

Appendix D – Junction Layout Drawings

Technical Note for Design Strategy

Project Name: Land South and East of Adastral Park, Ipswich, Suffolk
Project Number: 10391
Client Name: Carlyle Land Ltd and Commercial Estates Group
Note Number: 07
Date: September 2017
Prepared By: Matthew Moss
Checked By: Lee Witts
Subject/Topic: Proposed Traffic Signals Access off A12 Dual Carriageway



Item	Subject
1	<p>Brookbanks Consulting Limited is appointed by CEG to provide transportation advice for a proposed mixed-use development on land at Adastral Park near Ipswich in Suffolk. The aim of this signal-controlled junction design is to provide an access from the west of the proposed development via the A12 Dual Carriageway.</p> <p>This note should be read in conjunction with drawing no: 10391-HL-07C. The existing length of the A12 Dual Carriageway affected by this scheme is:</p> <ul style="list-style-type: none">• Approximate carriageway and footway dimensions: 2 No. 7.3m Carriageways, 1 No. 5m Central Reservation, 1 No. 2m footway on north-eastern edge with 1.5m verge.• Local Vegetation/Existing Constraints: Ministry of Defence Training Base to north-east of development site. Laybys on northbound and southbound carriageways to be removed as agreed with highway authority. Artificial Embankment on east side of dual carriageway to be partly removed to accommodate the signal-controlled junction.• Local Speed Limits: 70 mph (120 kph).• Street Lighting: None.• Local water courses that may constrain the site: None.• Local Accesses that must be maintained: Existing Bridleway Alignment to be maintained. <p>No discussions have taken place with the Local Authority or Highways England at the time of writing.</p> <div data-bbox="240 1621 700 1928"></div> <div data-bbox="240 1939 719 1966"><p>Figure 1: Northbound Carriageway looking North</p></div> <div data-bbox="820 1621 1279 1928"></div> <div data-bbox="820 1939 1299 1966"><p>Figure 2: Northbound Carriageway looking South</p></div>



Figure 3: Southbound Carriageway looking North



Figure 4: Southbound Carriageway looking South

2 Design Standards:

The design parameters of the proposed junction have been determined following a review of the following documents:-

- Design Manual for Roads and Bridges:
 - TA 23/81: Junctions and Accesses – Determination of Size of Roundabouts and Major-Minor Junctions;
 - TA 90/05: The Geometric Design of Pedestrian, Cycle and Equestrian Routes;
 - TA 91/05: Provision for Non-Motorised Users;
 - TD 9/93: Highway Link Design;
 - TD 50/04: The Geometric Layout of Signal-controlled Junctions and Signalized Roundabouts
- LTN 2/95: Pedestrian Crossings;
- Traffic Signs Manual Design Standard: Chapter 5 Road Markings

3 Site Surveys:

No surveys were carried out for the site at the time of writing.

4 2D Design Elements:

- Northern Arm (Major): A12 Ring Road (North) 70 mph
- Eastern Arm (Minor): Adastral Park Road 30 mph
- Southern Arm (Major): A12 Ring Road (South) 70 mph
- Design Speed for the Major Road = 120 kph (TD 9/93, Table 2);
- Design Speed for the Minor Road = 60 kph (TD 9/93, Table 2);
- Desirable Minimum Stopping Sight Distance Major Road = 295m (TD 9/93, Table 3. TD 50/04 Item 2.7.);
- Desirable Minimum Stopping Site Distance Minor Road = 90m (TD 9/93, Table 3. TD 50/04 Item 2.7.);
- Inter-visibility Zone for a traffic signalised junction of up to 70m (TD 50/04 Item 2.10, Figure 2/2 and 2/3).

	DMRB COMPLIANCE WITH TD 50/04							
	Entry Lane Width into Junction (m)	Number of Lanes into Junction	Exit Lane Width from Junction (m)	Number of Lanes from Junction	Stopping Sight Distance (m)	Corner Radii to Left (m)	Exit Design Speed (mph)	Approx. Intervisibility Splay across Arm (m)
A12 Ring Road (North)	10.5	3	3.6	2	295	10	70	51
A12 Ring Road (South)	7.0	2	6.9	2	295	N/A	70	46
A12 Ring Road (South) Right-turn Lane	4.5	1	N/A	N/A	295	N/A	N/A	46
Adastral Park Road	7.0	2	4.5	1	90	15	30	70

5 Buffer Zone

It is recommended in LTN 1/12 that shared use routes alongside high speed roads (i.e. 85th percentile speed of 35mph or more), user comfort and safety can be improved by maximising the separation distance between the carriageway and the shared use facility to create a buffer zone.

