

Appendix G – RTS Section B – Option 3 - Rail Route - B355363A-RTS-HGN-SB-RP-003



RTS Section B - Option 3

Rail Route

July 2019

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1 Introduction

Jacobs have been commissioned by Essex County Council (ECC) to investigate the feasibility of providing a new Rapid Transit System (RTS) between the proposed Tendering Colchester Border Garden Community (TCBGC)(part of North Essex Garden Community), Colchester Town Centre, and the existing Colchester Park and Ride site north of the A12 Junction 27.

The RTS is part of a Housing Infrastructure Funding (HIF) bid that also included A120/ A133 Link Road. The bid was submitted by ECC in March 2019.

The RTS route comprises 4 Sections (Section A, B, C & D).

Section A runs between Colchester Park and Ride terminal north A12 Junction 27 and North Hill, whilst Section B runs between North Hill and University of Essex through Colchester Town Centre. Section C covers the area between Greenstead Roundabout and the proposed North Essex Garden Community.

This note considers the feasibility of Section B Option 3. It looks at the infrastructure along the route and the existing constraints. Based on the RTS requirements and objectives, it assesses the practicality of this option.

This feasibility of this proposal was previously investigated by Mouchel Consultants and a draft Technical Note was produced in 2010. This document is included in Appendix A to this report.

This report examines only the offset that would be required to the Track and other Network Rail infrastructure to any RTS route. The report concludes that a 2-3m offset is recommended to all network rail infrastructure, which includes track, signals, mast arms, and cable runs. A full topographical survey is also recommended to establish the location of all infrastructure and therefore what route alignment is required following this offset.

An overview of all 5 options for Section B have been provided in Appendix B – Stage 1 Section B Options Drawing – B355363A-RTS-HGN-SB-SK-001.

2 Overview

2.1 Route Description

The existing rail line is predominantly a two track line with 25kV overhead electrification.

The proposed route for the adjacent RTS facility is 4.35km long. A typical cross section for this option has been provided in Appendix C – Section B Option 3 Rail Route Cross Section Drawing – B355363A-RTS-HGN-SB-SK-004.

The North Hill, High Street and Queen Street elements of this route are already subject to dedicated bus facilities, these will be optimised for RTS if required.

The route between Colchester Town Station and Colchester Hythe Station crosses the River Colne, passes beneath Brook Street, and crosses several pedestrian rights of way via grade-separated facilities (underpasses and footbridges). These are listed below:

- A footbridge approximately 350m east of Colchester Town Station.
- The Brook Street Overbridge approximately 200m east of the footbridge.
- A further footway underpass approximately 100m east of Brook Street.
- A bridge over the River Colne and adjacent footway, approximately 80m east of the footway underpass.

The proposed route passes by a “triangle” rail junction that connects the Colchester Town spur, the Clacton branch line and the link to Colchester North Station. It also approaches the existing Hythe Railway Station, which is adjacent to the level rail crossing. (Crossing point is an existing Bus Lane).

On its route, the proposal intersects an existing maintenance access at the eastern end of the former Colchester Town station car park (believed to be one of very few maintenance accesses between Colchester and Walton).

There is an existing commuter car park, along the route, to the north of Colchester Town station.

The east-west section from Colchester Town Station to the triangle junction runs along the side of a hill, with the northern side being lower than the southern side.

The route then travels east along Hythe Station Road, an existing Bus Lane, turning right on to Greenstead Road heading towards the University.

A proposed crossing point at the existing controlled crossing from Elmstead Road to the Tesco entrance will need constructing.

The route then uses private roads within the University to connect to Section C (exact route and tie-in location to be determined).

2.2 Constraints

The following are constraints that need to be considered and overcome when assessing the feasibility of the railway line as a potential rapid transit route.

There are few constraints to North Hill, the High Street and Queen Street. North Hill is an existing Bus Lane enforced with cameras. All buses currently entering the High Street have at least one stop before Queen Street, therefore are deemed necessary movements. The eastbound junction from the High Street to Queen Street is an existing Bus Lane, also enforced by cameras. Consideration shall be given to a part-time peak hour RTS gate at the western end of the High St to restrict eastbound High St traffic to RTS vehicles (and authorised vehicles) only. All town centre routes have been assumed to have heavy pedestrian use.

