

Appendix B2 – Proposed Haul Road Junctions

Figure B-2-01: Proposed Junction Swept Path - Braddup Junction (MNA_B-2-01)

Figure B-2-02: Proposed Marl Hill Section – Braddup Compound Access Design - B27070CQ-JAC-XX-DR-C-TR4_VS-1008 (MNA_B-2-02_ B27070CQ-JAC-XX-DR-C-TR4_VS-1008)

Figure B-2-03: Proposed Braddup Junction Daily Movements (MNA_B-2-03)

Figure B-2-05: Proposed Marl Hill Section – Bonstone Compound Access Junction with B6478 Access Design - B27070CQ-JAC-XX-DR-C-TR4_VS-1007 (MNA_B-2-05_ B27070CQ-JAC-XX-DR-C-TR4_VS-1007)

Figure B-2-06: Proposed Bonstone Junction Daily Movements (MNA_B-2-06)

Figure B-2-07: Proposed Bowland Section – Temporary Haul Road Hallgate Hill Junction – Vehicle Tracking – Three Axle Loader (FH16 Assumption) - B27070CQ-JAC-XX-DR-C-TR3_VT-1124 (MNA_B-2-07_ B27070CQ-JAC-XX-DR-C-TR3_VT-1124)

Figure B-2-08: Proposed Bowland Section – Temporary Haul Road – Hallgate Hill Access Design - B27070CQ-JAC-XX-DR-C-TR3_VS-1006 (MNA_B-2-08_ B27070CQ-JAC-XX-DR-C-TR3_VS-1006)

Figure B-2-09: Proposed Junction Access Design - Hallgate Hill Junction - Proximity to Tree (MNA_B-2-09)

Figure B-2-10: Proposed Hallgate Hill Junction Daily Movements (MNA_B-2-10)

Figure B-2-11: Proposed Bowland Section – Newton-in-Bowland Compound – Vehicle Across Junction (staggered) – Standard Vehicle Tracking - B27070CQ-JAC-XX-DR-C-TR3_VT-1108 (MNA_B-2-11_ B27070CQ-JAC-XX-DR-C-TR3_VT-1108)

Figure B-2-12: Proposed Bowland Section – Newton-Bowland Compound – Access Design - B27070CQ-JAC-XX-DR-C-TR3_VS-1002 (MNA_B-2-12_ B27070CQ-JAC-XX-DR-C-TR3_VS-1002)

Figure B-2-13: Proposed Bowland Section – Newton-in-Bowland Compound South – Access Design - B27070CQ-JAC-XX-DR-C-TR3_VS-1003 (MNA_B-2-13_ B27070CQ-JAC-XX-DR-C-TR3_VS-1003)

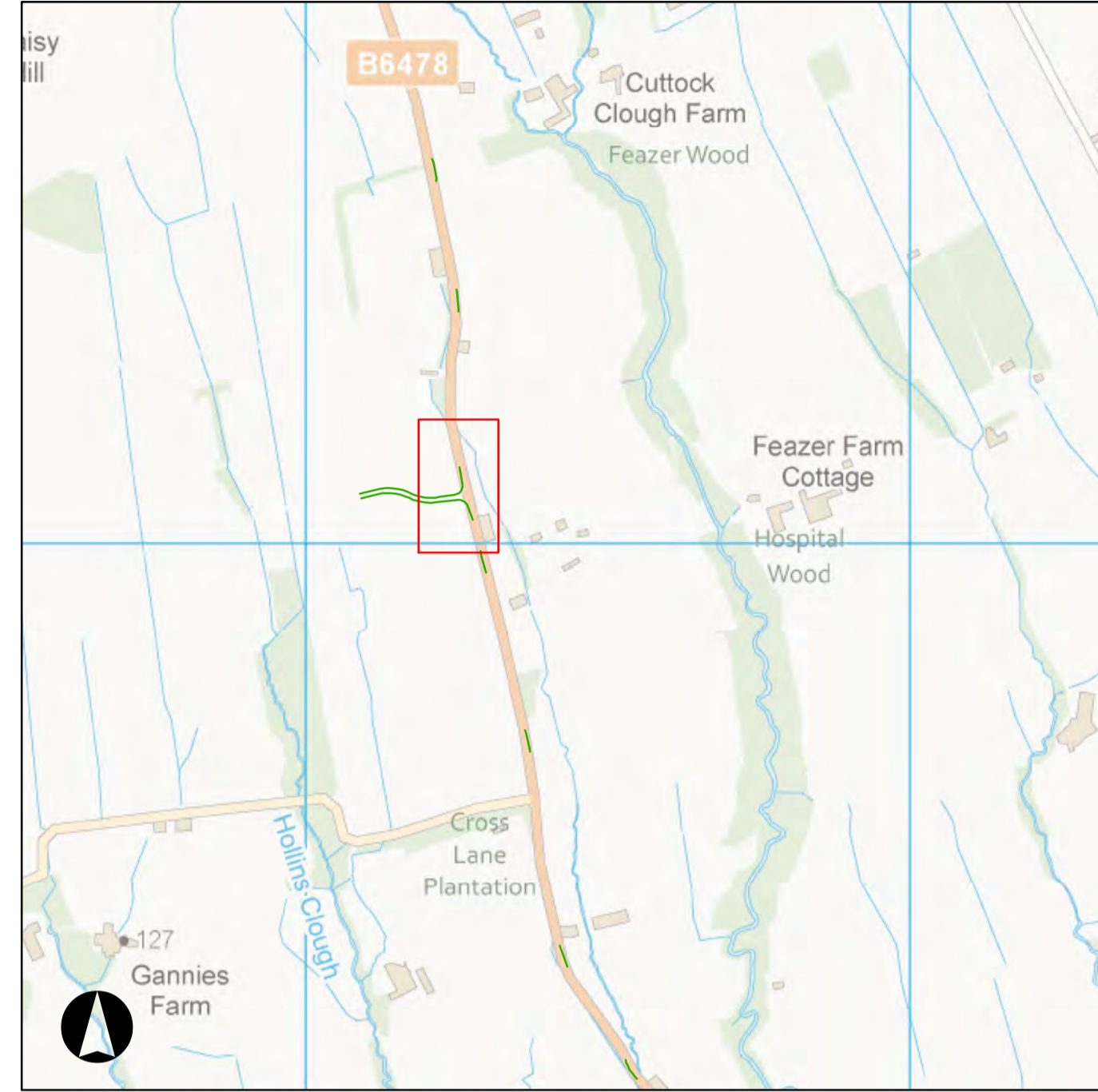
Figure B-2-14: Proposed Newton Road Junction Daily Movements (MNA_B-2-14)

Figure B-2-15: Proposed Bowland Section Braddup, Bonstone and Newton Compounds – Mitigation Measures – Waddington - West Bradford Rd to Slaidburn Rd – B27070CQ-JAC-XX-DR-C-TR4_MIT-0001 (MNA_B-2-15_ B27070CQ-JAC-XX-DR-C-TR4_MIT-0001)

Figure B-2-16: Proposed Speed Limits (MNA_B-2-16)

**APPENDIX B2 - PROPOSED JUNCTION SWEEP PATHS
JUNCTIONS FIGURE B - 2 - 01**

BRADDUP COMPOUND - B6478 SLAIDBURN ROAD JUNCTION



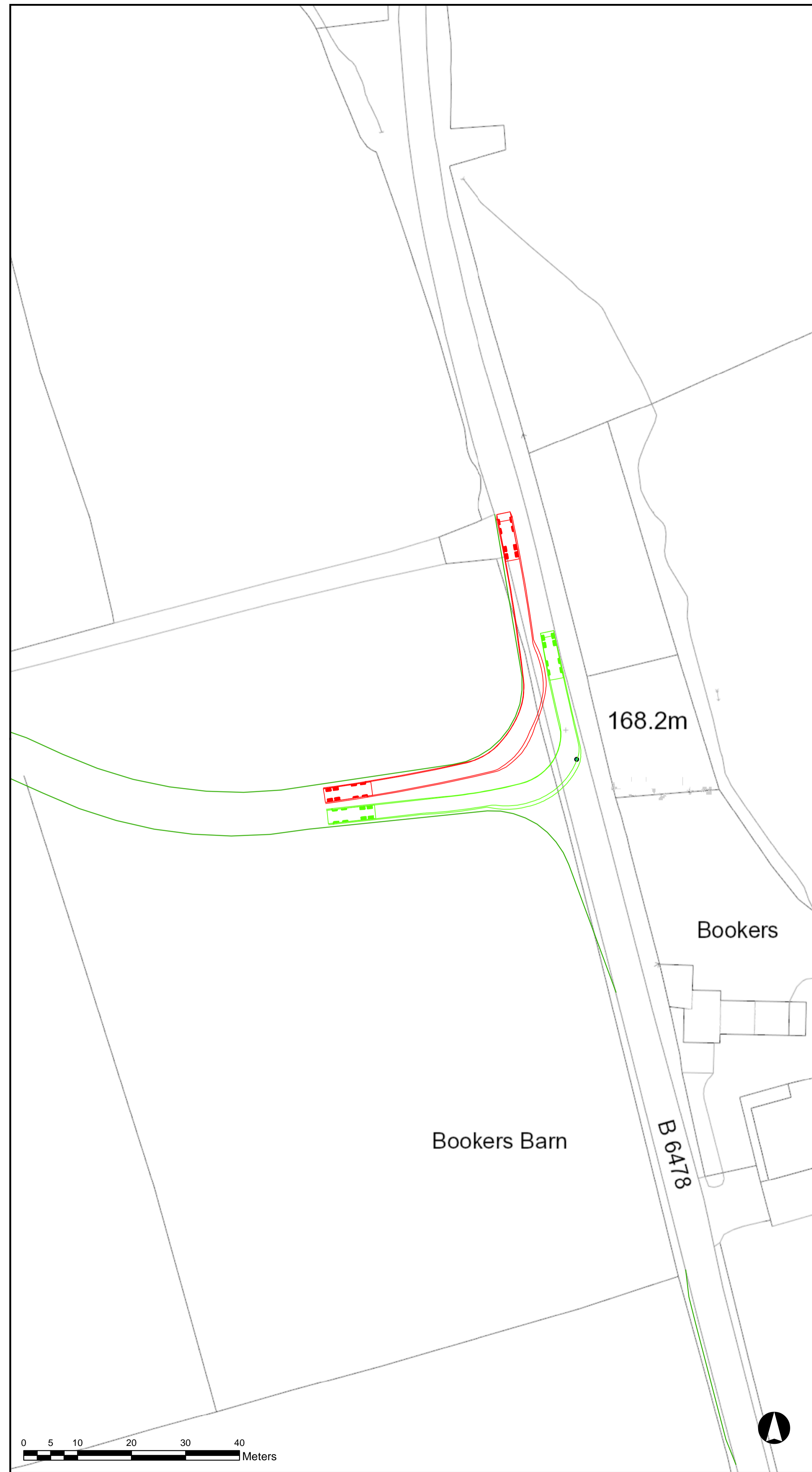
WIDER AREA 0 0.1 0.2 0.4 Kilometers



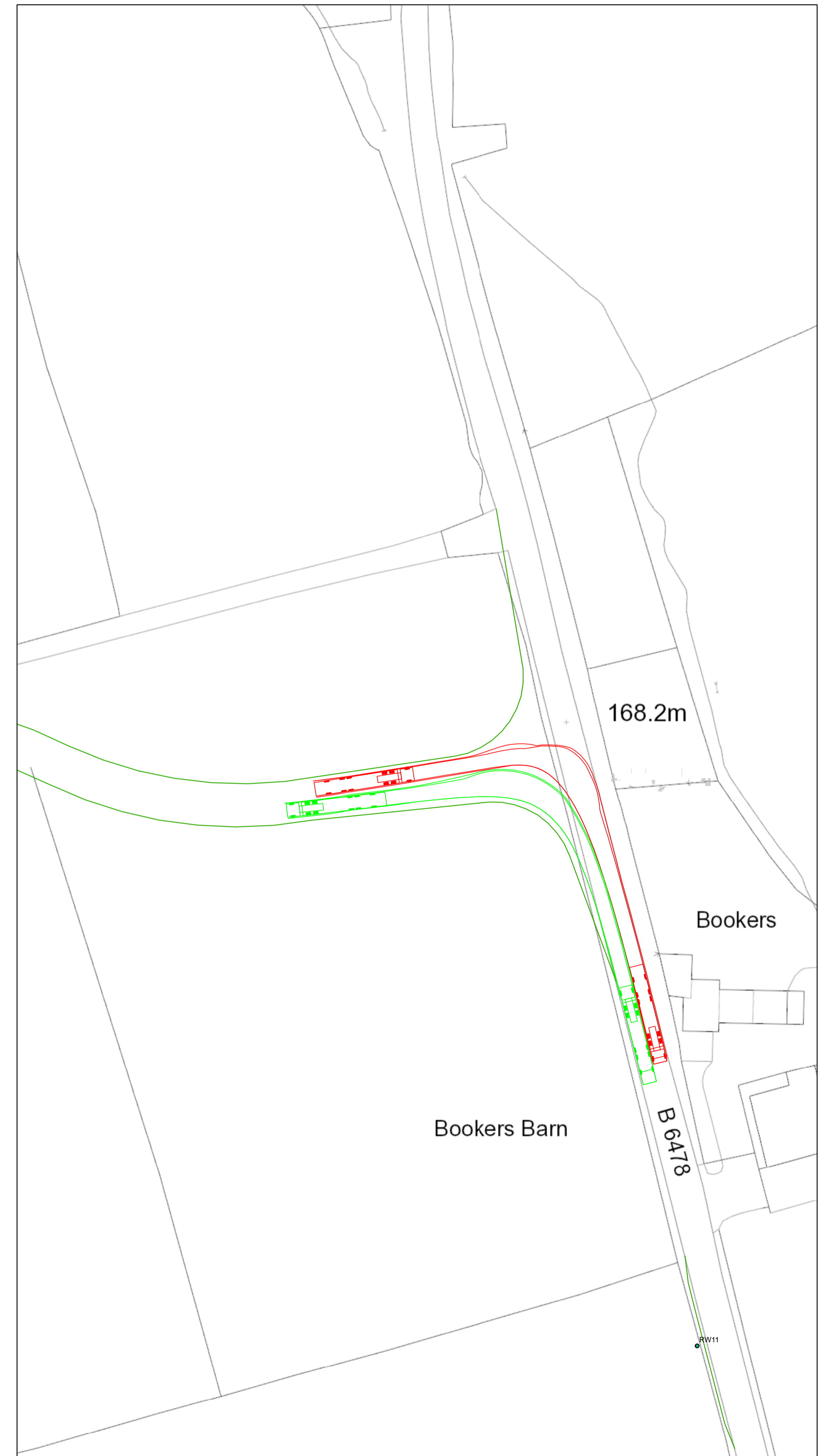
**HGV TRIAL 11th NOVEMBER 2020
4 AXLE RIGID TIPPER FRONT VIEW**



**HGV TRIAL 11th NOVEMBER 2020
4 AXLE RIGID TIPPER REAR VIEW**

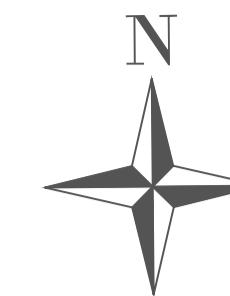
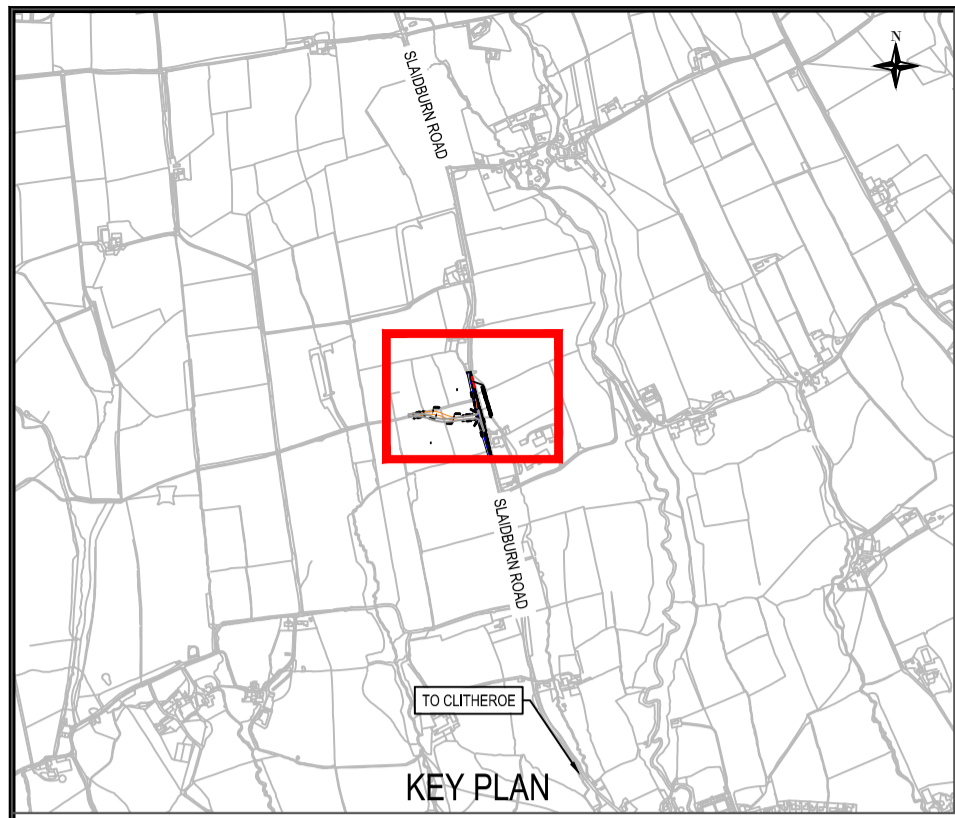


**HGV - 4 axle rigid (rigid/tipper) from site to Quarry (Northbound)
HGV - 4 axle rigid (rigid/tipper) to site from Quarry (Southbound)**

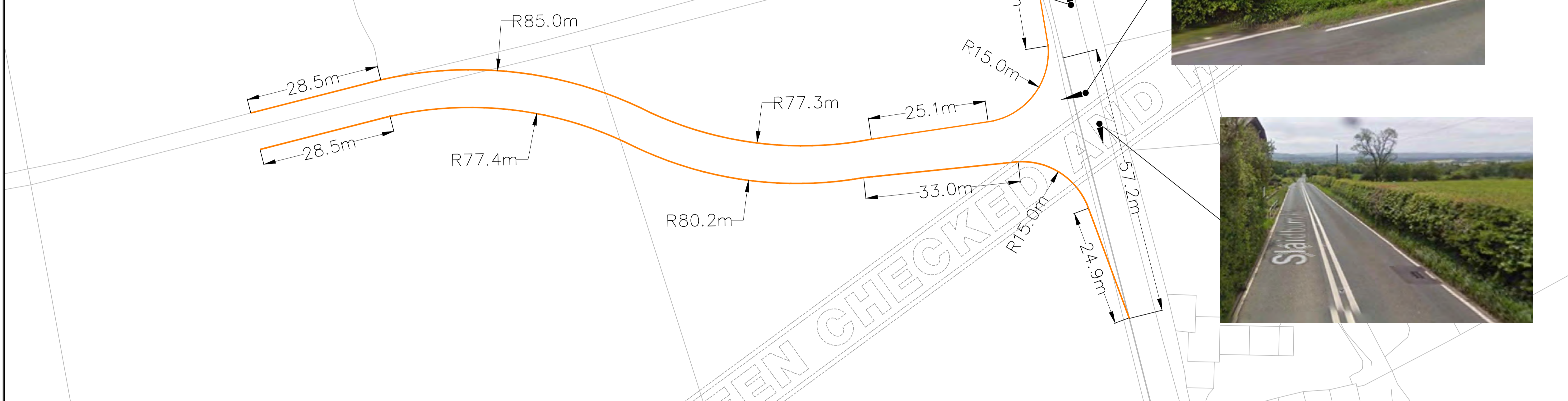


**HGV - 6 axle articulated flat bed to site (Northbound)
HGV - 6 axle articulated flat bed to site from site (Southbound)**

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown. Crown copyright and database rights 2017 Ordnance Survey 100022432.

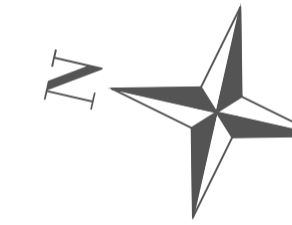
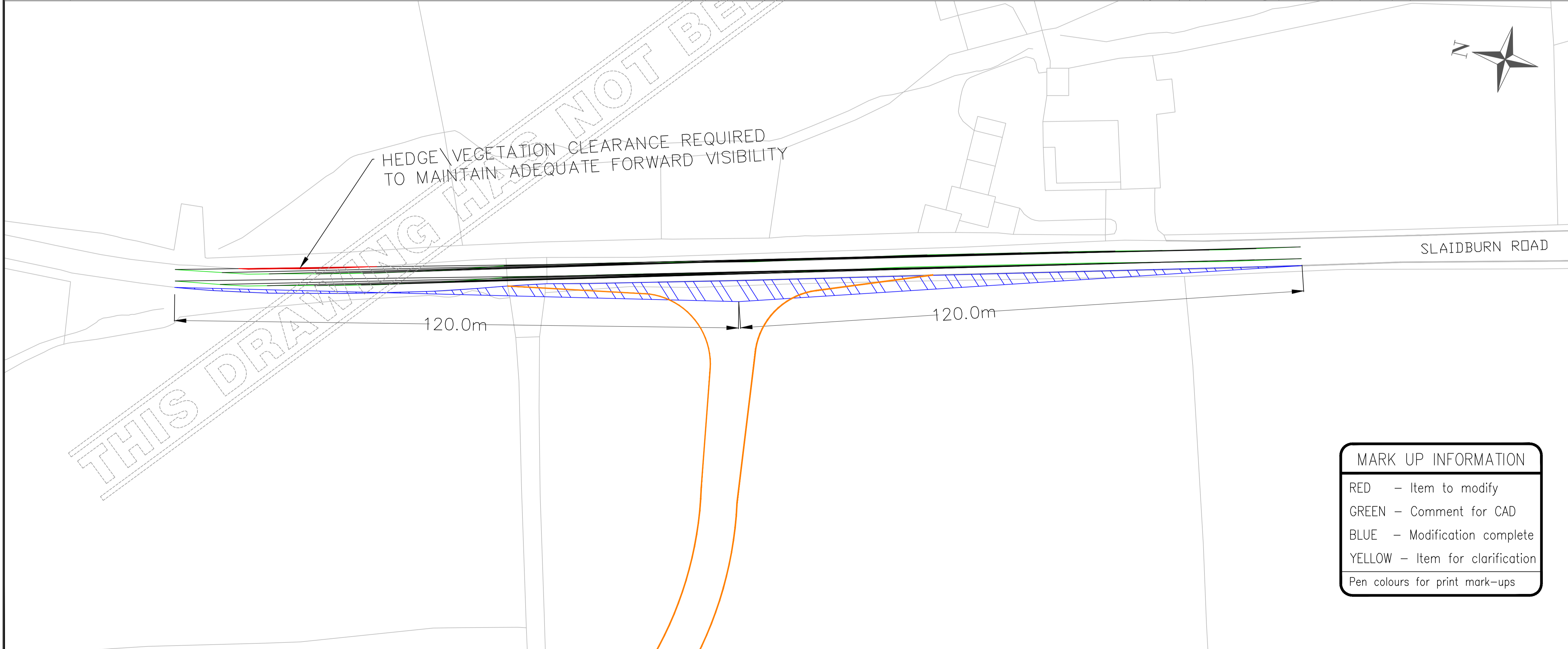


- NOTES**
- DO NOT SCALE FROM THIS DRAWING.
 - TAKEN FROM CD 109 (TABLES 2.5 AND 2.10)
- | DESIRED VISIBILITY SPLAY | ACHIEVED VISIBILITY SPLAY |
|--------------------------|---------------------------|
| 4.5m x 215m | 4.5m x 120m |
- | EXISTING SPEED LIMIT | PROPOSED SPEED LIMIT |
|----------------------|----------------------|
| 60 mph | 40 mph |
- 120 METER VISIBILITY SPLAY IS APPLICABLE FROM TABLE 2.10 OF CD 109 DUE TO RESTRICTING FACTORS OF ROAD CURVATURE AND EXISTING VEGETATION. A REDUCED 40 MPH SECTION OF ROAD CAN ACHIEVE ADEQUATE VISIBILITY.
 - VISIBILITY SPLAY (VALUE X) SET BACK 4.5m FROM EDGE OF CARRIAGEWAY



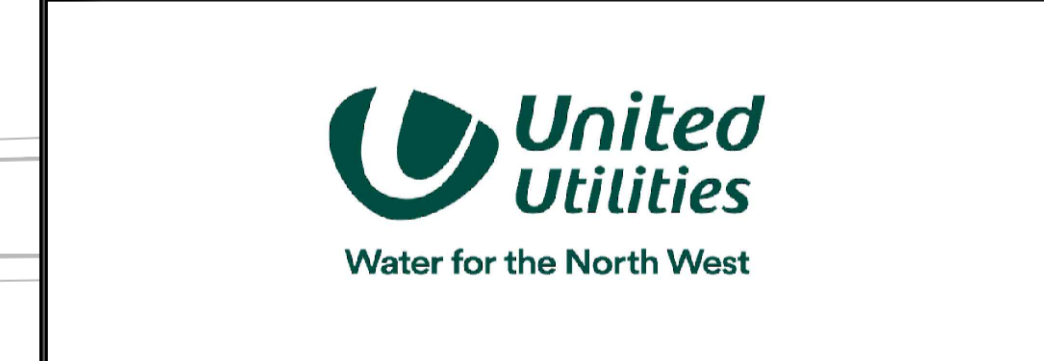
LEGEND

	EXISTING KERB
	PROPOSED KERB
	VISIBILITY SPLAY
	SSD ENVELOPE (120m)
	SSD CLEARANCE



CURRENT ISSUE INFORMATION

P01.4	HS	SP	--	--	--
VERSION	AUTH	CHKD	REVD	REASON FOR ISSUE	DATE
SO	WORK IN PROGRESS (WIP)				
SUITABILITY CODE	SUITABILITY DESCRIPTION				



HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED MARL HILL SECTION - BRADDUP COMPOUND
 ACCESS DESIGN

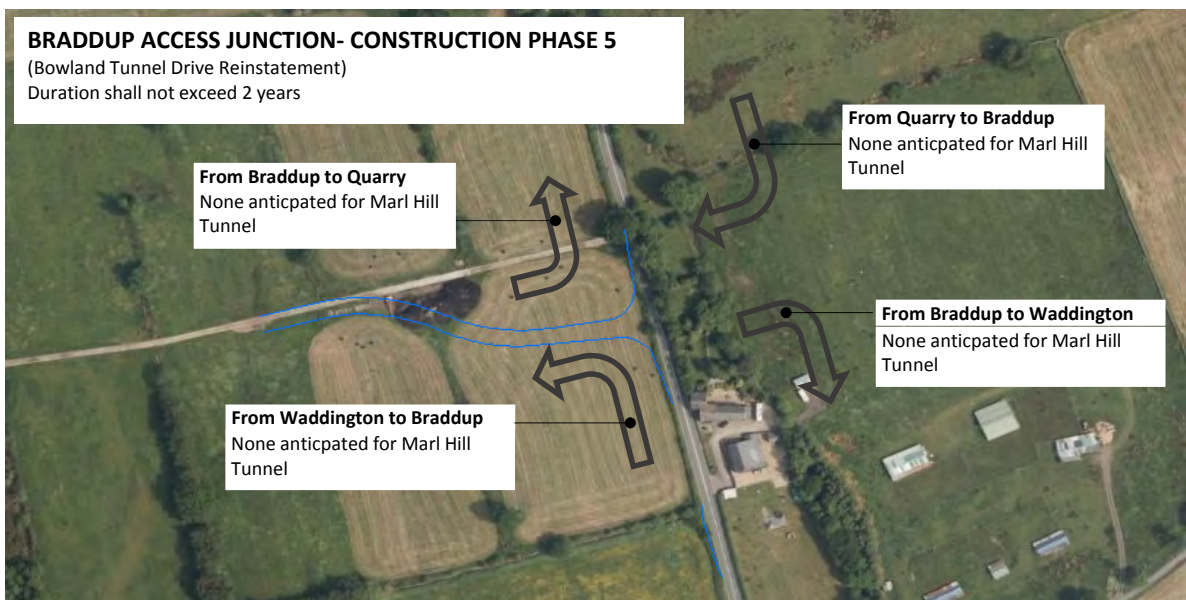
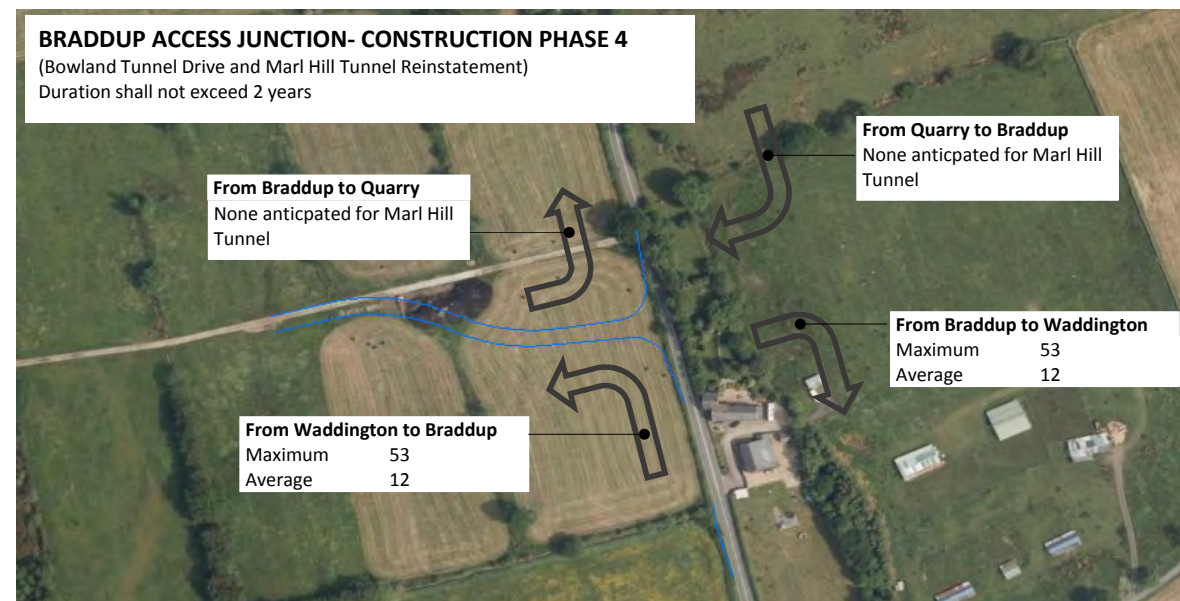
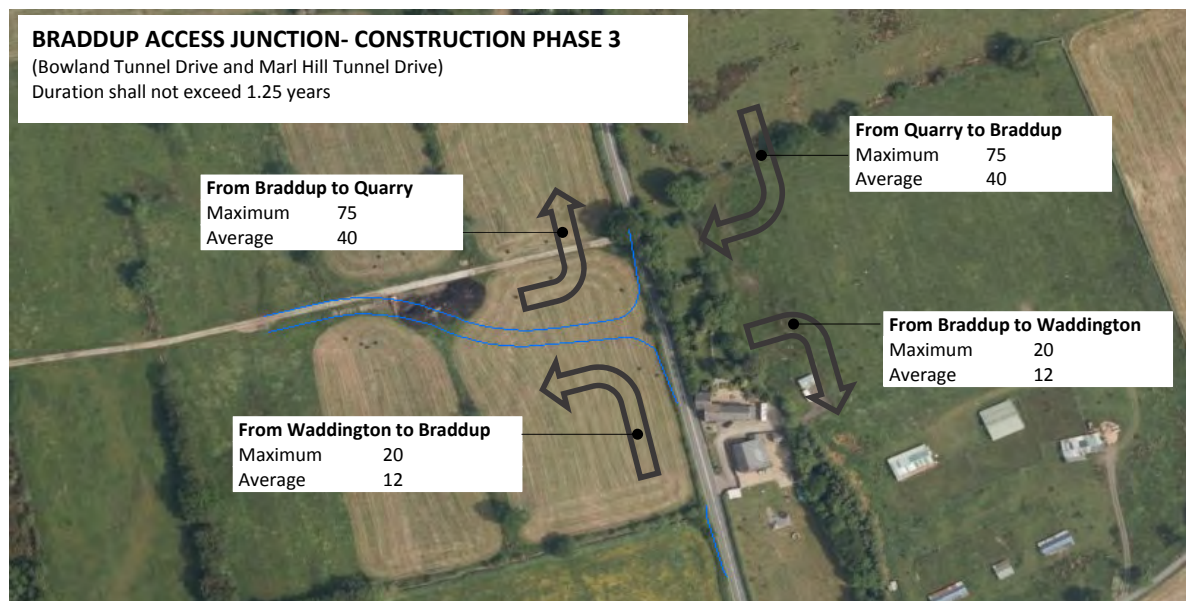
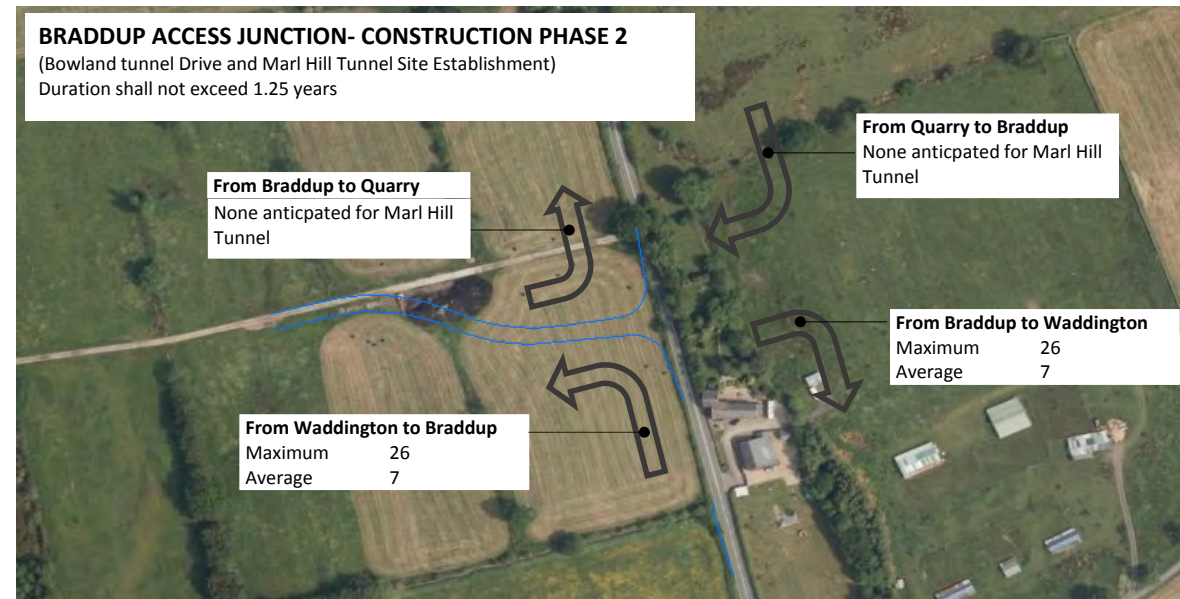
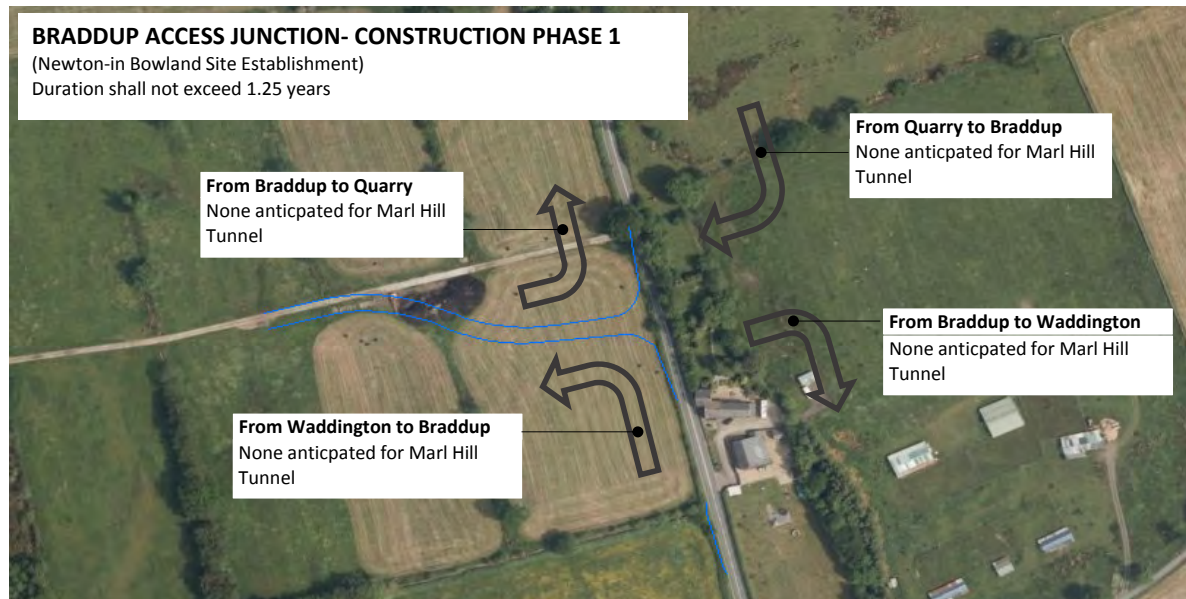
MARK UP INFORMATION

RED	- Item to modify
GREEN	- Comment for CAD
BLUE	- Modification complete
YELLOW	- Item for clarification
Pen colours for print mark-ups	

SCALE 1:250 / 1:500	SHEET SIZE A1
DRAWING NUMBER B27070CQ-JAC-XX-DR-C-TR4_VS-1008	REVISION P01.4

APPENDIX B2 - FIGURE B-2-03

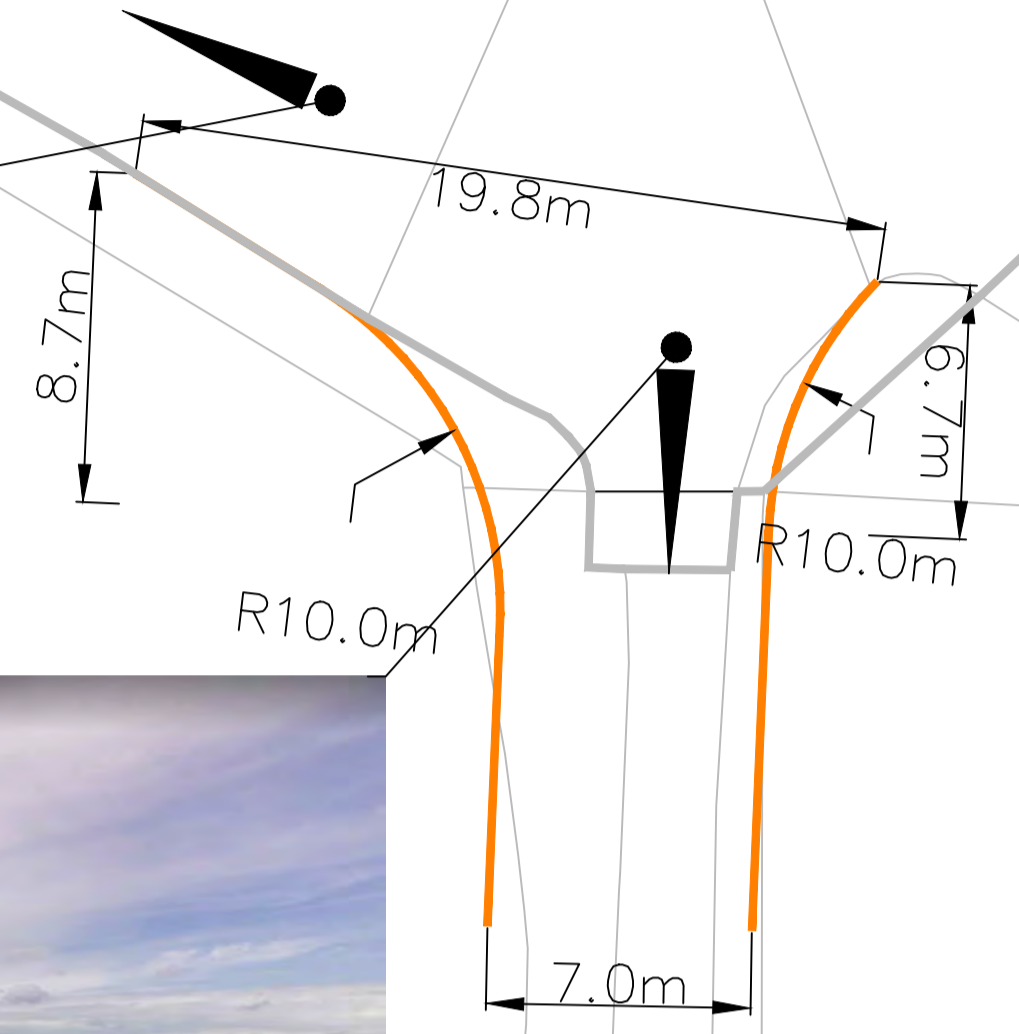
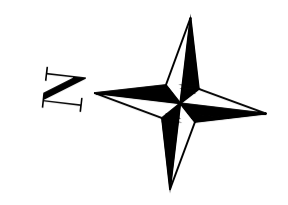
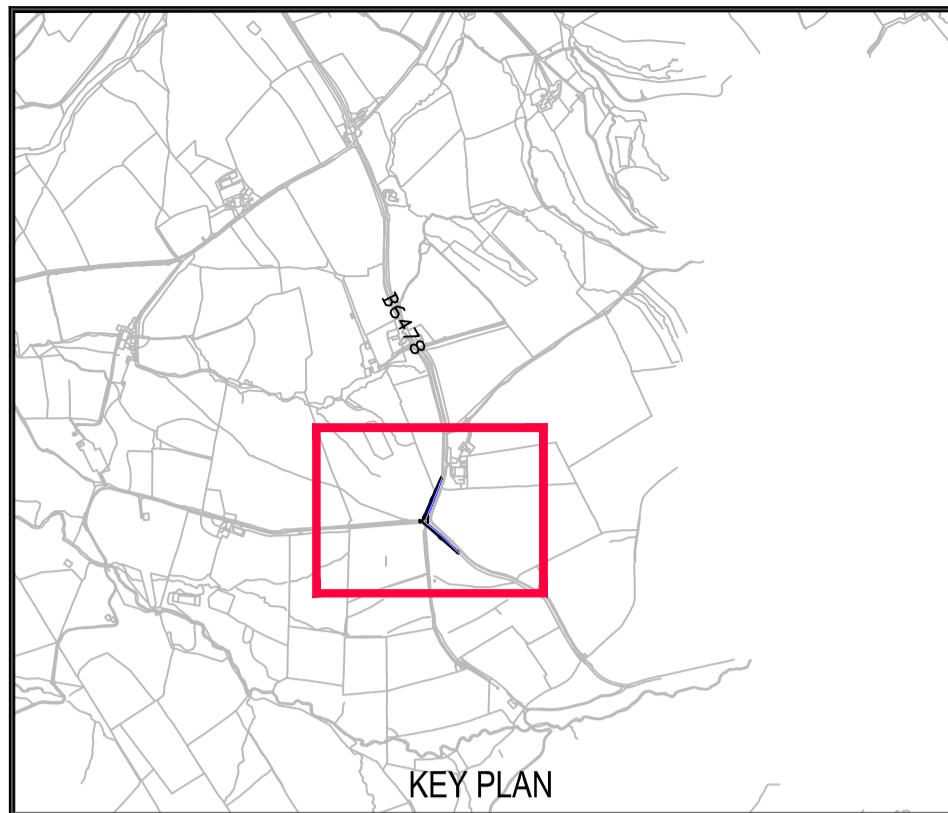
PROPOSED BRADDUP JUNCTION DAILY MOVEMENTS



LEGEND

Average: averaged over 1 year and rounded to the nearest whole number the number of movements per day turning in shown direction

Maximum: the anticipated maximum number of movements on any single day turning in shown direction



NOTES

- DO NOT SCALE FROM THIS DRAWING.
- TAKEN FROM CD 109 (TABLES 2.5 AND 2.10)

DESIRED VISIBILITY SPLAY	ACHIEVED VISIBILITY SPLAY
4.5m x 215m	4.5m x 120m

EXISTING SPEED LIMIT	PROPOSED SPEED LIMIT
60 mph	40 mph
- 120 METER VISIBILITY SPLAY IS THE DESIRED MINIMUM VISIBILITY SPLAY OF 40 MPH AS SPECIFIED IN TABLE 2.10 OF CD 109. VISIBILITY IS GENEROUS BOTH WAYS DUE TO LACK OF OBSTACLES.
- VISIBILITY SPLAY (VALUE X) SET BACK 4.5m FROM EDGE OF CARRIAGEWAY

LEGEND

	EXISTING KERB
	PROPOSED KERB
	VISIBILITY SPLAY

CURRENT ISSUE INFORMATION

P01.1	MB	SP	--	--	
VERSION	AUTH	CHKD	REVD	REASON FOR ISSUE	DATE
SO	WORK IN PROGRESS (WIP)				
SUITABILITY CODE	SUITABILITY DESCRIPTION				



HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED MARL HILL SECTION
 BONSTONE COMPOUND ACCESS JUNCTION WITH B6478
 ACCESS DESIGN

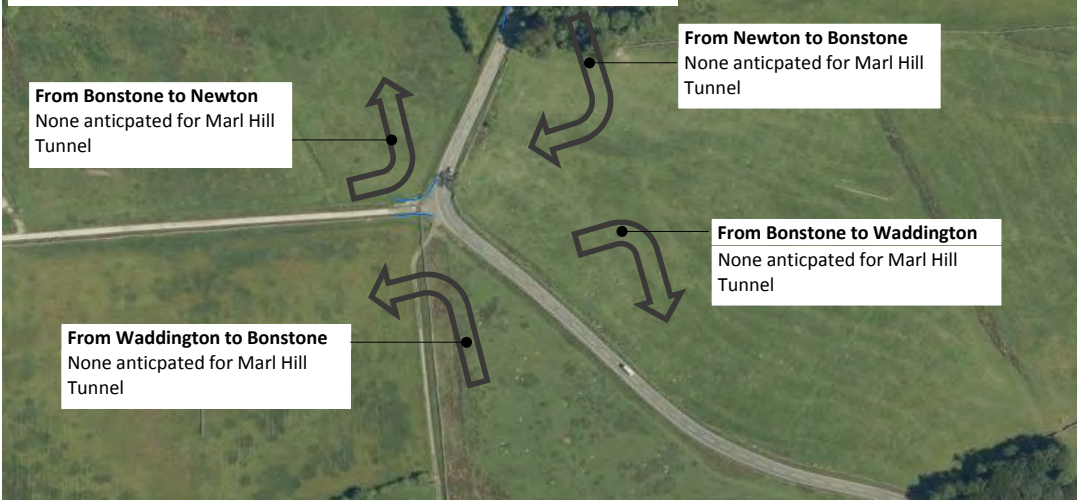
MARK UP INFORMATION

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GREEN	- Comment for CAD
BLUE	- Modification complete
YELLOW	- Item for clarification
Pen colours for print mark-ups	

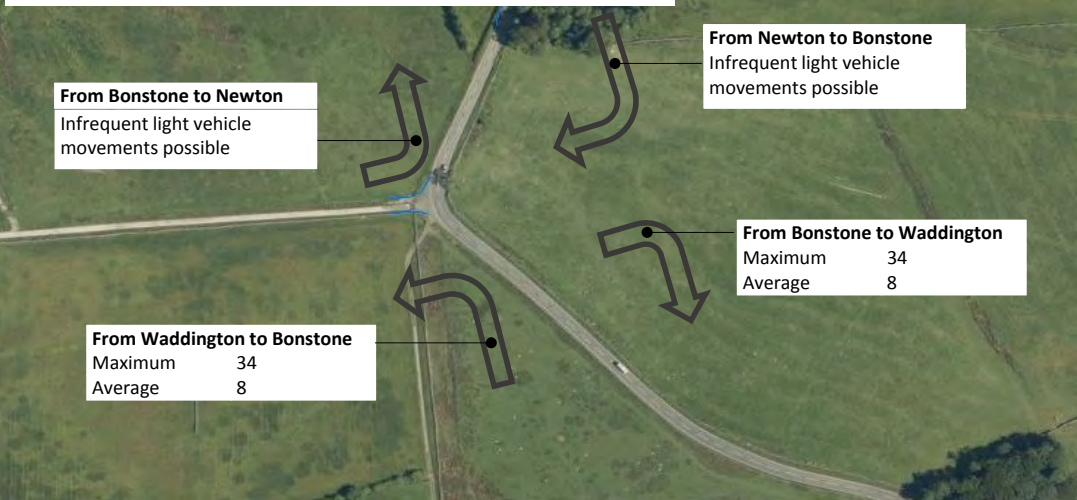
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PROPOSED BONSTONE JUNCTION DAILY MOVEMENTS

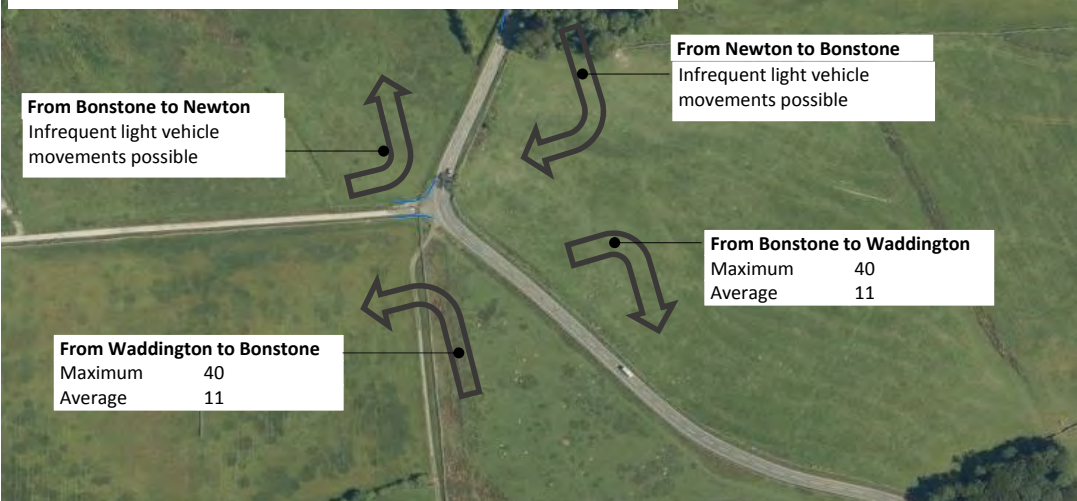
BONSTONE ACCESS JUNCTION- CONSTRUCTION PHASE 1
(Newton-in Bowland Site Establishment)
Duration shall not exceed 1.25 years



