


<b>Departure Reference:</b>	N009	<b>Departure Type:</b>	General
<b>Document File Name:</b>	133735_RW-EWR-XX-XX-RP-CH-000115	<b>Local Highway Authority:</b>	Oxfordshire County Council

<b>Departure Title:</b>	<p>Reduced visibility standard along the major road at:</p> <ul style="list-style-type: none"> <li>Junction Improvement – A3-J-2 (Unnamed Road)</li> </ul>
<b>Departure Location:</b>	
<b>Supporting Information:</b>	<p><b>General Arrangement Drawing Number</b>          A3-J-2 - 133735_2A-EWR-OXD-A3_J_2-DR-CH-010001</p> <p><b>Visibility Splay Drawings Number</b>          A3-J-2 - 133735_2A-EWR-OXD-A3_J_2-DR-CH-010011 &amp; 010012</p>
<b>Consultations:</b>	Oxfordshire County Council

DEPARTURE DETAILS

<b>Relevant Standards:</b>	<p>DMRB, Volume 6, Section 2, Part 6, TD 42/95          DMRB, Volume 6, Section 2, Part 6, TD 9/93</p>
<b>Clause/Paragraphs:</b>	TD 42/95, 7.6c

**Volume 6 Section 2**  
**Part 6 TD 42/95**

c. The distance back along the minor road from which the full visibility is measured is known as the 'x' distance. It is measured back along the centreline of the minor road from the continuation of the line of the nearside edge of the running carriageway of the major road. The 'x' distance shall be desirably 9m (but see para 7.8). From this point an approaching driver shall be able to see clearly points to the left and right on the nearer edge of the major road running carriageway at a distance given in Table 7/1, measured from its intersection with the centreline

Design Speed of Major Road (kph)	'y' Distance (m)
50	70
60	90
70	120
85	160
100	215
120	295

Table 7/1: 'y' Visibility Distances from the Minor Road (Relaxations not available - para 7.6c)

<b>Departure Description:</b>	Visibility from minor arm along major road is sub-standard.
<b>Associated Departures:</b>	None
<b>Reason for Departure:</b>	The junction listed above does not appear to provide the required visibility distance 'y' from the junction along the major road, for their respective posted speed limit.

DESIGN DETAILS

<b>Design Year Traffic Flow (AADT):</b>	Unknown
<b>Design Speed:</b>	<p>The design speed of the major road is calculated using advise in TD 9/93, Paragraph 1.7.</p> <p><b>Extracts from TD 9/93</b></p> <p>1.7 <u>Existing Rural Road Improvements:</u> (including short diversions or bypasses up to about 2 km in length) Design Speed shall be derived in a similar manner to Paragraph 1.6 above, with Ac measured over a minimum length of 2 km incorporating the improvement, provided there are no discontinuities such as roundabouts. The strategy for the contiguous sections of road, however, must be considered when determining Ac and the cross-sectional design. It might be unnecessary to provide a full Standard cross-section for a minor re-alignment within a low Standard route, unless it represented a stage of a realistic improvement strategy.</p>

**Selection of Design Speed**

1.6 New Rural Roads: Design Speed shall be derived from Figure 1, which shows the variation in speeds for a given Lc against Ac. The Design Speeds are arranged in bands, ie. 120, 100, 85, etc., within which suffixes A and B indicate the higher and lower categories of each band. An initial alignment to a trial Design Speed should be drawn

up, and Ac measured for each section of the route demonstrating significant changes thereof, over a minimum length of 2 km. The Design Speed calculated from the ensuing Ac and Lc should be checked against the initial choice to identify locations where elements of the initial trial alignment may be relaxed to achieve cost or environmental savings, or conversely where design should be upgraded, according to the calculated Design Speed. If any changes to road geometry result, then the Design Speed should be recalculated to check that it has not changed.

