

Road Safety Audit Overview

A Road Safety Audit (RSA) considers the road safety implications of a scheme on all roads users, particularly vulnerable users. The RSA team are independent from the designers and identify potential risks and mitigation measures for consideration by the designer and client.

RSA is not a single procedure but a series of stages carried out pre and post implementation.

Stage 1: Completion of Preliminary Design / Conceptual Design

Carried out as soon as practicable following completion of the preliminary design, when the scheme is sufficiently progressed so that all significant features are clearly shown.

Stage 2: Completion of Detailed Design

Carried out as soon as practicable after the detailed design is sufficiently progressed so that it could be constructed.

Stage 3: Completion of Construction

Carried out as soon as practicable after the works are complete.

Stage 4: Monitoring

Carried out when monitoring identifies an emerging collision problem.

Further information about RSA is set out in [TfL's RSA Procedure note: SQA-0170](#)

Mini Holland Cycle Scheme

Stage 1 Road Safety Audit

Ref: 2524/032/A105/BOR/2016

Prepared for:

London Borough of Enfield

By:

Road Safety Audit, TfL Asset Management Directorate

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Approved by: Andrew Coventry

Version	Status	Date
A	Audit report issued to Client	22/03/2016



1.0 INTRODUCTION

1.1 Commission

- 1.1.1 This report results from a Stage 1 Road Safety Audit carried out on the A105 Green Lanes, Enfield, Mini Holland Cycle Scheme proposals.
- 1.1.2 The Audit was undertaken by TfL Road Safety Audit in accordance with the Audit Brief issued by the Client Organisation on 1st February 2016. It took place at the Palestra offices of TfL on 1st March 2016 and comprised an examination of the documents provided as listed in Appendix A, plus a visit to the site of the proposed scheme.
- 1.1.3 The visit to the site of the proposed scheme was made on 1st March 2016. During the site visit the weather was overcast and the existing road surface was dry.

1.2 Terms of Reference

- 1.2.1 The Terms of Reference of this Audit are as described in TfL Procedure SQA-0170 dated May 2014. The Audit Team has examined and reported only on the road safety implications of the scheme as presented and how it impacts on all road users and has not examined or verified the compliance of the designs to any other criteria. However, to clearly explain a safety problem or the recommendation to resolve a problem the Audit Team may, on occasion, have referred to a design standard without touching on technical audit. An absence of comment relating to specific road users / modes in Section 3 of this report does not imply that they have not been considered; instead the Audit Team feels they are not adversely affected by the proposed changes.
- 1.2.2 This Safety Audit is not intended to identify pre-existing hazards which remain unchanged due to the proposals; hence they will not be raised in Section 3 of this report as they fall outside the remit of Road Safety Audit in general as specified in the procedure SQA-0170 dated May 2014. Safety issues identified during the Audit and site visit that are considered to be outside the Terms of Reference, but which the Audit Team wishes to draw to the attention of the Client Organisation, are set out in Section 4 of this report.
- 1.2.3 Nothing in this Audit should be regarded as a direct instruction to include or remove a measure from within the scheme. Responsibility for designing the scheme lies with the Designer and as such the Audit Team accepts no design responsibility for any changes made to the scheme as a result of this Audit.
- 1.2.4 In accordance with TfL Procedure SQA-0170 dated May 2014, this Audit has a maximum shelf life of 2 years. If the scheme does not progress to the next stage in its development within this period, then the scheme should be re-audited.
- 1.2.5 Unless general to the scheme, all comments and recommendations are referenced to the detailed design drawings and the locations have been indicated on the plan located in Appendix B.
- 1.2.6 It is the responsibility of the Design Organisation to complete the Designer's response section of this Audit report. Where applicable and necessary it is the responsibility of the Client Organisation to complete the Client comment section of this Audit report. Signatures from both the Design Organisation and Client Organisation must be added within Section 5 of this Audit report. A copy of which must be returned to the Audit Team.

1.3 Main Parties to the Audit

1.3.1 Client Organisation

Client contact details: Paul Rogers – London Borough of Enfield

1.3.2 Design Organisation

Design contact details: Alexander Stebbings - Jacobs

1.3.3 Audit Team

Audit Team Leader: Kevin Seymour – TfL Road Safety Audit

Audit Team Member: Shane Martin – TfL Road Safety Audit

Audit Team Observer: None Present

1.3.4 Other Specialist Advisors

Specialist Advisor Details: None Present

1.4 Purpose of the Scheme

The purpose of the scheme is to provide 5.5km of two-way segregated cycle route with public realm improvements at town centres*.

*Taken directly from the Audit Brief.

1.5 Special Considerations

1.5.1 The Audit Team has no special considerations to raise.

2.0 ITEMS RAISED IN PREVIOUS ROAD SAFETY AUDITS

The Audit Team is not aware of any other Audits having been carried out on the proposals.

3.0 ITEMS RAISED AT THIS STAGE 1 ROAD SAFETY AUDIT

This section should be read in conjunction with Paragraphs 1.2.1, 1.2.2 and 1.2.3 of this report.

3.1 GENERAL

3.1.1 PROBLEM

Location: General to the scheme – combined zebra/cycle crossing facilities

Summary: Proposed zebra and cycle crossing layouts may result in drivers failing to give way to cyclists

The Audit Team are concerned that the proposed zebra and cycle crossings may not be understood by motorists particularly as the layout is new to drivers and not currently a permitted marking. The following issues may result in an increased potential for collisions:

- Zebra crossings are well established and the conspicuousness of the thick black and white striped road markings help to clearly indicate that a pedestrian has priority over vehicular traffic in this area. The lack of these markings within the proposed cycle section of the crossing may lead to ambiguity over who has priority and motorists may fail to give way to cyclists.
- Slow approach speeds by pedestrians enable an approaching motorist to notice they intend to cross, slow down and stop. Cyclists are likely to approach faster than pedestrians and may therefore fail to be noticed by approaching motorists.
- The cycle element of the crossing is potentially ambiguous as there isn't currently a legal requirement for vehicles to stop for cyclists however a cyclist approaching may expect the same priority as adjacent pedestrians.

These issues may lead to an increased potential for collisions between motorists and cyclists or shunt type collisions as motorists brake hard as they unexpectedly encounter a cyclist attempting to assert priority.

These crossings are provided at likely cycle cross routes and it is unclear how the proposed facilities will link in with existing facilities.

RECOMMENDATION

Provide measures which will allow cyclists to assert priority over motorists. This could include an alternative crossing type, or provide appropriate temporary signing etc to inform drivers of the intended usage until this layout becomes more commonplace.

Proposed facilities should link in safely with existing cross routes.

Design Organisation Response	Rejected
<p>This type of crossing appears in the new TSRGD which will be coming into force on the 22nd of April 2016. We refer to page 476 Sign table Item 53, Schedule 14, Part 2 in the new TSRGD document. The crossings are proposed for the A105 as well as other major corridors as part of Cycle Enfield so will be common within the borough of Enfield within the next few years. The crossings have been sited at locations where a Greenway is intersecting with the A105 corridor and crossing facilities are required to safely link the routes. Signage will be introduced following</p>	

implementation, so that all road users will be aware of the proposed crossings.

Client Organisation Comments

Designer's response accepted - use of new crossings will be monitored post-implementation

3.1.2 PROBLEM

Location: General to the scheme - town centre / shopping street areas

Summary: Narrowed footway areas in shopping streets may bring cyclists and pedestrians closer together and lead to pedestrian to cycle collisions

Within the main shopping streets the cycle lanes will reduce footways and segregate pedestrians from crossing points, bus stops and parking / loading bays. Pedestrians using or crossing the cycle lanes may be at a greater risk of collision with cyclists.

RECOMMENDATION

A step kerbed definition between footway to cycle lane, and cycle lane to carriageway should be provided. A clear contrast colour and/or texture between cycle lane and footway should be introduced. The need for measures to address cycle speeds within the shopping areas should be assessed and introduced to ensure safe pedestrian to cycle interaction on the cycle lanes; this could include the provision of suitable "gateway" signing and features to highlight the change in cycling environment from "route" to "place".

Design Organisation Response	Part Accepted
<p>Given existing constraints imposed by low kerbs in some locations, it may not be possible to provide a continuous stepped facility from footway to cycle path to carriageway. The ability to provide a consistent stepped track will be confirmed at Detailed Design stage. Therefore, it is currently proposed that the cycle paths on footways will be flush with surrounding footway areas. The cycle path will be clearly identified through the use of different material (asphalt) to the surrounding footway which is predominantly to be concrete paving. This will also provide a marked tonal difference.</p>	

Client Organisation Comments

Designer's response accepted.

3.1.3 PROBLEM.

Location: General to the scheme – cycle lanes past junction locations

Summary: Segregated cycle lanes terminating just before side road junctions may increase left turning collisions between vehicles and cyclists

At a number of locations, segregated cycle lane / bypasses are returned to the carriageway just before side road junction locations. At such locations it may be difficult for both sets of road users to understand who has priority and this may lead to turning collisions involving cyclists, particularly where bus stop bypasses are located upstream of junctions and where 'floating' parking / loading areas are close to junctions. Cyclists may find it difficult to avoid vehicles emerging from side roads if

constrained by the kerb line of cycle bypass facilities, which could lead to increased risk of merging / failure to give way type collisions.

RECOMMENDATION

Research from TRL (PPR703 – Trials of segregation set-back at side roads) indicates that setting back cycle lanes by at least 20m from side roads may improve cyclist safety at junctions. Such an approach would have an effect on bus stop locations and the cycle bypass facilities provided at them. There is also likely to be an effect on the length of ‘floating’ parking / loading bays.

Design Organisation Response	Part Accepted
<p>Raised entry treatments have been proposed at all junctions, where there is parking or a bus stop on the approach to reduce the speeds of traffic turning into side roads.</p> <p>Bus stops are located in-carriageway so vehicles will be held behind stationary buses, which will therefore not affect visibility to the side road for left turning vehicles.</p> <p>The scheme reduces carriageway widths, which will reduce traffic speeds along the corridor, compared to existing, which will mitigate the reduction in visibility splays when compared to existing. We would also expect to see a behavioural change for all road users give the introduction of the transformational cycle facilities along the length of the corridor.</p> <p>Where visibility splays are significantly reduced, raised entry treatments will be introduced to reduce vehicle speeds further.</p> <p>For a short period after implementation signage will be provided to warn drivers of layout changes, for a short term.</p>	
Client Organisation Comments	
<p>Designer’s response accepted – post implementation monitoring will be carried out and adjustments to the scheme made if necessary</p>	

3.1.4 PROBLEM

Location: General to the scheme – side road cycle crossovers at raised junction tables

Summary: Drivers turning from main roads to side roads may brake late due to cyclists crossing side roads, leading to nose to tail collisions, or cycle to vehicle conflict

At a number of locations the off-road cycle facilities cross side roads at raised table areas. Drivers turning from the main road have a short stacking space between the main road and these cycle crossovers due to the location of the give way lines to create priority for cyclists. Drivers may be confused by the arrangement and fail to give way to cyclists, or may stop suddenly and remain partially within the main carriageway, which may lead to late braking nose to tail collisions.

Drivers entering the main road may be confused by the double give way feature, and/or stop across the cycle lane, which may lead to nose to tail collisions or cycle to vehicle conflict.

There is inconsistency in the provision of give ways for cyclists at such crossing locations and this may confuse users and lead to failure to give way type conflicts between cycles and vehicles.

RECOMMENDATION

If such cycle priority is to be provided at side roads then an appropriate stacking space should be provided between the main road and cycle crossing to allow a single vehicle to wait between the main road and cycle crossing without encroaching in to the main carriageway or blocking the cycle crossing (reference London Cycle Design Guide).

Design Organisation Response	Rejected
<p>Where there is available footway space an offset of 6m between the cycle lane and junction mouth has been provided to allow cycle priority with scope for a car to turn into the side road and wait, without blocking A105 traffic. However, given the available space this is not possible at the majority of side roads and has only been include where possible. It is felt that providing the added protection to cyclists where possible will benefit the scheme. Signage will be provided to warn traffic on the approach to these treatments.</p>	
Client Organisation Comments	
<p>Designer's response accepted – post implementation monitoring will be carried out and adjustments to the scheme made if necessary</p>	

3.1.5 PROBLEM

Location: General to the scheme – bus stops / loading / parking bays close to side roads

Summary: Stationary vehicles close to side road junctions and accesses may restrict junction visibility splays and lead to failure to give way type collisions

At many locations loading / parking and bus stop bays are located close to side road junctions and accesses. Stationary vehicles close to side roads may restrict visibility for drivers emerging from the side roads and this may lead to failure to give way type collisions.

RECOMMENDATION

Appropriate visibility splays at side roads should be provided and kept free of obstruction and stationary vehicles.

Design Organisation Response	Part Accepted
<p>We accept the comment however the majority of the side roads, where visibility splays are not to standard Manual for Street (MfS), are comparable with the existing situation, where visibility splays are also below the recommended standards. There also are some locations where the visibility splays in the proposed are improved compared to the existing, as a result of replacing the uncontrolled on street parking with lightly segregated cycle lanes.</p> <p>The scheme reduces carriageway widths, which will reduce traffic speeds along the corridor, compared to existing, which will mitigate the reduction in visibility splays when compared to existing. We would also expect to see a behavioural change for all road users give the introduction of the transformational cycle facilities along the length of the corridor.</p> <p>Where visibility splays are significantly reduced, raised entry treatments will be</p>	

introduced to reduce vehicle speeds further.

For a short period after implementation signage will be provided to warn drivers of layout changes, for a short term.

Client Organisation Comments

Designer's response accepted – post implementation monitoring will be carried out and adjustments to the scheme made if necessary

3.2 DRAWING 001-01

3.2.1 PROBLEM

Location: A - Zebra crossing near Village Road

Summary: Narrow footways may bring cyclists and pedestrians into conflict

The footways in the vicinity of the zebra crossing are relatively narrow and may not safely accommodate pedestrians and cyclists at the crossing area. This may lead to pedestrian to cycle collisions.

RECOMMENDATION

The footway areas should be widened to accommodate both user types. Cycle routes through the crossing area should be clarified.

Design Organisation Response	Part Accepted
<p>It is accepted that footways are constrained in this location which is why the corner between Village Road and Green Lanes, outside Ascot Lodge has been tightened. However no further widening of the footway is recommended as carriageway widths are already constrained on the bend, with traffic lanes at 3.25m wide and the cycle lane at approximately 1.70m wide at the crossing location. Pedestrian volumes are low at this location and therefore it is felt that the benefits from widening the footway further would be small for pedestrians but the dis-benefits to motor traffic and cyclists' safety would be significant. The crossing provides a safe movement for nervous cyclists travelling to and from the greenway cycle routes.</p>	
<h4>Client Organisation Comments</h4> <p>Designer's response accepted</p>	

3.3 DRAWING 001-02

3.3.1 PROBLEM

Location: B - At the zebra crossing near Bush Hill

Summary: Poor visibility at the bend may lead to failure to give way type collisions involving pedestrians

On the southbound approach to the crossing, drivers may have a poor view of pedestrians on the eastern footway. This may lead to drivers failing to give way at the crossing and may result in pedestrian to vehicle collisions.