Furthermore, TA 90/05 states that it is desirable to provide physical separation between Non-Motorised User (NMU) routes and carriageways. Item 7.22 states that the recommended preferred separation between NMU routes and the carriageway is 1.5m, with an acceptable separation of 0.5m. There should be no street furniture or vegetation (except grass) within the separation distance.

Therefore, a buffer zone of 1.5m will be provided. This buffer zone has been formed by a 1.5m continuous grass verge and the total width of footway area is 2m.

6 Relation to Existing Access Points

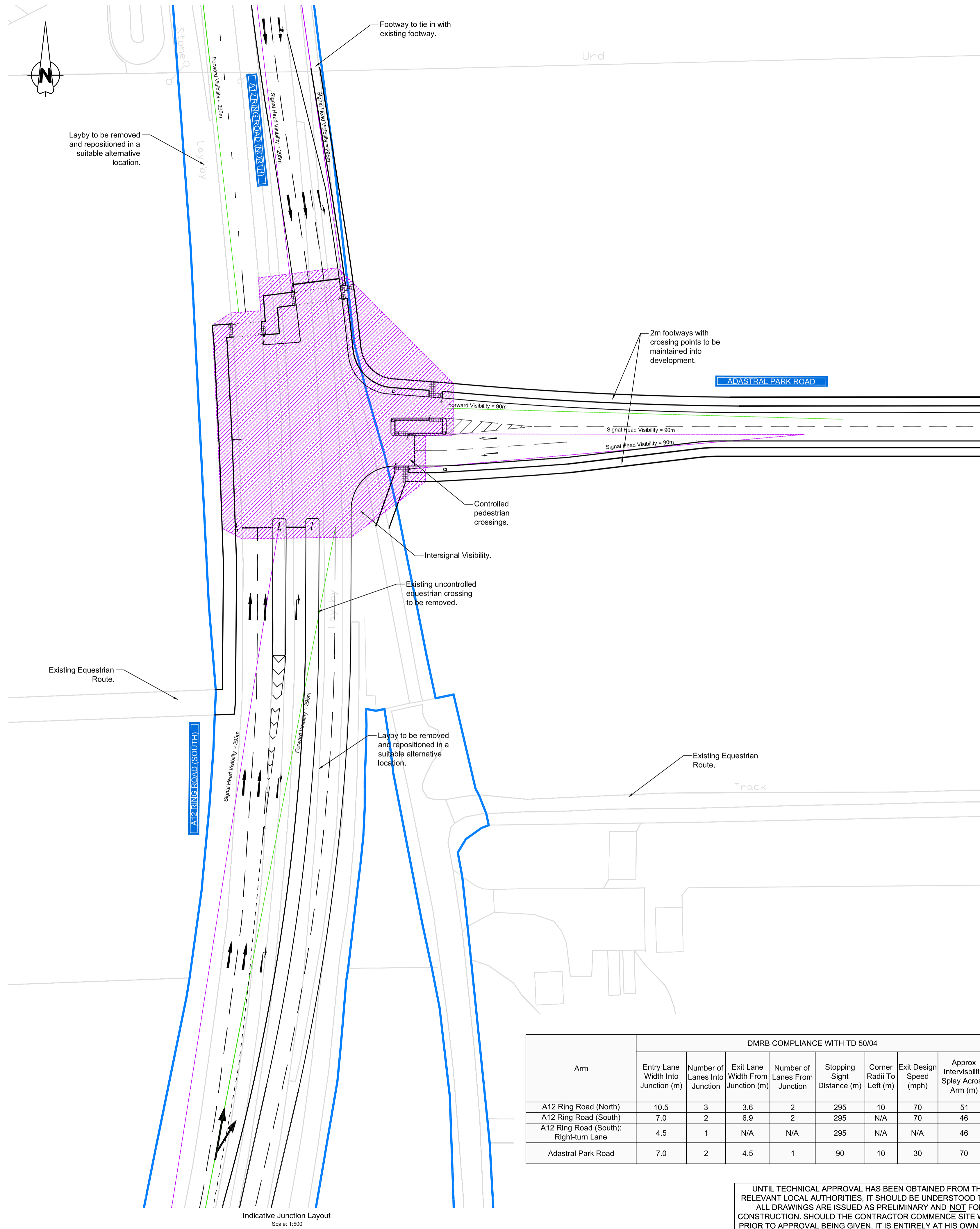
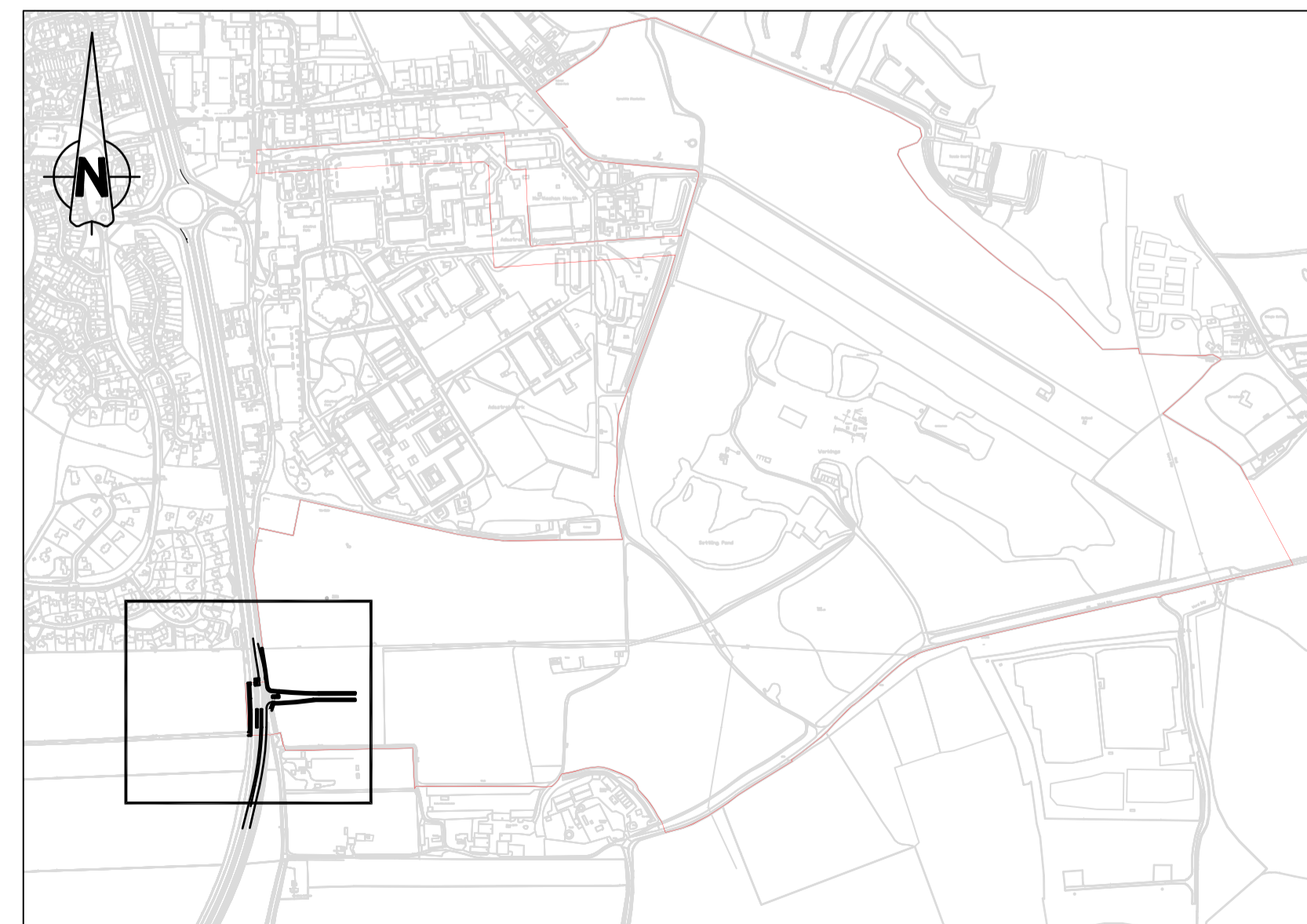
The proposed traffic signal controlled junction has been located near an existing roundabout with Newbourne Road and Foxhall Way to the south. It is located an appropriate distance from this roundabout. Any traffic movements undertaken into or out of these existing access points are not restricted by the proposed junction.

7 Traffic Signs

Advance Direction Signs (ADS) shall be provided on the approaches to the signal-controlled junction, as well as Flag type directional signs on the exit arms as prescribed in the Traffic Signs Regulations and General Directions (TRSGD). Care has been taken with the positioning and the size of these signs so that they do not interfere with driver's visibility requirements. A 2m mounting height will be provided to Flag type signs to ensure visibility is not restricted (Mandatory Item 8.2).

