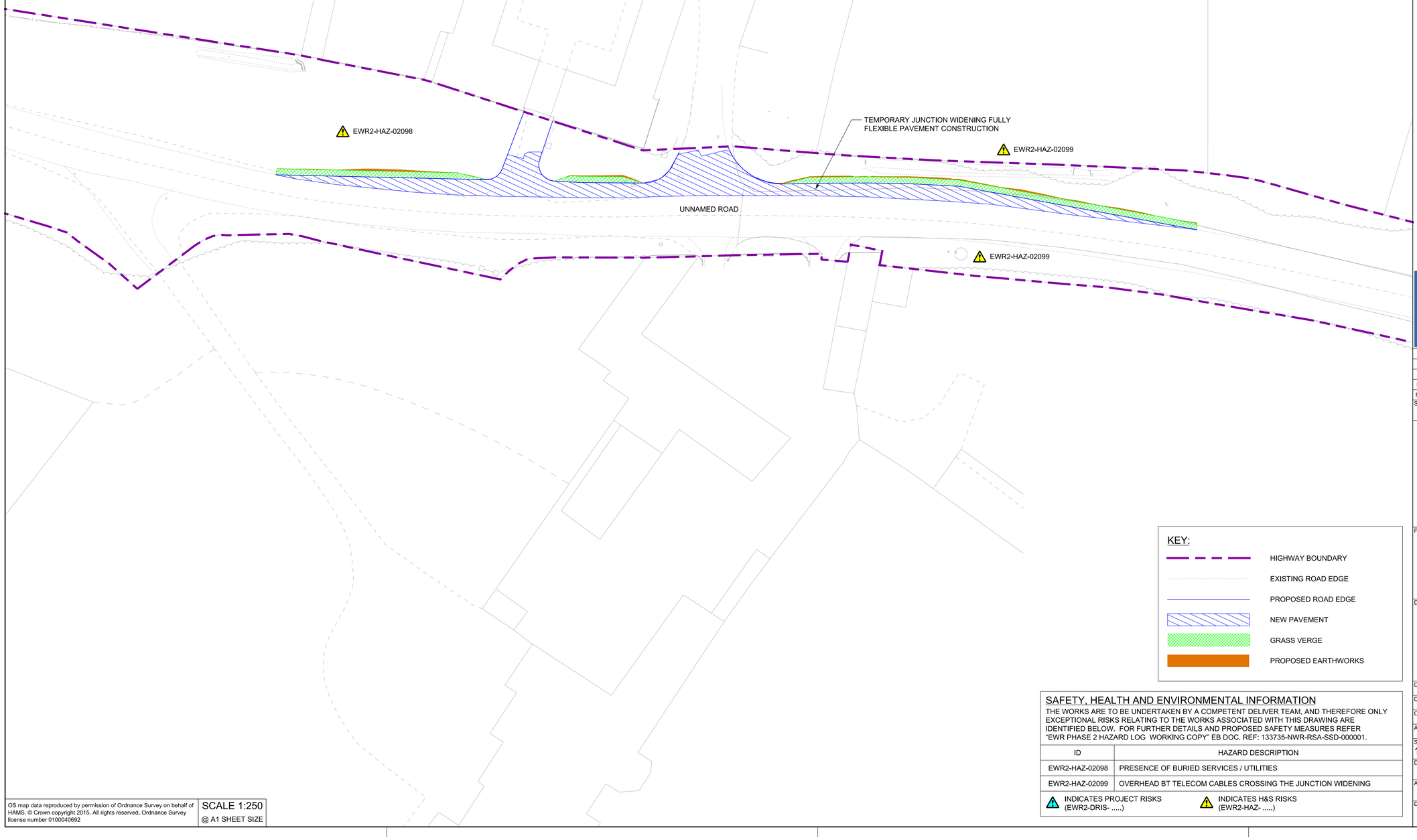
Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010001



KEY:

- HIGHWAY BOUNDARY
- EXISTING ROAD EDGE
- PROPOSED ROAD EDGE
- NEW PAVEMENT
- GRASS VERGE
- PROPOSED EARTHWORKS

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

THE WORKS ARE TO BE UNDERTAKEN BY A COMPETENT DELIVER 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- .....)

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SCALE 1:250 @ A1 SHEET SIZE

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)'.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
JUNCTION IMPROVEMENT A3_J_2
GENERAL ARRANGEMENT

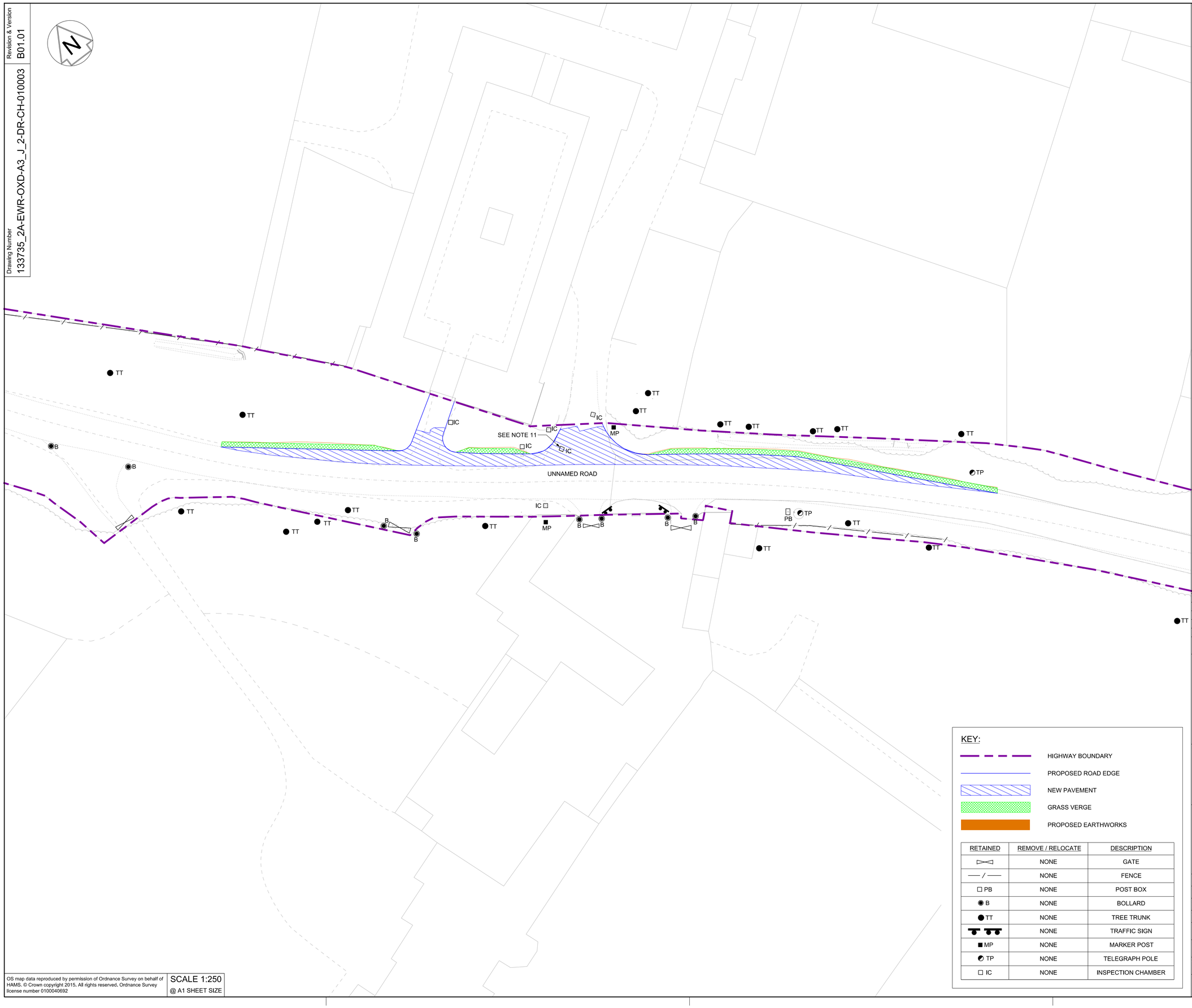
Designed	Nagoth Thomas Ravi Kumar	Signed N. T. R. Kumar	Date 06/09/19
Drawn	Ravikumar KN	Signed R. KN	Date 08/03/19
Checked	Lisa Taylor	Signed L. Taylor	Date 12/09/19
Approved	Stephen Abe	Signed S. Abe	Date 12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 1 of 2
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010001

