OPTIMA
Intelligent Highways Solutions

5th March 2018

Ms H Andrew
Senior Planner
Planning and Building Control
Barnsley Metropolitan Borough Council

Dear Hannah,

**Land off Halifax Road, Thurgoland - Proposed Residential Development of 25 dwellings**
**Planning Application Reference 2018/0028 (Our Ref: 17121)**

I write following receipt of the comments received from the Highways, Engineering and Transportation Team (dated 13th February 2018) and Thurgoland Parish Council (dated 12th February 2018) and to provide additional information in support of the development.

It should be noted that upon instruction Optima considered in detail the option of providing the primary access along Smithy Hill. However, this was rejected because it is not possible within the space constraints to provide an access to adoptable standards.

Firstly, an independent Stage 1 Road Safety Audit (RSA) has been undertaken by experienced Road Safety Engineers employed by Road Safety Initiatives to ensure that the road safety implications of the proposed access has been fully considered for all users. The RSA is enclosed.

This RSA raised a single problem relating to the potential for the existing guard railing to restrict visibility. A Designers Response to the Audit (enclosed) has been produced which accepts the recommendation which can be addressed at the S38/S278 detailed design stage.

The points raised by Highways and the Parish Council are addressed in turn below using the same referencing where applicable.

**Barnsley Council Highways, Engineering and Transportation**

1. ***Visibility splays, having the dimensions 2.4m x 90m, should be safeguarded at the access/egress such that there is no obstruction to visibility and forming part of the adopted highway. This will affect the vegetation on the frontage.***

The consultation response refers to the requirement for visibility splays of .4m x 90m which is based upon Design Manual for Roads and Bridges (DMRB) Stopping Sight Distance (SSD) requirements.

DMRB is not an appropriate design standard to apply in this situation and the following section clarifies this position.

Manual for Streets (MfS) national guidance published in 2007 states the following at Paragraph 1.1.7:

> *"A street is defined as a highway that has important public realm functions beyond the movement of traffic. Most critically, streets should have a sense of place, which is mainly realised through local distinctiveness and sensitivity in design. They also provide direct access to the buildings and the spaces that line them. Most highways in built-up areas can therefore be considered as streets"* (My underlining)

Paragraph 1.4.4 goes on to say:

> *"The DMRB is not an appropriate design standard for most streets, particularly those in lightly-trafficked residential and mixed use areas".* (My underlining)

Paragraph 7.5.1 states:

> *"This section provides guidance on stopping sight distances (SSDs) for streets where 85th percentile speeds are up to 60 kph. At speeds above this, the recommended SSDs in the DMRB may be more appropriate"*

Manual for Streets 2: Wider Application of the Principles (MfS2), which was published in September 2010, forms a companion guide to MfS. MfS2 builds on the advice in MfS and assists in clarifying and filling the perceived gap in design guidance between MfS and DMRB.

Under the introductory heading "*Status and Application*" MfS2 states:

> *"DMRB is the design standard for Trunk Roads and Motorways in England, Scotland, Wales and Northern Ireland. The strict application of DMRB to non-trunk routes is rarely appropriate for highway design in built up areas, regardless of traffic volume".* (My underlining)

MfS2 paragraph 1.3.2 states:

> *"It is clear from Table 1.1 that most MfS advice can be applied to a highway regardless of speed limit.* ***It is therefore recommended that as a starting point for any scheme affecting non-trunk roads, designers should start with MfS".*** (My underlining. The bold emphasis is taken from MfS2)

MfS2 paragraph 1.3.3 states:

> *"Where designers do refer to DMRB for detailed technical guidance on specific aspects, for example on strategic inter-urban non-trunk roads, it is recommended that they bear in mind the key principles of MfS, and apply DMRB in a way that respects local context. It is further recommended that DMRB or other standards and guidance is only used where the guidance contained in MfS is not sufficient or where particular evidence leads a designer to conclude that MfS is not applicable"*

MfS2 paragraph 1.3.4 states:

> *"The application of MfS advice to all 30mph speed limits as a starting point is in keeping with MfS1"*

*MfS 2 paragraph 1.3.6 states:*

> *"It is only where actual speeds are above 40mph for significant periods of the day that DMRB parameters for SSD are recommended. Where speeds are lower, MfS parameters are recommended".* (My underlining)

Halifax Road is subject to a 30 mph speed limit which is well below the 40mph threshold referred to above.

It is therefore clear that visibility splays should be provided in accordance with MfS guidance. Trunk road guidance contained in DMRB is not applicable in this area.

Furthermore the independent Stage 1 Road Safety Audit (RSA) does not raise any concerns relating to the MfS visibility splays proposed.

2. ***The proposed new access to the development is approximately 40m from the stop line for the traffic signals; queuing traffic could block the exit of any vehicles waiting to turn right out of the development especially at peak times.***

The proposed development is modest in scale and is predicted to generate low volumes of traffic during both the network peak hours and throughout the day as set out within the Optima Transport Statement dated January 2018.

Capacity assessments of the proposed site access do not predict any queuing traffic or delay on either the right turn into the site access or the right turn out of the site access, indeed a maximum RFC value of 0.03 is predicted which is well below the 0.85 RFC desirable threshold.

