



## INFRASTRUCTURE PLANNING

### THE INFRASTRUCTURE PLANNING (APPLICATIONS: PRESCRIBED FORMS AND PROCEDURE) REGULATIONS 2009

### THE NETWORK RAIL (NORTH DONCASTER CHORD) ORDER

---

#### Description of the development

---

Regulation number:	Regulation 5(2)[q]
Document Ref:	3.8
Author	Network Rail
Date:	May/2011
Date of revision and version number	March 2011 – version 1 May 2011 – version 2
IPC Ref	TR040001

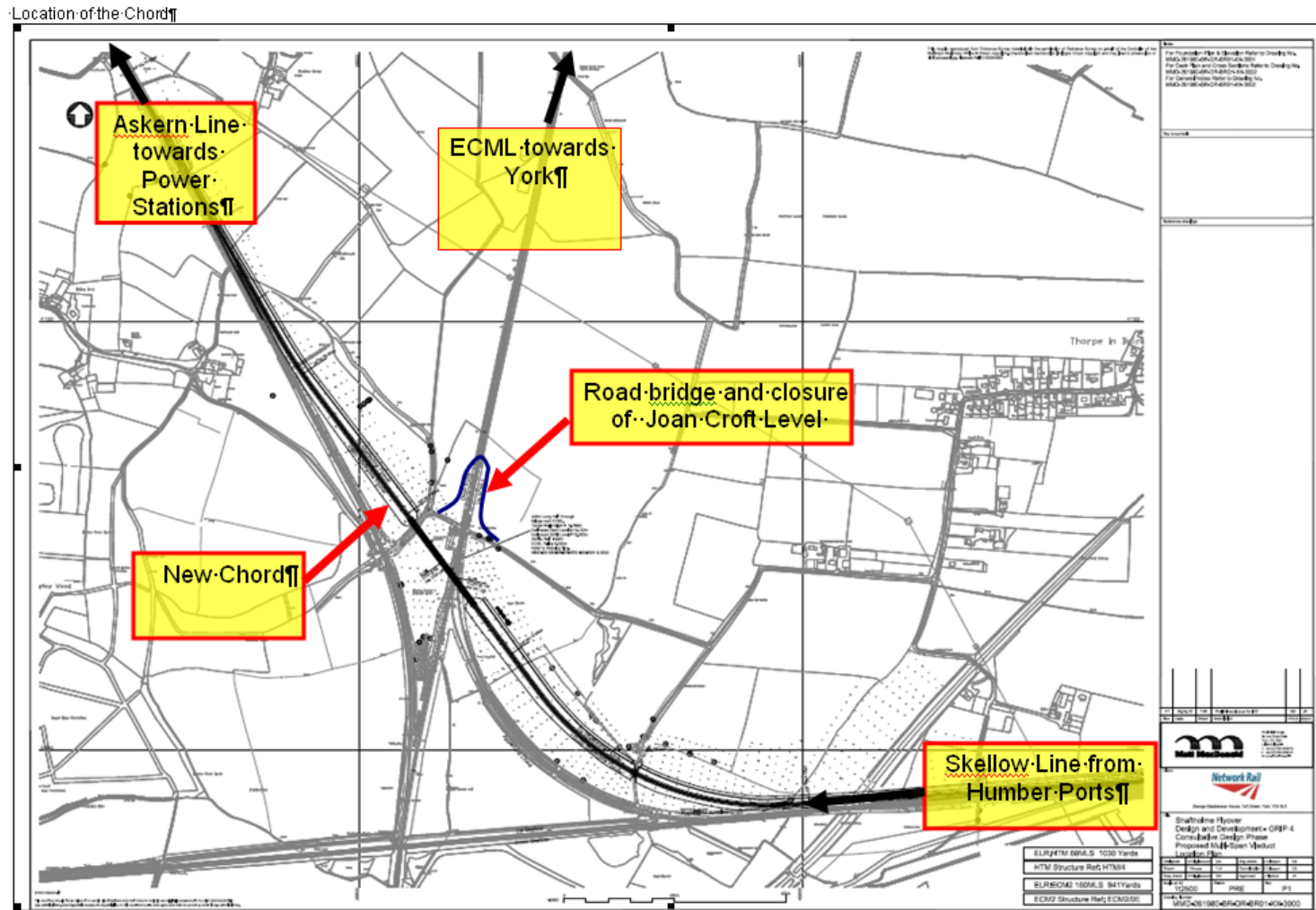
## TABLE OF CONTENTS

1.0	INTRODUCTION	2
2.0	SUMMARY	4
3.0	NEED FOR THE DEVELOPMENT	4
4.0	BENEFITS OF THE DEVELOPMENT	5
5.0	CONSIDERATION OF ALTERNATIVES	6
6.0	DESCRIPTION	7
7.0	LIST OF FIGURES	10
8.0	GLOSSARY	10

## 1.0 INTRODUCTION

- 1.1 Joan Croft Junction is a key junction on the increasingly busy East Coast Main Line (ECML) which runs between London and Scotland. This junction is the point at which freight trains join the ECML passenger line. Over the past decade, there has been a 35% increase in passengers travelling between Doncaster and York and a 60% increase in the amount of freight carried by rail across the UK, and passenger growth is expected to continue. In order to support this growth, train operating and freight operating companies are increasingly looking to run more services whilst still meeting improved performance targets.
- 1.2 Without changes to the infrastructure, the growth in demand forecast for the ECML for both passenger and freight services will be impossible to accommodate without significant impact on journey times, performance or punctuality. At Shaftholme, this manifests itself with slow freight trains travelling from the Humber ports to the Aire Valley power stations having to cross and run for approximately 14 miles on the ECML, which in turn constrains the number of paths for the faster moving passenger services.
- 1.3 The purpose of the North Doncaster Chord Development is to remove freight traffic from the ECML by constructing a new 3.2 km twin track railway constructed of two embankments and a 246m long viaduct spanning the ECML providing a connection between the Skellow and Askern lines. This is designed to increase the capacity of high speed traffic on the ECML, as well as enhancing freight movements.