RECOMMENDATION

It is acknowledged that the raised table will reduce vehicle speeds however adequate visibility between users should be provided at the crossing. This may require the relocation of the crossing.

Design Organisation Response	Rejected
<p>The proposed visibility splay is 33.8m. Relocating the crossing to the south reduces visibility splays, and there is no scope to the north because of the junctions of Uvedale Road and Bush Hill.</p> <p>ATC data shows that the mean speed is 22.6mph and 85%ile of 25.9 at a comparable location (Green Dragons Lane to the south of Bush Hill on the A105).</p> <p>The proposed scheme reduces carriageway widths and the area is on a raised table and is therefore likely to reduce speeds, compared to existing.</p> <p>Assuming a speed of 25mph the recommended Stopping Sight Distance (SSD) is 33m, at 20mph this is 25m.</p> <p>The alternative would be to remove the crossing which is considered a negative impact on pedestrians, particularly with the closely associated bus stops to the south.</p>	
Client Organisation Comments	
Designer's response accepted	

3.3.2 PROBLEM

Location: C - At Bush Hill and Uvedale Road

Summary: Inconsistent cycle crossing facilities may lead to late braking nose to tail or failure to give way type collisions

There are inconsistent cycle crossing facilities across these junction cycle facilities. At Bush Hill drivers entering the side road are asked to give way to cyclists, whereas at Uvedale Road there are no give way facilities. The inconsistent provision may confuse drivers and cyclists and may lead to failure to give way or late braking type collisions.

RECOMMENDATION

The cycle crossing provision at these junctions should be consistent with each other and consistent along the route to assist users in adequately comprehending the likely manoeuvres of users at these locations.

Design Organisation Response	Accepted
<p>The design has been amended so there is a consistent layout on both side arms</p>	
Client Organisation Comments	
Designer's response accepted	

3.4 DRAWING 001-04

3.4.1 PROBLEM

Location: D - Bush Hill Road – Avenue Parade access

Summary: Two-way cycle lane past side road access may increase the potential for turning collisions involving cyclists

The two-way cycle lane past the shopping parade access is likely to increase the complexity of decision making for drivers making turns to or from the access. Poor turning manoeuvres are likely to increase the likelihood of collisions involving cyclists at this location.

RECOMMENDATION

Ideally, the cycle lane should be one-way, with alternative routing for cyclist travelling eastbound. If such an arrangement is not possible then the side road access area could be raised on a platform to give cyclists priority across the access (similar to 'Copenhagen' style junction crossovers).

Design Organisation Response	Part Accepted
<p>Under the proposed designs the service road (Avenue Parade) would become one-way north-eastbound, so vehicles from Bush Hill Road cannot turn directly onto Avenue Parade. This simplifies the turning manoeuvres from Avenue Parade to Bush Hill Road compared to the existing situation. The cycle track on Bush Hill Road will be raised to give cyclists priority across the access, as recommended.</p> <p>There is not scope to provide a one-way segregated cycle track on Bush Hill Road and Church Street due to constraints on carriageway widths.</p>	
Client Organisation Comments	
<p>Designer's response accepted</p>	

3.5 DRAWING 001-07

3.5.1 PROBLEM

Location: E – Station Road entry treatment

Summary: Cycle crossing close to the ramped exit from Green Lanes may mean the rear end of a car remains on the main carriageway with consequent risk of vehicle to vehicle collisions

The ramped access on to the entry feature may mean that some drivers stop to give way to cyclists at the raised feature, with the rear of their vehicle remaining in the main carriageway. Following drivers may not comprehend the need for vehicles to give way and this may lead to failure to give way type collisions.

RECOMMENDATION

The cycle crossing should be located to allow a left turning vehicle to be positioned on the raised platform area, rather than on the ramp, or partially within the main carriageway.

Design Organisation Response	Accepted

The design has been amended to address this. Stacking space of approximately 6m (excluding the ramp) has been provided for the left turning vehicle onto Station Road.

Client Organisation Comments

Designer's response accepted

3.5.2 PROBLEM

Location: F – At the junction of Station Road / Fords Grove with Green Lanes

Summary: Right turn cyclists unaware of / ignoring the proposed 2SRT, could potentially be in conflict with other traffic movements at the junction leading to vehicle to cycle and cycle to cycle collisions

It is proposed to introduce 'two-stage right turn' (2SRT) facilities for cyclists turning right from Green Lanes. It is not known if an 'early release' signal feature is incorporated as part of the 2SRT facility. There is a concern that cyclists turning right from Green Lanes might not be aware of / ignore the proposed 2SRT, leading to vehicle to cycle and cycle to cycle collisions at the junction.

RECOMMENDATION

It is recommended that 'early release' signals should be provided for the 2SRT facilities. The need for right turn facilities for cyclists making the manoeuvre from both Fords Grove and Station Road directions should be assessed and, if appropriate they should be consistent with the proposed facilities for the other right turn manoeuvres.

Ensure that cyclists approaching the junction are informed of the facility, by providing 2SRT direction signs. It should be ensured that cyclists can see an appropriate signal head when making the right turn manoeuvre in two stages.

Design Organisation Response	Rejected
<p>A cycle early release cannot be incorporated into the design due to its implications on the junction's capacity. Transport for London is currently implementing 2-Stage right turns, without early release. The Traffic Infrastructure team within TfL have confirmed that 2 Stage right turns without early release can be implemented at these locations. The volume of right turn cycles is anticipated to be low as Station Road and Ford's Grove do not form part of the cycle network.</p> <p>Signage will be located on the approach to junctions so cyclists are informed of the facility.</p>	
Client Organisation Comments	
Designer's response accepted	

3.6 DRAWING 001-08

3.6.1 PROBLEM

Location: G - At Compton Road

Summary: Loading bay and bus stop located close to the junction may lead to failure to give way type collisions

When the northbound bus stop is occupied there will be poor side road visibility to the left for drivers emerging from Compton Road. When the loading bay to the right of Compton Road is occupied, visibility to the right for drivers emerging from the side road will be reduced. Poor side road visibility may lead to failure to give way type collisions.

RECOMMENDATION

Adequate side road visibility should be provided and maintained free from obstruction. The bus stop and loading bays could be relocated to provide appropriate side road visibility. Additional speed reducing features could be introduced to minimise the relocation distance.

Design Organisation Response	Rejected
<p>The bus stop is served by the 329 and 629, as well as the N29. The 629 is a school bus so the only regular bus is the 329, which has a frequency of 8 PCUs per hour. So the amount of time when the bus stop is in use over the hour will be low. Also the bus cage is 22m long so a bus would be located in the front portion of the bus cage and not block back to the rear of the cage.</p> <p>It is not considered possible to relocate the bus stop further north, as this will reduce the footway.</p> <p>The loading bay is located 20m from the side road and is 6m in length, so will not be used by MGVs/HGVs or other high sided vehicles.</p> <p>It is accepted that the visibility splays are below recommend length. However, although reduced, the visibility splays are comparable with existing. The proposed design is considered better in terms of visibility as Compton Road is at right angles to the A105, whereas previously it was at an acute angle, even though both the right and the left turns were permitted.</p> <p>Furthermore, the scheme reduces the carriageway width, which is anticipated to reduce traffic speeds on the A105.</p>	
Client Organisation Comments	
Designer's response accepted	

3.6.2 PROBLEM

Location: H - Zebra crossing outside Sainburys

Summary: Proximity of bus stops to the zebra crossing reduces forward visibility and may lead to failure to give way type collisions involving cyclists

Bus stops on both sides of the crossing are located upstream of the zebra crossing location. When buses occupy the stops there will be poor forward visibility to the pedestrian waiting areas of the crossing for approaching drivers. Poor visibility may

lead to drivers failing to stop at the crossing when a pedestrian is crossing, with consequent risk of pedestrian injury.

RECOMMENDATION

Adequate forward visibility should be provided to the pedestrian waiting areas on the approach to stops to a 'tail to tail' orientation.

Design Organisation Response	Rejected
<p>The suggested 'tail to tail' layout was considered either side of the crossing. However, the concern was that this would result in traffic regularly blocking back over the zebra crossings. A review of the bus stops has shown that the vast majority of passengers boarding and alighting at the two existing bus stops are travelling to/from the Sainsbury's store and therefore relocating the bus stops away from the supermarket was not considered satisfactory and tail to tail bus stops would result in the crossing being away from pedestrian desire lines, increasing the potential for informal crossing. Therefore it is felt that the proposed design represents the optimum layout for the location. The potential number of vehicles overtaking buses at speed is considered to be low.</p>	
Client Organisation Comments	
<p>Designer's response accepted but post implementation monitoring will be carried out.</p>	

3.7 DRAWING 001-10

3.7.1 PROBLEM

Location: I - Green Lanes (North and South) at the junction with Bourne Hill

Summary: Separator islands may not be obvious to all road users, leading to collisions with the island

The separator islands segregating vehicles from cyclists are narrow and may not safely accommodate a vertical highlighting feature. Poor appreciation of the refuge islands may lead to vehicles striking them and may lead to loss of control type collisions.

RECOMMENDATION

The refuge islands should be wide enough to accommodate a suitable bollard or flexible post with adequate lateral edge clearance.

Design Organisation Response	Part Accepted
<p>The island separating cycles from traffic on the southbound approach has been widened to 1.20m (previously 1m). In order to retain the cycle lane width on the approach, the proposed triangular island has been trimmed. This island will have a signal head located on it.</p> <p>The island separating cycles from traffic in the northbound direction has been widened to 1.20m on the approach (previously 1m), with the cycle lane width reduced to 1.50m. This island will have a signal head located on it.</p> <p>Regarding the island on the A105 SB exit, it is there to accommodate a wand and not a signal therefore the proposed 1m width is sufficient.</p> <p>The cycle track south of the junction in the southbound direction has been raised to</p>	

footway, to offer greater protection to cyclists.

Client Organisation Comments

Designer's response accepted but post implementation monitoring will be carried.

3.7.2 PROBLEM

Location: J – At the junction of Bourne Hill with Green Lanes

Summary: Right turning cyclists unaware of / ignoring the proposed 2SRT, could potentially be in conflict with other traffic movements at the junction leading to vehicle to cycle and cycle to cycle collisions

It is proposed to introduce 'two-stage right turn' (2SRT) facilities for cyclists turning right from Hedge Lane and Bourne Hill. It is not known if an 'early release' signal feature is incorporated as part of the 2SRT facility. There is a concern that cyclists turning right into Green Lanes might not be aware of / ignore the proposed 2SRT, leading to vehicle to cycle and cycle to cycle collisions at the junction.

It is unclear whether cyclists making the right turn from Green Lanes (North and South) will have similar facilities to make there manoeuvre. If not they may be in conflict with vehicular traffic.

RECOMMENDATION

It is recommended that 'early release' signals should be provided for the 2SRT for right turn facilities for cyclists making the manoeuvre from Hedge Lane and Bourne Hill. The need for similar facilities for both Green Lanes right turns should be assessed and, if appropriate they should be consistent with the proposed facilities for the other right turn manoeuvres.

Ensure that cyclists approaching the junction are informed of the facility, by providing 2SRT direction signs. It should be ensured that cyclists can see an appropriate signal head when making the right turn manoeuvre in two stages.

Design Organisation Response	Rejected
<p>As cycle flows are expected to be low on the A111 Hedge Lane/Bourne Hill and as there is no signal detector for cyclists (to date), the cycle early release phase would have to be called even if no cyclists were present. This would have a significant negative effect on the capacity of the junction which is already at high saturation levels. The designers have been in contact with TfL -Traffic Infrastructure who have confirmed that 2SRT can be implemented without an early release as the geometry of this junction is such that 2SRT cyclists on both Hedge Lane and Bourne Hill will have adequate distance to head-start in front of traffic, even without the early release.</p> <p>Cyclists along the A105 will not need to turn right in two stages as both the NB and SB cyclists run together in Stage 1 while all traffic movements are held (separation of cyclists from traffic 'in time').</p> <p>Signage will be provided on the approaches to make cyclists aware of the 2SRT facility.</p>	

Client Organisation Comments

Designer's response accepted.

3.8 DRAWING 001-11

3.8.1 PROBLEM

Location: K - At side roads between Osborne Road and Devonshire Road

Summary: Parking / loading bays close to the junctions may lead to failure to give way type collisions, or cycle to vehicle conflict

At the side roads, visibility to the right may be restricted when the parking / loading bays are occupied. Poor side road visibility may lead to failure to give way type collisions, or collisions involving left turning vehicles versus cyclists, when there may be restricted intervisibility between users (see also Problem 3.1.3).

RECOMMENDATION

At side roads, where parking / loading bays on Green Lanes are located close to junctions, adequate side road visibility splays should be provided and kept clear of obstructions.

Design Organisation Response	Part Accepted
<p>Parking has been retained as much as possible, where possible, to minimise the loss of parking in the high street areas.</p> <p>Carriageway widths have been reduced, which will in turn reduce average vehicle speeds on the A105. All side roads along this section (excluding Park Avenue) have side road entry treatments, which will further reduce speeds of turning vehicles.</p> <p>We would also expect to see a behavioural change for all road users given the introduction of the transformational cycle facilities along the length of the corridor.</p> <p>For a short period after implementation signage will be provided to warn drivers of layout changes, for a short term.</p>	
Client Organisation Comments	
<p>Designer's response accepted.</p>	

3.9 DRAWING 001-13

3.9.1 PROBLEM

Location: L – At Palmerston Crescent

Summary: Northbound cycle facility returns cyclists from footway to carriageway at the junction and this may lead to failure to give way type collisions

The northbound cycle lane is on footway south of the junction and cyclists appear to be discharged on to the carriageway within the junction mouth; it then enters a bus boarder bypass. Drivers may not perceive the cycle manoeuvre required at this location and this may lead to failure to give way type collisions involving turning vehicles and cyclists.

RECOMMENDATION

The need for the on - footway cycle lane provision should be reconsidered.

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Design Organisation Response	Accepted
Accepted design change. The kerblineline on the raised junction area has been redesigned so that the cycle lane remains at all times on the carriageway side to eliminate the ambiguity regarding the cycle manoeuvre at the junction mouth.	
Client Organisation Comments	
Designer's response accepted.	