Paragraph 1.3 identifies how Alignment Constraint, Ac is calculated for a single carriageway;

$$Ac = 12 - VISI/60 + 2B/45$$

Where: B = Bendiness in degrees/km

And VISI is established from Annex A, paragraph 3;

3. For existing roads, an empirical relationship has been derived which provides estimates of VISI given in bendiness and verge width (applicable up to VISI = 720m) i.e.

$$\text{Log}_{10} \text{VISI} = 2.46 + \text{VW}/25 - \text{B}/400$$

where:

VW = Average verge width (averaged for both sides of the road)

B = Bendiness (Degree per km - minimum Length of about 2 km)

This relationship is valid for existing roads, but on long straight roads, or where sight distance is available outside the highway boundary, significant underestimates of VISI will result.

Paragraph 1.4 identifies how the Layout Constraint Lc is established

1.4 Layout Constraint Lc: This measures the degree of constraint imparted by the road cross section, verge width, and frequency of junctions and accesses. Table 1 shows the values of Lc relative to cross section features and density of access, expressed as the total number of junctions, laybys and commercial accesses per km, summed for both sides of the road, where:

L = Low Access numbering 2 to 5 per km

M = Medium Access numbering 6 to 8 per km

H = High Access numbering 9 to 12 per km

Road Type	S2				WS2		D2AP		D3AP		D2M	D3M
Carriageway Width (Ex. Metre Strips)	6m		7.3m		10m		Dual 7.3m		Dual 11m		Dual 7.3m & Hard Shoulder	Dual 11m & Hard Shoulder
Degree of Access and Junctions	H	M	M	L	M	L	M	L	L		L	L
Standard Verge Width	29	26	23	21	19	17	10	9	6		4	0
1.5m Verge	31	28	25	23								
0.5m Verge	33	30										

There is no research data available for 4 lane Single Carriageway roads between 12 and 14.6m width (S4). In the limited circumstances for their use described in this document, Design Speed should be estimated assuming a normal D2AP with a Layout Constraint of 15 - 13 kph

Table 1 Layout Constraint Lc kph

Design speed is then established using Figure 1

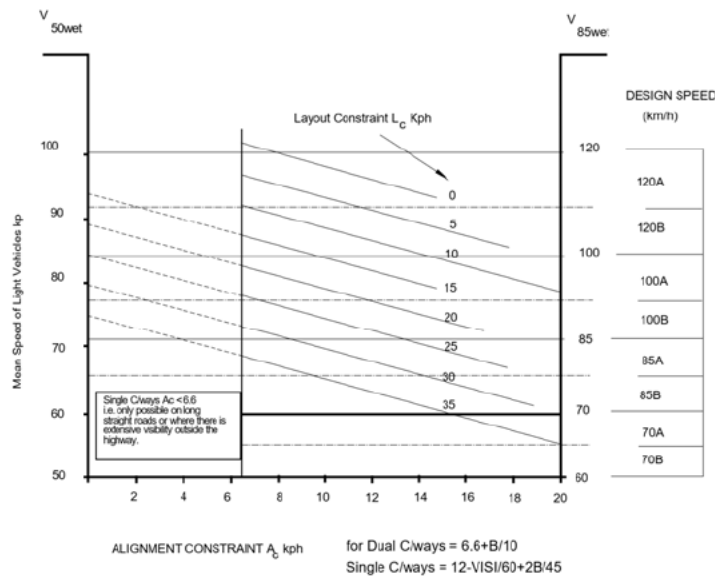


Figure 1 Selection of Design Speed (Rural Roads)

The design road speed is calculated as follows:

Location	VW	B	Log10 VISI	VISI	Ac	Lc	Design speed kph
A3-J-2	0.5	39	2.38	241	10	30	85

JUSTIFICATION

TD 42/95, Paragraph 7.8 states:

7.8 In difficult circumstances, the 'x' distance may be taken as a Relaxation from 9.0m to 4.5m for lightly trafficked simple junctions, and in exceptionally difficult circumstances, to 2.4m back from the nearer edge of the major road running carriageway. The 'x' distance, from which full 'y' distance visibility is provided, shall not be more than 9m, as this induces high minor road approach speeds into the junction, and leads to excessive land take.