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010003



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. PRIOR TO THE COMMENCEMENT OF WORKS, A SUITABLY QUALIFIED ECOLOGIST SHALL INSPECT THE SITE FOR THE PRESENCE OF PROTECTED SPECIES AND HABITAT. THE ECOLOGIST SHALL THEN ADVISE EWR ALLIANCE ON THE REQUIRED PRECAUTIONARY METHODS AND AREAS OF EXCLUSION.
5. WHERE SITE CLEARANCE WORKS HAVE THE POTENTIAL TO IMPACT TREES OR HEDGES WHICH ARE TO BE RETAINED, AN ARBORICULTURIST SHALL BE PRESENT TO ADVISE ON ROOT PROTECTION ZONE EXTENTS, ROOT PRUNING AND CROWN RAISING. WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BS3998:2010.
6. SITE CLEARANCE, WHERE THERE IS PROXIMITY TO HABITAT OF PROTECTED SPECIES, SHALL BE CARRIED OUT UNDER THE SUPERVISION OF A SUITABLY QUALIFIED ECOLOGIST.
7. THE EXTENTS OF ALL SITE CLEARANCE WORKS SHALL BE RECORDED IN THE AS-BUILT SITE CLEARANCE DRAWINGS AND SHALL ALSO BE RECORDED, WITH PHOTOGRAPHS OF FEATURES PRIOR TO REMOVAL, IN THE SITE CLEARANCE REGISTER. THE SITE CLEARANCE REGISTER SHALL BE MAINTAINED BY EWR ALLIANCE AND WILL INFORM REINSTATEMENT DETERMINATION.
8. IN LOCATIONS WHERE EXISTING TREES OVERHANG THE PASSING PLACE CROWN LIFTING, TO GIVE 5m CLEARANCE ABOVE GROUND LEVEL, SHALL BE UNDERTAKEN TO THE BACK OF THE PROPOSED VERGE. THIS SHALL BE UNDERTAKEN UNDER THE SUPERVISION OF AN ARBORICULTURIST.
9. THE VEGETATION CLEARANCE SHOWN HERE ON THE DRAWING IS INDICATIVE ONLY. THE SITE TEAM NEEDS TO ASCERTAIN THE REQUIRED CLEARANCE BASED ON THE VISIBILITY SPLAY, INTERVISIBILITY ZONE AND OR WORKS REQUIRED FOR THIS SITE.
10. FOR CLARITY ONLY THE TRUNKS OF EXISTING TREES ARE SHOWN, FOR CANOPY EXTENTS THE TREE SURVEY MODEL AND MASTER SCHEDULE ARE TO BE REFERRED TO.
11. EXISTING BT CHAMBER TO BE RETAINED SHALL BE STRENGTHENED SUCH THAT IT CAN WITHSTAND HGV LOADING.

KEY:

- HIGHWAY BOUNDARY
- PROPOSED ROAD EDGE
- NEW PAVEMENT
- GRASS VERGE
- PROPOSED EARTHWORKS

RETAINED	REMOVE / RELOCATE	DESCRIPTION
⋈	NONE	GATE
—— / ——	NONE	FENCE
□ PB	NONE	POST BOX
◉ B	NONE	BOLLARD
● TT	NONE	TREE TRUNK
	NONE	TRAFFIC SIGN
■ MP	NONE	MARKER POST
◐ TP	NONE	TELEGRAPH POLE
□ IC	NONE	INSPECTION CHAMBER

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
JUNCTION IMPROVEMENT A3_J_2
SITE CLEARANCE

Designed	Nagoth Thomas Ravi Kumar	Signed N. T. R. Kumar	Date 06/09/19
Drawn	Ravikumar KN	Signed R. KN	Date 08/03/19
Checked	Lisa Taylor	Signed L. Taylor	Date 12/09/19
Approved	Stephen Abe	Signed S. Abe	Date 12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 1 of 1
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010003

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SCALE 1:250 @ A1 SHEET SIZE

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010004

KEY:

- HIGHWAY BOUNDARY
- PROPOSED ROAD EDGE
- NEW PAVEMENT
- GRASS VERGE
- PROPOSED EARTHWORKS
- WATER — THAMES WATER SUPPLY
- OBT — BT TELECOM OVERHEAD CABLES
- BT — BT TELECOM UNDERGROUND CABLES

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SCALE 1:250 @ A1 SHEET SIZE

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. THE EXACT LOCATION AND EXTENT OF BURIED SERVICES SHALL BE VERIFIED ON SITE PRIOR TO COMMENCEMENT OF THE WORKS. AGREEMENT WITH PRIVATE LAND OWNERS SHALL BE OBTAINED PRIOR TO WORKS WHERE ACCESS TO PRIVATE LAND IS REQUIRED.
5. THIS DRAWING SHOWS THE POSITION OF UTILITY COMPANIES APPARATUS KNOWN TO OPERATE IN THE AREA IMMEDIATELY ADJACENT TO AND WITHIN THE LAND TAKE BOUNDARY FOR EAST WEST RAIL.
6. THE POSITIONS INDICATED FOR THE APPARATUS ARE BASED ON RECORDS PROVIDED BY NETWORK RAIL. THE ACCURACY OF THE DRAWING IS THEREFORE LIMITED BY THE ACCURACY OF THE RECORDS MAINTAINED BY THE UTILITY COMPANIES, THE METHODS AVAILABLE TO PROCESS / REPRODUCE THIS INFORMATION IN THE DRAWINGS AND THE AGE OF THE INFORMATION. THERE IS THE POSSIBILITY THAT APPARATUS HAS BEEN ADDED OR REMOVED SINCE THE RECORDS WERE PROVIDED.
7. ALL SEARCHES MUST BE VERIFIED AND ESTABLISHED ON SITE BEFORE WORK COMMENCES. IT IS THE RESPONSIBILITY OF THE EWR ALLIANCE TO IDENTIFY AND LOCATE UTILITY PLANT PRIOR TO WORK GOING AHEAD.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
JUNCTION IMPROVEMENT A3_J_2
EXISTING UTILITIES

Designed	Nagoth Thomas Ravi Kumar	Signed N. T. R. Kumar	Date 06/09/19
Drawn	Ravikumar KN	Signed R. KN	Date 08/03/19
Checked	Lisa Taylor	Signed L. Taylor	Date 12/09/19
Approved	Stephen Abe	Signed S. Abe	Date 12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 1 of 1
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010004

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010008

KEY:

- HIGHWAY BOUNDARY
- EXISTING CONTOUR MAJOR @ 0.05m INTERVALS
- EXISTING CONTOUR MINOR @ 0.01m INTERVALS
- PROPOSED CONTOUR MAJOR @ 0.05m INTERVALS
- PROPOSED CONTOUR MINOR @ 0.01m INTERVALS

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SCALE 1:250 @ A1 SHEET SIZE

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. ALL WORKS TO BE IN ACCORDANCE WITH THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAYS WORKS VOL 1 (SPECIFICATION FOR HIGHWAY WORKS) AND STANDARD CONSTRUCTION DETAILS.
5. THE DELIVERY TEAM IS TO VERIFY DIMENSION ON SITE AND ADVISE OF ANY INFORMATION DISCREPANCIES. TIE-IN POINTS SHOULD BE VERIFIED ON SITE WITH THE ENGINEER PRIOR TO CONSTRUCTION.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
JUNCTION IMPROVEMENT A3_J_2
EXISTING AND PROPOSED CONTOURS

Designed	Nagoth Thomas Ravi Kumar	Signed	N. T. R. Kumar	Date 06/09/19
Drawn	Ravikumar KN	Signed	R. KN	Date 08/03/19
Checked	Lisa Taylor	Signed	L. Taylor	Date 12/09/19
Approved	Stephen Abe	Signed	S. Abe	Date 12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 1 of 1
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010008

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010010

UNNAMED ROAD

ONE-WAY MOVEMENT, ONE IN
AND ONE OUT OF THE JUNCTION.

