

**TRANSPORT & INFRASTRUCTURE
PLANNING**

Alfa Homes Ltd.
Netherley Drive
Marsden, Kirklees

HIGHWAYS NOTE

TRANSPORT & INFRASTRUCTURE

PLANNING

Alfa Homes Ltd
Netherley Drive
Marsden, Kirklees

HIGHWAYS NOTE

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S2	P2 – updated with latest plans	01.03.2018	M. Addison	M. Addison	M. Addison

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1.0 INTRODUCTION

Appointment

- 1.1 BWB Consulting Ltd (BWB) has been appointed by Alfa Homes Ltd (the 'Applicant') to prepare this Highways Note to support a planning application for residential development at land off Netherley Drive in Marsden, Kirklees (the 'Site').
- 1.2 The proposal comprises a residential development of five dwellings with vehicle and pedestrian access proposed to be taken from Netherley Drive. The proposed site plan is included in **Appendix A** to this Note.

Background

- 1.3 The Local Planning and Highways Authority is Kirklees Council (KC).
- 1.4 BWB attended a meeting with KC development control officers (including representatives from Planning, Highways and Public Rights of Way) on 15th August 2017 to discuss the pre-application advice provided for a larger 22-dwelling scheme at the site.
- 1.5 KC Highways noted that 'the principle of a residential development in this location is considered acceptable in highways terms' and requested that the 'application coming forward would need to be supported by a Transport Statement/Assessment and will need to focus upon the access proposals'. This Highways Note is considered equivalent to a Transport Statement, albeit suitable for the significantly reduced scheme of five dwellings. Unlike a TS, this report does not quantify the trip generation of the proposed development with this expected to be immaterial, rather it focuses on the access arrangements.
- 1.6 The KC 'Highways Development Delivery: Planning Pre-Application and Application Advice Note' (2016) states that the 'Kirklees Street Design Guide is currently being developed and that in the interim, Manual for Streets (MfS) 1 & 2 and the Design Manual for Roads and Bridges (DMRB) should be referred to'. As such, BWB has considered these design guidance documents accordingly.
- 1.7 Following this introductory section, the Highways Note is structured as follows:
 - **Section 2: Existing Conditions** - describes the existing conditions in the vicinity of the site, the location in detail, the surrounding highway network and an analysis of Personal Injury Collision (PIC) data;
 - **Section 3: Proposed Development** - describes the development proposals, including access, servicing arrangements and parking provision, which is assessed in terms of the local parking standards;
 - **Section 4: Summary and Conclusions**

2.0 EXISTING CONDITIONS

Site Location

- 2.1 The application site is located to north of Netherley Drive in Marsden, a large village within the Metropolitan Borough of Kirklees district in West Yorkshire. Marsden is situated approximately 13km south-west of Huddersfield town centre at the confluence of the River Colne and the Wessenden Brook.
- 2.2 The location of the application site in relation to Marsden and the local highway network is shown in **Figure 1**. The site red line boundary is shown on the official Location Plan included in **Appendix B**.

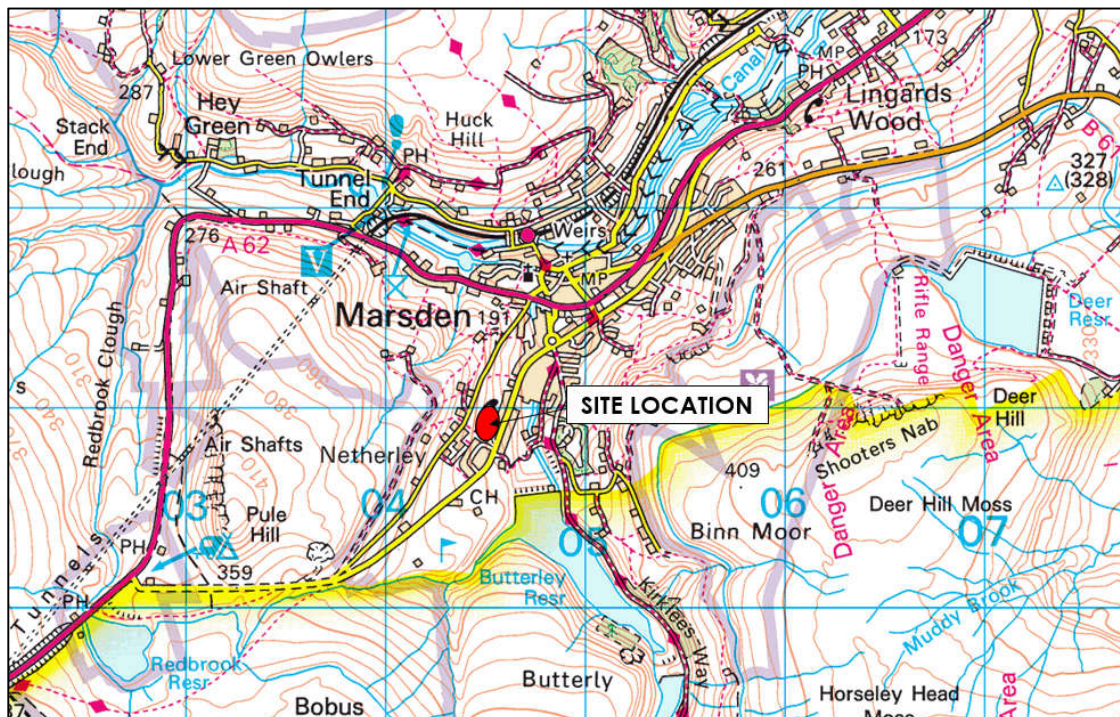


Figure 1: Site Location Plan

Existing Use and Access Arrangements

- 2.3 The site is currently vacant land with no formal point of vehicle access provided from the adopted highway network. It is bounded by open land to the north, existing terraced housing fronting Mount Road to the east and existing residential development to the south and west.

Local Highway Network

- 2.4 Netherley Drive forms a priority junction with Mount Road 40m to the east of the proposed site access. Mount Road connects to Marsden to the north and the A62 approximately 2km to the south west.
- 2.5 Mount Road has a speed limit of 30mph which changes to a derestricted zone approximately 300m north of the Netherley Drive junction. Street lighting is provided on both Mount Road and Netherley Drive within the vicinity of the site.

- 2.6 Netherley Drive provides a 5.0m wide carriageway and currently serves approximately 35 dwellings. It has two points of access from Mount Road. Footways of 2.0m are present on both sides of Netherley Drive with the footway along the eastern side forming part of the Colne Valley 207 footpath, a public right of way (PRoW).
- 2.7 Mount Road to the north of the Netherley Drive/Mount Road junction is approximately 7.7m wide with a footway provided along the western side only. To the south of the Netherley Drive junction, the Mount Road carriageway narrows to approximately 6.8m with footways provided on both sides.