Safety:

The junction circumstances are considered exceptionally difficult in this location as the junction is a private access which is being improved as part of road widening. The proposed widening and junction improvement is temporary and will be removed when construction of EWR is complete. Vehicles using this junction will be private vehicles and as such it is anticipated that the traffic flows will be low. An 'x' distance of 2.4m is considered for visibility from the private access.

The two main contributing factors to limited sight visibility is the availability of land and the geometry of the existing highway. However, the proposed junction improvement increases the radii and increases the existing carriageway to allow two large vehicles to safely pass.

TD 42/95, Paragraph 7.6, Table 7/1 provides distances ('y').

c. The distance back along the minor road from which the full visibility is measured is known as the 'x' distance. It is measured back along the centreline of the minor road from the continuation of the line of the nearside edge of the running carriageway of the major road. The 'x' distance shall be desirably 9m (but see para 7.8). From this point an approaching driver shall be able to see clearly points to the left and right on the nearer edge of the major road running carriageway at a distance given in Table 7/1, measured from its intersection with the centreline

of the minor road. This is called the 'y' distance and is defined in Fig 7/1. Relaxations are not available for this distance.

7.7 If the line of vision lies partially within the major road carriageway, it shall be made tangential to the nearer edge of the major road running carriageway, as shown in Fig 7/2.

Design Speed of Major Road (kph)	'y' Distance (m)
50	70
60	90
70	120
85	160
100	215
120	295

Table 7/1: 'y' Visibility Distances from the Minor Road (Relaxations not available - para 7.6c)

The 'y' distances for design and relevant posted speed at this location is;

Location	Design Speed (kph)	Posted Speed (mph/kph)	Design Speed 'y' Distance (m)
A3-J-2	85	60/96	160

The 'x' and 'y' distances specified and achieved at this location is;

Location	'y' Distance			'x' Distance Achieved (m)
	Specified (m)	Achieved (m)		
		Left	Right	
A3-J-2 Proposed Access	160	129	64	2.4
Existing Access	160	132	69	2.4

Visibility has been maximised as far as reasonably practicable. The constraints are beyond the control of EWR Alliance and it is not possible to amend the constraints or move the access location, due to requirements for maintenance and construction of EWR.

A3-J-2 proposes to increase the turning entry and exit radius of an existing junction and widen the road to facilitate larger vehicles which will be using the road to gain access to the EWR construction compounds. The sight visibility of 129m to the left of the junction and 64m to the

	right is similar to the existing arrangement. Large mature trees to the left and road geometry to the right restrict the visibility and to gain full visibility requirements (160m) mature vegetation would need to be cleared and road geometry amended. A widened junction radius and improved width of road increases safety allowing vehicles to pass in a safer manner.
<b>Congestion/Delay:</b>	n/a
<b>Environment/Sustainability:</b>	It is not proposed to provide the full 'y' distance, as this would involve heavy vegetation clearance, including several mature trees.
<b>Accessibility:</b>	n/a
<b>Maintenance:</b>	Any vegetation trimming required to provide the 'y' distances, will be maintained during the course of the works, with this carried out at the appropriate time of year.
<b>Economic (whole life cost):</b>	n/a


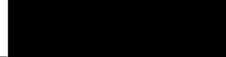
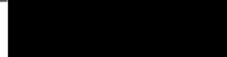
MITIGATION

<b>Risk Assessment Classification:</b>	n/a
<b>Other Options Considered:</b>	n/a
<b>Mitigation:</b>	On the approach, on both directions, agricultural vehicle ahead signs to TSRGD Diag 553.1 with supplementary plate "Tractors Turning" will be installed to warn drivers that there is a risk of encountering agricultural vehicle entering and existing the private access.