Access to the George Hotel (accessed solely from the High Street) would need to be maintained, possibly by means of a short (25-30m) 2-way section of High Street being created between St Nicholas Street and Maidenburgh Street. It is envisaged that the removal of redundant parking spaces from the High Street will create sufficient space for 2-way running in this location. There is the potential for this route to be used by vehicles not accessing the George Hotel that wish to access the High Street. Parking and loading bans are envisaged to be required.

The option then runs south along Queen Street and then left at St Botolph’s Roundabout, entering the existing rail station/proposed Rapid Transit facility.

Westbound RTS vehicles will travel via Osborne Street and Head Street, heading back towards North Hill (northbound) and onward to the Colchester Park and Ride facility. There is an existing westbound Bus Gate at the western end of Osborne Street.

The existing Colchester Town Rail Station vehicle access to St Botolph’s Roundabout has a poor alignment and has to cross traffic flows exiting the roundabout. Additional signals would be required here to provide a priority access/exit for the buses. Substantial improvement works are planned for this roundabout in the medium term, therefore a timely decision would allow a fully integrated roundabout design to be realised.

The proposals for this option is then for the route to follow the alignment of the rail track from Colchester station to the Hythe Station.

Colchester Borough Council have safeguarded land at the western end of the route for the RTS infrastructure, however this is only for a portion of the corridor and there is existing development around Brook Street which may require demolition.

The existing maintenance access gate at the eastern end of the former car park to the south of Colchester Town Station is believed to be the only maintenance access point to the railway between Colchester and Clacton. It is expected that Network Rail would want to keep this access.

There is considerable rail infrastructure along this route. There are existing cable trenches to both the north and south of the rail line. It is believed that the trench to the north carries power, and to the south carries signal information/data. Whilst these trenches can be relocated, they will still require their own dedicated corridor, limiting the amount of width that is available.

The footbridge between Colchester Town Railway Station and Brook Street is supported by a pier between the tracks. This crossing point limits development potential in its existing arrangement, and would require replacement in order to most effectively make use of the corridor. An at-grade crossing in this location would not be recommended due to the frequency of both pedestrian and rail/potential RTS use.

The Brook Street overbridge is a concrete deck design with adjacent retaining walls. Given the proximity of housing on Brook Street, realising extra width at this bridge is not practical. This would remain a pinch-point under the proposals for this route, which would dictate a replacement bridge as the only solution to improve this route. Replacing the bridge would cause significant disruption, as this is one of the few routes in the town that cross both the river and railway. The site is also very constrained due to topography and adjacent land use, and any reconstruction work here would require significant planning and consultation, and would be subject to significant potential objection from local residents.

The footway underpass to the east of Brook Street is very narrow, and any widening of the rail track/Rapid Transit route would increase the length of the underpass, and would be a very unattractive route for pedestrians. It could also have adverse effect on public safety for pedestrians due to its narrow and dark nature – this would be exacerbated by any extension in length.

The existing railway bridge over the River Colne is very narrow and skeletal. It is not expected that the bridge can be widened to accommodate the proposals within this report, and will need to be replaced in its entirety. Due to the tidal nature of the river here, there would be additional consents and requirements from the Maritime Agency. In addition, the footway that runs beneath the bridge here would require works to permit an extended bridge to be installed. The works to install a replacement bridge here would be subject to significant programming constraints from the rail operator, and would also be heavily constrained by the existing statutory undertaker's plant running beneath the road.

There is, generally, insufficient width along the whole route to accommodate this option. Given the inclusion of the cable trenches, cable masts, and other associated rail signal infrastructure, any widening would need to be predominantly outside the existing railway footprint.

The existing railway uses signals to pass information to the trains. Any signals will need to be shielded from the RTS, as RTS drivers could miss-interpret the signal and stop in unwarranted locations. Similarly, both the train and the RTS would require shielding from headlight glare as they pass each other in dark conditions.

The existing topography between Colchester Town and the Hythe is predominantly hillside, with the railway running in cutting and embankments on either side. These would need geotechnical assessment and potential steepening (and any relevant retaining features) to provide suitable widths for the rail and RTS vehicles to run without interference or conflict. This would result in removing much-needed vegetation which acts as a screen to residential and commercial properties along the

route. Any railway equipment/ plant would need a minimum of further 0.5m clearance from the equipment vegetation trimming/maintenance purposes.

