD		

RSA team membership
David Colley MCIHT Associate Director at Sanderson Associates (Consulting Engineers) Ltd
Ashley Armitage AMIHE Assistant Engineer at Sanderson Associates (Consulting Engineers) Ltd
Terms of reference
GG119 Road Safety Audit

Table C.3 Scheme Details

Scheme Description/Objective
General
Drawing 11613-003:- Access Arrangements shows the scheme details.
The proposal comprises the development of a 150 space surface level car park with improvements to the existing site access on to the A174 adjacent to East Row Bridge. The parking comprises of 140 Standard spaces, 8 disabled spaces and 2 electric charging spaces. In addition to car parking the facility will provide 2 motorcycle spaces and 8 cycle bays. The car park will operate a pay on foot system and will be controlled by ANPR cameras.
The proposed improved access arrangement provides visibility splays, from an x-distance of 2.4m, of 33m to the right (south-east) of the access and 66m to the left (north).
The access features a 6.0m wide carriageway and has a 6.0m junction radius on the south side of the access and an 8.0m radius on the north side of the access.
Pedestrians will be directed to use the existing footpath (public right of way) which provides a pedestrian connection to the south of the East Row Bridge as shown on drawing 11613-004.
The scope of the RSA includes the works associated with the improved site access on to the A174 as shown on Sanderson's drawings referenced 11613-003 and 11613-004.
Design standards applied to the scheme design
The design standards applied are Manual for Streets 2 and those of North Yorkshire County Council.
Design speeds
Speed limit is 30mph adjacent to the site.
Speed limits
A174: Existing 30mph mandatory speed limit.
Data on traffic speeds along the A174 were presented in the Transport Assessment. In the vicinity of the site these were determined from ATC data.
The ATC survey was undertaken by placing automatic traffic counting equipment in two locations on the carriageway over the period 10 th to 16 th November 2017. The ATC equipment was located on the approach to the site access from both directions.
The above ATC data recorded average 85 th percentile wet weather 24hr vehicle speeds of 28.1 mph (southbound) and 14.7 mph (northwest bound).

Existing traffic flows/queues						
Automatic Traffic Count (ATC) surveys were undertaken for a period of 7 consecutive days (10 th to 16 th November 2017) on the A174.						
From the results of the ATCs the 24 hour 5 day average was 2215 vehicles travelling southbound on approach to the site access with the highest 24 hour period being 2320 vehicles (Friday) and the lowest period being 2122 vehicles (Monday). For northwest bound traffic on approach to the site access the 24 hour 5 day average was 2185 with the highest 24 hour period being 2302 vehicles (Thursday) and the lowest period being 2009 vehicles (Monday).						
Forecast traffic flows						
The Transport Assessment presented information on the proposed traffic generation for a 150 space car park based on ticket sales data for Sandsend Car Park (98 spaces) provided by Scarborough Council. The table below shows the predicted traffic generation in the time periods including the traditional network peak periods:-						
	Traffic Generations Weekday			Traffic Generations Weekend		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
AM 0000-0930	6	0	6	13	0	13
PM 1700-2359	2	23	25	4	35	39
Pedestrian, cyclists and equestrian desire lines						
Walking and cycling accessibility is discussed at Section 4 of the Transport Assessment. However, due to the nature of the development, users are expected to arrive and depart the site by car or motor cycle therefore no multimodal trip generation potential is included.						
Environmental constraints						

Table C.4 Locality

Description of Locality
The site is situated off the A174 within Sandsend village.
General description
The A174 is the main coastal route between Teeside and Whitby and serves as the arterial route through Sandsend. Within the vicinity of the site access the A174 is a single carriageway road subject to a speed limit of 30mph.
Approximately midway through Sandsend, adjacent to the site access, the A174 passes over East Row Beck and at this point is known as East Row Bridge. Narrow footways are present on both sides of the bridge, however, in 2017 a separate footbridge was installed adjacent to East Row Bridge to provide an alternative crossing facility for pedestrians and improve highway safety.
Relevant factors which may affect road safety
N/A.

Table C.5 Analysis

Collision data analysis
Personal injury road traffic accident data has been reviewed using the online resource Crashmap and was included in the Transport Assessment. Throughout Sandsend, two incidents resulting in personal injury have been recorded; one 'slight' in severity and one 'serious'. Both incidents occurred in 2018 and both took place in relative proximity to the bus stops adjacent the A174 / Dunsley Lane junction (approximately 400m from the site access)
Departures from standards
None.
Previous road safety audit stage reports, road safety audit response reports and evidence of agreed actions
None undertaken.
Strategic decisions
None.
List of included documents and drawings
Documents Document reference 11613-001-02 TA
Drawings Drawing reference 11613-003:- Access Arrangement Drawing reference 11613-004:- Pedestrian Access Drawing reference 11613-005:- Vehicle Swept Paths North Yorkshire Highway Adoption Plan

Table C.6 Checklist

Tick all that are included and provide reasons for those that are not included			
Site location plan	Within TA	Scale layout plans	✓
Departures and relaxations from standards	None	Construction/ typical details	N/A (Stage1)
Previous RSA reports	None	Previous RSA response reports and evidence of agreed actions	N/A
Collision data and collision data analysis	Within TA	Road traffic collision plot	N/A
Traffic signal staging	None	Traffic counts	In Brief
Speed surveys	In Brief	Pedestrian, cyclist and horse riding desire lines and volumes	In Brief
Walking, cycling and horse riding assessment and reviews	N/A	Items outside the scope of the RSA/ strategic decisions	None
Other factors that may impact on road safety	N/A	Design speeds / speed limits	In Brief
Design standards used	In Brief	Adjacent land uses	Within TA

Prepared on behalf of

The Mulgrave Estate

**Proposed Car Park,
The Mulgrave Estate, Land off the A174
Sandsend**

Stage 1 Road Safety Audit

Acknowledgements:

Disclaimer

The methodology adopted and the sources of information used by Sanderson Associates (Consulting Engineers) Ltd in providing its services are outlined within this Report.

Any information provided by third parties and referred to herein has not been checked or verified by Sanderson Associates (Consulting Engineers) Ltd, unless otherwise expressly stated within this report.

This report was checked and approved on the 9th March 2021 and the Report is therefore valid on this date, circumstances, regulations and professional standards do change which could subsequently affect the validity of this Report.

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Report Ref:	11817/001/02		
Author:	David Colley MCIHT	Date:	9 th March 2021

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Appendices

APPENDIX A

Marked up drawing

1 Introduction

1.1 Sanderson Associates (Consulting Engineers) Ltd have been appointed by The Mulgrave Estate to carry out a Stage 1 Road Safety Audit (RSA) of the highway works comprising of vehicular access improvements from the A174 to serve a proposed new 150 space car park and pedestrian access.

1.2 The Audit Team have been requested to consider the works associated with the improved site access on to the A174 as shown on Sanderson's drawings referenced 11613-003 and 11613-004. The following drawings and information were provided to the Audit Team and the problems listed in Section 2 relate to these drawings and information:

- Drawing reference 11613-003:- Access Arrangement
- Drawing reference 11613-004:- Pedestrian Access
- Drawing reference 11613-005:- Vehicle Swept Paths
- North Yorkshire Highway Adoption Plan
- Transport Assessment reference 11613/001/02 dated December 2020
- Road Safety Audit Brief ref 11613-002-01 dated 1st March 2021

1.3 This Stage 1 Road Safety Audit has been instructed by Sanderson Associates for the Mulgrave Estate Limited on the 1st March 2021 and has been undertaken in accordance with the Audit Brief ref 11613-002-01 dated 1st March 2021 provided to the Audit Team.

1.4 The Audit Team members were as follows:

- Audit Team Leader - David Colley MCIHT, Associate Director at Sanderson Associates
- Audit Team Member – Ashley Armitage MIHE, Assistant Engineer at Sanderson Associates

-
- 1.5 The Audit took place on site on Wednesday 3rd March 2021 and was discussed further by the Audit team. During the site visit the weather was cold and overcast with the road surface being dry.
- 1.6 Reference to the Audit Brief indicates that there are no accidents on the A174 adjacent to the proposed access works. The nearest incidents are noted to have occurred adjacent to the bus stops just to the east of the A174 / Dunsley Lane junction (approximately 400m from the site access) on A174 Sandsend Road.
- 1.7 The proposed access is situated in the same location as an existing access serving a takeaway / restaurant (Fish Cottage), two gift type shops, other buildings, a car park area and access to the Mulgrave Estate woodland to the west. A number of vehicles were observed using the car park and people were walking into the woodland from the A174.
- 1.8 Drawing 11613-003 shows the proposed access layout on to the A174 in the same location as an existing access and drawing 11613-004 shows the internal access route to the proposed car park. Drawing 11613-004 also shows proposals for two new bridges, one for vehicular traffic across the East Row Beck, to access the car park area and one for pedestrians which are approximately 68m apart. A footpath is shown on the southern side of the access road, between the two bridges with the distance to the A174 being circa 110m. Furthermore, the drawing also indicates that vehicle occupants should use an existing footpath route to link between the A174 (on the southern side of the East Row Beck) and the car park. This route is outside the planning application red line as shown on the drawing and a sign (erected by the Mulgrave Estate) adjacent to the A174 states that it is a private drive and no parking. In addition there is a sign approximately 127m from the A174 indicating that a public footpath joins the private drive from the south.
- 1.9 The terms of reference of the Road Safety Audit are as described in GG119 and the Audit Brief. The Audit Team has examined the works and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the works to any other criteria.

-
- 1.10 All of the problems described in Section 2 of this report are considered by the Audit Team to require action in order to improve the safety of the scheme. However, any recommendation included within this report should not be regarded as being a prescriptive design solution to the problem raised. They are intended only to indicate a proportionate means of eliminating or mitigating the identified problem. It is noted that there may be alternative methods of addressing a problem that would be equally acceptable in achieving the desired elimination or mitigation and these should be considered when responding to this report.
- 1.11 A marked up plan is included in **Appendix A**, which identifies the general location of problems that have been raised. General problems or those with multiple locations have not all been shown.
- 1.12 Following the completion of the Road Safety Audit, the design team should prepare a '*Road Safety Audit Response Report*' in collaboration with the Overseeing Organisation. The response report should incorporate the following:
- Decision Log spreadsheet, where each Problem and Recommendation in the Road Safety Audit report is reiterated;
 - In the Decision Log, a response should be provided by the Design Team and then by the Overseeing Organisation for each problem raised. This should then be followed by an agreed action.

Further information to assist the preparation of the Road Safety Audit Response Report is provided in **GG119 Sections 4.11 to 4.19 and Appendix F** (that includes a Road Safety Audit Response Report template). In accordance with GG119, the response report should be produced and finalised within one month of the issue of the Road Safety Audit report. A copy of the response report should be issued to the Road Safety Audit Team for information.

2 Items Raised for the Stage 1 Audit

Problem 1.1:

Location: Existing access and car parking adjacent to the A174.

Summary: Drawings 11613-003 & 004 do not show if the existing parking (adjacent to the A174) is retained and whether pedestrian facilities will be provided along the new access road to access the existing shops, Fish Cottage, other buildings and the woodland. If the car parking is retained in an 'ad hoc' fashion adjacent to the new access road this could lead vehicles manoeuvring on and off the access road in conjunction with people on foot accessing the shops and woodland along the access road leading to pedestrian / vehicle conflict and vehicle / vehicle manoeuvring collisions.

Recommendation: If the car parking (for the shops and Fish Cottage) is to be retained, formalise the parking arrangements and its management and provide pedestrian facilities to access the shops and other buildings on the northern side of the new access road and across the access road junction with the A174, providing dropped kerbs and tactile paving where appropriate.

Problem 1.2:

Location: Existing footpath / private drive along the south side of East Row Beck to the A174.

Summary: Drawing 11613-004 indicates that there is no pedestrian route on to the A174 via the new vehicle access road and that the pedestrian access to / from the car park to the A174 is along the existing footpath / private drive to minimise foot traffic across East Row Bridge. The existing footpath / private drive is in very poor condition in terms of its surfacing and drainage for access on foot and there is no indication of whether improvements are proposed. It is also used for vehicular access to the properties along the private drive. The existing footpath route in its present condition would not be attractive for use by people with pushchairs / wheelchairs, young children and those with mobility / visual impairments and vehicle occupants would likely be attracted to use the new access road since there is a footpath along part of it (between the two proposed bridges) and it is then only a short distance (circa 110m) to the A174 where there are the existing shops and

Fish Cottage. Pedestrians using the new access road in this manner could lead to pedestrian / vehicle conflict if they walk in the carriageway to gain access to the A174.

Recommendation: Provide appropriate improvements to the footpath / private drive in terms of surfacing, drainage, signage and levels / gradients for pedestrians in accordance with the proposed pedestrian access strategy.

Problem 1.3:

Location: Existing footpath / private drive junction with the A174.

Summary: Drawings 11613-003 & 004 do not show if any pedestrian improvements are proposed at the junction of the existing footpath / private drive with the A174. There are existing part time (21 March to 30 September) waiting restrictions on the adopted part of the A174 junction area and a car was observed parking on the private drive part against the existing footway, effectively blocking access to the footway from the private drive. Furthermore, there are no existing dropped kerbs (or tactile paving) or a clear route to indicate how pedestrians should join the existing footway from the end of the private drive. Inadequate pedestrian facilities could lead to conflict between pedestrians and vehicles in the private drive junction area and where vehicles are also negotiating the sharp bend on to the East Row Bridge.

Recommendation: Provide appropriate pedestrian facilities including footway provision, dropped kerbs / tactile paving in the private drive / A174 junction area.

Problem 1.4:

Location: Proposed car park vehicular bridge north and south ends.

Summary: Drawing 11613-004 does not show the vehicle route arrangements at the ends of the proposed car park vehicular bridge, carriageway widths or vehicle swept paths. If the carriageway width is inadequate to allow two way flow at the bridge ends in conjunction with restricted forward visibility across the bends it could lead to head on vehicle collisions.

Recommendation: Provide appropriate carriageway width on the bends for the predicted types of vehicle swept paths and forward visibility taking into account the proposed bridge parapets and abutment walls in conjunction with the pedestrian facilities.

Problem 1.5:

Location: Proposed car park vehicular bridge south end.

Summary: Drawing 11613-004 does not clearly show the proposed pedestrian facilities and dimensions where the pedestrian access route joins the access road just to the south of the vehicle access bridge or across the bridge. In addition 2 pay stations are shown on the northern side of the access road which would require pedestrians to cross the access road from the pedestrian access route. Inadequate pedestrian facilities and width could lead to conflict between pedestrians and vehicles where pedestrians need to cross the access road or walk along it to access the car parking area.

Recommendation: Provide footways / footpath routes of appropriate width on the bends at both ends of the bridge, across the bridge and where the pedestrian access route joins the access road together with provision of pedestrian / vehicle inter-visibility taking into account the proposed bridge parapets and abutment walls in conjunction with the proposed pedestrian facilities. If the pay stations are relocated to the southern side this would reduce the need for pedestrians to cross the access road.

Problem 1.6:

Location: Proposed car park vehicular bridge.

Summary: Drawing 11613-004 does not show the proposed dimensions of the vehicle access bridge. It is not clear from the drawings if the car park would remain open if maintenance operations are needed to the bridge. Adequate width would be required to allow for at least single file traffic (vehicle and pedestrian) together with working room for maintenance operations if the car park is not closed. Inadequate width could lead to conflict between pedestrians / vehicles and construction operatives carrying out maintenance activities on the bridge.

Recommendation: Provide appropriate bridge widths for the proposed maintenance strategy and its management.

3 Audit Team Statement

3.1 We certify that the terms of reference of the audit are as described in GG119.

AUDIT TEAM LEADER:

Name: David Colley MCIHT
Highways England Approved RSA Certificate of Competency

Position: Associate Director at Sanderson Associates (Consulting Engineers) Ltd

Sanderson Associates (Consulting Engineers) Ltd

Signed:

Date: 9th March 2021

.....

AUDIT TEAM MEMBER:

Name Ashley Armitage MIHE

Position: Assistant Engineer at Sanderson Associates (Consulting Engineers) Ltd

Sanderson Associates (Consulting Engineers) Ltd

Signed:

Date: 9th March 2021

.....

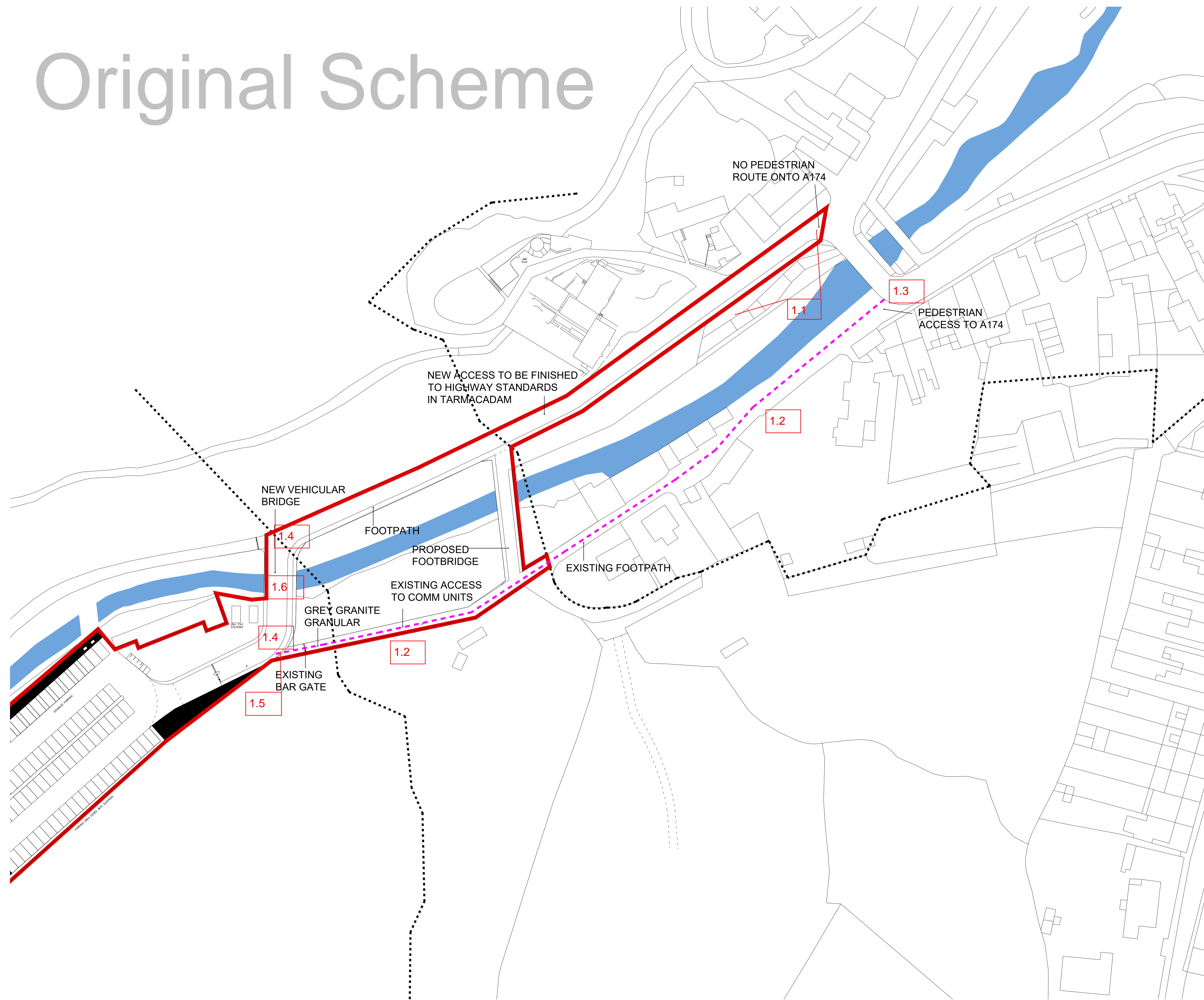
Road Safety Audit

APPENDIX A

Marked up drawing



Original Scheme



- Sanderson Associates (Consulting Engineers) Ltd ("the consultant"), has not checked or verified, and shall have no liability whatsoever for any inaccuracies which may be attributable to any data, reports, base plan(s) and drawings provided by the client, or purchased by the consultant on the client's behalf, that may have been utilised within this drawing.
- The consultant shall not be liable for the use by any person of any document for any purpose other than that for which the same were provided by the consultant.
- No liability whatsoever is accepted by the consultant for any error or omissions.
- The consultant accepts no liability for any vehicle specification errors within the vehicle track software used and / or its vehicle libraries.
- The locations of utilities apparatus, if shown, is reproduced from plans supplied to the consultant, although care has been taken when duplicating this information. These locations are approximate only and no guarantee can be given for their accuracy. It is the client's or its appointed agent/contractors responsibility to verify the exact locations on site by hand dug trial holes or other appropriate means prior to mechanical excavation.
- Service connections are not shown but their presence should be anticipated.
- Reference to any third party equipment shown on this drawing was only relevant at the time the drawing was prepared.
- It is the client's responsibility to ensure that any equipment ordered meets the design.