CONCLUDING COMMENTS

<p>The design speed calculated at this location was 85kph which was lower than the posted speed of 60mph/100kph.</p> <p>The sub-standard 'y' distance for A3-J-2 junction improvement is due to the existing road geometry and third-party land ownership. The junction improvement includes entry/exit radius alterations and road widening where the 'give way' line will be changed. However, the amendments will create a safer junction with more space for vehicle manoeuvres and sight visibility similar to the existing scenario.</p> <p>To provide warning of large agricultural vehicles possibly turning TSRGD Sign 553.1 will be installed with supplementary plates 150m in advance of the private access.</p>
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ALLIANCE ASSURANCE

	Name	Signed	Date
<b>Originator</b>	Andrew Kirk		09/06/2020
<b>Reviewer</b>	Lisa Taylor		09/06/2020
<b>Authorised</b>	Gareth Johnston		09/06/2020

LOCAL HIGHWAY AUTHORITY RESPONSE

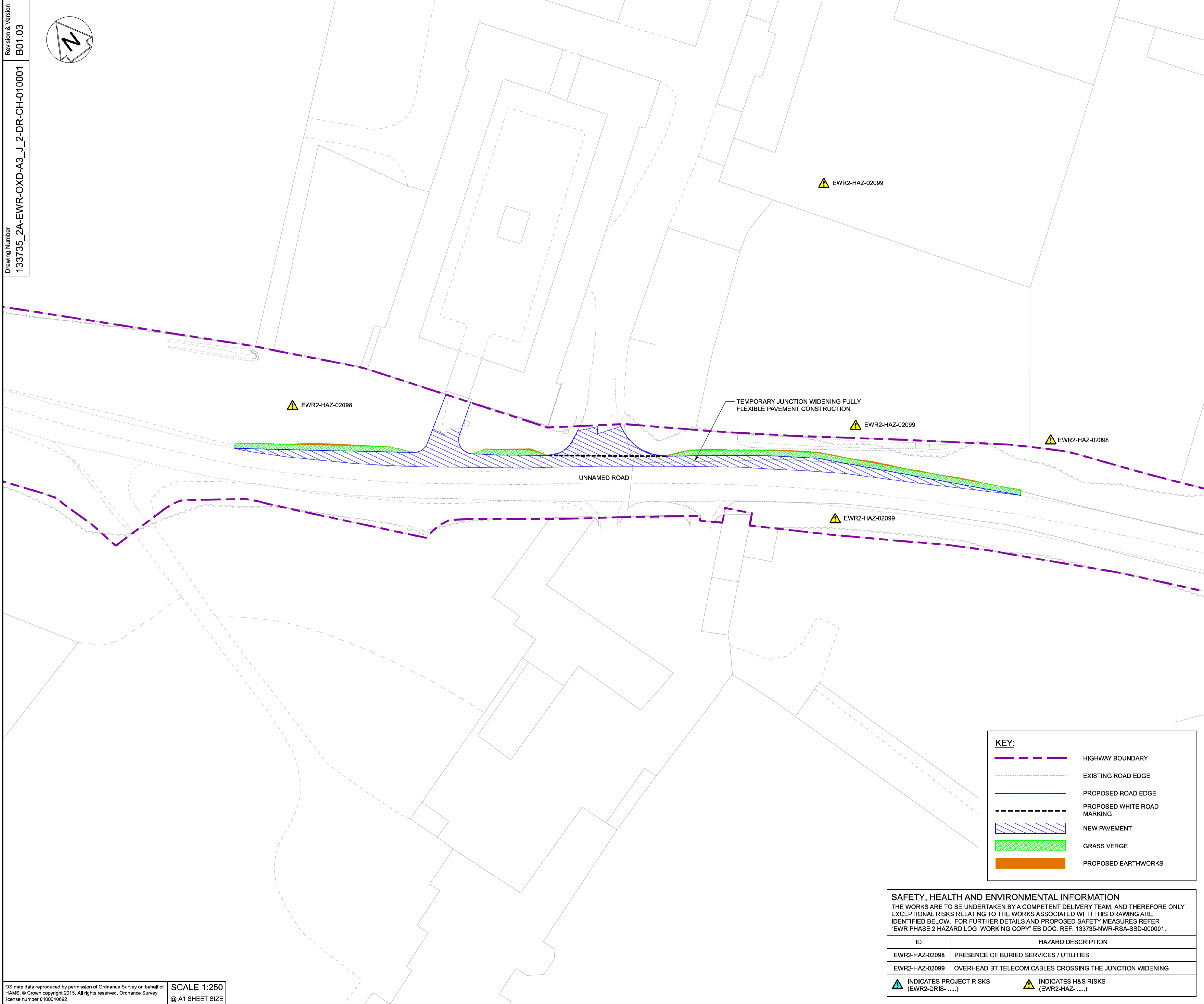
For completion by Local Highway Authority Representative