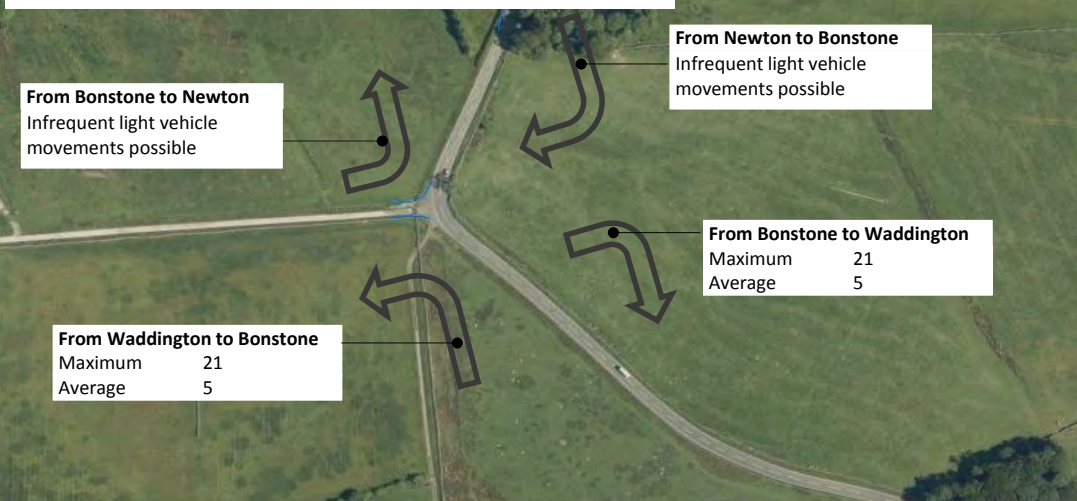
BONSTONE ACCESS JUNCTION- CONSTRUCTION PHASE 2
(Bowland tunnel Drive and Marl Hill Tunnel Site Establishment)
Duration shall not exceed 1.25 years



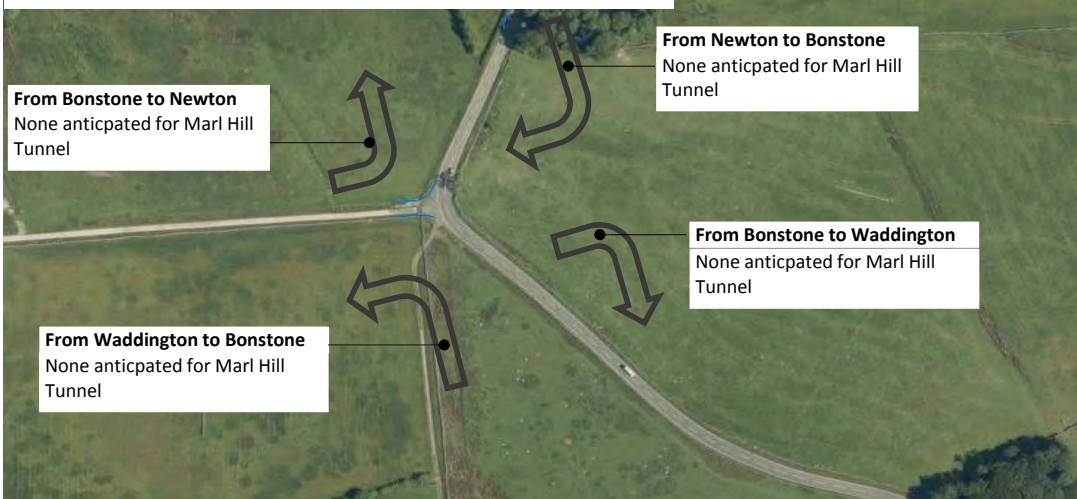
BONSTONE ACCESS JUNCTION- CONSTRUCTION PHASE 3
(Bowland Tunnel Drive and Marl Hill Tunnel Drive)
Duration shall not exceed 1.25 years



BONSTONE ACCESS JUNCTION- CONSTRUCTION PHASE 4
(Bowland Tunnel Drive and Marl Hill Tunnel Reinstatement)
Duration shall not exceed 2 years



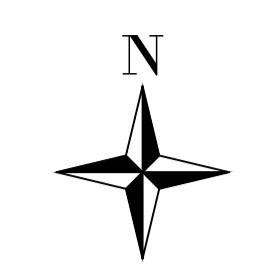
BONSTONE ACCESS JUNCTION- CONSTRUCTION PHASE 5
(Bowland Tunnel Drive Reinstatement)
Duration shall not exceed 2 years



LEGEND

Average: averaged over 1 year and rounded to the nearest whole number the number of movements per day turning in shown direction

Maximum: the anticipated maximum number of movements on any single day turning in shown direction



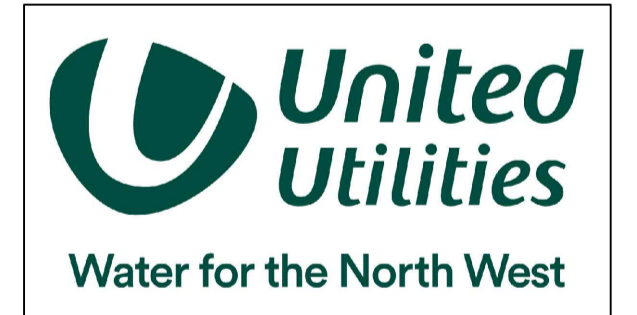
NOTES
1. DO NOT SCALE FROM THIS DRAWING

LEGEND

	PROPOSED KERB
	EXISTING KERB

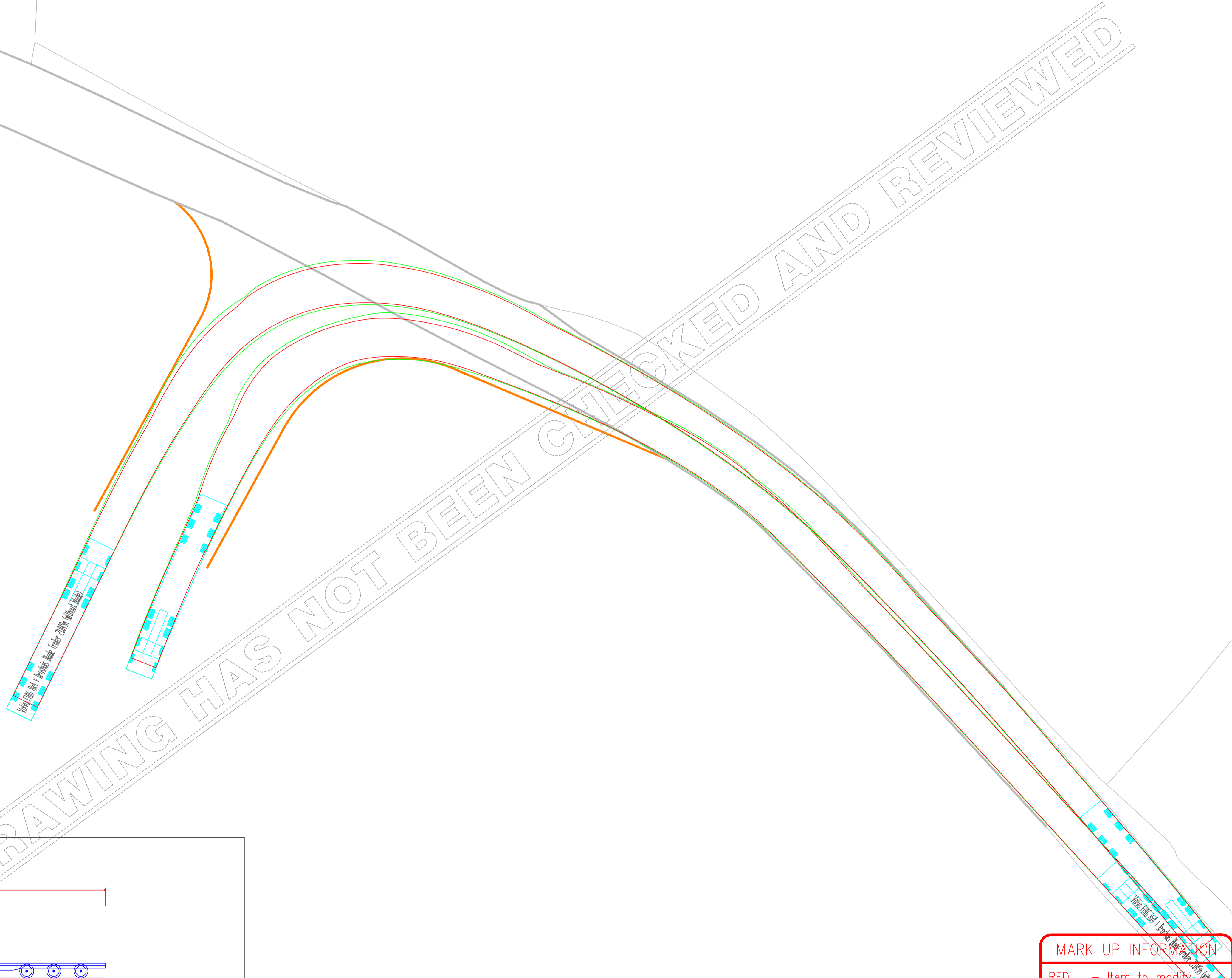
CURRENT ISSUE INFORMATION

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SUITABILITY CODE	SUITABILITY DESCRIPTION				

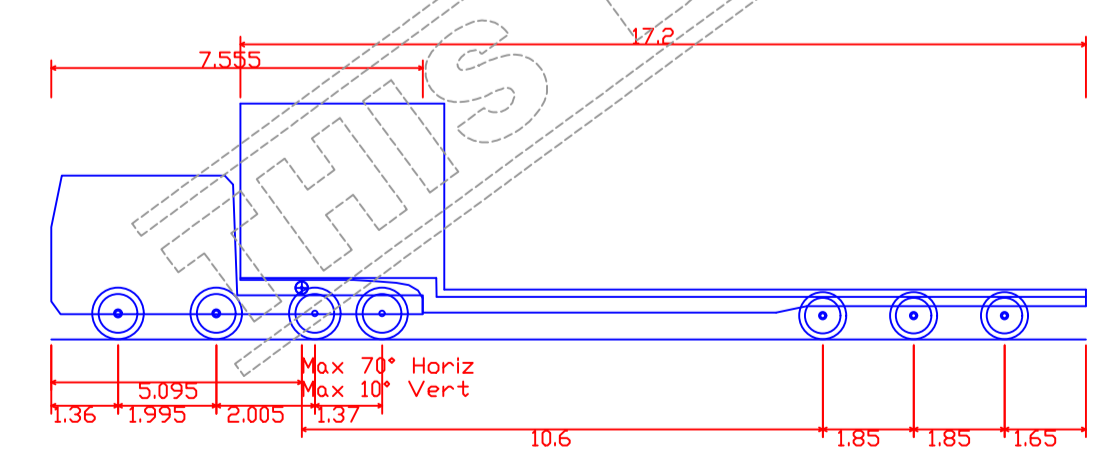


HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
PROPOSED BOWLAND SECTION - TEMPORARY HAUL ROAD
HALLGATE HILL JUNCTION
VEHICLE TRACKING - THREE AXLE LOADER
(FH16 ASSUMPTION)

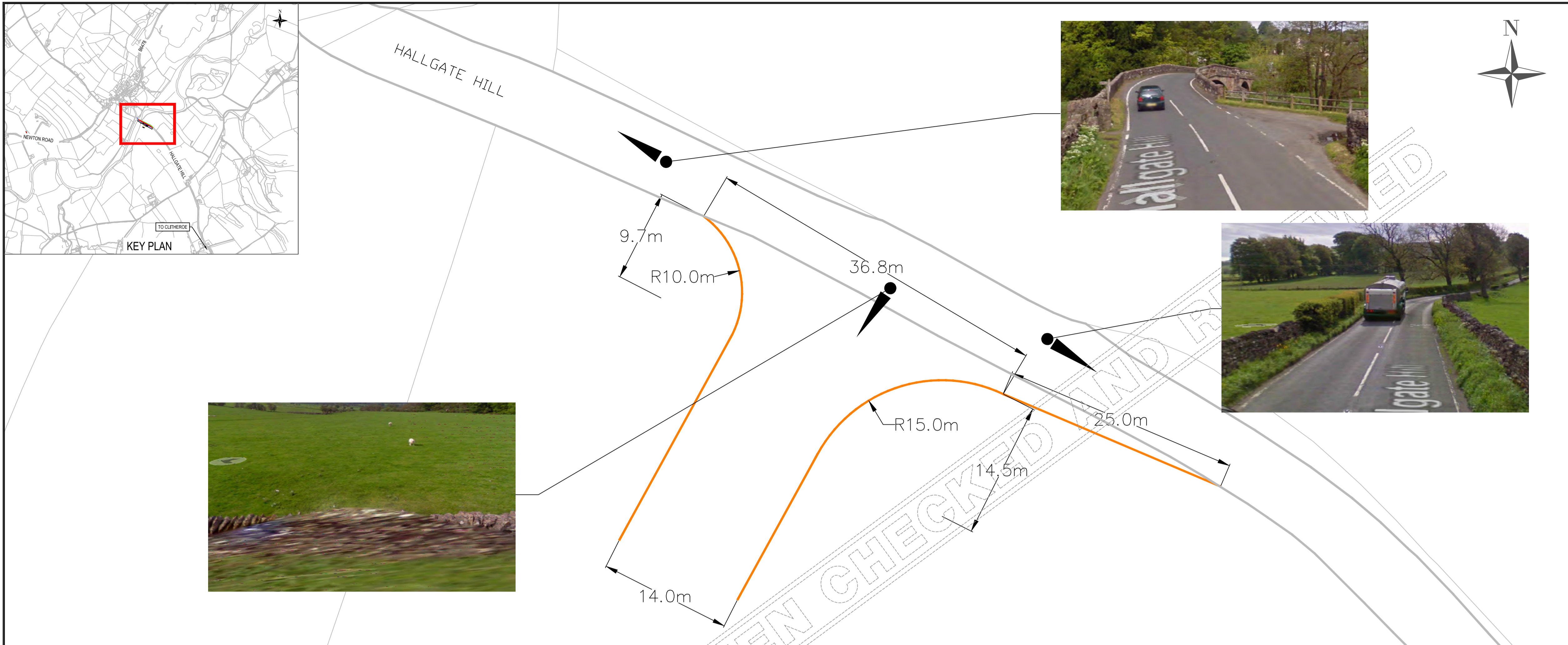
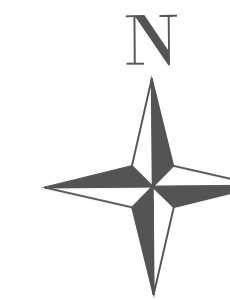
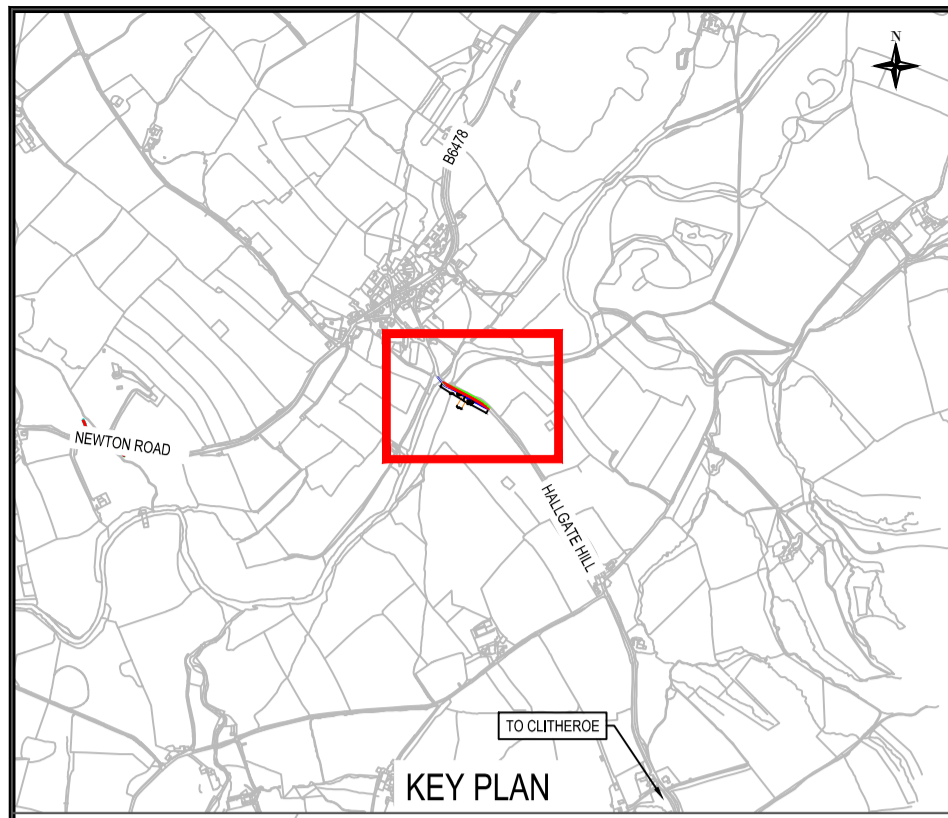
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MARK UP INFORMATION
RED - Item to modify
GREEN - Comment for CAD
BLUE - Modification complete
YELLOW - Item for clarification
Pen colours for print mark-ups



Volvo FH16 8x4 + Broshuis Blade Trailer 21.049m (without blade)
Overall Length 21.045m
Overall Width 3.050m
Overall Body Height 4.800m
Min Body Ground Clearance 0.515m
Track Width 3.000m
Lock to lock time 6.00s
Wall to Wall Turning Radius 9.800m








NOTES

- DO NOT SCALE FROM THIS DRAWING.
- TAKEN FROM CD 109 (TABLES 2.5 AND 2.10)

DESIRED VISIBILITY SPLAY	ACHIEVED VISIBILITY SPLAY
4.5m x 215m	4.5m x 70m

EXISTING SPEED LIMIT	PROPOSED SPEED LIMIT
60 mph	30 mph
- 70 METER VISIBILITY SPLAY IS ONE STEP BELOW IN TABLE 2.10 OF CD 109 DUE TO RESTRICTING FACTORS OF ROAD CURVATURE, EXISTING VEGETATION AND EXISTING OVERBRIDGE TO THE NORTH.
- VISIBILITY SPLAY (VALUE X) SET BACK 4.5m FROM EDGE OF CARRIAGEWAY

LEGEND

-  EXISTING KERB
-  PROPOSED KERB
-  VISIBILITY SPLAY
-  SSD ENVELOPE NORTHBOUND
-  SSD ENVELOPE SOUTHBOUND

CURRENT ISSUE INFORMATION

P01.3	HS	SP	--	--	--
VERSION	AUTH	CHKD	REVD	REASON FOR ISSUE	DATE
SO		WORK IN PROGRESS (WIP)			
SUITABILITY CODE	SUITABILITY DESCRIPTION				



HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED BOWLAND SECTION
 TEMPORARY HAUL ROAD - HALLGATE HILL
 ACCESS DESIGN

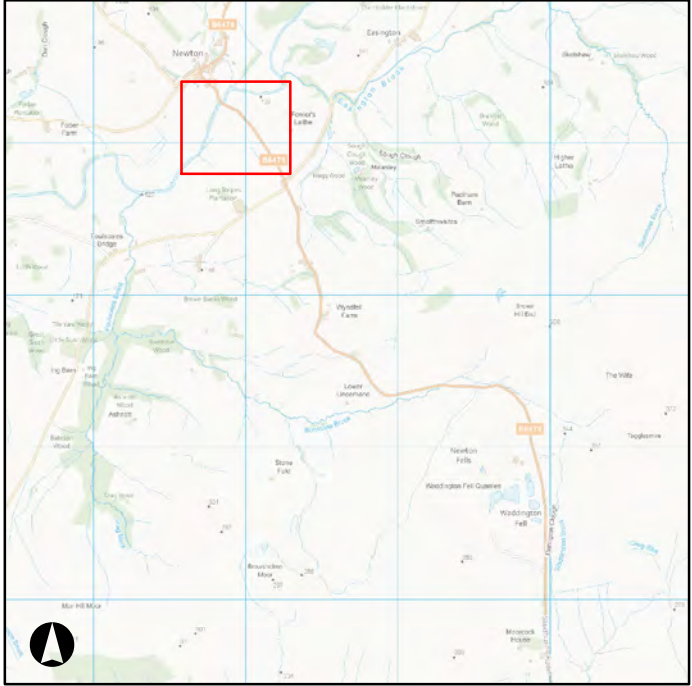
MARK UP INFORMATION
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 GREEN - Comment for CAD
 BLUE - Modification complete
 YELLOW - Item for clarification
 Pen colours for print mark-ups