--- PEDESTRIAN ACCESS TO A174

1.1

Rev	Amendment	Drawn	Date	Checked

sanderson[®]
associates
 (consulting engineers) ltd
 Highways | Traffic | Transportation | Water
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Client
 The Mulgrave Estate

Project Title
 Sandsend Scheme, Whitby

Drawing Title
 Proposed Pedestrian Route

Scale	1:500	Drawn By	BL
Drawing Size	A1	Checked By	SB
Date	Feb 2021	Approved By	KS

Drawing Number	11613-004	Rev	
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APPENDIX C
Designer's Response

Prepared on behalf of

The Mulgrave Estate

**Proposed Car Park,
The Mulgrave Estate, Land off the A174
Sandsend**

**Designers Response to
Stage 1 Road Safety Audit**

Acknowledgements:

Disclaimer

The methodology adopted and the sources of information used by Sanderson Associates (Consulting Engineers) Ltd in providing its services are outlined within this Report.

Any information provided by third parties and referred to herein has not been checked or verified by Sanderson Associates (Consulting Engineers) Ltd, unless otherwise expressly stated within this report.

This report was checked and approved on the 19th May 2021 and the Report is therefore valid on this date, circumstances, regulations and professional standards do change which could subsequently affect the validity of this Report.

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Report Ref:	11613/004/01		
Prepared By	Brett Littlewood		
Checked and Approved	Karen Smith MIHE	Date:	19 th May 2021

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Appendices

APPENDIX A

Road Safety Audit Decision Log

APPENDIX B

Drawing 11613-006

Report title:	Designers Response to Stage 1 RSA
Date:	May 2021
Document reference and revision:	11613-004-01
Prepared by:	Sanderson Associates (Consulting Engineers) Ltd
On behalf of:	The Mulgrave Estate

Project:	Proposed Car Park
Report title:	Designers Response to Stage 1 Road Safety Audit
Prepared by:	
Name:	Brett Littlewood
Position:	Engineer
Signed:	
Organisation:	Sanderson Associates (Consulting Engineers) Limited
Date:	19 th May 2021
Approved by:	
Name:	
Position:	
Signed	
Organisation:	
Date:	

1 Introduction

1.1 Sanderson Associates (Consulting Engineers) Ltd have been appointed by The Mulgrave Estate to prepare a Designer's Response to the Stage 1 Road Safety Audit (RSA) of the highway works comprising of vehicular access improvements from the A174 to serve a proposed new 150 space car park and pedestrian access.

1.2 The Audit Team considered the works associated with the improved site access on to the A174 as shown on Sanderson's drawings referenced 11613-003 and 11613-004. The following drawings and information were provided to the Audit Team and the problems listed in Section 2 relate to these drawings and information:

- Drawing reference 11613-003:- Access Arrangement
- Drawing reference 11613-004:- Pedestrian Access
- Drawing reference 11613-005:- Vehicle Swept Paths
- North Yorkshire Highway Adoption Plan
- Transport Assessment reference 11613/001/02 dated December 2020
- Road Safety Audit Brief ref 11613-002-01 dated 1st March 2021

1.3 The Audit Team members were as follows:

- Audit Team Leader - David Colley MCIHT, Associate Director at Sanderson Associates
- Audit Team Member – Ashley Armitage MIHE, Assistant Engineer at Sanderson Associates

2 Items Raised from the Stage 1 Road Safety Audit

Please also refer to the appended Road Safety Audit Decision Log at **Appendix A**

Problem 1.1:

Location: Existing access and car parking adjacent to the A174.

Summary: Drawings 11613-003 & 004 do not show if the existing parking (adjacent to the A174) is retained and whether pedestrian facilities will be provided along the new access road to access the existing shops, Fish Cottage, other buildings and the woodland. If the car parking is retained in an 'ad hoc' fashion adjacent to the new access road this could lead vehicles manoeuvring on and off the access road in conjunction with people on foot accessing the shops and woodland along the access road leading to pedestrian / vehicle conflict and vehicle / vehicle manoeuvring collisions.

Recommendation: If the car parking (for the shops and Fish Cottage) is to be retained, formalise the parking arrangements and its management and provide pedestrian facilities to access the shops and other buildings on the northern side of the new access road and across the access road junction with the A174, providing dropped kerbs and tactile paving where appropriate.

Designers Response: *The existing 2 N° shops and bistro have existing access to designated spaces located in proximity to the site access. The units will remain to have access to designated parking, however, the spaces will be provided in an alternative location (to be agreed) in order to accommodate the proposed layout.*

Problem 1.2:

Location: Existing footpath / private drive along the south side of East Row Beck to the A174.

Summary: Drawing 11613-004 indicates that there is no pedestrian route on to the A174 and that the pedestrian access to / from the car park to the A174 is along the existing footpath / private drive. It is understood that this relates to vehicle occupants accessing the car parking where the existing footpath should be used to minimise foot traffic across East Row Bridge. The existing footpath / private drive is in very poor condition in terms of its surfacing and drainage for access on foot and there is no indication of whether improvements are proposed. It is also used for vehicular access to the properties along the private drive. The existing footpath route in its present condition would not be attractive for use by people with pushchairs / wheelchairs, young children and those with mobility / visual impairments and vehicle occupants would likely be attracted to use the new access road since there is a footpath along part of it (between the two proposed bridges) and it is then only a short distance (circa 110m) to the A174 where there are the existing shops and Fish Cottage. Pedestrians using the new access road in this manner could lead to pedestrian / vehicle conflict if they walk in the carriageway to gain access to the A174.

Recommendation: Provide appropriate improvements to the footpath / private drive in terms of surfacing, drainage, signage and levels / gradients for pedestrians in accordance with the proposed pedestrian access strategy.

Designers Response: *An alternative pedestrian access strategy has been developed which does not involve pedestrian movements along the unmade sections of the private road. Pedestrians will utilise a proposed footbridge located ~45m south-west of the A174 East Row Bridge to cross between the vehicle access road to the north of the beck and the private road to the south of the beck. A suitably surfaced, delineated footway is proposed along the southern side of the private road between the footbridge and existing pedestrian infrastructure along the A174. The proposed pedestrian improvements are shown on drawing 11613-006 at **Appendix B**.*

Problem 1.3:

Location: Existing footpath / private drive junction with the A174.

Summary: Drawings 11613-003 & 004 do not show if any pedestrian improvements are proposed at the junction of the existing footpath / private drive with the A174. There are existing part time (21 March to 30 September) waiting restrictions on the adopted part of the A174 junction area and a car was observed parking on the private drive part against the existing footway, effectively blocking access to the footway from the private drive. Furthermore, there are no existing dropped kerbs (or tactile paving) or a clear route to indicate how pedestrians should join the existing footway from the end of the private drive. Inadequate pedestrian facilities could lead to conflict between pedestrians and vehicles in the private drive junction area and where vehicles are also negotiating the sharp bend on to the East Row Bridge.

Recommendation: Provide appropriate pedestrian facilities including footway provision, dropped kerbs / tactile paving in the private drive / A174 junction area.

Designers Response: *A suitably surfaced, delineated footway is proposed along the southern side of the private road from the footbridge and will tie in directly with the existing pedestrian infrastructure along the A174. This is shown on drawing 11613-006 at Appendix B.*

Problem 1.4:

Location: Proposed car park vehicular bridge north and south ends.

Summary: Drawing 11613-004 does not show the vehicle route arrangements at the ends of the proposed car park vehicular bridge, carriageway widths or vehicle swept paths. If the carriageway width is adequate to allow two way flow at the bridge ends in conjunction with restricted forward visibility across the bends it could lead to head on vehicle collisions.

Recommendation: Provide appropriate carriageway width on the bends for the predicted types of vehicle swept paths and forward visibility taking into account the proposed bridge parapets and abutment walls in conjunction with the pedestrian facilities.

Designers Response: *The bridge alignment and carriageway widths have been slightly amended to ensure that two-way vehicle flow can be accommodated at both ends of the bridge.*

Problem 1.5:

Location: Proposed car park vehicular bridge south end.

Summary: Drawing 11613-004 does not clearly show the proposed pedestrian facilities and dimensions where the pedestrian access route joins the access road just to the south of the vehicle access bridge or across the bridge. Inadequate pedestrian facilities and width could lead to conflict between pedestrians and vehicles where pedestrians need to cross the access road or walk along it to access the car parking area.

Recommendation: Provide footways / footpath routes of appropriate width on the bends at both ends of the bridge, across the bridge and where the pedestrian access route joins the access road together with provision of pedestrian / vehicle inter-visibility taking into account the proposed bridge parapets and abutment walls in conjunction with the proposed pedestrian facilities. If the pay stations are relocated to the southern side this would reduce the need for pedestrians to cross the access road.

Designers Response:- *A continuous 2.0m wide pedestrian footway is proposed from the car park, along the access road to the proposed pedestrian footbridge located ~45m to the south-west of East Row Bridge. The footway will include 1.0m high bird-mouth fencing along the top of embankment to prevent falling from height and a 0.45m high chain-link fence will be provided along the edge of footway / edge of carriageway.*

Problem 1.6:

Location: Proposed car park vehicular bridge.

Summary: Drawing 11613-004 does not show the proposed dimensions of the vehicle access bridge. It is not clear from the drawings if the car park would remain open if maintenance operations are needed to the bridge. Adequate width would be required to allow for at least single file traffic (vehicle and pedestrian) together with working room for maintenance operations if the car park is not closed. Inadequate width could lead to conflict between pedestrians / vehicles and construction operatives carrying out maintenance activities on the bridge.

Recommendation: Provide appropriate bridge widths for the proposed maintenance strategy and its management.

Designers Response: *Car park will be closed during bridge maintenance periods. The car park is to operate on a seasonal basis and any maintenance will be programmed to take place during these non-operational periods.*

Designer's Response

APPENDIX A

Road Safety Audit Decision Log

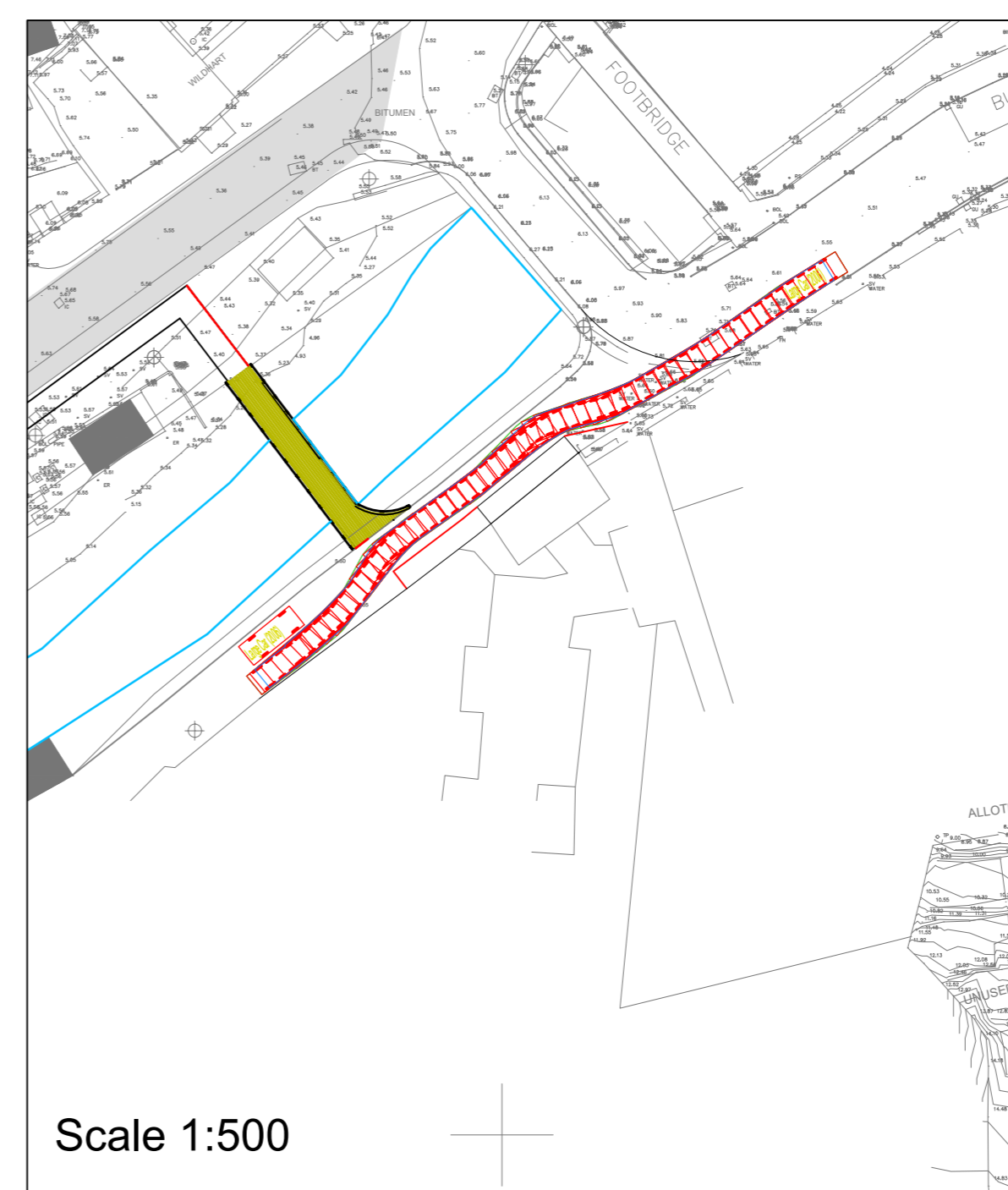
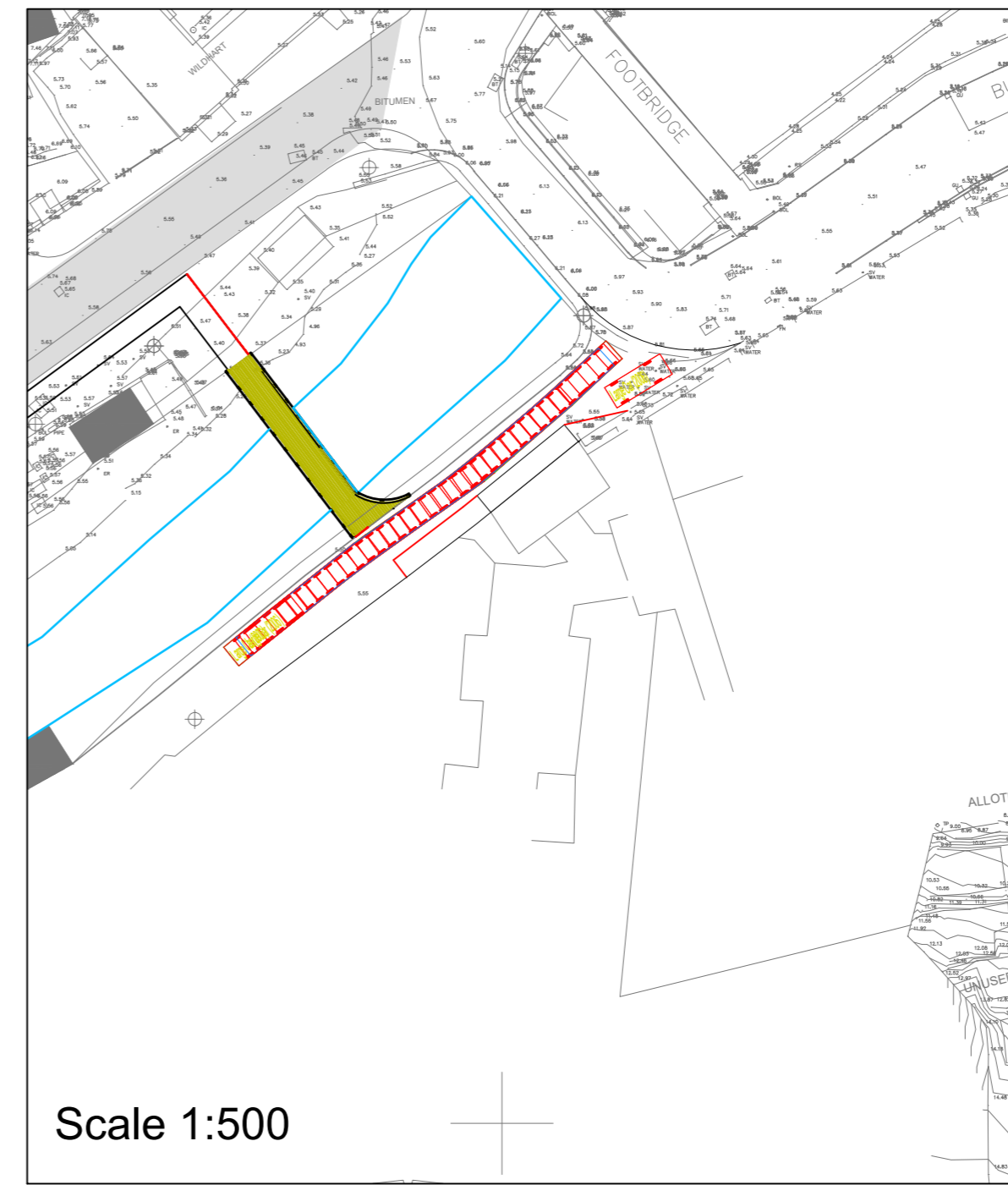
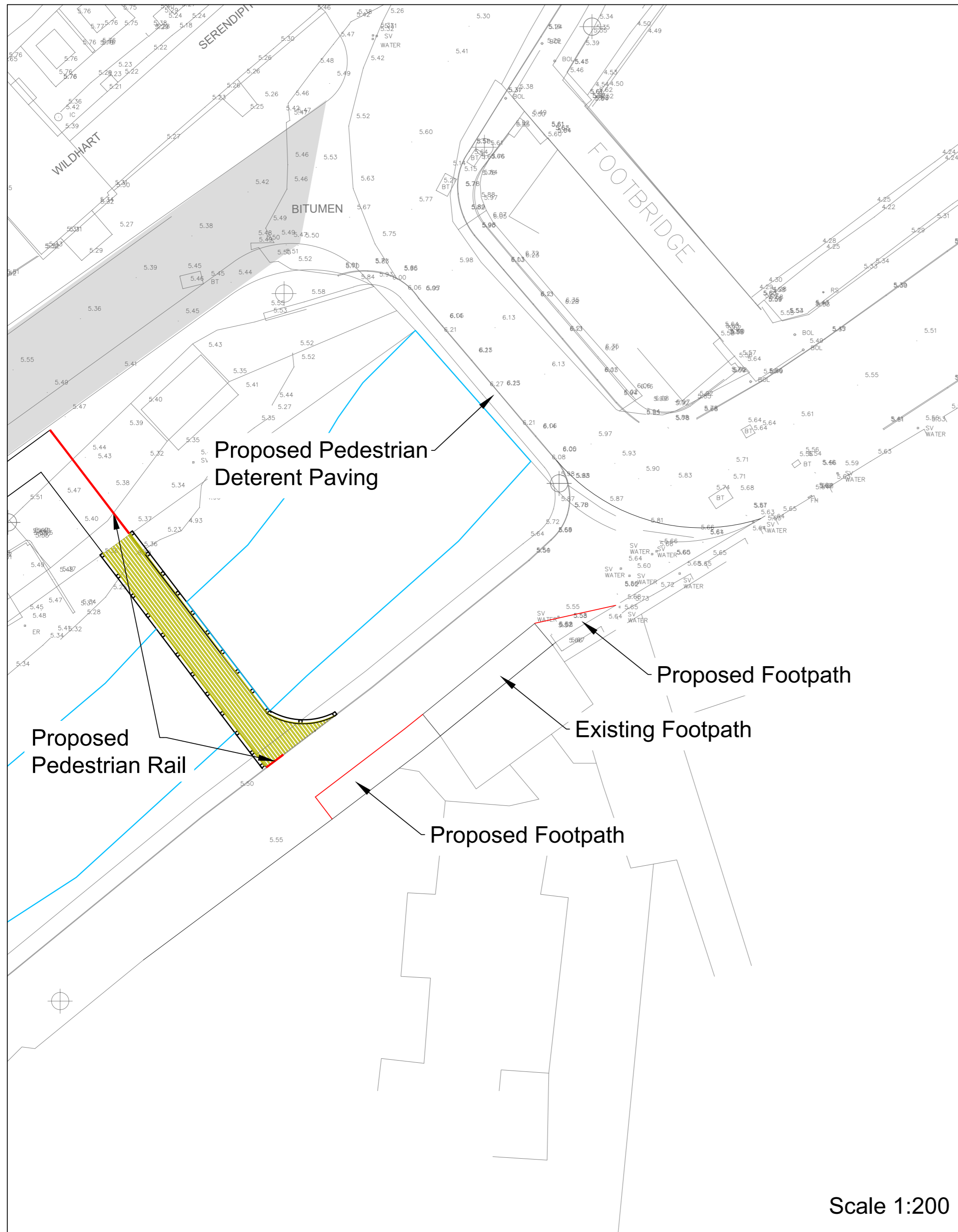
ROAD SAFETY AUDIT STAGE 1

