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Technical note

Project	**York Northwest Masterplanning & Infrastructure Study**	**Date**	14 January 2013
Subject	Update	**Ref**	DOC/001
Author	C Griffin / L Cable	**Rev**	

York Northwest Masterplanning & Infrastructure Study Update

1 Introduction

1.1 Background

The purpose of this technical note is to update the original Masterplanning and Infrastructure Study prepared for City of York Council in June 2011, following the release of information from Network Rail in respect of revised rail siding information. This original report dealt with the council's aspirations to provide new access corridors to the York Central area, delivering long term housing and employment growth in the York Northwest area.

The report addressed the significant challenges presented by the anticipated scale of development, the limited available highway capacity and the presence of operational rail uses in the development corridors, bounded by operational rail lines including the East Coast Main Line (ECML), the Harrogate Line, York Station and the Freight Avoiding Line (FAL). The York Central development area is shown in Figure 1.1 of that report.

The report also discussed the cost of the new infrastructure to access the York Central site, a number of different access corridors and preferred existing junction improvement options, various bridge options, project risks, buildability assessments and the feasibility of removing the existing Queen Street bridge and associated infrastructure to the south east of York Rail Station.

1.2 Purpose of this Technical Note update

Network Rail has advised City of York Council of its desire to introduce a number of new sidings to the Thrall Works in the Holgate Park Drive Corridor as presented in Figure 1.1 below. The City of York Council (CYC) has commissioned Halcrow to examine the impact of amending the access corridor

Prepared by	C Griffin	Date	14 January 2013
Checked by	L J Cable	Date	17 January 2013
Approved by	S Stamper	Date	17 January 2013

proposals for the western option (referred to in the original report as Option B1), in terms of engineering solutions for highway infrastructure, bridges and associated changes to cost.

Due to the introduction of additional sidings to the eastern side of this site, Corridor Option B1 is rendered untenable as the gradient of the highway solution approaching a bridge over all of the sidings and rail lines would be far in excess of the maximum 6% gradient adopted previously, as detailed in Section 3.3 of the previous report. No additional work has therefore been produced to discuss that option.

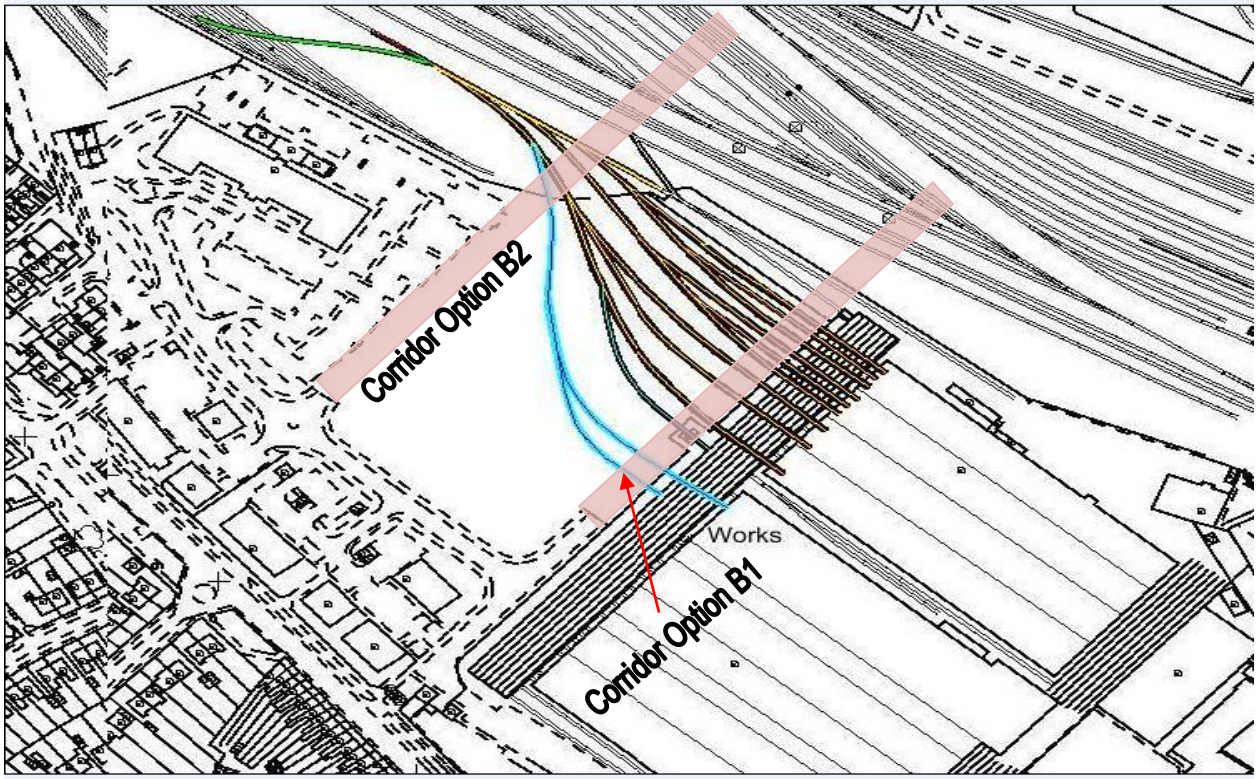


Figure 1.1 New sidings to Thrall works in Holgate Drive access corridor (new sidings are shown coloured in blue, green and orange / brown.

2 Impact of Sidings proposals

2.1 Development Options

As described in the original report, the differing Rail Land Options present alternative options for crossing the railway line sidings and FAL from the Five Acre Site. Rail Land Options 1 to 5 present a longer crossing than in Scenario 6. The land available within the Five Acre site was previously reported as

presenting two further potential access corridors linking to the existing highway junctions within the Business Park.

It should be noted that the sidings proposals appear to connect through the Thrall works to sidings in between the main buildings, and consequently run through the site of the existing sub station at that location. It should be noted that whilst no costs have been sought or included to account for the relocation of the substation, the cost associated with this is considered to be very significant. In the previous study, Corridor B1 was aligned to avoid this substation, with suitable retaining walls and service access road included to avoid this cost implication.

2.2 Highway Infrastructure for Access Corridor B1

The first of these corridor options, referred to as Access B1, considered the use of the junction at the south eastern corner of the site adjacent to the Traverse Table, west of the Thrall Works. It will not be possible to maintain a viable proposal on this corridor owing to the presence of the sidings shown in Figure 1.1 above.

This arrangement would have resulted in attempting to achieve a vertical clearance of 5.8m minimum over the new siding leading into the Thrall Works at chainage 60 approximately. Previously, such clearance was not required until chainage 180 approximately. The existing ground level at chainage 60 is approximately 11.72m. With a clearance of 5.8m, this would have resulted in a road level of 19.52m (including a 2m deep bridge depth), a level difference of 7.8m and hence a gradient of around 13% between chainage 0 and 60.

It is not considered a viable option to include a highway and associated off carriageway footway and cycleway at this gradient. To attempt to reduce this gradient for this corridor may be possible, but would likely result in having to extend works back onto the existing business park roads, with the existing t-junction immediately to the south having to be rebuilt as an elevated junction. This would result in the inclusion of significant retaining structures and excessive cost increases.

Furthermore, the bridge solution would have to be extended by approximately 120m, likely a series of pier supports between sidings, to elevate the carriageway over this entire area. For Land Option 1 to 5, this would result in a cost increase compared to the original bridge span of 80m of 250% and for Land Option 6 with an original span of 52m of 330%.

For the above reasons, the development of solutions for this corridor with the siding locations has not been progressed any further.

2.3 Highway Infrastructure for Access Corridor B2

The second corridor option, referred to as Access B2, considers the use of the roundabout junction at the south western corner of the site, from within the Business Park. This corridor is situated adjacent to the CPP car parks.

There were previously two options developed for Corridor B2, one in which the highway corridor continued in a right handed bend into the development site and one which terminates in the development after the sidings at an elevated roundabout. These options (referred to as Options A and B) have slightly different vertical highway alignments, owing to the nature in which the alignments terminate in the development. The text below considers the impact for Options A as shown on drawings CTDAOB-003-005 (Rail Land Option 1-5) and CTDAOB-003-013 (Rail Land Option 6) and for Options B as shown on drawings CTDAOB-003-007 (Rail Land Option 1-5) and CTDAOB-003-015.

The addition of the sidings results in having to extend the current bridge span proposals approximately 10m to the south.

In order to achieve the same vertical clearance of 5.8m minimum over the new sidings leading east to the Thrall Works it has been necessary to amend the vertical alignment, elevating by an additional 500mm to 770mm (for the option terminating at the roundabout) at the point where the siding is located (chainage 140m approximately). This has the effect of increasing the height of the embankment supporting the highway.

The 6% gradient previously commenced at around chainage 45 approx in Land Use options 1 to 5 and option 6, with a sag (parabolic) curve connecting to the junction over the first 45m. To accommodate the same gradient to connect to the higher levels outlined above, clearing the siding, it has been necessary to commence the 6% gradient earlier at around chainage 30. Sag curves connect to the existing roundabout over the first 30m from the junction. The radii of these sag curves at 930m and 1160m (for the option terminating at the roundabout), conform to the minimum values of 650m adopted in the design parameters adhered to in the original study.

Owing to the extension of the bridge some 10m further south and the presence of the rail sidings, it will be necessary to retain the highway corridor with embankment and retaining structure on the eastern side from chainage 100 up to the bridge abutments, offset a minimum of 4.5m from the line of the southern most siding. The retaining wall to the western side, halting the embankment form encroaching into the CPP car parks, will increase in height, but notionally apply over the same distance.

With the exception of the items listed above, the inclusion of the sidings does not have any other impact upon the physical engineering proposals.

2.4 Bridge Design Options

2.4.1 Access Corridor B1, all Land Use Scenarios

The steep vertical highway alignment associated with Access Corridor B1, immediately west of the Thrall works, precludes this location as a viable access point; no further discussion is presented with regard to bridge forms.

2.4.2 Access Corridor B2, Land Use Scenarios 1 to 5

The bridge solution is to provide a tied arch with ladder deck with a span of approximately 130m. The design option is similar to that presented in Drawing No. CTDAOB-003-017 in Appendix C. The other bridge options discussed in the main report are not appropriate given the long span required. The shape of the arch mirrors the arch barrels used in the York Railway station roof. It is anticipated that for a tied arch, the maximum rise at the centre of the arch would be over 30m. It is expected that this would be visible from York Minster and that further consultation would be required to determine if this would be acceptable. The proposed bridge has a deck depth to finished road levels of around 1.6m, which is less than the 2m depth initially assumed in this study. Given the size of this structure and the constrained nature of the site, we believe there will be problems associated with erection of the bridge.