End of list of problems identified and recommendations offered in this Stage 1 Road Safety Audit

4.0 ISSUES IDENTIFIED DURING THE STAGE 1 ROAD SAFETY AUDIT THAT ARE OUTSIDE THE TERMS OF REFERENCE

Safety issues identified during the audit and site inspection that are considered to be outside the Terms of Reference, but which the Audit Team wishes to draw to the attention of the Client Organisation, are set out in this section. It is to be understood that, in raising these issues, the Audit Team in no way warrants that a full review of the highway environment has been undertaken beyond that necessary to undertake the Audit as commissioned.

4.1 ISSUE

Location: General to the scheme – at side road junctions

Reason considered to be outside the Terms of Reference: Detailed design issue

At a number of side road junctions kerb lines are to be amended and side roads narrowed. Swept path analysis should be carried out to assess large vehicle paths and minimise the possibility of vehicle to vehicle conflict within junction turning areas.

Design Organisation Response	Accepted
This has been undertaken as part of the design process.	
Client Organisation Comments	
No further action required	

4.2 ISSUE

Location: General to the scheme – bus stop locations

Reason considered to be outside the Terms of Reference: Detailed design issue / minor collision risk

At many of the bus stop locations, bus stop boarders will be separated from footways by cycle lanes. The bus stop boarders are narrow and this may lead to pedestrians waiting in the cycle lane. This may lead to low level conflicts between cyclists and pedestrians. Vulnerable pedestrians such as blind or partially sighted, or wheelchair users may feel vulnerable when attempting to access bus facilities, or kerb delineation may lead to trip hazards for some user types.

Design Organisation Response	Part Accepted
Bus boarders have been introduced at locations where there is not scope to introduce a bus stop by-pass, to deliver an acceptable level of route continuity particularly at conflict points such as bus stops, where buses will be pulling into the kerb, through the desire line of a cyclist. The proposed bus stop boarders will use different material/tones to clearly show a change in environment from a segregated facility to a shared space. This is not dissimilar to a shared space environment adjacent to a toucan crossing, where pedestrian and cycles mix. Signage will also be used to warn cyclists and pedestrians of the shared space environment. Monitoring will be undertaken post-implementation to review the safety implications of the proposed design but at other sites where this has been implemented such as Royal College Street in Camden there has been not record of incidents between pedestrians and cyclists.	

Client Organisation Comments

Designer's response accepted - post implementation monitoring will be carried and design adjustments made if necessary.

4.3 ISSUE

Location: 1 - Drawing 001-03 – near Park Avenue

Reason considered to be outside the Terms of Reference: Demand dependant issue

The pedestrian refuge close to the junction is to be relocated as part of the scheme. Pedestrian desire lines may be affected by the relocation of the crossing and lead to pedestrians crossing close to the existing refuge (which is at the junction area). The proposed relocation of the refuge appears to be close to a dropped kerb property access and this may lead to difficult manoeuvres for drivers entering or leaving the property.

Pedestrian desire lines should be assessed and informal crossing points provided close to such desire lines. The interaction between the proposed refuge location and private driveway should be assessed.

Design Organisation Response	Rejected
<p>Pedestrian desire lines in this location around Park Avenue are served by two crossings on both sides of the A105/Park Avenue junction. There is an existing formal (zebra) crossing north of Park Avenue which is retained and an advisory crossing facility south of Park Avenue which is relocated 70m south of the existing one. The reason for this relocation was to provide adequate traffic lane and cycle lane widths around the horizontal curve on the A105 in this location. The desire lines are still safely accommodated by these two crossing facilities proposed. The only pedestrian movements that will be negatively impacted by the relocation of the informal crossing will be pedestrian movements between Park Avenue and the properties between the existing pedestrian refuge and the proposed one (property numbers 53-67).</p>	

Client Organisation Comments

Designer's response accepted,

4.4 ISSUE

Location: 2 - Drawing 001-03 & 04 – at the northbound bus boarder

Reason considered to be outside the Terms of Reference: Detailed design issue

The northbound bus boarder and cycle bypass lane appears to be located at the private driveways of 87 / 89 and 93 London Road. This may affect the ability of drivers to enter and emerge from the driveways.

The location of driveways should be established and should not be coincident with the bus stop facilities.

Design Organisation Response	Part Accepted
<p>The proposed bus stop is retained in the existing bus stop location. The driveways of 87/89 and 93 are within the bus stop cage, as existing. In the designs we propose a bus stop boarder 1.50m wide with an additional 0.50m buffer strip for extra safety. Dropped kerbs will be provided to these properties within the 0.50m buffer strip. This will be addressed in the detailed design stage where levels and kerb heights will be looked at in detail.</p>	
Client Organisation Comments	
<p>Designer's response accepted.</p>	

4.5 ISSUE

Location: 3 - Drawing 001-04 – at the southbound bus boarder outside Westwood Court

Reason considered to be outside the Terms of Reference: Detailed design issue

The southbound bus boarder and cycle bypass lane appears to be located at the private driveway of Westwood Court. This may affect the ability of drivers to enter and emerge from the driveways.

The location of driveways should be established and should not be coincident with the bus stop facilities.

Design Organisation Response	Part Accepted
<p>As with Issue 4.4, the proposed bus stop is retained in the existing bus stop location, with driveways within the bus stop cage, as existing. In the designs we propose a bus stop boarder 1.50m wide with an additional 0.50m buffer strip for extra safety. Dropped kerbs will be provided to these properties within the 0.50m buffer strip. This will be addressed in the detailed design stage where levels and kerb heights will be looked at in detail.</p>	
Client Organisation Comments	
<p>Designer's response accepted.</p>	

4.6 ISSUE

Location: 4 – Drawing 001-004 – At the junction of Village Road with Bush Hill Road

Reason considered to be outside the Terms of Reference: Design clarification

Cycle routes across the junction appear to be unclear. Northbound cyclists appear to be directed back on to the carriageway within the mouth of the controlled area of the junction. The southbound cycle route is unclear and passes the left slip lane from Church Street.

Pedestrian crossing facilities appear to have been revised, with removal of refuge islands, but it is unclear how the replacement facilities will operate.

The tie-ins of the proposed Quietway scheme are unclear.

The junction arrangements should be clarified and subject to an independent safety review before proceeding to detailed design.

Design Organisation Response	Partially Accepted
<p>The design has been updated following comments from TfL Traffic Infrastructure, as part of the signalised junction safety review. Under the updated proposed designs, ahead moving cyclists in the North/South direction along the A105 are expected to use the Toucan crossing facilities on Bush Hill Road and Church Street and then re-join the lightly segregated cycle facilities beyond the junction. While this arrangement is not direct for cyclists along the A105, having cyclists on the carriageway would require additional stage/s so they could be protected through the junction which would have a significant impact on traffic capacity, generating delays and traffic reassignment.</p> <p>Tie-ins to the Quietway have been improved by extending the cycle lanes on the approaches.</p> <p>Toucan crossings on all arms of the junction run in an all-red stage along with the diagonal cycle crossings, through the centre of the junction, linking the Quietway.</p>	
Client Organisation Comments	
<p>Designer's response accepted.</p>	

4.7 ISSUE

Location: 5 - Drawing 001-06 - At the junction with Green Dragon Lane

Reason considered to be outside the Terms of Reference: Detailed design issue

There is an existing cycle route through to Bush Hill. It is unclear how the Mini Holland scheme will link with existing cycle facilities. At the detailed design stage, existing cycle facilities should be linked with the proposals.

Design Organisation Response	Accepted
<p>This is an accepted design change which will be looked at the detailed design stage. However, at this stage, the preliminary design drawing has been amended to provide a connection between the Bush Hill cycle route and the A105 via the parallel cycle/pedestrian crossing. The existing cycle track connecting Bush Hill and Green Dragon Lane would be retained to continue to provide a connection between Bush Hill and Green Dragon Lane.</p>	
Client Organisation Comments	
<p>Designer's response accepted.</p>	

4.8 ISSUE

Location: 6 - Drawing 001-06 – Winchmore Hill – existing pedestrian refuge location

Reason considered to be outside the Terms of Reference: Demand dependant issue

The pedestrian refuge south of Vicars Moor Lane appears to be removed as part of the scheme. Pedestrian desire lines may be affected by the removal of the crossing and lead to pedestrians crossing close to the parking bays or bus stops, which may compromise pedestrian safety.

Pedestrian desire lines should be assessed and informal crossing points provided close to such desire lines.

Design Organisation Response	Partially Accepted
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The existing refuge island south of Vicars Moor Lane cannot be retained as the carriageway has been narrowed in order to provide the cycle tracks, parking bays and acceptable traffic lane widths. While we accept the comment that the removal of the refuge will affect the desire lines, the following mitigation is in place:

- Narrower carriageway widths proposed, therefore it is easier to cross the road informally.
- A parallel cycle/pedestrian zebra crossing is proposed south of Shrubbery Gardens, which is approximately 60m south of the existing refuge that is being removed.
- The refuge was on a horizontal curve of the alignment so retaining it could potentially be unsafe.

Client Organisation Comments

Designer's response accepted.

4.9 ISSUE

Location: 7 - Drawing 001-08 – Winchmore Hill – existing pedestrian refuge locations

Reason considered to be outside the Terms of Reference: Demand dependant issue

The pedestrian refuges either side of Compton Road appear to be removed as part of the scheme. Pedestrian desire lines may be affected by the removal of the crossing and lead to pedestrians crossing close to the parking bays or bus stops, which may compromise pedestrian safety.

Pedestrian desire lines should be assessed and informal crossing points provided close to such desire lines.

Design Organisation Response	Rejected
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The pedestrian refuge could not be retained as the carriageway width is reduced to accommodate the proposed cycle lanes, parking bays and acceptable traffic lane widths.

However the pedestrian refuge is replaced by a formal zebra crossing that is proposed approximately 65m south of the existing refuge.

The crossing at the northern end of the retail area (South of Station Road) has been retained, albeit converted to a staggered signal crossing and integrated within the

Station Road junction.

Client Organisation Comments

Designer's response accepted.

4.10 ISSUE

Location: 8 - Drawing 001-08 – At Duncan Court

Reason considered to be outside the Terms of Reference: Design clarification

It appears that one of the accesses to / from Duncan Court will be located at the ASL of the signal junction. Drivers emerging into the junction area may not be able to adequately perceive an appropriate time to emerge. At detailed design stage the need for this additional access should be reviewed. If the access is required it should be ensured that emerging drivers can view an appropriate signal head in order to assess a suitable time to emerge.

Design Organisation Response

Accepted

The ASL has been relocated to the south to retain the access at this location.

Client Organisation Comments

Designer's response accepted.

4.11 ISSUE

Location: 9 - Drawing 001-09 – South of Eaton Park Road

Reason considered to be outside the Terms of Reference: Demand dependant issue

The pedestrian refuge on the south side of Eaton Park Road appears to be removed as part of the scheme. Pedestrian desire lines may be affected by the removal of the crossing and lead to pedestrians crossing close to the parking bays or bus stops, which may compromise pedestrian safety.

Pedestrian desire lines should be assessed and informal crossing points provided close to such desire lines.

Design Organisation Response

Partially Accepted

A pedestrian refuge island could not be accommodated in the proposed design, whilst retaining acceptable carriageway widths of minimum 3.25m in each direction, the existing two on-street parking spaces (to satisfy local residents) and the proposed cycle lanes.

The distance between the retained zebra crossing south of Barrowell Green and the proposed crossing outside St Monica's church is approximately 350m, which is considered a reasonable spacing along a residential corridor.

Reduced carriageway widths are anticipated to reduce vehicles speeds, increasing the safety for informal crossing.

Client Organisation Comments

Designer's response accepted.

4.12 ISSUE

Location: 10 - Drawing 001-10 – Zebra crossing south of Stonard Road

Reason considered to be outside the Terms of Reference: Detailed design issue

At the zebra crossing existing vehicle speeds appeared to be high. High vehicle speeds are generally considered incompatible with zebra crossing provision. Speed surveys should be carried out to establish the appropriateness of using a zebra crossing at this location (it is acknowledged that the introduction of the cycle lanes and bus boarders may influence vehicle speeds).

Design Organisation Response	Rejected
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The proposed scheme reduces carriageway widths, which will reduce speeds along the corridor. There is an existing advisory crossing serving Saint Monica's church and retaining crossing provision in this location is important. There is no longer space for an advisory crossing island, so a zebra crossing is considered the most appropriate crossing facility. The crossing also serves the northbound bus stop, to the south of the crossing. The proximity of the crossing to the signalised junction of Hedge Lane will also limit vehicle speeds.

Client Organisation Comments

Designer's response accepted.

4.13 ISSUE

Location: 11 – Drawing 001-12 – At the junction of Green Lanes with Broomfield Lane

Reason considered to be outside the Terms of Reference: Detailed design issue

The northbound cycle lane appears to briefly be directed on to the footway, north of the junction area. The reason for this is unclear and it may be appropriate to keep the cycle facility on carriageway to link with the on-road facility north of the junction area.

Design Organisation Response	Rejected
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Due to capacity constraints at the junction it is not possible to provide a separate stage for cycling, to segregate them from traffic. The southbound left turn movement for general traffic is low and therefore an early release is considered an acceptable provision for this approach. However, the northbound approach has a heavy left turn and therefore simply providing an early release is not considered sufficient provision. The proposed junction operates with the northbound cycle phase running in the same stage as the pedestrian crossings. If cyclists were on carriageway, they would be in conflict with the pedestrian crossings on the A105 northern arm.

It is acknowledged that there will be potential conflicts between cyclists and pedestrians in the shared area on the north-western footway of the A105, however the following mitigations are in place:

- There are "Slow" markings in addition to corduroy tactile paving, emphasising the shared space area. A similar design is currently in place on Cycle Superhighway 5 in Pimlico.
-

- As cyclists have a right of way at the same time as pedestrians, there would be no-one waiting to cross, while cyclists pass the crossing on the northern arm.
- Furthermore, existing pedestrian levels are low in this particular location.

Client Organisation Comments

Designer's response accepted.

4.14 ISSUE

Location: 12 – Drawing 001-13 – Green Lanes south of Palmerston Crescent

Reason considered to be outside the Terms of Reference: Detailed design issue
Green Lanes northbound is currently two lanes wide in the vicinity of Palmerston Crescent. It is unclear how the proposed cycle lane and traffic lane configuration will be tied in to the existing arrangement at the scheme extents.

The tie-in details should be clarified and subject to an independent safety review.

Design Organisation Response	Accepted
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The design has been amended to provide a single lane northbound between the advisory crossing adjacent to 201 Green Lanes and Palmerston Crescent. Lane markings have been amended to tie in with the existing lane arrangement south of the scheme extents.

Client Organisation Comments

Designer's response accepted.