SCALE 1:250 / 1:500	SHEET SIZE A1
DRAWING NUMBER B27070CQ-JAC-XX-DR-C-TR3_VS-1006	REVISION P01.3



APPENDIX B2 - PROPOSED JUNCTION

FIGURE B - 2 - 09

B6478 Hallgate Hill



WIDER AREA 0 0.275 0.55 1.1 Kilometers

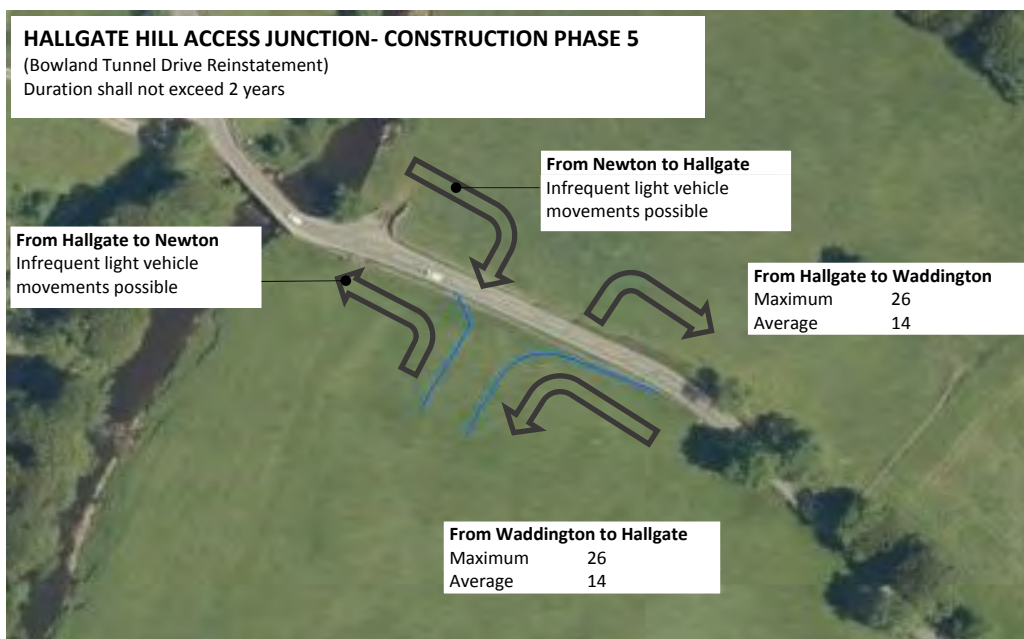
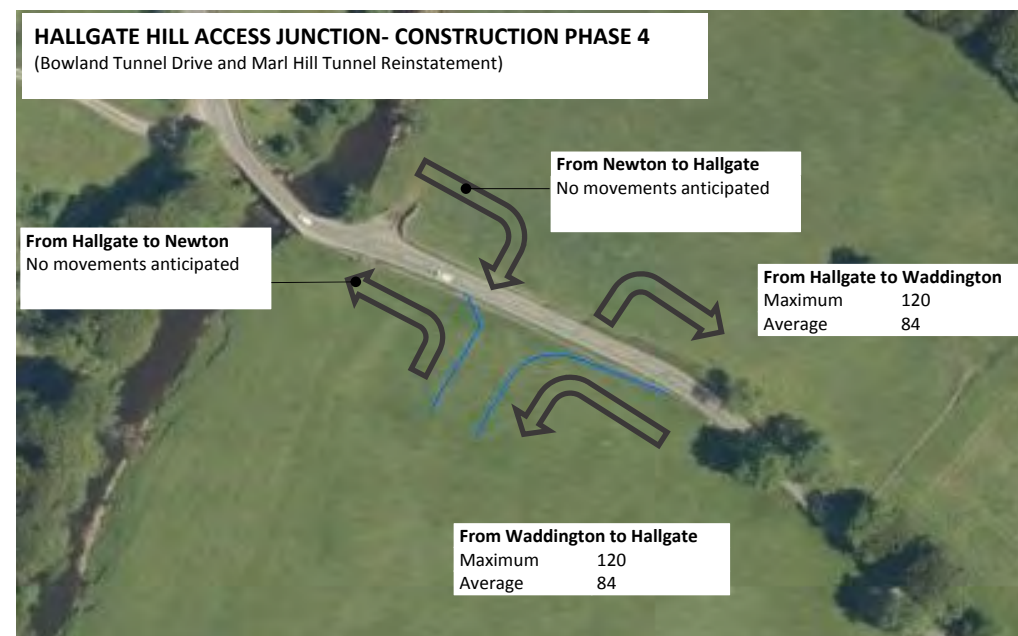
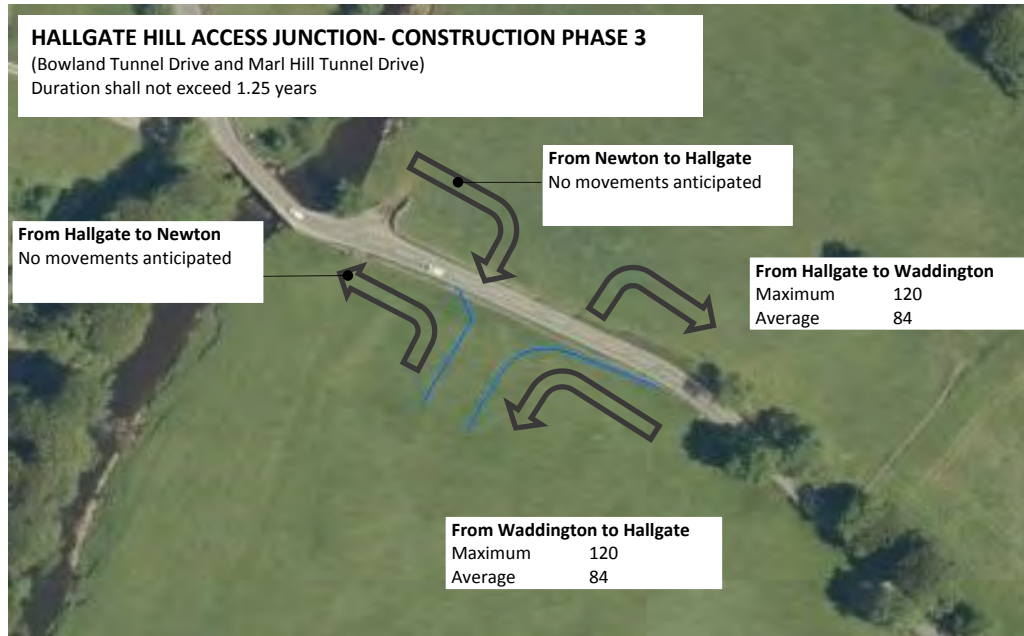
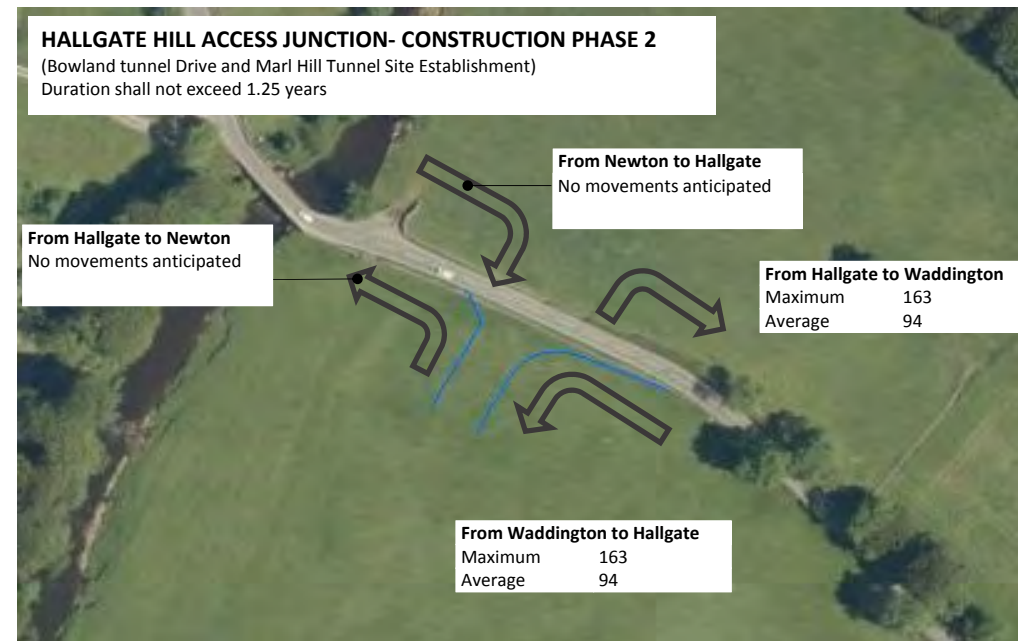
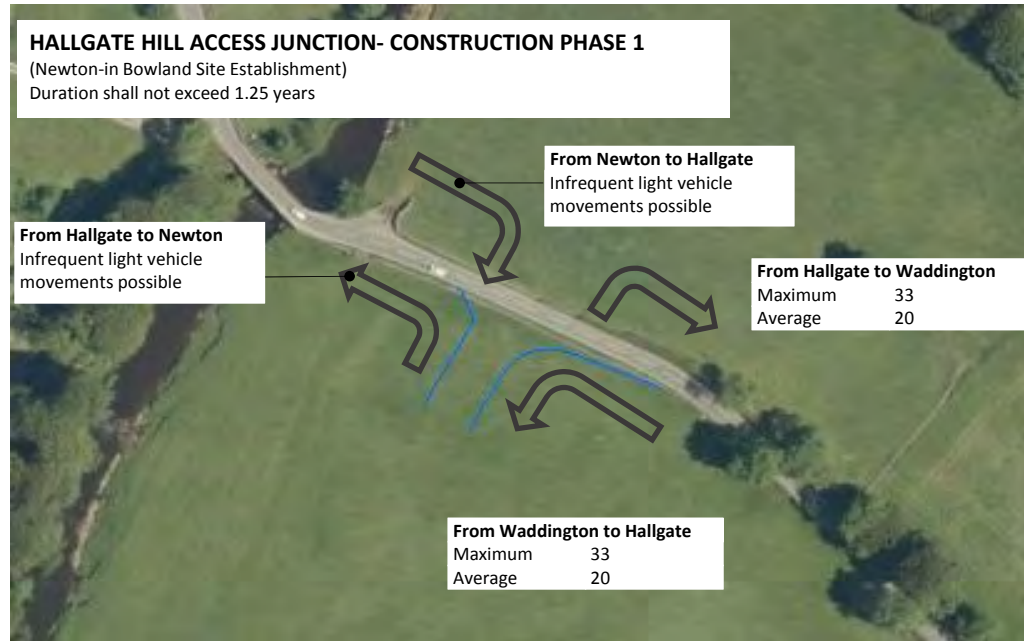
- Legend**
-  4.5m x 70m Visibility splay
 -  Proposed Junction



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown. Crown copyright and database rights 2017 Ordnance Survey 100022432.

APPENDIX B2 - FIGURE B-2-10

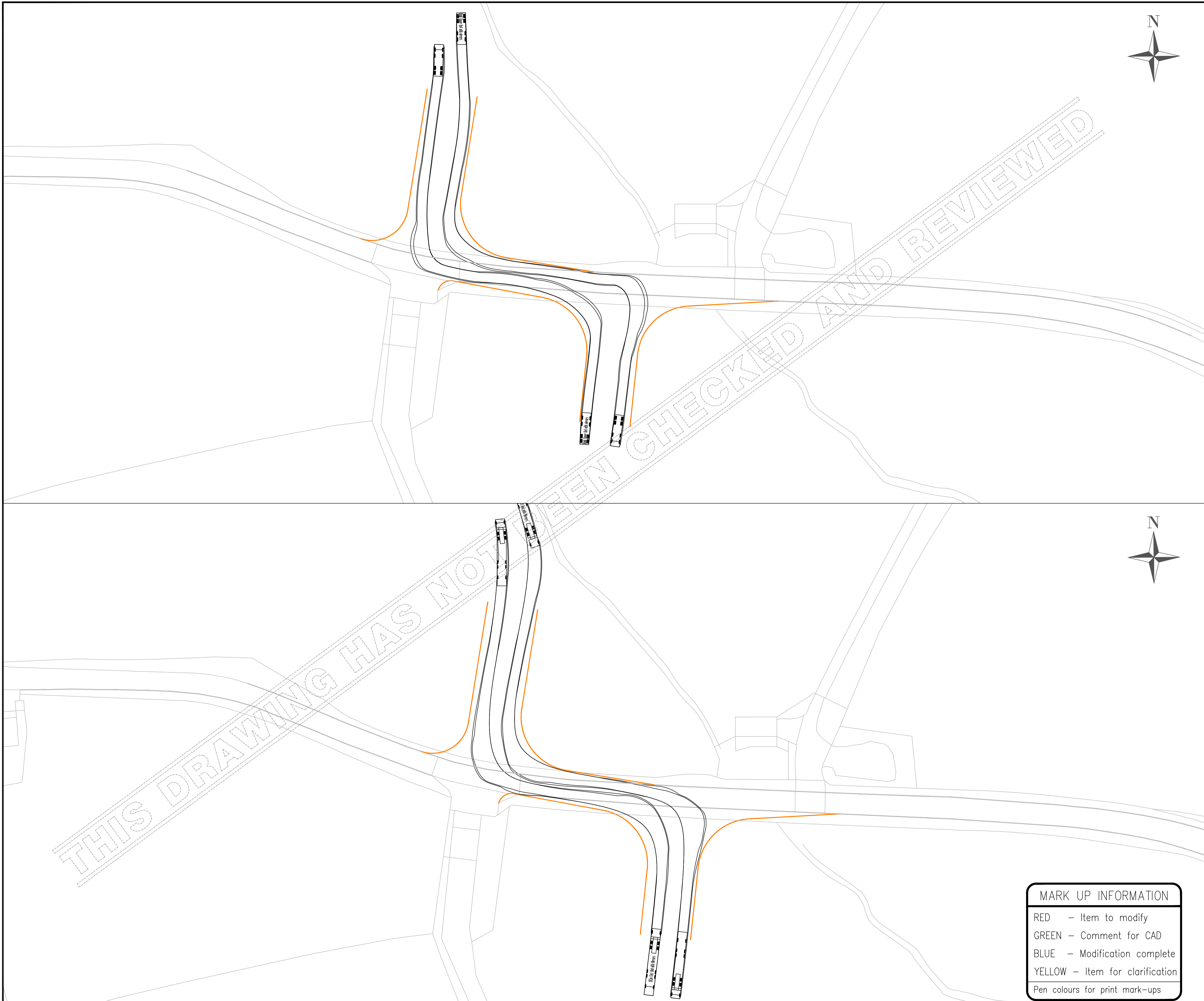
PROPOSED HALLGATE HILL JUNCTION DAILY MOVEMENTS



LEGEND


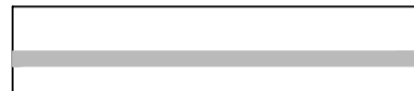
Average: averaged over 1 year and rounded to the nearest whole number the number of movements per day turning in shown direction

Maximum: the anticipated maximum number of movements on any single day turning in shown direction



- NOTES**
- DO NOT SCALE FROM THIS DRAWING
 - VEHICLE MEASUREMENTS

LEGEND

	PROPOSED KERB
	EXISTING KERB

CURRENT ISSUE INFORMATION

P01.1	HS	SP	--	--	-
VERSION	AUTH	CHKD	REVD	REASON FOR ISSUE	DATE
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SUITABILITY CODE		SUITABILITY DESCRIPTION			

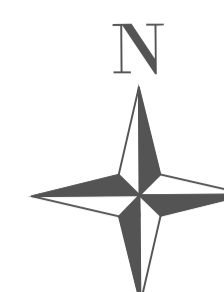
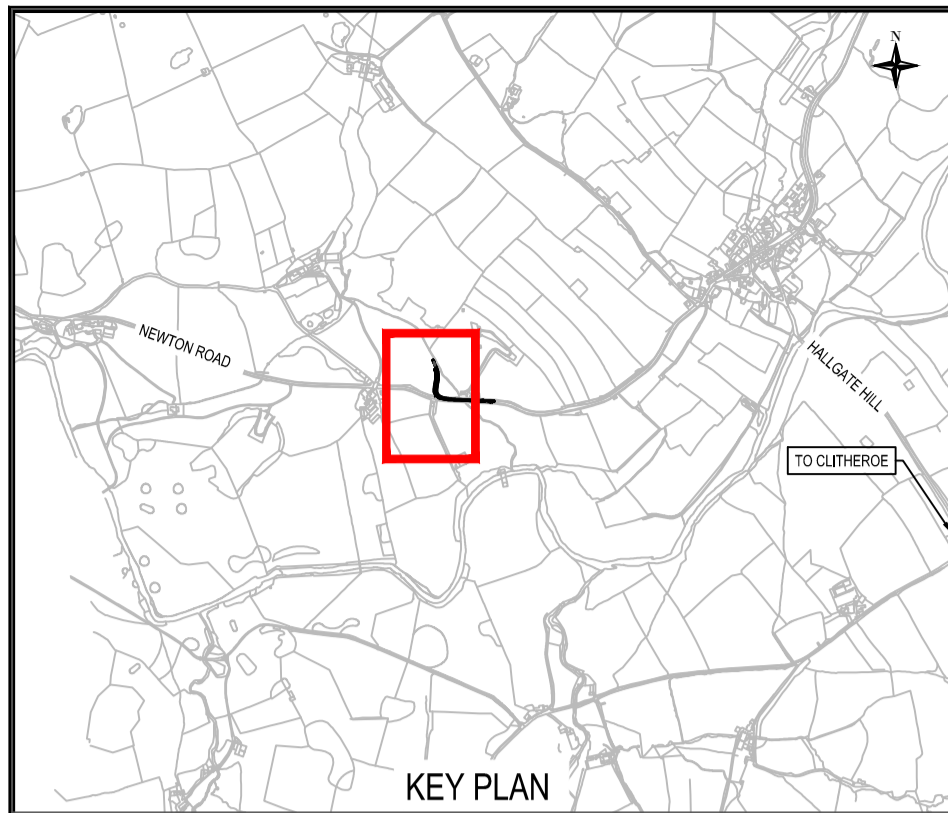


HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED BOWLAND SECTION
 NEWTON-IN-BOWLAND COMPOUND
 VEHICLE ACROSS JUNCTION (STAGGERED)
 STANDARD VEHICLE TRACKING

MARK UP INFORMATION

RED	- Item to modify
GREEN	- Comment for CAD
BLUE	- Modification complete
YELLOW	- Item for clarification
Pen colours for print mark-ups	

SCALE 1:500	SHEET SIZE A1
DRAWING NUMBER B27070CQ-JAC-XX-DR-C-TR3_VT-1108	REVISION P01.1






NOTES

- DO NOT SCALE FROM THIS DRAWING.
- TAKEN FROM CD 109 (TABLES 2.5 AND 2.10)

DESIRED VISIBILITY SPLAY	ACHIEVED VISIBILITY SPLAY
4.5m x 215m	4.5m x 120m

EXISTING SPEED LIMIT	PROPOSED SPEED LIMIT
60 mph	40 mph
- 120 METER VISIBILITY SPLAY IS ACHIEVABLE TO TABLE 2.10 OF CD 109 REQUIRING REMOVAL OF EXISTING VEGETATION. A REDUCED 40 MPH SECTION OF ROAD CAN ACHIEVE ADEQUATE VISIBILITY.
- VISIBILITY SPLAY (VALUE X) SET BACK 4.5m FROM EDGE OF CARRIAGEWAY

LEGEND

-  EXISTING KERB
-  PROPOSED KERB
-  VISIBILITY SPLAY

CURRENT ISSUE INFORMATION

P01.2	HS	SP	--	--	--
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SUITABILITY CODE		SUITABILITY DESCRIPTION			



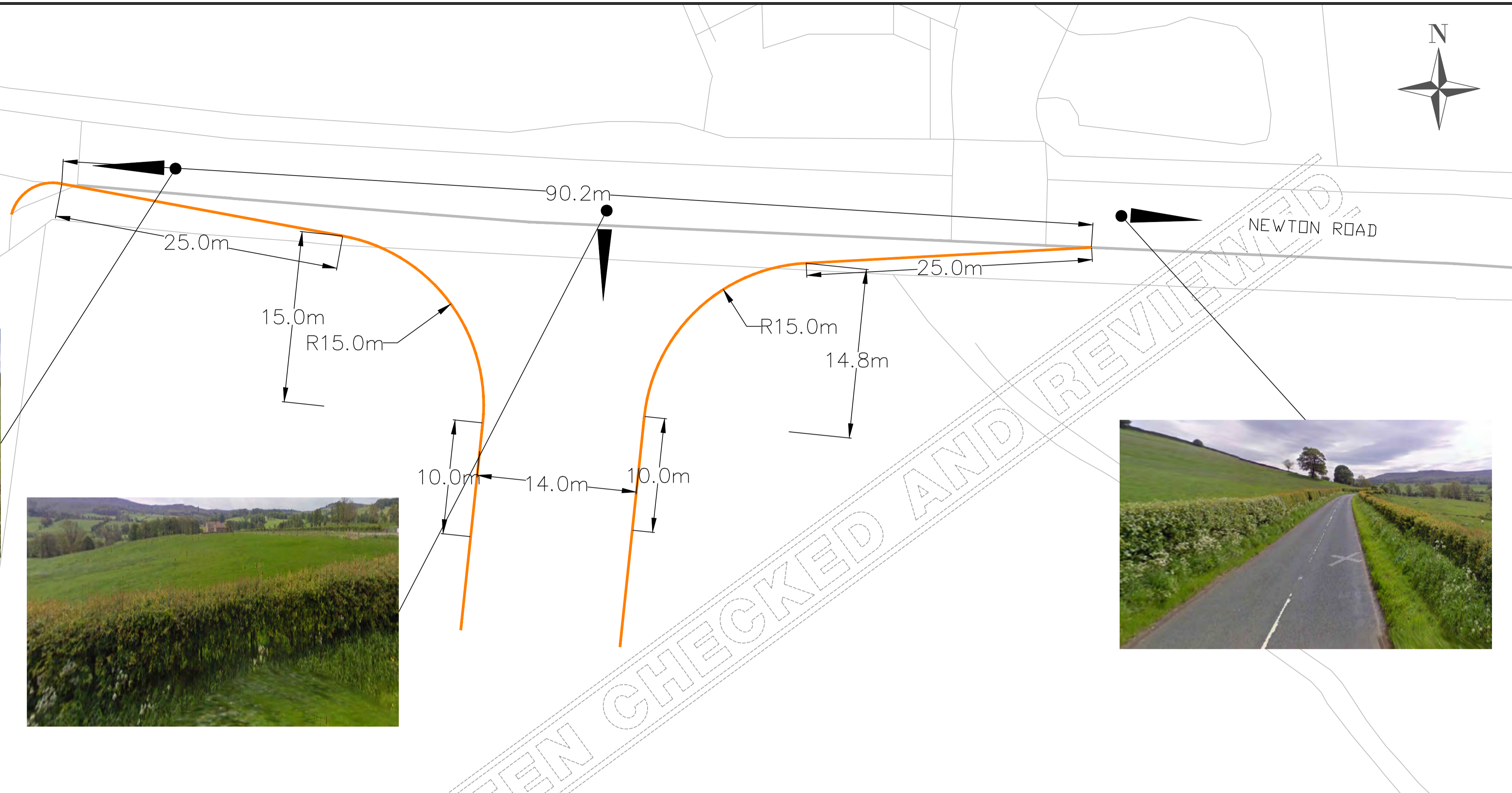
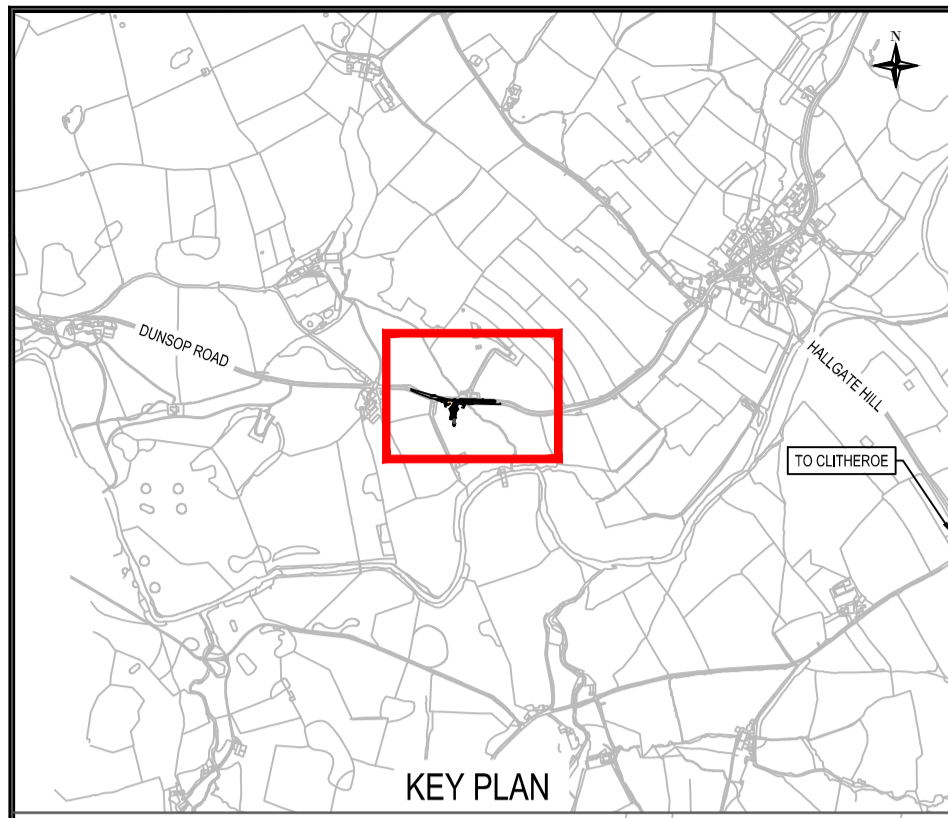
HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED BOWLAND SECTION
 NEWTON-IN-BOWLAND COMPOUND
 ACCESS DESIGN

MARK UP INFORMATION

- RED - Item to modify
- GREEN - Comment for CAD
- BLUE - Modification complete
- YELLOW - Item for clarification

Pen colours for print mark-ups

SCALE 1:250 / 1:500	SHEET SIZE A1
DRAWING NUMBER B27070CQ-JAC-XX-DR-C-TR3_VS-1002	REVISION P01.2



NOTES

- DO NOT SCALE FROM THIS DRAWING.
- TAKEN FROM CD 109 (TABLES 2.5 AND 2.10)

DESIRED VISIBILITY SPLAY	ACHIEVED VISIBILITY SPLAY
4.5m x 215m	4.5m x 120m

EXISTING SPEED LIMIT	PROPOSED SPEED LIMIT
60 mph	40 mph
- 120 METER VISIBILITY SPLAY IS ACHIEVABLE TO TABLE 2.10 OF CD 109 REQUIRING REMOVAL OF EXISTING VEGETATION. A REDUCED 40 MPH SECTION OF ROAD CAN ACHIEVE ADEQUATE VISIBILITY.
- VISIBILITY SPLAY (VALUE X) SET BACK 4.5m FROM EDGE OF CARRIAGEWAY

LEGEND

	EXISTING KERB
	PROPOSED KERB
	VISIBILITY SPLAY

CURRENT ISSUE INFORMATION

P01.2	HS	SP	--	--	--
VERSION	AUTH	CHKD	REVD	REASON FOR ISSUE	DATE
SO	WORK IN PROGRESS (WIP)				
SUITABILITY CODE	SUITABILITY DESCRIPTION				



HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED BOWLAND SECTION
 NEWTON-IN-BOWLAND COMPOUND SOUTH
 ACCESS DESIGN