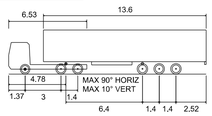
KEY:

VEHICLE TRACKING

HIGHWAY BOUNDARY

PROPOSED ROAD EDGE

VEHICLE DETAILS



MAX LEGAL LENGTH (UK) ARTICULATED VEHICLE (16.5m)

OVERALL LENGTH	16.500m
OVERALL WIDTH	2.550m
OVERALL BODY HEIGHT	3.681m
MIN BODY GROUND CLEARANCE	0.411m
MAX TRACK WIDTH	2.500m
LOCK TO LOCK TIME	6.00s
KERB TO KERB TURNING RADIUS	6.530m

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. VEHICLE TRACKING IS UNDERTAKEN WITH COMPUTER MODELLING SOFTWARE AND IS BASED ON IDEAL SITUATIONS WHERE REAL WORLD OBSTRUCTIONS ON THE ROAD NETWORK SUCH AS PARKING OR LOADING ACTIVITY WOULD NOT HAVE BEEN FORESEEN.
4. THE MODELLING IS BASED IN 2D PLAN WHERE SWEPT PATHS ARE INFLUENCED BY ANTICIPATED MOVEMENTS AND THEREFORE LEAD TO IDEAL APPROACH ANGLES, WHICH MIGHT NOT BE OBVIOUS IN REALITY.
5. APPROACH SPEEDS, APPROACH ANGLES, ROAD SURFACE, WEATHER CONDITIONS AND TYRE WEAR ARE ALL FACTORS THAT WILL INFLUENCE VEHICLE PATHS.
6. JUNCTION HAS BEEN DESIGNED FOR THE FOLLOWING VEHICLES AND MOVEMENTS:
   A) ONE IN AND ONE OUT SINGLE DIRECTION MOVEMENT FOR A MAX LEGAL (16,5m) ARTICULATED HGV.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
JUNCTION IMPROVEMENT A3_J_2
VEHICLE SWEPT PATH ANALYSIS

Designed	Nagoth Thomas Ravi Kumar	Signed N. T. R. Kumar	Date 06/09/19
Drawn	Ravikumar KN	Signed R. KN	Date 08/03/19
Checked	Lisa Taylor	Signed L. Taylor	Date 12/09/19
Approved	Stephen Abe	Signed S. Abe	Date 12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 1 of 1
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010010

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SCALE 1:250
@ A1 SHEET SIZE

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010011

KEY:

- VISIBILITY SPLAY
- HIGHWAY BOUNDARY
- PROPOSED ROAD EDGE

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SCALE 1:250
@ A1 SHEET SIZE

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.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
JUNCTION IMPROVEMENT A3_J_2
VISIBILITY SPLAY

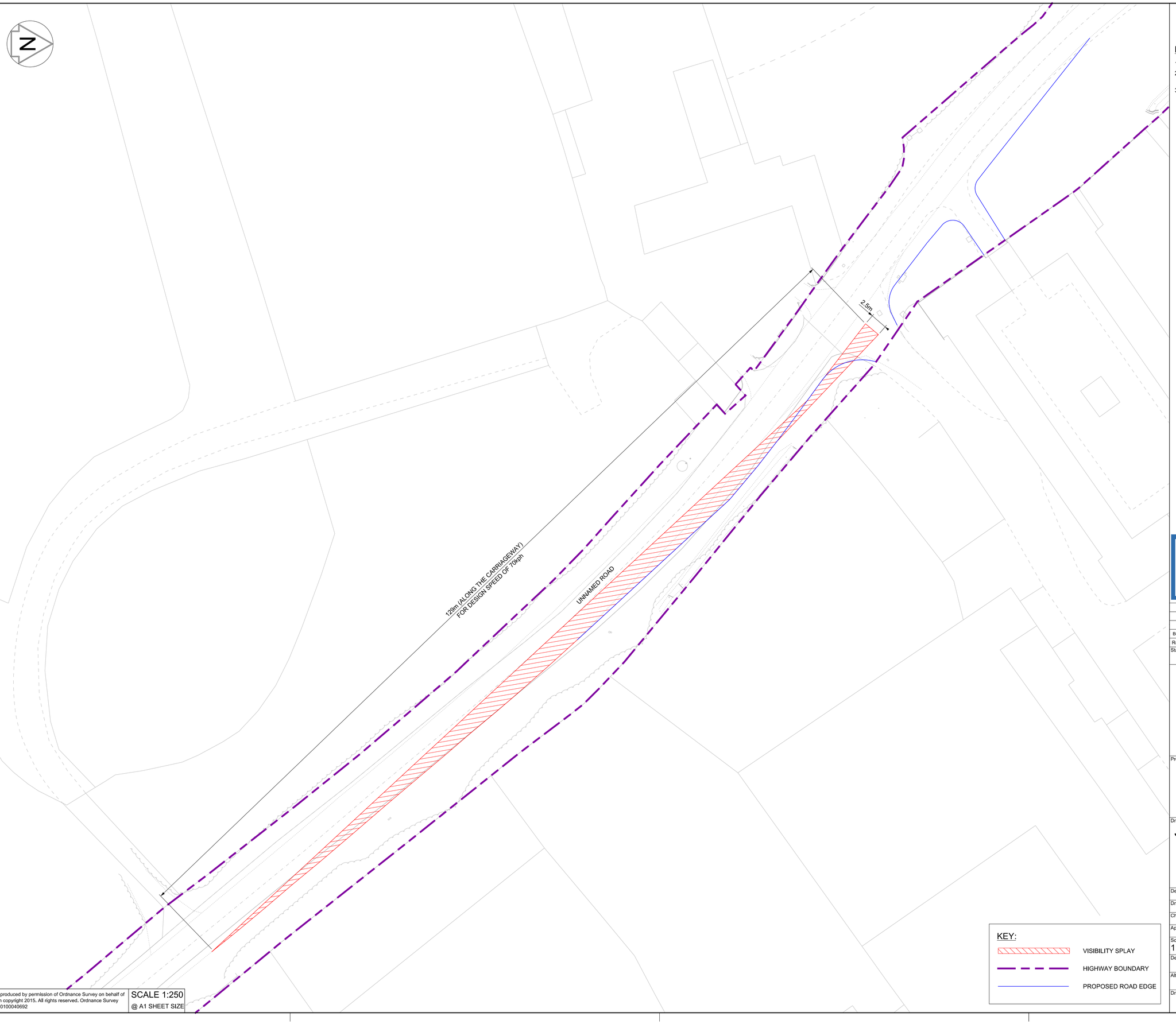
Designed	Nagoth Thomas Ravi Kumar	Signed	N. T. R. Kumar	Date	06/09/19
Drawn	Ravikumar KN	Signed	R. KN	Date	20/05/19
Checked	Lisa Taylor	Signed	L. Taylor	Date	12/09/19
Approved	Stephen Abe	Signed	S. Abe	Date	12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 1 of 3
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010011

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010012



KEY:

- VISIBILITY SPLAY
- HIGHWAY BOUNDARY
- PROPOSED ROAD EDGE

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SCALE 1:250
@ A1 SHEET SIZE

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.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

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 06/09/19
Drawn	Ravikumar KN	Signed R. KN	Date 20/05/19
Checked	Lisa Taylor	Signed L. Taylor	Date 12/09/19
Approved	Stephen Abe	Signed S. Abe	Date 12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 2 of 3
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010012

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-A3_J_2-DR-CH-010013

30m (ALONG THE CARRIAGEWAY)
FOR DESIGN SPEED OF 50kph

2.4m

UNNAMED ROAD

116m (ALONG THE CARRIAGEWAY)
FOR DESIGN SPEED OF 60kph

KEY:

VISIBILITY SPLAY

HIGHWAY BOUNDARY

PROPOSED ROAD EDGE

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SCALE 1:250
@ A1 SHEET SIZE

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.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	23/09/19	FOR INFORMATION	N.T.	L.T.	S.A.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
JUNCTION IMPROVEMENT A3_J_2
VISIBILITY SPLAY

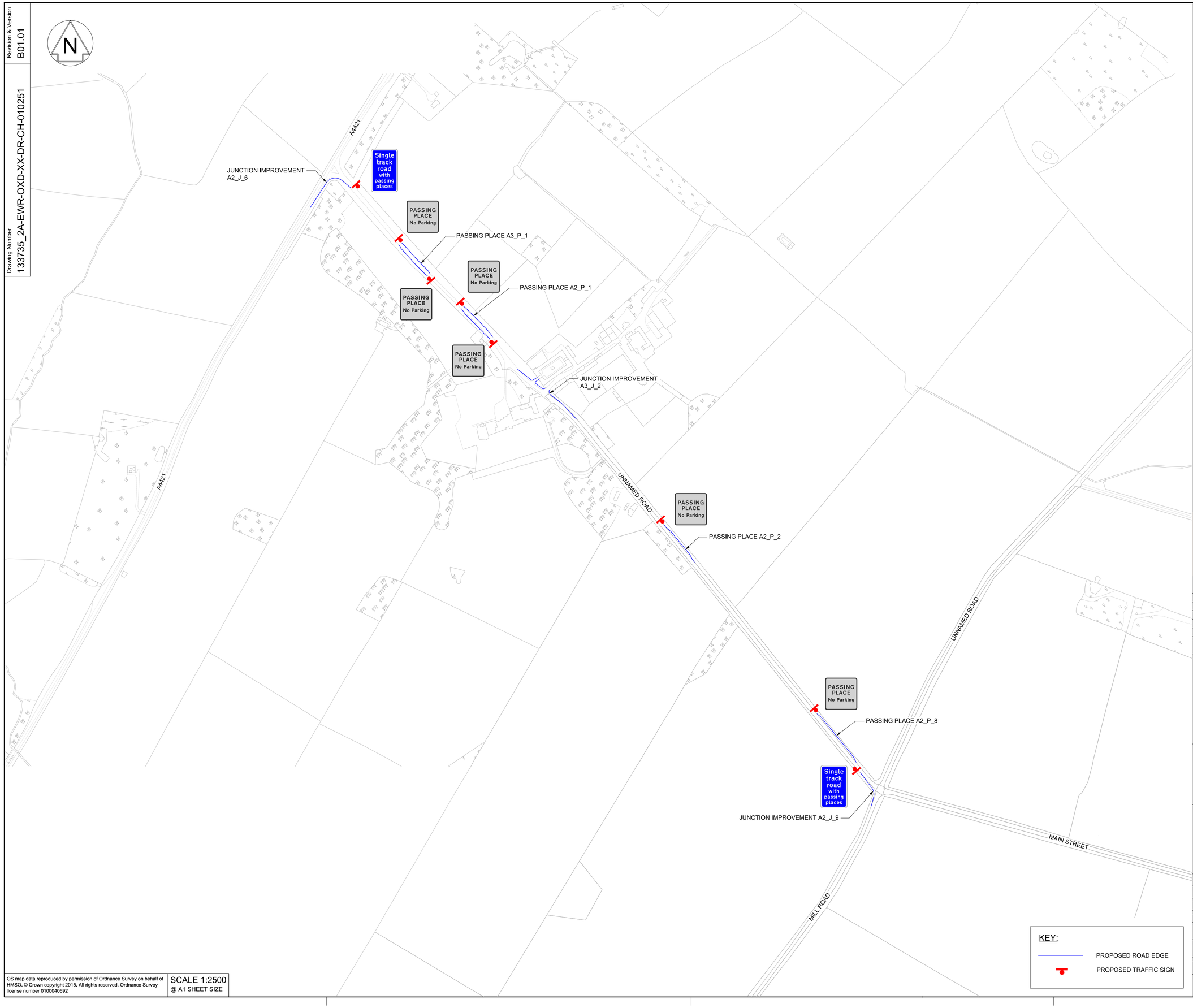
Designed	Nagoth Thomas Ravi Kumar	Signed N. T. R. Kumar	Date 06/09/19
Drawn	Ravikumar KN	Signed R. KN	Date 05/09/19
Checked	Lisa Taylor	Signed L. Taylor	Date 12/09/19
Approved	Stephen Abe	Signed S. Abe	Date 12/09/19

Scale(s): 1:250
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 3 of 3
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-A3_J_2-DR-CH-010013

Sheet Size A1 594 x 841

Revision & Version
B01.01

Drawing Number
133735_2A-EWR-OXD-XX-DR-CH-010251



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SCALE 1:2500
@ A1 SHEET SIZE

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. WHERE SITE CLEARANCE WORKS HAVE THE POTENTIAL TO IMPACT TREES OR HEDGES WHICH ARE TO BE RETAINED, AN ABORICULTURALIST SHALL BE PRESENT TO ADVISE ON ROOT PROTECTION ZONE EXTENTS, ROOT PRUNING AND CROWN RAISING. WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BS3998:2010.
5. SITE CLEARANCE, WHERE THERE IS PROXIMITY TO HABITAT OF PROTECTED SPECIES, SHALL BE CARRIED OUT UNDER THE SUPERVISION OF A SUITABLY QUALIFIED ECOLOGIST.
6. ALL SIGNS SHOWN HERE ARE INTENDED TO BE INSTALLED WITHIN THE HIGHWAYS BOUNDARY.

DRAFT

Rev	Date	Description of Revisions	Dsnd	Chkd	Appr
B01	12/08/19	FOR INFORMATION	N.T.	N.R.	E.F.

Status: SHARED - for Information
Suitability: S2

EWR Alliance
Connecting People

Project
East West Rail
(Western Section)
Phase 2

Drawing Title
SIGNAGE STRATEGY DRAWING FOR OXFORDSHIRE COUNTY COUNCIL

Designed	Nagoth Thomas Ravi Kumar	Signed	N. T. R. Kumar	Date	08/08/19
Drawn	Ravikumar KN	Signed	R. KN	Date	10/06/19
Checked	Nadeem Rashid	Signed	N. Rashid	Date	08/08/19
Approved	Edward Findlay	Signed	E. Findlay	Date	08/08/19

Scale(s): 1:2500
ELR - Project Chainage (Miles Yards): OXD -
Design Package Risk Classification: Normal
Sheet: 1 of 1
Alternative Reference:
Revision: B01
Drawing Number: 133735_2A-EWR-OXD-XX-DR-CH-010251

Sheet Size A1 594 x 841

East West Rail Phase 2

GRIP 5 Offline Highways

Stage 2 Road safety audit response report

Offline Highways – Compound Accesses and Junctions – Oxfordshire (A1 Bicester Road Compound Access), (A2 Station Road Compound Access), (A3_J_2 Stratton Audley Park Junction Improvement), (A2_J_9 Mill Road Junction Improvement)

Document Number: 133735_RW-EWR-XX-XX-RP-CH-000035

(ProjectWise no.)

xxx-xxx-xxx-xx (eB no.)

Rev B01

East West Rail Phase 2

Stage 2 Road safety audit response report

Offline Highways – Compound Accesses and Junctions – Oxfordshire (A1 Bicester Road Compound Access), (A2 Station Road Compound Access), (A3_J_2 Stratton Audley Park Junction Improvement), (A2_J_9 Mill Road Junction Improvement)

Prepared by EWR Alliance on behalf of Network Rail

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Document History

Project Number: 133735		**DOCUMENT REF: 133735_RW-EWR-XX-XX-RP-CH-000035 (ProjectWise no.)** **xxxx-xxxx-xxxx-xx (eB no.)**				
Revision	**Purpose and description**	**Originated**	**Checked**	**Reviewed**	**Authorised**	**Date**
B01	For LHA Approval	N. Rashid	E. Findlay	S. Abe	S. Abe	14/05/2019

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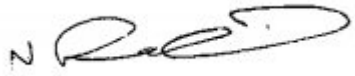
Authorisation sheet

Project:	East West Rail Phase 2 (EWR2)
Report title:	Stage 2 Road safety audit response report Offline Highways – Compound Accesses and Junctions – Oxfordshire (A1 Bicester Road Compound Access), (A2 Station Road Compound Access), (A3_J_2 Stratton Audley Park Junction Improvement), (A2_J_9 Mill Road Junction Improvement)
Prepared by:	
Name:	Nadeem Rashid
Position:	Lead Engineer
Signed:	
Organisation:	EWR Alliance
Date:	14/05/2019
Approved by:	
Name:	Chris Uren
Position:	Designated Project Engineer
Signed:	
Organisation:	Network Rail
Date:	14/05/2019

Introduction

The works are in association with the East West Rail Phase 2 (EWR2) project and are intended to provide the required 'offline highway' works to enable the movement of construction materials and plant on existing local highway authority networks. These works include the provision of temporary passing places, temporary junction improvements and temporary compound accesses for use during the construction period. Further works include the provision of additional temporary and permanent accesses which are to be used during the beyond the construction phase.