4.15 ISSUE

Location: 13 – Drawing 001-13 – Green Lanes south of of Ecclesbourne Gardens

Reason considered to be outside the Terms of Reference: Detailed design issue
The southbound bus lane commences just south of Ecclesbourne Gardens. The markings indicate a re-start to the bus lane, whereas the southbound bus lane is terminated north of the junction with Broomfield Lane within the new scheme.

The bus lane markings should be amended at detailed design stage, to reflect the new arrangement.

Design Organisation Response	Accepted
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The design has been amended to reflect the start of the bus lane.

Client Organisation Comments

Designer's response accepted.

4.16 ISSUE

Location: 14 – Drawing 001-14 – Palmerston Road junction with A405

Reason considered to be outside the Terms of Reference: Detailed design consideration

North of the A405, there is existing on-street parking and a double height kerb at the return to carriageway level at Palmerston Crescent. It is unclear whether the existing footpath link is to be retained, and if so, how it is to be incorporated in to the proposed cycle track facility.

South of the A405, on Palmerston Road, the cycle diverge for northbound cyclists is to be located at a narrow section of footway, with a sign post located within the dual use area.

The design of this section of the route should be clarified and subject to an independent road safety review.

Design Organisation Response	Accepted subject to Detailed Design
<p>North of the A406, the route at the southern end of Palmerston Crescent will be realigned away from the double height kerb. A drop kerb will be provided with a short section of keep clear marking (1026.1) to maintain access for cyclist to the cycle track. The footpath will be widened to allow for a cycle track parallel to the footpath. The exact alignment of the path will be confirmed at detailed design stage following an assessment of the levels.</p> <p>South of the A406 the cycle diverge has been removed, with the existing layout retained.</p> <p>The greenway route, south of the A406 will form part of a separate safety audit.</p>	
Client Organisation Comments	
Designer's response accepted.	

5.0 SIGNATURES AND SIGN-OFF

5.1 AUDIT TEAM STATEMENT

We certify that we have examined the drawings and documents listed in Appendix A. to this Safety Audit report. The Road Safety Audit has been carried out in accordance with TfL Procedure SQA-0170 dated May 2014, with the sole purpose of identifying any feature that could be removed or modified in order to improve the safety of the measures. The problems identified have been noted in this report together with associated suggestions for safety improvements that we recommend should be studied for implementation.

No one on the Audit Team has been involved with the design of the measures.

AUDIT TEAM LEADER:

Name: Kevin Seymour
B Sc, PG Dip TS, MCIHT MSoRSA Signed: 
Position: Principal Road Safety Auditor Date: 22/03/2016
Organisation: Transport for London, Road Safety Audit
Asset Management Directorate
Address: 4th Floor Palestra, 197 Blackfriars Road, London, SE1 8NJ
Contact: kevinseymour@tfl.gov.uk (020 3054 1037)

AUDIT TEAM MEMBER:

Name: Shane Martin MCIHT, MSoRSA Signed: 
Position: Principal Road Safety Auditor Date: 22/03/2016
Organisation: Transport for London, Road Safety Audit
Asset Management Directorate
Address: 4th Floor Palestra, 197 Blackfriars Road, London, SE1 8NJ
Contact: shane.martin@tfl.gov.uk (020 3054 2590)

5.2 DESIGN TEAM STATEMENT

In accordance with SQA-0170 dated May 2014, I certify that I have reviewed the items raised in this Stage 1 Safety Audit report. I have given due consideration to each issue raised and have stated my proposed course of action for each in this report. I seek the Client Organisation's endorsement of my proposals.

Name: Alex Stebbings

Position: Project Manager

Organisation: Jacobs

Signed: 

Dated: 29 06 2016

5.3 CLIENT ORGANISATION STATEMENT

I accept these proposals by the Design Organisation.

Name: David Taylor

Position: Head of Traffic & Transportation

Organisation: LB Enfield

Signed: 

Dated: 29 06 2016

5.4 SECONDARY CLIENT ORGANISATION STATEMENT (where appropriate)

I accept these proposals by the Design Organisation.

Name:

Position:

Organisation:

Signed:

Dated:

APPENDIX A

Documents Forming the Audit Brief

DRAWING NUMBER

B240G001-SK-A105-001-01 Rev E
B240G001-SK-A105-001-02 Rev E
B240G001-SK-A105-001-03 Rev E
B240G001-SK-A105-001-04 Rev E
B240G001-SK-A105-001-05 Rev E
B240G001-SK-A105-001-06 Rev E
B240G001-SK-A105-001-07 Rev E
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B240G001-SK-A105-001-09 Rev E
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B240G001-SK-A105-001-11 Rev E
B240G001-SK-A105-001-12 Rev E
B240G001-SK-A105-001-13 Rev E
B240G001-SK-A105-001-14 Rev E

DRAWING TITLE

Proposed A105 Route (Sheet 1)
Proposed A105 Route (Sheet 2)
Proposed A105 Route (Sheet 3)
Proposed A105 Route (Sheet 4)
Proposed A105 Route (Sheet 5)
Proposed A105 Route (Sheet 6)
Proposed A105 Route (Sheet 7)
Proposed A105 Route (Sheet 8)
Proposed A105 Route (Sheet 9)
Proposed A105 Route (Sheet 10)
Proposed A105 Route (Sheet 11)
Proposed A105 Route (Sheet 12)
Proposed A105 Route (Sheet 13)
Proposed A105 Route (Sheet 14)

DOCUMENTS

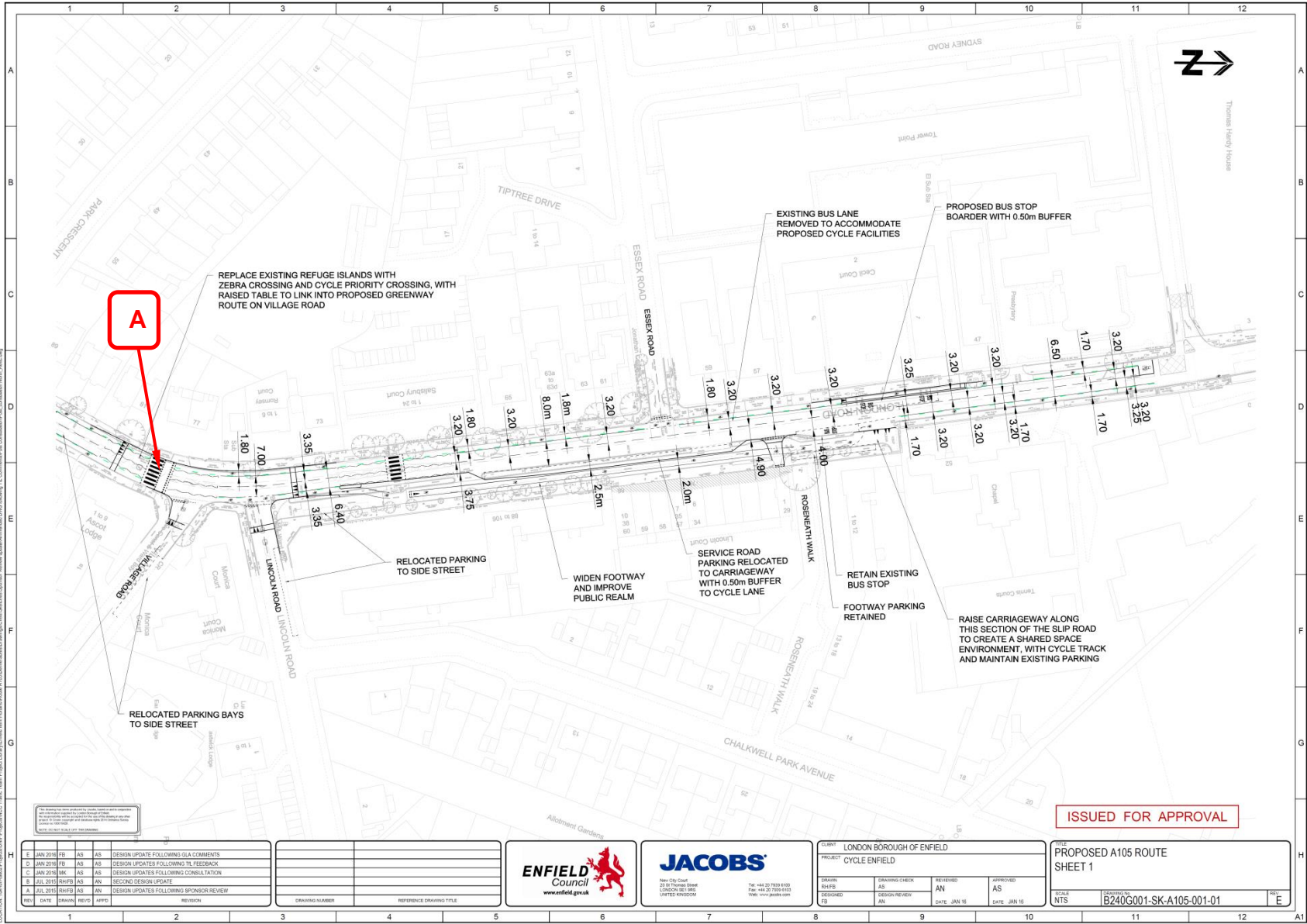
- Safety Audit Brief
- Site Location Plan
- Traffic signal details
- TfL signal safety checklist
- Departures from standard
- Previous Road Safety Audits
- Previous Designer Responses
- Collision data
- Collision plot
- Traffic flow / modelling data
- Pedestrian flow / modelling data
- Speed survey data
- Other documents

DETAILS (where appropriate)

Sketch signal staging / phasing diagrams

APPENDIX B

Problem Locations



DATE: 20/01/2016 DRAWN BY: ENFIELD BARCELLOS
 CHECKED BY: ENFIELD BARCELLOS
 PROJECT: ENFIELD A105 ROUTE
 SHEET: 1 OF 1
 SCALE: 1:500
 DRAWING NO: B240G001-SK-A105-001-01

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D	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING TL FEEDBACK
C	JAN 2016	MC	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
B	JUL 2015	RHTB	AS	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHTB	AS	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

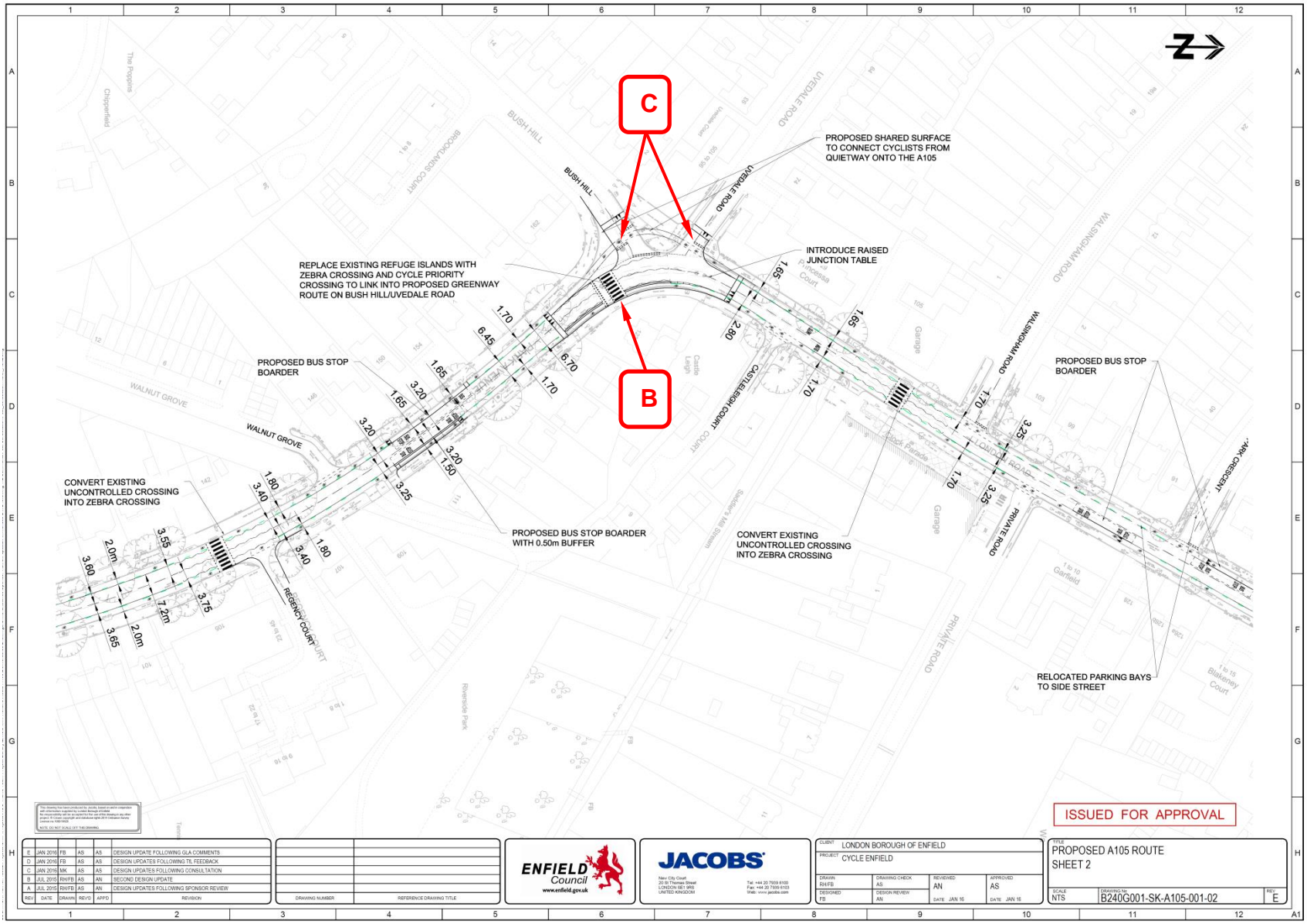
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DRAWN: FB	DRAWING CHECK: AS	REVIEWED: AN	APPROVED: AS
DESIGNED: FB	DESIGN REVIEW: AN	DATE: JAN 16	DATE: JAN 16