Junction spacing requirements are set out within MfS2 paragraph 9.2.1 which states:

> *"In the past, guidance on minimum junction spacing has often been based upon recommended stopping sight distances (SSD) for 85th percentile speeds. The reductions in SSD compared to previous practice means that junction spacing criteria determined on this basis should be reduced. However, in any event there appears to be little evidence that spacing criteria based on SSD are justified on safety or other grounds".*

The proposed access is located some 46m from the northbound stop line at the nearby signals which exceeds the SSD for a 30mph speed limit (43m including bonnet length) and therefore provides more than adequate separation from the signals.

It acknowledged that traffic from the nearby signals may on occasion queue past the proposed site access – this is the nature of traffic signal control, however this will not result in any highway safety

or efficiency issues. An emerging vehicle would simply dwell for a short period at the give way line until traffic clears. As demonstrated within the capacity modelling work undertaken this is considered to be extremely rare based upon the level of traffic generated by a development of this scale and would not result in a severe impact with reference to paragraph 32 of the NPPF.

It should also be noted that the presence of driveways and side roads on the approaches to signalised junctions is common ground within both urban and rural locations, indeed examples of a similar situation are present to the north of the signals (residential estates served from Churchfields and Trinity Meadows). No operational or safety issues were observed during a site visit and no accidents have been recorded at these locations over the latest 5 years.

Furthermore, as stated above an independent Road Safety Audit of the access arrangements has been undertaken which has not raised any concern over the proximity of the junction to the traffic signals.

Notwithstanding the above, should the Council's Highways team deem it necessary, this perceived issue can be easily mitigated by the provision of keep clear/yellow box markings to allow an emerging vehicle to enter the through traffic in the event that queuing traffic extends beyond the access during peak periods.

3. ***The carriageway adjacent to the site entrance is of limited width and a right turn lane cannot be accommodated. This will lead to potential delays to through traffic as vehicles wait to turn right into the site. This is also likely to lead to an increase in rear end shunts.***

Halifax Road is 6.0m-6.5m wide in the vicinity of the site access which is suitable to accommodate two way passing of all vehicle types in accordance with MfS guidance and therefore is not considered to be limited.

TD 42/95 'Geometric Design of Major/Minor Priority Junctions' provides guidance on the provision of right turn lanes. TD 42/95 states that the provision of a right turn lane should be considered for the following:

- If the minor road flow exceeds 300 vehicles 2-way AADT;
- A right turning accident problem is evident; or
- Where vehicles waiting on the major road flow create a hazard.

Based upon the trip rates contained within the Transport Assessment, a development comprising of up to 25 residential dwelling would generate in the order of 116 two-way trips over a typical day, therefore the development does not meet or exceed the 300 two way AADT trip test.

Furthermore, the more recently published Manual for Streets 2 - Wider Application of the Principles (MfS2) states the following at paragraph 9.4.7:

> *"TD 42/95 recommends that consideration should be given to providing right turning lane at priority junctions where the side road flow exceeds 500 vehicles per day, but this advice relates to trunk roads, where there is an emphasis on providing an unimpeded route for through*

*traffic. It is a relatively low flow, and junctions without right turn lanes will often be able to cater for higher levels of turning traffic without resulting in congestion".*

MfS2 paragraph 9.4.8 goes on to state:

*"Right turning lanes make it more difficult for pedestrians to cross major roads and lead to higher traffic speeds and authorities should therefore consider carefully all the effects before deciding to provide them".*

It is also clear that Halifax Road is not a trunk road, and therefore advice on the provision of right turn lanes contained within TD 42/95 should only be utilised as a guide only and the latest prevailing guidance contained within MfS is more relevant in this case.

The key considerations for the requirements for a right turn lane are:

- Junction capacity; and
- Highway safety.

In terms of junction capacity, the assessment of the site access contained within the Optima Transport Statement is summarised within Table 1 for ease of reference:

**Table 1 Proposed Site Access/Halifax Road AM and PM Design**

| Movement | AM | | PM | |
|---|---|---|---|---|
| | RFC | Queue | RFC | Queue |
| Site Access | 0.03 | 0.0 | 0.00 | 0.0 |
| Halifax Road | 0.01 | 0.0 | 0.01 | 0.0 |

Source Table 4.3 Optima Transport Statement dated Jan 2018

A Ratio of Flow to Capacity (RFC) value below 0.85 indicates that a junction or arm operates within its desirable practical capacity. An RFC value between 0.85 and 1.00 indicates that there may be occasions during the period modelled when queues will develop and delays will occur. An RFC value greater than 1.00 indicates that the junction or arm operates beyond its theoretical capacity and increased queuing and delay will be experienced.

The results summarised above confirm that the junction operates with substantial spare capacity in both peak periods. The RFC for right turning traffic is 0.01 for the AM and PM peak periods with no predicted queuing.

Figures 8 and 9 contained within the Transport Assessment predict just 3 right turning vehicles during the AM and PM peaks.

It can therefore be concluded that there is no requirement in capacity terms to justify the provision of a right turn lane.

With regard to highway safety, drawing 17121/GA/01 A confirms that appropriate visibility splays can be achieved from the proposed access point and northbound traffic has substantial forward visibility to view both an emerging vehicle and a vehicle slowing to turn right into the site.

Furthermore, the Road Safety Audit Team were specifically advised of this particular concern (as referenced within paragraph 1.2.2 of the RSA report) and following consideration, raised no problems or concerns over this perceived issue.

In light of the above the it has been demonstrated that the provision of a simple T junction is both appropriate and proportional to the proposed development quantum both in terms of junction capacity and highway safety and the provision of a right turn lane would represent an unnecessary overprovision which could also lead to increased vehicle speeds.