A Stage 2 Road Safety Audit has been carried out (Appendix A). The Road Safety Audit Report Title is Offline Highways – Compound Accesses and Junctions – Oxfordshire (A1 Bicester Road Compound Access), (A2 Station Road Compound Access), (A3_J_2 Stratton Audley Park Junction Improvement), (A2_J_9 Mill Road Junction Improvement) and it is dated 25/04/2019. This Road safety audit response report relates specifically to this report and has been prepared by Atkins Employees Nadeem Rashid, Lead Engineer and Edward Findlay, Design Manager. The report has been authorised by Stephen Abe, CRE on behalf of EWR Alliance (the Design organisation) and Chris Uren, Designated Project Engineer, on behalf of Network Rail (the Overseeing Organisation).

Key Personnel

Overseeing Organisation (Network Rail):	Chris Uren (Designated Project Engineer)
RSA team:	Kevin Freimanis (Lead RSA), Rebecca Thomas (RSA Team Member)
Design Organisation (EWR Alliance):	Nadeem Rashid (Lead Engineer), Edward Findlay (Design Manager)

Road safety audit decision log

Please refer to Appendix B.

Design organisation and Overseeing Organisation (EWR Alliance) statements

Design organisation statement

On behalf of the design organisation I verify that: **1) the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation.**	
Name:	Stephen Abe
Signed:	
Position:	CRE
Organisation:	EWR Alliance
Date:	14/05/2019

Overseeing Organisation (Network Rail) statement

On behalf of the Overseeing Organisation I certify that: **1) the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and** **2) the agreed RSA actions will be progressed.**	
Name:	Chris Uren
Signed:	
Position:	Designated Project Engineer
Organisation:	Network Rail
Date:	14/05/2019

Appendix A Road safety audit report

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Offline Highways - Compound Accesses and Junctions – Oxfordshire (A1 Bicester Road Compound Access), (A2 Station Road Compound Access), (A3_J_2 Stratton Audley Park Junction Improvement), (A2_J_9 Mill Road Junction Improvement)

Stage 2 Road Safety Audit

East West Rail (Western Section) Phase 2

25 April 2019

Notice

This document and its contents have been prepared and are intended solely as information for East West Rail and use in relation to the proposed accesses to site compounds on Bicester Road and Station Road and proposed junction improvements at Stratton Audley Park and Mill Road near Bicester in Oxfordshire.

Atkins Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 20 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Initial Issue	KF	RT	JPD	KF	25/04/19

Client signoff

Overseeing Organisation	East West Rail
RSA team organisation	Atkins
Report title	Offline Highways Compound Accesses and Junctions Oxfordshire (A1 Bicester Road Compound Access), (A2 Station Road Compound Access), (A3_J_2 Stratton Audley Park Junction Improvement), (A2_J_9 Mill Road Junction Improvement) Stage 2 Road Safety Audit
Job number	5167214-616
Document reference	5167214-616-RSA2-STR-A1-A2-A3_J_2-A2_J_9
Client signature / date	

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1. Introduction

Commission and Terms of Reference

Atkins has been commissioned by East West Rail (EWR) to undertake a Stage 2 Road Safety Audit of the proposed site compound accesses (two sites) and proposed junction improvements (two sites) near Bicester in Oxfordshire.

The Audit Team membership was as follows:

Kevin Freimanis	BSc, MCIHT, MSoRSA Senior Planner, Atkins Transportation Atkins Transportation (Certificate of Competency in RSA, 2017)
Rebecca Thomas	BSc (Hons), MCIHT, MSoRSA Senior Operational Safety Consultant, Atkins IM&ST (Certificate of Competency in RSA, 2017)

The Audit comprised a desktop review of the information provided and a site visit. The site visit was undertaken during daylight hours on Thursday 28th March 2019 by both of the Audit Team members together to view the proposed compound accesses and carriageway widening locations near Bicester in Oxfordshire, between 08:15 and 12:00.

During the site visit the road surface was dry, the weather was sunny, and traffic was free flowing.

The Audit has been conducted with reference to the procedures and scope set out in Design Manual for Roads and Bridges, Volume 5, Section 2, Part 2, Road Safety Audit Standard GG 119.

The Audit Team has examined and reported only on the road safety implications of the measures as proposed and has not specifically examined or verified the compliance of the designs to any other criteria.

The Audit Team were provided with the scheme drawings by Ajit Shivaprasad of Atkins, on behalf of East West Rail. Details of the information provided are included in Appendix A. Problems and recommendation locations are indicated on the plan of the scheme(s) included in Appendix B.

Scope

The proposals are for three temporary site compound accesses and two carriageway widenings to facilitate access and movement of construction traffic to five East West Rail compounds for a five-year period.

The sites visited as part of this audit include:-

Site Compound (Site Reference)	Location with nearest Post Code	Brief Site Description
A1	Bicester Road, Bicester OX25 6EP	Modifications to an existing access to provide access to a compound, and a new traffic signal-controlled compound access
A2	Station Road, Winslow, OX26 5EH	Modifications to existing access to provide access to a compound
A3_J_2	Unnamed Road, Stratton Audley Park, OX27 9AB	Widening of carriageway

A2_J_9	Mill Road, Stratton Audley, OX27 9AB	Realignment of the western corner of the crossroads junction

Table 1.1 – List of Sites Audited

The issues raised by this Stage 2 Road Safety Audit are detailed in Section 2 with recommendations to be considered. Section 3 comprises the Audit Team Statement.

All comments and recommendations are referenced to the detailed design drawings and the locations have been indicated on the A3 plan supplied within the Road Safety Audit Brief.

Notes and clarifications

The Audit Team were provided with no details of any Departure from Standard applications associated with the proposals. It is the Designer's responsibility to ensure that any Departures and Relaxations are identified, recorded, and approval gained, where necessary.

The Audit team has been provided incomplete layouts of following aspects:-

- Fencing boundaries
- Kerbing Edging and channel details
- Landscaping details
- Traffic signal control details (including phasing)
- Structures
- Pavement construction details
- Contours/ levels
- Sections
- Street furniture relocation details
- Drainage/ connections
- Electrical connections, and
- Traffic signals and phasing

The Audit Team have assumed these problems may be resolved as the design process progresses.

2. Issues Raised at this Stage 2 Audit

This section details the issues raised by this Stage 2 Road Safety Audit.

PROBLEM 2.1

Location: Site Compound A1 & A2- Bicester Road and Station Road.

Summary: Increase in HGV movements may increase the risk of collisions with other road users

Larger vehicles move at a slower speed than standard cars and require more time to turn into and out of junctions with more onerous manoeuvres. Drivers who do not anticipate slow moving vehicles or large turning vehicles ahead may not adjust their speed accordingly. An increase in HGV movements into and out of the proposed compound accesses may increase the risk of side impact or nose to tail collisions between construction traffic and road users.

RECOMMENDATION

It is recommended to provide temporary "caution construction traffic" road signage to increase road user awareness of slow heavy vehicles turning at the junctions. As the duration of the works will be five years it is recommended signs are mounted on posts.

PROBLEM 2.2

Location: Site Compound A1 & A2- Bicester Road and Station Road.