Guidance on the design of directional traffic signs is given in the Traffic Signs Manual (Chapter 7) and LTN 1/94 – 'The Design and Use of Directional Informatory Signs', particularly Appendix A. The 'x' heights for these directional sign have been informed by the existing 60 mph speed limit along the highway.

	<p>Road Markings</p> <p>The existing road markings along the A12 Dual Carriageway have been provided in response to the existing 60 mph speed limit along the highway. The proposed speed limit along Adastral Park Road (30 mph) has required the road markings to be designed to reflect this lower limit. All road markings have been informed by Traffic Signs Manual Chapter 5.</p>
<p>8</p>	<p>Highway Boundary</p> <p>The location of the existing highway boundary has been determined using plans provided by Suffolk County Council which has been transferred onto survey data.</p> <p>It has been confirmed by Suffolk County Council that the Highway Boundary is located as indicated on the drawings.</p> <p>The design of this signal-controlled junction requires additional carriageway width in order to accommodate the infrastructure. The signal-controlled junction will be constructed slightly off line to the existing carriageway so that no works encroach onto 3rd party land not within the control of the Developer or Highway Authority.</p>
<p>9</p>	<p>Street Lighting</p> <p>The A12 Ring Road, at the location of the proposed junction does not have a system of street lighting. However, the proposed signal-controlled junction and the Development Access Road are recommended to be illuminated by a system of street lighting. The extent and classification of lighting will be determined by Suffolk County Council.</p>



Arm	DMRB COMPLIANCE WITH TD 50/04							
	Entry Lane Width Into Junction (m)	Number of Lanes Into Junction	Exit Lane Width From Junction (m)	Number of Lanes From Junction	Stopping Sight Distance (m)	Corner Radii To Left (m)	Exit Design Speed (mph)	Approx. Intervisibility Splay Across Arm (m)
A12 Ring Road (North)	10.5	3	3.6	2	295	10	70	51
A12 Ring Road (South)	7.0	2	6.9	2	295	N/A	70	46
A12 Ring Road (South): Right-Turn Lane	4.5	1	N/A	N/A	295	N/A	N/A	46
Adastral Park Road	7.0	2	4.5	1	90	10	30	70

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.

Construction Design and Management (CDM) Key Residual Risks
 Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

- 1) Overhead and underground services
- 2) Street Lighting Cables
- 3) Working adjacent to water courses and flood plain
- 4) Soft ground conditions
- 5) Working adjacent to live highways and railway line
- 6) Unchartered services
- 7) Existing buildings with potential asbestos hazards

- NOTES:**
1. Do not scale from this drawing
 2. All dimensions are in metres unless otherwise stated.
 3. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
 4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting.
 5. The junctions, roundabouts and links have been designed in accordance with the following DMRB standards:
 - TA 23/81: Junctions and Accesses - Determination of Size of Roundabouts and Major-Minor Junctions
 - TA 90/05: The Geometric Design of Pedestrian, Cycle and Equestrian Routes;
 - TA 91/05: Provision for Non-Motorised Users;
 - TD 9/93: Highway Link Design;
 - TD 50/04: The Geometric Layout of Signal-controlled Junctions and Signalized Roundabouts.

- KEY:**
- Site Boundary
 - Assumed Highway Boundary
 - Signal Head Visibility
 - Traffic Signal Head
 - Pedestrian Signal Head with Push Button
 - Intersignal Visibility
 - Forward Visibility on Exit
 - Tactile Paving

C Modifications as per RSA comments. MDM LW PAB 07.09.17
 B Modifications as per SCC's comments. MDM LW PAB 01.09.17
 A Reflection of existing speed limits. MDM LW PAB 01.08.17
 - First Issue - - - 21.06.17

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Carlyle Land Ltd and
 Commercial Estates Group
 Land South and East of
 Adastral Park, Ipswich





Proposed Western Signalized
 Access off A12 Dual Carriageway

Status	Approval	Checked	MDM	LW	Date	June 2017
Scale	As Shown	Number	10391-HL-07	Rev	C	21.06.2017

0 10 20 30 40 50
 METRES

Technical Note for Design Strategy

Project Name: Land South and East of Adastral Park, Ipswich, Suffolk
Project Number: 10391
Client Name: Carlyle Land Ltd and Commercial Estates Group
Note Number: 03
Date: September 2017
Prepared By: Matthew Moss
Checked By: Lee Witts
Subject/Topic: Proposed Priority Junction Accesses off Ipswich Road