RSA problem	RSA recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA action
<p>Problem 1.1: Location: Existing access and car parking adjacent to the A174. Summary: Drawings 11613-003 & 004 do not show if the existing parking (adjacent to the A174) is retained and whether pedestrian facilities will be provided along the new access road to access the existing shops, Fish Cottage, other buildings and the woodland. If the car parking is retained in an 'ad hoc' fashion adjacent to the new access road this could lead vehicles manoeuvring on and off the access road in conjunction with people on foot accessing the shops and woodland along the access road leading to pedestrian / vehicle conflict and vehicle / vehicle manoeuvring collisions.</p>	<p>If the car parking (for the shops and Fish Cottage) is to be retained, formalise the parking arrangements and its management and provide pedestrian facilities to access the shops and other buildings on the northern side of the new access road and across the access road junction with the A174, providing dropped kerbs and tactile paving where appropriate.</p>	<p>The existing 2 N° shops and bistro have existing access to designated spaces located in proximity to the site access. The units will remain to have access to designated parking, however, the spaces will be provided in an alternative location (to be agreed) in order to accommodate the proposed layout.</p>		
<p>Problem 1.2: Location: Existing footpath / private drive along the south side of East Row Beck to the A174. Summary: Drawing 11613-004 indicates that there is no pedestrian route on to the A174 and that the pedestrian access to / from the car park to the A174 is along the existing footpath / private drive. It is understood that this relates to vehicle occupants accessing the car parking where the existing footpath should be used to minimise foot traffic across East Row Bridge. The existing footpath / private drive is in very poor condition in terms of its surfacing and drainage for access on foot and there is no indication of whether improvements are proposed. It is also used for vehicular access to the properties along the private drive. The existing footpath route in its present condition would not be attractive for use by people with pushchairs / wheelchairs, young children and those with mobility / visual impairments and vehicle occupants would likely be attracted to use the new access road since there is a footpath along part of it (between the two proposed bridges) and it is then only a short distance (circa 110m) to the A174 where there are the existing shops and Fish Cottage. Pedestrians using the new access road in this manner could lead to pedestrian / vehicle conflict if they walk in the carriageway to gain access to the A174.</p>	<p>Provide appropriate improvements to the footpath / private drive in terms of surfacing, drainage, signage and levels / gradients for pedestrians in accordance with the proposed pedestrian access strategy.</p>	<p>An alternative pedestrian access strategy has been developed which does not involve pedestrian movements along the unmade sections of the private road. Pedestrians will utilise a proposed footbridge located ~45m south-west of the A174 East Row Bridge to cross between the vehicle access road to the north of the beck and the private road to the south of the beck. A suitably surfaced, delineated footway is proposed along the southern side of the private road between the footbridge and existing pedestrian infrastructure along the A174. The proposed pedestrian improvements are shown on drawing 11613-006 at Appendix B.</p>		
<p>Problem 1.3: Location: Existing footpath / private drive junction with the A174. Summary: Drawings 11613-003 & 004 do not show if any pedestrian improvements are proposed at the junction of the existing footpath / private drive with the A174. There are existing part time (21 March to 30 September) waiting restrictions on the adopted part of the A174 junction area and a car was observed parking on the private drive part against the existing footway, effectively blocking access to the footway from the private drive. Furthermore, there are no existing dropped kerbs (or tactile paving) or a clear route to indicate how pedestrians should join the existing footway from the end of the private drive. Inadequate pedestrian facilities could lead to conflict between pedestrians and vehicles in the private drive junction area and where vehicles are also negotiating the sharp bend on to the East Row Bridge.</p>	<p>Provide appropriate pedestrian facilities including footway provision, dropped kerbs / tactile paving in the private drive / A174 junction area.</p>	<p>A suitably surfaced, delineated footway is proposed along the southern side of the private road from the footbridge and will tie in directly with the existing pedestrian infrastructure along the A174. This is shown on drawing 11613-006 at Appendix B.</p>		
<p>Problem 1.4: Location: Proposed car park vehicular bridge north and south ends. Summary: Drawing 11613-004 does not show the vehicle route arrangements at the ends of the proposed car park vehicular bridge, carriageway widths or vehicle swept paths. If the carriageway width is adequate to allow two way flow at the bridge ends in conjunction with restricted forward visibility across the bends it could lead to head on vehicle collisions.</p>	<p>Provide appropriate carriageway width on the bends for the predicted types of vehicle swept paths and forward visibility taking into account the proposed bridge parapets and abutment walls in conjunction with the pedestrian facilities.</p>	<p>The bridge alignment and carriageway widths have been slightly amended to ensure that two-way vehicle flow can be accommodated at both ends of the bridge.</p>		
<p>Problem 1.5: Location: Proposed car park vehicular bridge south end. Summary: Drawing 11613-004 does not clearly show the proposed pedestrian facilities and dimensions where the pedestrian access route joins the access road just to the south of the vehicle access bridge or across the bridge. Inadequate pedestrian facilities and width could lead to conflict between pedestrians and vehicles where pedestrians need to cross the access road or walk along it to access the car parking area.</p>	<p>Provide footways / footpath routes of appropriate width on the bends at both ends of the bridge, across the bridge and where the pedestrian access route joins the access road together with provision of pedestrian / vehicle inter-visibility taking into account the proposed bridge parapets and abutment walls in conjunction with the proposed pedestrian facilities. If the pay stations are relocated to the southern side this would reduce the need for pedestrians to cross the access road.</p>	<p>A continuous 2.0m wide pedestrian footway is proposed from the car park, along the access road to the proposed pedestrian footbridge located ~45m to the south-west of East Row Bridge. The footway will include 1.0m high bird-mouth fencing along the top of embankment to prevent falling from height and a 0.45m high chain-link fence will be provided along the edge of footway / edge of carriageway.</p>		
<p>Problem 1.6: Location: Proposed car park vehicular bridge. Summary: Drawing 11613-004 does not show the proposed dimensions of the vehicle access bridge. It is not clear from the drawings if the car park would remain open if maintenance operations are needed to the bridge. Adequate width would be required to allow for at least single file traffic (vehicle and pedestrian) together with working room for maintenance operations if the car park is not closed. Inadequate width could lead to conflict between pedestrians / vehicles and construction operatives carrying out maintenance activities on the bridge.</p>	<p>Provide appropriate bridge widths for the proposed maintenance strategy and its management.</p>	<p>Car park will be closed during bridge maintenance periods. The car park is to operate on a seasonal basis and any maintenance will be programmed to take place during these non-operational periods.</p>		

Designer's Response

APPENDIX B

Drawing 11613-006



	Large Car (2006)
5.079m	Overall Length
1.872m	Overall Width
1.525m	Overall Body Height
0.310m	Min Body Ground Clearance
1.831m	Max Track Width
4.03s	Lock to lock time
5.900m	Kerb to Kerb Turning Radius

Rev	Amendment	Drawn	Date	Checked

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Client
 The Mulgrave Estate

Project Title
 Sandsend Scheme, Whitby

Drawing Title
 Proposed Pedestrian Route

Scale	As Shown	Drawn By	BL
Drawing Size	A2	Checked By	SB
Date	May 2021	Approved By	KS

	Drawing Number	Rev
ISO 9001 REGISTERED FIRM	11613-006	

APPENDIX D

ATC Data

Whitby ATC 1, A174 (Northern Site)

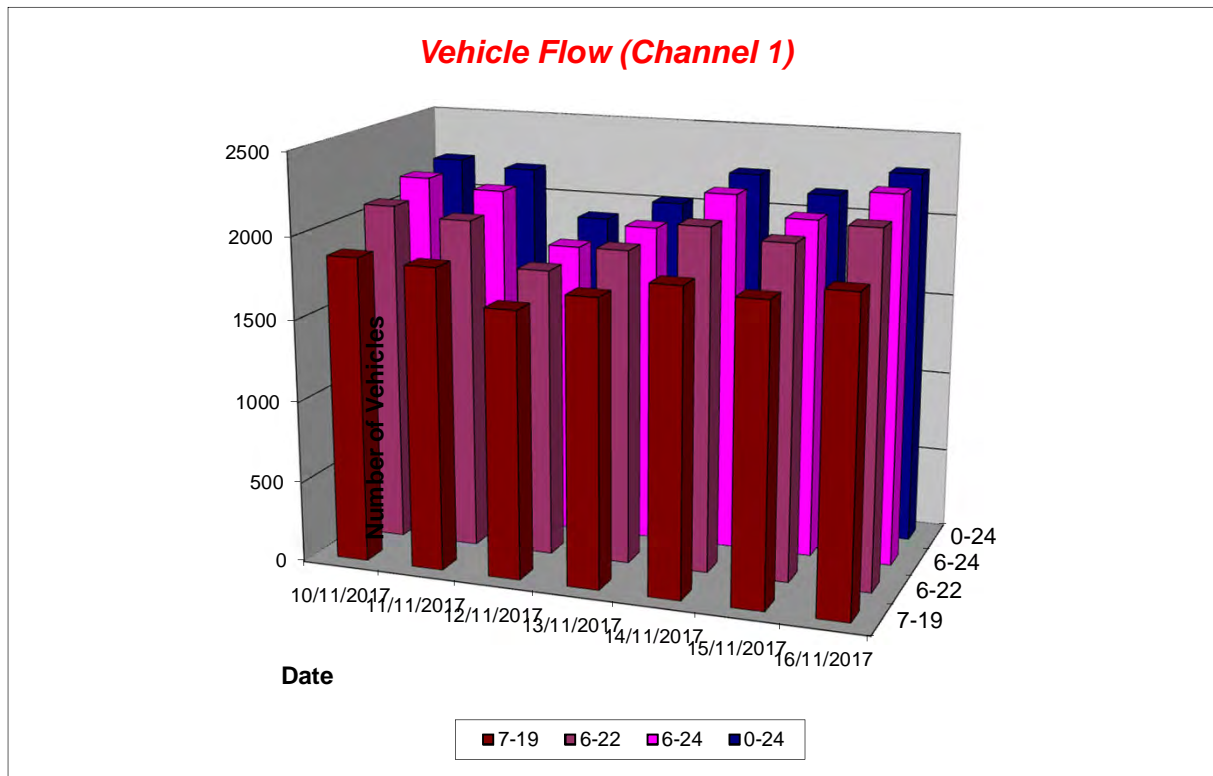
Produced by Road Data Services Ltd.

Channel 1 - Northbound

Vehicle Flow

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday	5 Day Ave	7 Day Ave
1	6	22	40	13	10	9	12	10	16
2	2	9	14	5	2	5	2	3	6
3	0	3	10	3	1	4	2	2	3
4	1	6	11	4	1	4	1	2	4
5	3	6	1	8	7	11	4	7	6
6	27	10	9	29	18	28	14	23	19
7	29	12	10	29	38	24	45	33	27
8	86	40	28	106	98	104	91	97	79
9	118	59	30	125	139	129	148	132	107
10	143	95	93	147	126	156	128	140	127
11	142	160	177	140	137	134	143	139	148
12	158	167	181	166	153	168	163	162	165
13	163	188	213	131	162	129	170	151	165
14	167	221	198	131	163	139	158	152	168
15	202	211	178	177	194	181	187	188	190
16	222	224	212	203	224	211	244	221	220
17	211	227	155	177	204	199	202	199	196
18	159	151	102	166	148	165	148	157	148
19	100	107	70	83	110	103	119	103	99
20	80	70	39	59	88	63	93	77	70
21	55	54	49	39	52	61	63	54	53
22	54	46	30	43	60	69	55	56	51
23	60	54	31	34	66	26	67	51	48
24	30	41	16	8	36	17	38	26	27
7-19	1871	1850	1637	1752	1858	1818	1901	1840	1812
6-22	2089	2032	1765	1922	2096	2035	2157	2060	2014
6-24	2179	2127	1812	1964	2198	2078	2262	2136	2089
0-24	2218	2183	1897	2026	2237	2139	2297	2183	2142



Whitby ATC 1, A174 (Northern Site)

Produced by Road Data Services Ltd.

Channel 1 - Northbound

Average Speed

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	24.7	27.4	24.8	25.7	27.6	26.2	27.4
2	30.0	27.0	26.7	25.2	26.3	24.4	24.4
3	-	25.3	26.8	30.7	25.3	30.0	29.1
4	27.6	26.6	25.5	25.4	26.8	25.0	27.7
5	28.7	30.1	25.9	25.3	24.3	25.1	24.8
6	27.3	28.2	25.0	26.5	26.4	26.7	26.1
7	25.5	24.0	23.8	25.9	25.0	25.3	25.1
8	23.7	24.0	25.0	24.6	23.8	24.6	24.0
9	24.3	23.4	23.6	24.0	23.2	23.6	23.4
10	23.6	23.5	22.4	23.8	23.7	23.3	23.7
11	22.0	21.6	21.7	22.7	22.4	22.6	22.6
12	23.0	22.1	21.9	22.9	22.9	22.5	22.8
13	22.9	22.5	21.4	22.2	23.3	22.2	23.0
14	22.8	21.9	21.0	22.8	23.1	22.6	22.9
15	22.6	22.8	21.6	22.2	22.7	21.9	22.6
16	22.8	22.4	22.3	23.1	22.3	22.6	22.7
17	23.5	23.2	23.0	23.4	23.1	23.2	23.2
18	24.2	23.5	23.8	24.3	23.8	23.8	24.3
19	24.5	23.3	24.3	24.3	24.6	25.2	24.7
20	25.0	24.1	25.0	24.2	24.4	25.3	24.4
21	24.7	23.3	24.7	25.0	25.8	23.9	25.7
22	24.9	25.8	24.6	25.7	25.2	24.8	24.9
23	25.1	23.9	23.8	26.6	25.0	26.2	24.8
24	25.4	25.3	25.3	29.7	25.5	26.3	25.4

10-12	22.5	21.9	21.8	22.8	22.7	22.5	22.7
14-16	22.7	22.6	21.9	22.7	22.5	22.3	22.6
0-24	23.6	23.0	22.5	23.6	23.5	23.4	23.5

Average	23.3
---------	------

Channel 1 - Northbound

85th Percentile

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	28.6	32.7	28.4	29.8	32.0	30.3	33.8
2	33.3	28.5	30.1	29.3	27.1	27.8	26.6
3	-	27.6	29.5	33.9	-	33.0	29.4
4	-	28.9	29.9	27.5	-	28.7	-
5	30.6	34.0	-	29.5	27.5	28.8	27.0
6	31.2	30.7	28.0	29.0	28.8	29.4	28.9
7	29.1	29.0	28.9	29.8	27.9	29.8	28.6
8	27.4	28.3	29.5	28.1	27.7	28.2	27.3
9	27.2	26.3	27.2	27.5	27.1	26.9	27.8
10	27.3	26.9	25.5	28.2	27.2	27.4	27.5
11	26.4	24.8	24.9	25.9	25.8	26.4	25.4
12	27.1	25.6	25.5	26.4	25.7	25.6	25.8
13	26.3	25.7	25.1	25.1	26.8	25.4	26.3
14	26.7	24.7	24.6	26.3	26.5	25.7	26.5
15	25.7	25.7	25.1	25.6	25.7	25.5	25.5
16	25.9	25.3	25.4	26.2	25.3	26.1	25.8
17	27.0	26.3	26.1	27.1	26.5	26.6	26.8
18	28.1	26.3	27.0	27.9	27.6	27.8	28.2
19	27.6	25.7	28.4	27.6	28.5	28.6	28.7
20	29.3	27.4	28.6	27.7	27.3	28.6	27.3
21	27.8	27.2	29.0	28.7	29.4	28.5	29.2
22	28.6	30.2	28.0	30.2	29.7	28.7	27.9
23	27.9	27.8	27.9	29.6	29.3	29.8	27.6
24	29.4	27.8	27.4	33.5	28.4	31.9	28.3