ISSUED FOR APPROVAL

FILE: PROPOSED A105 ROUTE SHEET 1	
SCALE: NTS	DRAWING NO: B240G001-SK-A105-001-01
REV: E	



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C	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
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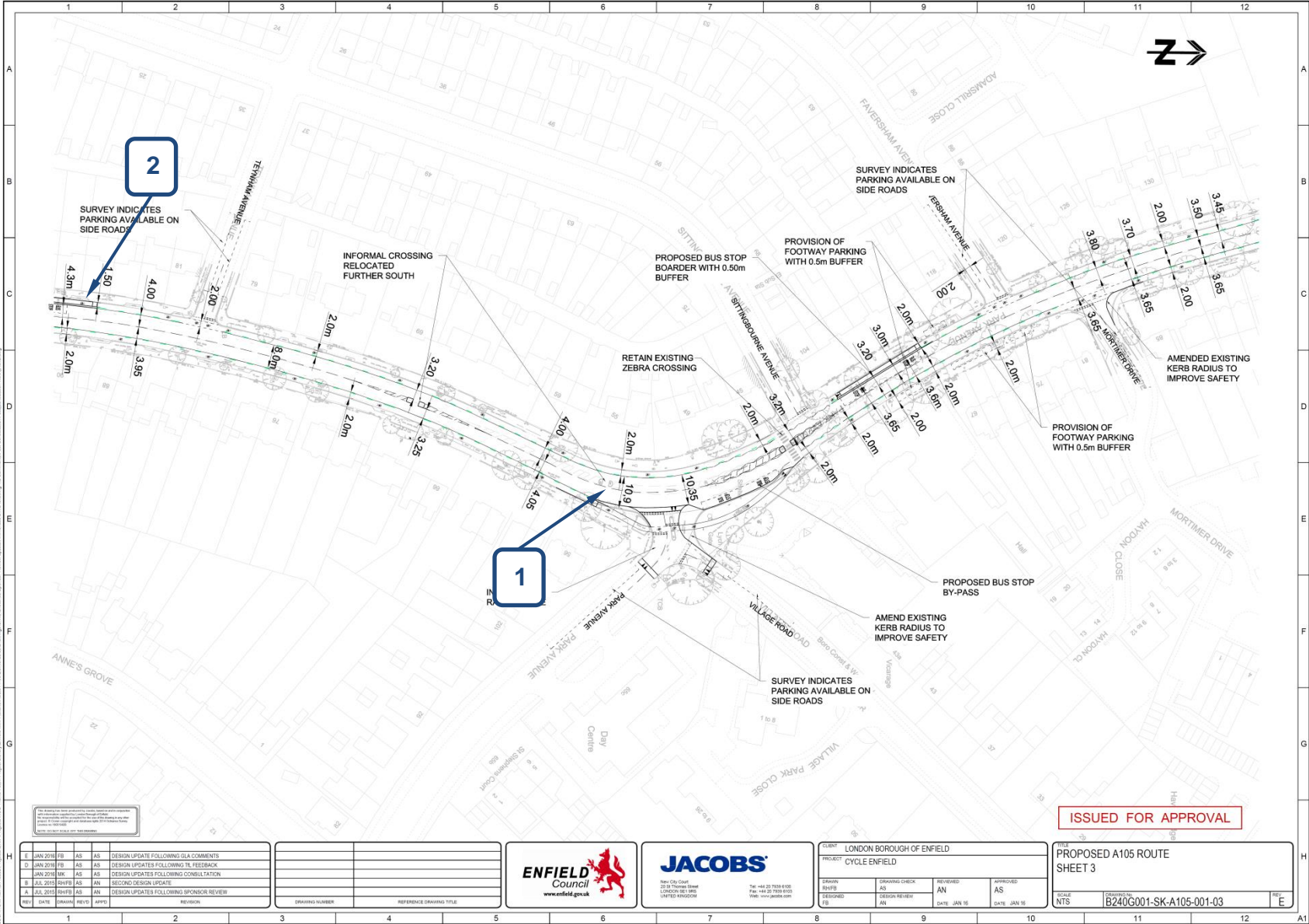
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PROJECT	CYCLE ENFIELD			
DRAWN	DRAWING CHECK	REVIEWED	APPROVED	
RHFB	AS	AN	AS	
DESIGNED	DESIGN REVIEW	DATE	DATE	
FB	AN	JAN 16	JAN 16	

ISSUED FOR APPROVAL

FILE	PROPOSED A105 ROUTE SHEET 2	
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 CHECKED: ENFIELD COUNCIL
 DESIGN NAME: BLANCO, FERNANDO BAÑADOS
 PROJECT: PROPOSED A105 ROUTE THROUGH ENFIELD
 SHEET: PROPOSED A105 ROUTE THROUGH ENFIELD SHEET 3

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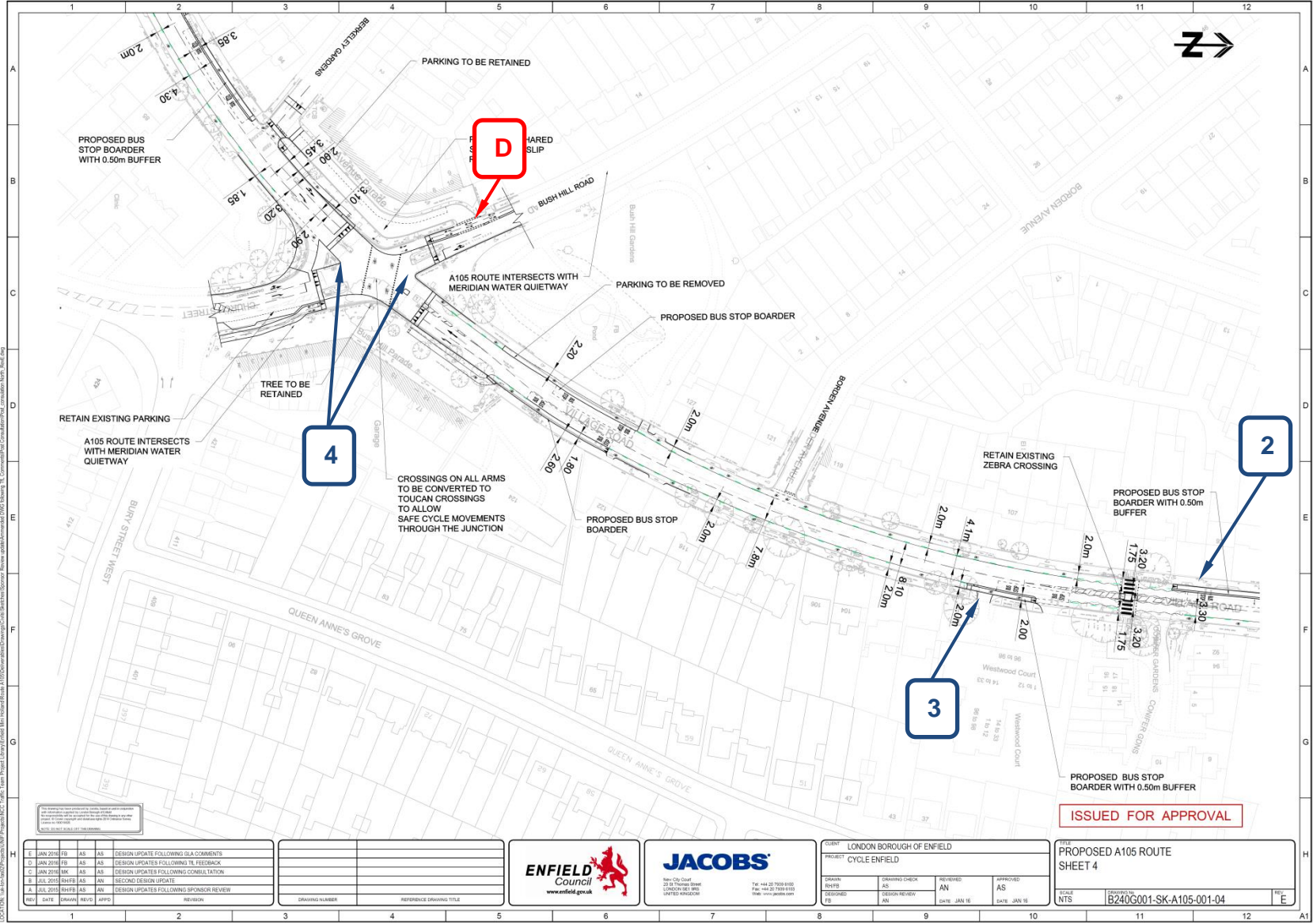
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DATE	JAN 16
APPROVED	AS
DATE	JAN 16

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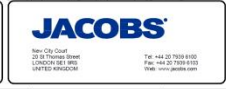
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REV.	E



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 PROJECT: B240G001-SK-A105-001-04
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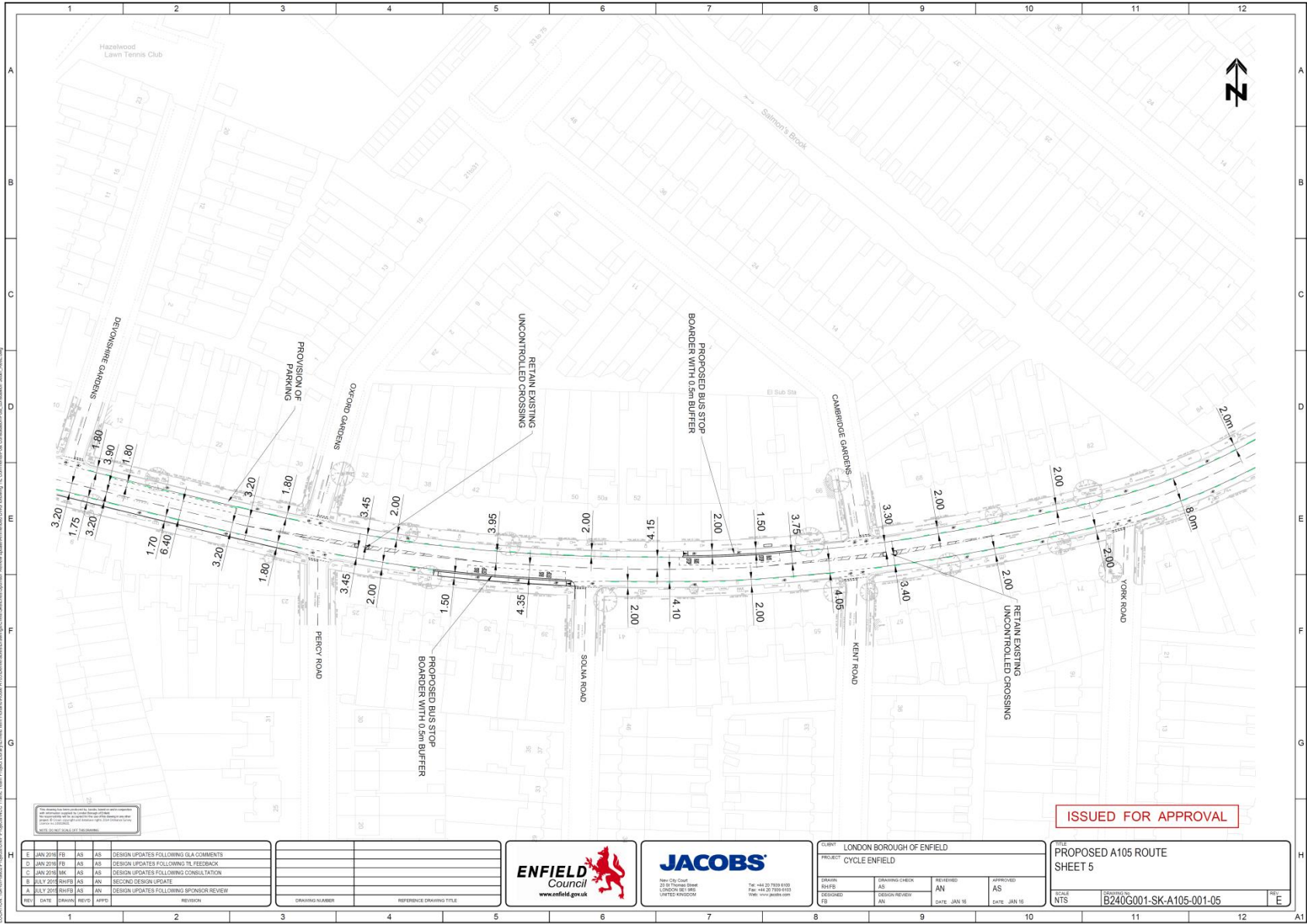
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B	JUL 2015	RHFB	AS	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHFB	AS	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE



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PROJECT: CYCLE ENFIELD	
DESIGNER: AN	DESIGNED: AN
DRAWING CHECK: AN	REVIEWED: AN
DATE: JAN 16	DATE: JAN 16

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 DRAWING: A105-001-SK-A105-001-05
 SCALE: 1:500
 SHEET: 5 OF 5

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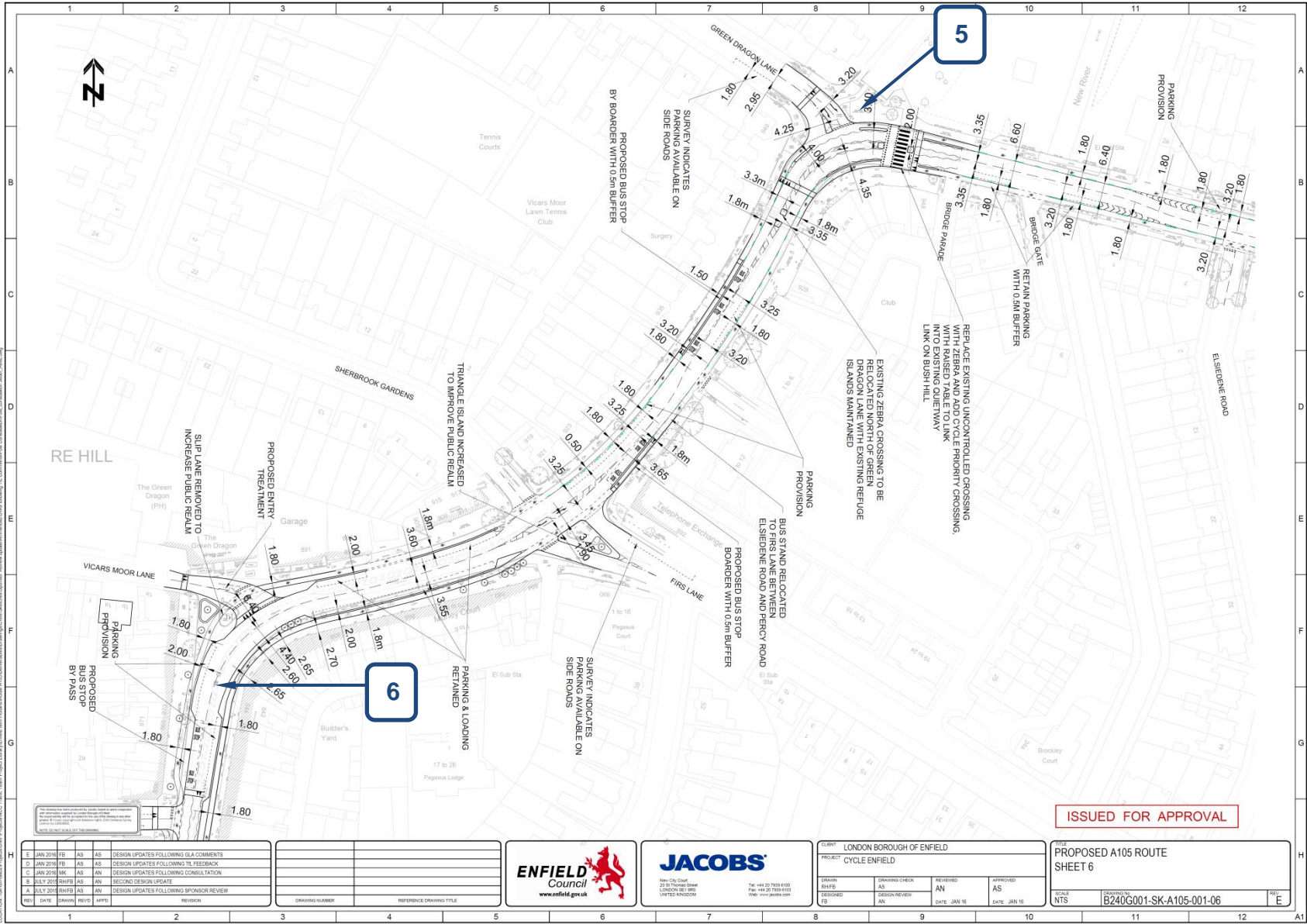
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DESIGNED: FB	DESIGN REVIEW: AN	DATE: JAN 16	DATE: JAN 16