Item	Subject
1	<p>Brookbanks Consulting Limited is appointed by CEG to provide transportation advice for a proposed mixed-use development on land at Adastral Park near Ipswich in Suffolk. The aim of these priority junction designs is to provide accesses from the south of the proposed development via Ipswich Road.</p> <p>This note should be read in conjunction with drawing nos: 10391-HL-04 and 10391-HL-05. The existing length of the A12 Dual Carriageway affected by this scheme is:</p> <ul style="list-style-type: none">• Approximate carriageway and footway dimensions: Average 5.5m Carriageway.• Local Vegetation/Existing Constraints: Ditches in immediate vicinity of road.• Local Speed Limits: 60 mph (100 kph)• Street Lighting: None.• Local water courses that may constrain the site: None.• Local Accesses that must be maintained: None. <div data-bbox="240 1317 699 1626"></div> <div data-bbox="240 1637 699 1664"><p>Figure 1: Ipswich Road (West Site) looking East</p></div> <div data-bbox="820 1317 1278 1626"></div> <div data-bbox="820 1637 1278 1664"><p>Figure 2: Ipswich Road (West Site) looking West</p></div> <div data-bbox="240 1711 729 2020"></div> <div data-bbox="240 2031 699 2054"><p>Figure 3: Ipswich Road (East Site) looking East</p></div> <div data-bbox="820 1711 1278 2020"></div> <div data-bbox="820 2031 1278 2054"><p>Figure 4: Ipswich Road (East Site) looking West</p></div>

2 **Design Standards:**

The design parameters of the proposed junction have been determined following a review of the following documents:-

- Design Manual for Roads and Bridges:
 - TD 9/93: Highway Link Design;
 - TD 42/95: Geometric Design of Major-Minor Priority Junctions.
- Manual for Streets;
- Traffic Signs Manual Design Standard: Chapter 5 Road Markings

3 **Site Surveys:**

No surveys were carried out for the site at the time of writing.

4 **2D Design Elements:**

- Western Arm (Major): Ipswich Road (West) 60 mph
- Northern Arm (Minor): Adastral Park Road 30 mph
- Eastern Southern Arm (Major): Ipswich Road (East) 60 mph
- Design Speed for the Major Road = 100 kph (Manual for Streets: Table 7.1);
- Design Speed for the Minor Road = 48 kph (Manual for Streets: Table 7.1);

	DMRB COMPLIANCE WITH TD 42/95					
	Corner Radii (m)	Lane Widths through Junction (m)	Taper for Ghost Island (m)	Direct Taper for Ghost Island (m)	Design Speed (mph)	Deceleration Length (m)
Ipswich Road (West)	10	3.25	N/A	N/A	60	N/A
Adastral Park Road	10	3.25	N/A	N/A	30	N/A
Ipswich Road (East)	N/A	3.25	N/A	N/A	60	N/A

7 **Traffic Signs**

Advance Direction Signs (ADS) shall be provided on the approaches to the priority junction, as well as Flag type directional signs on the exit arms as prescribed in the Traffic Signs Regulations and General Directions (TRSGD). Care has been taken with the positioning and the size of these signs so that they do not interfere with driver’s visibility requirements. A 2m mounting height will be provided to Flag type signs to ensure visibility is not restricted (Mandatory Item 8.2).

Guidance on the design of directional traffic signs is given in the Traffic Signs Manual (Chapter 7) and LTN 1/94 – ‘The Design and Use of Directional Informatory Signs’, particularly Appendix A. The ‘x’ heights for these directional sign have been informed by the existing speed limit being maintained on the highway.

	<p>Road Markings</p> <p>The road markings along Ipswich Road have been provided in response to the existing speed limit along Ipswich Road of 60 mph. The proposed speed limit along Adastral Park Road (30 mph) has required the road markings to be designed to reflect this lower limit. All road markings have been informed by Traffic Signs Manual Chapter 5.</p>
<p>8</p>	<p>Highway Boundary</p> <p>The location of the existing highway boundary has been determined using plans provided by Suffolk County Council which has been transferred onto survey data.</p> <p>It has been confirmed by Suffolk County Council that the Highway Boundary is located as indicated on the drawings.</p> <p>The design of these priority junctions requires additional carriageway width in order to accommodate the infrastructure. The priority junctions will be constructed slightly off line to the existing carriageway so that no works encroach onto 3rd party land not within the control of the Developer or Highway Authority.</p>
<p>9</p>	<p>Street Lighting</p> <p>Ipswich Road, at the location of the proposed junction does not have a system of street lighting. However, the proposed Priority Junction and the Development Access Road is recommended to be illuminated by a system of street lighting. The extent and classification of lighting will be determined by Suffolk County Council.</p>