10-12	26.7	25.3	25.3	26.2	25.8	26.2	25.6
14-16	25.9	25.6	25.4	25.9	25.5	25.8	25.6
0-24	27.4	26.3	26.3	27.5	27.2	27.3	27.3

85th %ile	27.2
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Whitby ATC 1, A174 (Northern Site)

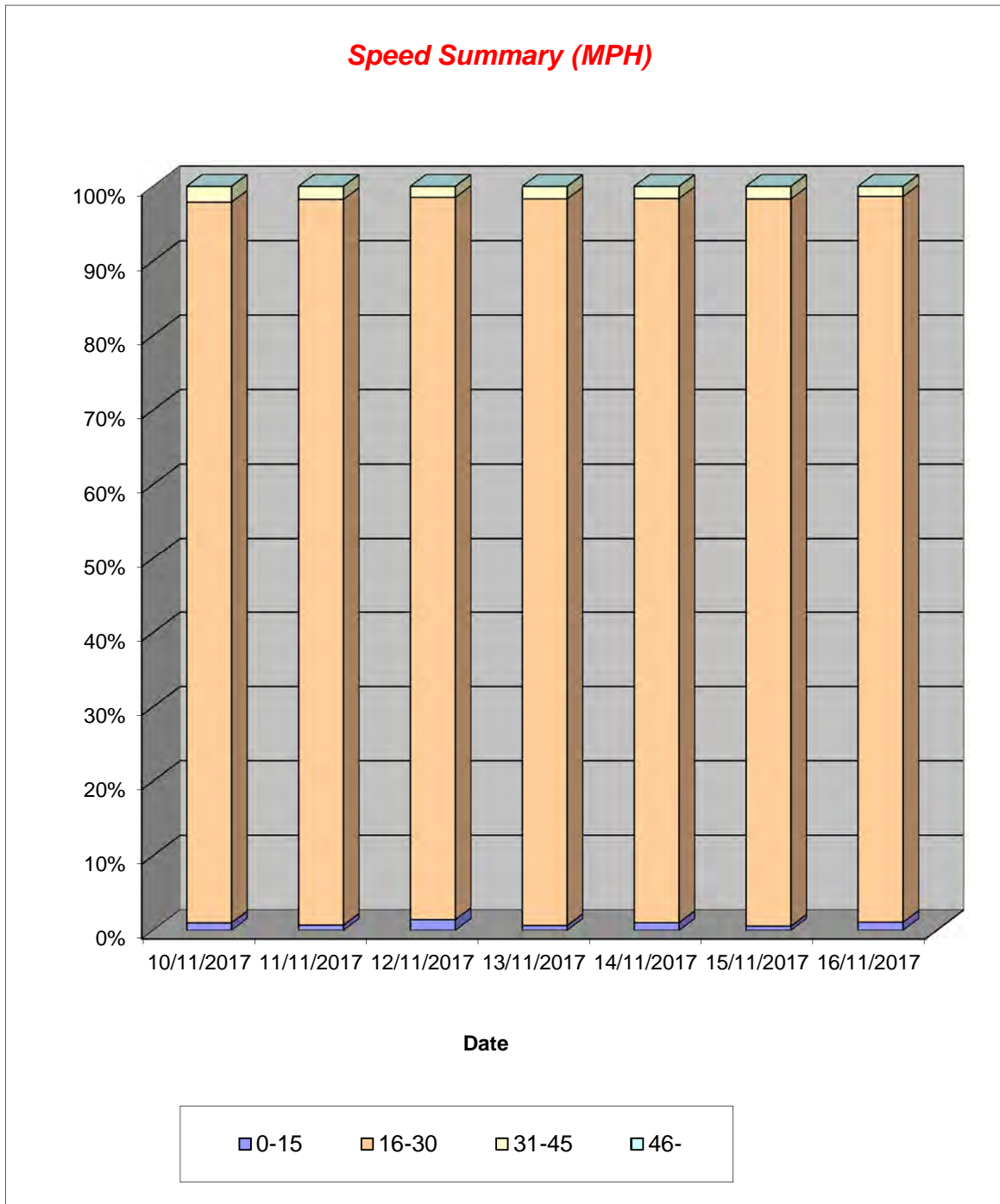
Produced by Road Data Services Ltd.

Channel 1 - Northbound

Speed Summary

Week 1

Speed (MPH)	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
0-15	22	15	27	13	23	12	25
16-30	2149	2130	1842	1979	2178	2091	2241
31-45	47	38	28	34	36	36	31
46-	0	0	0	0	0	0	0
TOTAL	2218	2183	1897	2026	2237	2139	2297

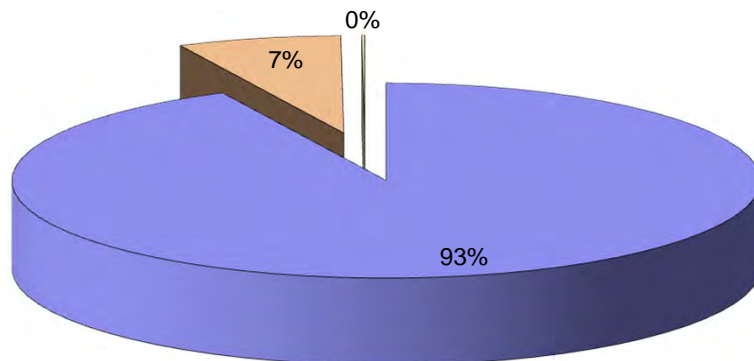


Whitby ATC 1, A174 (Northern Site)

Produced by Road Data Services Ltd.

Channel 1 - Northbound		Vehicle Class			Week 1
Classes Day / Time	Car / LGV / Caravan - 1	OGV1 / Bus - 2,3,5,6,7,12	OGV2 - 4,8,9,10,11,13	TOTAL - 1-13	
10/11/2017					
7-19	1691	178	2	1871	
6-22	1896	191	2	2089	
6-24	1986	191	2	2179	
0-24	2023	193	2	2218	
11/11/2017					
7-19	1750	96	4	1850	
6-22	1921	106	5	2032	
6-24	2010	112	5	2127	
0-24	2063	115	5	2183	
12/11/2017					
7-19	1590	45	2	1637	
6-22	1713	49	3	1765	
6-24	1756	53	3	1812	
0-24	1836	58	3	1897	
13/11/2017					
7-19	1627	123	2	1752	
6-22	1787	133	2	1922	
6-24	1828	134	2	1964	
0-24	1883	141	2	2026	
14/11/2017					
7-19	1690	167	1	1858	
6-22	1913	182	1	2096	
6-24	2015	182	1	2198	
0-24	2052	184	1	2237	
15/11/2017					
7-19	1667	148	3	1818	
6-22	1870	162	3	2035	
6-24	1908	167	3	2078	
0-24	1963	173	3	2139	
16/11/2017					
7-19	1720	180	1	1901	
6-22	1960	194	3	2157	
6-24	2065	194	3	2262	
0-24	2097	197	3	2297	
Average					
7-19	1676	134	2	1812	
6-22	1866	145	3	2014	
6-24	1938	148	3	2089	
0-24	1988	152	3	2142	

Total Vehicle Class Distribution



Whitby ATC 1, A174 (Northern Site)

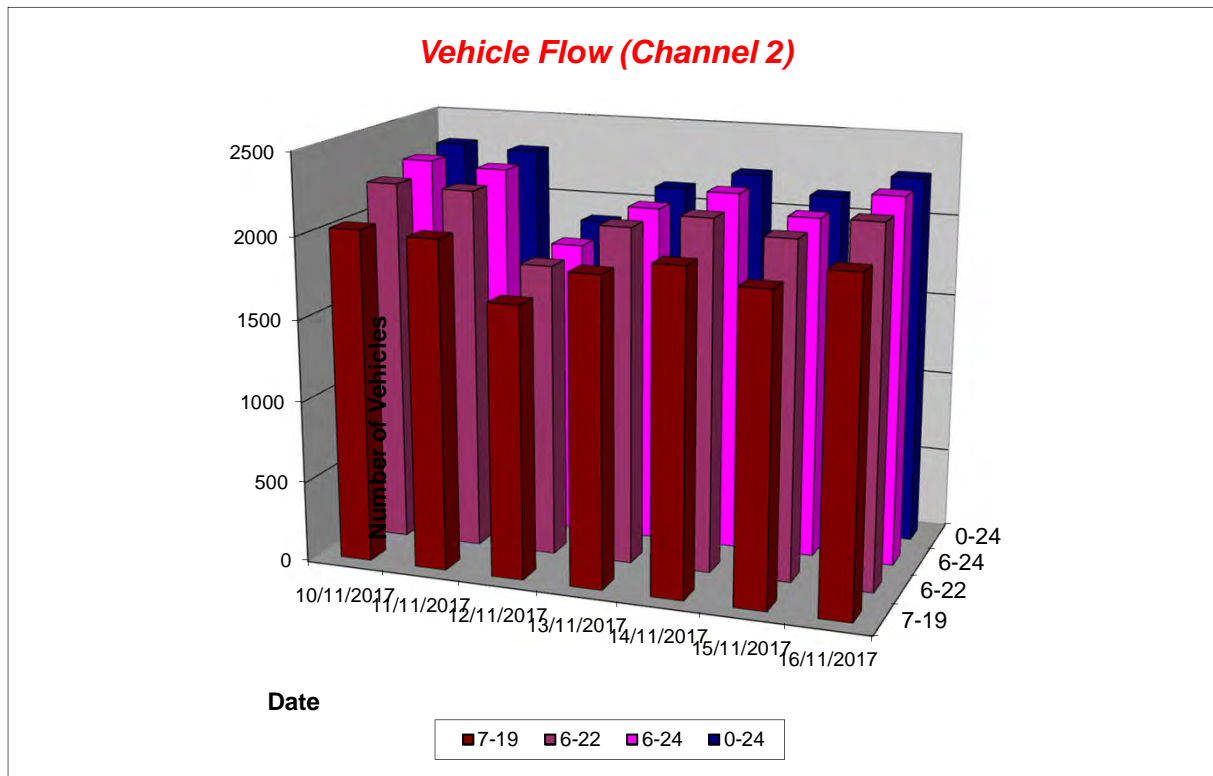
Produced by Road Data Services Ltd.

Channel 2 - Southbound

Vehicle Flow

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday	5 Day Ave	7 Day Ave
1	3	9	27	4	2	3	3	3	7
2	1	6	12	10	1	8	1	4	6
3	1	9	5	3	2	2	2	2	3
4	1	3	6	0	1	0	1	1	2
5	5	1	1	5	4	6	4	5	4
6	21	12	4	19	19	22	14	19	16
7	47	27	15	46	41	56	45	47	40
8	137	71	53	141	134	141	143	139	117
9	225	108	62	209	191	201	202	206	171
10	181	169	128	177	169	167	169	173	166
11	176	174	207	169	182	156	181	173	178
12	178	221	183	149	157	145	163	158	171
13	198	254	220	169	203	161	206	187	202
14	176	228	204	161	172	152	172	167	181
15	170	230	227	150	161	149	156	157	178
16	201	227	143	178	204	200	214	199	195
17	181	158	115	189	184	186	194	187	172
18	109	116	73	109	109	125	102	111	106
19	104	60	53	82	104	93	106	98	86
20	64	78	46	60	60	56	62	60	61
21	43	52	36	41	42	50	44	44	44
22	35	38	27	29	33	22	30	30	31
23	30	30	18	17	26	17	30	24	24
24	33	19	11	5	32	11	29	22	20
7-19	2036	2016	1668	1883	1970	1876	2008	1955	1922
6-22	2225	2211	1792	2059	2146	2060	2189	2136	2097
6-24	2288	2260	1821	2081	2204	2088	2248	2182	2141
0-24	2320	2300	1876	2122	2233	2129	2273	2215	2179



Whitby ATC 1, A174 (Northern Site)

Produced by Road Data Services Ltd.

Channel 2 - Southbound

Average Speed

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	30.8	26.7	27.6	27.2	31.4	23.2	32.6
2	24.5	27.9	29.6	24.2	36.1	25.4	38.3
3	27.8	27.7	27.9	23.7	22.3	26.1	27.4
4	28.9	26.0	28.8	-	26.8	-	27.8
5	32.4	34.5	39.0	28.0	24.7	27.3	26.4
6	27.8	27.8	24.3	27.1	27.6	27.7	28.1
7	26.5	27.4	27.9	26.7	26.2	27.3	25.8
8	24.6	26.3	25.6	22.7	24.0	22.8	24.3
9	23.7	25.1	25.2	24.4	24.1	23.9	23.9
10	23.3	23.0	23.5	22.4	23.7	22.2	23.2
11	23.4	22.8	23.0	22.6	23.3	22.7	23.2
12	22.0	22.9	22.0	21.4	22.3	21.4	21.8
13	22.6	21.4	20.8	22.1	22.4	22.4	22.7
14	21.7	21.3	20.4	22.5	21.6	23.2	21.4
15	21.6	20.9	21.7	22.2	21.4	22.3	21.2
16	21.3	20.7	23.1	23.7	21.1	21.9	20.7
17	22.3	22.7	22.9	23.2	22.7	21.5	23.2
18	24.4	22.3	24.9	24.2	23.9	23.1	24.0
19	24.2	26.6	24.1	24.5	23.9	23.8	23.8
20	25.6	23.5	25.6	24.4	26.0	25.1	25.8
21	26.3	24.6	27.1	26.7	26.6	27.0	26.7
22	26.1	25.3	27.5	26.3	26.3	25.6	25.9
23	25.0	26.0	28.2	25.6	24.9	26.7	24.4
24	27.4	26.3	27.4	28.3	26.0	26.5	27.8

10-12	22.7	22.8	22.5	22.0	22.8	22.1	22.5
14-16	21.4	20.8	22.2	23.0	21.2	22.1	20.9
0-24	23.2	22.7	23.0	23.3	23.2	23.0	23.1

Average	23.1
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Channel 2 - Southbound

85th Percentile

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	32.0	30.5	30.9	34.3	31.6	28.7	34.0
2	-	31.6	35.4	27.9	-	30.7	-
3	-	33.3	32.2	26.0	22.6	26.4	30.9
4	-	30.6	36.2	-	-	-	-
5	34.8	-	-	30.8	25.7	29.9	28.1
6	30.2	31.3	25.2	31.8	31.0	31.0	31.1
7	29.9	31.1	30.7	30.5	31.1	30.7	30.9
8	29.5	30.3	29.4	28.1	28.5	28.2	28.7
9	28.8	29.6	29.4	28.5	28.7	27.8	28.2
10	29.0	27.7	27.3	26.9	28.6	26.8	28.1
11	27.6	26.9	26.5	27.1	27.1	26.7	27.1
12	27.0	26.8	25.7	26.2	25.6	25.5	25.4
13	27.6	25.3	25.2	25.8	27.5	26.1	27.0
14	25.7	25.5	25.3	25.9	25.7	26.3	25.7
15	26.5	25.2	25.2	26.1	25.6	26.4	25.6
16	25.7	24.8	26.9	26.9	25.9	25.8	25.7
17	26.8	26.0	27.4	28.3	25.9	25.3	27.7
18	29.2	27.2	29.4	28.4	29.1	28.1	28.9
19	28.6	30.7	27.5	29.2	28.3	27.9	28.9
20	29.6	28.4	29.7	28.4	29.7	30.2	29.4
21	30.0	30.3	29.8	29.8	29.7	32.1	30.1
22	29.7	30.3	30.6	30.5	30.6	29.8	28.9
23	28.4	29.1	30.5	29.8	29.3	30.4	27.1
24	30.8	29.9	32.2	31.1	32.5	33.3	33.3

10-12	27.3	26.9	25.9	26.6	26.2	26.1	25.9
14-16	25.8	25.1	25.8	26.5	25.8	25.9	25.7
0-24	28.4	27.5	27.9	28.1	28.2	27.8	27.9

85th %ile	28.1
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Whitby ATC 1, A174 (Northern Site)

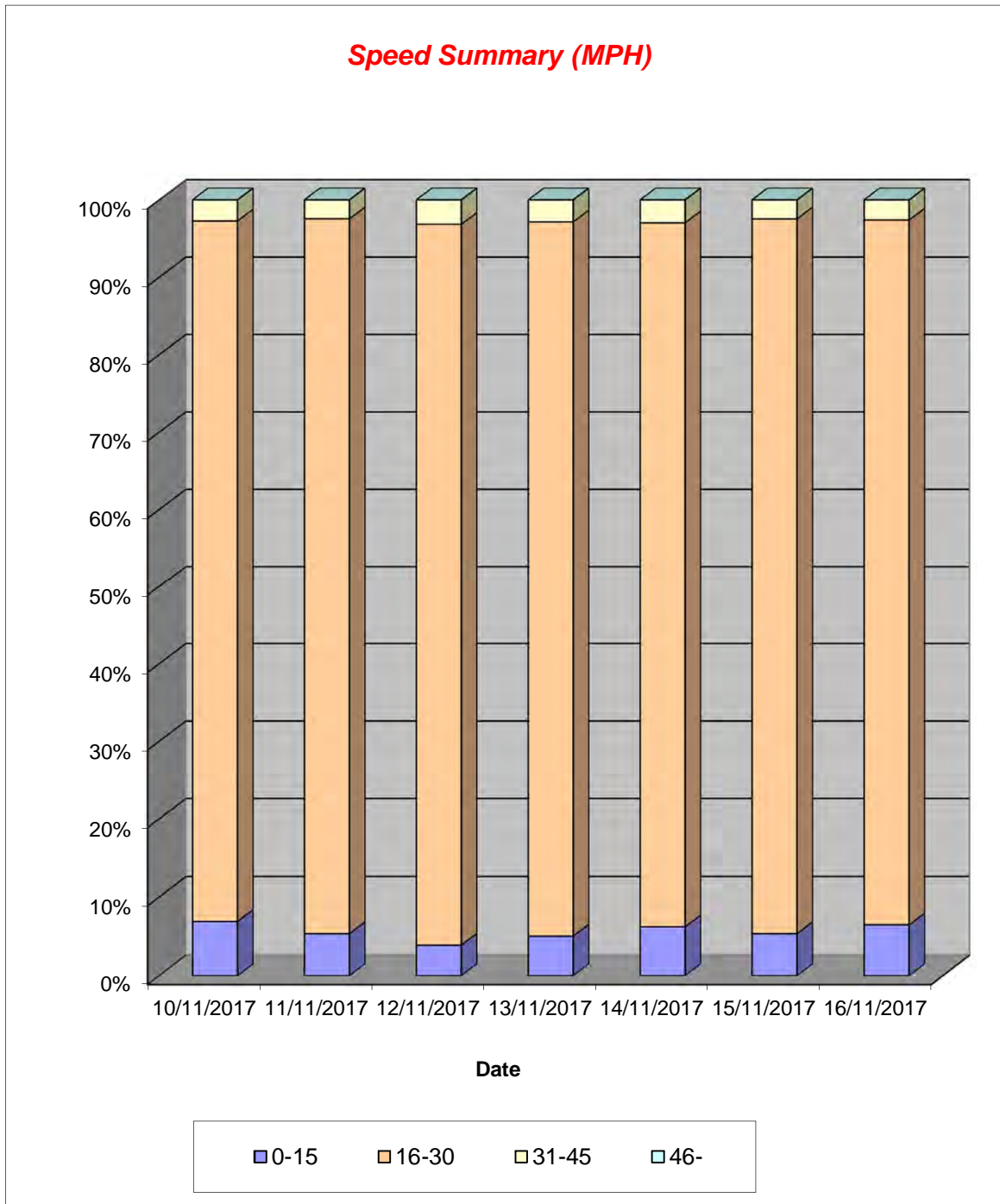
Produced by Road Data Services Ltd.