2.4.3 Access Corridor B2, Land Use Scenario 6

For this land use option, the proposed bridge solution is to provide a tied arch with ladder deck at a span of approximately 70m. It is anticipated that the maximum rise at the centre of the arch would be in the order of 16m.

2.5 Land Acquisition

CYC also requested that Halcrow prepare an additional drawing to demonstrate the area of land in the Five Acres site that Network Rail would have to acquire in order to develop the sidings proposals. This equates to 1.083 hectares and is shown on additional drawing CTDAOB-003-022.

3 Cost

The previous cost estimates for provision of all infrastructure are reproduced in Table 3.1 below, as presented in the Masterplanning and Infrastructure Study Report, Table 5.3.

Although the vertical alignment has altered, in lifting by approximately 500 to 700mm it should be noted that the costs of the highway, drainage, safety fencing, street lighting, roundabouts and earthworks have not changed.

The previous cost estimates were based upon the earthworks reaching a minimum height of 7.8m (5.8m and 2m bridge and carriageway construction depths) at the point that the embankment terminated at the interface with the bridge abutments. The calculations assumed a length of rising carriageway, based upon a 6% gradient up to this interface, with a 5% adjustment to allow for curved tie ins. This provided embankment lengths of 136.5m which were then used as the cost basis for all scenarios, a total of £1,045,773.89 for both ramped approaches to the bridges. The final design level may differ slightly from the assumed 7.8m height figure, either lower or higher and the length of embankment may be slightly longer or shorter. However, for the purposes of cost estimating, the assumptions used are believe to provide a worst case scenario and are therefore used again as the basis for the cost estimates for this study.

The substantial difference for this study is the length of the bridges as longer spans are now required in order to bridge over the new sidings and the existing rail infrastructure. Cost estimates were previously based upon a figure of £3, 285.00 per square metre. This figure will be applied again, but in this study the total length of spans will be significantly increase and hence the costs associated with the bridges will be substantially higher.

The figure determined for the bridge for Corridor B2 Options A and B, Land Rail Uses 1 to 5 was £8,698,760, including allowances for preliminaries, design and supervision and contingencies as applied to all other elements also.

Likewise the figure used for the bridge for Corridor B2 Options A and B, Land Rail Use 6 was £4,621,810, including the same allowances and reflecting a much shorter span.

These figures are reproduced in Table 3.1 below.

Description	Cost (£)	Cost (£)	Cost (£)	Cost (£)
Land Rail Use Option	1 to 5	1 to 5	6	6
Option	A	B	A	B
Junction Improvement	214,230	428,460	214,230	428,460
Access corridor	2,849,629	2,941,996	2,803,717	2,833,753
Bridge Designs	8,698,760	8,698,760	4,621,810	4,621,810
Archaeology	125,235	125,235	125,235	125,235
Sub total (including General preliminaries, design and supervision costs and contingencies)	11,887,854	12,194,452	7,764,992	8,009,258
Optimism Bias (@ 44%)	5,230,656	5,365,559	3,416,596	3,524,074
Total	17,118,510	17,560,011	11,181,588	11,533,332

Table 3.1 Estimated Scheme Costs for Access corridor B2 (2011 Prices) as presented in the previous Masterplanning and Infrastructure Study report

In both scenarios, the type of bridge recommended is the tied arch and ladder deck form, with different spans. The cost per square metre of this form of bridge is estimated to be £3,285 and this is applied to the spans of 130m and 70m assumed for Land Rail Use Options 1 to 5 and 6 respectively. The overall revised scheme costs are presented in Table 3.2 below.

Description	Cost (£)	Cost (£)	Cost (£)	Cost (£)
Land Rail Use Option	1 to 5	1 to 5	6	6
Option	A	B	A	B
Junction Improvement	214,230	428,460	214,230	428,460
Access corridor	2,849,629	2,941,996	2,803,717	2,833,753
Bridge Designs	10,280,353	10,280,353	5,535,575	5,535,575
Archaeology	125,235	125,235	125,235	125,235
Sub total (including General preliminaries, design and supervision costs and contingencies)	13,469,447	13,776,045	8,678,757	8,923,023
Optimism Bias (@ 44%)	5,926,557	6,061,460	3,818,653	3,926,130
Total	19,396,004	19,837,505	12,497,410	12,894,153

Table 3.2 Revised Scheme Costs Estimates for Access corridor B2 (2011 Prices) to account for the proposed Network Rail sidings development

Table 3.3 below compares the costs of the revised proposals against those in the original study and provides a percentage increase for ease of reference.

Description	Cost (£)	Cost (£)	Cost (£)	Cost (£)
Land Rail Use Option	1 to 5	1 to 5	6	6
Option	A	B	A	B
Original Study Total	17,118,510	17,560,011	11,181,588	11,533,332
Updated Study Total	19,396,004	19,837,505	12,497,410	12,894,153
Total change	+2,277,494	+2,277,494	+1,315,822	+1,360,821
% change from original	13	13	12	12

4 Conclusion

This study demonstrates the financial and engineering implications on the York Central development, arising from the Network Rail new sidings proposals in the Five Acres site in Holgate Park.

Section 2.2 and 2.4.1 both identify that the current proposal of providing an Access Corridor (B1) in the south eastern area of the Five Acres site would be severely affected by the proposal to provide new sidings to the Thrall works, resulting in excessive highway corridor gradients and bridge spans. In effect, this corridor is not considered economically viable because of Network Rail's proposals and has not been investigated in any detail.

Sections 2.3 and 2.4.2 discussed how the proposals could be amended to incorporate the sidings and discussed the engineering implications. Whilst possible to incorporate a longer bridge span of 130m to suit the land constraints presented by Rail Land Options 1 to 5, it was felt that there were significant engineering construction difficulties associated with this proposal, given the constrained nature of the site at this location

Section 2.3 and 2.4.3 discussed how the proposals could be amended to accommodate the constraints provided in Rail Land Option 6. Essentially this does not impact upon the highway engineering proposals, but has a much more positive effect upon the bridge proposal, which could be reduced to a span of 70m.

Section 2.4 identifies the land required by Network Rail to develop the sidings proposals, 1.083 hectares as shown on drawing CTDAOB-003-022.

In Section 3, Table 3.3, the cost comparisons demonstrate that the Network Rail sidings proposals have a the effect of increasing scheme costs by 13% for Rail Land Options 1 to 5, equating to £2.3M. Similarly, the 12% increase for Rail Land Option 6 equates to an increase of scheme costs of around £1.3M.

Appendix A

Drawings accompanying this updated Study

CTDAOB-003-005 Rev B – Holgate Park Access Corridor B2 Rail Land Use Options 1-5 Option A

CTDAOB-003-006 Rev B – Holgate Park Access Corridor B2 Rail Land Use Options 1-5 Option A Long Section

CTDAOB-003-007 Rev B – Holgate Park Access Corridor B2 Rail Land Use Options 1-5 Option B

CTDAOB-003-008 Rev B – Holgate Park Access Corridor B2 Rail Land Use Options 1-5 Option B Long Section

CTDAOB-003-013 Rev B – Holgate Park Access Corridor B2 Rail Land Use Option 6 Option A

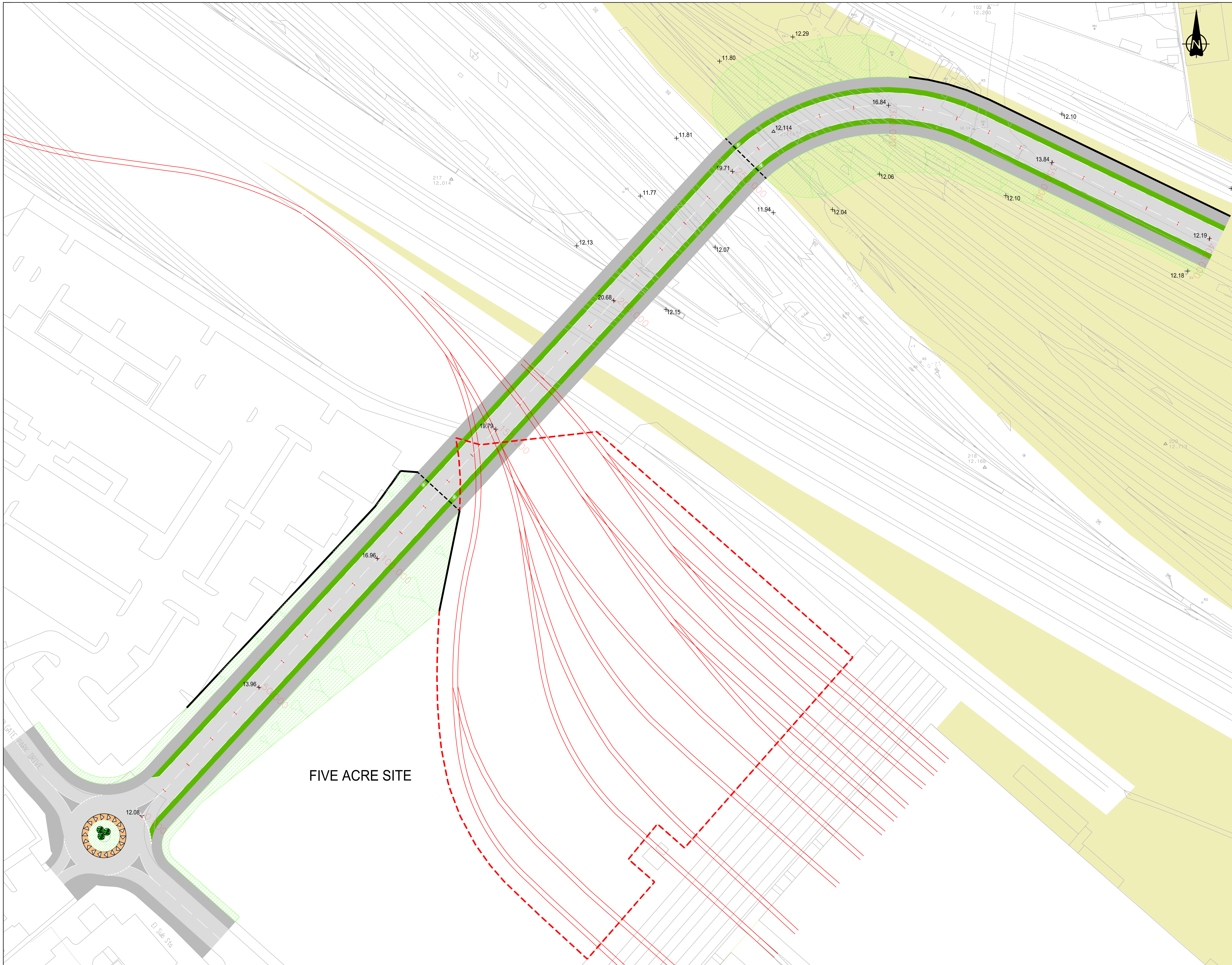
CTDAOB-003-014 Rev B – Holgate Park Access Corridor B2 Rail Land Use Option 6 Option A Long Section