Any construction works along this route would need careful and considered working practices, agreed with Network Rail or their agents, and it is likely that any works would be limited to night time working. This would not be acceptable due to the heavily residential nature of surrounding land.

Along the Hythe Station Road there is an existing dedicated Bus Lane that crosses the river. The RTS will also service the Hythe (rail) Station at this location. This would, therefore, require a new entrance on to Hythe Station Road, or would need to acquire the land to the west of the railway track. Care would need to be taken to ensure vehicles can turn on to the route from the highway and that the vehicles would not encroach across the centreline.

The route then turns right on to Greenstead Road towards the Greenstead Roundabout. Immediately before the roundabout, the route proposals continue east, directly connecting with the parking/turning head in Elmstead Road. (This follows the historic route of the road, prior to the diversion to accommodate the construction of the Greenstead Roundabout.) This presents a number of associated constraints and health and safety risks:

- The existing Toucan crossing would need to be removed and replaced with a signalised junction to allow RTS vehicles to cross the Colne Causeway.
- A pedestrian phase would need to be included within the signal timings.
- Pedestrian facilities would need sufficient clearance to be feasible, attractive and safe.
- There are significant utilities in the vicinity which would need diverting and/or protecting.
- There are retaining features surrounding Tesco, which is built in a natural bowl. These would need to be protected from vibration and impact during construction, and would need careful design to ensure there are no conflicts.
- Amendments would be required to Greenstead Roundabout to ensure there is suitable visibility to the signals and sufficient stacking space for queuing traffic.
- Careful consideration would need to be given to the arrangement of the proposed roads with regard to the remaining existing roads.
- The existing turning/parking head at the western end of Elmstead Road shall be removed, therefore a replacement parking area and turning head will be required.
- It is anticipated that residents on Elmstead Road will resist the RTS/pedestrian crossing amendments.

Once east of Elmstead Road, the route will connect with Section C.

Significant local resistance is anticipated for routing RTS vehicles through the cul-de-sac portion of Elmstead Road and the amendments to the crossing at Elmstead Road. Residents will see an increase in traffic, and their parking areas and frontages will be affected. Queuing traffic may also have a negative impact on the already-congested roundabout at Tesco. Given these factors and the existing topography, any amendments here are not considered feasible.

3 Conclusion

It is not deemed a practical or workable solution to expand the rail route corridor to a suitable width to share with adjacent RTS vehicles, issues include:

- Additional signalisation and works to St Botolph's Roundabout would be required to allow direct access to the roundabout from the Station forecourt area.
- Maintenance access to the rail line would need to be via the car park access at Colchester Town station.
- All existing rail infrastructure including masts and earthworks features will need retaining, although subject to possible rearrangement to provide additional width.
- Bridges over and under the rail line would need significant improvement, if not total replacement, with associated disruptions and utility diversion costs.
- An additional/widened river crossing would be required, requiring temporary suspension/shutdown of the rail spur to Colchester Town, and with associated environmental and health and safety constraints.
- Purchase and demolition of properties may be required
- Infrastructure/separation would also be required to reduce confusion from similar signals, and to prevent headlight dazzling.
- Risks associated with working over a tidal watercourse, including structural element replacement.
- All widening required would involve the acquisition of land and would require significant structural and geotechnical surveys and any potential amendments arising from these surveys.
- Provision of a new crossing point from Greenstead Road to Elmstead Road will generate considerable congestion and objection. Careful design will be needed to keep any knock-on congestion to Greenstead Roundabout to a minimum. Routeing across Colne Causeway will have to be carefully designed. Tesco is built at a much lower level than Greenstead Road/Roundabout, and there are retaining features that will need to be protected (or potentially refurbished/improved) during construction. This section of the route may require the removal of the southern-most entry to Greenstead Roundabout from Greenstead Road. This would have a knock-on effect of re-directing all traffic wishing to use Greenstead Roundabout to west along Greenstead Road and then north to the A133 St Andrews Avenue, potentially increasing the current congestion at this junction.

Given these issues it is recommended that this option is not progressed at this time as it would be unachievable within the timescales and budgets imposed by this project. However, this could present a viable option for future improvements to the RTS, and therefore the land should continue to be safeguarded and future developments in the locality should not obstruct this aspiration.