Summary: Driver intervisibility reduced by vegetation could increase risk of collisions

It is unclear from the drawings provided to audit the extent of vegetation removal proposed. Not clearing enough vegetation may restrict the intervisibilty of road users and the visibility of roads traffic control facilities increasing the risk of failure to give way, stopping at junctions, or reducing road user awareness of hazards on the highway. Reduced road user intervisibilty may increase the risk of side impacts, hard/ late braking, rear shunts, and collisions with non-motorised road users.

RECOMMENDATION

It is recommended that adequate vegetation is removed to ensure clear road user visibility splays, road user intervisibilty, the visibility of hazards, warning signage, and traffic control facilities.

PROBLEM 2.3

Location: Site Compound, A3_J_2- Unnamed Road.

Summary: Overhanging vegetation could obstruct road users, damage vehicles, and increase the risk of collisions or injury occurring

It is unclear from the drawings provided to audit the extent of vegetation clearance proposed. Existing vegetation overhanging an area where carriageway widening is proposed may damage passing vehicles, cause branches to fall in the carriageway (forming an obstruction in the carriageway), or force opposing traffic flows together (through evasive manoeuvres) increasing the risk of head on collisions or side swipes.

RECOMMENDATION

It is recommended that adequate vegetation is cleared to ensure vehicles can pass along the carriageway safely.

PROBLEM 2.4

Location: Site Compound A1, A2_J_9- Bicester Road and Mill Road.

Summary: Unprotected level differences may present a risk to road users

It is unclear from the drawings provided to audit the extent of the proposed landscaping. The above sites have notable level drops adjacent to the proposed carriageway. Site A2_J_9 proposes an unprotected road edge with a narrow verge adjacent to the level drop. Errant vehicles or large vehicles passing each other may be at risk of overturning or loss of control if leave the carriageway onto the soft verge/ slopes.

RECOMMENDATION

It is recommended that suitable landscaping is provided to support the carriageway/ soft verge, avoid errant vehicles overturning, and adequate RRS is provided to protect road users from leaving the carriageway.

PROBLEM 2.5

Location: Site Compound A1, A2, A2_J_9 & A3_J_2- Bicester Road, Station Road, Mill Road and Unnamed Road.

Summary: Poor carriageway drainage may increase risk of braking/ loss of control collisions

On Bicester Road gullies have been earmarked for removal/ relocation but it is not clear from the drawings where they are being relocated to. It is unclear how the compound accesses A1 and A2 will drain as they have no proposed gullies. It is also unclear for sites A2_J_9 and A3_J_2 whether the carriageway will be graded to drain to the proposed edge of carriageway or to the existing edge of carriageway. During cold, wet periods, surface water may freeze on the carriageway surface presenting a braking/loss of control issue to motorised road users or a slip/ fall risk to non-motorised users.

RECOMMENDATION

It is recommended that drainage measures be provided where required to ensure effective surface water run-off from the carriageway.

PROBLEM 2.6

Location: Site Compound A3_J_2- Unnamed Road.

Summary: Inadequate clearance increases risk of vehicle strikes

The carriageway is being widened with a narrow safety margin to an existing telegraph pole in the verge. This may increase the risk of road users side swiping or striking the pole causing it to become unstable and at risk of falling and causing injury.

RECOMMENDATION

It is recommended that a minimum of 450mm is provide between the edge of the carriageway and any physical obstruction.

PROBLEM 2.7

Location: Site Compound A3_J_2- Unnamed Road.

Summary: Collapse of utility covers

Carriageway widening has been proposed but existing utility covers, and chambers in the area of widening are not earmarked for strengthening. The audit team noted a number of utility covers in the verges not strong enough to withstand loading from laden HGVs. The utility covers, and chambers may collapse when overrun by heavy vehicles creating a dip in the carriageway. This may damage passing vehicles or increase the risk of head on collisions as road users try to avoid the uneven surface. Two-wheeler riders who overrun the damaged covers are at increased risk of becoming destabilised and falling as a result.

RECOMMENDATION

It is recommended that affected utility covers are replaced with suitable strength covers, and chambers are assessed for suitability to be overrun by loaded HGVs.

PROBLEM 2.8

Location: Site Compound A1, Bicester Road.

Summary: Position of traffic signal feeder pillar and signal control cabinet could compromise the safety of road users

It is unclear from the drawings where the traffic signals feeder pillar or controller cabinet will be positioned. If the feeder pillar or signal control cabinet are positioned in an inappropriate location, they may pose an increased risk of collision with road users.

RECOMMENDATION

It is recommended that traffic signal feeder pillars and controller cabinets are positioned in a location they will not pose an increased risk of collision with road users.

PROBLEM 2.9

Location: Site Compound A1, Bicester Road.

Summary: Programming of traffic signals phasing could increase risk of collisions

It is unclear from the brief provided to the audit team how the traffic signals phasing will operate. If the traffic flow stage for the compound arm is too long queuing on Bicester Road will extend into the adjacent roundabout or over the adjacent traffic signal-controlled bridge increasing the risk of road user frustration, nose to tail collisions, and side swipes. Queuing on the north side of the bridge may be masked by the crest of the bridge, increasing the risk of nose to tail collisions.

RECOMMENDATION

It is recommended that either a robust traffic signals phasing is designed, an alternative junction control is considered, or alterations are made to the adjacent junction and traffic signal-controlled bridge to increase capacity.

To reduce delay to northbound traffic, and subsequent delays to southbound traffic, the designer could provide a right turn lane for traffic entering the proposed compound arm.

It is suggested to link the proposed traffic signals to the existing bridge traffic signals.

Hazard warning signs should be provided to warn road users to expected queuing traffic.

PROBLEM 2.10

Location: Site Compound A1, Bicester Road.

Summary: Queuing on the approach to new traffic signalised junction may affect the adjacent bridge and roundabout increasing the risk of side swipe and nose-to-tail collisions

The close proximity of the proposed compound traffic signals junction from the roundabout to the north and traffic signal controlled narrow bridge to the south may increase the risk of vehicles obstructing the roundabout and signalised bridge. Queuing back through the roundabout would affect traffic circulation of the junction increasing congestion and the risk of road users hard/ late braking increasing the risk of nose to tail and side swipe collisions. Queuing onto the bridge would restrict traffic movements southbound as it would narrow an already narrow carriageway. Queuing on the north side of the bridge may be masked by the crest of the bridge, increasing the risk of nose to tail collisions.

During the site visit, the audit team observed at times the existing traffic flow for the roundabout queuing back across the proposed traffic signal junction location. Traffic waiting at the traffic signals associated with the bridge was also observed queuing back across the proposed traffic signal junction area. Queues for the existing roundabout and bridge may cause obstruction of the proposed junction, increasing the risk of road user frustration, side swipe, side impacts and nose to tail collisions.

RECOMMENDATION

It is recommended that measures are put in place to reduce the risk of vehicles obstructing the adjacent roundabout and traffic signalised bridge.

PROBLEM 2.11

Location: Site Compound A1, Bicester Road.

Summary: Failure to stop at traffic signal stop line

It is unclear from the drawings provided to audit if high friction surface or high PSV carriageway surfacing will be provided on the approaches to the proposed traffic signal junction. The uphill and downhill gradients on the approaches to the traffic signal junction may increase the risk of road users failing to stop at a stop line, late braking/ hard braking leading to nose to tail collisions, or restart collisions.

RECOMMENDATION

It is recommended that a high friction or high PSV surface is provided on the approaches to the signalised junction to aid road user braking.

PROBLEM 2.12

Location: Site Compound A1, Bicester Road.

Summary: Non-provision of non-motorised user access may increase risk of non-motorised user collisions with compound traffic

Bicester Road has footway and cycle facilities along its southern kerb line. The site is also close to a network of cycle facilities around Bicester. The presence of the facilities may increase the likelihood of road users accessing the site other than by motorised means. Footway/ cycle facilities have not been proposed to allow access into the compound from the southern kerb line of Bicester Road. Non-motorised users will have to cross Bicester Road uncontrolled, to walk along the verge (increasing the risk of tripping, slipping or falling on an uneven verge) or walk/ cycle in the carriageway increasing the risk of collisions between non-motorised users and works vehicles.