CTDAOB-003-015 Rev B – Holgate Park Access Corridor B2 Rail Land Use Option 6 Option B

CTDAOB-003-016 Rev B – Holgate Park Access Corridor B2 Rail Land Use Option 6 Option B Long Section

CTDAOB-003-017 – Access Holgate Park Corridor B1 Rail Land Option 1 to 5 Bridge Solution A

CTDAOB-003-022 – Holgate Park Land Required by Network Rail for New Sidings



Key:

- Retaining Wall
- Bridge abutment
- Landscaping on embankments
- Footway
- Carriageway
- Cycle Lane
- Proposed new sidings
- Land required by NR for new sidings

Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	SS	16/01/13	Updated to include Network Rail sidings

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York Northwest
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Drawing

Holgate Park
Access Corridor B2
Rail Land Options 1-5
Option A

Drawn by: J Grant/C Griffin Date: 25/02/11

Checked by: L Cable Date: 17/03/11

Approved by: S Stamper Date: 17/03/11

Drawing No. CTDAOB-003-005

Revision B

Drawing Scale: 1 :500 at A1

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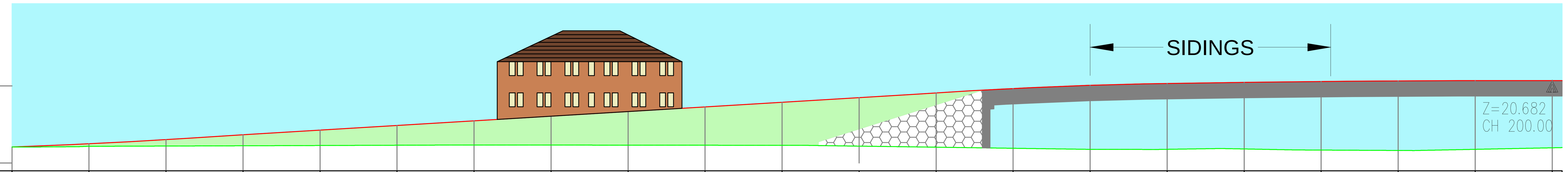
Xreference file path :
User and Plot Date :

Section A



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EXISTING GROUND (DASHED)	12.08	12.17	12.20	12.24	12.27	12.31	12.34	12.33	12.32	12.31	12.30	12.20	12.06	11.92	11.78	11.78	11.83	11.68	11.63	11.78	11.98

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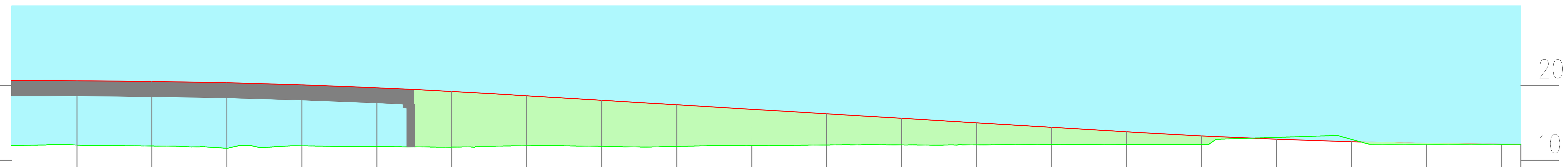

CHAINAGE	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390	400 403
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EXISTING GROUND (DASHED)	12.07	11.95	11.64	11.98	11.89	11.80	11.98	11.92	11.90	11.99	12.08	12.09	12.10	12.15	12.13	12.14	13.10	12.83	12.19	12.18 12.18

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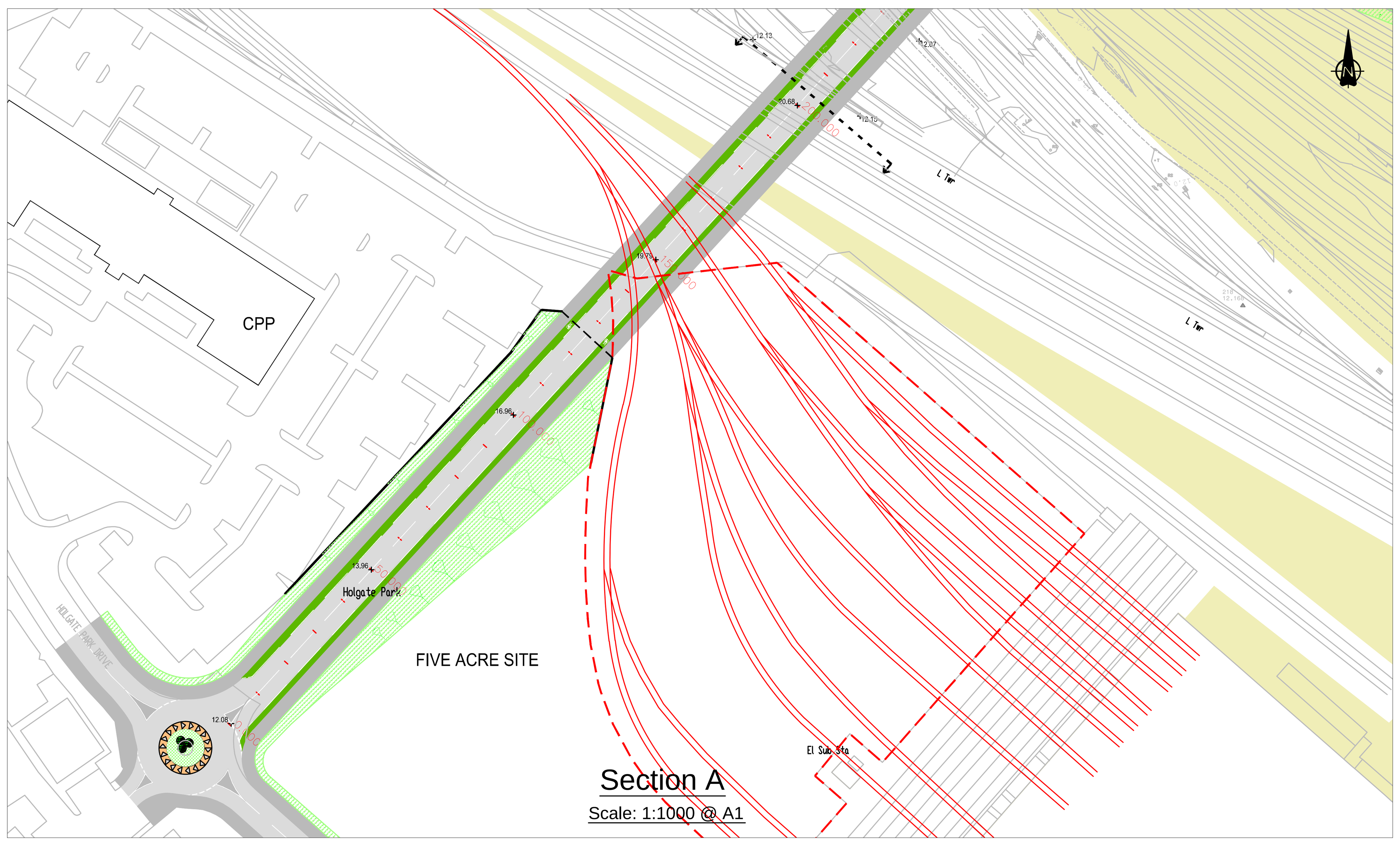

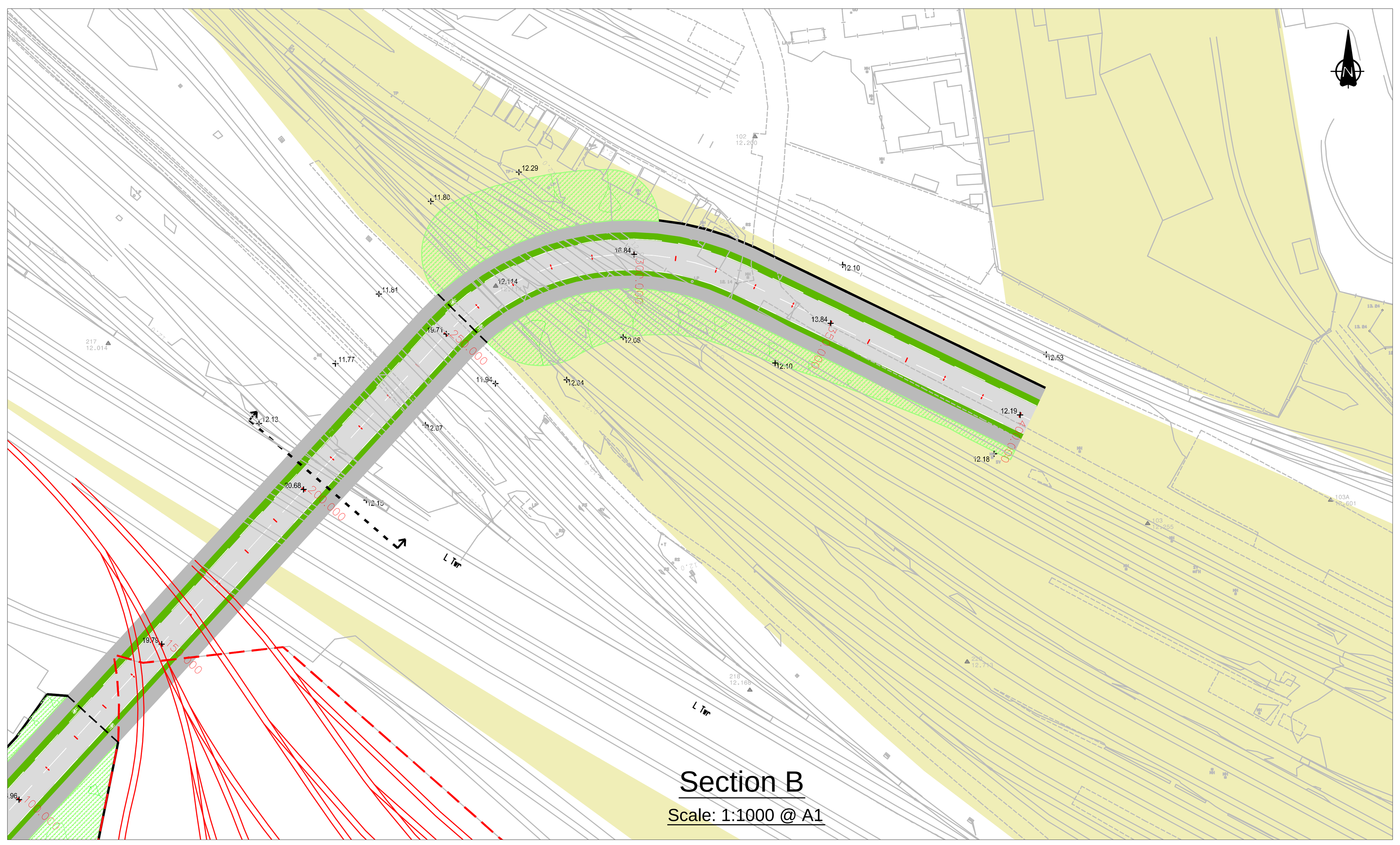

Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	SS	16/01/13	Updated to include Network Rail sidings