Channel 2 - Southbound

Speed Summary

Week 1

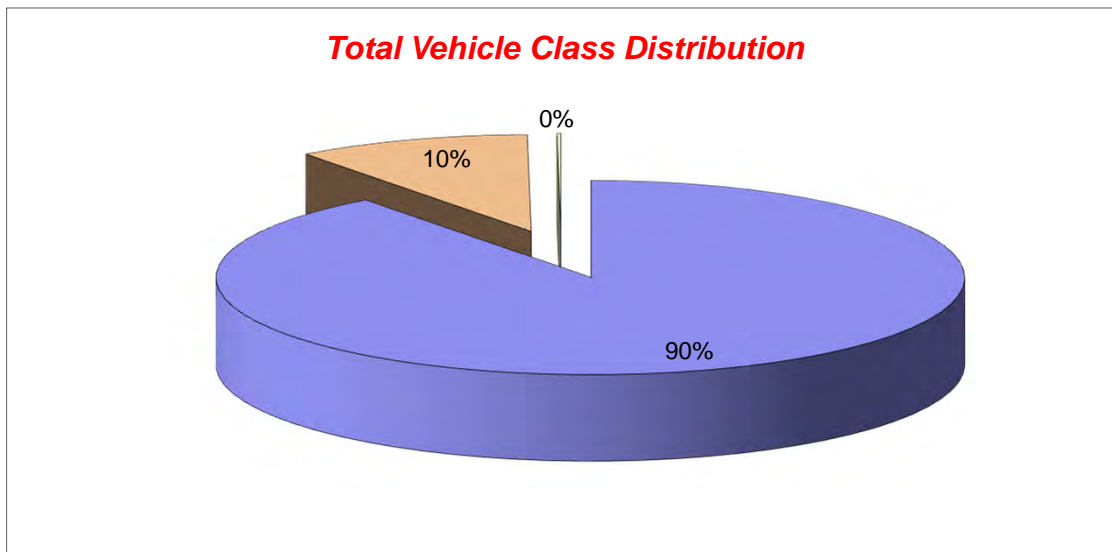
Speed (MPH)	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
0-15	160	123	73	107	139	114	147
16-30	2097	2121	1744	1955	2028	1963	2067
31-45	63	56	59	60	66	52	59
46-	0	0	0	0	0	0	0
TOTAL	2320	2300	1876	2122	2233	2129	2273



Whitby ATC 1, A174 (Northern Site)

Produced by Road Data Services Ltd.

Channel 2 - Southbound		Vehicle Class			Week 1
Classes Day / Time	Car / LGV / Caravan - 1	OGV1 / Bus - 2,3,5,6,7,12	OGV2 - 4,8,9,10,11,13	TOTAL - 1-13	
10/11/2017					
7-19	1800	234	2	2036	
6-22	1970	253	2	2225	
6-24	2027	259	2	2288	
0-24	2055	263	2	2320	
11/11/2017					
7-19	1864	149	3	2016	
6-22	2043	165	3	2211	
6-24	2089	167	4	2260	
0-24	2125	170	5	2300	
12/11/2017					
7-19	1569	97	2	1668	
6-22	1680	110	2	1792	
6-24	1707	112	2	1821	
0-24	1755	119	2	1876	
13/11/2017					
7-19	1665	215	3	1883	
6-22	1823	233	3	2059	
6-24	1844	233	4	2081	
0-24	1879	239	4	2122	
14/11/2017					
7-19	1727	241	2	1970	
6-22	1883	259	4	2146	
6-24	1935	265	4	2204	
0-24	1962	267	4	2233	
15/11/2017					
7-19	1670	203	3	1876	
6-22	1841	215	4	2060	
6-24	1869	215	4	2088	
0-24	1903	222	4	2129	
16/11/2017					
7-19	1772	234	2	2008	
6-22	1932	253	4	2189	
6-24	1985	259	4	2248	
0-24	2007	261	5	2273	
Average					
7-19	1724	196	2	1922	
6-22	1882	213	3	2097	
6-24	1922	216	3	2141	
0-24	1955	220	4	2179	



Whitby ATC 2, A174 (Southern Site)

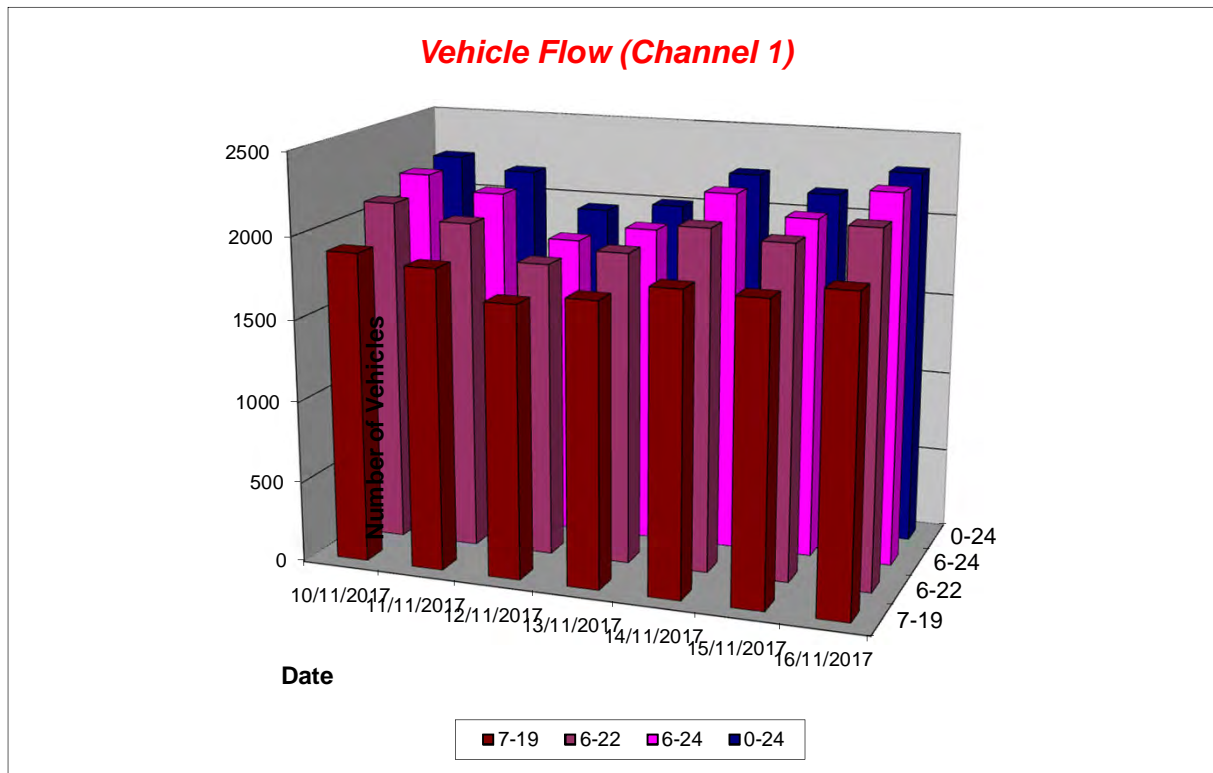
Produced by Road Data Services Ltd.

Channel 1 - Northbound

Vehicle Flow

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday	5 Day Ave	7 Day Ave
1	7	17	47	10	7	8	9	8	15
2	1	14	11	4	2	4	3	3	6
3	1	2	16	2	1	5	3	2	4
4	1	9	15	3	1	4	2	2	5
5	3	6	1	5	9	10	5	6	6
6	23	8	10	33	13	29	10	22	18
7	24	11	4	28	41	21	44	32	25
8	93	31	32	94	106	100	93	97	78
9	122	61	35	121	131	119	139	126	104
10	136	102	108	152	118	162	128	139	129
11	153	155	182	134	134	139	150	142	150
12	170	160	185	160	157	156	158	160	164
13	174	196	214	125	154	131	166	150	166
14	161	218	195	136	163	135	169	153	168
15	192	222	183	178	189	179	173	182	188
16	229	221	195	205	239	226	254	231	224
17	203	216	164	179	213	208	201	201	198
18	156	151	100	169	143	158	153	156	147
19	109	111	79	81	91	112	121	103	101
20	77	65	43	55	84	64	101	76	70
21	59	53	59	42	62	56	55	55	55
22	48	42	25	47	63	69	52	56	49
23	58	54	32	39	70	30	73	54	51
24	36	41	17	7	44	18	40	29	29
7-19	1898	1844	1672	1734	1838	1825	1905	1840	1817
6-22	2106	2015	1803	1906	2088	2035	2157	2058	2016
6-24	2200	2110	1852	1952	2202	2083	2270	2141	2096
0-24	2236	2166	1952	2009	2235	2143	2302	2185	2149



Whitby ATC 2, A174 (Southern Site)

Produced by Road Data Services Ltd.

Channel 1 - Northbound

Average Speed

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	12.8	11.6	11.9	11.6	12.6	11.6	11.9
2	15.5	12.9	12.3	12.3	10.6	12.0	11.0
3	10.5	12.4	12.3	12.3	15.7	14.4	13.0
4	12.8	13.5	12.3	12.8	10.3	12.9	13.5
5	11.2	13.0	14.5	12.4	12.5	11.8	12.1
6	11.9	10.8	12.1	11.4	13.7	12.0	12.2
7	12.2	12.9	11.7	11.7	11.2	12.3	12.4
8	12.5	12.1	12.1	11.6	12.0	12.2	12.1
9	12.0	12.2	12.6	11.9	12.2	11.7	12.1
10	11.8	12.6	12.5	12.2	11.8	12.0	11.7
11	12.3	12.5	12.7	11.9	11.8	12.5	11.9
12	11.9	12.6	12.2	11.6	12.1	12.0	12.0
13	12.0	12.5	12.8	12.2	12.1	11.8	12.1
14	11.2	12.5	12.2	11.8	12.0	12.2	11.9
15	11.9	12.3	12.2	11.9	11.9	11.8	11.9
16	12.1	12.5	12.2	11.6	12.0	11.8	11.9
17	11.8	12.0	11.9	11.7	12.2	12.1	11.9
18	11.8	12.6	12.5	11.7	12.2	11.9	11.9
19	11.8	12.5	12.1	11.9	12.5	11.6	11.9
20	12.0	12.4	12.3	11.6	11.7	11.6	11.2
21	12.0	12.8	12.2	12.2	11.2	12.1	12.2
22	11.5	12.2	12.9	12.0	12.2	11.9	12.3
23	12.0	12.1	11.8	11.9	11.7	12.0	12.2
24	12.1	12.0	10.7	11.8	12.0	12.2	12.3

10-12	12.1	12.5	12.5	11.7	12.0	12.2	12.0
14-16	12.0	12.4	12.2	11.8	11.9	11.8	11.9
0-24	11.9	12.4	12.3	11.8	12.0	12.0	12.0

Average	12.1
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Channel 1 - Northbound

85th Percentile

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	14.7	13.9	14.5	14.4	14.6	12.7	14.5
2	-	14.9	14.1	14.8	12.8	13.9	13.5
3	-	13.3	14.9	13.1	-	17.7	17.7
4	-	16.5	14.7	14.7	-	14.3	14.2
5	12.6	15.3	-	14.6	15.2	14.5	14.7
6	14.8	15.2	14.4	14.4	16.4	14.9	14.0
7	14.4	15.7	13.5	14.7	13.6	15.5	14.7
8	14.9	14.4	14.2	14.4	15.1	15.4	14.9
9	14.8	14.3	14.4	14.3	14.6	14.5	14.6
10	14.5	15.1	14.8	14.6	14.6	14.7	14.6
11	14.8	14.9	14.8	14.6	14.5	14.8	14.4
12	14.8	14.8	14.7	14.7	14.7	14.9	14.8
13	14.6	14.8	15.1	14.5	14.8	14.6	14.6
14	14.2	14.8	14.4	14.4	14.4	14.8	14.6
15	14.7	14.6	14.5	14.6	14.7	14.6	14.4
16	14.8	14.7	14.6	14.6	14.8	14.6	14.7
17	14.8	14.7	14.5	14.5	14.8	14.9	14.6
18	14.9	14.8	15.3	14.5	14.9	14.8	14.5
19	14.6	15.0	14.6	14.7	14.8	14.5	14.6
20	14.7	14.8	14.8	14.3	14.7	14.5	14.4
21	14.5	15.0	14.4	14.4	14.0	14.5	14.7
22	14.4	14.2	15.7	14.9	14.9	14.5	14.5
23	14.6	14.3	14.8	14.5	14.3	14.8	14.8
24	14.6	13.8	13.9	14.4	14.6	14.2	15.3

10-12	14.8	14.9	14.8	14.7	14.6	14.8	14.7
14-16	14.8	14.7	14.6	14.6	14.7	14.6	14.6
0-24	14.7	14.8	14.7	14.6	14.7	14.8	14.6

85th %ile	14.7
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Whitby ATC 2, A174 (Southern Site)

Produced by Road Data Services Ltd.

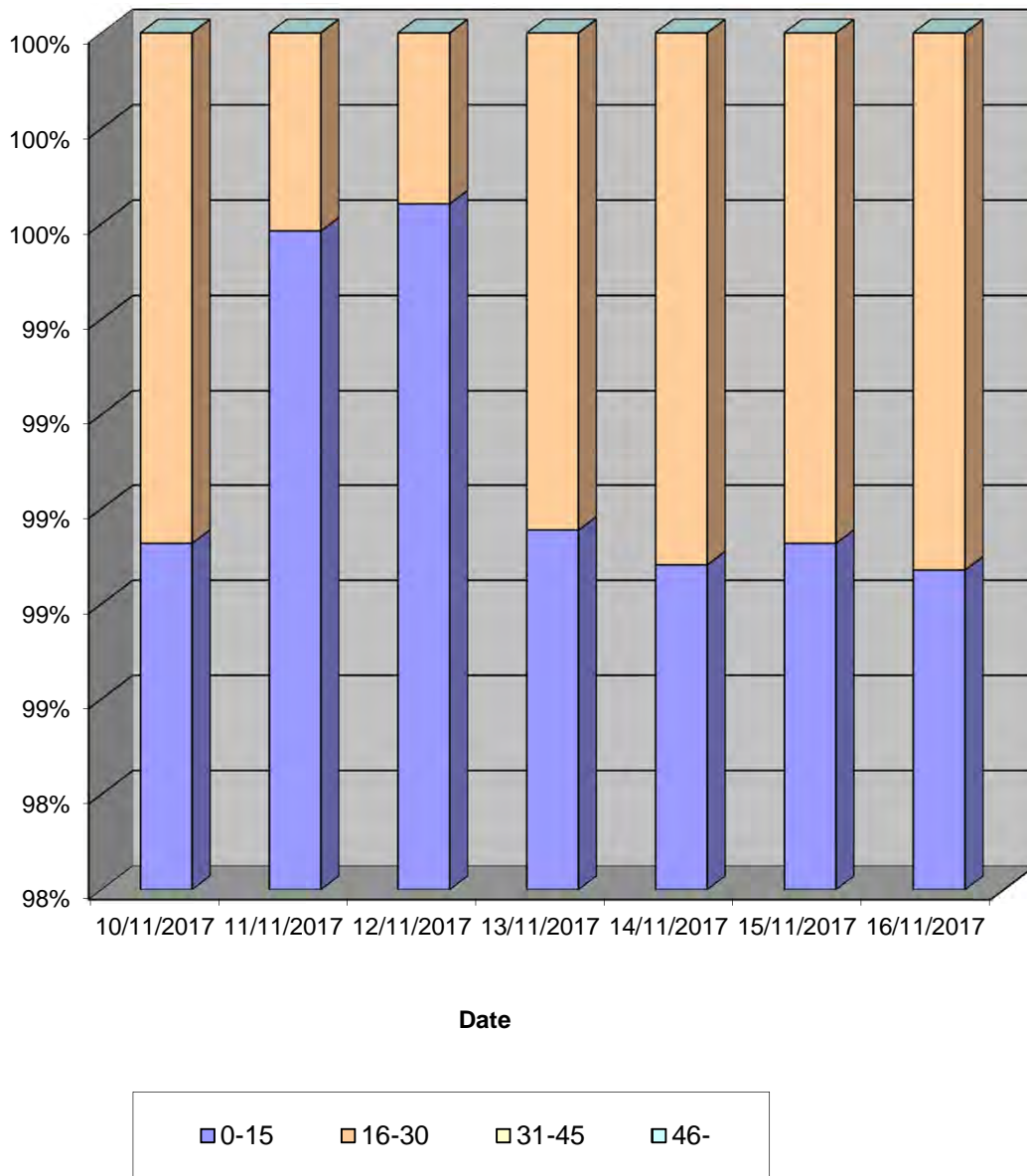
Channel 1 - Northbound

Speed Summary

Week 1

Speed (MPH)	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
0-15	2212	2157	1945	1988	2210	2120	2276
16-30	24	9	7	21	25	23	26
31-45	0	0	0	0	0	0	0
46-	0	0	0	0	0	0	0
TOTAL	2236	2166	1952	2009	2235	2143	2302

Speed Summary (MPH)

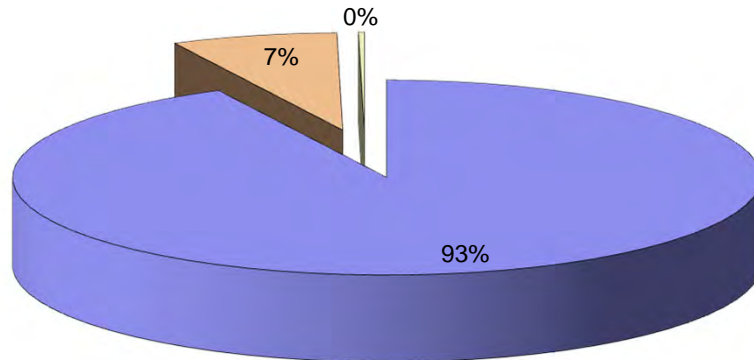


Whitby ATC 2, A174 (Southern Site)

Produced by Road Data Services Ltd.