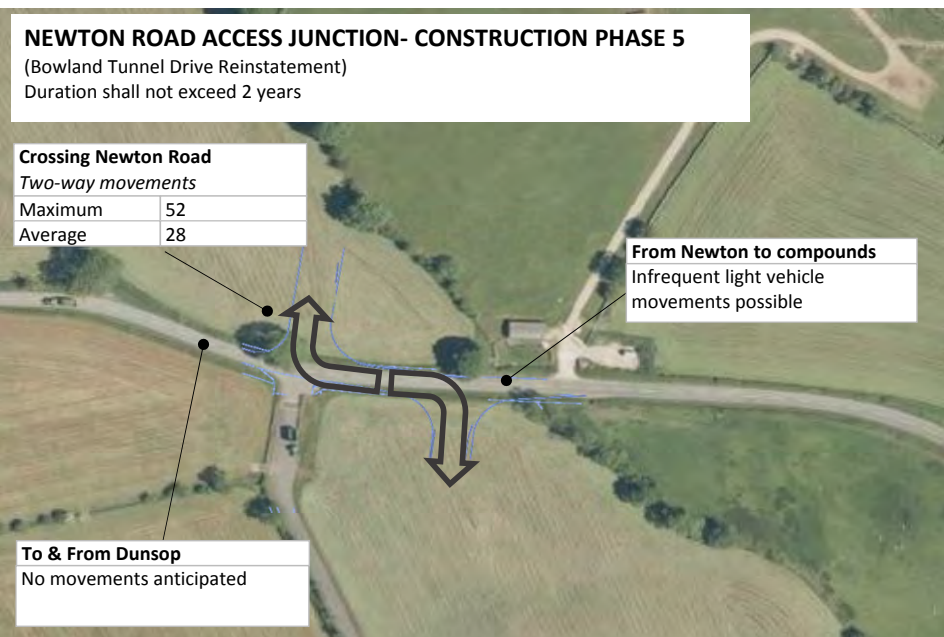
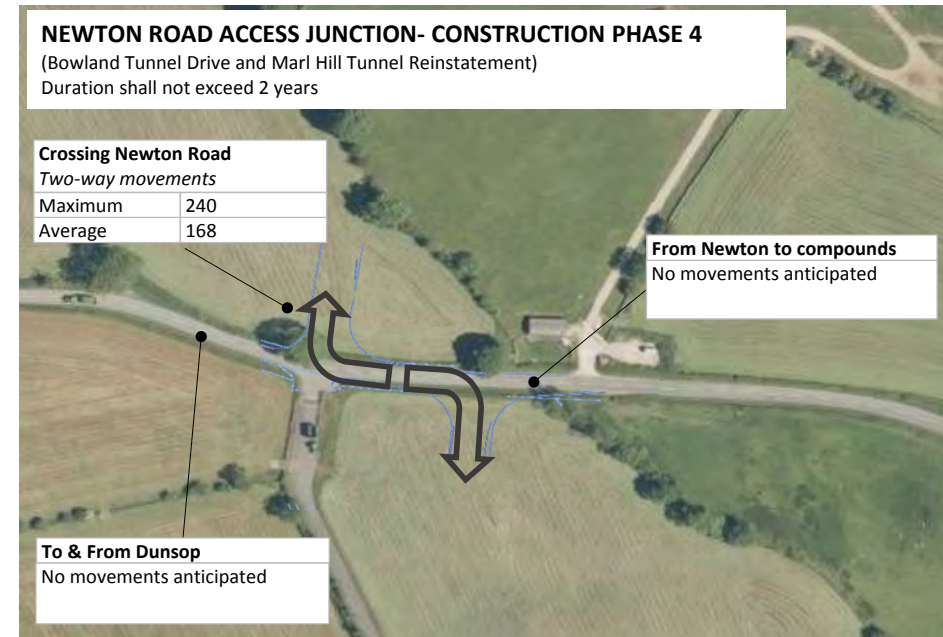
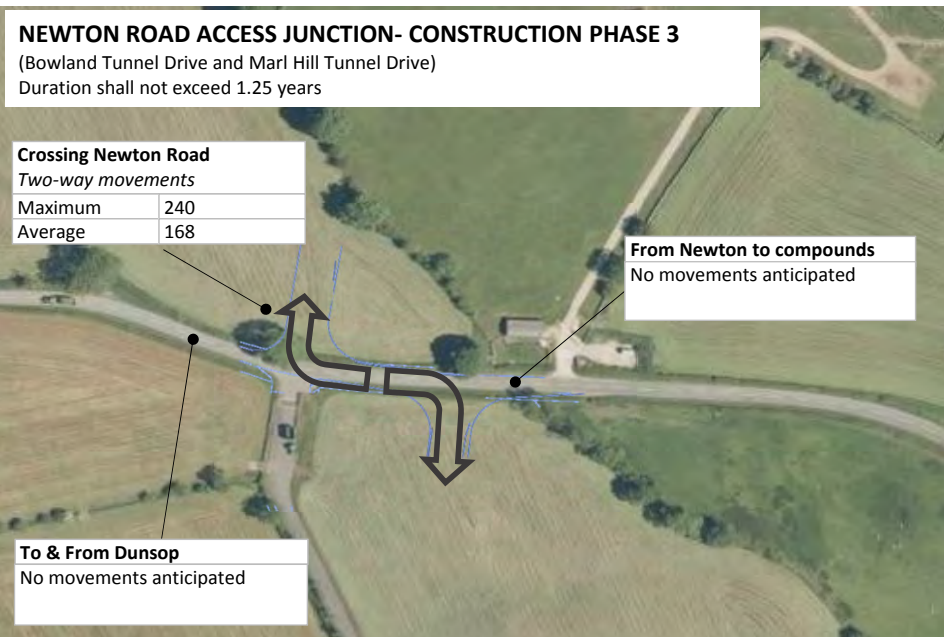
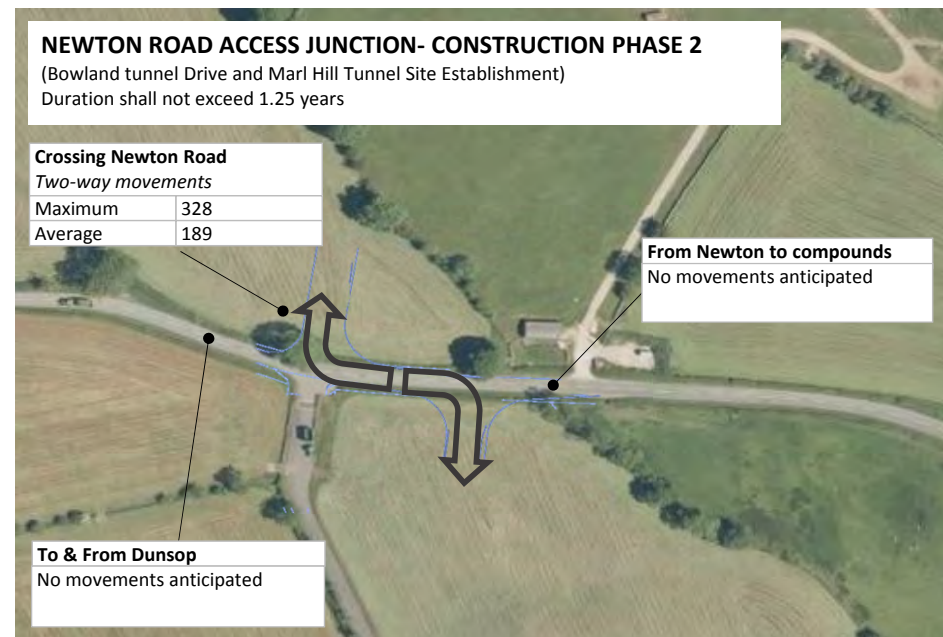
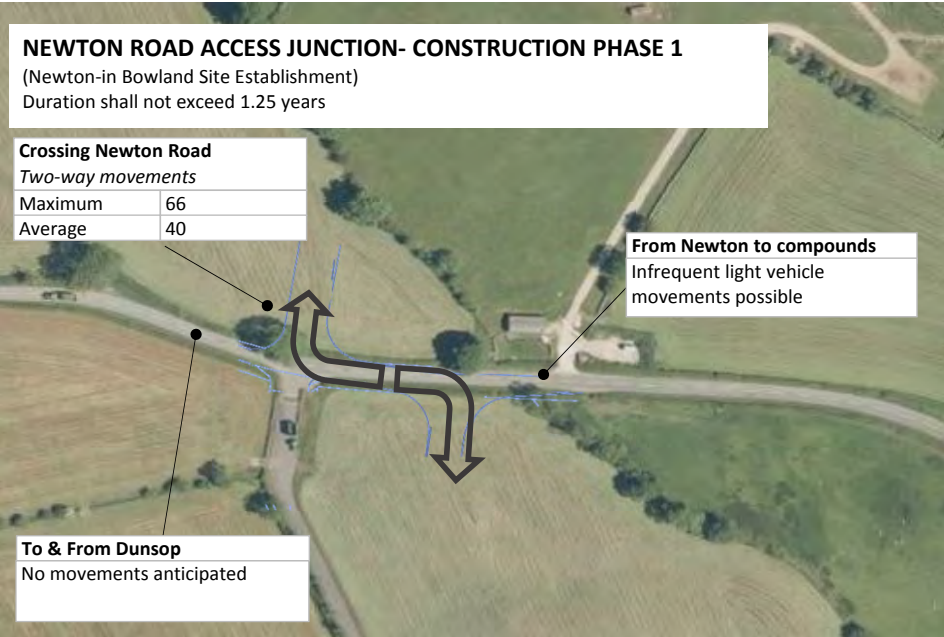
MARK UP INFORMATION

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- BLUE - Modification complete
- YELLOW - Item for clarification
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SCALE 1:250 / 1:500	SHEET SIZE A1
DRAWING NUMBER B27070CQ-JAC-XX-DR-C-TR3_VS-1003	REVISION P01.2

APPENDIX B2 - FIGURE B-2-14

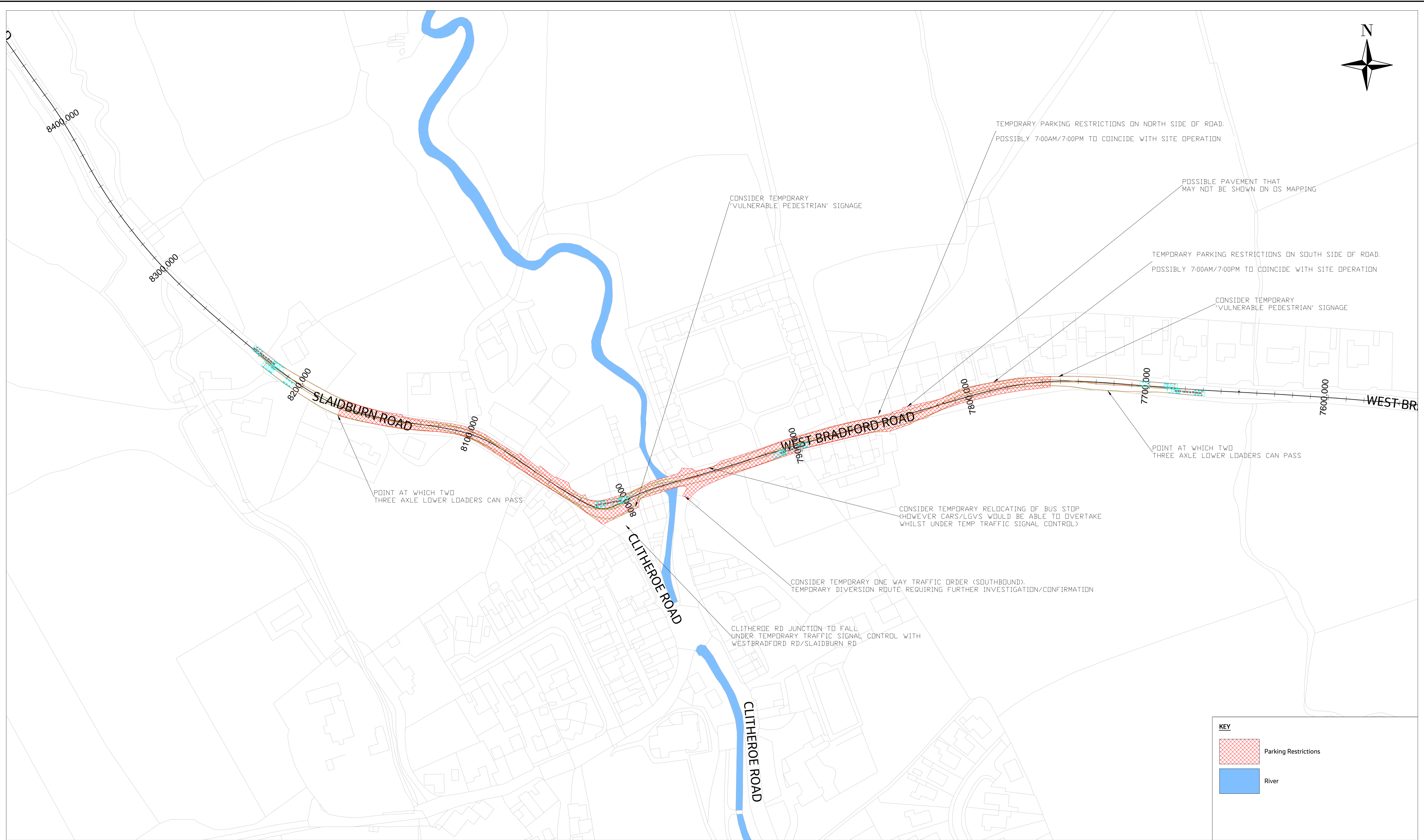
PROPOSED NEWTON ROAD JUNCTION DAILY MOVEMENTS



LEGEND

Average: averaged over 1 year and rounded to the nearest whole number the number of movements per day turning in shown direction

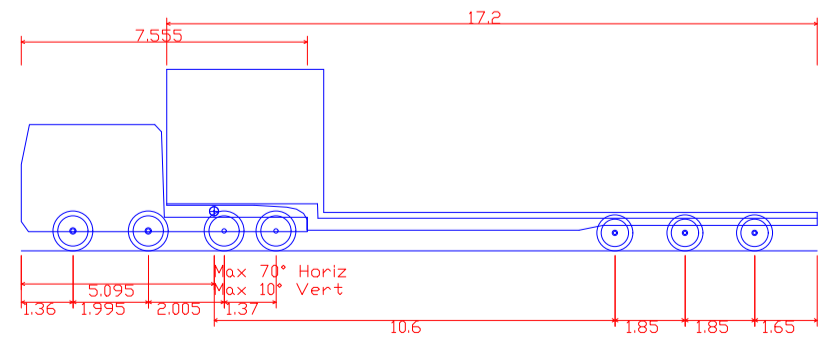
Maximum: the anticipated maximum number of movements on any single day turning in shown direction



KEY

	Parking Restrictions
	River

M:\Projects\Transport\Projects\B27070BW - Haweswater Aqueduct Renewal\5. Project Work\5. Drawings & OS Tiles\1 - Swept path Analysis\5. Working



Volvo FH16 8x4 + Broshuis Blade Trailer 21.049m (without blade)

Overall Length	21.045m
Overall Width	3.050m
Overall Body Height	4.800m
Min Body Ground Clearance	0.510m
Track Width	3.000m
Lock to lock time	6.00s
Wall to wall Turning Radius	9.800m

Rev	Rev. Date	Purpose of revision	Orig	Check'd	Rev'd	Apprv'd
P01	2021-02-09		HS	SP	SP	

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Client: **United Utilities**

Project: **Haweswater Aqueduct Resilience Programme**

Drawing title: **PROPOSED BOWLAND SECTION
BRADDUP, BONSTONE & NEWTON COMPOUNDS
MITIGATION MEASURES - WADDINGTON
WEST BRADFORD RD TO SLAIDBURN RD**

Drawing status: **DRAFT** Suitability: **SO**

Scale: **1:1000 @ A1** DO NOT SCALE

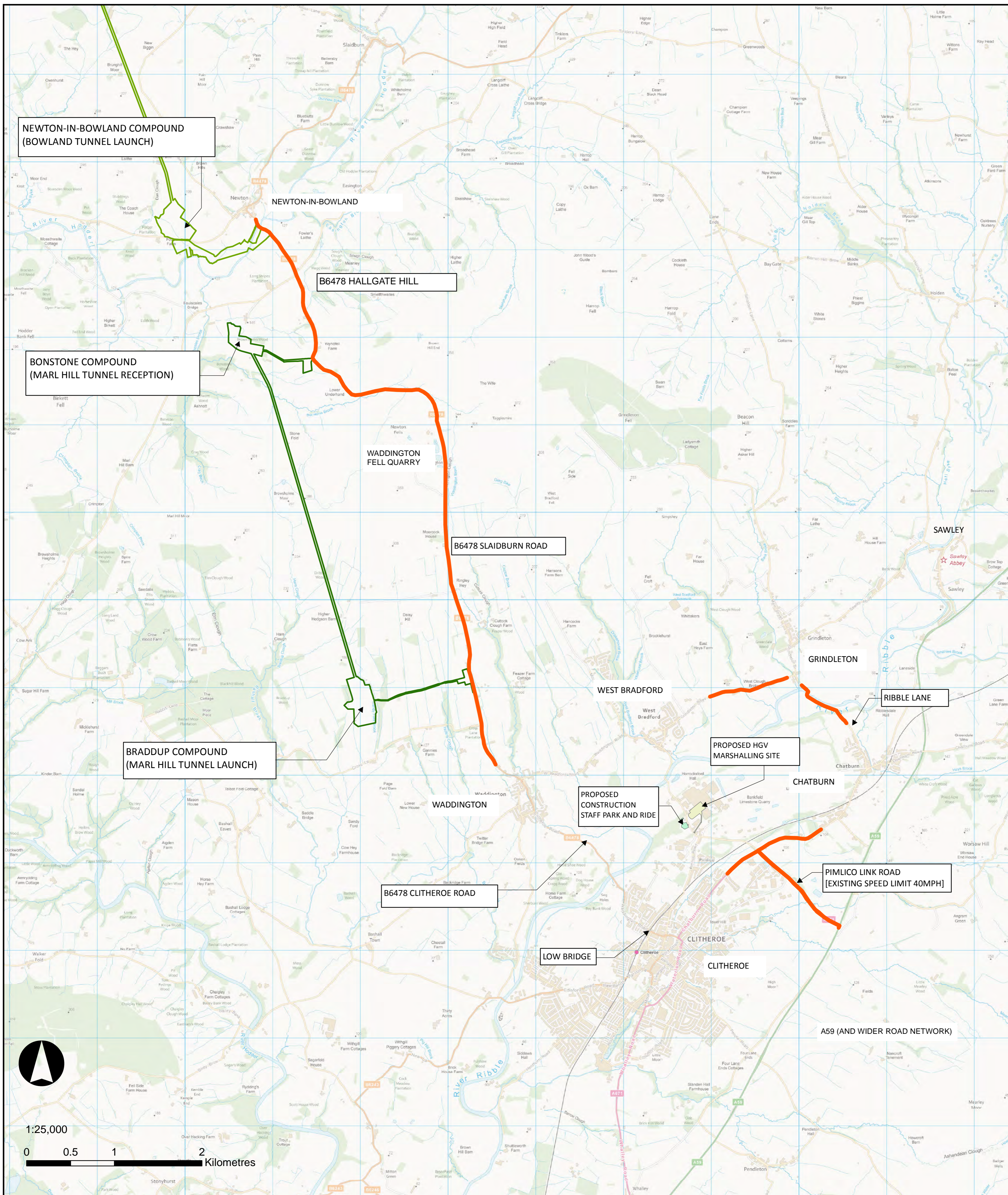
Jacobs No. **B27070CQ** Rev

Client No. **P01**

Drawing number: **B27070CQ-JAC-XX-DR-C-TR4_MIT-0001**

APPENDIX B2

FIGURE B-2-16: PROPOSED SPEED LIMITS



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Legend	
	PROPOSED 30MPH SPEED LIMIT
	PROPOSED CONSTRUCTION STAFF AND VISITOR PARK AND RIDE SITE
	PROPOSED HGV MARSHALLING AND HOLDING AREA
	PROPOSED BOWLAND TUNNEL DEVELOPMENT AREA
	PROPOSED MARL HILL TUNNEL DEVELOPMENT AREA

NOTES:

EXISTING SPEED LIMIT WHERE CHANGES ARE PROPOSED IS NATIONAL SPEED LIMIT UNLESS OTHERWISE STATED

Appendix B3 – Abnormal Indivisible Load Review

Figure B-3-01: AIL Access Route Options (MNA_B-3-01)

Figure B-3-02: AIL Swept Path Sawley Bridge (Discounted Option) (MNA_B-3-02)

Figure B-3-03: AIL Swept Path Grindleton Bridge (MNA_B-3-03)

Figure B-3-04: Swept Paths Grindleton Road (MNA_B-3-04)

Figure B-3-05: Swept Paths Waddington (MNA_B-3-05)

Figure B-3-06: Proposed Marl Hill Section – Bonstone Compound Access Junction with B6478 – Abnormal Load Vehicle Tracking - B27070CQ-JAC-XX-DR-C-TR4_VT-1113 (MNA_B-3-06_ B27070CQ-JAC-XX-DR-C-TR4_VT-1113)

Figure B-3-07: AIL Proposed Junction Swept Paths Junctions (MNA_B-3-07)

Figure B-3-08: Proposed Bowland Section – Temporary Haul Road – Hallgate Hill Junction Abnormal Load Vehicle Tracking – B27070CQ-JAC-XX-DR-C-TR3_VT-1112 (MNA_B-3-08 B27070CQ-JAC-XX-DR-C-TR3_VT-1112)

Figure B-3-09: Proposed Bowland Section – Newton-in-Bowland Compound – Vehicle Across Junction (Staggered) – Abnormal Load Vehicle Tracking (TBM) – B27070CQ-JAC-XX-DR-C-TR3_VT-1107 (MNA_B-3-09_ B27070CQ-JAC-XX-DR-C-TR3_VT-1107)

Abnormal Indivisible Load Movements

Introduction

Route 2 will be used for all AIL movements. The following sets out the rationale for this approach and some additional considerations that the Contractor will address as the CTMP is developed.

Abnormal Loads Services' Findings and Adopted Route

Abnormal Loads Services (ALS) were engaged on United Utilities behalf by Costain (Costain providing United Utilities with Early Contractor Involvement for the HARP). ALS's remit in relation to the MNA was the provision of route survey investigations to identify feasible access routes for the anticipated AILs focusing on the anticipated largest indivisible load (TBM Shield haulage). The review was completed in order to obtain advice on which route or routes are most suitable.

ALS provided a report (Route Survey Report, September 2020) that included a section that addresses the MNA (Section 3.2). The report also covers elements of HARP that relate to separate planning applications that are not applicable to the MNA so the report is not included in full here. The key findings relevant to the MNA are summarised below.

Figure B-3-01 shows the range of routes considered. ALS considered that the majority were not suitable. In particular the nature of many of the existing River Ribble crossings and the extent of road modification needed ruled these options out. The route ALS identified in their report as the most practical has been discounted. This was via Sawley (Option 3-E).

Along this discounted route ALS identified the following as being applicable to the whole route:

- It is advised that extensive tree surgery will be required on all roads on the route (this may attract objections from local residents)
- There are a number of structures along the route (culverts and bridges) for which the capacity is unknown. In the event there are structural limits it is anticipated that these structures can be "Overbridged" utilising temporary works (see Figure B-3-02)
- Temporary parking restrictions when AIL movements are proposed will be necessary to permit the sweep of the vehicle in a number of locations.

These considerations are also applicable to Route 2.

For Option 3-E the crossing of the River Ribble is the first area that is discussed in detail by ALS. They anticipate that the conventional TBM configuration considered will not be able to navigate the bridge without localised widening works (Figure B-3-02 illustrates this). They suggest that a suitable transshipment location should be sourced prior to the bridge and the TBM Section transferred to a shorter vehicle configuration. [Note: this may result in increasing the overall height of the vehicle to approx. 5.50m. At this increased height any overhead wires telecoms / electrical will have to be lifted or isolated. Swept path analysis will still be required to confirm this.]

Along Option 3-E, Sawley Road passes closely to the River Ribble wall. If Option 3-E is used ALS recommend the road should be assessed to check that it can withstand the pressure of the vehicle.

ALS concluded that Option 3-E (the route via Sawley) provides the best route to support the current vehicle configuration which is road going and legal, without the need for any bridge modifications. They highlight that this route does however include various pinch points between Sawley and Waddington which will need to be addressed. An alternative route via Chatburn (Option 3A – the proposed Route 2) was discounted by ALS because of the limitations of Grindleton Bridge (East View).

There are two possible ways in which the Grindleton Bridge limitation might be overcome:

- One will be to widen the approaches to Grindleton Bridge.

- ALS suggest that another will be similar to that proposed for the Sawley crossing. It will be to tranship the TBM section onto a configuration that could navigate the crossing. In this instance it will necessitate the use of a configuration using a self-powered remote power pack unit which attaches to the rear of the trailer, this will permit the removal of the tractor unit but still powers the trailer configuration to travel legally on a public road (the example system cited is produced by Enerpac). By removing the tractor unit and reconfiguring the trailer, the weight and length of the means of navigation could be reduced and the existing bridge crossed. Once the bridge has been crossed the tractor unit could be re-attached and the load could progress onwards to Waddington.

In addition to ALLs a route avoiding the low bridge in Clitheroe (3.5m restriction) is also necessary to accommodate the anticipated HGV traffic needed for the scheme that exceeds 3.5m high. Route 2, is a more direct route than Option 3-E. Route 2 passes through Chatburn, reduces the distance travelled on narrow roads (reducing the number of pinch point issues that will have to be resolved) and whilst it does impact Chatburn it minimises impact to both Sawley and Grindleton.

On balance it is considered that if Route 2 is used for all traffic that cannot pass beneath the low railway bridge (i.e. ALLs and HGVs) the works associated with widening the Grindleton Bridge Approach are justifiable.

Independently of the ALS exercise, Jacobs were engaged by United Utilities to complete swept path analysis and as necessary develop appropriate indicative mitigation.

Figure B-3-02 shows the swept path for the TBM along the discounted Option 3-E route at the Sawley Ribble crossing and shows, as highlighted in the ALS report, that the proposed TBM configuration cannot cross the bridge.

Figure B-3-03 shows the swept path for the proposed Route 2 at the Grindleton Bridge Ribble crossing and the proposed approach of widening.

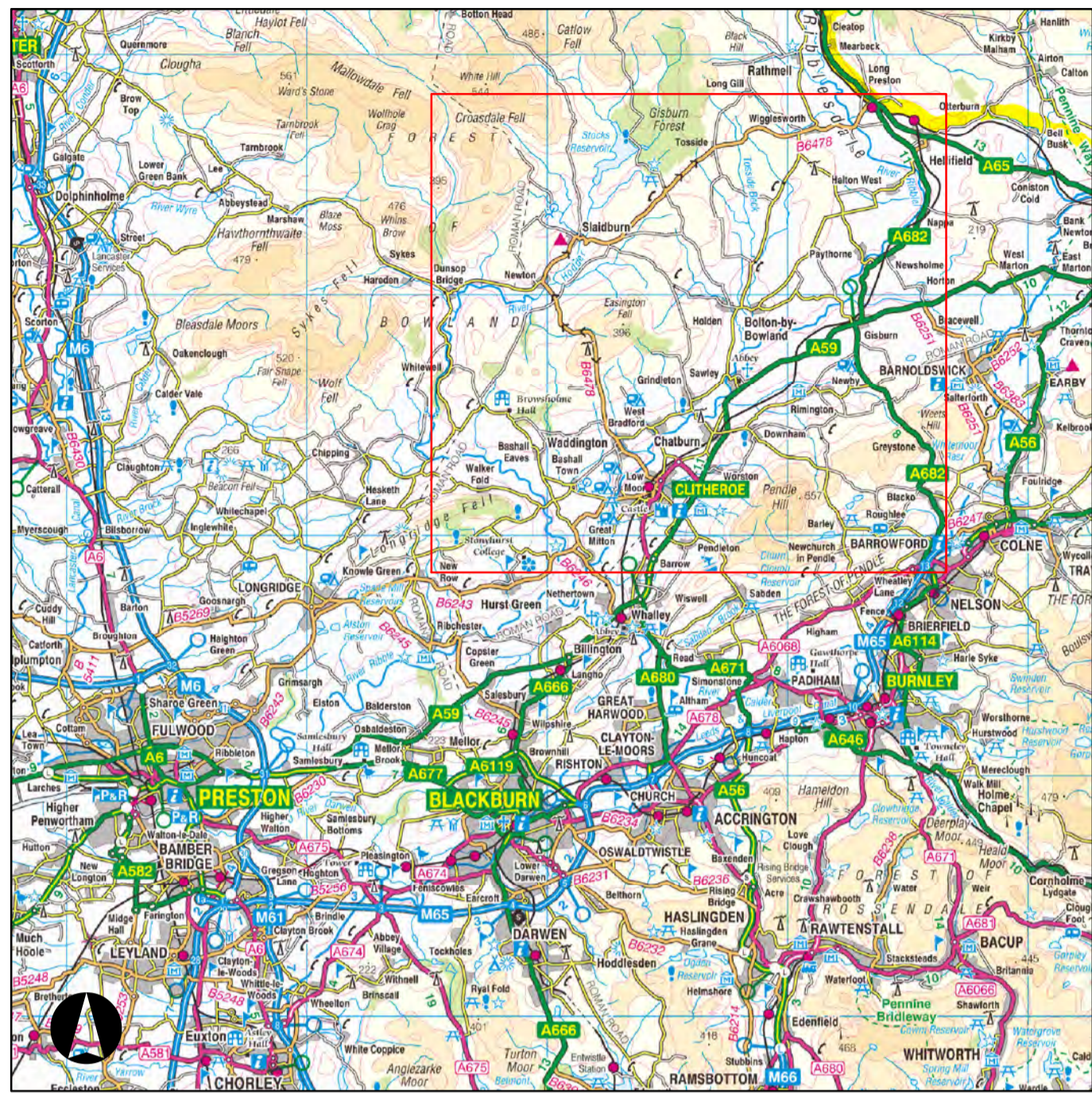
The Jacobs swept path analysis also identified a need for significant road widening at the junction between East View and Grindleton Road (see Figure B-3-04).