- 1.4 The North Doncaster Chord Development forms part of the portfolio of projects funded by the Office of Rail Regulation's (ORR) Final Determination to 'deliver both the HLOS (High Level Output Statement) passenger kilometre specification and the London Capacity Specification on the East Coast route' and also supports the Government policies on climate change, air quality and train performance as outlined in 'The Case for Rail 2007'.

Fig 1 - The location of the North Doncaster Chord



## **2.0 SUMMARY**

- 2.1 This document has been included within the application documents to help explain why Network Rail is promoting the North Doncaster Chord Development.
- 2.2 Chapter three explains how predicted growth forecasts have created a need to increase the capacity and capability of the rail network now so that passenger and freight growth is not restricted in the future. In particular, timetable analysis indicates that there is insufficient capacity on the ECML to increase off-peak Long Distance High Speed (LDHS) passenger services to six trains per hour and to accommodate forecast freight train paths without worsening freight and passenger journey times and performance.
- 2.3 This description then outlines what and how the development will make a change to the operations of the rail network under chapter 4 and what benefits will be derived to the rail network, including easing capacity constraints, increasing and improving long distance passenger services throughout the day and benefits to the wider society, such as environmental spin offs in journey distance reductions due to a more direct route.
- 2.4 Chapter 5 (Consideration of Alternatives) explains why there are limited alternative locations for the new railway chord, in the main due to fixed exit and entry points to the network. Chapter 6 provides simplified design, construction details and also includes indicative visual representations of the chord and proposed highway bridge over the ECML (figures 2 and 3).