Appendix A – East Colchester Rapid Transit Link

Draft – Mouchel - 2010

East Colchester Rapid Transit Link

Investigation of the requirements of placing a bus facility adjacent to the existing Colchester Town rail spur

January 2010



Produced for
Mouchel Transport Planning East

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1. Introduction

Mouchel Rail were asked by Mouchel Transport Planning East to undertake a feasibility study of the rail corridor between Colchester Town and Hythe Station to ascertain the issues, pertaining to infrastructure and equipment associated with the operation of the rail line, that are likely to be encountered in placing a Guided Bus system alongside the rail line. The report does not attempt to address aspects outside Network Rail land. The objective was primarily to answer the question on how close to the rail line another facility could be placed.

The dimensions quoted in this report appertain solely to clearances from the track to Network rail Infrastructure i.e. overhead line masts, cable routes, signal posts and the fence line between Network Rail and the adjacent land owner

2. Scope

The scope of the study was to take a look at the existing infrastructure along the route and indicate any potential issues with resolutions that would be potentially accepted by Network Rail. The study was undertaken by an inspection of the site of the route but without accessing Network Rail land.

3. Description of the route

The route from Colchester Town to Hythe is predominately a two track railway which culminates in a short stretch of single track at Colchester Town station. The features of the route are:

- The line is electrified on a 25Kv overhead line system
- Colour light signalling controlled from Colchester Signal Box.
- A cable trough route either side of the railway. The one to the North appears to be a power cable route and that to the South the signal and telecoms cable route.
- A car park adjacent to Colchester Town station with an access gate at the far end of the car park.
- A footbridge a short distance from the station.
- An overbridge (Brooke Street) approx 200m beyond the footbridge.
- An underbridge (Footpath subway) approx 100m beyond Brooke Street overbridge.
- An overbridge (River Colne) approx 80m beyond the underbridge.
- The triangle junction leading to Clacton or Colchester.
- Hythe Station just beyond the triangle.

Colchester Town station, whilst currently a single platform station, used to possess two platforms and an electrified siding to the south of the station.

4. Features affecting the provision of a guided bus route adjacent to the railway

The following section describes the features along the railway and how they would affect the proposal. It should be noted at this point that from a rail operation perspective there is nothing along the route that would preclude the provision of the guided bus route; however there are issues that would have to be addressed. These are described below:

1. There is an access gate to the track at the far end of the car park. This provides Network Rail maintenance staff with access to the track for staff and materials, and in the event it is in the way of the proposal it will require to be replaced in an alternative position acceptable to Network Rail. No further maintenance access to the railway was observed between Clacton Town Station and Hythe Station and it is not envisaged that Network Rail would require any additional provision.
2. The signal cable route to the South of the track is approximately 2m from the nearest rail where it can be seen. This is not necessarily the case throughout.
3. There is a signal on the approach to Colchester Town station. The signal is 2.1m from the nearest rail and the structure is a further 0.5m
4. There are a number of location cases (grey cabinets) that house signalling equipment that may require to be moved to facilitate the proposal.
5. The overhead lines are supported along the route by a mixture of single track cantilevers along most of the route and portal frames on the approach to Colchester Town Station and in the vicinity of Hythe station. The single track cantilevers are approximately 2.2m from the nearest rail. The portal frames on the South side are much further from the nearest rail as a result of the track layout prior to rationalisation to a single platform.
6. The footbridge has a pier located between the two tracks which are wider than standard at this point and an additional one on the embankment on the South side of the railway.
7. Brooke Street overbridge which is a concrete deck bridge built on brick abutments. There is a retaining wall adjacent to the railway
8. The underbridge provides pedestrian access along the footpath which starts on Brooke Street to the North of the railway and goes under the railway and heads in the direction of Hythe. This subway is extremely narrow and could present an issue to public safety when widened to take a guided bus line.

5. Issues raised by the proposal and mitigation

1. As described above the gate is required for ongoing maintenance and need to be replaced in a position acceptable to Network Rail if it is shown to be in the way.
2. The signal cable can be moved to be no closer than 2m from the nearest rail if required to alleviate a pinch point.