4. ***There are no pedestrian crossing facilities provided in the signal controlled junction.***

Pedestrian crossing facilities are provided at the signal controlled junction. Dropped kerbs with tactile paving are provided across all arms of the junction. These are identified on the topographical survey on drawing 17121/GA/01.

Following completion of the Transport Statement details of all personal injury accidents recorded in the vicinity of the site (including the site frontage and nearby traffic signals) have been obtained from Barnsley MBC for the last 5 years.

The accident data (enclosed) confirms that no accidents have been recorded either along the site frontage or at the traffic signals. The existing crossings are therefore being used safely by pedestrians.

Again, no issues over the existing crossing facilities were raised within the Road Safety Audit.

In light of the above the existing crossing facilities within the traffic signal control junction are considered to be appropriate to accommodate the modest increase in pedestrian demand resulting from the development.

5. ***The proposed access road also gives access to an adjacent field. Details regarding the largest size, type and frequency of vehicle expected to use this access should be submitted to assess whether it appropriate to use a residential road. The radii, carriageway width and construction may have to be adjusted accordingly.***

Drawing 17121/ATR/01 has been produced in order to demonstrate that the largest vehicle that requires access to the development can be accommodated.

6. ***Only a pedestrian access has been shown from Smithy Hill, but this is a vehicular route for existing properties.***

Please see the enclosed Masterplan which has been amended to confirm that access to the existing properties will not be prejudiced.

**Thurgoland Parish Council**

Similar items to those addressed above are also by the Parish Council, however for completeness these are responded to below:

> ***The Parish Council is of the opinion that this site is not suitable with the access, as shown, onto Halifax Road. The access is far too near the traffic lights on one side, and far too near the access/egress of Thorpe's Lorry Park on the other.***
>
> ***With regard to the nearness of the access to the traffic lights:***
> ***Traffic from the direction of Wortley regularly queues way beyond the access shown, which is as far as it can be on this site, so difficulties will be created for vehicles leaving the site and intending to turn right.***
>
> ***Traffic from the direction of Hoylandswaine/Penistone may have just set off when the lights turn green, or as those living in the village know, traffic seeing the lights already at green, seem to increase their speed to make sure they get through before the lights turn red.***

To summarise the points addressed above, the proposed access is considered to be appropriate for the following reasons:

- The proposed access has been designed to an adoptable standard;
- Visibility splays have been provided in accordance with the 30mph plated speed limit in force;
- The access exceeds junction spacing guidance to the traffic signals based upon the 30mph plated speed limit;
- No accidents have been recorded at comparable junctions to the north of the signals;
- There is no requirement to provide a ghost island right turn lane;
- The proposed development will generate low volumes of traffic;
- The proposed access will operate well within capacity – no queuing is predicted across all arms of the junction; and
- The access has been subject to an Independent Stage 1 Roads Safety Audit which has not raised any concerns over the form, location or proximity of the of the junction to the traffic signals or lorry park.

In light of the above, it has been demonstrated that the proposed access has been designed to an adoptable standard in accordance with national guidance. The access will operate well within capacity and an independent Road Safety Audit has established that there are no insurmountable highway safety concerns with an access in this location that cannot be addressed at the detail design stage through amended guard railing.

I would be grateful for your approval on the content of this letter.

I look forward to hearing from you shortly.

Yours sincerely,



**Richard Murphy**
**Director**
0113 245 1679

Encs – Designers Response to Road Safety Audit (including the original RSA)
Personal Injury Accident Data
Drawing 17121/GA/01
Drawing 17121/ATR/01
Proposed Masterplan

# Halifax Road, Thurgoland
# Proposed Residential Development
# Designers Response to Stage 1 Road Safety Audit

**March 2018 (Revision 1)**

**Prepared on behalf of**

## Mr RJA Elmhirst

**Optima Highways and Transportation Consultancy Ltd**
Suite 1, 3rd Floor, Goodbard House, Infirmary Street, Leeds, LS1 2JP
Tel: 0113 245 1679
www.optimahighways.com

# Quality Management

| Designers Response to Stage 1 Road Safety Audit<br>Project No: 17121 | | | | |
|---|---|---|---|---|
| **File reference** | O:\Halifax Road, Thurgoland\TEXT\REPORTS\1800302 RSA DR.docx | | | |
| **Issue/revision** | **Initial Issue** | **Revision 1** | **Revision 2** | **Revision 3** |
| **Remarks** | Final | | | |
| **Date** | 2nd March 2018 | | | |
| **Prepared by** | R Murphy | | | |
| **Signature** |  | | | |
| **Checked by** | M Whittaker | | | |
| **Signature** |  | | | |
| **Authorised by** | R Murphy | | | |
| **Signature** |  | | | |

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2. Designers Response to Items Raised in Audit ..... 2

## APPENDICES

Appendix A Stage 1 Road Safety Audit

# 1. Introduction

1.1.1 This report provides a response to the items raised within the Stage 1 Road Safety Audit (RSA) undertaken with regards to the associated proposed highway works relating to a residential development on land to the north of Halifax Road, Thurgoland.