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Drawing

Holgate Park Access Corridor B2 Rail Land Options 1-5 Option A Long Section

Drawn by: J Grant/C Griffin Date: 25/02/11
Checked by: L Cable Date: 17/03/11
Approved by: S Stamper Date: 17/03/11

Drawing No. CTDAOB-003-006 Revision B

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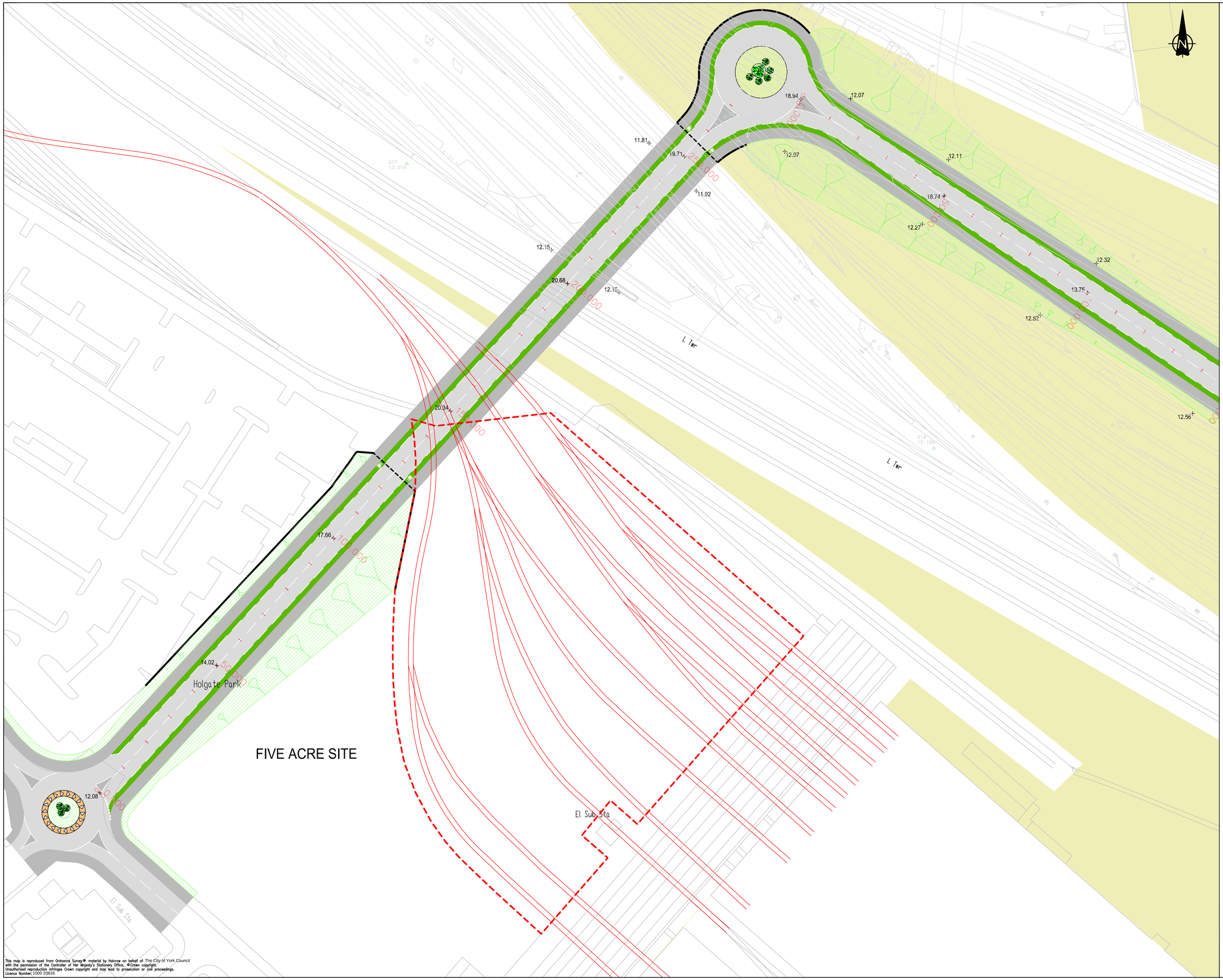
User and Plot Date :



Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	SS	16/01/13	Updated to include Network Rail sidings

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Drawing

Holgate Park
Access Corridor B2
Rail Land Options 1-5
Option B

Drawn by: J Grant/C Griffin	Date:	25/02/11
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Approved by: S Stamper	Date:	17/03/11

Drawing No.	Revision
CTDAOB-003-007	B

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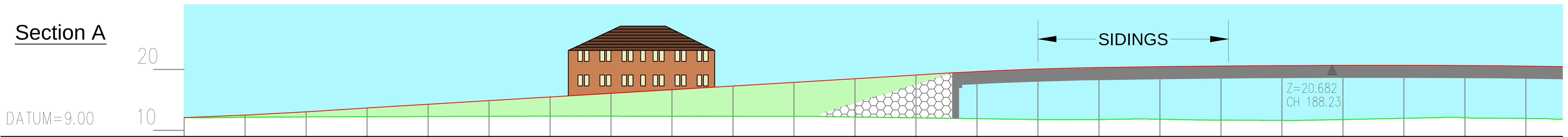
Section A



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EXISTING GROUND (DASHED)	12.08	12.17	12.20	12.24	12.27	12.31	12.34	12.33	12.32	12.31	12.30	12.20

CHAINAGE	120	130	140	150	160	170	180	190	200	210	220
NEW ROAD LEVEL (SOLID)	19.00	19.68	20.09	20.34	20.51	20.58	20.64	20.68	20.68	20.66	20.57
EXISTING GROUND (DASHED)	12.06	11.92	11.78	11.78	11.83	11.68	11.63	11.78	11.98	12.07	11.95

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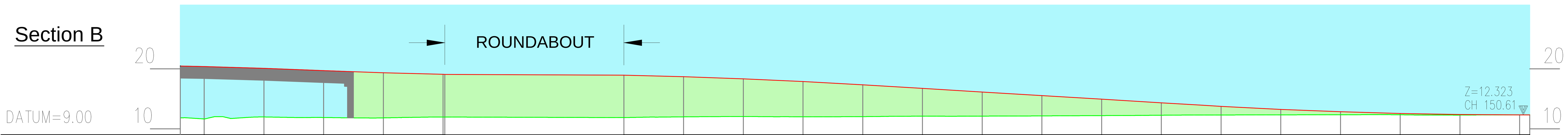

CHAINAGE	230	240	250	260	270
NEW ROAD LEVEL (SOLID)	20.39	20.10	19.71	19.34	19.08
EXISTING GROUND (DASHED)	11.64	11.98	11.89	11.82	11.96

CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	152
NEW ROAD LEVEL (SOLID)	18.94	18.69	18.34	17.89	17.34	16.74	16.14	15.54	14.94	14.34	13.75	13.24	12.84	12.56	12.39	12.32	12.32
EXISTING GROUND (DASHED)	11.87	11.99	12.05	12.01	12.03	12.11	12.12	12.15	12.20	12.26	12.31	12.33	12.35	12.34	12.29	12.32	12.32

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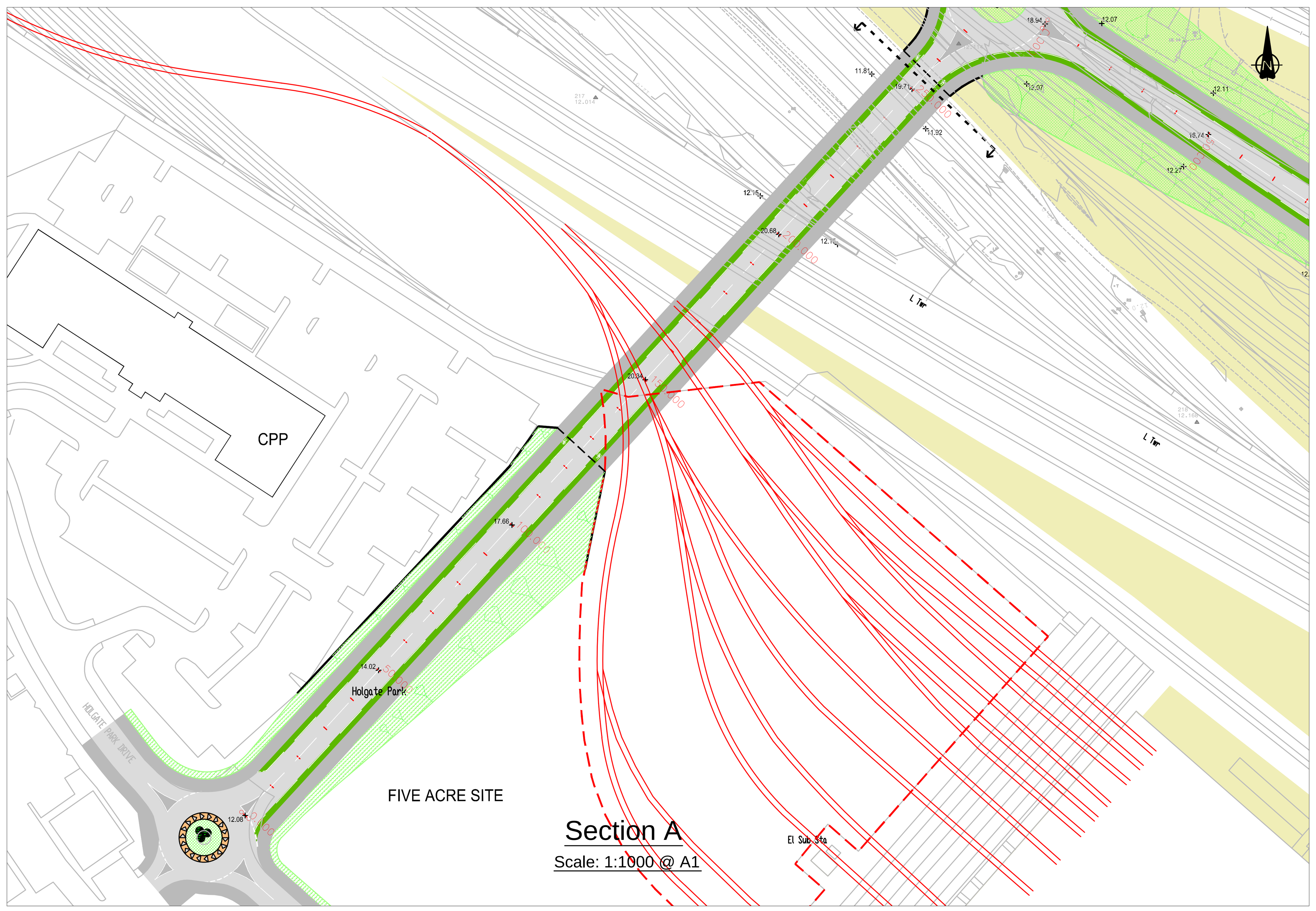