Channel 1 - Northbound		Vehicle Class			Week 1
Classes Day / Time	Car / LGV / Caravan - 1	OGV1 / Bus - 2,3,5,6,7,12	OGV2 - 4,8,9,10,11,13	TOTAL - 1-13	
10/11/2017					
7-19	1710	186	2	1898	
6-22	1902	202	2	2106	
6-24	1994	202	4	2200	
0-24	2027	205	4	2236	
11/11/2017					
7-19	1742	97	5	1844	
6-22	1903	106	6	2015	
6-24	1992	112	6	2110	
0-24	2045	115	6	2166	
12/11/2017					
7-19	1629	38	5	1672	
6-22	1754	41	8	1803	
6-24	1798	46	8	1852	
0-24	1892	50	10	1952	
13/11/2017					
7-19	1602	130	2	1734	
6-22	1764	140	2	1906	
6-24	1809	141	2	1952	
0-24	1858	149	2	2009	
14/11/2017					
7-19	1667	168	3	1838	
6-22	1901	184	3	2088	
6-24	2013	186	3	2202	
0-24	2044	188	3	2235	
15/11/2017					
7-19	1667	152	6	1825	
6-22	1863	166	6	2035	
6-24	1906	171	6	2083	
0-24	1959	178	6	2143	
16/11/2017					
7-19	1725	176	4	1905	
6-22	1961	190	6	2157	
6-24	2074	190	6	2270	
0-24	2101	194	7	2302	
Average					
7-19	1677	135	4	1817	
6-22	1864	147	5	2016	
6-24	1941	150	5	2096	
0-24	1989	154	5	2149	

Total Vehicle Class Distribution



Whitby ATC 2, A174 (Southern Site)

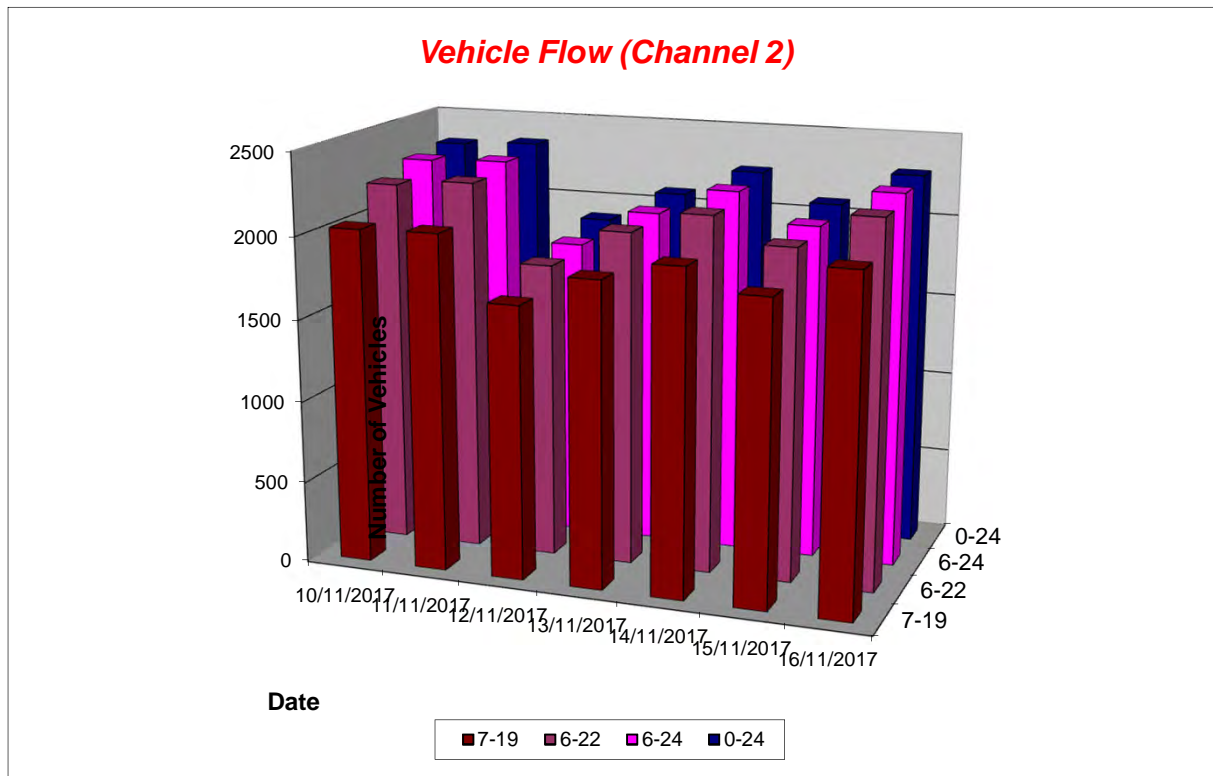
Produced by Road Data Services Ltd.

Channel 2 - Southbound

Vehicle Flow

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday	5 Day Ave	7 Day Ave
1	3	6	31	3	2	2	2	2	7
2	1	5	14	8	1	7	1	4	5
3	1	13	7	2	2	1	2	2	4
4	1	3	5	0	1	1	1	1	2
5	6	1	3	4	5	8	3	5	4
6	18	10	5	16	23	23	13	19	15
7	49	28	17	54	48	47	54	50	42
8	142	78	46	141	144	146	136	142	119
9	234	116	53	205	189	196	211	207	172
10	175	178	127	175	174	156	180	172	166
11	161	162	215	158	173	149	181	164	171
12	173	232	190	157	152	147	156	157	172
13	201	270	214	159	195	151	207	183	200
14	181	233	193	169	161	147	164	164	178
15	177	217	223	138	169	144	166	159	176
16	209	219	154	179	220	203	226	207	201
17	178	155	122	179	187	179	195	184	171
18	107	123	80	121	103	121	102	111	108
19	100	65	48	72	99	95	98	93	82
20	62	83	41	57	63	64	63	62	62
21	39	63	41	39	47	47	50	44	47
22	31	36	31	26	38	19	27	28	30
23	36	36	20	17	28	17	27	25	26
24	37	15	11	6	26	12	23	21	19
7-19	2038	2048	1665	1853	1966	1834	2022	1943	1918
6-22	2219	2258	1795	2029	2162	2011	2216	2127	2099
6-24	2292	2309	1826	2052	2216	2040	2266	2173	2143
0-24	2322	2347	1891	2085	2250	2082	2288	2205	2181



Whitby ATC 2, A174 (Southern Site)

Produced by Road Data Services Ltd.

Channel 2 - Southbound

Average Speed

Week 1

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	12.6	11.9	12.5	11.8	10.1	12.5	13.9
2	11.7	11.2	12.0	13.1	13.9	11.1	11.5
3	15.9	12.4	11.3	11.8	11.8	13.5	11.3
4	14.9	12.0	12.0	-	12.4	12.8	11.7
5	12.4	14.5	11.6	11.5	11.9	10.8	11.6
6	12.2	11.6	11.1	11.9	12.5	11.7	11.1
7	12.2	11.7	12.5	12.1	11.7	12.3	11.9
8	12.1	12.5	12.3	11.6	11.8	11.6	12.1
9	11.7	12.1	12.5	11.5	12.0	11.9	12.0
10	12.0	12.7	12.0	11.9	11.9	11.5	11.8
11	12.0	12.4	12.0	11.9	11.7	11.9	12.1
12	12.0	12.2	12.2	11.9	11.8	11.6	11.8
13	12.0	12.5	12.5	11.6	11.8	12.0	12.2
14	11.8	12.5	11.9	12.2	11.6	11.8	12.2
15	11.9	12.1	12.0	12.1	12.0	12.0	12.0
16	11.7	12.1	12.0	12.0	12.2	12.0	11.9
17	12.2	12.0	11.9	11.9	11.8	11.8	12.1
18	11.7	12.5	12.3	11.9	12.4	11.6	11.7
19	12.4	12.1	11.8	12.2	11.9	11.7	12.2
20	11.7	12.1	12.8	11.6	12.1	12.0	12.0
21	12.1	12.7	11.6	12.1	12.2	12.1	12.3
22	11.9	11.9	12.7	11.7	11.6	11.5	12.4
23	11.9	12.4	11.6	11.4	12.4	11.5	11.3
24	12.1	12.1	12.2	12.8	11.7	12.7	11.9

10-12	12.0	12.3	12.1	11.9	11.7	11.7	11.9
14-16	11.8	12.1	12.0	12.0	12.1	12.0	11.9
0-24	11.9	12.3	12.1	11.9	11.9	11.8	12.0

Average	12.0
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Channel 2 - Southbound

85th Percentile

Hr Ending	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
1	14.7	13.6	14.7	13.3	12.7	12.8	14.6
2	-	13.7	14.2	15.3	-	12.6	-
3	-	14.6	12.5	12.6	13.0	-	13.5
4	-	13.6	13.9	-	-	-	-
5	14.8	-	13.9	12.9	14.5	15.4	12.4
6	15.3	15.0	12.0	14.2	14.4	14.6	14.7
7	14.7	13.9	14.4	14.8	14.6	14.7	15.0
8	14.8	15.0	14.7	14.7	14.5	14.6	14.8
9	14.5	14.6	14.7	14.4	14.7	14.8	14.8
10	14.7	14.9	14.7	14.5	14.6	14.6	14.6
11	14.5	14.9	14.8	14.7	14.5	14.9	14.8
12	14.7	14.9	15.3	14.8	14.6	14.5	14.6
13	14.8	14.8	14.9	14.3	14.4	14.6	15.2
14	14.5	14.7	14.4	14.7	14.5	14.3	14.9
15	14.4	14.6	14.7	14.6	14.7	14.7	14.7
16	14.5	14.7	14.6	14.5	14.8	14.6	14.8
17	14.5	14.6	14.7	14.7	14.7	14.6	14.7
18	14.6	14.7	14.8	14.5	14.8	14.7	14.3
19	15.1	14.5	14.7	14.6	14.6	14.7	15.1
20	14.4	14.8	14.8	14.4	14.7	14.6	14.4
21	14.6	15.2	14.6	14.6	14.9	14.8	14.8
22	15.2	15.1	15.1	14.6	14.6	13.5	14.8
23	14.8	14.4	14.0	13.9	14.9	14.3	14.6
24	14.3	14.6	14.7	15.6	13.7	14.5	14.4

10-12	14.6	14.9	14.8	14.8	14.5	14.8	14.7
14-16	14.5	14.7	14.6	14.6	14.8	14.6	14.7
0-24	14.7	14.8	14.7	14.6	14.6	14.6	14.8

85th %ile	14.7
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Whitby ATC 2, A174 (Southern Site)

Produced by Road Data Services Ltd.

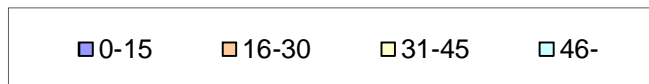
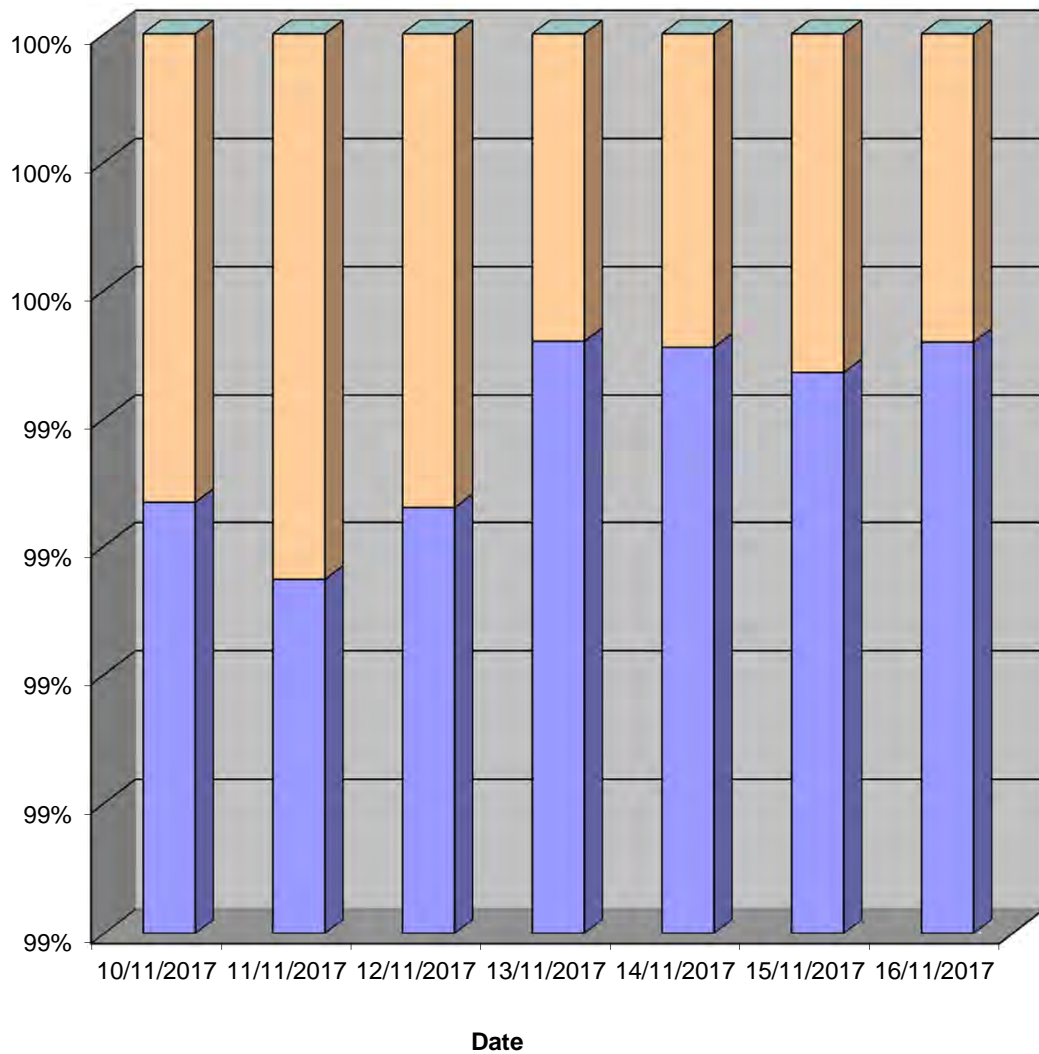
Channel 2 - Southbound

Speed Summary

Week 1

Speed (MPH)	10/11/2017 Friday	11/11/2017 Saturday	12/11/2017 Sunday	13/11/2017 Monday	14/11/2017 Tuesday	15/11/2017 Wednesday	16/11/2017 Thursday
0-15	2305	2327	1877	2075	2239	2071	2277
16-30	17	20	14	10	11	11	11
31-45	0	0	0	0	0	0	0
46-	0	0	0	0	0	0	0
TOTAL	2322	2347	1891	2085	2250	2082	2288

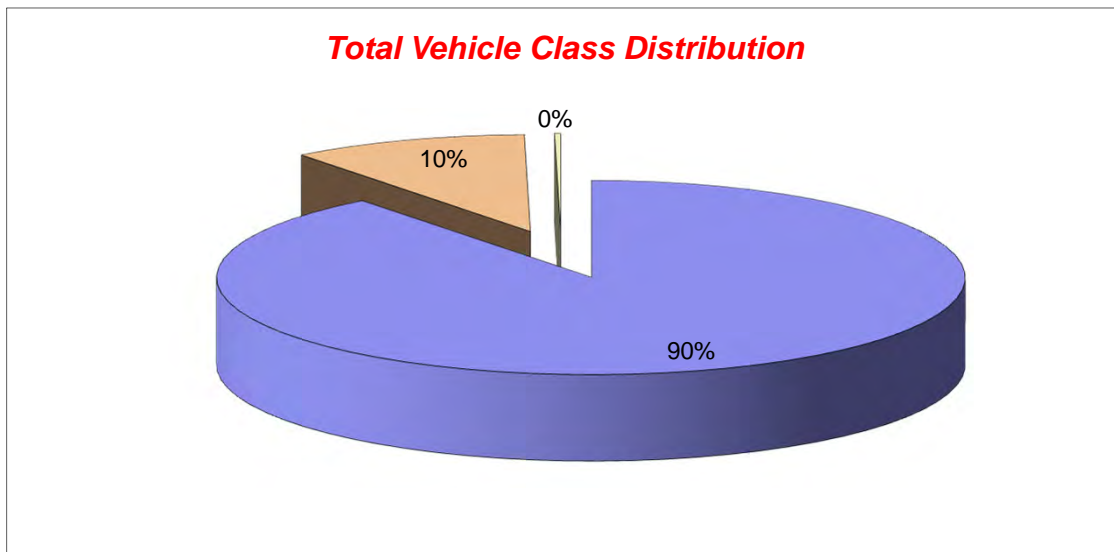
Speed Summary (MPH)



Whitby ATC 2, A174 (Southern Site)

Produced by Road Data Services Ltd.

Channel 2 - Southbound		Vehicle Class			Week 1
Classes Day / Time	Car / LGV / Caravan - 1	OGV1 / Bus - 2,3,5,6,7,12	OGV2 - 4,8,9,10,11,13	TOTAL - 1-13	
10/11/2017					
7-19	1815	218	5	2038	
6-22	1973	241	5	2219	
6-24	2041	246	5	2292	
0-24	2067	250	5	2322	
11/11/2017					
7-19	1898	146	4	2048	
6-22	2087	166	5	2258	
6-24	2134	168	7	2309	
0-24	2168	171	8	2347	
12/11/2017					
7-19	1554	109	2	1665	
6-22	1665	127	3	1795	
6-24	1694	129	3	1826	
0-24	1748	136	7	1891	
13/11/2017					
7-19	1638	212	3	1853	
6-22	1793	233	3	2029	
6-24	1815	233	4	2052	
0-24	1843	238	4	2085	
14/11/2017					
7-19	1720	244	2	1966	
6-22	1892	265	5	2162	
6-24	1940	271	5	2216	
0-24	1972	273	5	2250	
15/11/2017					
7-19	1632	199	3	1834	
6-22	1799	207	5	2011	
6-24	1828	207	5	2040	
0-24	1863	213	6	2082	
16/11/2017					
7-19	1769	251	2	2022	
6-22	1941	271	4	2216	
6-24	1986	276	4	2266	
0-24	2005	278	5	2288	
Average					
7-19	1718	197	3	1918	
6-22	1879	216	4	2099	
6-24	1920	219	5	2143	
0-24	1952	223	6	2181	



APPENDIX E
Junctions 9 modelling output

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.5.1.7462 © Copyright TRL Limited, 2019
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: Site Access - A174.j9
Path: J:\11000\11600\11613_A174AtEastbeckSandse\engineering\Traffic_Programs\Picady
Report generation date: 01/03/2021 11:11:26

- »2026 Base + Development, AM
- »2026 Base + Development, PM
- »2026 Base + Development, Saturday
- »2026 Base + Development Sensitivity, AM
- »2026 Base + Development Sensitivity, PM
- »2026 Base + Development Sensitivity, Saturday

Summary of junction performance

	AM			PM			Saturday		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2026 Base + Development									
Stream B-AC	0.0	0.00	0.00	0.0	8.17	0.05	0.1	8.14	0.07
Stream C-AB	0.0	5.43	0.02	0.0	5.52	0.02	0.0	5.46	0.02
2026 Base + Development Sensitivity									
Stream B-AC	0.0	0.00	0.00	0.1	14.83	0.08	0.1	14.21	0.11
Stream C-AB	0.0	4.29	0.03	0.0	4.39	0.03	0.1	4.27	0.05

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Site Access / A174
Location	Sandsend Scheme, Whitby
Site number	
Date	22/02/2021
Version	
Status	(new file)
Identifier	
Client	The Mulgrave Estate
Jobnumber	11613
Enumerator	SANDERSONASSOC\john.turner
Description	Base flows taken from northbound and southbound ATC data for 5 day average.