1.1.2 The RSA was completed by Road Safety Initiatives. A copy of the report is provided in Appendix A.

# 2. Designers Response to Items Raised in Audit

***Reference: 2.1.1***

***Location:*** *Proposed Junction – Halifax Road*

***Summary:*** *Restricted visibility may lead to 'failure to give-way' type collisions.*

*Visibility may be restricted by the existing pedestrian guardrail, which could lead to 'failure to give-way' collisions. The existing alignment of the road, and type/length of existing pedestrian guard rail and depending on the development road vertical alignment may restrict visibility.*

*In addition, the existing vegetation and ivory on the dry-stone wall surrounding the 'water pump' monument, may further impede visibility.*

***Recommendation:*** *It is recommended to review the existing pedestrian guardrail, with a view to changing the type to be suitable for the road alignment curvature and/or reduce the length of guardrail (retain final three panels) and remove the end panel.*

*Remove vegetation/ivory between proposed junction and 'water pump' and from the dry-stone wall.*

**Designers Response: The audit recommendation is agreed and the appropriate guard railing will be specified and agreed through the Section 38 agreement**

# Appendices

# Appendix A Stage 1 Road Safety Audit



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# HALIFAX ROAD, THURGOLAND - PROPOSED DEVELOPMENT ACCESS

## Stage 1 Road Safety Audit
## For Mr RJA Elmhirst

28/02/2018



# Quality Management

| ISSUE | REVISION | DESCRIPTION | DATE | PREPARED BY | CHECKED |
|---|---|---|---|---|---|
| 1 | - | Draft | 28 February 2018 | ***M Hedley*** | ***A Bawn*** |
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| **Project number - RSI-MH-0218-003** | | | | | |

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# Halifax Road, Thurgoland - Proposed Development Access

## Stage 1 Road Safety Audit

28/02/2018

## Client

Mr RJA Elmhirst

## Consultant

Road Safety Initiatives LLP

www.roadsafetyinitiatives.co.uk

## Registered Address

Road Safety Initiatives LLP
OC380991
c/o Harlands Accountants, The Greenhouse,
Amos Drive, Greencroft Industrial Park,
Annfield Plain, Stanley,
County Durham, DH9 7XN

## Enquiries regarding this audit should be made to

**M Hedley**

Partner
Road Safety Initiatives LLP

Tel: +44 (0)7960 798075
mailto: mark@roadsafetyinitiatives.co.uk

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APPENDIX A - Scheme Documents Issued for Road Safety Audit

APPENDIX B – Key Plan

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# 1 Introduction

1.1.1 This report results from a Stage 1 Road Safety Audit carried out on the new junction to access the proposed residential developments from Halifax Road, Thurgoland at the request of the Project Sponsor.

1.1.2 The Road Safety Audit was carried out by experienced Road Safety Engineers employed by Road Safety Initiatives LLP who have not been involved with the design process.

1.1.3 The terms of reference of the Road Safety Audit are described in HD 19/15. The Road Safety Audit Team has only reported on road safety implications in the context of the chosen scheme design. No attempt has been made to comment on the justification of the scheme or to carry out a technical/design standards check. Consequently, the Road Safety Auditors accept no responsibility for the design or construction of the scheme.

1.1.4 It is confirmed that this is a "Stage 1" Road Safety Audit, i.e. undertaken at completion of preliminary design. As far as the Road Safety Audit Team is aware, no Road Safety Audits have been undertaken on this scheme beforehand.

1.1.5 The Road Safety Audit Team membership, approved by the Overseeing Organisation Project Sponsor, consisted of:

**M Hedley**, IEng, MCIHT, MSoRSA, FIHE, RegRSA(IHE)

(Certificate of Competency in Road Safety Audit gained in November 2013)

Road Safety Audit Team Leader (Partner, Road Safety Initiatives LLP)

**A Bawn,** BSc (Hons), CEng, MICE

Road Safety Audit Team Member (Consultant, Road Safety Initiatives LLP)

1.1.6 The Road Safety Audit was undertaken in accordance with the information provided by Richard Murphy (Director, Optima Highways & Transportation) on behalf of the Project Sponsor. The Road Safety Audit comprised an examination of the documents provided and listed in **Appendix A**.

1.1.7 The Road Safety Audit Team visited the site together on Tuesday 27 February 2018 between 15:45 and 16:30 hours. It was overcast, the road surface was wet, and there was some snow on the footway/verge at the time of the site visit. During the site visit, traffic flows were moderate and there were some pedestrians with no cyclists observed.

1.1.8 Matters which the Terms of Reference exclude from this report, but which the Road Safety Audit Team wishes to draw to the attention of the Project Sponsor, will be supplied in a separate document in the covering email to this Road Safety Audit Report.

1.1.9 If there are Road Safety problems identified, these will be refenced to the design drawings and the locations indicated on the plan in **Appendix B.**

## 1.2 Scheme Description

1.2.1 This Road Safety Audit will review the road safety aspects of the proposed priority junction to access the residential development (up to 25 residential dwellings) to the north of Halifax Road, Thurgoland.

1.2.2 The Road Safety Audit Team were made aware of the following point raised by the local highway authority, which will be assessed during the Road Safety Audit.

*"The carriageway adjacent to the site entrance is of limited width and a right turn lane cannot be accommodated. This will lead to potential delays to through traffic as vehicles wait to turn right into the site. This is also likely to lead to an increase in rear end shunts."*

## 1.3 Site Description

1.3.1 The development site is located to the north of Halifax Road, in the village of Thurgoland which is located 9km south west of Barnsley and 6km south east of Penistone.

1.3.2 The A629 Halifax Road provides the frontage to the southern boundary of the Site, is a single carriageway road connecting Huddersfield to the north and to Sheffield to the south. Halifax Road through Thurgoland is subject to a 30 mph speed limit and has road lighting. The junction is approximately 65m east of the signalised junction with Smithy Hill.