Road Safety

- 2.8 Personal Injury Collision (PIC) records for the local highway network in the vicinity of the site has been reviewed using the Crashmap database, which includes records up to June 2017. The data has been analysed for the latest available five-year period between June 2012 and June 2017 inclusive.
- 2.9 The study area reviewed includes the full extent of Netherley Drive along with the extent of Mount Road between the entrance to Marsden Cricket and Bowling Club, to the south and to the end of the existing row of terraces to the north, approximately 500 metres of carriageway.
- 2.10 There have not been any PICs recorded within the study area during the most recent five-year assessment period. As such, there is no particular road safety issue on the local highway network that needs to be given due attention as part of the site access proposals.

Access by Sustainable Modes of Travel

- 2.11 Bus stops are located on Mount Road, adjacent to the Netherley Road junction some 130m from the centre of the application site. The bus stop is served by Bus Route 183. This bus route operates 7-days-a-week with an hourly frequency in each direction. It serves destinations including Marsden, Slaithwaite, Linthwaite and Huddersfield.
- 2.12 In light of the availability of the above both service, the site is considered to be a sustainable location relative to the number of dwellings being proposed.

3.0 PROPOSED DEVELOPMENT

Overview

- 3.1 The proposal comprises a residential development of 5 no. 5-bed detached dwellings (Use Class C3).
- 3.2 The Proposed Site Plan is provided in **Appendix A**.

Access Arrangements

- 3.3 The following parameters have been considered as part of the proposed site access arrangements:
- Vehicle speeds along Netherley Drive and subsequent visibility splay requirements (MfS);
 - The extent of the adopted highway network and land within the Applicant's control;
 - The alignment of the existing Public Right of Way;
 - Design standards relative to the scale of development proposed; and
 - Swept path analysis of design vehicles.
- 3.4 The site access junction is proposed to take the form of a priority junction with Netherley Drive and a private access road (and public right of way) also branching off of this.
- 3.5 The preliminary design of the proposed site access is shown on BWB Drawing No. **NET-BWB-GEN-01-DR-TR-100** provided at the end of this note. The above information has been considered in the design of the access and is described below. Given that the proposal is for only five dwellings, the access road has been designed as a 4.1m wide private drive with 0.6m grass service margin along its northern side.
- 3.6 The following paragraphs explain how the key design parameters have been considered.

Vehicle Speeds and Visibility Splays

- 3.7 An Automatic Traffic Counter (ATC) survey was undertaken on Netherley Drive between Tuesday 14th and Monday 20th March 2017 to record vehicle speeds (and flows) in the vicinity of the proposed site access.
- 3.8 The ATC was installed on the bend of Netherley Drive to the north of the proposed access location in order to gain a realistic sample of speeds for vehicles approaching down the hill from the south-west direction. The installed location of the ATC unit is shown in **Figure 2** below.



Figure 2: ATC Location in relation to Proposed Access

- 3.9 Full results from this survey are included in **Appendix C** and a summary of the 85th Percentile and average speed is provided in **Table 1** below.

Table 1: Recorded Speeds on Netherley Drive

Direction	85 th Percentile (Dry Weather) Speed		Average Speed	
	MPH	KPH	MPH	KPH
Eastbound	13.7	22.0	11.3	18.2
Westbound	13.3	21.4	11.3	18.2

Source: ATC Survey (March 2017)

- 3.10 Using the formula provided in Manual for Streets (MfS) 2, BWB has calculated the recommended Stopping Sight Distances (SSD) required to inform the visibility splay assessments. The above 85th Percentile dry weather speeds have been converted to wet weather speeds and thereafter the calculation has included an allowance for a -5% gradient for vehicles travelling eastbound and a +5% gradient for vehicles travelling westbound.
- 3.11 Based on the calculation, the minimum required SSD for vehicles approaching from the west is 15 metres and from the east is 16.4 metres. Printouts of the SSD calculations for the east and westbound vehicle speeds are included in **Appendix D** for reference. Drawing **NET-BWB-GEN-01-DR-TR-101** shows that these levels of visibility are achievable.

Extent of Adopted Highway

- 3.12 BWB instructed the Council to undertake a highway search of the area in the vicinity of the proposed site access in order to identify the extent of the adopted highway network maintainable at public expense. A copy of the adopted highway mapping received from the Highways Registry Officer is included in **Appendix E** and indicates that this does extend to the site red line boundary within the applications ownership and therefore there is no requirement for third party land.

Public Rights of Way

- 3.13 In addition to showing the extent of the adopted highway network, the Highways Registry Officer also provided information on Public Rights of Way (PRoW) in the vicinity of the site. A copy of this plan is included in **Appendix E**. The Colne Valley footpath PRoW runs across the proposed site access location, which will be retained as part of the proposal.

Swept Path Analysis

- 3.14 BWB has undertaken swept path analysis of the proposed site access to demonstrate that a large refuse vehicle (or as equivalent to KC standard refuse vehicle) can enter and egress the site in forward gear. Drawing **NET-BWB-GEN-XX-RP-TR-110** shown the swept path manoeuvres. Drawing **NET-BWB-GEN-XX-RP-TR-111** shows the manoeuvre on the internal turning head.