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TITLE: PROPOSED A105 ROUTE SHEET 5	
SCALE: NTS	DRAWING NO: B240G001-SK-A105-001-05
REV: E	



DATE: 27/01/2018 10:26:26 AM
 DRAWING NAME: B240G001-SK-A105-001-06
 LOCATION: C:\Users\jacob.fernando\Documents\Projects\A105\A105-001-06\A105-001-06.dwg

REV	DATE	DRAWN	REVISED	APPROVED	REVISION
E	JAN 2018	FB	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2018	FB	AS	AS	DESIGN UPDATES FOLLOWING TL FEEDBACK
C	JAN 2018	MC	AS	AN	DESIGN UPDATES FOLLOWING CONSULTATION
B	JULY 2018	RHTB	AS	AN	SECOND DESIGN UPDATE
A	JULY 2018	RHTB	AS	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

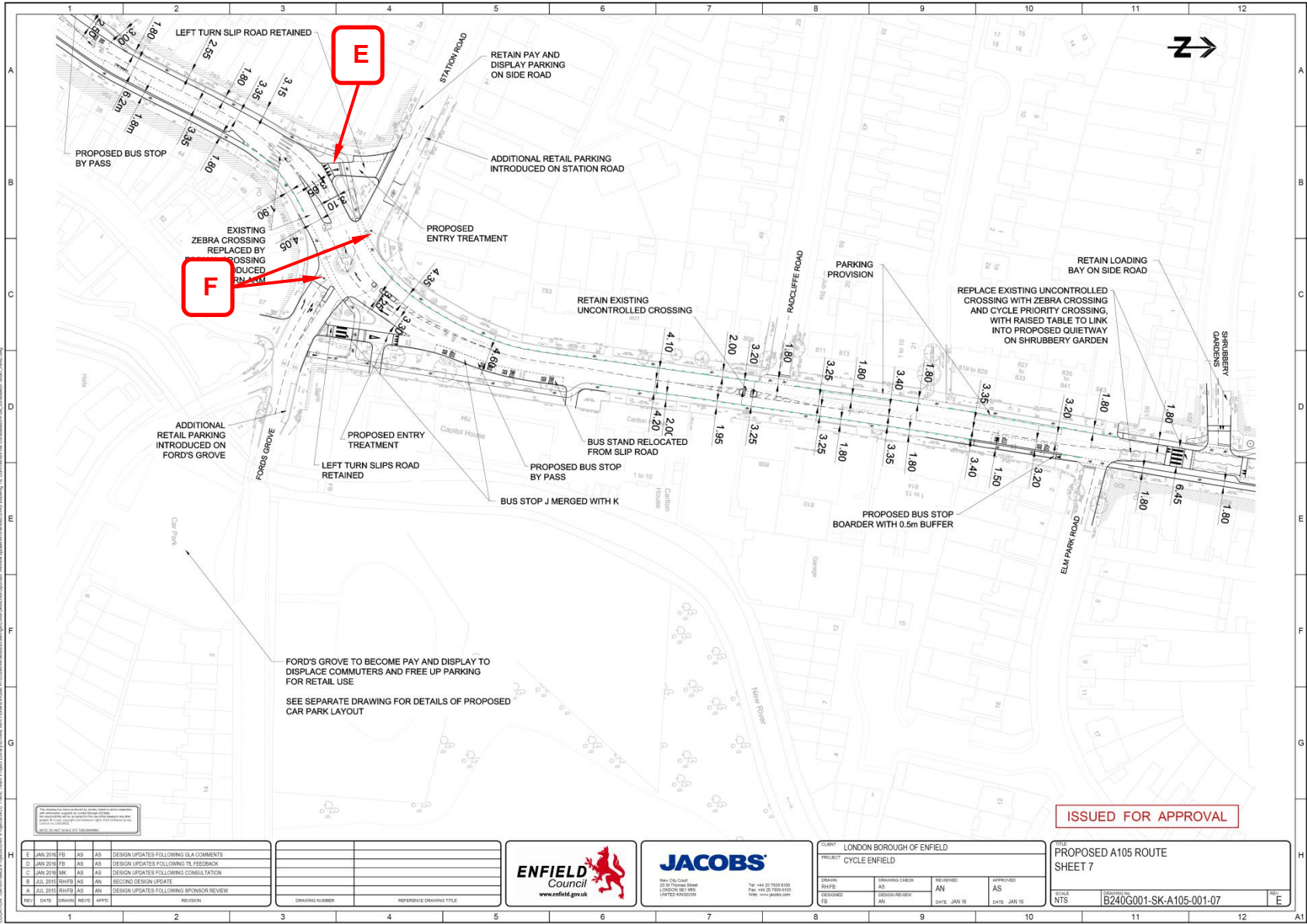
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CLIENT: LONDON BOROUGH OF ENFIELD		PROJECT: CYCLE ENFIELD	
DRAWN: FB	DRAWING CHECK: AS	REVIEWED: AN	APPROVED: AS
DESIGNED: FB	DESIGN REVIEW: AN	DATE: JAN 16	DATE: JAN 16

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FILE: PROPOSED A105 ROUTE SHEET 6	
SCALE: NTS	DRAWING NO: B240G001-SK-A105-001-06
REV: E	



DATE: 27/01/2016 10:53:03 AM
 LOCATION: C:\Users\james.fernando\Documents\Projects\A105\A105_Schematic\A105_Schematic.dwg
 DRAWING TITLE: PROPOSED A105 ROUTE SHEET 7
 DRAWING NUMBER: B240G001-SK-A105-001-07
 PROJECT: CYCLE ENFIELD
 CLIENT: LONDON BOROUGH OF ENFIELD
 PROJECT: CYCLE ENFIELD
 DRAWN BY: JAMES FERNANDO
 CHECKED BY: ANTHONY NICHOLS
 DESIGNED BY: JAMES FERNANDO
 REVIEWED BY: ANTHONY NICHOLS
 APPROVED BY: ANTHONY NICHOLS
 DATE: 16/01/16
 DATE: 16/01/16
 DATE: 16/01/16
 SCALE: NTS
 SHEET: 7 OF 7
 FILE: B240G001-SK-A105-001-07.dwg
 USER: j.fernando

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REV	DATE	BY	CHKD	APPD	REVISION
E	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING TFL FEEDBACK
C	JAN 2016	MC	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
B	JUL 2015	RHTB	AS	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHTB	AS	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

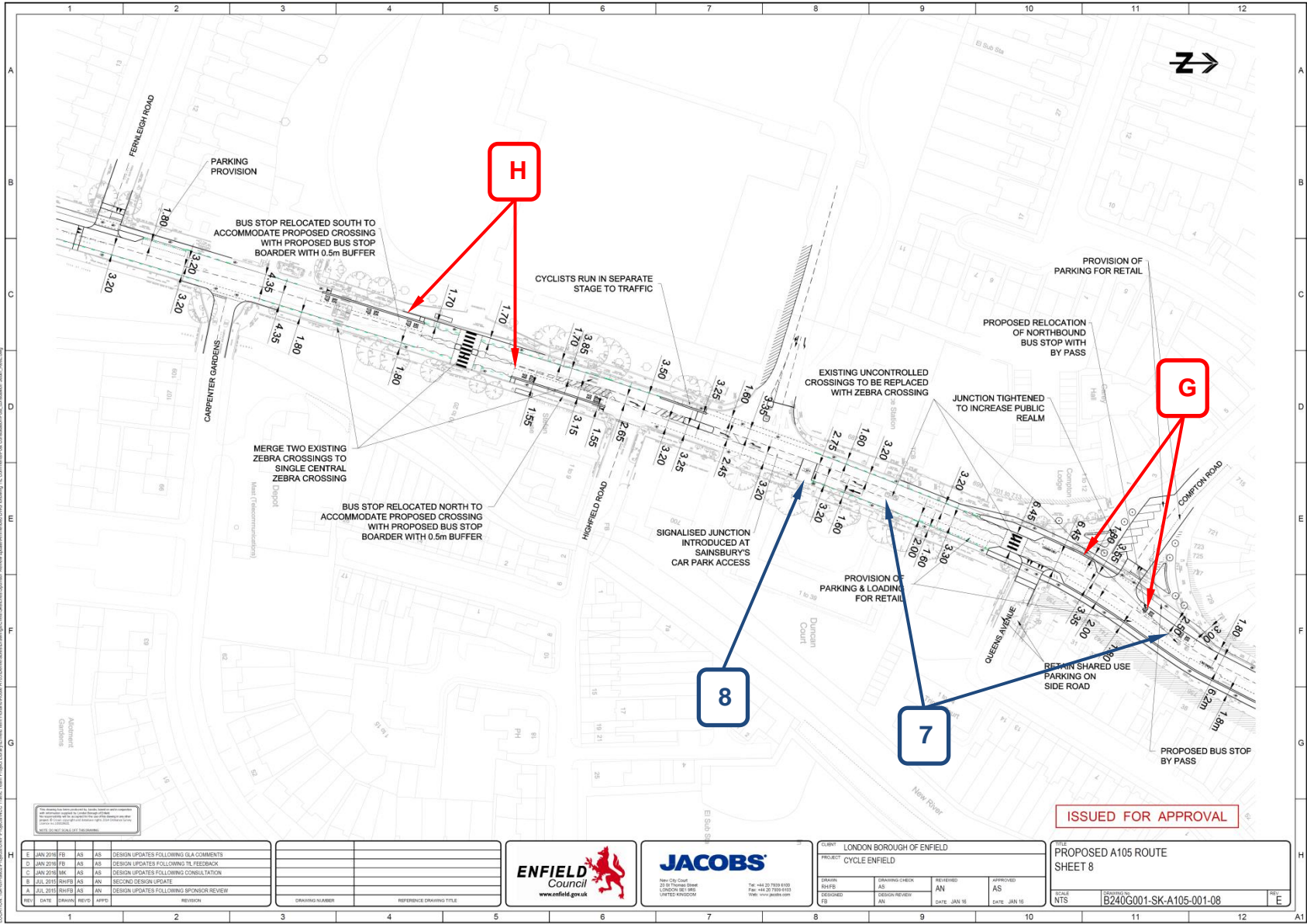
DRAWING NUMBER	REFERENCE DRAWING TITLE



DRAWN	DRAWING CHECK	REVIEWED	APPROVED
FB	AS	AN	AS
DESIGNED <td>DESIGN REVIEW <td>DATE: JAN 16</td> <td>DATE: JAN 16</td> </td>	DESIGN REVIEW <td>DATE: JAN 16</td> <td>DATE: JAN 16</td>	DATE: JAN 16	DATE: JAN 16

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FILE	PROPOSED A105 ROUTE SHEET 7
SCALE	NTS
DRAWING NO.	B240G001-SK-A105-001-07
REV.	E



DRAWING NAME: B240G001-SK-A105-001-08
 DATE: 27/01/2016 10:56:56 AM
 PROJECT: PROPOSED A105 ROUTE
 DRAWING NO: B240G001-SK-A105-001-08
 SHEET NO: 8
 PROJECT NO: B240G001-SK-A105-001-08
 DRAWING NO: B240G001-SK-A105-001-08
 SHEET NO: 8
 PROJECT NO: B240G001-SK-A105-001-08

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REV	DATE	DRAWN	REV'D	APP'D	REVISION
E	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING TL FEEDBACK
C	JAN 2016	MC	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
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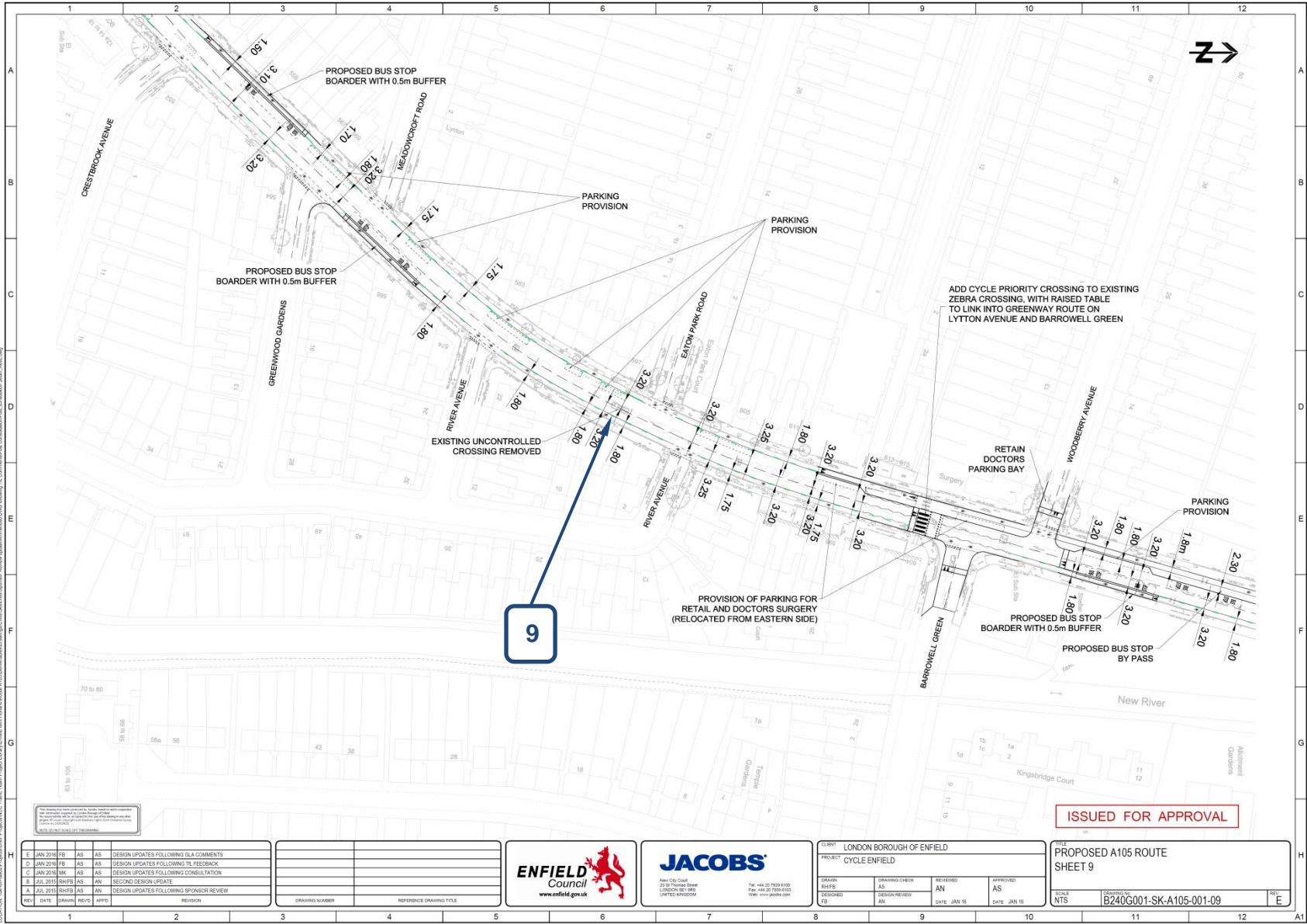
DRAWING NUMBER	REFERENCE DRAWING TITLE