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D1	2021 Base	AM	ONE HOUR	07:45	09:15	15			
D2	2021 Base	PM	ONE HOUR	14:45	16:15	15			
D3	2021 Base	Saturday	ONE HOUR	14:45	16:15	15			
D4	2026 Base	AM	ONE HOUR	07:45	09:15	15			
D5	2026 Base	PM	ONE HOUR	14:45	16:15	15			
D6	2026 Base	Saturday	ONE HOUR	14:45	16:15	15			
D7	Development	AM	ONE HOUR	07:45	09:15	15			
D8	Development	PM	ONE HOUR	14:45	16:15	15			
D9	Development	Saturday	ONE HOUR	14:45	16:15	15			
D10	2026 Base + Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D4+D7
D11	2026 Base + Development	PM	ONE HOUR	14:45	16:15	15	✓	Simple	D5+D8
D12	2026 Base + Development	Saturday	ONE HOUR	14:45	16:15	15	✓	Simple	D6+D9
D13	2026 Base + Development Sensitivity	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D4*3+D7
D14	2026 Base + Development Sensitivity	PM	ONE HOUR	14:45	16:15	15	✓	Simple	D5*3+D8
D15	2026 Base + Development Sensitivity	Saturday	ONE HOUR	14:45	16:15	15	✓	Simple	D6*3+D9

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 Base + Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A174 South		Major
B	Site Access		Minor
C	A174 North		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - A174 North	6.30			21.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Site Access	One lane	3.00	65	17

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	507	0.091	0.230	0.145	0.329
B-C	635	0.096	0.243	-	-
C-B	586	0.224	0.224	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D10	2026 Base + Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D4+D7

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A174 South		ONE HOUR	✓	161	100.000
B - Site Access		ONE HOUR	✓	0	100.000
C - A174 North		ONE HOUR	✓	220	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	5	156
	B - Site Access	0	0	0
	C - A174 North	213	7	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	0	0
	B - Site Access	0	0	0
	C - A174 North	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.02	5.43	0.0	A	9	14
C-A					193	289
A-B					5	7
A-C					143	215

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	519	0.000	0	0.0	0.0	0.000	A
C-AB	7	2	670	0.010	7	0.0	0.0	5.432	A
C-A	159	40			159				
A-B	4	0.94			4				
A-C	117	29			117				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	511	0.000	0	0.0	0.0	0.000	A
C-AB	9	2	686	0.013	9	0.0	0.0	5.312	A
C-A	189	47			189				
A-B	4	1			4				
A-C	140	35			140				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	499	0.000	0	0.0	0.0	0.000	A
C-AB	12	3	710	0.016	12	0.0	0.0	5.155	A
C-A	231	58			231				
A-B	6	1			6				
A-C	172	43			172				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	499	0.000	0	0.0	0.0	0.000	A
C-AB	12	3	710	0.016	12	0.0	0.0	5.157	A
C-A	231	58			231				
A-B	6	1			6				
A-C	172	43			172				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	511	0.000	0	0.0	0.0	0.000	A
C-AB	9	2	686	0.013	9	0.0	0.0	5.315	A
C-A	189	47			189				
A-B	4	1			4				
A-C	140	35			140				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	519	0.000	0	0.0	0.0	0.000	A
C-AB	7	2	670	0.010	7	0.0	0.0	5.432	A
C-A	159	40			159				
A-B	4	0.94			4				
A-C	117	29			117				

2026 Base + Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.43	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D11	2026 Base + Development	PM	ONE HOUR	14:45	16:15	15	✓	Simple	D5+D8

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A174 South		ONE HOUR	✓	263	100.000
B - Site Access		ONE HOUR	✓	20	100.000
C - A174 North		ONE HOUR	✓	231	100.000

Origin-Destination Data

Demand (PCU/hr)

From	To		
	A - A174 South	B - Site Access	C - A174 North
A - A174 South	0	7	256
B - Site Access	11	0	9
C - A174 North	224	7	0

Vehicle Mix

Heavy Vehicle Percentages

From	To		
	A - A174 South	B - Site Access	C - A174 North
A - A174 South	0	0	0
B - Site Access	0	0	0
C - A174 North	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.05	8.17	0.0	A	18	28
C-AB	0.02	5.52	0.0	A	9	14
C-A					203	304
A-B					6	10
A-C					235	352

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	493	0.031	15	0.0	0.0	7.527	A
C-AB	7	2	660	0.011	7	0.0	0.0	5.516	A
C-A	167	42			167				
A-B	5	1			5				
A-C	193	48			193				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	4	480	0.037	18	0.0	0.0	7.784	A
C-AB	9	2	675	0.013	9	0.0	0.0	5.405	A
C-A	199	50			199				
A-B	6	2			6				
A-C	230	58			230				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	6	463	0.048	22	0.0	0.0	8.164	A
C-AB	12	3	696	0.017	12	0.0	0.0	5.258	A
C-A	242	61			242				
A-B	8	2			8				
A-C	282	70			282				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	6	463	0.048	22	0.0	0.0	8.166	A
C-AB	12	3	696	0.017	12	0.0	0.0	5.258	A
C-A	242	61			242				
A-B	8	2			8				
A-C	282	70			282				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	4	480	0.037	18	0.0	0.0	7.787	A
C-AB	9	2	675	0.013	9	0.0	0.0	5.408	A
C-A	199	50			199				
A-B	6	2			6				
A-C	230	58			230				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	493	0.031	15	0.0	0.0	7.534	A
C-AB	7	2	660	0.011	7	0.0	0.0	5.516	A
C-A	167	42			167				
A-B	5	1			5				
A-C	193	48			193				

2026 Base + Development, Saturday

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.59	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D12	2026 Base + Development	Saturday	ONE HOUR	14:45	16:15	15	✓	Simple	D6+D9

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A174 South		ONE HOUR	✓	246	100.000
B - Site Access		ONE HOUR	✓	28	100.000
C - A174 North		ONE HOUR	✓	248	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	10	236
	B - Site Access	14	0	14
	C - A174 North	238	10	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	0	0
	B - Site Access	0	0	0
	C - A174 North	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.07	8.14	0.1	A	26	39
C-AB	0.02	5.46	0.0	A	14	20
C-A					214	321
A-B					9	14
A-C					217	325

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	21	5	502	0.042	21	0.0	0.0	7.477	A
C-AB	10	3	670	0.015	10	0.0	0.0	5.459	A
C-A	176	44			176				
A-B	8	2			8				
A-C	178	44			178				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	25	6	490	0.051	25	0.0	0.1	7.741	A
C-AB	13	3	687	0.019	13	0.0	0.0	5.343	A
C-A	210	52			210				
A-B	9	2			9				
A-C	212	53			212				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	31	8	473	0.065	31	0.1	0.1	8.133	A
C-AB	17	4	711	0.025	17	0.0	0.0	5.190	A
C-A	256	64			256				
A-B	11	3			11				
A-C	260	65			260				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	31	8	473	0.065	31	0.1	0.1	8.135	A
C-AB	17	4	711	0.025	17	0.0	0.0	5.190	A
C-A	256	64			256				
A-B	11	3			11				
A-C	260	65			260				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	25	6	490	0.051	25	0.1	0.1	7.743	A
C-AB	13	3	687	0.019	13	0.0	0.0	5.343	A
C-A	210	52			210				
A-B	9	2			9				
A-C	212	53			212				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	21	5	502	0.042	21	0.1	0.0	7.484	A
C-AB	10	3	670	0.015	10	0.0	0.0	5.460	A
C-A	176	44			176				
A-B	8	2			8				
A-C	178	44			178				

2026 Base + Development Sensitivity, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D13	2026 Base + Development Sensitivity	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D4*3+D7

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A174 South		ONE HOUR	✓	473	100.000
B - Site Access		ONE HOUR	✓	0	100.000
C - A174 North		ONE HOUR	✓	646	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	5	468
	B - Site Access	0	0	0
	C - A174 North	639	7	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	0	0
	B - Site Access	0	0	0
	C - A174 North	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.03	4.29	0.0	A	19	28
C-A					574	861
A-B					5	7
A-C					429	644

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	430	0.000	0	0.0	0.0	0.000	A
C-AB	12	3	852	0.014	12	0.0	0.0	4.285	A
C-A	474	119			474				
A-B	4	0.94			4				
A-C	352	88			352				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	403	0.000	0	0.0	0.0	0.000	A
C-AB	17	4	909	0.019	17	0.0	0.0	4.037	A
C-A	564	141			564				
A-B	4	1			4				
A-C	421	105			421				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	364	0.000	0	0.0	0.0	0.000	A
C-AB	27	7	990	0.027	27	0.0	0.0	3.738	A
C-A	685	171			685				
A-B	6	1			6				
A-C	515	129			515				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	364	0.000	0	0.0	0.0	0.000	A
C-AB	27	7	990	0.027	27	0.0	0.0	3.741	A
C-A	684	171			684				
A-B	6	1			6				
A-C	515	129			515				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	403	0.000	0	0.0	0.0	0.000	A
C-AB	17	4	909	0.019	17	0.0	0.0	4.039	A
C-A	564	141			564				
A-B	4	1			4				
A-C	421	105			421				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	430	0.000	0	0.0	0.0	0.000	A
C-AB	12	3	852	0.014	12	0.0	0.0	4.287	A
C-A	474	119			474				
A-B	4	0.94			4				
A-C	352	88			352				

2026 Base + Development Sensitivity, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.27	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D14	2026 Base + Development Sensitivity	PM	ONE HOUR	14:45	16:15	15	✓	Simple	D5*3+D8

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A174 South		ONE HOUR	✓	775	100.000
B - Site Access		ONE HOUR	✓	20	100.000
C - A174 North		ONE HOUR	✓	679	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	7	768
	B - Site Access	11	0	9
	C - A174 North	672	7	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	0	0
	B - Site Access	0	0	0
	C - A174 North	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.08	14.83	0.1	B	18	28
C-AB	0.03	4.39	0.0	A	22	33
C-A					601	902
A-B					6	10
A-C					705	1057

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	363	0.041	15	0.0	0.0	10.341	B
C-AB	13	3	833	0.016	13	0.0	0.0	4.390	A
C-A	498	124			498				
A-B	5	1			5				
A-C	578	145			578				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	4	323	0.056	18	0.0	0.1	11.809	B
C-AB	20	5	890	0.022	20	0.0	0.0	4.136	A
C-A	591	148			591				
A-B	6	2			6				
A-C	690	173			690				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	6	265	0.083	22	0.1	0.1	14.814	B
C-AB	32	8	973	0.033	32	0.0	0.0	3.828	A
C-A	715	179			715				
A-B	8	2			8				
A-C	846	211			846				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	6	265	0.083	22	0.1	0.1	14.829	B
C-AB	32	8	973	0.033	32	0.0	0.0	3.828	A
C-A	715	179			715				
A-B	8	2			8				
A-C	846	211			846				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	4	323	0.056	18	0.1	0.1	11.824	B
C-AB	20	5	890	0.022	20	0.0	0.0	4.139	A
C-A	591	148			591				
A-B	6	2			6				
A-C	690	173			690				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	363	0.041	15	0.1	0.0	10.353	B
C-AB	13	3	833	0.016	14	0.0	0.0	4.392	A
C-A	498	124			498				
A-B	5	1			5				
A-C	578	145			578				

2026 Base + Development Sensitivity, Saturday

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.37	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D15	2026 Base + Development Sensitivity	Saturday	ONE HOUR	14:45	16:15	15	✓	Simple	D6*3+D9

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - A174 South		ONE HOUR	✓	718	100.000
B - Site Access		ONE HOUR	✓	28	100.000
C - A174 North		ONE HOUR	✓	724	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	10	708
	B - Site Access	14	0	14
	C - A174 North	714	10	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A174 South	B - Site Access	C - A174 North
From	A - A174 South	0	0	0
	B - Site Access	0	0	0
	C - A174 North	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.11	14.21	0.1	B	26	39
C-AB	0.05	4.27	0.1	A	33	49
C-A					632	947
A-B					9	14
A-C					650	975

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	21	5	379	0.056	21	0.0	0.1	10.054	B
C-AB	20	5	864	0.023	20	0.0	0.0	4.266	A
C-A	525	131			525				
A-B	8	2			8				
A-C	533	133			533				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	25	6	340	0.074	25	0.1	0.1	11.427	B
C-AB	29	7	926	0.032	29	0.0	0.0	4.015	A
C-A	621	155			621				
A-B	9	2			9				
A-C	636	159			636				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	31	8	284	0.109	31	0.1	0.1	14.196	B
C-AB	49	12	1017	0.048	49	0.0	0.1	3.718	A
C-A	748	187			748				
A-B	11	3			11				
A-C	780	195			780				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	31	8	284	0.109	31	0.1	0.1	14.214	B
C-AB	49	12	1017	0.048	49	0.1	0.1	3.719	A
C-A	748	187			748				
A-B	11	3			11				
A-C	780	195			780				

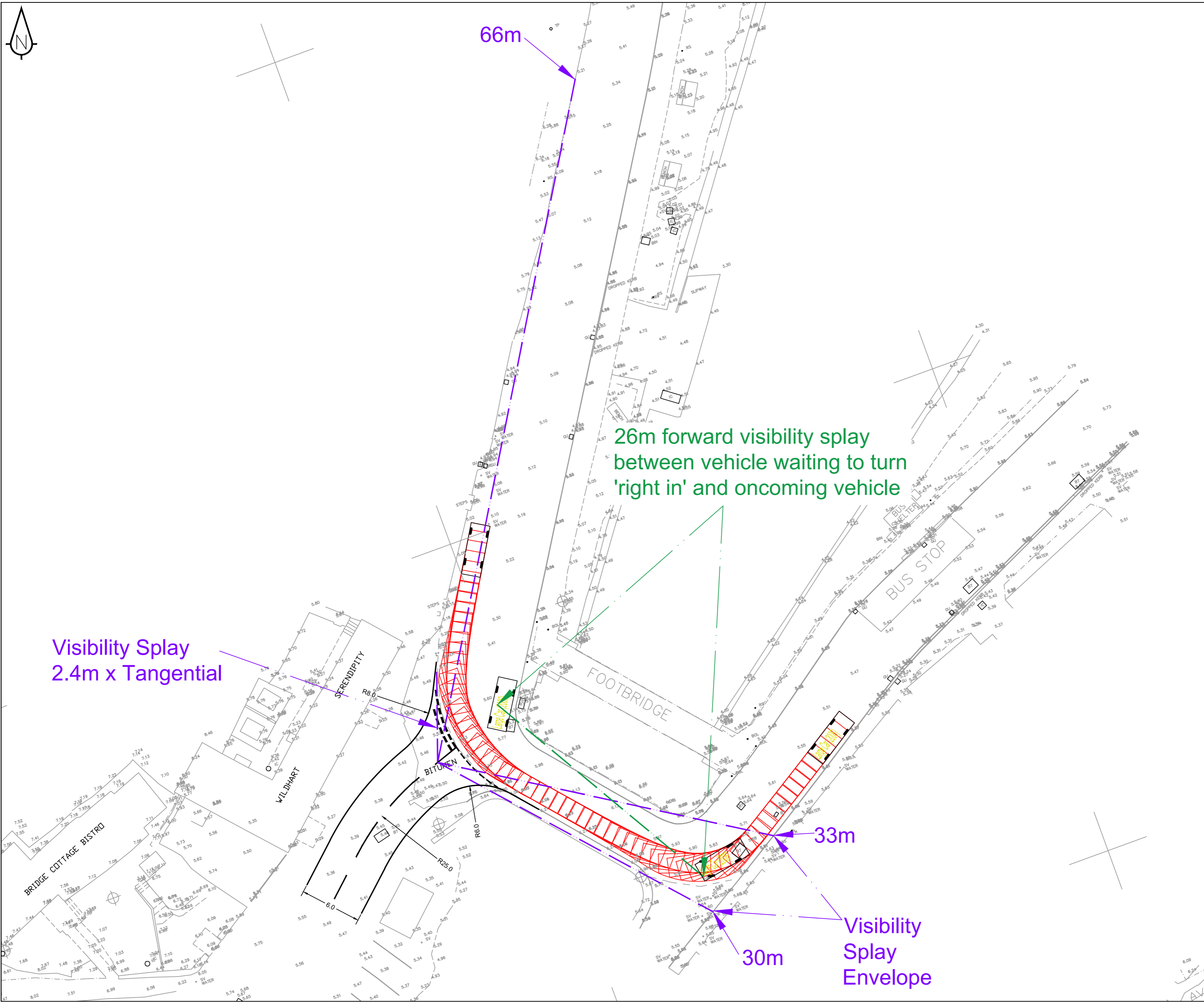
15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	25	6	340	0.074	25	0.1	0.1	11.447	B
C-AB	29	7	926	0.032	30	0.1	0.0	4.017	A
C-A	621	155			621				
A-B	9	2			9				
A-C	636	159			636				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	21	5	379	0.056	21	0.1	0.1	10.072	B
C-AB	20	5	864	0.023	20	0.0	0.0	4.268	A
C-A	525	131			525				
A-B	8	2			8				
A-C	533	133			533				

APPENDIX F
Drawing 11613-003 Rev A



26m forward visibility splay between vehicle waiting to turn 'right in' and oncoming vehicle

Visibility Splay 2.4m x Tangential

30m
33m
Visibility Splay Envelope

66m

Rev	A	Forward visibility splay added	BL	19.05.21	SB
		Amendment	Drawn	Date	Checked