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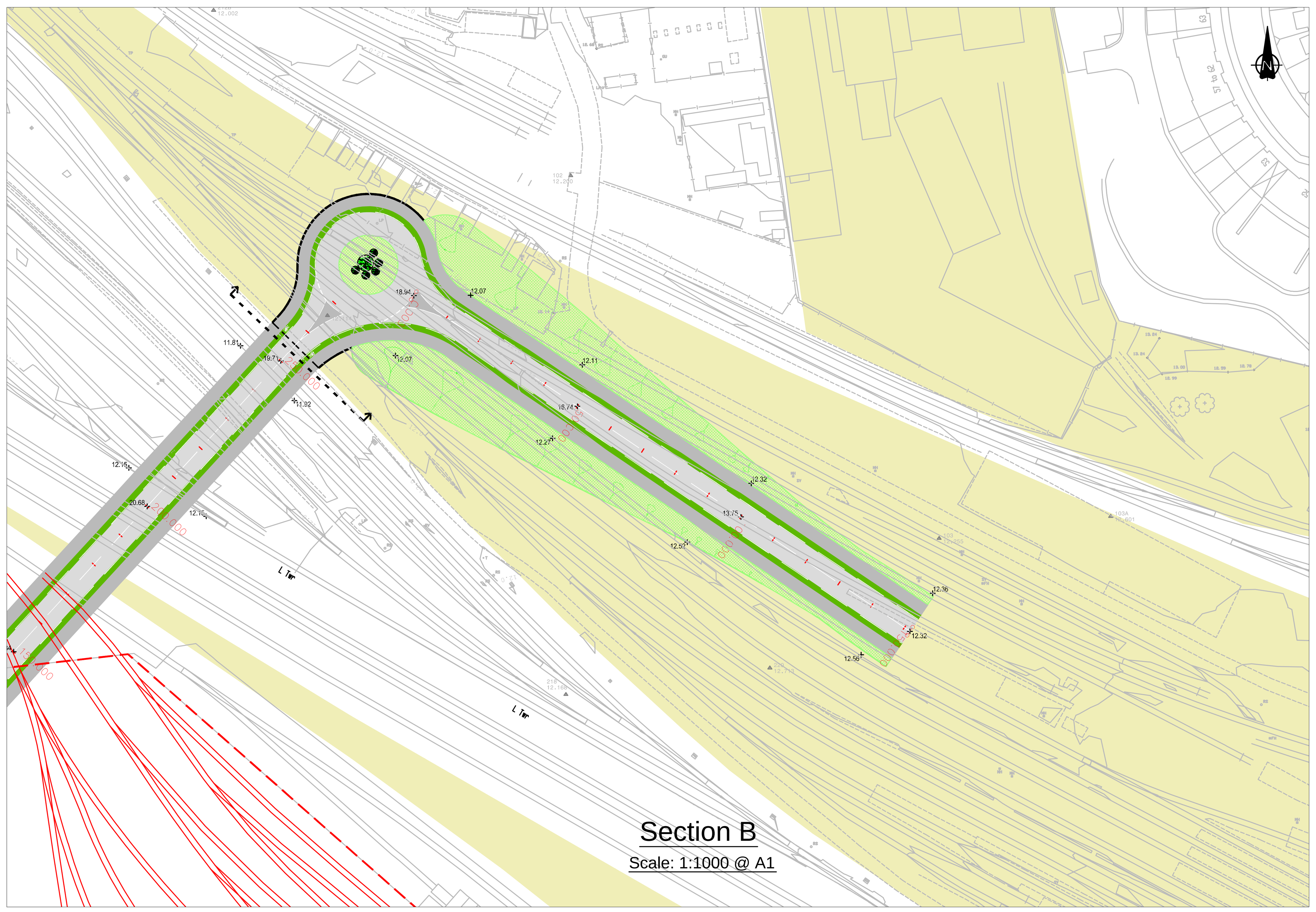

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Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	SS	16/01/13	Updated to include Network Rail sidings

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Drawing

Holgate Park Access Corridor B2 Rail Land Options 1-5 Option B Long Section

Drawn by: J Grant/C Griffin Date: 25/02/11
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Drawing No.: CTDAOB-003-008
Revision: B

Drawing Scale: 1 :50 at A1

Drawing file path & name :
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User and Plot Date :

Key:

- Retaining Wall
- Bridge abutment
- Landscaping on embankments
- Footway
- Carriageway
- Cycle Lane
- Proposed new sidings
- Land required by NR for new sidings

Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	-	-	Updated to include Network Rail sidings

Client

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www.halcrow.com

Halcrow

Project

York Northwest
Masterplanning and Infrastructure

Drawing

Holgate Park
Access Corridor B2
Rail Land Option 6
Option A

Drawn by: J Grant/C Griffin Date: 01/03/11

Checked by: L Cable Date: 17/03/11

Approved by: S Stamper Date: 17/03/11

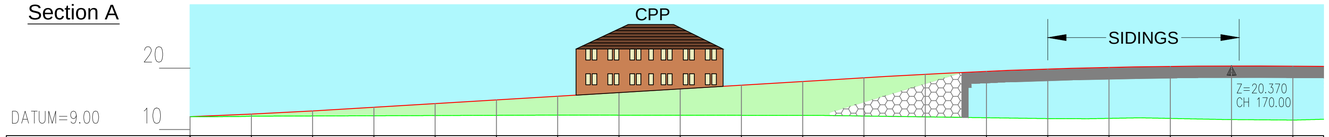
Drawing No. CTDAOB-003-013

Revision B

Drawing Scale: 1 :500 at A1

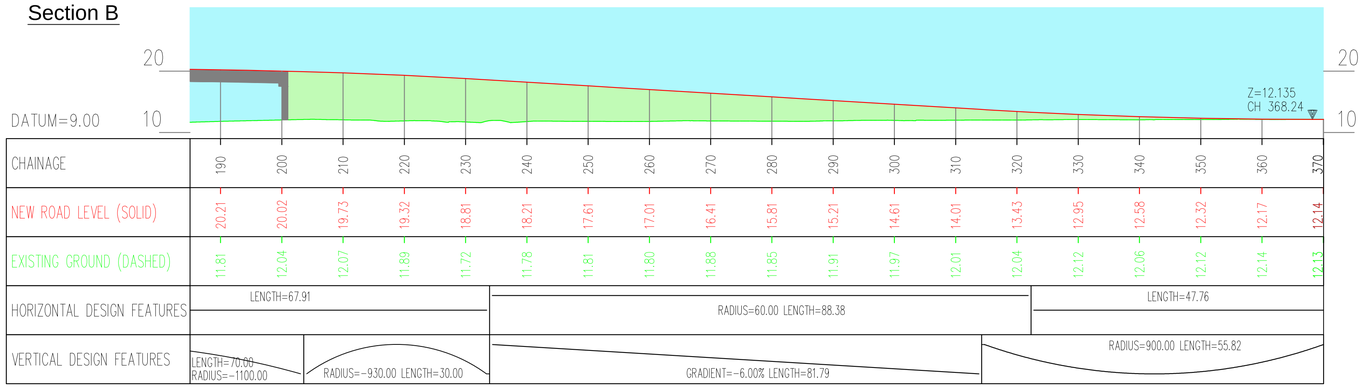
Drawing file path & name :
Xreference file path :
User and Plot Date :