Parking Provision

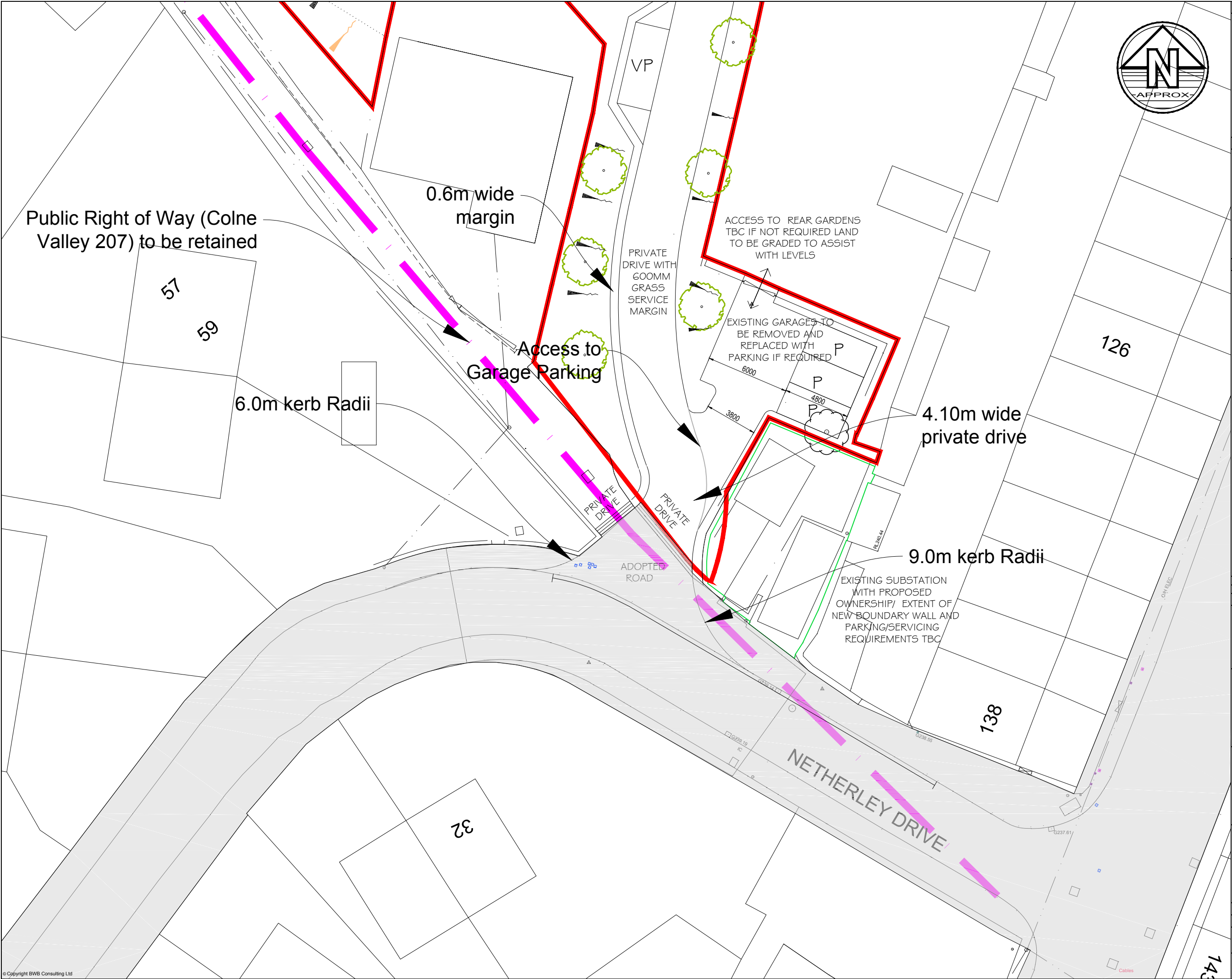
- 3.15 The Council's car parking standards for residential developments are as follows:
- 2 & 3 bedroom dwellings = 2 spaces
 - 4+ bedroom dwellings = 3 spaces
 - Visitor parking = 1 space per 4 dwellings
- 3.16 The proposal includes 5 no. five-bed dwellings and therefore each dwelling requires three car parking spaces plus two visitor spaces. Each dwelling is provided with two off-street driveway spaces plus double garages (up to 4 spaces).
- 3.17 As noted in the Council's Pre-application Advice Note, there is now a requirement to provide one electric vehicle charging connection point per dwelling. This connection has been provided in each of the garage spaces.
- 3.18 In addition to car parking, the Council also has a desirable standard for cycle parking, this equates to one cycle space per dwelling. The proposed dwellings have access to garages and outside space which can be used for adequate cycle storage.

4.0 SUMMARY & CONCLUSION

- 4.1 BWB Consulting Ltd has been appointed by Alfa Homes Ltd to prepare this Highways Note to support a planning application for five dwellings at land off Netherley Drive in Marsden, Kirklees.
- 4.2 BWB attended a meeting with Kirklees Council development control officers (including representatives from Planning, Highways and Public Rights of Way) on 15th August 2017 to discuss the pre-application advice provided for a larger 22-dwelling scheme at the site.
- 4.3 In their pre-application response to the 22-dwelling, Kirklees Council Highways noted that *'the principle of a residential development in this location is considered acceptable in highways terms'* and requested that the *'application coming forward would need to be supported by a Transport Statement and will need to focus upon the access proposals'*.
- 4.4 Owing to the significantly reduced scale of the proposal, this Highways Note focuses on addressing the access arrangements to the site rather than the traffic impacts, which would be limited. The 'Kirklees Street Design Guide is currently being developed and that in the interim, Manual for Streets (MfS) 1 & 2 and the Design Manual for Roads and Bridges (DMRB) should be referred to'. As such, BWB has considered these design guidance documents accordingly.
- 4.5 The proposed site access road has been designed as a private drive, a road type that is suitable to accommodate a development of up to five dwellings. The internal access road will terminate in a cul-de-sac arrangement with a turning head provided at the terminus enabling a refuse vehicle to enter and egress the site in forward gear. The design of the access road has been subject to swept path analysis for appropriate design vehicles.
- 4.6 There is a public right of way footpath routed across the proposed site access between the Netherley Drive eastern footway, up the private track towards Pule Springs. The public right of way route is proposed to be retained as part of the access arrangements.
- 4.7 Visibility splays from the proposed site access junction onto Netherley Drive have been based on MfS guidance and informed by a speed survey. Visibility splays in excess of the minimum requirements can be achieved in both directions.
- 4.8 The site is in a sustainable location with opportunities available to access a range of local amenities by public transport, walking and cycling.
- 4.9 In light of the findings of this Highways Note, it is considered that the proposed development of 5 dwellings at the application site in accordance with local and national design guidance and policy.

DRAWINGS

NET-BWB-GEN-01-DR-TR-100
General Access Arrangements



- Notes**
1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
 2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 4. Any discrepancies noted on site are to be reported to the engineer immediately.

Key Plan

 Highway Boundary

 Application Boundary Line

Legend

P1	19.02.18	Preliminary Issue		AH	MA
Rev	Date	Details of issue / revision		Drw	Rev

Issues & Revisions

 **BWB**
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Client: **Berkeley DeVeer Ltd**

Project Title
Netherley Drive, Marsden, Kirklees

Drawing Title
General Access Arrangements

Drawn:	A. Huneidi	Reviewed:	M. Addison
BWB Ref:	LDT2198	Date:	19.02.18
Scale:	A3	Scale:	1:250
Drawing Status	Preliminary		
Project - Originator - Zone - Level - Type - Role - Number	NET-BWB-GEN-XX-DR-TR-100	Status	S2
Rev	P1		

NET-BWB-GEN-01-DR-TR-101
Visibility Splays Assessment

NET-BWB-HGN-01-DR-TR-110
Swept Path Analysis of Site Access



- Notes**
1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
 2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 4. Any discrepancies noted on site are to be reported to the engineer immediately.