1.3.3 The footway on the northern flank is adjacent to the carriageway and terminates at the eastern extent of the proposed site and is approximately 1.7m in width. A water pump monument is located within the existing verge at the point where the footway terminates.

1.3.4 A footway is provided on the southern side of Halifax Road opposite the Site. Uncontrolled dropped crossings with tactile paving are provided across each arm of the Halifax Road/Smithy Hill signalised crossroads.

## 1.4 Traffic and Non-Motorised User (NMU) Data

1.4.1 The Road Safety Audit Team was provided with the Transport Statement. The following table was taken from the Transport Statement.

| Time Period | Proposed Traffic Generations | | |
|---|---|---|---|
| | Arrivals | Departures | Total |
| AM Peak 08:00-09:00 | 4 | 10 | 14 |
| PM Peak 17:00-18:00 | 8 | 4 | 12 |

1.4.2 The junction was modelled using PICADY, and it was confirmed that it will operate well within capacity in both the AM and PM peak periods in the design year. Also, all movements operate with significant capacity with no predicted queuing.

## 1.5 Collision Data

1.5.1 No collision data was provided to the Road Safety Audit Team.

## 1.6 Departures from Standard

1.6.1 No Departures from Standard were provided to the Road Safety Audit Team.

# 2 Items Raised At This Stage 1 Road Safety Audit

## 2.1 JUNCTIONS

### 2.1.1 Problem

**LOCATION:** Proposed Junction – Halifax Road.

**SUMMARY:** Restricted visibility may lead to 'failure to give-way' type collisions.

Visibility may be restricted by the existing pedestrian guardrail, which could lead to 'failure to give-way' collisions. The existing alignment of the road, and type/length of existing pedestrian guard rail and depending on the development road vertical alignment may restrict visibility.

In addition, the existing vegetation and ivory on the dry-stone wall surrounding the 'water pump' monument, may further impede visibility.



**RECOMMENDATION**

It is recommended to review the existing pedestrian guardrail, with a view to changing the type to be suitable for the road alignment curvature and/or reduce the length of guardrail (retain final three panels) and remove the end panel.

Remove vegetation/ivory between proposed junction and 'water pump' and from the dry-stone wall.

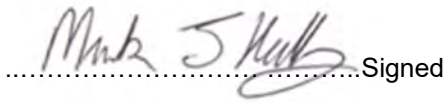
# 3 Audit Team Statement

We certify that this Road Safety Audit has been carried out in accordance with HD 19/15.

**ROAD SAFETY AUDIT TEAM LEADER**

**M Hedley**

Partner
Road Safety Initiatives LLP


.....Signed

28 February 2018
.....Date

**ROAD SAFETY AUDIT TEAM MEMBER**

**A Bawn**

Consultant
Road Safety Initiatives LLP


.. .... .....Signed

28 February 2018
.....Date

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# Appendices, Figures and Tables

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# Appendix A: Scheme Documents Issued for Road Safety Audit

| Drawing No. | Rev | Title |
|---|---|---|
| 17121/GA/01 | - | Proposed Site Access Arrangments |

# Other Supplied Information

| Type | Rev | Title |
|---|---|---|
| Transport Statement | 5 Jan 2018 | Halifax Road, Thurgoland - Proposed Residential Development Transport Statement |

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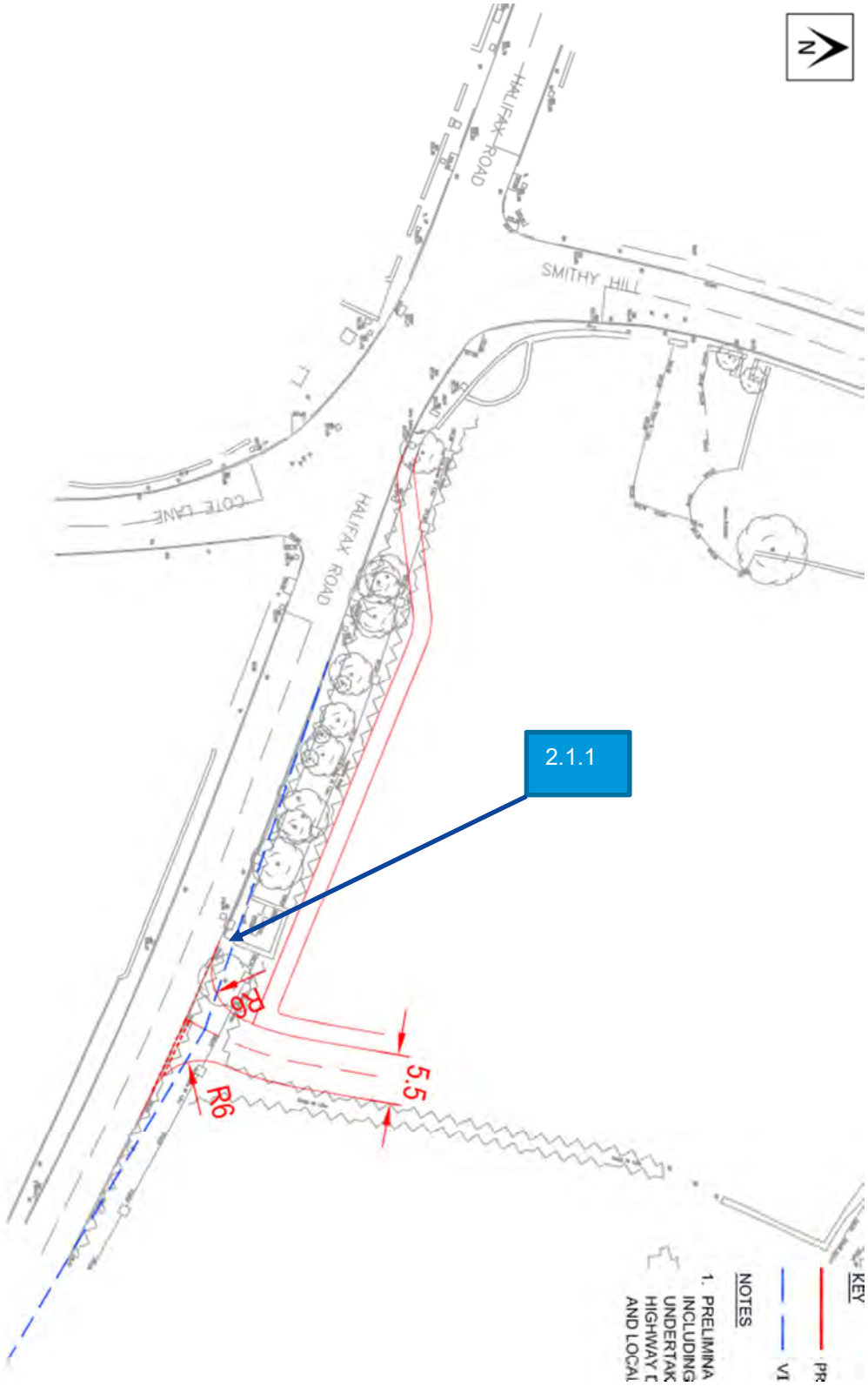
# Appendix B:  Key Plan