Section A

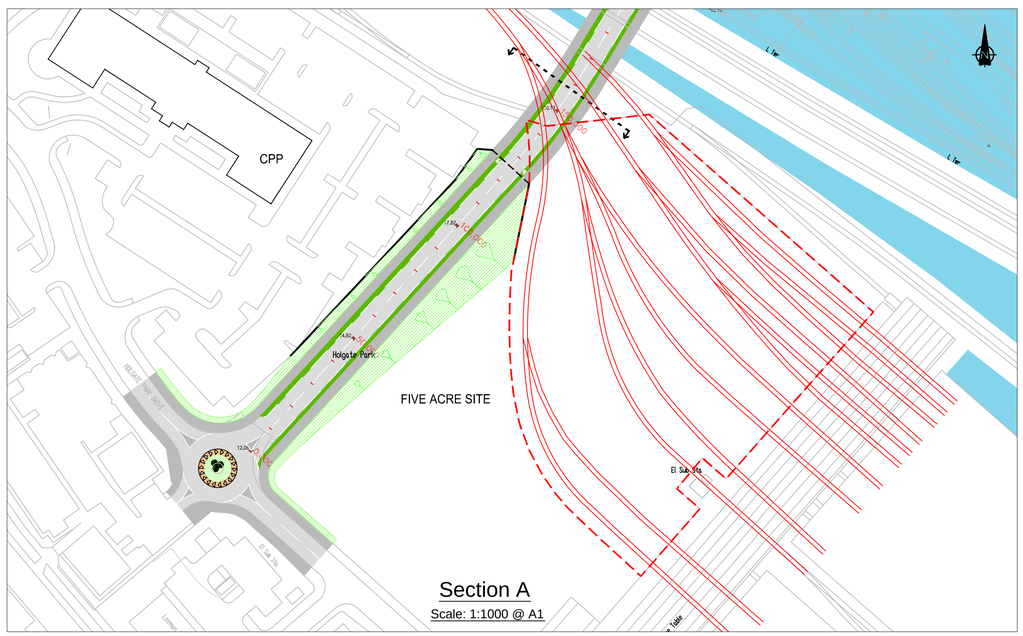


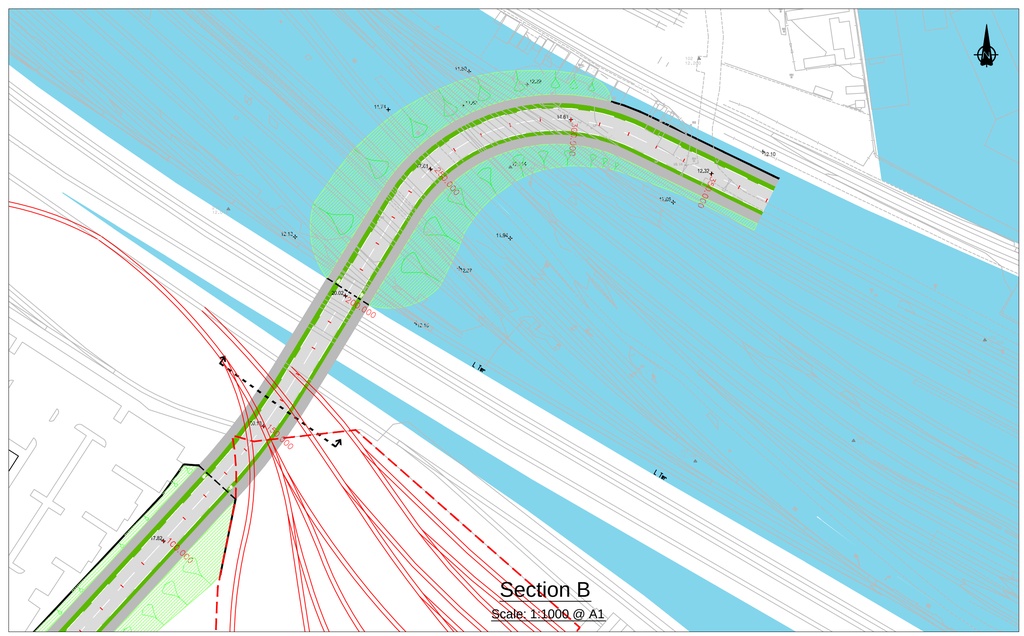
CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
NEW ROAD LEVEL (SOLID)	12.08	12.51	13.02	13.62	14.22	14.82	15.42	16.02	16.62	17.22	17.82	18.44	19.01	19.49	19.86	20.13	20.29	20.37	20.34
EXISTING GROUND (DASHED)	12.08	12.17	12.20	12.24	12.27	12.31	12.34	12.33	12.32	12.31	12.30	12.20	12.06	11.92	11.78	11.81	11.80	11.62	11.54
HORIZONTAL DESIGN FEATURES	LENGTH=127.07														RADIUS=-200.00 LENGTH=38.92				
VERTICAL DESIGN FEATURES	RADIUS=1160.00 LENGTH=30.00				GRADIENT=6.00% LENGTH=73.80							RADIUS=-1270.00 LENGTH=30.00			RADIUS=-1100.00 LENGTH=70.00				

Section B



CHAINAGE	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370
NEW ROAD LEVEL (SOLID)	20.21	20.02	19.73	19.32	18.81	18.21	17.61	17.01	16.41	15.81	15.21	14.61	14.01	13.43	12.95	12.58	12.32	12.17	12.14
EXISTING GROUND (DASHED)	11.81	12.04	12.07	11.89	11.72	11.78	11.81	11.80	11.88	11.85	11.91	11.97	12.01	12.04	12.12	12.06	12.12	12.14	12.13
HORIZONTAL DESIGN FEATURES	LENGTH=67.91					RADIUS=60.00 LENGTH=88.38									LENGTH=47.76				
VERTICAL DESIGN FEATURES	LENGTH=70.00 RADIUS=-1100.00		RADIUS=-930.00 LENGTH=30.00				GRADIENT=-6.00% LENGTH=81.79							RADIUS=900.00 LENGTH=55.82					





Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	SS	16/01/13	Updated to include Network Rail sidings

Client

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Halcrow

Project

York Northwest
Masterplanning and Infrastructure

Drawing

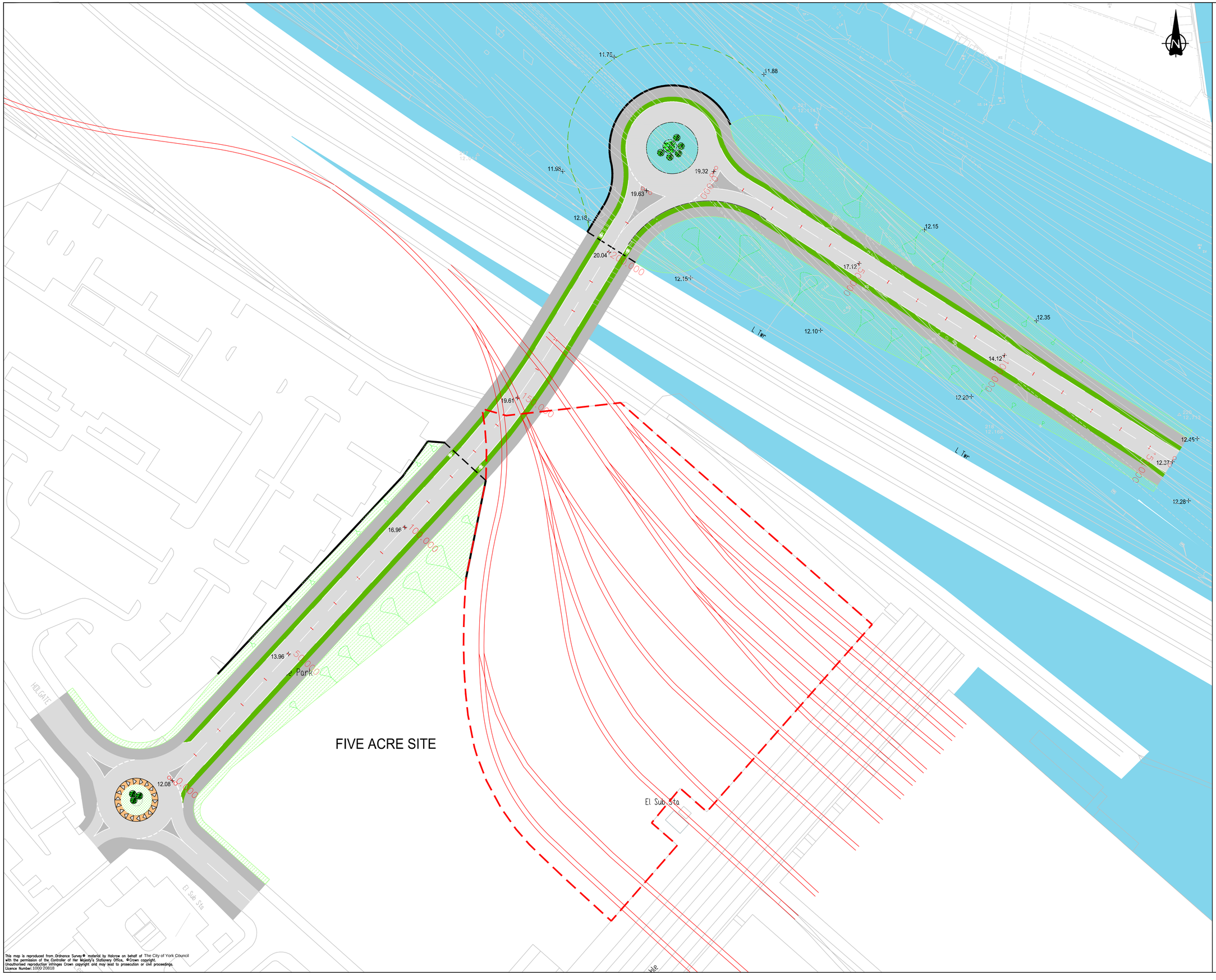
Holgate Park Access Corridor B2 Rail Land Option 6 Option A Long Section

Drawn by:	J Grant/C Griffin	Date: 25/02/11
Checked by:	L Cable	Date: 17/03/11
Approved by:	S Stamper	Date: 17/03/11

Drawing No.	Revision
CTDAOB-003-014	B

Drawing Scale: 1 :50 at A1

Drawing file path & name
Xref file path
User and Plot Date



Key:

- Retaining Wall
- Earthworks alternative to retaining wall
- Bridge abutment
- Landscaping
- Landscaping on embankments
- Footway
- Carriageway
- Cycle Lane
- Proposed new sidings
- Land required by NR for new sidings

Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	SS	16/01/13	Updated to include Network Rail sidings

Client

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Project

York Northwest
Masterplanning and Infrastructure

Drawing

Holgate Park
Access Corridor B2
Rail Land Option 6
Option B

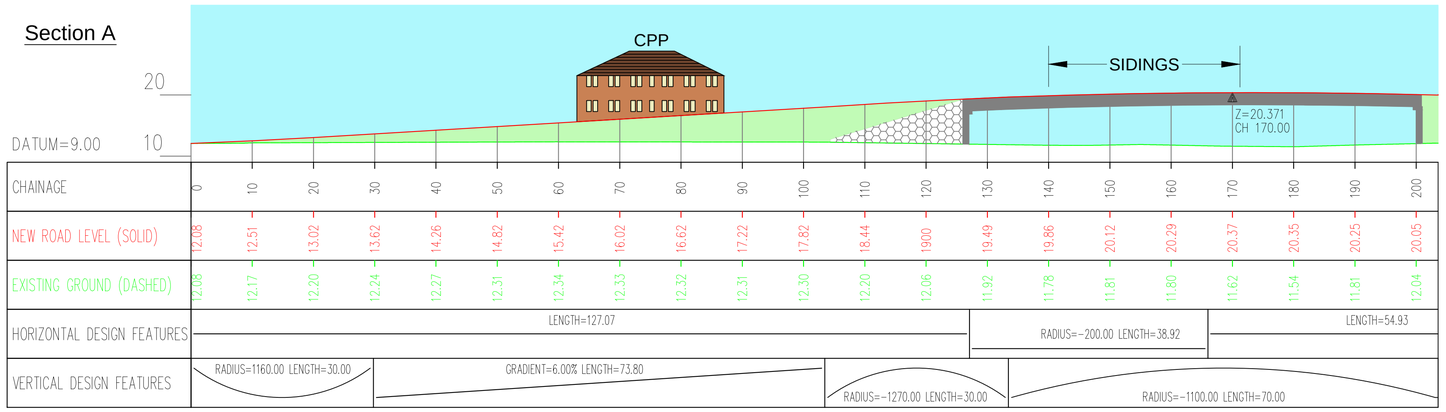
Drawn by:	J Grant/C Griffin	Date: 01/03/11
Checked by:	L Cable	Date: 17/03/11
Approved by:	S Stamper	Date: 17/03/11