Key Plan

Phoenix 2-23W (with Elite 2 6x4 chassis)	10.595m
Overall Length	2.530m
Overall Width	3.205m
Overall Body Height	0.410m
Min Body Ground Clearance	2.500m
Track Width	4.00s
Lock-to-lock time	9.250m
Curb to Curb Turning Radius	

- Legend**
- Vehicle Wheel Track
 - Vehicle Body Overhang

Legend

P2	19.02.18	Preliminary Issue: Revised Layout	AH	MA
P1	05.02.18	Preliminary Issue	AH	MA
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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- ☐ London | 020 7234 9122
- ☐ Manchester | 0161 233 4260
- ☐ Nottingham | 0115 924 1100

www.bwbconsulting.com

Client
Berkeley DeVeer Ltd

Project Title
**Netherley Drive, Marsden,
Kirklees**

Drawing Title
**Swept Path Analysis of the
Site Access: Phoenix
2-23W Refuse Vehicle**

Drawn:	A. Huneidi	Reviewed:	M. Addison
BWB Ref:	LDT2198	Date:	19.02.18
Scale:	A3	Scale:	1:500

Drawing Status
Preliminary

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
NET-BWB-GEN-XX-DR-TR-110	S2	P3

NET-BWB-HGN-01-DR-TR-111
Swept Path Analysis of Turning Head



- Notes**
1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
 2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 4. Any discrepancies noted on site are to be reported to the engineer immediately.

Key Plan

Phoenix 2-23W (with Elite 2 6x4 chassis)

Overall Length	10.595m
Overall Width	2.530m
Overall Body Height	3.205m
Min Body Ground Clearance	0.410m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	9.250m

Vehicle Wheel Track
Vehicle Body Overhang

Legend

P2	19.02.18	Preliminary Issue: Revised Site Layout	AH MA
P1	05.02.18	Preliminary Issue	AH MA
Rev	Date	Details of issue / revision	Drw Rev

Issues & Revisions

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INFRASTRUCTURE | BUILDINGS

Client: **Berkeley DeVeer Ltd**

Project Title: **Netherley Drive, Marsden, Kirklees**

Drawing Title: **Swept Path Analysis of the Turning Head: Phoenix 2-23W Refuse Vehicle**

Drawn:	A. Huneidi	Reviewed:	M. Addison
BWB Ref:	LDT2198	Date:	19.02.18
Scale:	A3	Scale:	1:500

Drawing Status: **Preliminary**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
NET-BWB-GEN-XX-DR-TR-111	S2	P2

APPENDICES

Appendix A

Proposed Site Layout



PLANNING LAYOUT LAYERS KEY:

	APPLICATION BOUNDARY
	RETAINING WALL TBC
	1800mm TIMBER FENCE
	450mm KNEE HIGH RAIL
	REAR ACCESS GATES (LOCKABLE)
	FOCAL POINT
	BLOCK PAVING
	PROPOSED TREES
	LAND GRADIENT
	BIN STORE
	BIN COLLECTION POINT
	VISITOR PARKING

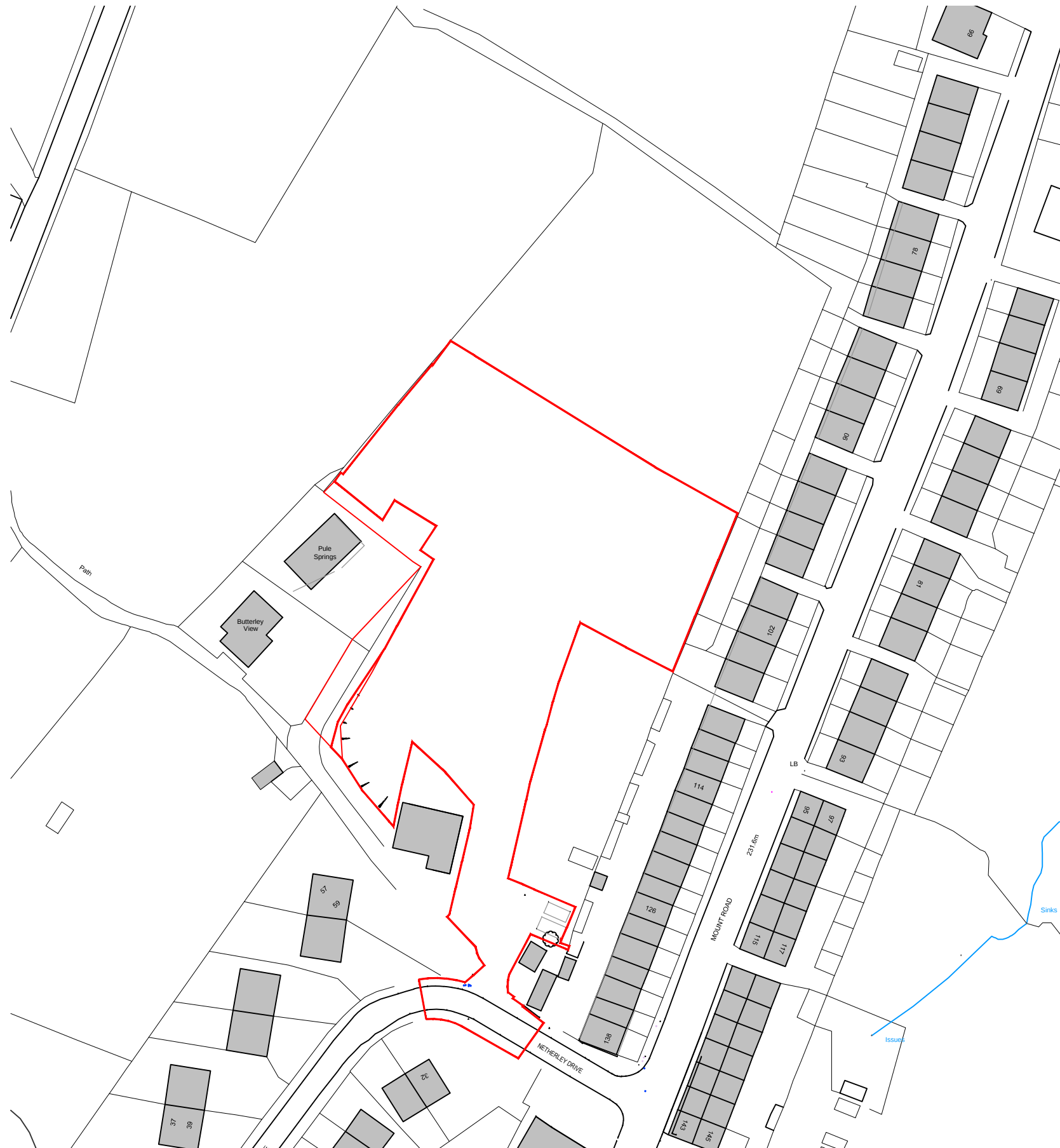
SCHEDULE OF ACCOMMODATION:

OPEN MARKET UNITS	HOUSETYPE	AMOUNT
	T-502 (2013M) 2 STOREY 5 BED DETACHED	2 No.
	T-510(2119) 3 STOREY (SPLIT LEVEL) 5 BED DETACHED	3 No.