Travelling towards the proposed construction compounds along Route 2 West Bradford Road in Waddington and turning right onto Slaidburn Rd / The Square / B6478, ALS suggested that the removal of bollards is required outside the Higher Buck Inn. The initial swept path analysis completed by Jacobs suggests this may not be required (see figure B-3-05). (Note: As stated elsewhere the specification of the TBMs and vehicle / trailer configurations will be determined by the appointed contractor(s) and a specific more detailed assessment will be completed in due course).

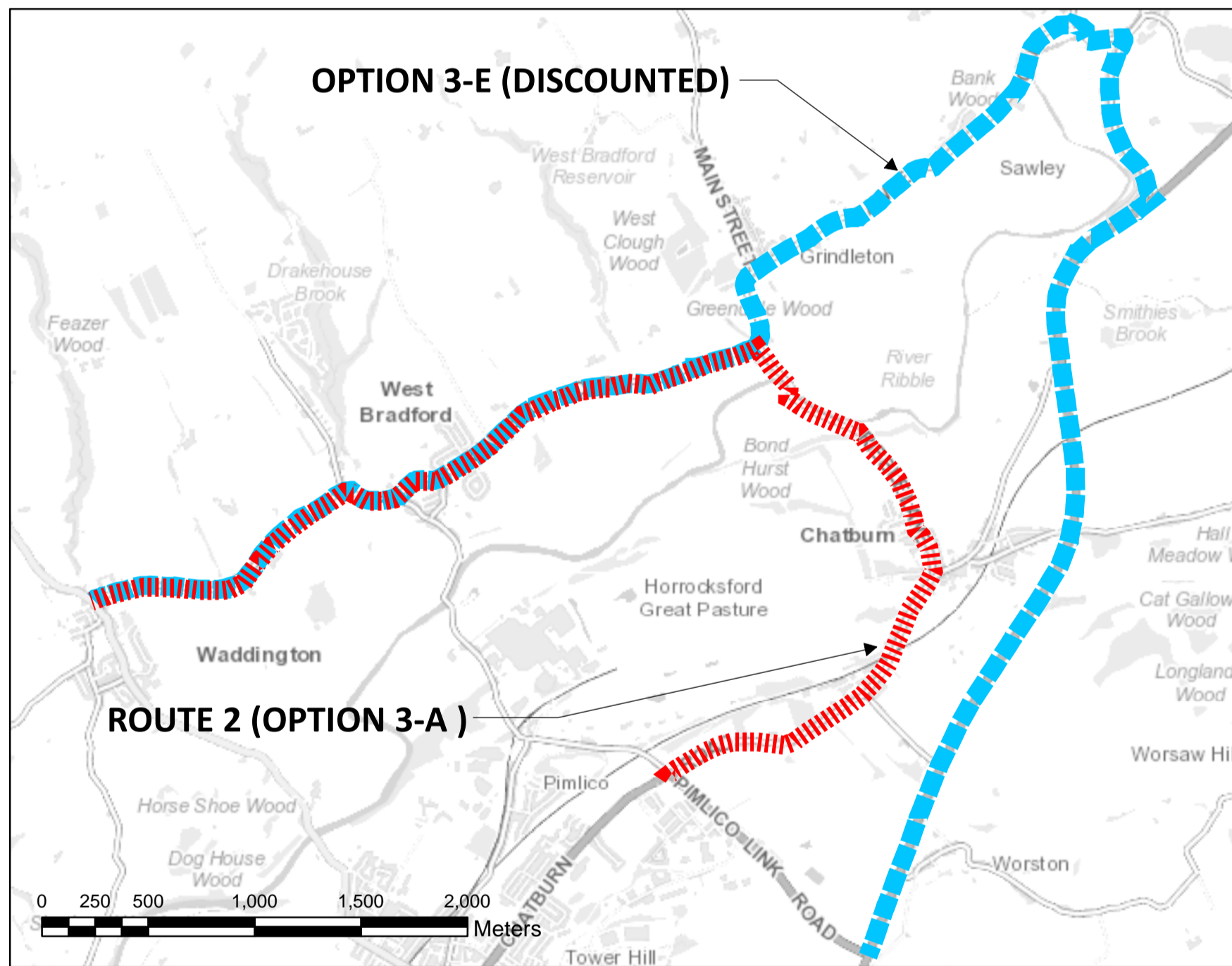
The swept path assessments indicate that some of the wider ALLs will require temporary traffic management, the timing of movements will be agreed to minimise disturbance/disruption.

APPENDIX B3 - AIL ACCESS ROUTE OPTIONS

FIGURE B - 3 - 01

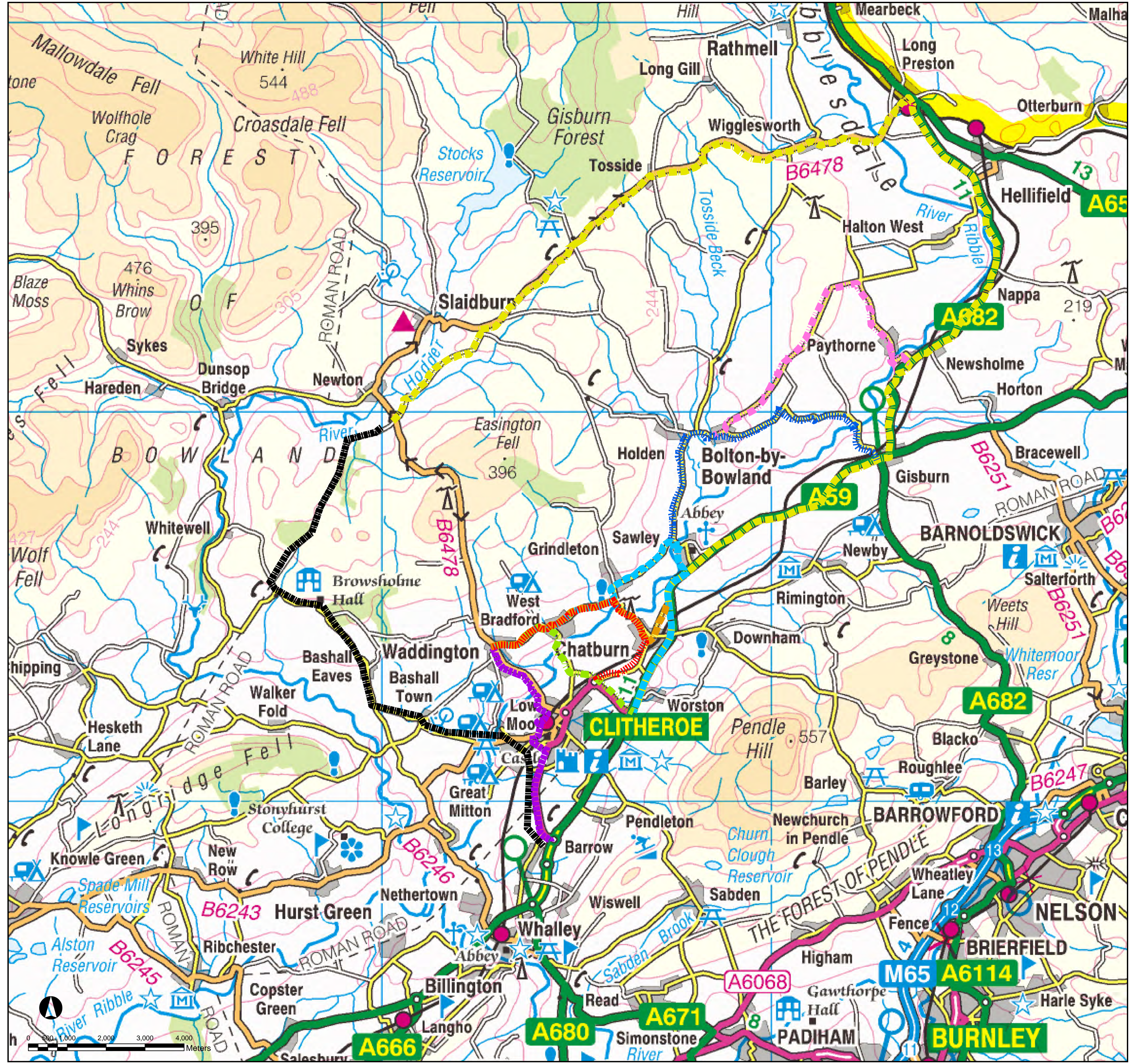


WIDER AREA 0 3 6 12 Kilometers



PREFERRED OPTIONS IDENTIFIED IN ROUTE SURVEY (SEPTEMBER 2020 ALS)

- Legend**
- Abnormal_Load_Route_3A
 - Abnormal_Load_Route_3B
 - Abnormal_Load_Route_3C
 - Abnormal_Load_Route_3D
 - Abnormal_Load_Route_3E
 - Abnormal_Load_Route_3F
 - Abnormal_Load_Route_3G
 - Abnormal_Load_Route_3H
 - Abnormal_Load_Route_3J

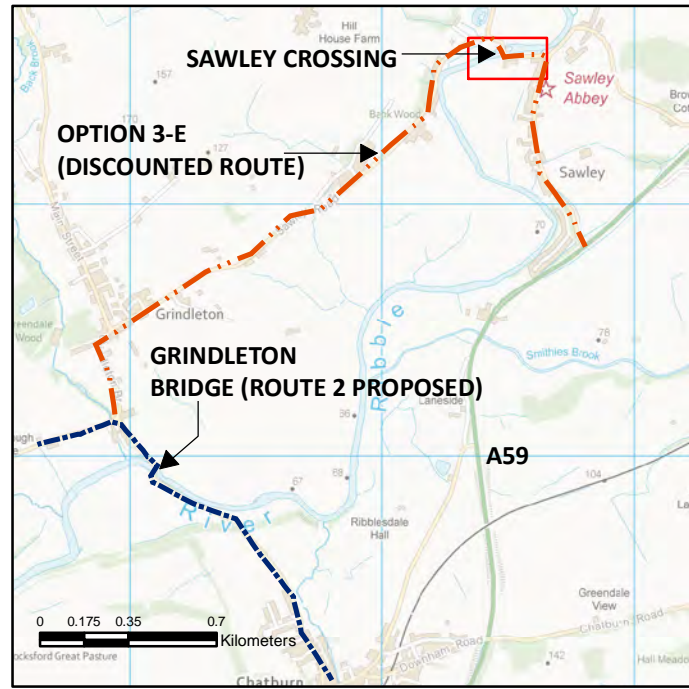


AIL Route Options Considered

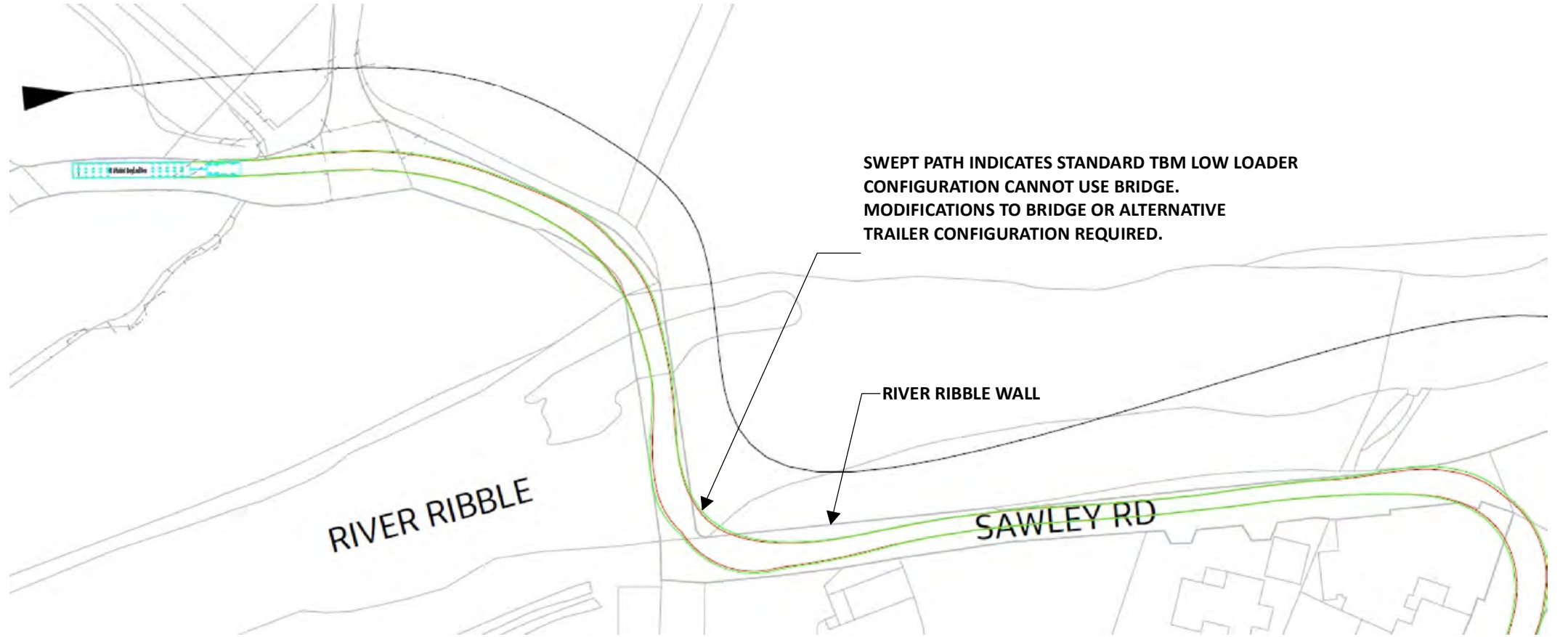
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APPENDIX B3 - AIL SWEEP PATH SAWLEY BRIDGE (DISCOUNTED OPTION)

FIGURE B - 3 - 02



WIDER AREA



Largest AIL (TBM) from site (Southbound)



Largest AIL (TBM) to site (Northbound)



EXAMPLE OF OVERBRIDGING TEMPORARY WORKS



SAWLEY ROAD PROXIMITY OF RIVER RIBBLE WALL (GOOGLE STREET VIEW) EASTWARD VIEW

APPENDIX B3 - AIL SWEPT PATH GRINDLETON BRIDGE
FIGURE B - 3 - 03

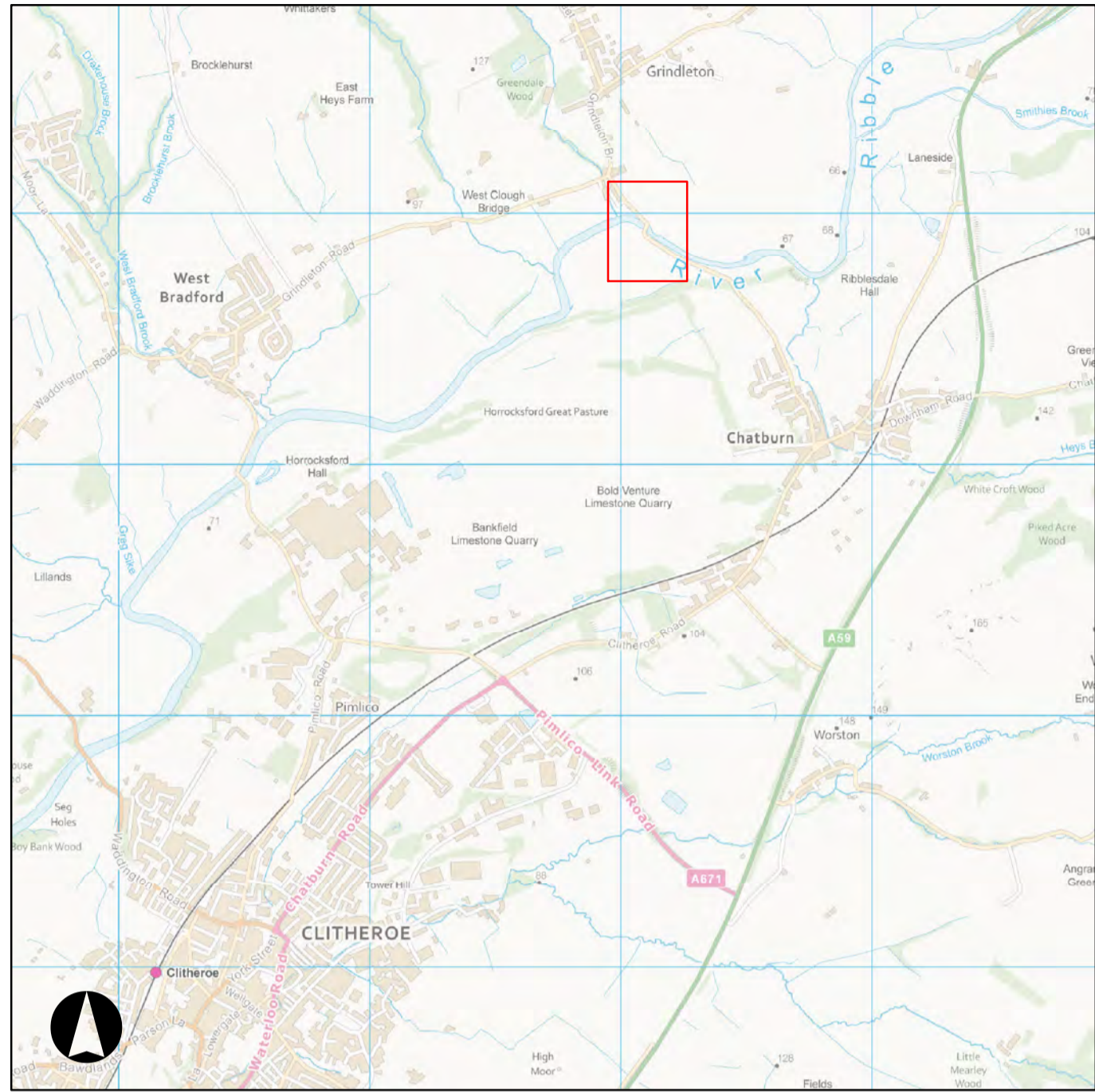
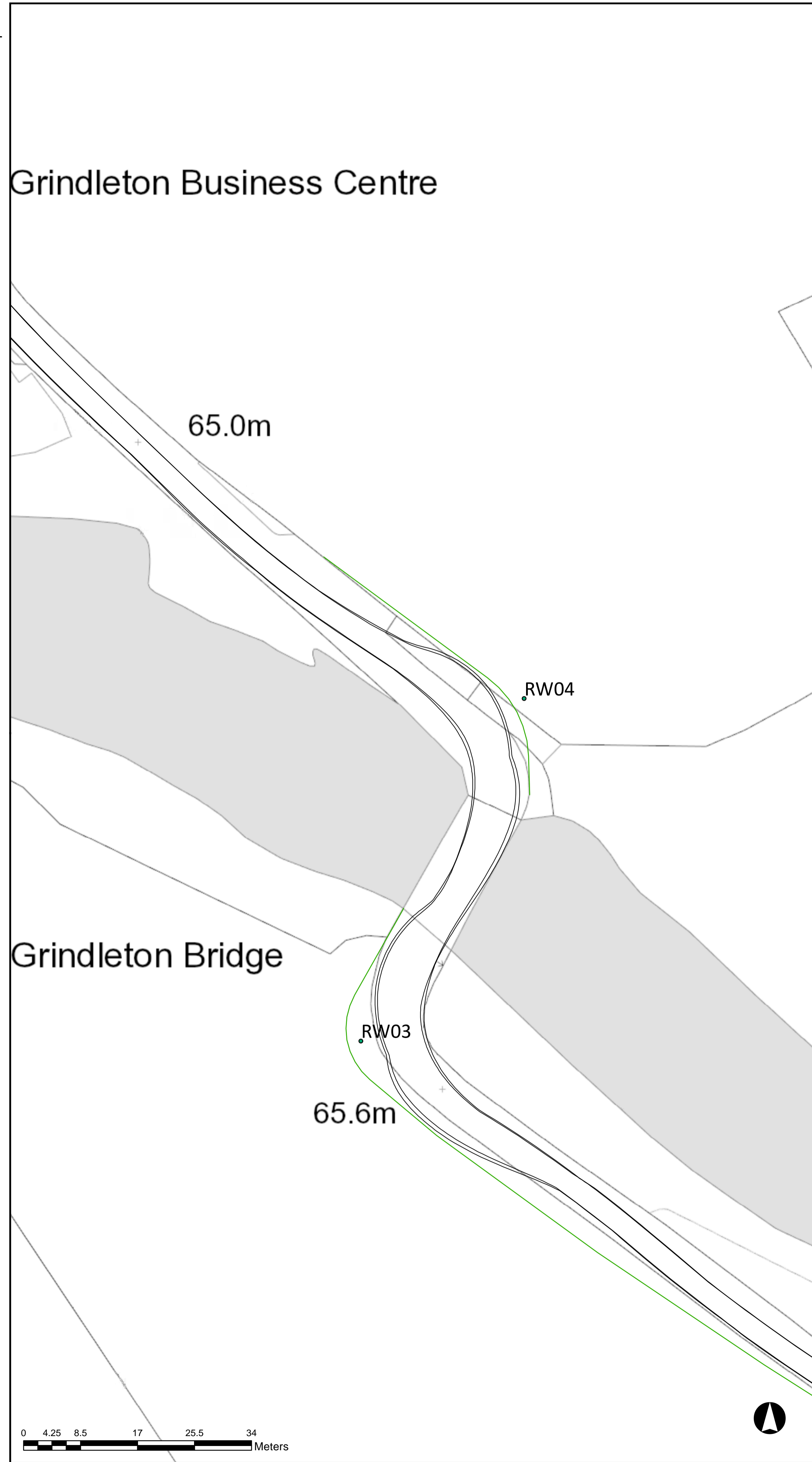