Category		Tick
1	Approved	
2	Approved with comments*	
3	Rejected with comments*	

Name	Position	Signed	Date

\*comments are to be provided on the form provided. Responses will be provided back to the LHA on these forms and close out monitored. Link to template: [133735\\_RW-EWR-XX-XX-CM-CH-000002](#)

Note: Where comments impact upon a design decision or have multidiscipline impacts, they will be entered into BIMCollab the projects online issues management system.



**NETWORK RAIL (EAST WEST RAIL WESTERN SECTION PHASE 2)**

**NOTES:**

1. THIS DRAWING IS NOT TO BE SCALED.
2. ALL DIMENSIONS ARE IN METRES (m) UNLESS SHOWN OTHERWISE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE HIGHWAY DESIGN PACKAGE OF DRAWINGS AND DOCUMENTS.
4. WHEREVER REQUIRED, ROAD MARKINGS ARE TO BE LAID IN ACCORDANCE WITH 'THE TRAFFIC SIGN REGULATIONS AND GENERAL DIRECTIONS 2016' & 'TRAFFIC SIGNS MANUAL CHAPTER 5 (2003)'.
5. FOR POSITIONS OF UTILITY COMPANIES APPARATUS REFER TO DRAWING No.133735\_2A-EWR-OXD-A3\_J\_2-DR-CH-010004.
6. REFER TO DRAWING No.133735\_2A-EWR-OXD-XX-DR-CH-010251 FOR OFFLINE HIGHWAYS SIGNAGE STRATEGY.
7. FOR DETAILS OF SIGN FACES, POSTS AND FOUNDATIONS, SEE SIGNAGE STRATEGY SCHEDULE DRAWINGS 133735\_RW-EWR-XX-DR-CH-000300 - 133735\_RW-EWR-XX-DR-CH-000301.

Rev	Date	Description of Revisions	Desd	Chkd	Appr	Suitability
B01	03/04/20	FOR INFORMATION		N.T.	L.T.	G.J.
Status						S3



Project  
**East West Rail (Western Section) Phase 2**

Drawing Title  
**JUNCTION IMPROVEMENT A3\_J\_2 GENERAL ARRANGEMENT**

Designed	Nagoth Thomas Ravi Kumar	Signed	N. T. R. Kumar	Date	31/03/20
Drawn	Ravikumar KN	Signed	R. KN	Date	08/03/19
Checked	Lisa Taylor	Signed	L. Taylor	Date	01/04/20
Approved	Gareth Johnston	Signed	G. Johnston	Date	03/04/20
Scale(s)	1:250				
Design Package Risk Classification	OXD - Normal				
Alternative Reference	Sheet 1 of 1				
Drawing Number	Revision B01				
133735_2A-EWR-OXD-A3_J_2-DR-CH-010001					

**KEY:**

	HIGHWAY BOUNDARY
	EXISTING ROAD EDGE
	PROPOSED ROAD EDGE
	PROPOSED WHITE ROAD MARKING
	NEW PAVEMENT
	GRASS VERGE
	PROPOSED EARTHWORKS

**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

THE WORKS ARE TO BE UNDERTAKEN BY A COMPETENT DELIVERY TEAM, AND THEREFORE ONLY EXCEPTIONAL RISKS RELATING TO THE WORKS ASSOCIATED WITH THIS DRAWING ARE IDENTIFIED BELOW. FOR FURTHER DETAILS AND PROPOSED SAFETY MEASURES REFER "EWR PHASE 2 HAZARD LOG WORKING COPY" EB DOC. REF: 133735-NWR-RSA-SSD-000001.