NOTES:

- FOR SITE LEVELS AND RETAINING WALLS REFER TO SEPARATE ENGINEERS DESIGNS AND SPECIFICATIONS.
- LANDSCAPE INDICATIVE REFER TO SEPARATE LANDSCAPE DRAWINGS FOR PLANTING SCHEME
- LAND OWNERSHIP AND ACCESS TO SUB STATION TBC.
- TURNING HEAD TO BE ABLE TO ACCOMMODATE BOTH REFUSE AND FIRE VEHICLES. PRIVATE DRIVE CONSTRUCTION SUBJECT TO CIVIL ENGINEERS DESIGN AND SPECIFICATION.

Appendix B
Site Location / Red Line Boundary



1:1000 SCALE



CLIENT:
BERKLEY DEVEER

DRAWING NUMBER:
18 5153 00

PROJECT:
LAND OFF NETHERLEY DRIVE
MARSDEN
DRAWING:
LOCATION PLAN

SCALE @ A3:
1:100

DRAWN: THS
DATE: FEB 2018

CHECKED: VD
DATE: FEB 2018

00/ LOCATION PLAN

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Appendix C

ATC Survey Results

Report ID	11407
Site Name	Site 1 of 1
Description	Spillway Dam, West end of Mount Road
Direction	E to W

[illegible][illegible]

General Information	
Report ID	12345
Report Name	Q4 2023 - Sales Performance
Report Date	2023-12-31
Report Author	John Doe