IMAGE 1: HGV TRIAL 11th NOVEMBER 2020
4 AXLE RIGID ENTERING BRIDGE FROM NORTH BANK

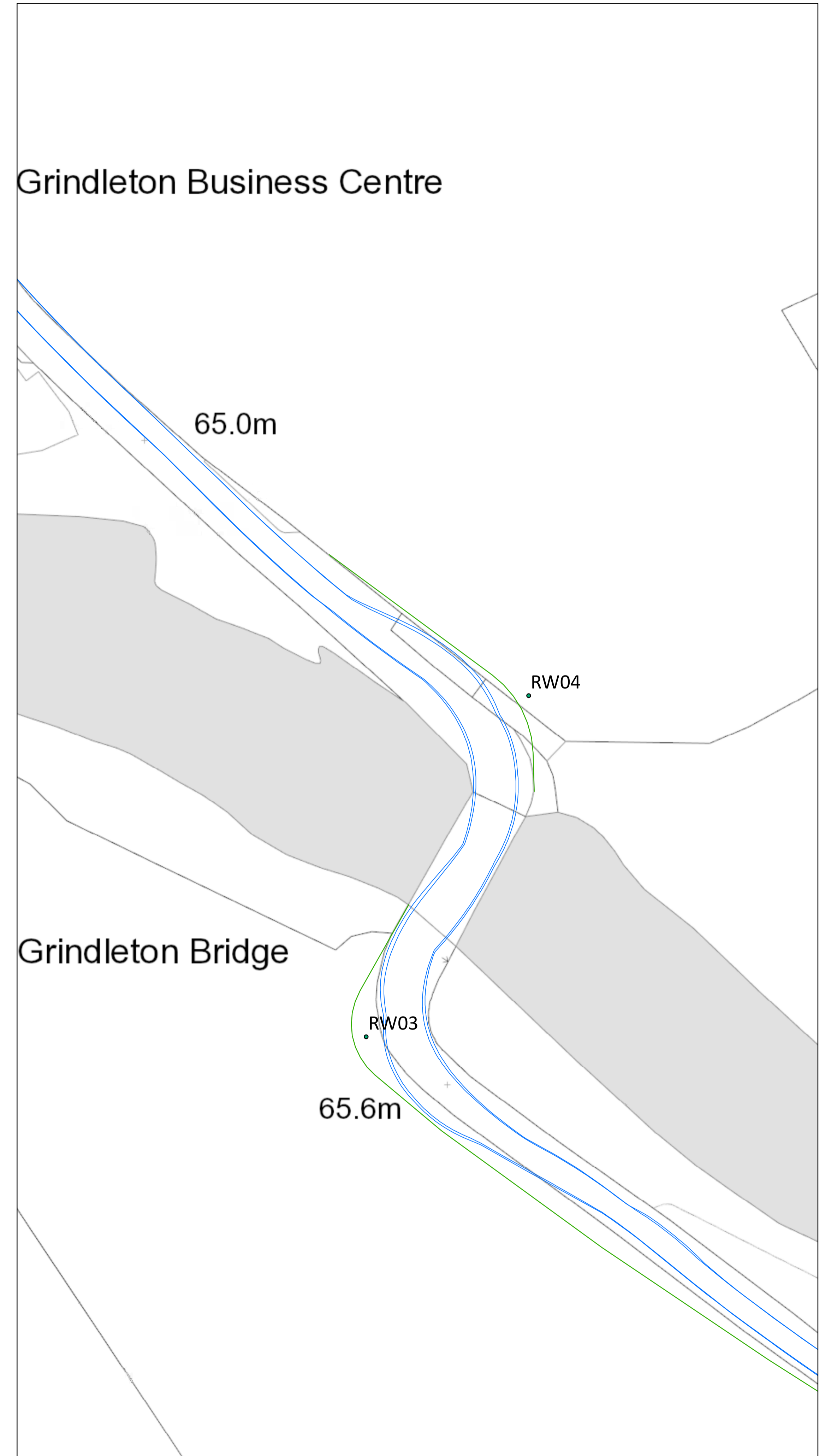


IMAGE 2: HGV TRIAL 11th NOVEMBER 2020
4 AXLE RIGID LEAVING BRIDGE TOWARDS SOUTH BANK

Legend
 PROPOSED ROAD MODIFICATIONS

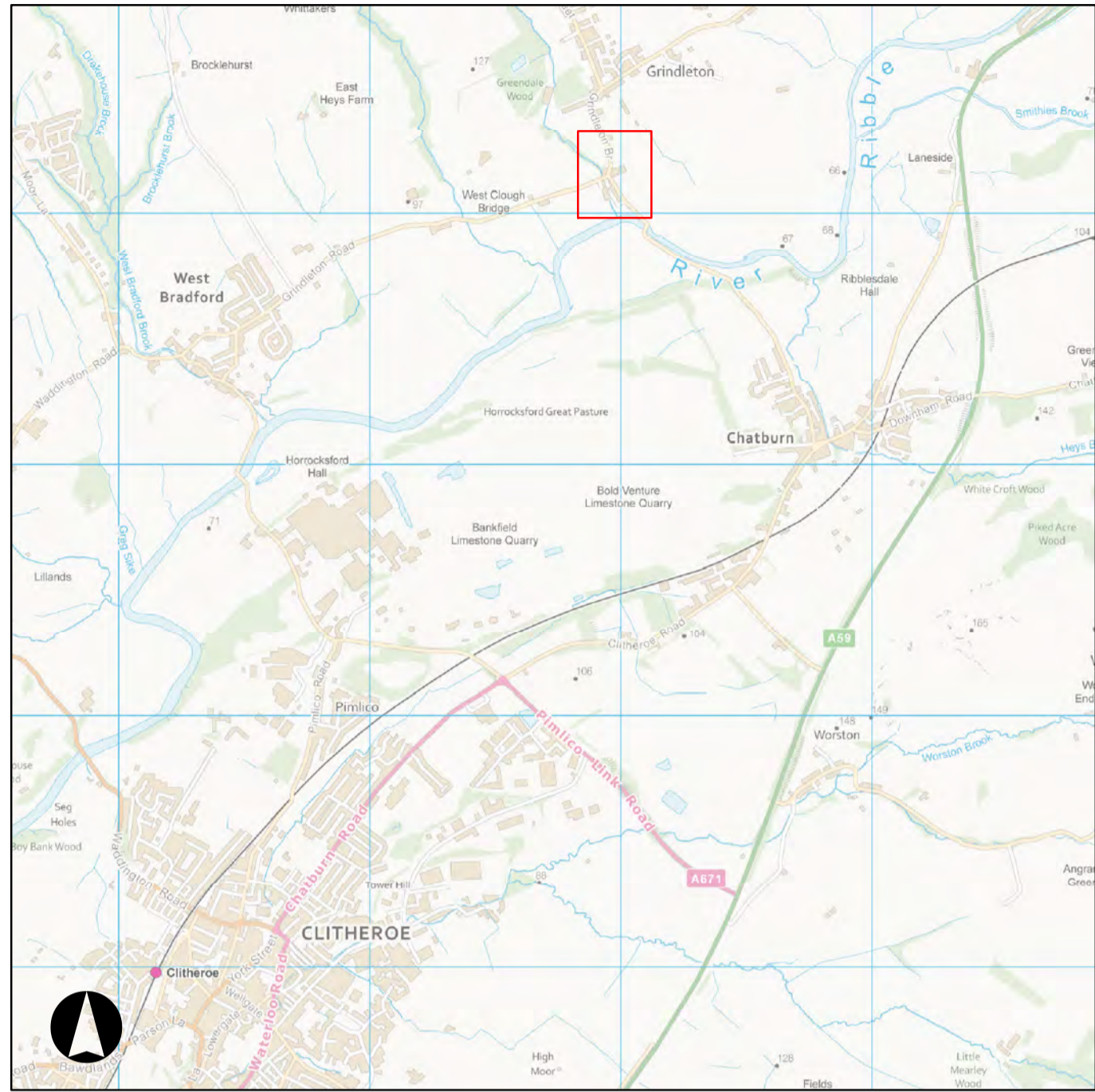


Largest AIL (TBM) to site (Northbound)



Largest AIL (TBM) from site (Southbound)

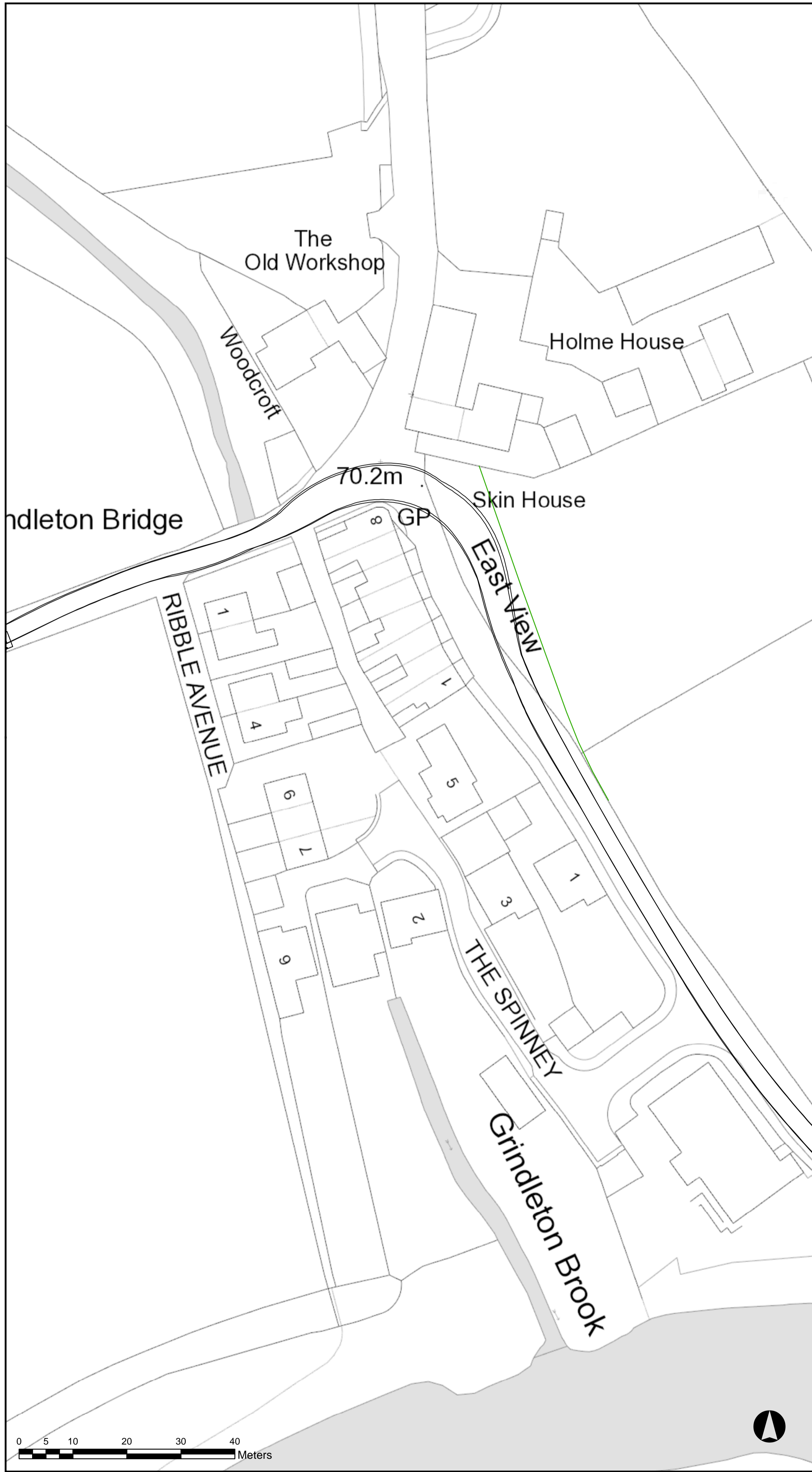
APPENDIX B3 - SWEEP PATHS GRINDLETON ROAD
FIGURE B - 3 - 04



WIDER AREA 0 0.275 0.55 1.1 Kilometers



IMAGE 1: HGV TRIAL 11th NOVEMBER 2020
4 AXLE RIGID ENTERING EAST VIEW FROM GRINDLETON ROAD



Largest AIL (TBM) to site (Northbound)



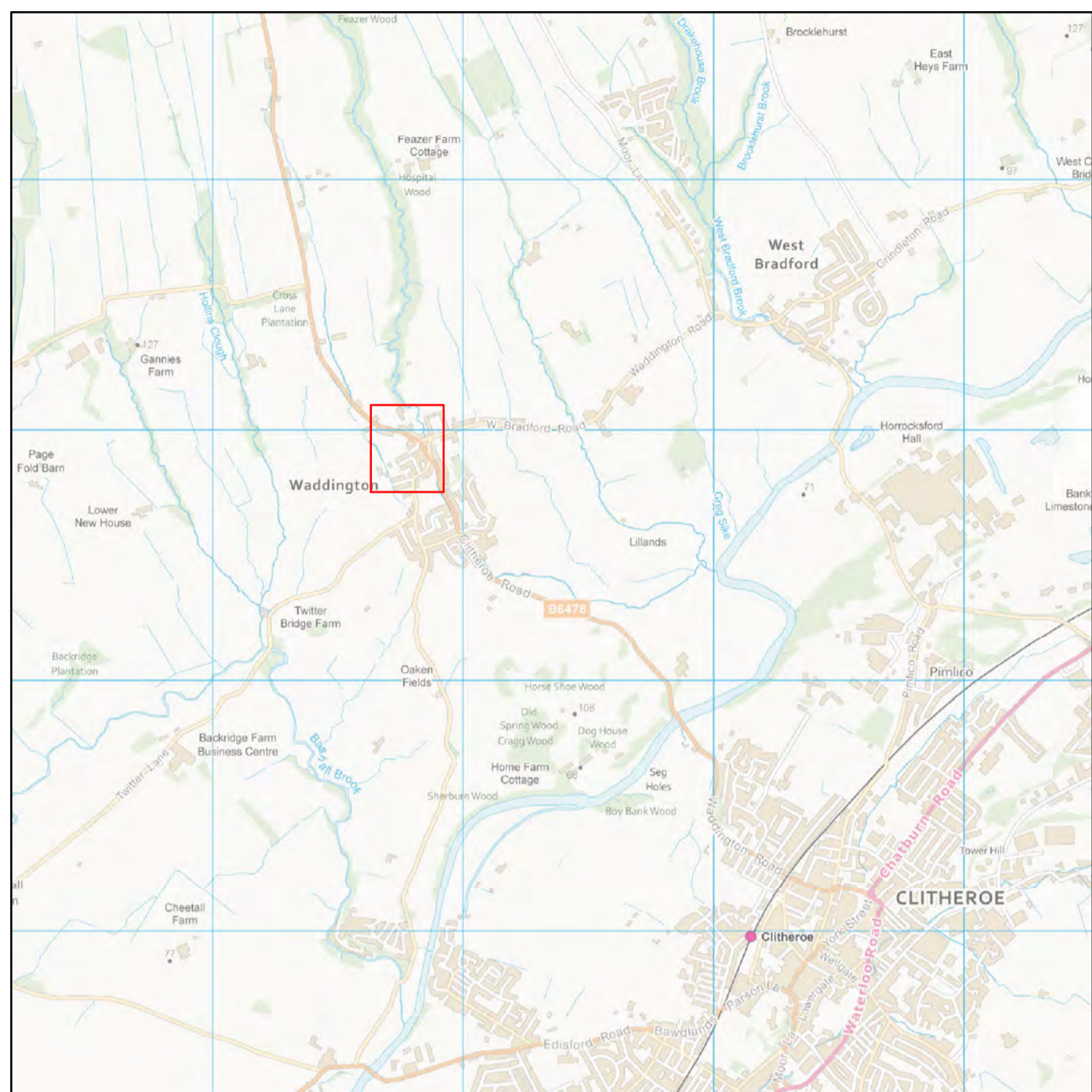
Largest AIL (TBM) from site (Southbound)

Legend
 PROPOSED ROAD MODIFICATION

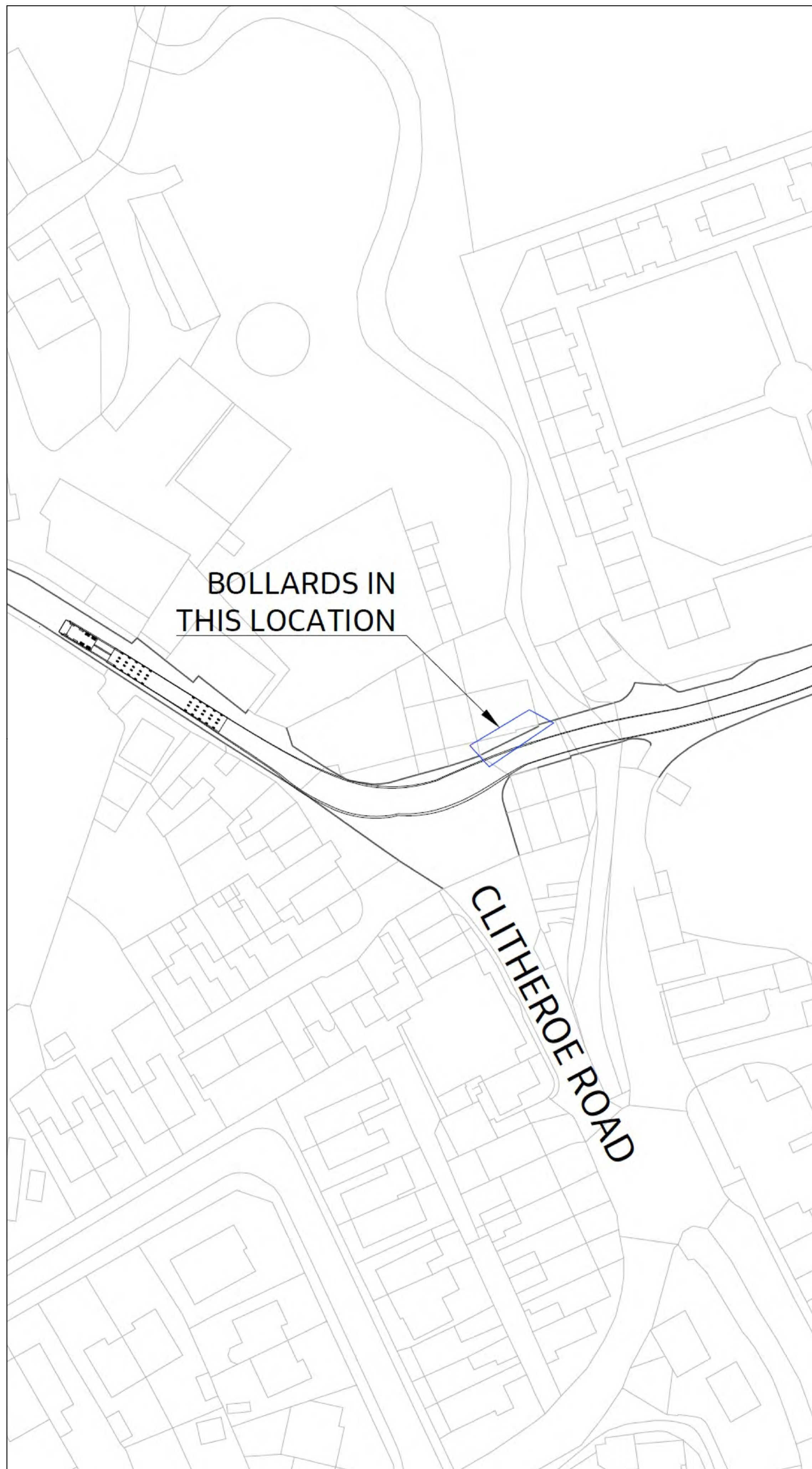
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APPENDIX B3 - SWEEP PATHS WADDINGTON

FIGURE B - 3 - 05



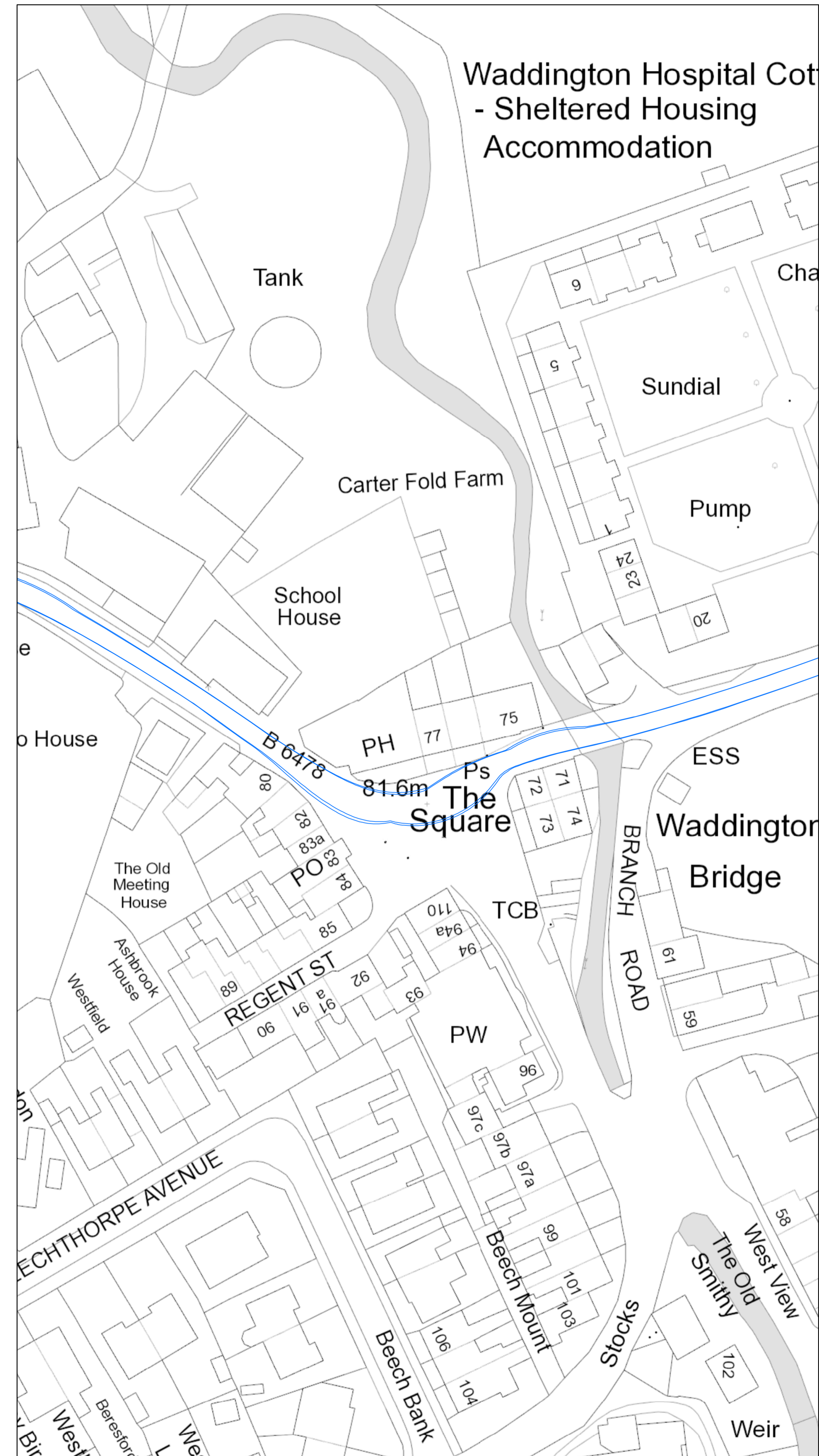
WIDER AREA 0 0.275 0.55 1.1 Kilometers



BOLLARDS IN THIS LOCATION

CLITHEROE ROAD

Largest AIL (TBM) to site (Northbound)



Waddington Hospital Cottages - Sheltered Housing Accommodation

Tank

Carter Fold Farm

School House

The Square

81.6m

B 6478

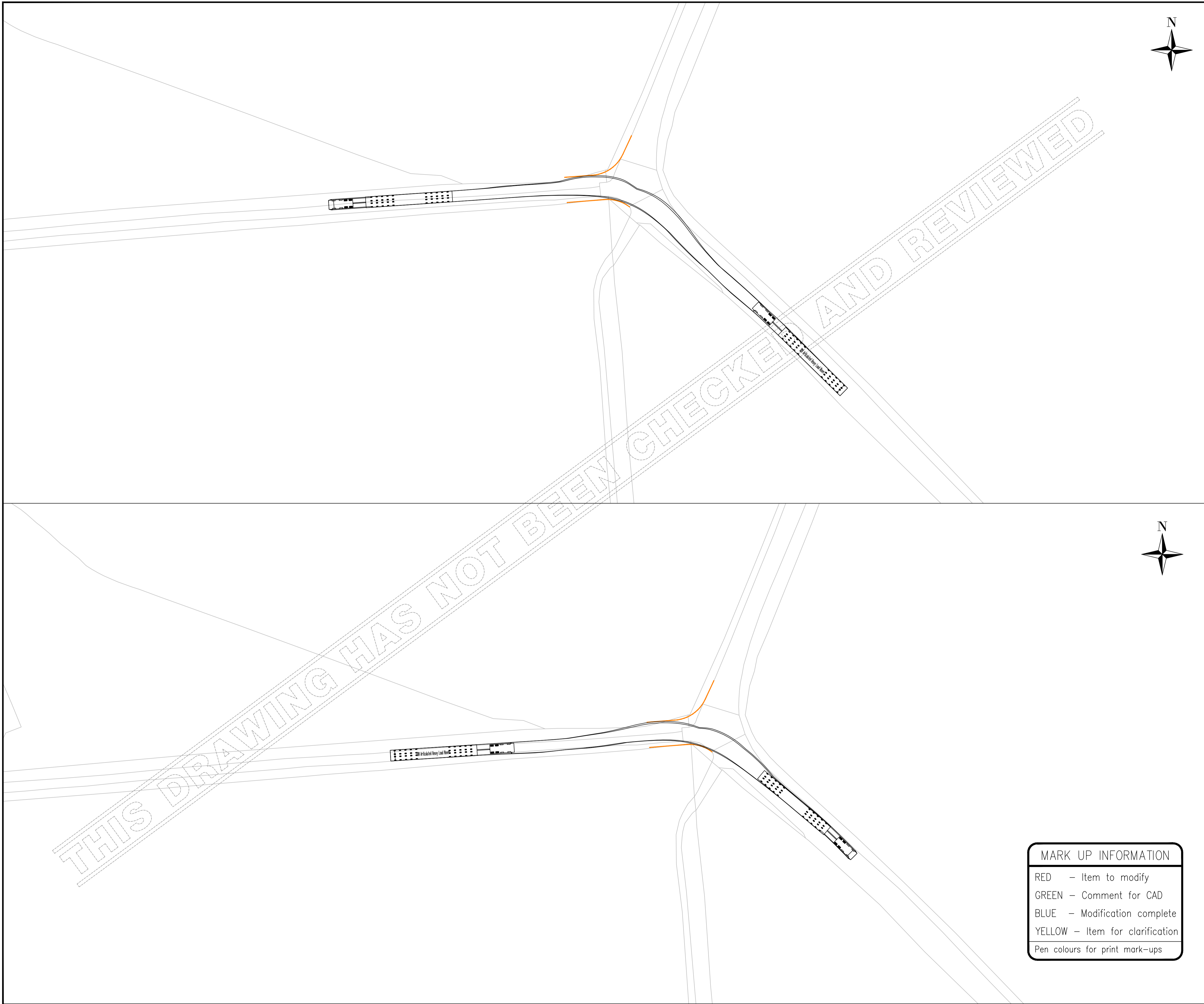
Largest AIL (TBM) from site (Southbound)



**IMAGE 1: HGV TRIAL 11th NOVEMBER 2020
4 AXLE RIGID LEAVING THE SQUARE**



**IMAGE 2: HGV TRIAL 11th NOVEMBER 2020
4 AXLE RIGID LEAVING THE SQUARE (REAR SHOT)**



NOTES

1. DO NOT SCALE FROM THIS DRAWING
2. VEHICLE MEASUREMENTS

TBM ARTICULATED HEAVY TRANSPORT	
OVERALL LENGTH	34.335m
OVERALL WIDTH	3.000m
OVERALL BODY HEIGHT	3.638m
MIN. BODY GROUND CLEARANCE	0.221m
TRACK WIDTH	3.000m
3. AN OVERRUN AREA HAS BEEN PROPOSED TO ALLOW EXTRA LEEWAY FOR THE TBM TO MANOEUVRE SAFELY INTO THE ACCESS POINT