3. The signal which is on the east side of Brooke street overbridge is at the optimum position in relation to trains and cannot be moved.
4. The location cases can be resited.
5. The single track cantilevers supporting the overhead line are approximately 2.2m from the nearest rail and require approximately 0.5m behind the mast for maintenance access. The portal frames in the vicinity of Colchester Town station will require to be removed, and replaced with alternative masts. The alternatives are single track cantilevers on the south side or twin track cantilevers sited on the North side of the line to support both tracks. The advantage of twin track cantilevers is that they will allow a fence line to be erected 2m from the nearest rail.
6. The existing footbridge will require to be replaced to enable the pier on the south side embankment to be removed. As the tracks are further apart than normal at this point, the centre pier could also be removed and the southerly track moved northward to provide additional clearance if required.
7. The Brooke Street Bridge provides no major issue, however the new proposal must ensure that access to the structure for examination is not impaired. The bridge will presumably have to be widened for a guided bus facility.
8. The underbridge taking the footpath under the railway provides no major issue, however the new proposal must ensure that access to the structure for examination is not impaired.
9. The bridge over the river provides no major issue, however the new proposal must ensure that access to the structure for examination is not impaired.
10. A fence will require to be erected of sufficient height and type to ensure that the headlights of the buses do not shine in the drivers eyes. The fence will be agreed with Network Rail.
11. The signal will require signal sighting to ensure that the works of the proposal do not affect the driver's view of it.

6. Standards

The Network Rail standards for clearance from the nearest rail to other structures, or fence lines are as follows:

- Distance to a fence 2m
- Distance to a structure 1.624m
- Distance to a cable route 1.7m

In certain cases the standard for a fence can be reduced to 1.624m.

A case in question is the Robin Hood Line in Nottingham which was originally a double track railway and was singled. In the early part of 2001 the Nottingham Express Transit was built on the adjacent track formation. At one particular bridge the Robin Hood Line and the Tram line were required to pass through the same structure. This led to a fence being erected 1.624m from the Robin Hood line to enable the project to go ahead.

7. Conclusion

The proposed guided bus route could be built adjacent to the railway with an absolute minimum distance of 2m plus the width of the proposed fence line, however this would require the overhead line masts to be replaced where this distance is proposed. It would be more prudent to consider a distance of approximately 3m which would reduce the work to a minimum. At points where pinch points exist, the distance could be reduced.

The dimensions quoted in this report appertain solely to clearances from the track to Network Rail infrastructure, i.e. overhead line masts, cable routes, signal posts and the fence line between Network Rail and the adjacent land owner. It should be noted that whilst the normal minimum clearance of 2m from the nearest rail to fence line is the minimum, certain features on site may require this distance to be increased or features relocated at local points. Any additional clearances required by these features can only be ascertained following a detailed topographical survey and discussions with the relevant discipline engineers and Network Rail.

8. Recommendations

To be able to ascertain the exact position of the fence line between the two systems, a topographical survey to ascertain the exact position of all railway infrastructure is required. Following the completion of a topographical survey a member of the rail team would sit down with a member of the design team to ascertain the most cost effective alignment that would consider the rail works and general civil engineering works.

To enable the topographical survey to be undertaken a Basic Asset Protection Agreement would require to be signed between Network Rail and Essex County Council. This agreement would enable Network Rail to provide track safety protection and would also be the vehicle for Network Rail to recover any costs they incur in giving the assistance. Also in the event that the scheme is to go ahead, then Network Rail would recover their costs for considering the scheme and giving their approvals. Unless there are proven benefits for the rail operations all costs of changes to infrastructure will be for the applicant.