## **3.0 NEED FOR THE DEVELOPMENT**

- 3.1 There has been considerable growth in the demand for rail passenger services particularly between London and Yorkshire, the North-East and eastern Scotland, as well as an increase in the demand for freight; this is strengthened by the environmental case for encouraging freight to use rail rather than roads. In order to support this growth, train operating and freight operating companies are increasingly looking to run more services whilst still meeting improved performance targets. Further details of the predicted growth can be found within the background chapter 3 of the Assessment of Need (document 3.9).
- 3.2 The most acute issue on the line is accommodating the forecast growth in passenger and freight traffic without impacting performance. Timetable analysis has shown that there is insufficient capacity on the ECML to increase the level of off-peak LDHS services to six trains per hour and to accommodate forecast freight train paths without worsening freight and passenger journey times and performance. Additional track capacity is required on the ECML to accommodate the increase in LDHS alongside the freight requirements.
- 3.3 Currently, freight flows of imported coal between the Humber ports of Hull and Immingham and the Aire Valley power stations of Ferrybridge,

Eggborough and Drax have to traverse the ECML for approximately 14 miles between Joan Croft Junction and Hambleton South Junction. This is due to Shaftholme Junction and Joan Croft Junction not being aligned. As a result, these freight services present operational conflicts with the ECML which result in reduced capacity and also incur performance delays for high speed passenger trains.

- 3.4 Implementation of the North Doncaster Chord Development will provide a direct link between the Skellow and Askern lines and will remove Humber Ports Coal freight traffic to the West Yorkshire power stations from the ECML. This will provide greater capacity and efficiency on the ECML for high speed passenger trains and enable an additional passenger train per hour to be accommodated on this section of the route. A secondary benefit is the saving of an average of 14 freight train miles per train in each direction between Joan Croft Junction and Hambleton South Junction. Overall, performance savings of approximately 4,000 minutes per annum should be realised.

#### **4.0 BENEFITS OF THE DEVELOPMENT**

- 4.1 Creating a new railway that crosses over the ECML supports Government policies on climate change, air quality and train service performance outlined in 'The Case for Rail, 2007.' This is just one of the projects that make up part of a programme of works to create extra capacity on the ECML.

- 4.2 The benefits associated with the proposed development include increased passenger numbers, and improved reliability. In North Doncaster, the proposed scheme will:

- create extra capacity to run more passenger services on the ECML;
- increase and improve long distance passenger services throughout the day;
- create the potential for additional freight train movements on the Askern and Skellow Lines by avoiding use of the ECML, thereby providing an opportunity to take more traffic off roads;
- creates a more direct route for a significant number of freight trains each day. This saves an average of 28 miles per round trip for each coal train travelling between the Humber ports and the Aire valley power stations, with the following benefits:
  - journey time reduction;
  - less fuel used and therefore reduction in carbon footprint; and
  - cost saving in the production of electricity.

- 4.3 Local benefits include the closure of Joan Croft level crossing and a replacement highway bridge over the ECML. Once operational, the highway bridge will remove queuing traffic at the level crossing and improve local accessibility over the ECML. This will also provide a safety benefit through removal of the interface of road traffic and a busy railway line.

4.4 In addition the reduction in the height and footprint of the embankments has environmental benefits as it reduces the visual impact of the railway chord and creates a smaller footprint requiring land take. It is also expected that there will be wider socio-economic benefits arising from the proposed development, through improvements in accessibility.

## **5.0 CONSIDERATION OF ALTERNATIVES**

5.1 Alternatives to the location of the development are limited due to the overall aim of removing freight from the ECML in this area. However, during design development stage Network Rail considered alternative ways of solving the predicted growth demand that can be found within the Consideration of Alternatives, chapter 8 of the Assessment of Need (document 3.9) and also chapter 4 of the Environmental Statement (volume 1 Main Statement (document 4.1).

5.2 Whilst slightly varying alignments of the new chord have been considered, the nature and purpose of the chord and its general location means that there are no practicable alternative locations and the location has been relatively fixed since commencement of design work.