Numbers refer to problems identified in the text.






Road Safety Initiatives LLP
c/o Harlands Accountants,
The Greenhouse, Amos Drive,
Greencroft Industrial Park,
Annfield Plain, Stanley,
County Durham, DH9 7XN

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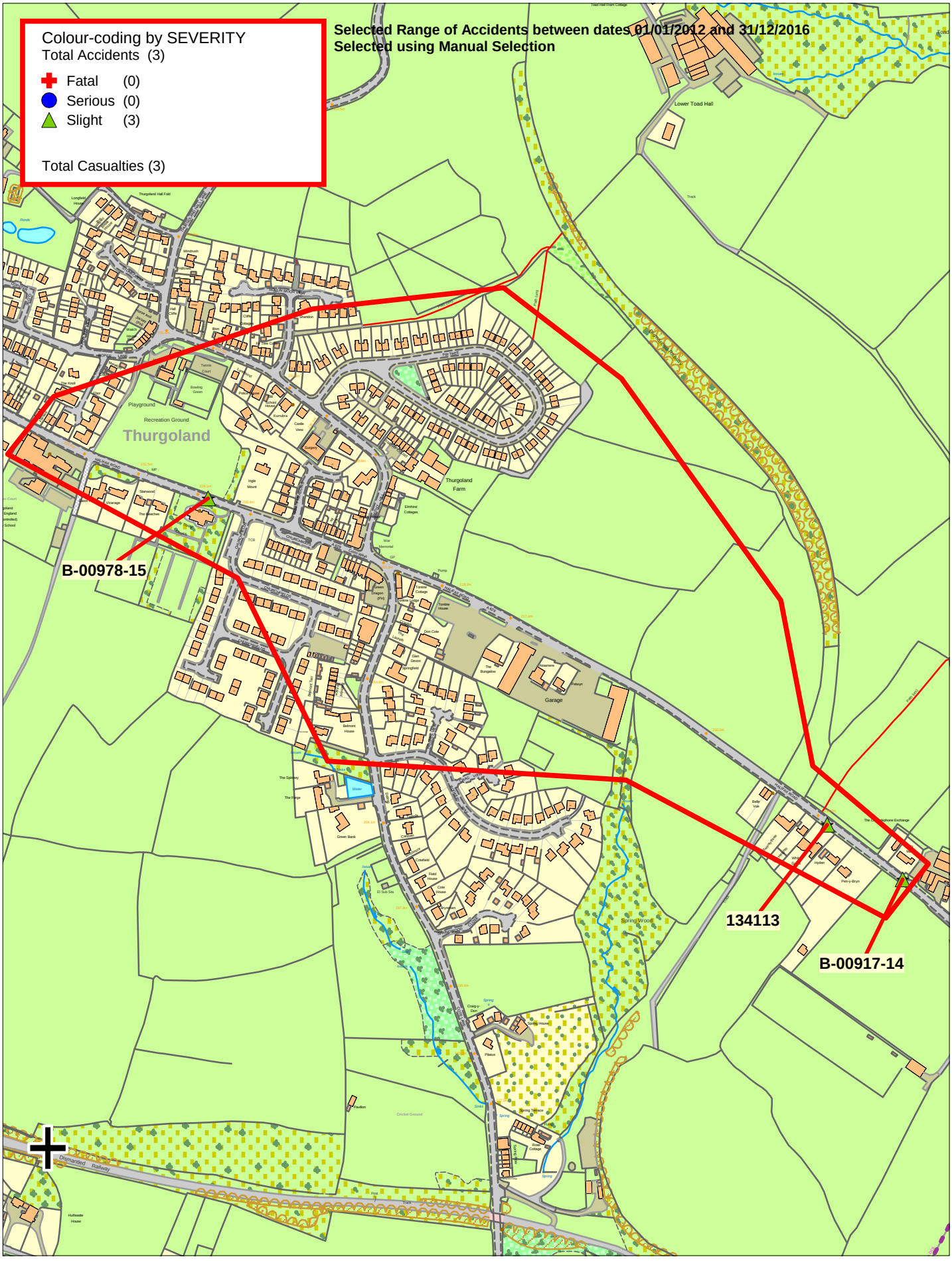