LEGEND

	PROPOSED KERB
	EXISTING KERB

CURRENT ISSUE INFORMATION

P01.1	MB	SP	--	--			
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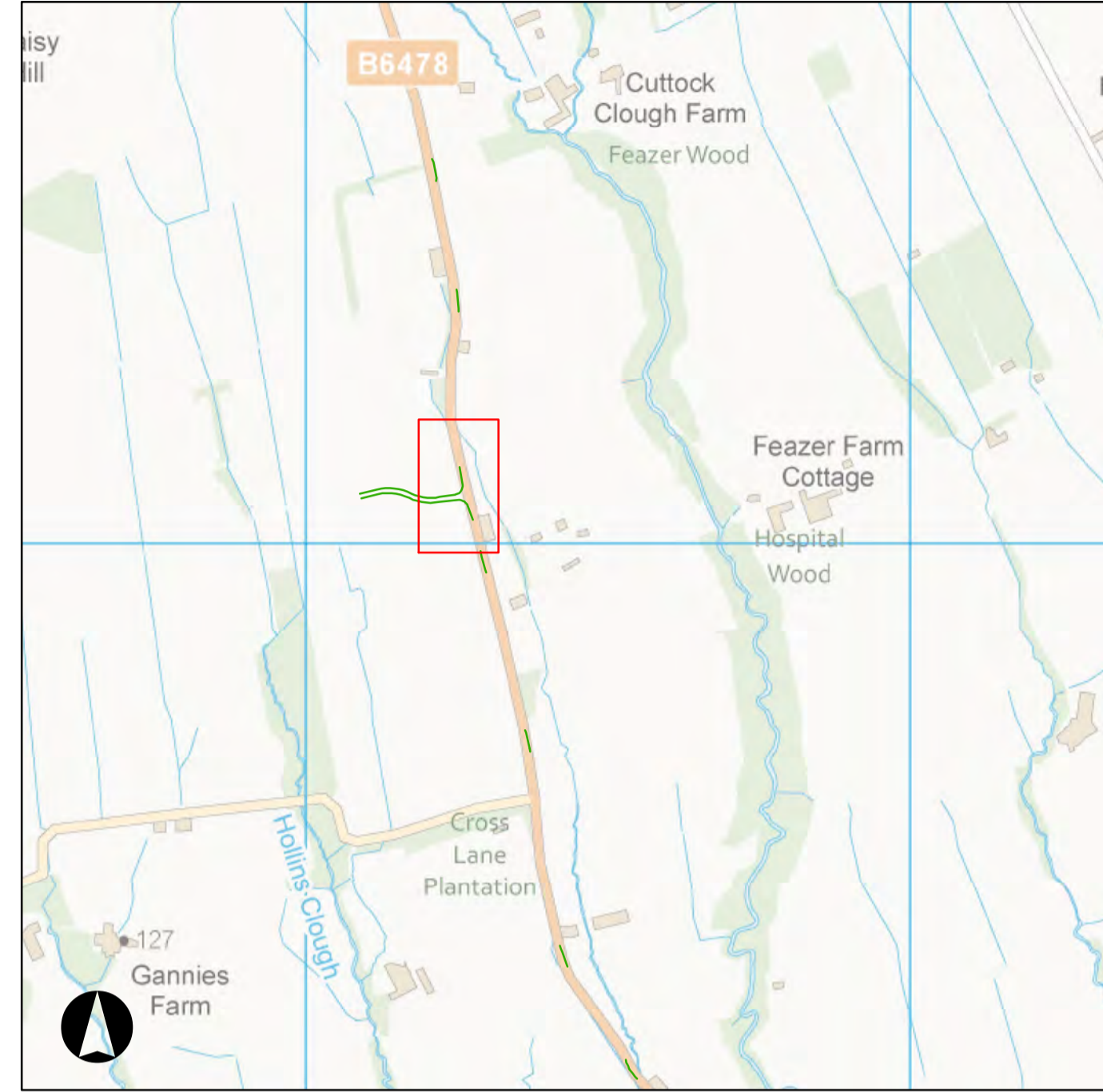
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HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED MARL HILL SECTION
 BONSTONE COMPOUND ACCESS JUNCTION WITH B6478
 ABNORMAL LOAD VEHICLE TRACKING

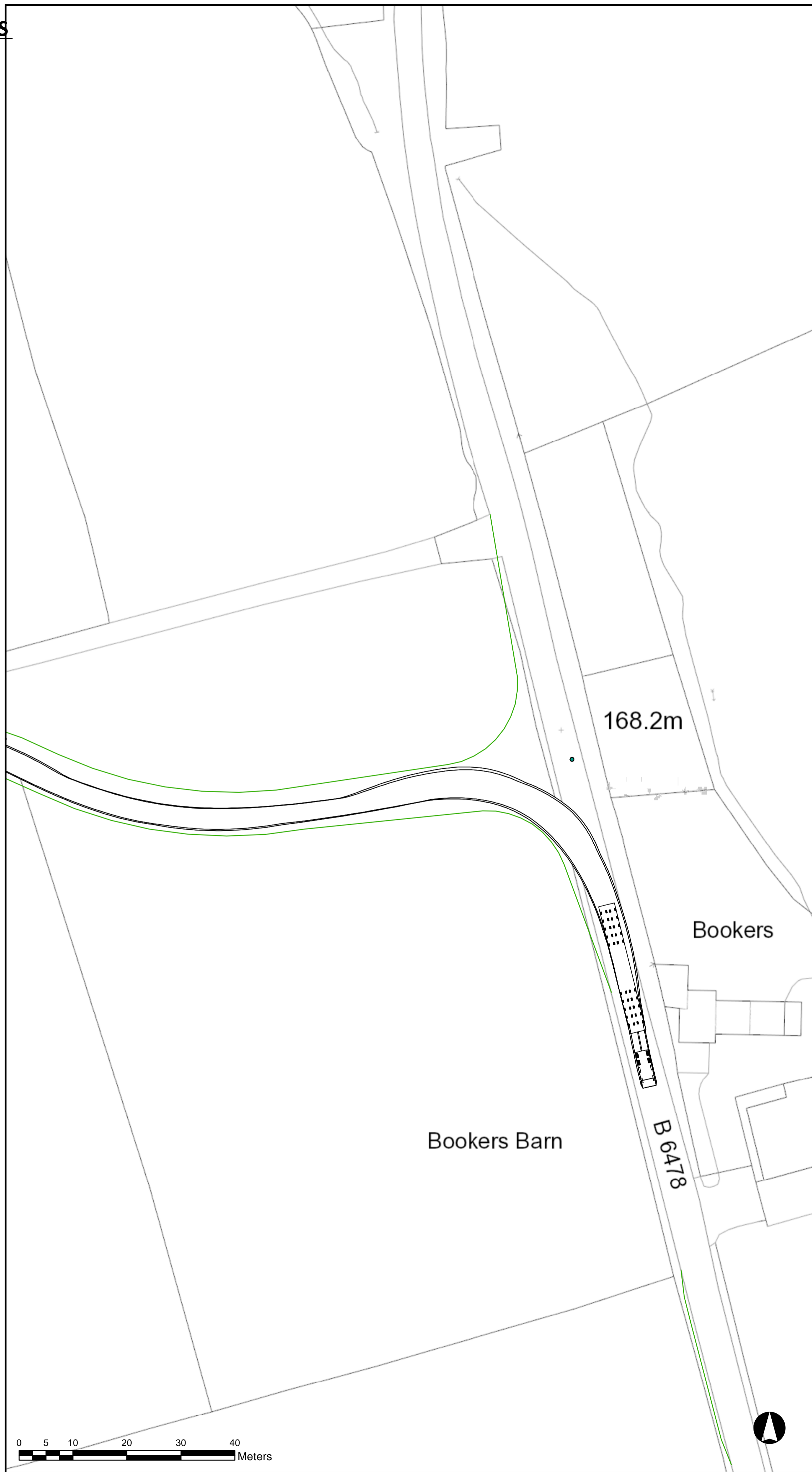
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**APPENDIX B3 - AIL PROPOSED JUNCTION SWEEP PATHS
JUNCTIONS FIGURE B-3 - 07**

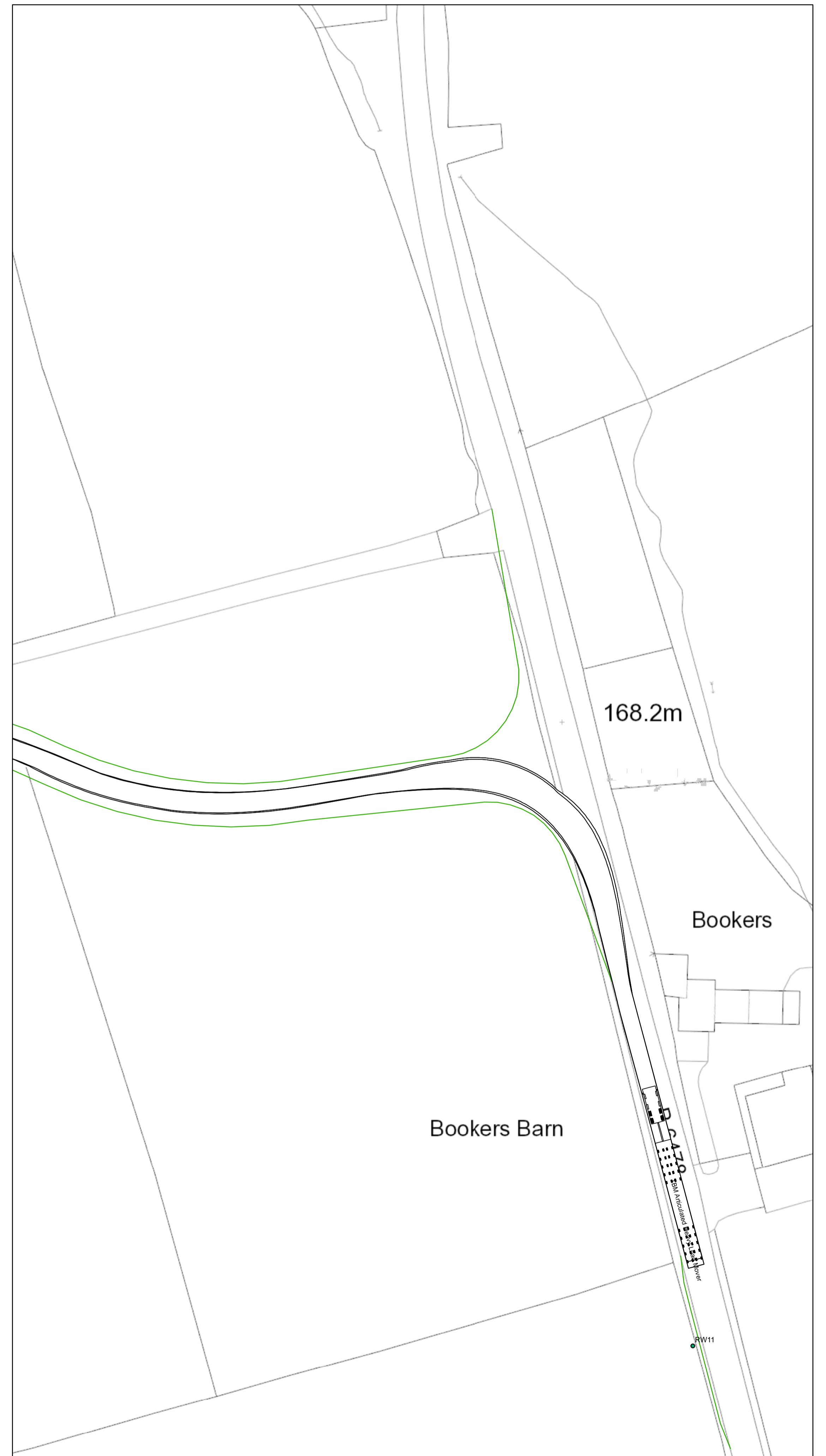
BRADDUP COMPOUND - B6478 SLAIDBURN ROAD JUNCTION



WIDER AREA 0 0.1 0.2 0.4 Kilometers

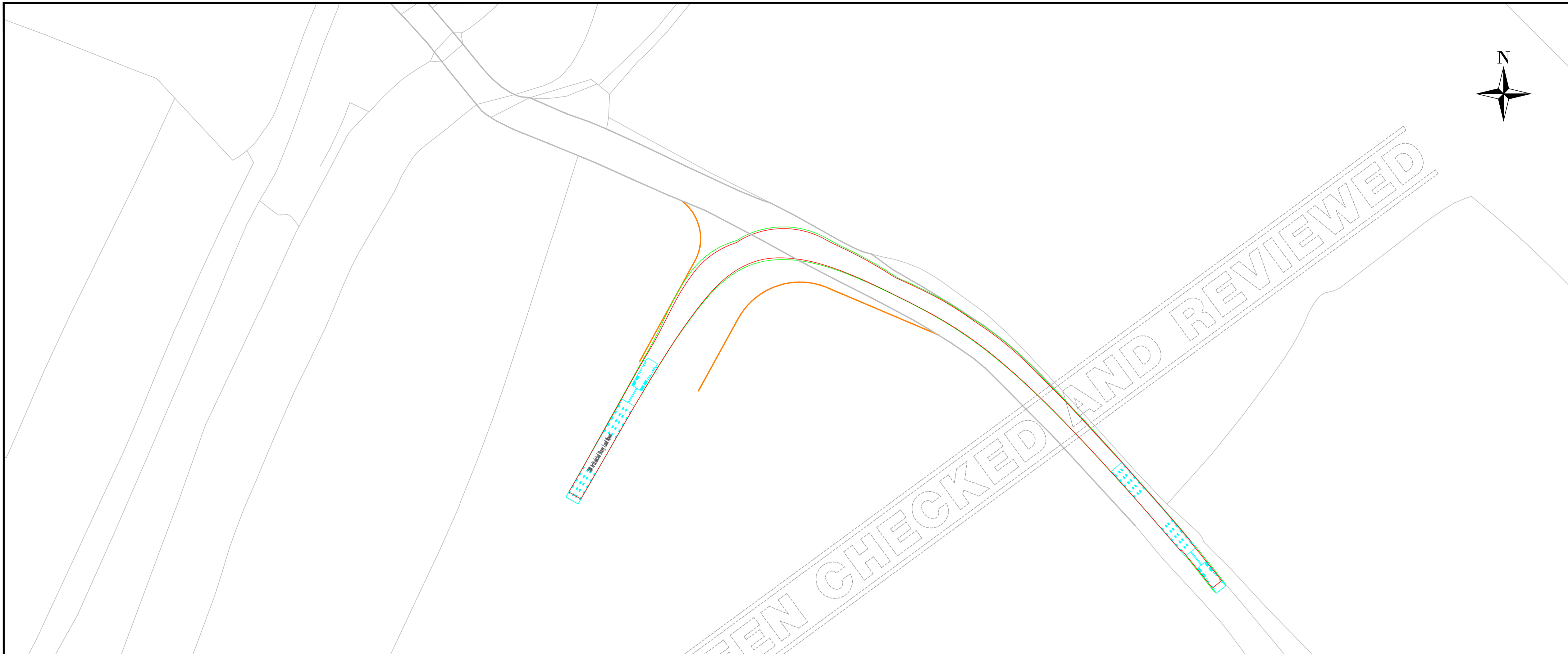


AIL - Tunnel Boring Machine Components from site (Southbound)



AIL - Tunnel Boring Machine Components to site (Southbound)

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NOTES

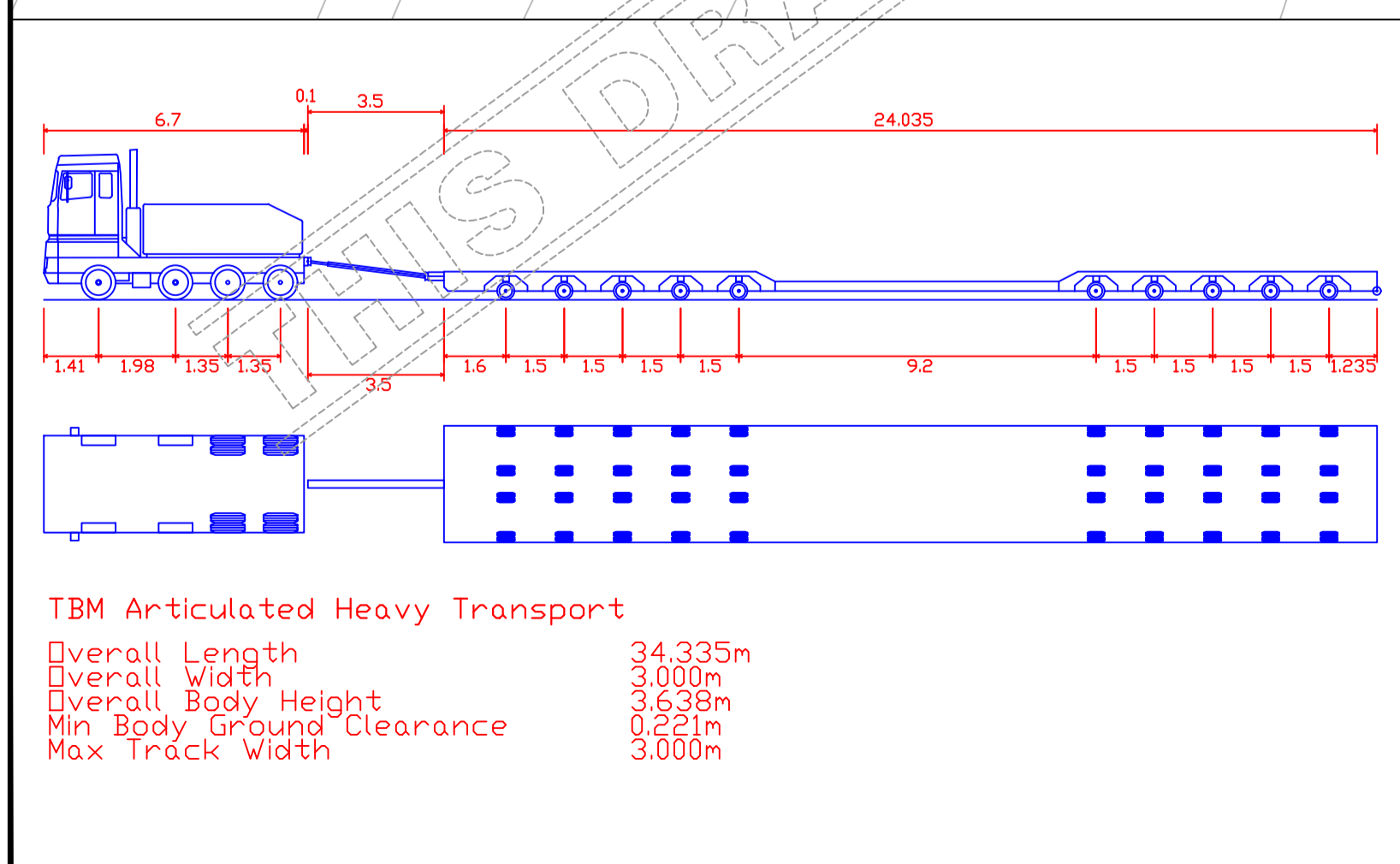
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LEGEND

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	EXISTING KERB

CURRENT ISSUE INFORMATION

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SUITABILITY CODE	SUITABILITY DESCRIPTION				

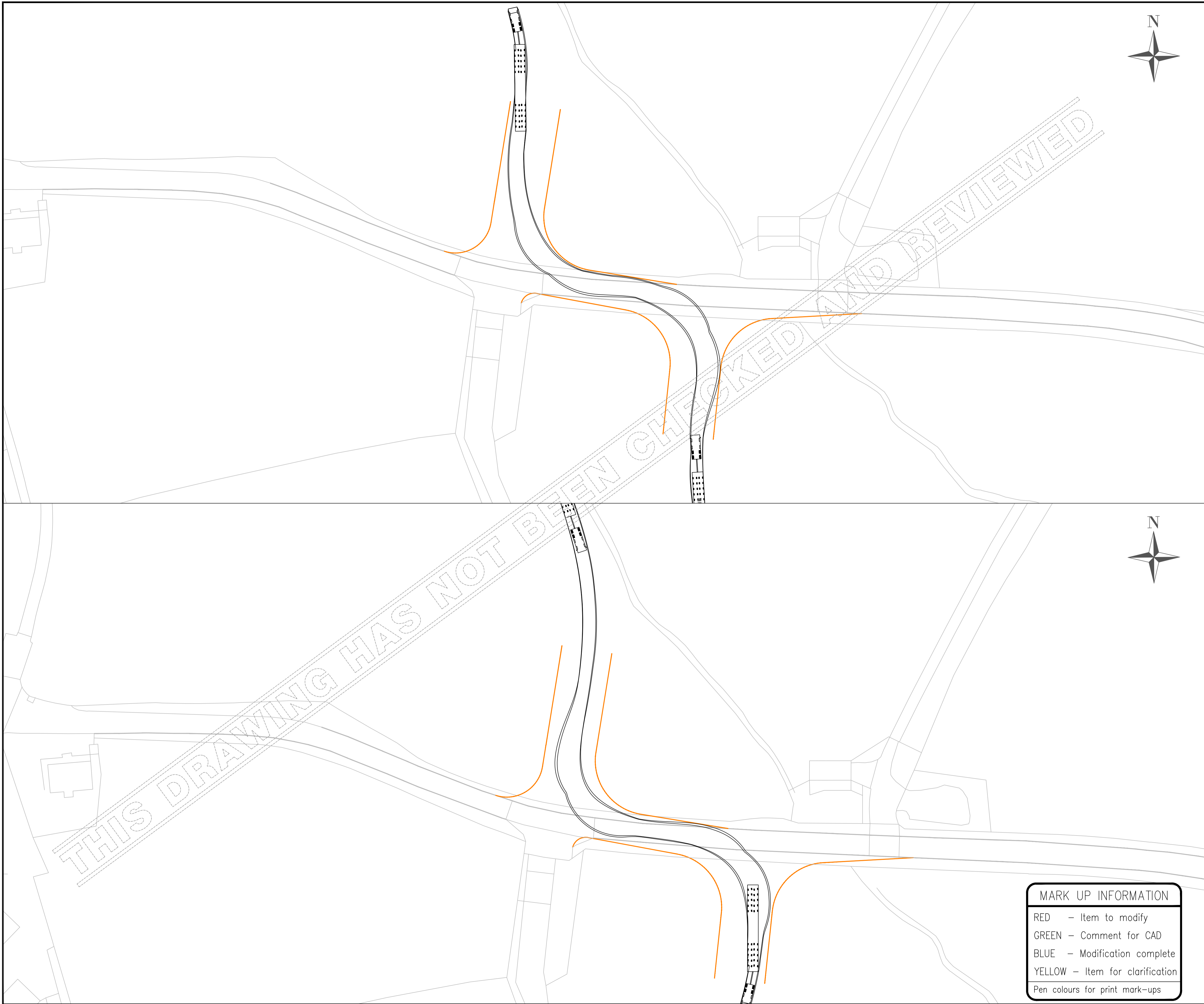



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HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED BOWLAND SECTION - TEMPORARY HAUL ROAD
 HALLGATE HILL JUNCTION ABNORMAL LOAD
 VEHICLE TRACKING

SCALE 1:500	SHEET SIZE A1
DRAWING NUMBER B27070CQ-JAC-XX-DR-C-TR3_VT-1112	REVISION P01.3



NOTES

1. DO NOT SCALE FROM THIS DRAWING
2. VEHICLE MEASUREMENTS

TBM ARTICULATED HEAVY TRANSPORT	
OVERALL LENGTH	34.335m
OVERALL WIDTH	3.000m
OVERALL BODY HEIGHT	3.638m
MIN. BODY GROUND CLEARANCE	0.221m
TRACK WIDTH	3.000m

LEGEND

	PROPOSED KERB
	EXISTING KERB

CURRENT ISSUE INFORMATION

P01.1	HS	SP	--	--	-
VERSION	AUTH	CHKD	REVD	REASON FOR ISSUE	DATE
SO	WORK IN PROGRESS (WIP)				
SUITABILITY CODE	SUITABILITY DESCRIPTION				



HAWESWATER AQUEDUCT RESILIENCE PROGRAMME
 PROPOSED BOWLAND SECTION
 NEWTON-IN-BOWLAND COMPOUND
 VEHICLE ACROSS JUNCTION (STAGGERED)
 ABNORMAL LOAD VEHICLE TRACKING (TBM)

MARK UP INFORMATION	
RED	- Item to modify
GREEN	- Comment for CAD
BLUE	- Modification complete
YELLOW	- Item for clarification
Pen colours for print mark-ups	

SCALE 1:500	SHEET SIZE A1
DRAWING NUMBER B27070CQ-JAC-XX-DR-C-TR3_VT-1107	REVISION P01.1

Appendix C1 – Affected Bus Routes

Identified bus services which may be affected as a result of the Proposed Bowland and Marl Hill Sections

Bus Service Number	Bus Operator
3	Boomerang Travel Ltd
14	Pilkington Bus
22 Valleyline	The Blackburn Bus Company
25	Pilkington Bus
25A	Pilkington Bus
59	Stagecoach
59C	Stagecoach
64	Boomerang Travel Ltd
66	Boomerang Travel Ltd
S66	Moving People Ltd
67	Pilkington Bus
S67	Moving People Ltd
109	The Burnley Bus Company
280	Stagecoach
462	P&S Nelson
510	Hodsons Coaches
616	Longridge Coaches
617	Longridge Coaches
621	Hodsons Coaches
622	Hodsons Coaches

Bus Service Number	Bus Operator
623	Pilkington Bus
626	Lakeland Coaches
628	Hodsons Coaches
631	Hodsons Coaches
637	Boomerang Travel Ltd
643	Hodsons Coaches
686	Hodsons Coaches
722	The Blackburn Bus Company
802	The Burnley Bus Company
852	The Burnley Bus Company
860	The Blackburn Bus Company
876	Hodsons Coaches
890	The Blackburn Bus Company
891	Pilkington Bus
903	P&S Nelson
995	Preston Bus Ltd
M2 Mainline	The Burnley Bus Company
V2	The Burnley Bus Company