Summary for Month 2023

Year	Month	Sales Performance				Category	Sales Volume	Revenue	Profit	Product Performance										Market Share										Growth Rate	Average Rating	Customer Feedback	
		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	Product A	Product B	Product C	Product D	Product E	Product F	Product G	Product H	Product I	Product J	Market A	Market B	Market C	Market D	Market E	Market F	Market G	Market H	Market I	Market J			
2023-01-01	1	10	12	15	18	Electronics	1000	1200	1500	1800	100	120	150	180	200	220	250	280	300	320	15%	18%	20%	22%	25%	28%	30%	32%	35%	38%	12%	4.5	Positive
2023-01-02	2	11	13	16	19	Electronics	1100	1300	1600	1900	110	130	160	190	210	230	260	290	310	330	16%	19%	21%	23%	26%	29%	31%	33%	36%	39%	13%	4.6	Positive
2023-01-03	3	12	14	17	20	Electronics	1200	1400	1700	2000	120	140	170	200	220	240	270	300	320	340	17%	20%	22%	24%	27%	30%	32%	34%	37%	40%	14%	4.7	Positive
2023-01-04	4	13	15	18	21	Electronics	1300	1500	1800	2100	130	150	180	210	230	250	280	310	330	350	18%	21%	23%	25%	28%	31%	33%	35%	38%	41%	15%	4.8	Positive
2023-01-05	5	14	16	19	22	Electronics	1400	1600	1900	2200	140	160	190	220	240	260	290	320	340	360	19%	22%	24%	26%	29%	32%	34%	36%	39%	42%	16%	4.9	Positive
2023-01-06	6	15	17	20	23	Electronics	1500	1700	2000	2300	150	170	200	230	250	270	300	330	350	370	20%	23%	25%	27%	30%	33%	35%	37%	40%	43%	17%	5.0	Positive
2023-01-07	7	16	18	21	24	Electronics	1600	1800	2100	2400	160	180	210	240	260	280	310	340	360	380	21%	24%	26%	28%	31%	34%	36%	38%	41%	44%	18%	5.1	Positive
2023-01-08	8	17	19	22	25	Electronics	1700	1900	2200	2500	170	190	220	250	270	290	320	350	370	390	22%	25%	27%	29%	32%	35%	37%	39%	42%	45%	19%	5.2	Positive
2023-01-09	9	18	20	23	26	Electronics	1800	2000	2300	2600	180	200	230	260	280	300	330	360	380	400	23%	26%	28%	30%	33%	36%	38%	40%	43%	46%	20%	5.3	Positive
2023-01-10	10	19	21	24	27	Electronics	1900	2100	2400	2700	190	210	240	270	290	310	340	370	390	410	24%	27%	29%	31%	34%	37%	39%	41%	44%	47%	21%	5.4	Positive
2023-01-11	11	20	22	25	28	Electronics	2000	2200	2500	2800	200	220	250	280	300	320	350	380	400	420	25%	28%	30%	32%	35%	38%	40%	42%	45%	48%	22%	5.5	Positive
2023-01-12	12	21	23	26	29	Electronics	2100	2300	2600	2900	210	230	260	290	310	330	360	390	410	430	26%	29%	31%	33%	36%	39%	41%	43%	46%	49%	23%	5.6	Positive
2023-01-13	13	22	24	27	30	Electronics	2200	2400	2700	3000	220	240	270	300	320	340	370	400	420	440	27%	30%	32%	34%	37%	40%	42%	44%	47%	50%	24%	5.7	Positive
2023-01-14	14	23	25	28	31	Electronics	2300	2500	2800	3100	230	250	280	310	330	350	380	410	430	450	28%	31%	33%	35%	38%	41%	43%	45%	48%	51%	25%	5.8	Positive
2023-01-15	15	24	26	29	32	Electronics	2400	2600	2900	3200	240	260	290	320	340	360	390	420	440	460	29%	32%	34%	36%	39%	42%	44%	46%	49%	52%	26%	5.9	Positive
2023-01-16	16	25	27	30	33	Electronics	2500	2700	3000	3300	250	270	300	330	350	370	400	430	450	470	30%	33%	35%	37%	40%	43%	45%	47%	50%	53%	27%	6.0	Positive
2023-01-17	17	26	28	31	34	Electronics	2600	2800	3100	3400	260	280	310	340	360	380	410	440	460	480	31%	34%	36%	38%	41%	44%	46%	48%	51%	54%	28%	6.1	Positive
2023-01-18	18	27	29	32	35	Electronics	2700	2900	3200	3500	270	290	320	350	370	390	420	450	470	490	32%	35%	37%	39%	42%	45%	47%	49%	52%	55%	29%	6.2	Positive
2023-01-19	19	28	30	33	36	Electronics	2800	3000	3300	3600	280	300	330	360	380	400	430	460	480	500	33%	36%	38%	40%	43%	46%	48%	50%	53%	56%	30%	6.3	Positive
2023-01-20	20	29	31	34	37	Electronics	2900	3100	3400	3700	290	310	340	370	390	410	440	470	490	510	34%	37%	39%	41%	44%	47%	49%	51%	54%	57%	31%	6.4	Positive
2023-01-21	21	30	32	35	38	Electronics	3000	3200	3500	3800	300	320	350	380	400	420	450	480	500	520	35%	38%	40%	42%	45%	48%	50%	52%	55%	58%	32%	6.5	Positive
2023-01-22	22	31	33	36	39	Electronics	3100	3300	3600	3900	310	330	360	390	410	430	460	490	510	530	36%	39%	41%	43%	46%	49%	51%	53%	56%	59%	33%	6.6	Positive
2023-01-23	23	32	34	37	40	Electronics	3200	3400	3700	4000	320	340	370	400	420	440	470	500	520	540	37%	40%	42%	44%	47%	50%	52%	54%	57%	60%	34%	6.7	Positive
2023-01-24	24	33	35	38	41	Electronics	3300	3500	3800	4100	330	350	380	410	430	450	480	510	530	550	38%	41%	43%	45%	48%	51%	53%	55%	58%	61%	35%	6.8	Positive
2023-01-25	25	34	36	39	42	Electronics	3400	3600	3900	4200	340	360	390	420	440	460	490	520	540	560	39%	42%	44%	46%	49%	52%	54%	56%	59%	62%	36%	6.9	Positive
2023-01-26	26	35	37	40	43	Electronics	3500	3700	4000	4300	350	370	400	430	450	470	500	530	550	570	40%	43%	45%	47%	50%	53%	55%	57%	60%	63%	37%	7.0	Positive
2023-01-27	27	36	38	41	44	Electronics	3600	3800	4100	4400	360	380	410	440	460	480	510	540	560	580	41%	44%	46%	48%	51%	54%	56%	58%	61%	64%	38%	7.1	Positive
2023-01-28	28	37	39	42	45	Electronics	3700	3900	4200	4500	370	390	420	450	470	490	520	550	570	590	42%	45%	47%	49%	52%	55%	57%	59%	62%	65%	39%	7.2	Positive
2023-01-29	29	38	40	43	46	Electronics	3800	4000	4300	4600	380	400	430	460	480	500	530	560	580	600	43%	46%	48%	50%	53%	56%	58%	60%	63%	66%	40%	7.3	Positive
2023-01-30	30	39	41	44	47	Electronics	3900	4100	4400	4700	390	410	440	470	490	510	540	570	590	610	44%	47%	49%	51%	54%	57%	59%	61%	64%	67%	41%	7.4	Positive
2023-01-31	31	40	42	45	48	Electronics	4000	4200	4500	4800	400	420	450	480	500	520	550	580	600	620	45%	48%	50%	52%	55%	58%	60%	62%	65%	68%	42%	7.5	Positive
2023-02-01	1	41	43	46	49	Electronics	4100	4300	4600	4900	410	430	460	490	510	530	560	590	610	630	46%	49%	51%	53%	56%	59%	61%	63%	66%	69%	43%	7.6	Positive
2023-02-02	2	42	44	47	50	Electronics	4200	4400	4700	5000	420	440	470	500	520	540	570	600	620	640	47%	50%	52%	54%	57%	60%	62%	64%	67%	70%	44%	7.7	Positive
2023-02-03	3	43	45	48	51	Electronics	4300	4500	4800	5100	430	450	480	510	530	550	580	610	630	650	48%	51%	53%	55%	58%	61%	63%	65%	68%	71%	45%	7.8	Positive
2023-02-04	4	44	46	49	52	Electronics	4400	4600	4900	5200	440	460	490	520	540	560	590	620	640	660	49%	52%	54%	56%	59%	62%	64%	66%	69%	72%	46%	7.9	Positive
2023-02-05	5	45	47	50	53	Electronics	4500	4700	5000	5300	450	470	500	530	550	570	600	630	650	670	50%	53%	55%	57%	60%	63%	65%	67%	70%	73%	47%	8.0	Positive
2023-02-06	6	46	48	51	54	Electronics	4600	4800	5100	5400	460	480	510	540	560	580	610	640	660	680	51%	54%	56%	58%	61%	64%	66%	68%	71%	74%	48%	8.1	Positive
2023-02-07	7	47	49	52	55	Electronics	4700	4900	5200	5500	470	490	520	550	570	590	620	650	670	690	52%	55%	57%	59%	62%	65%	67%	69%	72%	75%	49%	8.2	Positive
2023-02-08	8	48	50	53	56	Electronics	4800	5000	5300	5600	480	500	530	560	580	600	630	660	680	700	53%	56%	58%	60%	63%	66%	68%	70%	73%	76%	50%	8.3	Positive
2023-02-09	9	49	51	54	57	Electronics	4900	5100	5400	5700	490	510	540	570	590	610	640	670	690	710	54%	57%	59%	61%	64%	67%	69%	71%	74%	77%	51%	8.4	Positive
2023-02-10	10	50	52	55	58	Electronics	5000	5200	5500	5800	500	520	550	580	600	620	650	680	700	720	55%	58%	60%	62%	65%	68%	70%	72%	75%	78%	52%	8.5	Positive
2023-02-11	11	51	53	56	59	Electronics	5100	5300	5600	5900	510	530	560	590	610	630	660	690	710	730	56%	59%	61%	63%	66%	69%	71%	73%	76%	79%	53%	8.6	Positive
2023-02-12	12	52	54	57	60	Electronics	5200	5400	5700	6000	520	540	570	600	620	640	670	700	720	740	57%	60%	62%	64%	67%	70%	72%	74%	77%				