Drawing No.	Revision
CTDAOB-003-015	B

Drawing Scale: 1 :500 at A1

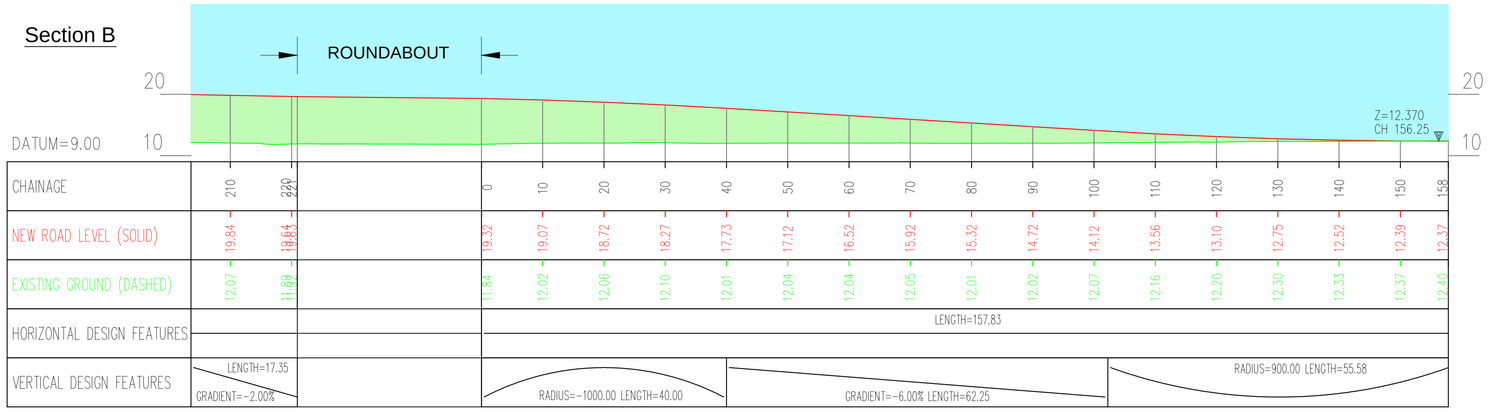
Drawing file path & name
Xrefs/images file path
User and Plot Date

Section A

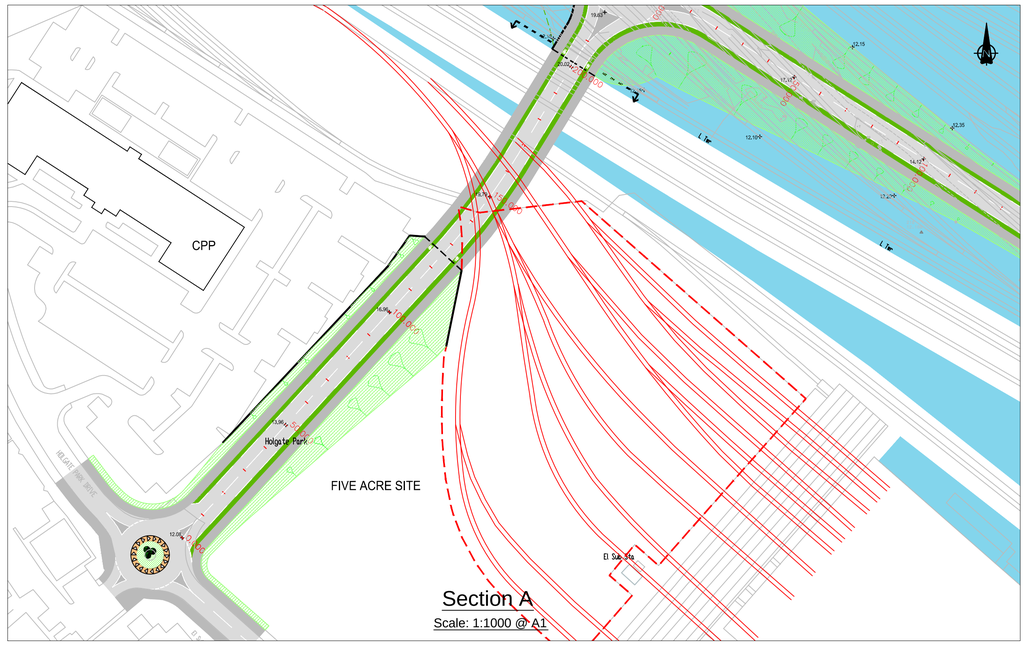


CHAINAGE	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
NEW ROAD LEVEL (SOLID)	12.08	12.51	13.02	13.62	14.26	14.82	15.42	16.02	16.62	17.22	17.82	18.44	1900	19.49	19.86	20.12	20.29	20.37	20.35	20.25	20.05
EXISTING GROUND (DASHED)	12.08	12.17	12.20	12.24	12.27	12.31	12.34	12.33	12.32	12.31	12.30	12.20	12.06	11.92	11.78	11.81	11.80	11.62	11.54	11.81	12.04
HORIZONTAL DESIGN FEATURES	LENGTH=127.07														RADIUS=-200.00 LENGTH=38.92				LENGTH=54.93		
VERTICAL DESIGN FEATURES	RADIUS=1160.00 LENGTH=30.00			GRADIENT=6.00% LENGTH=73.80									RADIUS=-1270.00 LENGTH=30.00			RADIUS=-1100.00 LENGTH=70.00					

Section B



CHAINAGE	210	220	221	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	158
NEW ROAD LEVEL (SOLID)	19.84	19.64	19.63	19.32	19.07	18.72	18.27	17.73	17.12	16.52	15.92	15.32	14.72	14.12	13.56	13.10	12.75	12.52	12.39	12.37
EXISTING GROUND (DASHED)	12.07	11.89	11.89	11.84	12.02	12.06	12.10	12.01	12.04	12.04	12.05	12.01	12.02	12.07	12.16	12.20	12.30	12.33	12.37	12.40
HORIZONTAL DESIGN FEATURES				LENGTH=157.83																
VERTICAL DESIGN FEATURES	LENGTH=17.35 GRADIENT=-2.00%			RADIUS=-1000.00 LENGTH=40.00			GRADIENT=-6.00% LENGTH=62.25						RADIUS=900.00 LENGTH=55.58							



Section A
Scale: 1:1000 @ A1

Section B
Scale: 1:1000 @ A1

Rev	By	Chkd	Apprvd	Date	Description
B	CG	LC	SS	16/01/13	Updated to include Network Rail sidings

Client

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Halcrow

Project

York Northwest
Masterplanning and Infrastructure

Drawing

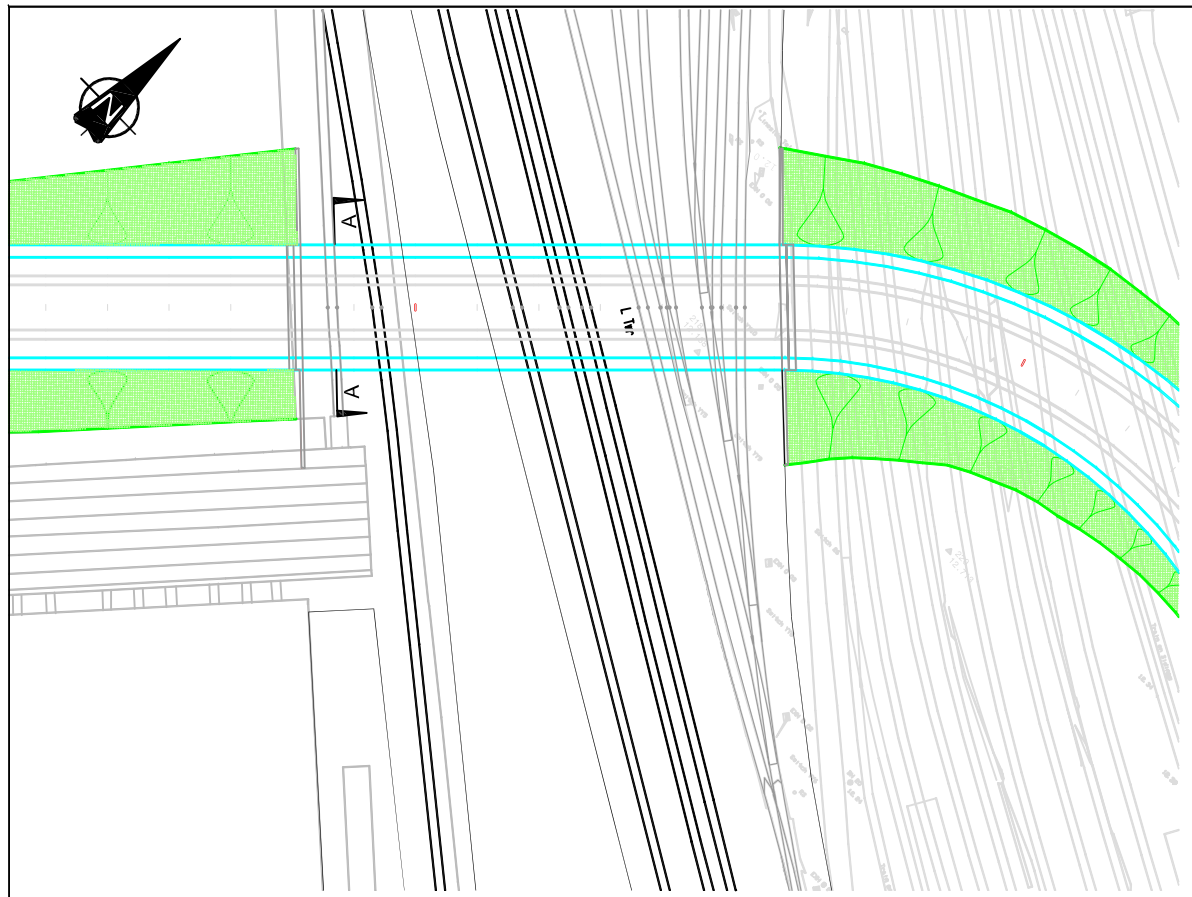
Holgate Park
Access Corridor B2
Rail Land Option 6
Option B Long Section

Drawn by:	J Grant/C Griffin	Date: 01/03/11
Checked by:	L Cable	Date: 17/03/11
Approved by:	S Stamper	Date: 17/03/11