CLIENT: LONDON BOROUGH OF ENFIELD		PROJECT: CYCLE ENFIELD	
DRAWN: FB	DESIGNED: FB	DRAWING CHECK: AS	DESIGN REVIEW: AN
REVIEWED: AN	DATE: JAN 16	APPROVED: AS	DATE: JAN 16

ISSUED FOR APPROVAL

FILE: PROPOSED A105 ROUTE SHEET 8	
SCALE: NTS	DRAWING NO: B240G001-SK-A105-001-08
REV: E	



DATE: 27/01/2018 10:16:53 AM DRAWING NUMBER: B240G001-SK-A105-001-09
 DRAWING TITLE: PROPOSED A105 ROUTE SHEET 9
 PROJECT: CYCLE ENFIELD
 CLIENT: LONDON BOROUGH OF ENFIELD
 DRAWN BY: AN DATE: JAN 16
 CHECKED BY: AS DATE: JAN 16
 DESIGNED BY: AN DATE: JAN 16
 APPROVED BY: AS DATE: JAN 16
 SCALE: NTS
 DRAWING NO: B240G001-SK-A105-001-09
 SHEET: 9 OF 9
 PROJECT: CYCLE ENFIELD
 CLIENT: LONDON BOROUGH OF ENFIELD
 DRAWN BY: AN DATE: JAN 16
 CHECKED BY: AS DATE: JAN 16
 DESIGNED BY: AN DATE: JAN 16
 APPROVED BY: AS DATE: JAN 16
 SCALE: NTS
 DRAWING NO: B240G001-SK-A105-001-09
 SHEET: 9 OF 9

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REV	DATE	DRAWN	REVISED	APPROVED	REVISION
E	JAN 2018	AN	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2018	AN	AS	AS	DESIGN UPDATES FOLLOWING TL FEEDBACK
C	JAN 2018	AN	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
B	JUL 2015	RHTB	AN	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHTB	AN	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

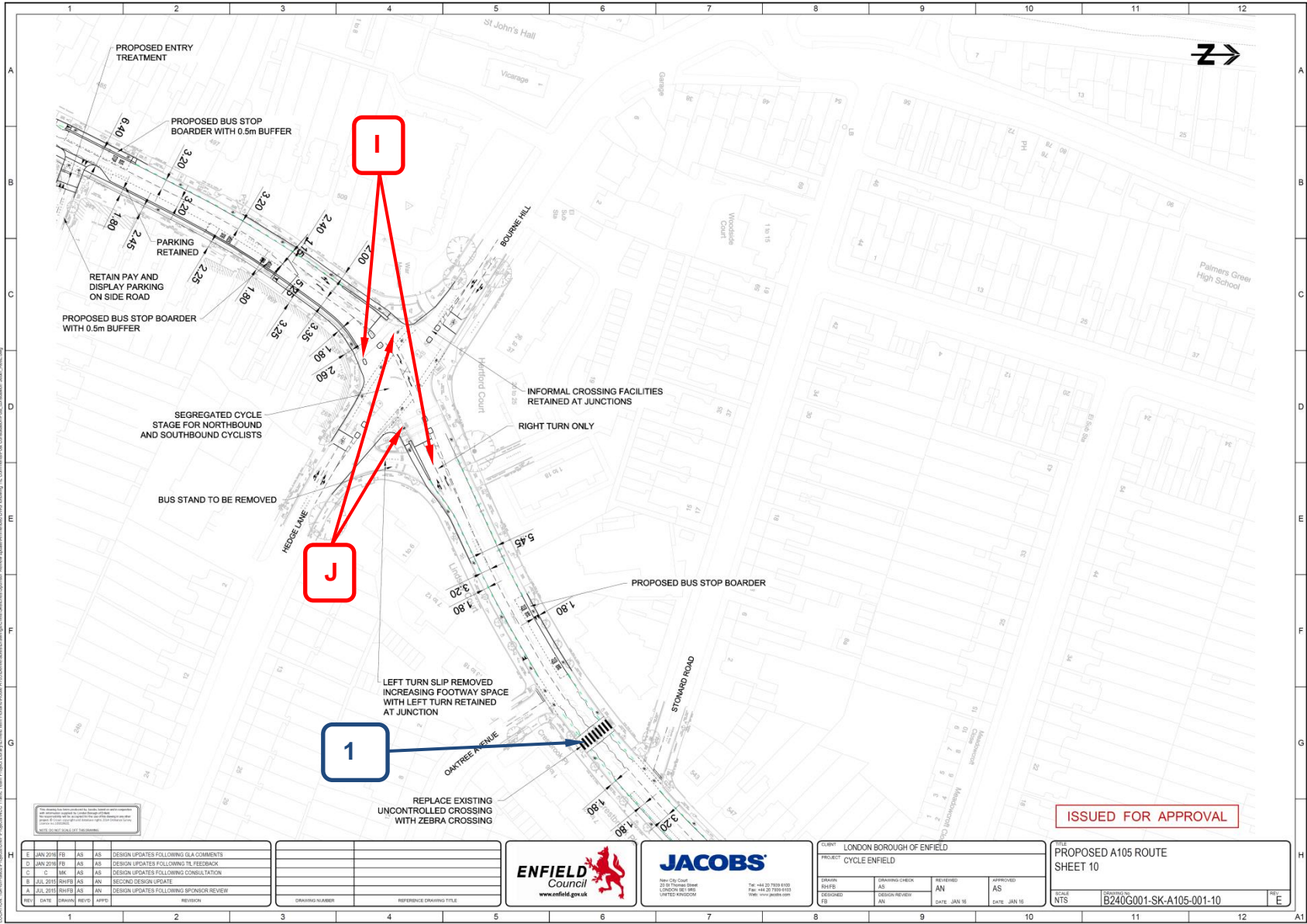
DRAWING NUMBER	REFERENCE DRAWING TITLE



CLIENT	LONDON BOROUGH OF ENFIELD		
PROJECT	CYCLE ENFIELD		
DRAWN	DATE	DRAWING CHECK	APPROVED
AN	JAN 16	AS	AS
DESIGNED	DATE	DESIGN REVIEW	DATE
AN	JAN 16	AN	JAN 16

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TITLE	PROPOSED A105 ROUTE SHEET 9
SCALE	NTS
DRAWING NO.	B240G001-SK-A105-001-09
SHEET	9 OF 9



DATE: 27/01/2016 10:57:17 AM
 LOCATION: C:\enfield\Projects\A105\Drawings\A105_Signage\A105_Signage\A105_Signage.dwg
 USER: JACOBSON, JACOBSON, JACOBSON
 PROJECT: A105
 SHEET: 10

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REV	DATE	DRAWN	REVISED	APP'D	REVISION
E	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING TLR FEEDBACK
C	C	LMK	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
B	JUL 2015	RHTB	AS	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHTB	AS	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

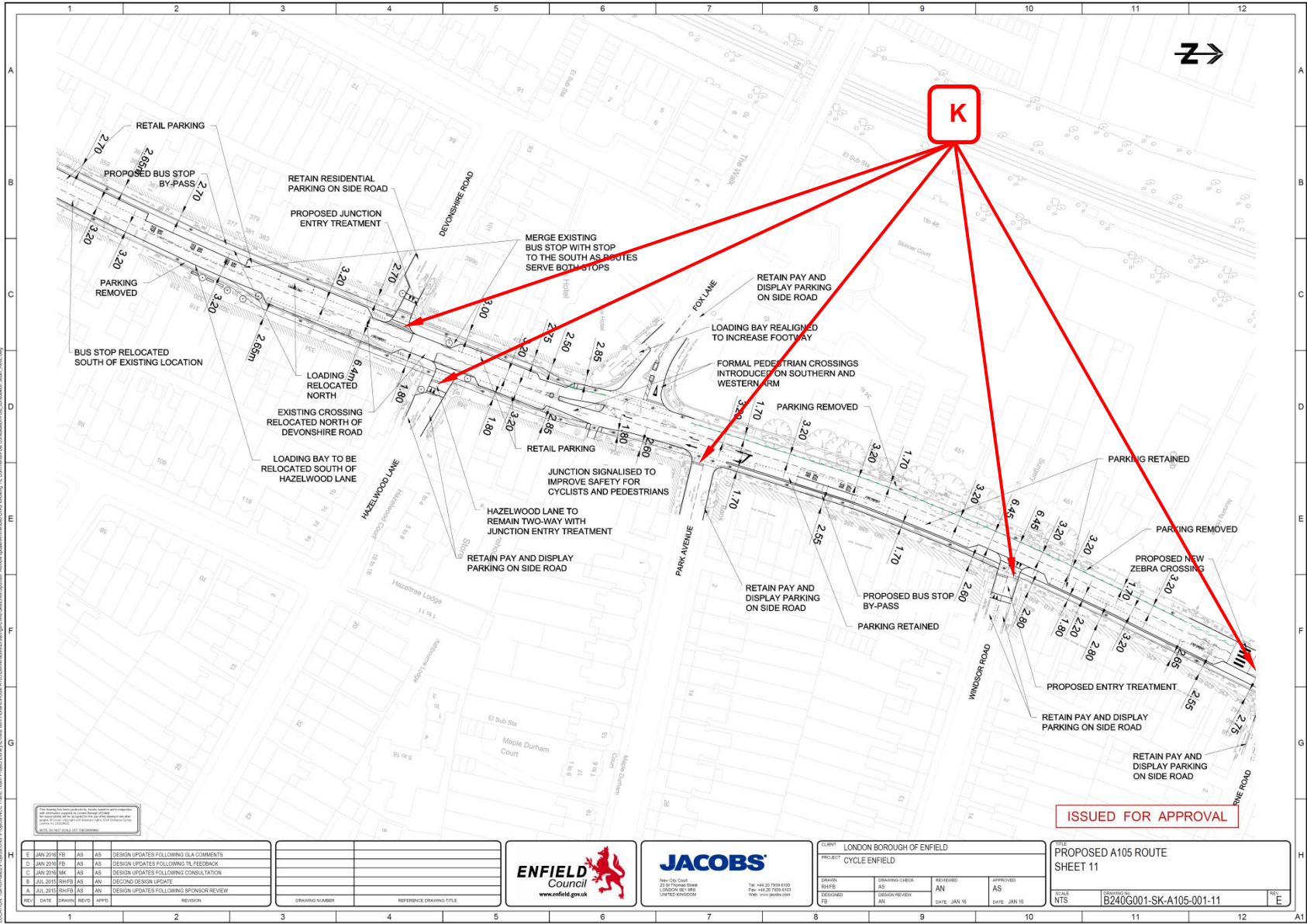
DRAWING NUMBER	REFERENCE DRAWING TITLE



CLIENT: LONDON BOROUGH OF ENFIELD		PROJECT: CYCLE ENFIELD	
DRAWN: ENFIELD	DRAWING CHECK: AS	REVIEWED: AN	APPROVED: AS
DESIGNED: FB	DESIGN REVIEW: AN	DATE: JAN 16	DATE: JAN 16

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FILE: PROPOSED A105 ROUTE SHEET 10	
SCALE: NTS	DRAWING NO: B240G001-SK-A105-001-10
REV: E	



DATE: 27/01/2016 10:28:18 AM
 LOCATION: C:\Users\Branco.Fernando\Documents\Projects\A105\A105_Cycleway\A105_Cycleway_Plan.dwg
 PROJECT: A105 Cycleway
 DRAWN BY: B.Fernando
 CHECKED BY: A.S.
 DATE: 27/01/2016