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MAKING SOUTH YORKSHIRE ROADS SAFER

Selected map area

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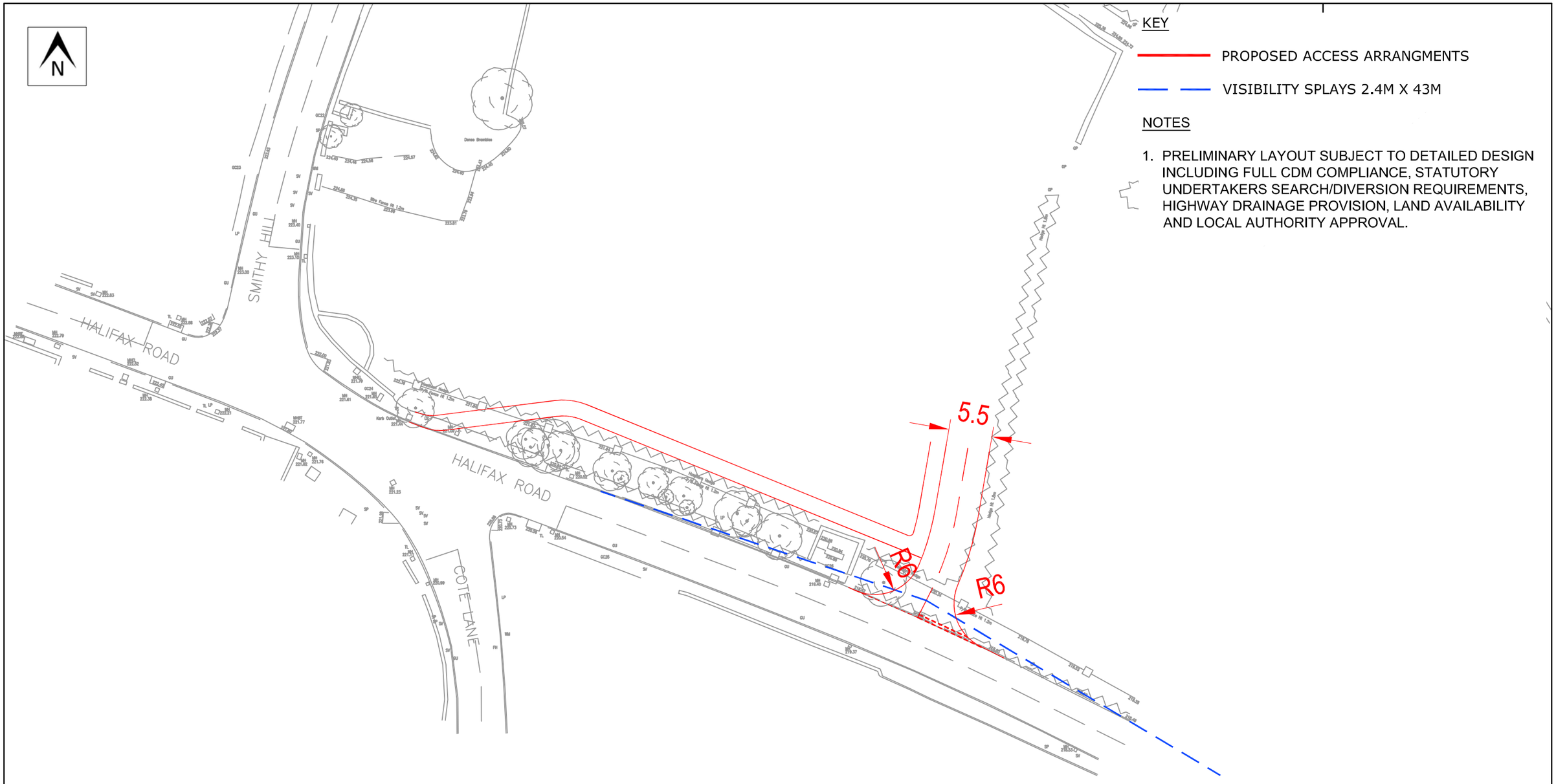


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STATUS: PRELIMINARY

PROJECT: HALIFAX ROAD, THURGOLAND

CLIENT: MR RJA ELMHURST

DRAWING TITLE: PROPOSED SITE ACCESS ARRANGEMENTS

| CHECKED | APPROVED | DRG No. | |
|---|---|---|---|
| RAM | RAM | 17121/GA/01 | |
| DRAWN BY: | SCALE @ A3 | DATE | REV. |
| NJ | 1:500 | 29/11/17 | |