RECOMMENDATION

It is recommended to provide footway and cycle access to the proposed compound.

PROBLEM 2.13

Location: Site Compound A1, Bicester Road.

Summary: Increased risk of cyclist collisions with traffic signal pole

The primary traffic signal for northbound traffic on Bicester Road is proposed in the middle of an existing cycleway. Positioning the traffic signal pole in the cycleway may increase the risk of cyclists colliding with the pole during periods of reduced visibility, i.e. during the hours of darkness, or cyclists colliding with pedestrians on the adjacent footway whilst trying to avoid the pole.

RECOMMENDATION

It is recommended that the traffic signal pole be relocated outside of the footway/ cycleway.

PROBLEM 2.14

Location: Site Compound A1, A2, A2_J_9, Bicester Road, Station Road, and Mill Road.

Summary: Lack of road marking provision may increase the risk of collisions between road users

It is unclear from the drawings provided whether road markings are proposed as part of the works. By not providing adequate road markings it may increase the risk of failure to stop at a traffic signal-controlled junction (compound access arm at A1), failure to give way at a junction, collisions between opposing traffic flows leading to side impacts, late/ hard braking, or head on collisions.

RECOMMENDATION

It is recommended that adequate road markings are provided where road users are expected to give way, stop for traffic signals, and to separate traffic flows. Road markings should be extended where the carriageway is widened.

Audit Team Statement

We certify that this road safety audit has been carried out in accordance with GG 119.

RSA team

Road safety audit team leader

Name: **Kevin Freimanis**

Signed: .....

Position: Senior Planner

Organisation: Atkins

Date: 25th April 2019

Road safety audit team member

Name: **Rebecca Thomas**

Signed: .....

Position: Senior Operational Safety Consultant

Organisation: Atkins

Date: 25th April 2019

Appendix B Road safety audit decision log

RSA Ref	Location	RSA Problem	RSA Recommendation	Design Team Response	Network Rail Response	Agreed RSA action
2.1	Site Compound A1 & A2- Bicester Road and Station Road	**Increase in HGV movements may increase the risk of collisions with other road users** Larger vehicles move at a slower speed than standard cars and require more time to turn into and out of junctions with more onerous manoeuvres. Drivers who do not anticipate slow moving vehicles or large turning vehicles ahead may not adjust their speed accordingly. An increase in HGV movements into and out of the proposed compound accesses may increase the risk of side impact or nose to tail collisions between construction traffic and road users	It is recommended to provide temporary "caution construction traffic" road signage to increase road user awareness of slow heavy vehicles turning at the junctions. As the duration of the works will be five years it is recommended signs are mounted on posts	**Accept the RSA problem and recommendation made by the RSA team.** Road safety Audit recommendation will be shared with logistics team for consideration when developing the signage strategy.	Accepted	Proceed as Design Team Response
2.2	Site Compound A1 & A2- Bicester Road and Station Road	**Driver intervisibility reduced by vegetation could increase risk of collisions** It is unclear from the drawings provided to audit the extent of vegetation removal proposed. Not clearing enough vegetation may restrict the intervisibility of road users and the visibility of roads traffic control facilities increasing the risk of failure to give way, stopping at junctions, or reducing road user awareness of hazards on the highway. Reduced road user intervisibility may increase the risk of side impacts, hard/ late braking, rear shunts, and collisions with non-motorised road users.	It is recommended that adequate vegetation is removed to ensure clear road user visibility splays, road user intervisibility, the visibility of hazards, warning signage, and traffic control facilities.	**Accept the RSA problem and recommendation made by the RSA team.** The site clearance drawings note that vegetation clearance shall be undertaken to provide suitable visibility.	Accepted	Proceed as Design Team Response
2.3	Site Compound, A3_J_2- Unnamed Road.	**Overhanging vegetation could obstruct road users, damage vehicles, and increase the risk of collisions or injury occurring** It is unclear from the drawings provided to audit the extent of vegetation clearance proposed. Existing vegetation overhanging an area where carriageway widening is proposed may damage passing vehicles, cause branches to fall in the carriageway (forming an obstruction in the carriageway), or force opposing traffic flows together (through evasive manoeuvres) increasing the risk of head on collisions or side swipes.	It is recommended that adequate vegetation is cleared to ensure vehicles can pass along the carriageway safely.	**Accept the RSA problem and recommendation made by the RSA team.** The site clearance drawings note that vegetation clearance shall be undertaken to provide suitable visibility.	Accepted	Proceed as Design Team Response

RSA Ref	Location	RSA Problem	RSA Recommendation	Design Team Response	Network Rail Response	Agreed RSA action
2.4	Site Compound A1, A2_J_9- Bicester Road and Mill Road	**Unprotected level differences may present a risk to road users** It is unclear from the drawings provided to audit the extent of the proposed landscaping. The above sites have notable level drops adjacent to the proposed carriageway. Site A2_J_9 proposes an unprotected road edge with a narrow verge adjacent to the level drop. Errant vehicles or large vehicles passing each other may be at risk of overturning or loss of control if leave the carriageway onto the soft verge/ slopes.	It is recommended that suitable landscaping is provided to support the carriageway/ soft verge, avoid errant vehicles overturning, and adequate RRS is provided to protect road users from leaving the carriageway	**Disagree with the RSA problem and recommendation raised by the RSA team.** The locations identified have had swept path analysis undertaken to ensure that proposed carriageways are wide enough to accommodate the construction vehicle movements without having to leave the carriageway. In both locations a 1m wide verge has been provided alongside 1 in 3 earthworks to tie into existing ground level. A temporary fenceline will also provide a visual deterrent.	Accepted	Proceed as Design Team Response
2.5	Site Compound A1, A2, A2_J_9 & A3_J_2- Bicester Road, Station Road, Mill Road and Unnamed Road.	**Poor carriageway drainage may increase risk of braking/ loss of control collisions** On Bicester Road gullies have been earmarked for removal/ relocation but it is not clear from the drawings where they are being relocated to. It is unclear how the compound accesses A1 and A2 will drain as they have no proposed gullies. It is also unclear for sites A2_J_9 and A3_J_2 whether the carriageway will be graded to drain to the proposed edge of carriageway or to the existing edge of carriageway. During cold, wet periods, surface water may freeze on the carriageway surface presenting a braking/loss of control issue to motorised road users or a slip/ fall risk to non-motorised users	It is recommended that drainage measures be provided where required to ensure effective surface water run-off from the carriageway.	**Disagree with the RSA problem and recommendation raised by the RSA team.** The proposed carriageways in these locations have been designed to eliminate flat spots where ponding could occur and to provide over the edge drainage.	Accepted	Proceed as Design Team Response
2.6	Site Compound A3_J_2- Unnamed Road.	**Inadequate clearance increases risk of vehicle strikes** The carriageway is being widened with a narrow safety margin to an existing telegraph pole in the verge. This may increase the risk of road users side swiping or striking the pole causing it to become unstable and at risk of falling and causing injury.	It is recommended that a minimum of 450mm is provide between the edge of the carriageway and any physical obstruction.	**Disagree with the RSA problem and recommendation raised by the RSA team.** The existing telegraph pole is approximately 2.3m away from the edge of the proposed carriageway widening.	Accepted	Proceed as Design Team Response