ID	HAZARD DESCRIPTION
EWR2-HAZ-02098	PRESENCE OF BURIED SERVICES / UTILITIES
EWR2-HAZ-02099	OVERHEAD BT TELECOM CABLES CROSSING THE JUNCTION WIDENING

INDICATES PROJECT RISKS (EWR2-DRIS- ....)  
 INDICATES H&S RISKS (EWR2-HAZ- ....)

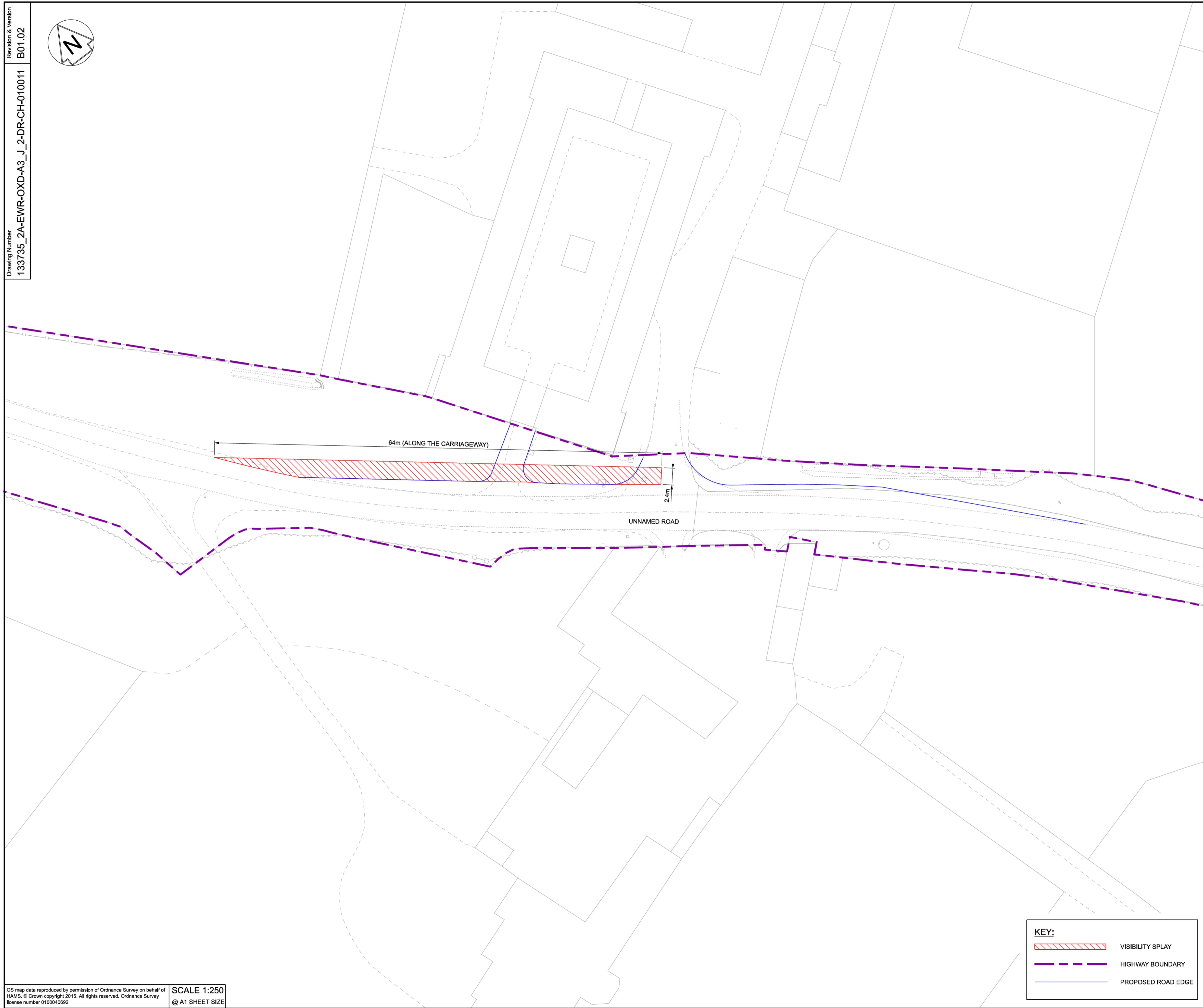




NETWORK RAIL (EAST WEST  
 RAIL WESTERN SECTION PHASE 2)

NOTES:

1. THIS DRAWING IS NOT TO BE SCALED.
2. ALL DIMENSIONS ARE IN METRES (m) UNLESS SHOWN OTHERWISE.
3. THE SITE TEAM NEEDS TO ASCERTAIN THE REQUIRED CLEARANCE BASED ON THE VISIBILITY SPLAY, INTERVISIBILITY ZONE AND OR WORKS REQUIRED FOR THIS SITE.



Rev	Date	Description of Revisions	Desd	Chkd	Appr	Suitability
B01	03/04/20	FOR INFORMATION		N.T.	L.T.	G.J.
Status: SHARED - for IDC Review						S3



Project  
**East West Rail  
 (Western Section)  
 Phase 2**

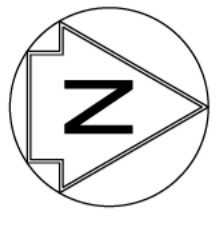
Drawing Title  
**JUNCTION IMPROVEMENT A3\_J\_2  
 VISIBILITY SPLAY**

Designed	Nagoth Thomas Ravi Kumar	Signed	N. T. R. Kumar	Date	11/03/20
Drawn	Ravikumar KN	Signed	R. KN	Date	20/05/19
Checked	Lisa Taylor	Signed	L. Taylor	Date	11/03/20
Approved	Gareth Johnston	Signed	G. Johnston	Date	03/04/20

Scale(s)	1:250	ELR - Project Chainage (Miles Yards)	OXD -
Design Package Risk Classification	Normal		Sheet
Alternative Reference		Revision	1 of 3 B01