Appendix D

Visibility Splay Calculations

Vehicle speeds	13.70 mph 22.04 kph 6.12 v (m/s) 37.49 v ²	Formula: $SSD = vt + v^2 / 2(d+0.1a)$	<table border="1"> <tr> <th colspan="2">Manual for Streets 2</th> <th>DMRB</th> </tr> <tr> <td>Light Vehicles (less than 5% HGVs)</td> <td>HGVs/Buses (over 5% of total vehicles)</td> <td>All traffic</td> </tr> <tr> <td>1.5s</td> <td>1.5s</td> <td>2s</td> </tr> <tr> <td>0.45g</td> <td>0.375g</td> <td>0.25g</td> </tr> </table>			Manual for Streets 2		DMRB	Light Vehicles (less than 5% HGVs)	HGVs/Buses (over 5% of total vehicles)	All traffic	1.5s	1.5s	2s	0.45g	0.375g	0.25g
Manual for Streets 2			DMRB														
Light Vehicles (less than 5% HGVs)	HGVs/Buses (over 5% of total vehicles)		All traffic														
1.5s	1.5s		2s														
0.45g	0.375g	0.25g															
Driver Perception-Reaction time	1.5 t (s)	Perception-Reaction Time (t)	1.5s	1.5s	2s												
Deceleration Rate	0.45 g 4.41 d (m/s) 8.83 2d	Deceleration Rate (g = 9.81m/s ²)	0.45g	0.375g	0.25g												
Gradient	-5.00 a* 3.91 d+0.1a 7.829 2(d+0.1a)	Enter gradient as positive for uphill towards junction and negative for downhill towards junction															
Stopping Sight Distance (SSD) =	v t + v ² / 2(d+0.1a)	<table border="1"> <tr> <td>9.18</td> <td>+</td> <td>4.79</td> <td>=</td> <td>13.97</td> </tr> </table>				9.18	+	4.79	=	13.97							
9.18	+	4.79	=	13.97													
SSD Bonnet Adjusted (SSD+2.4)**	16.37																

* for simplicity, gradient will be given as zero where details of levels are unavailable and observed gradients are deemed to be insignificant in terms of the effect on vehicle braking

** 2.4 metres added to splay to allow for bonnet length of approaching vehicles

- | | |
|--|------|
| 1) Did the weather conditions remain dry throughout the survey? | Yes |
| 2) What was the calculated 85th percentile speed in mph? | 13.7 |
| 3) Was there of 5% HGV movements during the survey? | no |
| 4) What is the gradient along the major road towards the junction? | -5 |

VISIBILITY SPLAY CALCULATOR: EASTBOUND DIRECTION

Vehicle speeds	13.30 mph 21.40 kph 5.94 v (m/s) 35.34 v ²	Formula: $SSD = vt + v^2 / 2(d + 0.1a)$	<table border="1"> <tr> <th colspan="2">Manual for Streets 2</th> <th>DMRB</th> </tr> <tr> <td>Light Vehicles (less than 5% HGVs)</td> <td>HGVs/Buses (over 5% of total vehicles)</td> <td>All traffic</td> </tr> <tr> <td>1.5s</td> <td>1.5s</td> <td>2s</td> </tr> <tr> <td>0.45g</td> <td>0.375g</td> <td>0.25g</td> </tr> </table>			Manual for Streets 2		DMRB	Light Vehicles (less than 5% HGVs)	HGVs/Buses (over 5% of total vehicles)	All traffic	1.5s	1.5s	2s	0.45g	0.375g	0.25g
Manual for Streets 2			DMRB														
Light Vehicles (less than 5% HGVs)	HGVs/Buses (over 5% of total vehicles)	All traffic															
1.5s	1.5s	2s															
0.45g	0.375g	0.25g															
Driver Perception-Reaction time	1.5 t (s)	<table border="1"> <tr> <td>Perception-Reaction Time (t)</td> <td>1.5s</td> </tr> <tr> <td>Deceleration Rate (g = 9.81m/s²)</td> <td>0.45g</td> </tr> </table>	Perception-Reaction Time (t)	1.5s	Deceleration Rate (g = 9.81m/s ²)	0.45g											
Perception-Reaction Time (t)	1.5s																
Deceleration Rate (g = 9.81m/s ²)	0.45g																
Deceleration Rate	0.45 g 4.41 d (m/s) 8.83 2d	Enter gradient as positive for uphill towards junction and negative for downhill towards junction															
Gradient	5.00 a* 4.91 d+0.1a 9.829 2(d+0.1a)																
Stopping Sight Distance (SSD) =	<table> <tr> <td>v t</td> <td>+</td> <td>v² / 2(d+0.1a)</td> <td>=</td> <td>SSD</td> </tr> <tr> <td>8.92</td> <td>+</td> <td>3.60</td> <td>=</td> <td>12.51</td> </tr> </table>	v t	+	v ² / 2(d+0.1a)	=	SSD	8.92	+	3.60	=	12.51						
v t	+	v ² / 2(d+0.1a)	=	SSD													
8.92	+	3.60	=	12.51													
SSD Bonnet Adjusted (SSD+2.4)**	14.91																

* for simplicity, gradient will be given as zero where details of levels are unavailable and observed gradients are deemed to be insignificant in terms of the effect on vehicle braking