View from Brooke Street Bridge towards Hythe



View from Station Car park towards Hythe

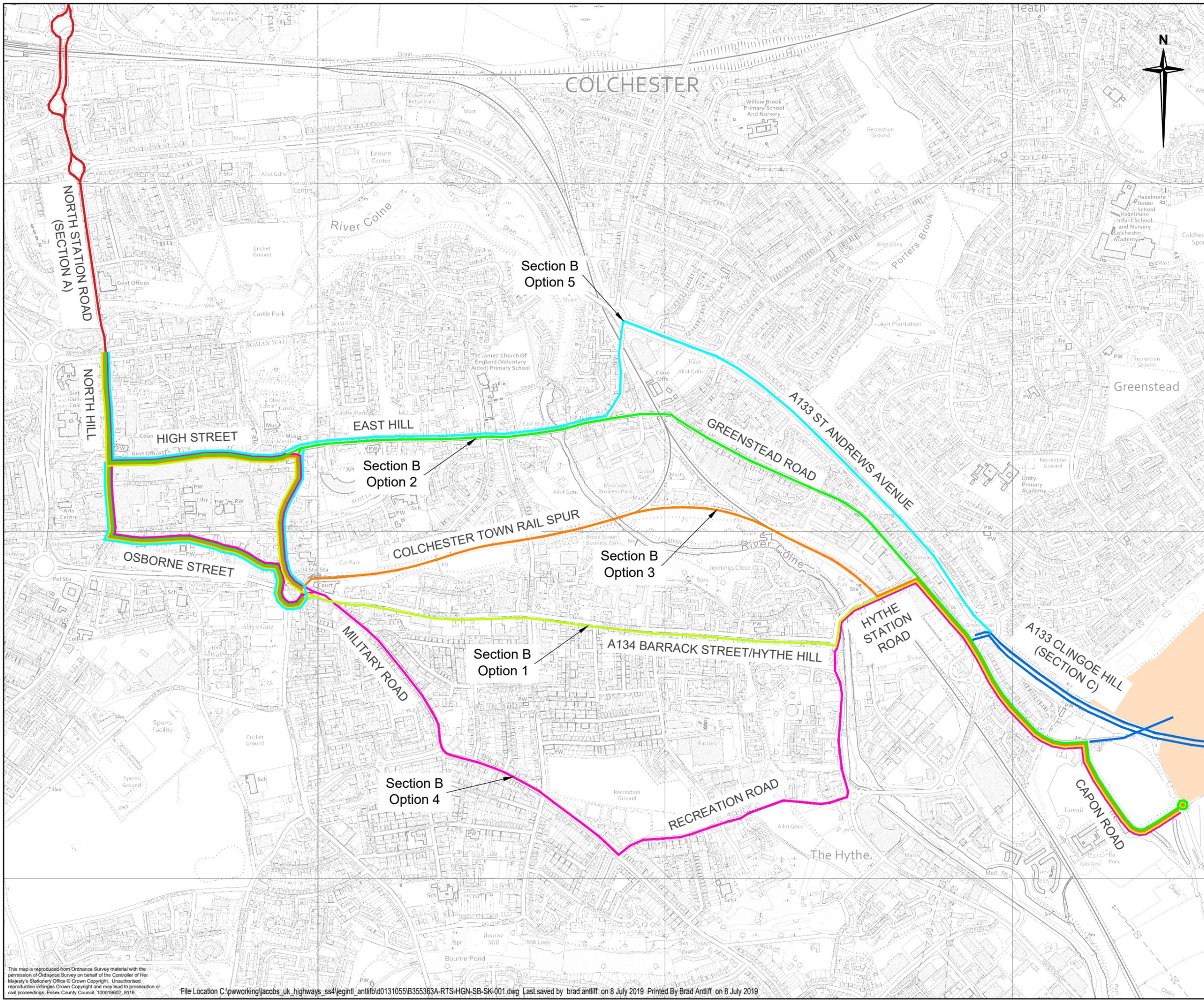


View of footbridge looking to the South



View from Footbridge looking towards Colchester Town Station

Appendix B – Stage 1 Section B Options Drawing – B355363A-RTS-HGN-SB-SK-001



Notes

1. Do not scale.
2. Indicative layouts based on Ordnance Survey data only. Topographical surveys to be undertaken at a later design stage.
3. Routes and options shown are an overview only, with no certainty as to feasibility of implementation. Therefore this plan is not for public distribution.