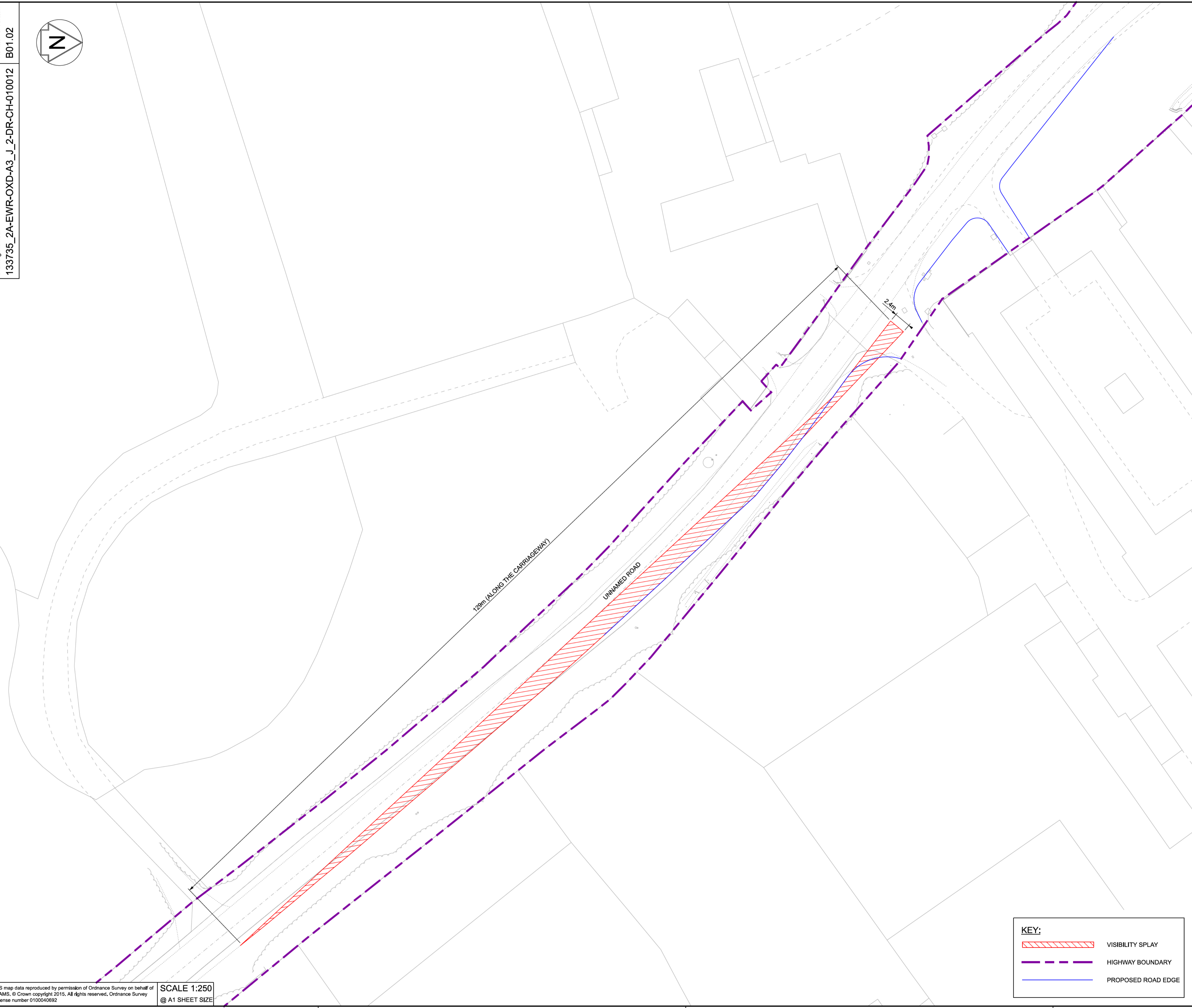
**KEY:**

	VISIBILITY SPLAY
	HIGHWAY BOUNDARY
	PROPOSED ROAD EDGE



NETWORK RAIL (EAST WEST  
 RAIL WESTERN SECTION PHASE 2)

- NOTES:**
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Rev	Date	Description of Revisions	Drawn	Chkd	Appr	Suitability
B01	03/04/20	FOR INFORMATION				

Status: SHARED - for IDC Review S3



Project  
**East West Rail  
 (Western Section)  
 Phase 2**

Drawing Title  
**JUNCTION IMPROVEMENT A3\_J\_2  
 VISIBILITY SPLAY**

Designed	Nagoth Thomas Ravi Kumar	Signed	N. T. R. Kumar	Date	11/03/20
Drawn	Ravikumar KN	Signed	R. KN	Date	20/05/19
Checked	Lisa Taylor	Signed	L. Taylor	Date	11/03/20
Approved	Gareth Johnston	Signed	G. Johnston	Date	03/04/20

Scale(s)	1:250	ELR - Project Chainage (Miles/Yards)	OXD -
Design Package Risk Classification	Normal	Sheet	2 of 3
Alternative Reference		Revision	B01

**KEY:**

- VISIBILITY SPLAY
- HIGHWAY BOUNDARY
- PROPOSED ROAD EDGE