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Intelligent Highways Solutions
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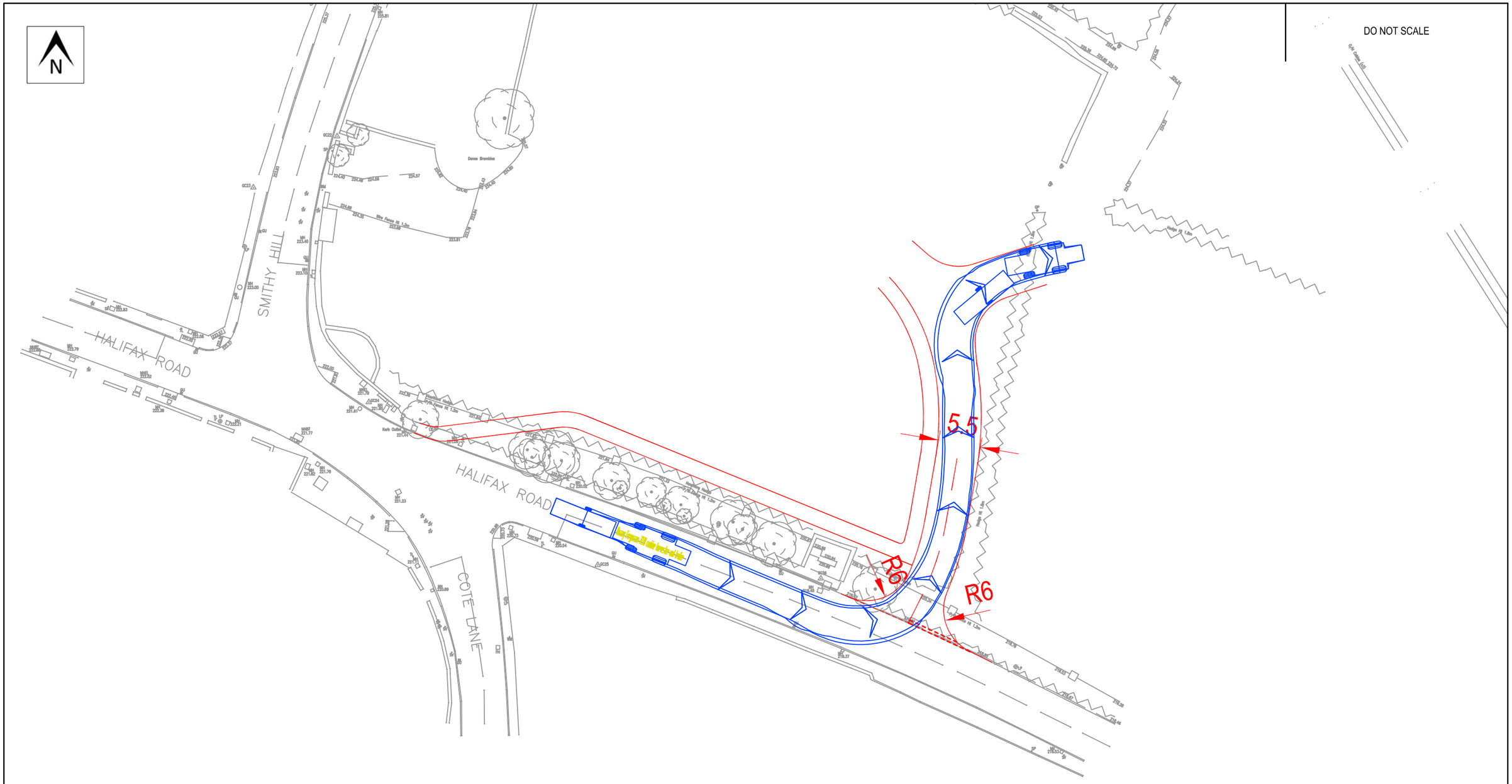
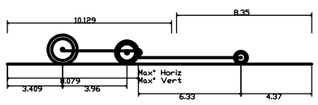
DO NOT SCALE




Massey Fergusson 7278 combine harvester and trailer

| | |
|---|---|
| Overall Length | 18.779m |
| Overall Width | 3.460m |
| Overall Body Height | 0.805m |
| Min Body Ground Clearance | 0.400m |
| Max Track Width | 4.060m |
| Lock-to-lock time | 5.00s |
| Curb to Curb Turning Radius | 12.770m |

| REV | DATE | BY | DESCRIPTION | CHK | APP |
|---|---|---|---|---|---|
| | | | | | |

STATUS: PRELIMINARY

PROJECT: HALIFAX ROAD, THURGOLAND

CLIENT: MR RJA ELMHURST

DRAWING TITLE: SWEPT PATH ANALYSIS

| CHECKED | APPROVED | DRG No. | |
|---|---|---|---|
| RAM | RAM | 17121/ATR/01 | |
| DRAWN BY: | SCALE @ A3 | DATE | REV. |
| NJ | 1:500 | 02/03/18 | |


OPTIMA
Intelligent Highways Solutions
Atlas House, 31 King Street, Leeds, LS1 2HL
T 0113 245 1679 F 0113 245 9042




## DEVELOPMENT SUMMARY

INDICATIVE NETT AREA:
1.73 ACRES / 0.70 HECTARES

INDICATIVE GROSS AREA:
2.56 ACRES / 1.04 HECTARES

DWELLINGS ACHIEVABLE @ 30 -35 DPH:
21 – 25 DWELLINGS

INDICATIVE POS AREA:
0.49 ACRES / 0.20 HECTARES

STEN ARCHITECTURE
STEN Architecture Ltd
Suite 4, Unit 1
Benton Office Park
Bennett Avenue
Horbury
WF4 5RA
Tel: 01924 669424
www.sten-architecture.co.uk

0 10 20 30 40 50

ILLUSTRATIVE MASTERPLAN | FEBRUARY 2018 | 1:500 @ A2

HALIFAX ROAD, THURGOLAND