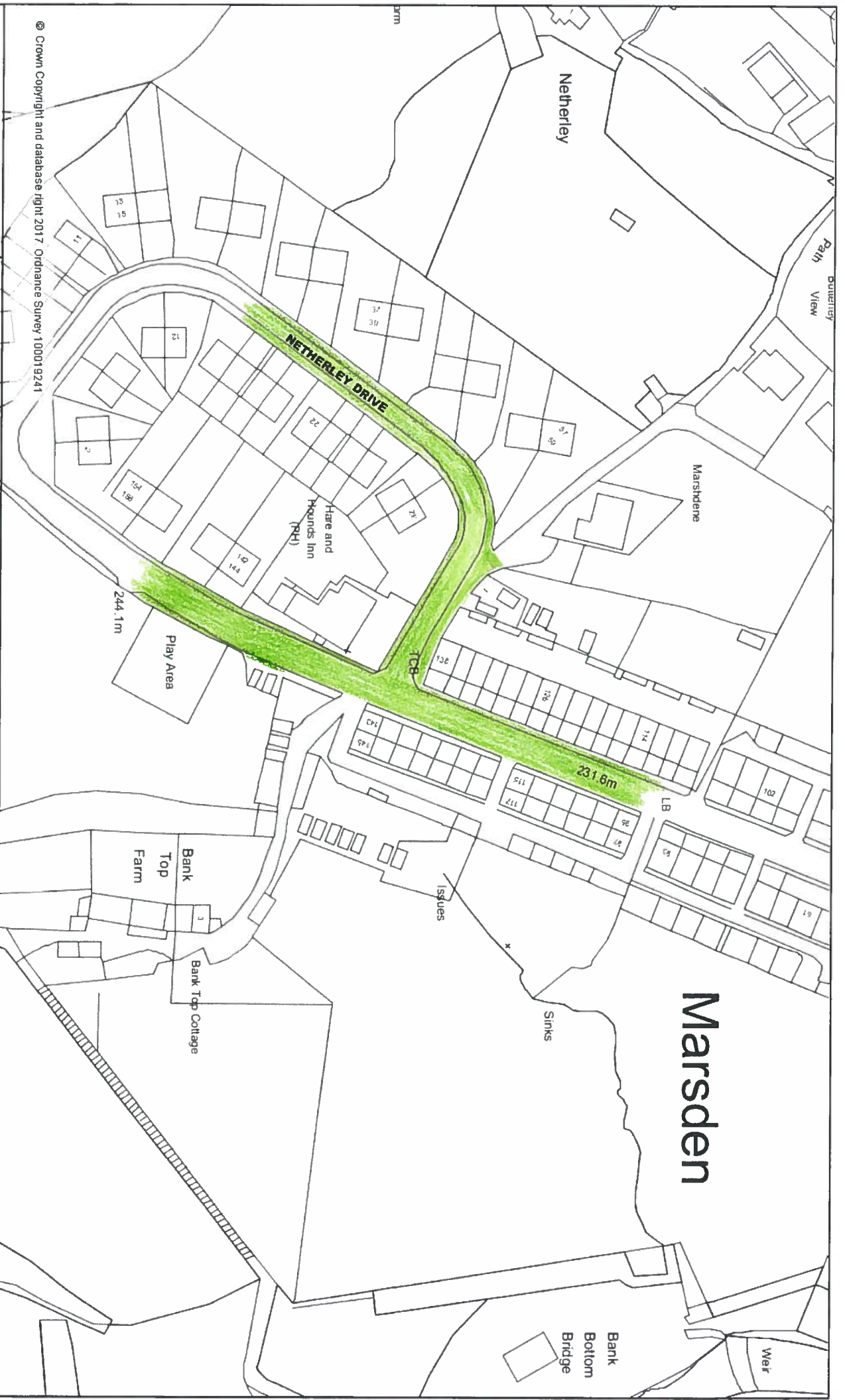
** 2.4 metres added to splay to allow for bonnet length of approaching vehicles

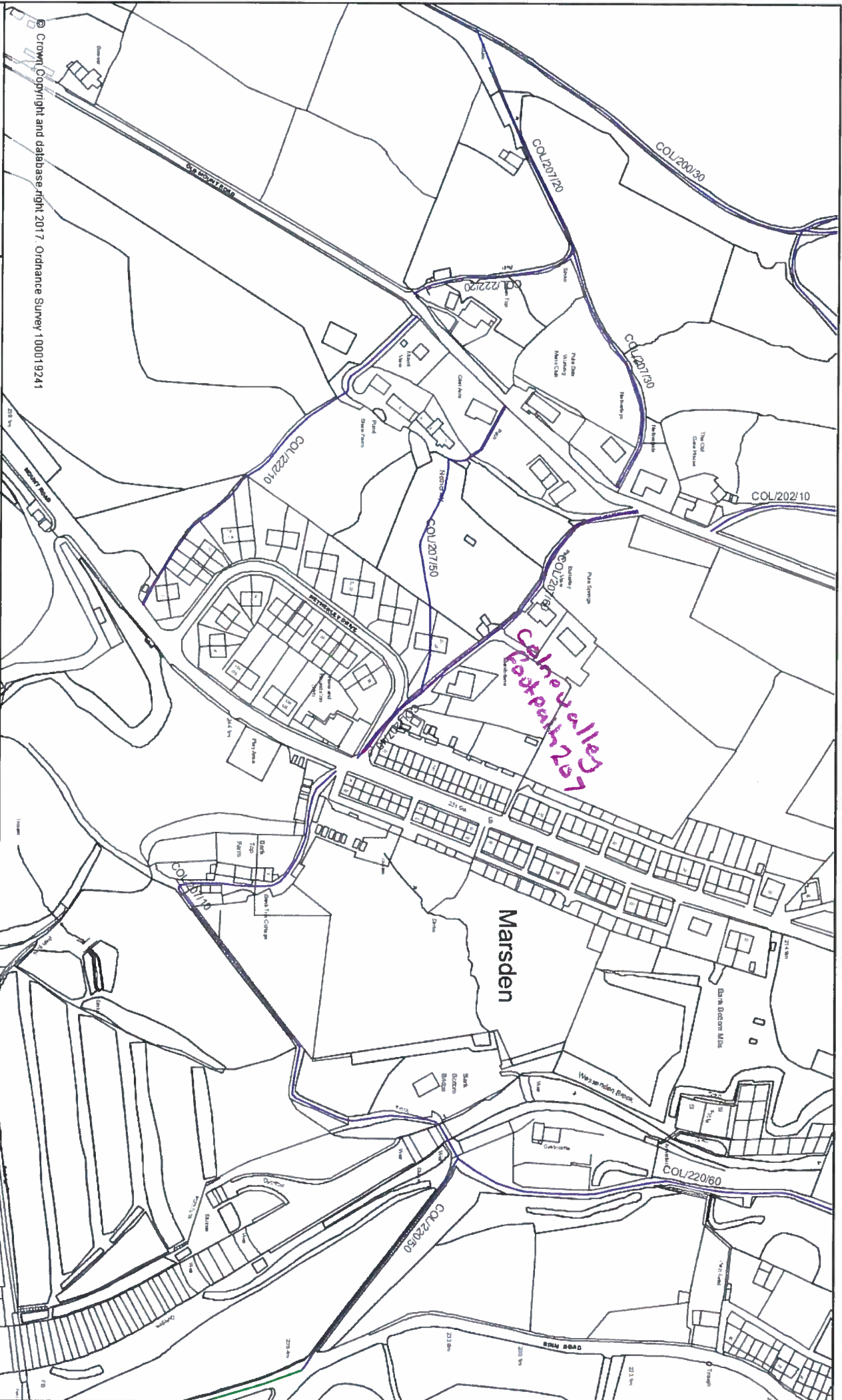
- | | |
|--|------|
| 1) Did the weather conditions remain dry throughout the survey? | Yes |
| 2) What was the calculated 85th percentile speed in mph? | 13.3 |
| 3) Was there of 5% HGV movements during the survey? | no |
| 4) What is the gradient along the major road towards the junction? | 5 |

VISIBILITY SPLAY CALCULATOR: WESTBOUND DIRECTION

Appendix E

Highway Searches Information





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Kirklees
COUNCIL

Tel: 01484 221757 (Internal 860 1757)
E-Mail: maps@kirklees.gov.uk

0 m

100 m

200 m

Scale 1 : 2500



BWB