Key

- Section A
- Section B Option 1
- Section B Option 2
- Section B Option 3
- Section B Option 4
- Section B Option 5
- Section C



Rev	Date	Description of revision	Drawn	Checked	Reviewed	Approved

DRAWING STATUS

FOR INFORMATION



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NORTH ESSEX RAPID TRANSIT SYSTEM

STAGE 1 SECTION B OPTIONS

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
PFW	PFW	PJN	PJN	MM
DATE	DATE	DATE	DATE	DATE
JUL 19	JUL 19	JUL 19	JUL 19	JUL 19

DRAWING UNITS U.N.O. SCALE AT A3 (420x297mm)
DIMENSIONS IN MILLIMETRES 1:10,000
LEVELS IN METRES

DRAWING No. **B355363A-RTS-HGN-SB-SK-001** REV. -



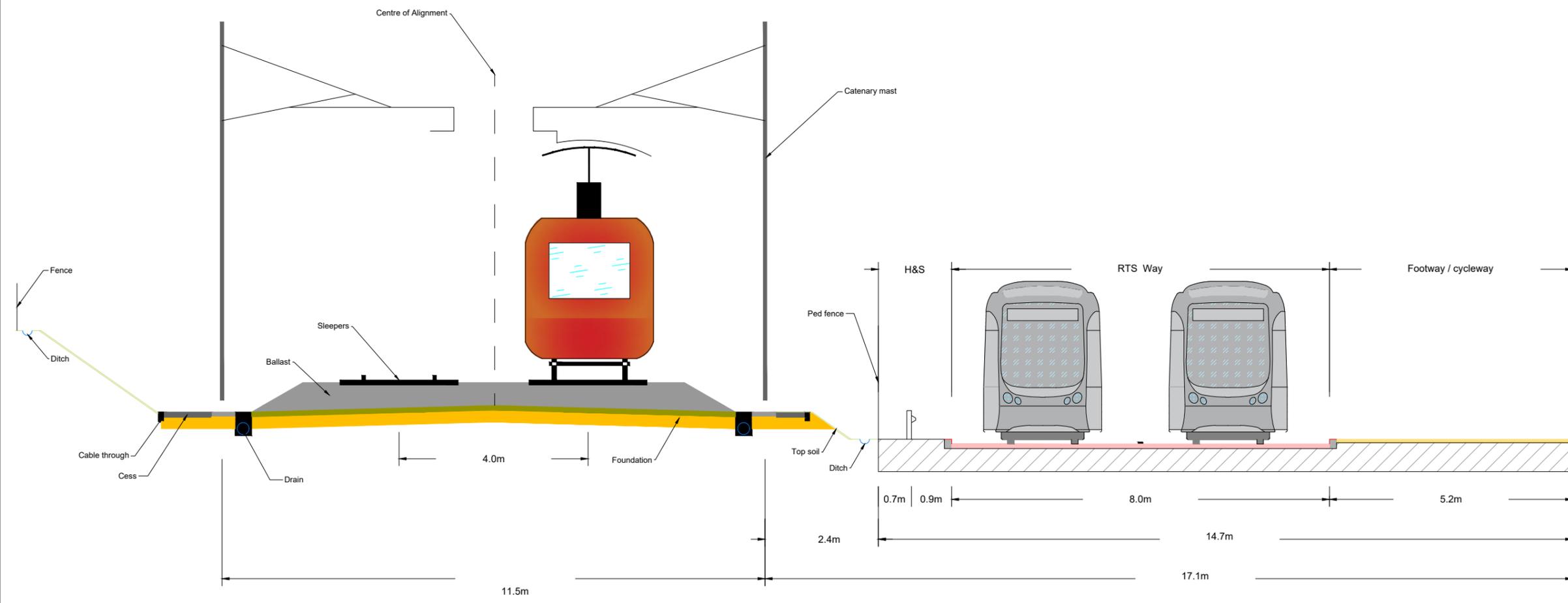
Appendix C – Section B Option 3 Rail Route Cross Section Drawing – B355363A-RTS-HGN-SB-SK-004

Notes

1. Do not scale.

Key

- Footway
- Footway / cycleway
- Carriageway
- RTS way
- Verge
- Road markings
- Kerb



Rev	Date	Description of revision	Drawn	Checked	Review'd/Approv'd

DRAWING STATUS

FOR INFORMATION



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SCHEME TITLE
NORTH ESSEX RAPID TRANSIT SYSTEM

DRAWING TITLE
SECTION B OPTION 3 RAIL ROUTE CROSS SECTION

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
MC	MC	BA	PN	PK
DATE	DATE	DATE	DATE	DATE
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DRAWING UNITS U.N.O. DIMENSIONS IN MILLIMETRES LEVELS IN METRES SCALE AT A1 (841X594mm) N.T.S

DRAWING No.	REV.
B355363A-RTS-HGN-SB-SK-004	-



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