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REV	DATE	BY	CHKD	APPD	REVISION
E	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2016	FB	AS	AS	DESIGN UPDATES FOLLOWING TL FEEDBACK
C	JAN 2016	MC	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
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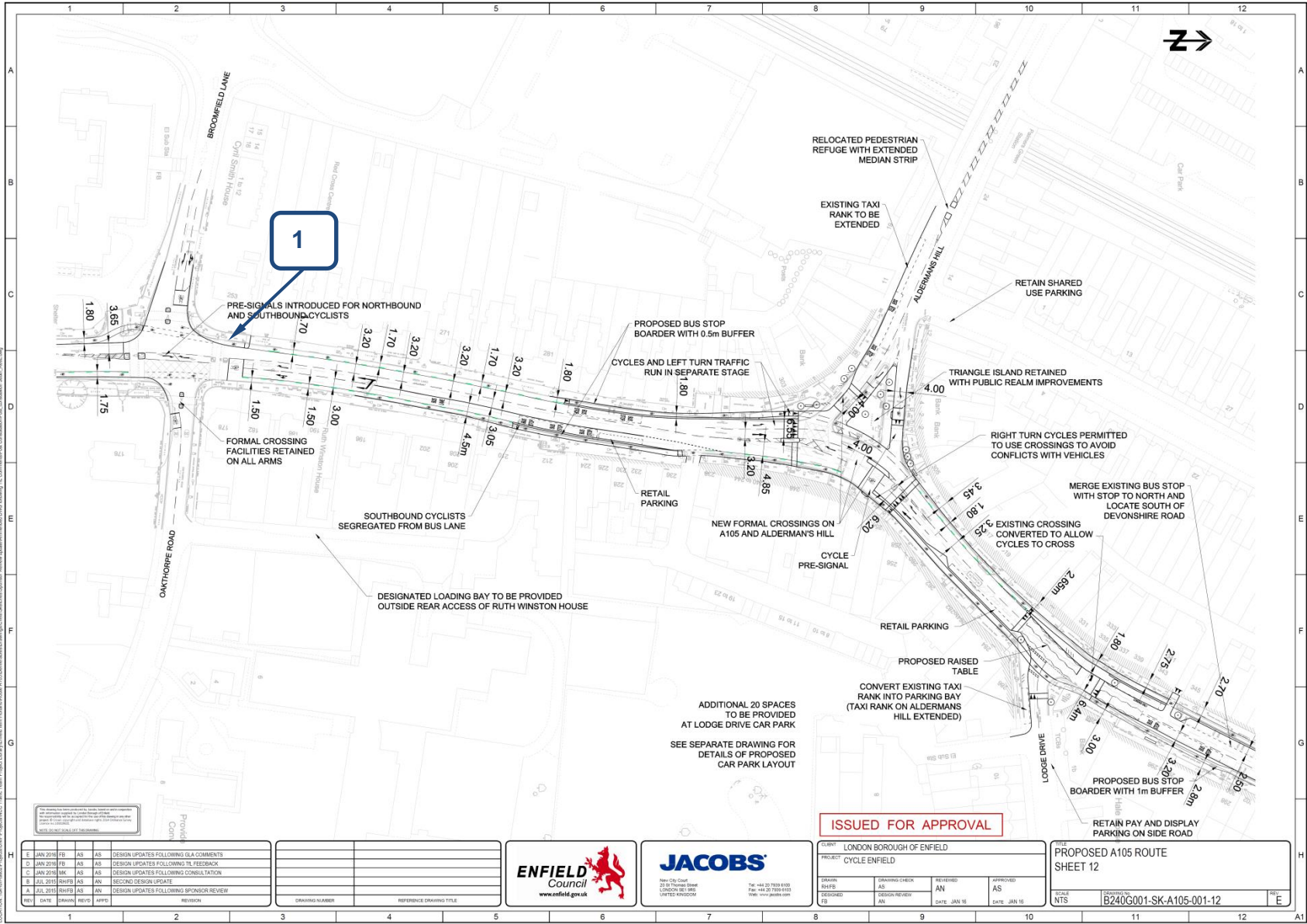
DRAWING NUMBER	REFERENCE DRAWING TITLE



CLIENT	LONDON BOROUGH OF ENFIELD		
PROJECT	CYCLE ENFIELD		
DRAWN	DATE	DRAWING CHECK	REVIEWED
FB	AS	AN	AS
DESIGNED	DATE	DESIGN REVIEW	DATE
AN	JAN 16	AN	JAN 16

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FILE	PROPOSED A105 ROUTE SHEET 11
SCALE	NTS
DRAWING NO.	B240G001-SK-A105-001-11
REV.	E



DRAWING NAME: B240G001-SK-A105-001-12
 DATE: 12/01/2016
 DRAWING NUMBER: B240G001-SK-A105-001-12
 PROJECT: CYCLE ENFIELD
 CLIENT: LONDON BOROUGH OF ENFIELD
 PROJECT: CYCLE ENFIELD
 DRAWN BY: AN
 CHECKED BY: AS
 DESIGNED BY: AN
 REVIEWED BY: AN
 DATE: JAN 16
 DATE: JAN 16
 SCALE: NTS
 DRAWING NO: B240G001-SK-A105-001-12
 REV: E

REV	DATE	DRAWN	REVISED	APPROVED	REVISION
E	JAN 2016	AN	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2016	AN	AS	AS	DESIGN UPDATES FOLLOWING TFL FEEDBACK
C	JAN 2016	AN	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
B	JUL 2015	RHTB	AN	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHTB	AN	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

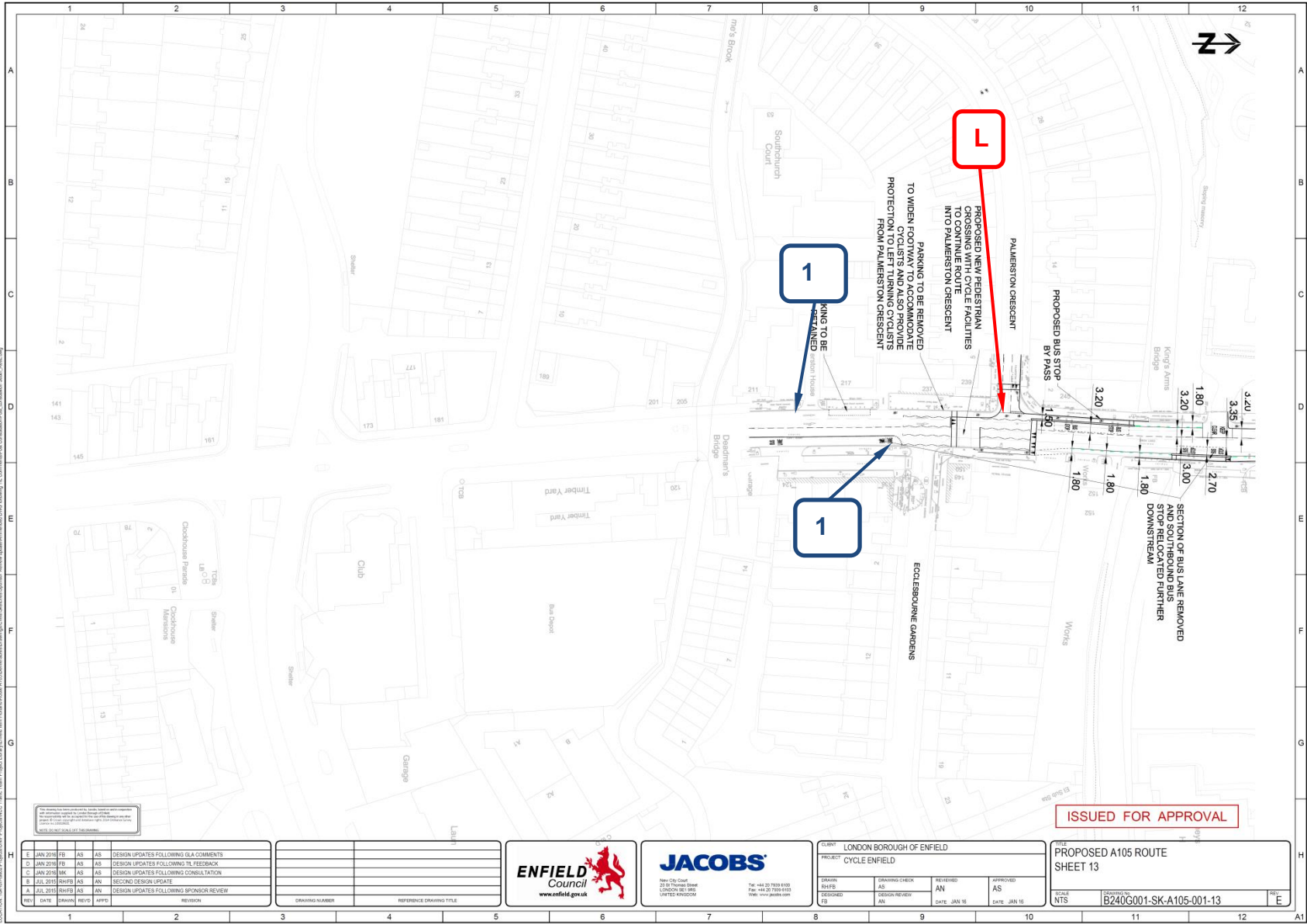
DRAWING NUMBER	REFERENCE DRAWING TITLE



CLIENT	LONDON BOROUGH OF ENFIELD		
PROJECT	CYCLE ENFIELD		
DRAWN	AN	DESIGNED	AN
CHECKED	AS	REVIEWED	AN
DATE	JAN 16	DATE	JAN 16

FILE	PROPOSED A105 ROUTE SHEET 12	
SCALE	NTS	
DRAWING NO	B240G001-SK-A105-001-12	
REV	E	

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REV	DATE	DRAWN	REV'D	APP'D	REVISION
E	JAN 2018	FB	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2018	FB	AS	AS	DESIGN UPDATES FOLLOWING TFL FEEDBACK
C	JAN 2018	MC	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
B	JUL 2015	RHTB	AS	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHTB	AS	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

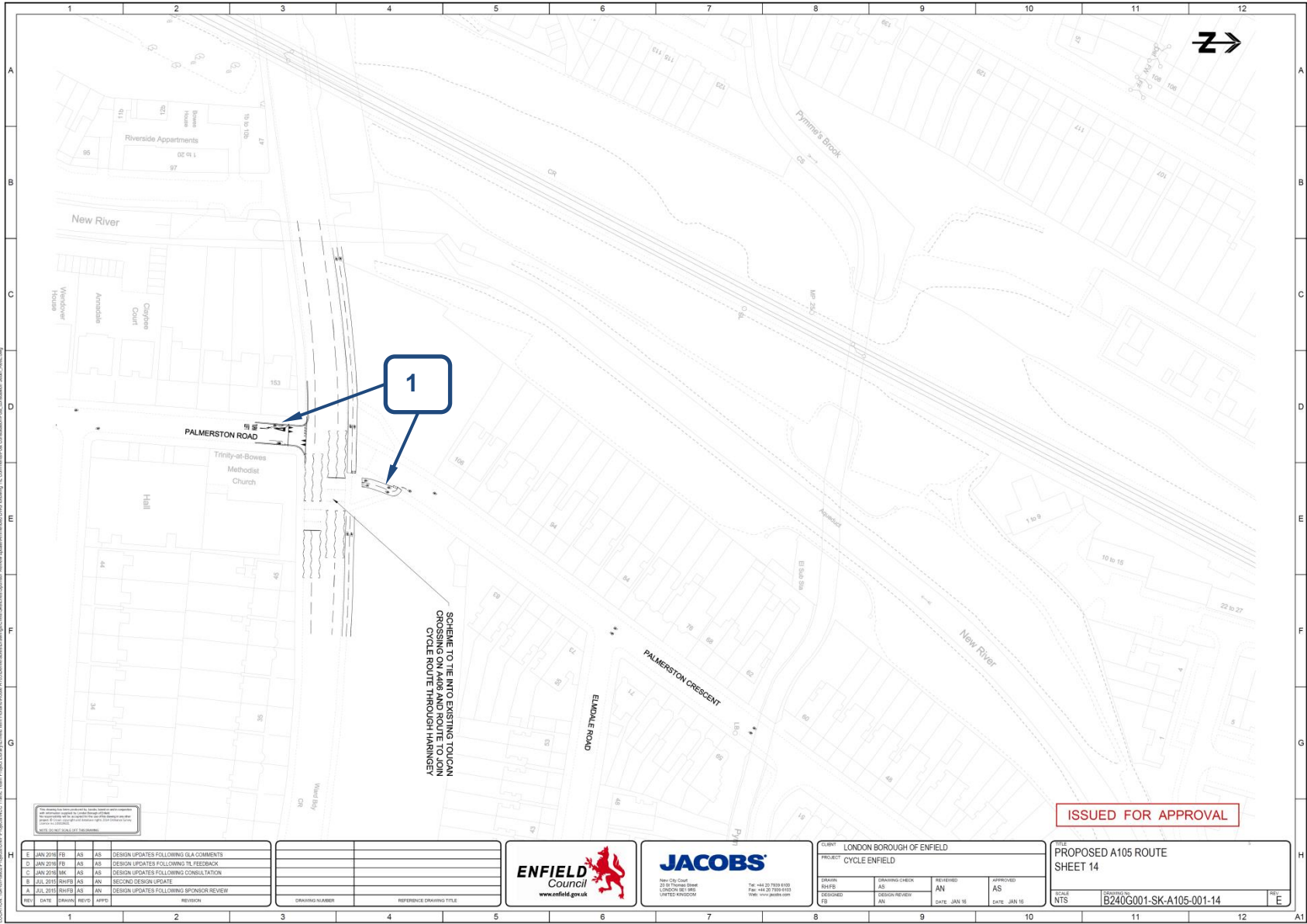
DRAWING NUMBER	REFERENCE DRAWING TITLE



CLIENT: LONDON BOROUGH OF ENFIELD		PROJECT: CYCLE ENFIELD	
DRAWN: FB	DESIGNED: FB	REVIEWED: AN	APPROVED: AS
DATE: JAN 16	DATE: JAN 16	DATE: JAN 16	DATE: JAN 16

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TITLE: PROPOSED A105 ROUTE SHEET 13	SCALE: NTS	DRAWING NO: B240G001-SK-A105-001-13	REV: E
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SCHEME TO BE INTO EXISTING TOUCAN CROSSING ON A105 AND ROUTE TO JOIN CYCLE ROUTE THROUGH HANDEL

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REV	DATE	DRAWN	REV'D	APPR	REVISION
E	JAN 2018	FB	AS	AS	DESIGN UPDATES FOLLOWING GLA COMMENTS
D	JAN 2018	FB	AS	AS	DESIGN UPDATES FOLLOWING TfL FEEDBACK
C	JAN 2018	MC	AS	AS	DESIGN UPDATES FOLLOWING CONSULTATION
B	JUL 2015	RHFB	AS	AN	SECOND DESIGN UPDATE
A	JUL 2015	RHFB	AS	AN	DESIGN UPDATES FOLLOWING SPONSOR REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE



CLIENT: LONDON BOROUGH OF ENFIELD		PROJECT: CYCLE ENFIELD	
DRAWN: FB	DRAWING CHECK: AS	REVIEWED: AN	APPROVED: AS
DESIGNED: FB	DESIGN REVIEW: AN	DATE: JAN 16	DATE: JAN 16

TITLE: PROPOSED A105 ROUTE SHEET 14	
SCALE: NTS	DRAWING NO: B240G001-SK-A105-001-14
REV: E	

DATE: 27/01/2018 10:46:48 AM
 LOCATION: C:\Users\jacob.ferrando\Documents\Projects\B240G001-SK-A105-001-14\Drawings\A105-001-14-Sheet14.dwg
 DRAWING: B240G001-SK-A105-001-14-Sheet14.dwg
 PROJECT: PROPOSED A105 ROUTE SHEET 14
 CLIENT: LONDON BOROUGH OF ENFIELD
 DRAWING NO: B240G001-SK-A105-001-14
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