RSA Ref	Location	RSA Problem	RSA Recommendation	Design Team Response	Network Rail Response	Agreed RSA action
2.7	Site Compound A3_J_2-Unnamed Road.	**Collapse of utility covers** Carriageway widening has been proposed but existing utility covers, and chambers in the area of widening are not earmarked for strengthening. The audit team noted a number of utility covers in the verges not strong enough to withstand loading from laden HGVs. The utility covers, and chambers may collapse when overrun by heavy vehicles creating a dip in the carriageway. This may damage passing vehicles or increase the risk of head on collisions as road users try to avoid the uneven surface. Two-wheeler riders who overrun the damaged covers are at increased risk of becoming destabilised and falling as a result.	It is recommended that affected utility covers are replaced with suitable strength covers, and chambers are assessed for suitability to be overrun by loaded HGVs.	**Disagree with the RSA problem and recommendation raised by the RSA team.** The utility covers are outside of the proposed works and as such will not be affected.	Accepted	Proceed as Design Team Response
2.8	Site Compound A1, Bicester Road.	**Position of traffic signal feeder pillar and signal control cabinet could compromise the safety of road users** It is unclear from the drawings where the traffic signals feeder pillar or controller cabinet will be positioned. If the feeder pillar or signal control cabinet are positioned in an inappropriate location, they may pose an increased risk of collision with road users	It is recommended that traffic signal feeder pillars and controller cabinets are positioned in a location they will not pose an increased risk of collision with road users.	**Accept the RSA problem and recommendation made by the RSA team.** Road safety Audit recommendation will be shared with signals team for consideration when developing the signals strategy.	Accepted	Proceed as Design Team Response

RSA Ref	Location	RSA Problem	RSA Recommendation	Design Team Response	Network Rail Response	Agreed RSA action
2.9	Site Compound A1, Bicester Road.	**Programming of traffic signals phasing could increase risk of collisions** It is unclear from the brief provided to the audit team how the traffic signals phasing will operate. If the traffic flow stage for the compound arm is too long queuing on Bicester Road will extend into the adjacent roundabout or over the adjacent traffic signal-controlled bridge increasing the risk of road user frustration, nose to tail collisions, and side swipes. Queuing on the north side of the bridge may be masked by the crest of the bridge, increasing the risk of nose to tail collisions.	It is recommended that either a robust traffic signals phasing is designed, an alternative junction control is considered, or alterations are made to the adjacent junction and traffic signal-controlled bridge to increase capacity. To reduce delay to northbound traffic, and subsequent delays to southbound traffic, the designer could provide a right turn lane for traffic entering the proposed compound arm. It is suggested to link the proposed traffic signals to the existing bridge traffic signals. Hazard warning signs should be provided to warn road users to expected queuing traffic.	**Accept the RSA problem and recommendation made by the RSA team.** A robust traffic signals design will be provided and agreed with the LHA. There is to be no direct access from the roundabout to A1 compound. The access on the same roundabout arm as the A1 compound and nearest the roundabout is for emergency use only. The main compound is situated between the roundabout and the bridge. The linkage between these signals and existing signals will be at the discretion of the LHA and the RSA findings and designers response will be provided to the LHA to inform this decision. The provision of hazard warning signs to warn road users to expect queuing traffic does not seem warranted since there is existing traffic signals provision at the bridge and the signalisation of the A1 compound access will be evident to motorists existing the roundabout and approaching the A1 compound traffic signals.	Accepted	Proceed as Design Team Response

RSA Ref	Location	RSA Problem	RSA Recommendation	Design Team Response	Network Rail Response	Agreed RSA action
2.10	Site Compound A1, Bicester Road.	**Queuing on the approach to new traffic signalised junction may affect the adjacent bridge and roundabout increasing the risk of side swipe and nose-to-tail collisions** The close proximity of the proposed compound traffic signals junction from the roundabout to the north and traffic signal controlled narrow bridge to the south may increase the risk of vehicles obstructing the roundabout and signalised bridge. Queuing back through the roundabout would affect traffic circulation of the junction increasing congestion and the risk of road users hard/ late braking increasing the risk of nose to tail and side swipe collisions. Queuing onto the bridge would restrict traffic movements southbound as it would narrow an already narrow carriageway. Queuing on the north side of the bridge may be masked by the crest of the bridge, increasing the risk of nose to tail collisions. During the site visit, the audit team observed at times the existing traffic flow for the roundabout queuing back across the proposed traffic signal junction location. Traffic waiting at the traffic signals associated with the bridge was also observed queuing back across the proposed traffic signal junction area. Queues for the existing roundabout and bridge may cause obstruction of the proposed junction, increasing the risk of road user frustration, side swipe, side impacts and nose to tail collisions.	It is recommended that measures are put in place to reduce the risk of vehicles obstructing the adjacent roundabout and traffic signalised bridge	**Accept the RSA problem and recommendation made by the RSA team.** The phasing of the proposed traffic signals will reduce the risk of vehicles obstructing the adjacent roundabout and traffic signalised bridge is as low as reasonably practicable.	Accepted	Proceed as Design Team Response

RSA Ref	Location	RSA Problem	RSA Recommendation	Design Team Response	Network Rail Response	Agreed RSA action
2.11	Site Compound A1, Bicester Road.	**Failure to stop at traffic signal stop line** It is unclear from the drawings provided to audit if high friction surface or high PSV carriageway surfacing will be provided on the approaches to the proposed traffic signal junction. The uphill and downhill gradients on the approaches to the traffic signal junction may increase the risk of road users failing to stop at a stop line, late braking/ hard braking leading to nose to tail collisions, or restart collisions.	It is recommended that a high friction or high PSV surface is provided on the approaches to the signalised junction to aid road user braking	**Disagree with the RSA problem and recommendation raised by the RSA team.** This problem is not seen as a critical item due to the close proximity of the existing roundabout and signalised bridge to the proposed signalised junction. Due to the short distance between the existing roundabout to the north and the signalised bridge to the south it can be assumed that the majority of vehicles will be traveling at speeds lower than the actual road speed. There is also sufficient visibility on the approach to the proposed junction in both directions to allow road users to clearly see the traffic signal heads.	Accepted	Proceed as Design Team Response
2.12	Site Compound A1, Bicester Road.	**Non-provision of non-motorised user access may increase risk of nonmotorised user collisions with compound traffic** Bicester Road has footway and cycle facilities along its southern kerb line. The site is also close to a network of cycle facilities around Bicester. The presence of the facilities may increase the likelihood of road users accessing the site other than by motorised means. Footway/ cycle facilities have not been proposed to allow access into the compound from the southern kerb line of Bicester Road. Non-motorised users will have to cross Bicester Road uncontrolled, to walk along the verge (increasing the risk of tripping, slipping or falling on an uneven verge) or walk/ cycle in the carriageway increasing the risk of collisions between non-motorised users and works vehicles	It is recommended to provide footway and cycle access to the proposed compound.	**Disagree with the RSA problem and recommendation raised by the RSA team.** There is no existing provision in this location and it is unclear why a temporary construction access would generate a requirement. It is not the intention of EWR Alliance to encourage pedestrian access to the site at this location for the reasons identified by the Road Safety Auditor.	Accepted	Proceed as Design Team Response
2.13	Site Compound A1, Bicester Road.	**Increased risk of cyclist collisions with traffic signal pole** The primary traffic signal for northbound traffic on Bicester Road is proposed in the middle of an existing cycleway. Positioning the traffic signal pole in the cycleway may increase the risk of cyclists colliding with the pole during periods of reduced visibility, i.e. during the hours of darkness, or cyclists colliding with pedestrians on the adjacent footway whilst trying to avoid the pole	It is recommended that the traffic signal pole be relocated outside of the footway/cycleway.	**Accept the RSA problem and recommendation made by the RSA team.** Traffic signal pole will be positioned outside of the footway/ cycleway.	Accepted	Proceed as Design Team Response

RSA Ref	Location	RSA Problem	RSA Recommendation	Design Team Response	Network Rail Response	Agreed RSA action
2.14	Site Compound A1, A2, A2_J_9, Bicester Road, Station Road, and Mill Road	**Lack of road marking provision may increase the risk of collisions between road users** It is unclear from the drawings provided whether road markings are proposed as part of the works. By not providing adequate road markings it may increase the risk of failure to stop at a traffic signal-controlled junction (compound access arm at A1), failure to give way at a junction, collisions between opposing traffic flows leading to side impacts, late/ hard braking, or head on collisions.	It is recommended that adequate road markings are provided where road users are expected to give way, stop for traffic signals, and to separate traffic flows. Road markings should be extended where the carriageway is widened.	**Accept the RSA problem and recommendation made by the RSA team.** Road markings will be provided as part of the works as required.	Accepted	Proceed as Design Team Response

EWR Alliance

4th Floor
One Victoria Square
Paradise Street
Birmingham
B1 1BD

Tel. +44
Email