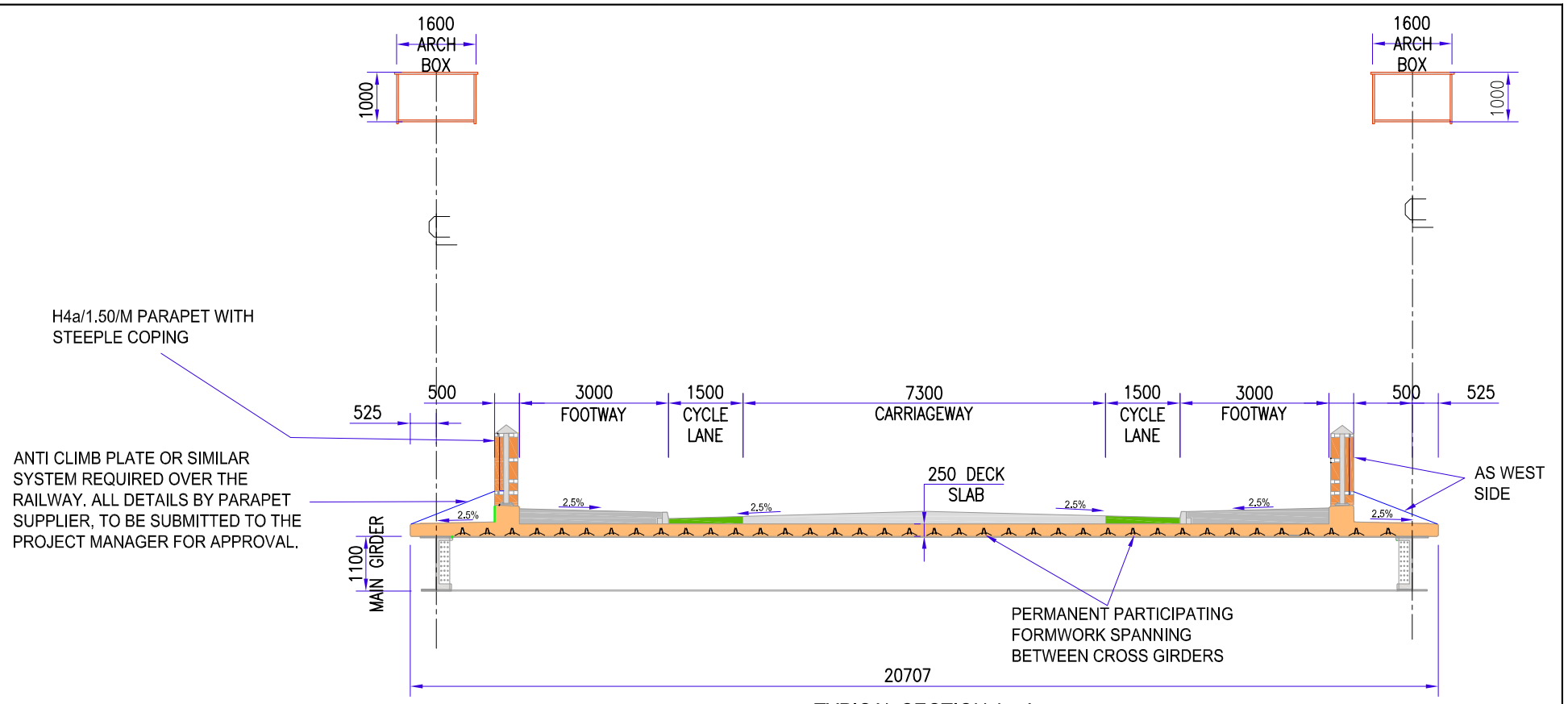
Drawing No.	Revision
CTDAOB-003-016	B

Drawing Scale: 1 :50 at A1

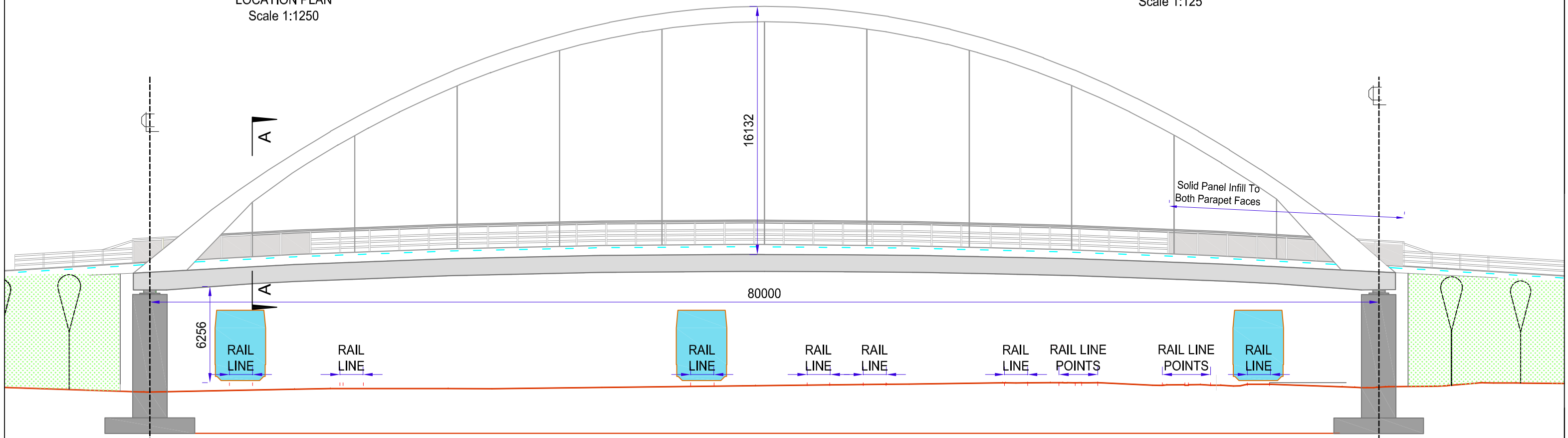
Drawing file path & name
Xrefs with file path
User and Plot Date



LOCATION PLAN
Scale 1:1250



TYPICAL SECTION A - A
Scale 1:125



TYPICAL ELEVATION
Scale 1 : 250

Client
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Project
YORK NORTHWEST
MASTERPLANNING &
INFRASTRUCTURE STUDY

Drawing
ACCESS -
HOLGATE PARK CORRIDOR B1
RAIL LAND OPTION 1 TO 5
BRIDGE SOLUTION A

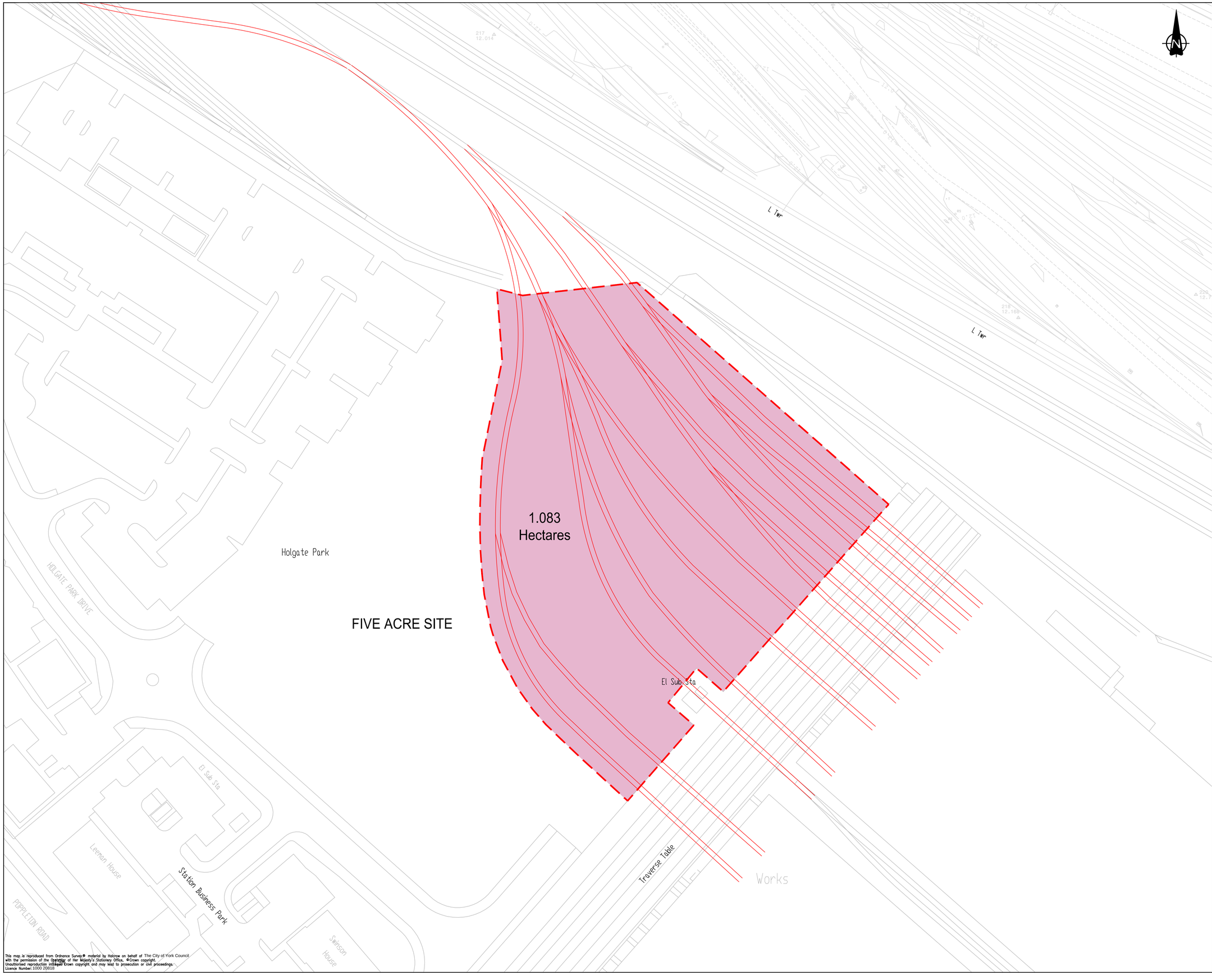
Drawn by:	VL	Date:	11.03.11
Checked by:	JA	Date:	11.03.11
Authorised by:	HG	Date:	11.03.11

Drawing No.
CTDAOB-003-017

Revision
-

Drawing Scale: As Noted Plot Scale: 1:1

CAD Filename:



Rev	By	Chkd	Apprvd	Date	Description
-	-	-	-	-	-

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Halcrow

Project

York Northwest
Masterplanning and Infrastructure

Drawing

Holgate Park
Land Required by Network Rail for New Sidings

Drawn by: C Griffin	Date:	16/01/13
Checked by: L Cable	Date:	16/01/13
Approved by: S Stamper	Date:	16/01/13

Drawing No.	Revision
CTDAOB-003-022	A

Drawing Scale: 1 :500 at A1

Drawing file path & name
Xrefs not attached
User and Plot Date