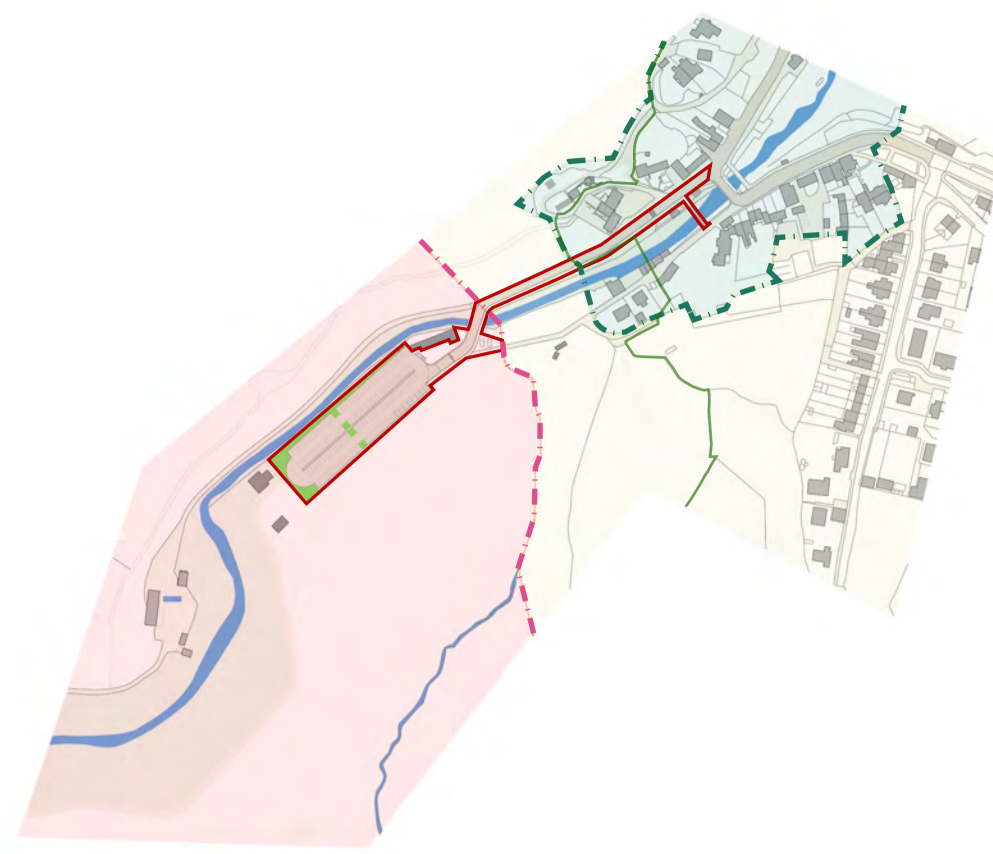
Client
The Mulgrave Estate

Project Title
Sandsend Scheme, Whitby

Drawing Title
Proposed Site Access and Visibility Splays

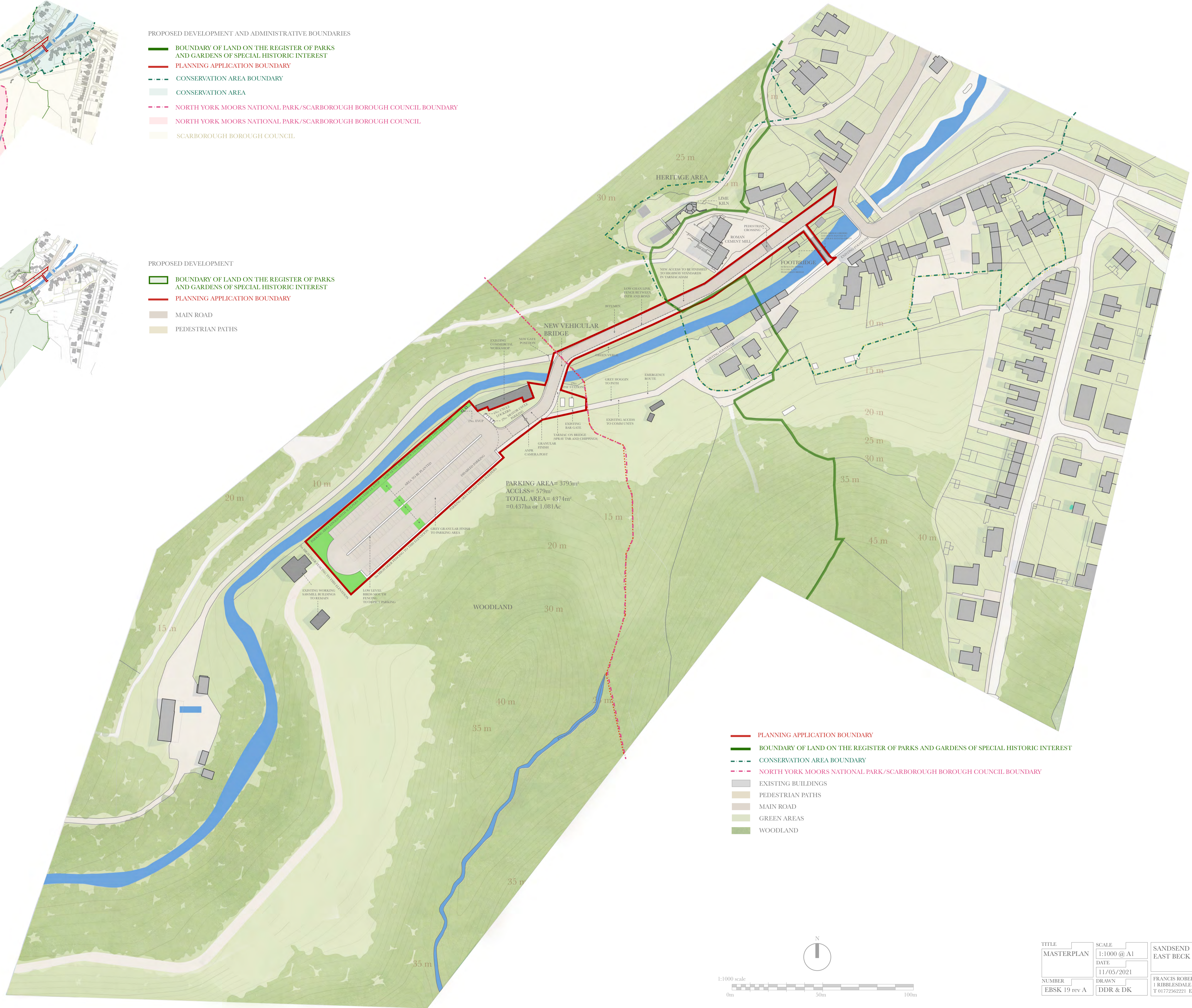
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Date	Dec 2020	Approved By	IEL
Drawing Number	11613/003	Rev	A

APPENDIX G
Revised Masterplan – EBSK 19 Rev A

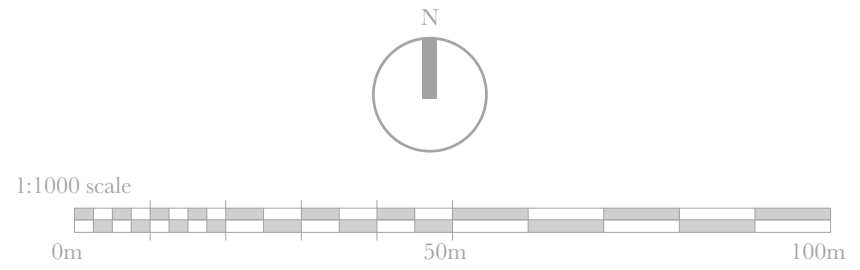


- PROPOSED DEVELOPMENT AND ADMINISTRATIVE BOUNDARIES
- BOUNDARY OF LAND ON THE REGISTER OF PARKS AND GARDENS OF SPECIAL HISTORIC INTEREST
 - PLANNING APPLICATION BOUNDARY
 - - - CONSERVATION AREA BOUNDARY
 - CONSERVATION AREA
 - - - NORTH YORK MOORS NATIONAL PARK/SCARBOROUGH BOROUGH COUNCIL BOUNDARY
 - NORTH YORK MOORS NATIONAL PARK/SCARBOROUGH BOROUGH COUNCIL
 - SCARBOROUGH BOROUGH COUNCIL

- PROPOSED DEVELOPMENT
- BOUNDARY OF LAND ON THE REGISTER OF PARKS AND GARDENS OF SPECIAL HISTORIC INTEREST
 - PLANNING APPLICATION BOUNDARY
 - MAIN ROAD
 - PEDESTRIAN PATHS



- PLANNING APPLICATION BOUNDARY
- BOUNDARY OF LAND ON THE REGISTER OF PARKS AND GARDENS OF SPECIAL HISTORIC INTEREST
- - - CONSERVATION AREA BOUNDARY
- - - NORTH YORK MOORS NATIONAL PARK/SCARBOROUGH BOROUGH COUNCIL BOUNDARY
- EXISTING BUILDINGS
- PEDESTRIAN PATHS
- MAIN ROAD
- GREEN AREAS
- WOODLAND

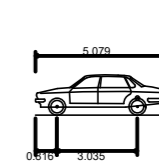
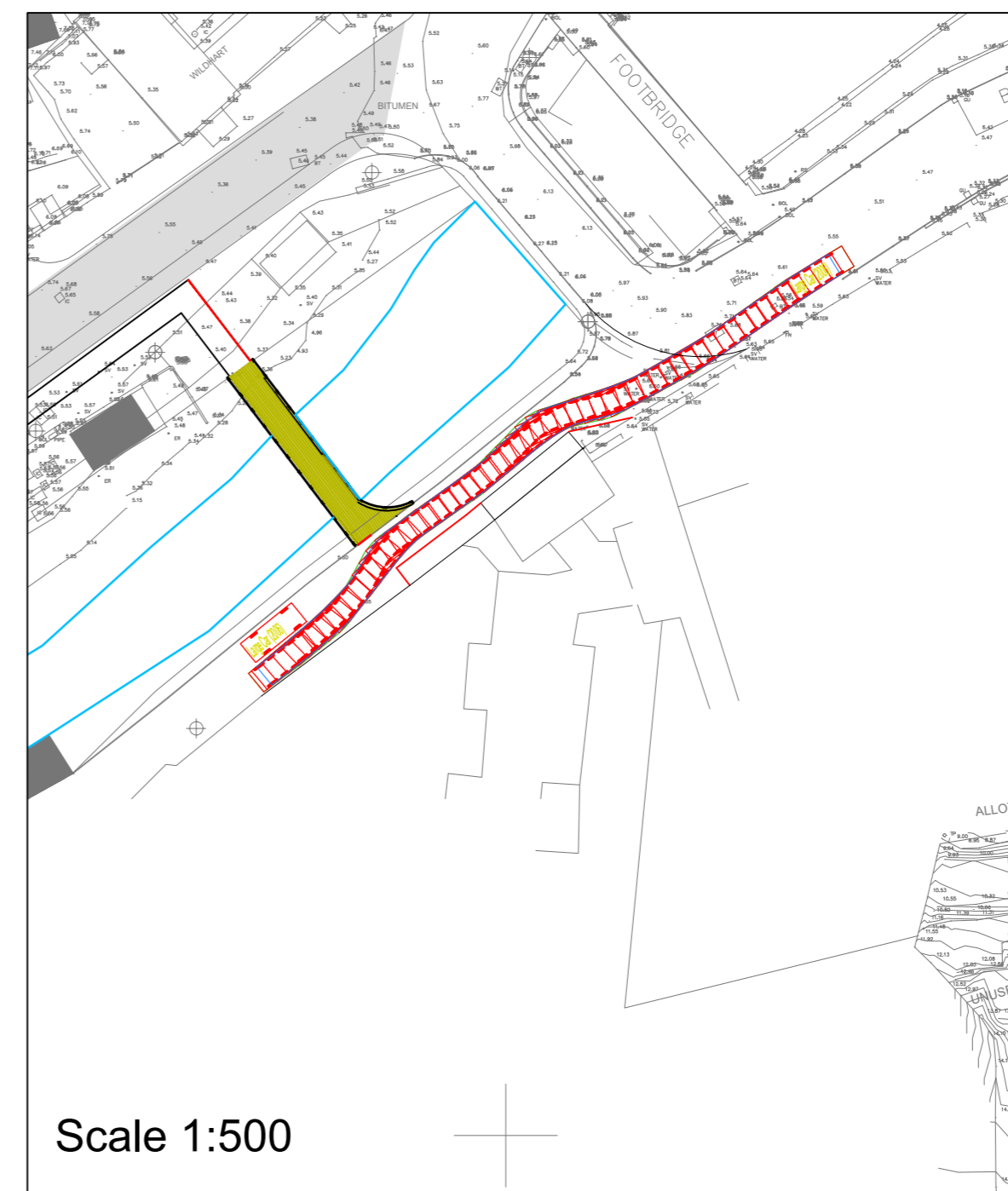
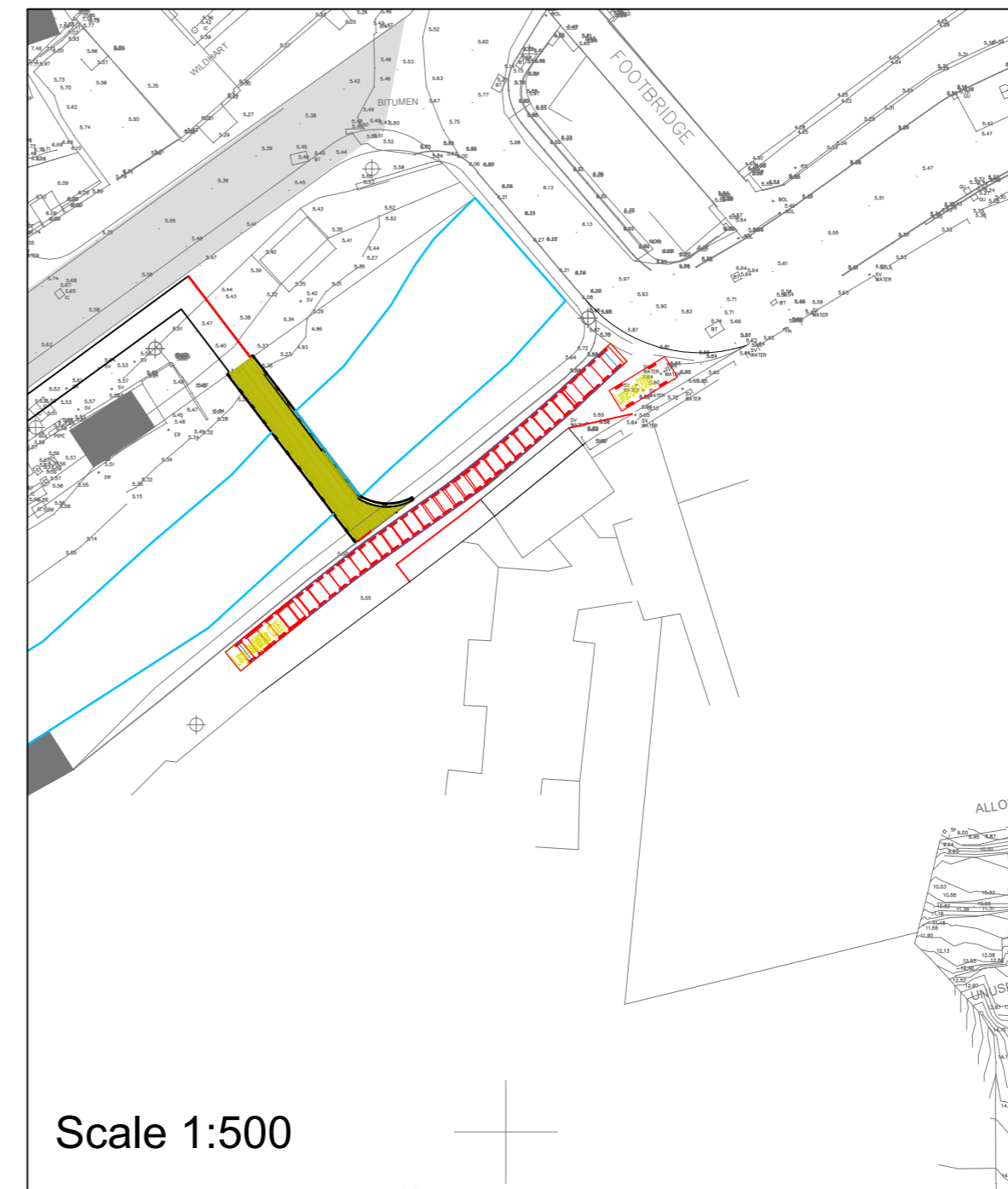
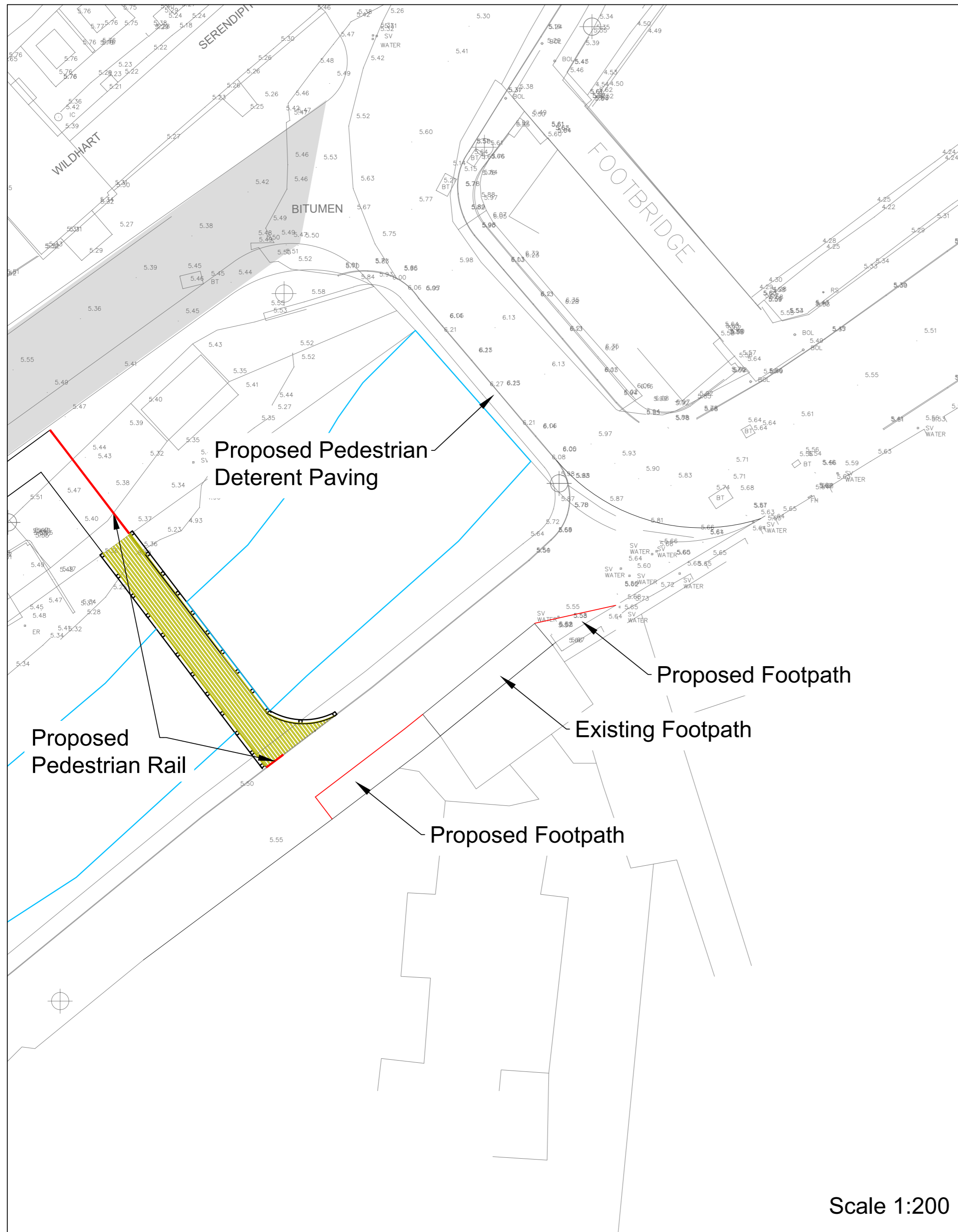


TITLE	SCALE	SANDSEND EAST BECK DEVELOPMENT
MASTERPLAN	1:1000 @ A1	
NUMBER	DATE	FRANCIS ROBERTS ARCHITECTS 1 RIBBLESDALE PLACE, PRESTON PR1 3NA T 01772562221 E architects@francisroberts.com
EBSK 19 rev A	11/05/2021	
	DRAWN	
	DDR & DK	

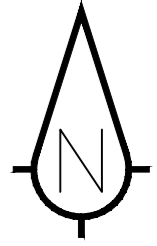


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APPENDIX H
Drawing 11613-006



Large Car (2006)
 Overall Length 5.079m
 Overall Width 1.872m
 Overall Body Height 1.525m
 Min Body Ground Clearance 0.310m
 Max Track Width 1.831m
 Lock to lock time 4.00s
 Kerb to Kerb Turning Radius 5.900m



Rev	Amendment	Drawn	Date	Checked

Client
 The Mulgrave Estate

Project Title
 Sandsend Scheme, Whitby

Drawing Title
 Proposed Pedestrian Route

Scale	As Shown	Drawn By	BL
Drawing Size	A2	Checked By	SB
Date	May 2021	Approved By	KS

	Drawing Number	Rev
	11613-006	