5.3 The design of the North Doncaster Chord Development has been underway for a number of years and has included a range of feasibility studies, signalling considerations etc. This has resulted in consideration of a number of different options. The recommended option was amended during the design process to include a highway bridge following public consultation undertaken in June 2010

5.4 In addition to the alignment, consideration has also been given to a number of alternatives concerning the construction access routes, type of viaduct structure and embankment fill that will be used in the scheme. As part of this process, the results from the environmental surveys were used to influence the design and reduce environmental impact. This has included using the results of the ecology and tree surveys to position passing places on Rockley Lane and Holme Lane to avoid the need to remove mature trees. The introduction of the highway bridge in the development also allowed a reduction in height of the viaduct and associated embankments, which helps to reduce the visual impact of the proposed development.

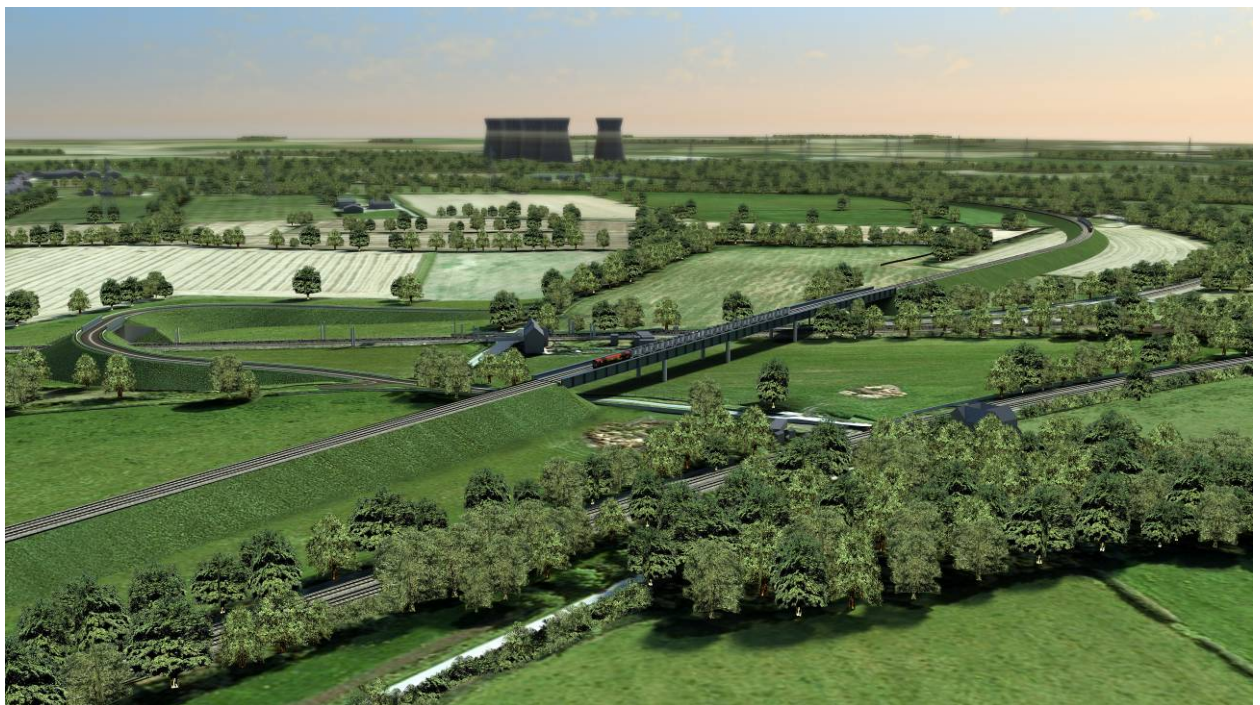
## 6.0 DESCRIPTION

- 6.1 This development has been progressed using Network Rail's design process and by considering responses from the public consultation which have taken place. In addition, technical consultations with various consultees such as Doncaster Metropolitan Borough Council (DMBC), the Internal Drainage Board (IDB), and those parties affected directly by the scheme such as local land owners have been considered and adopted where appropriate.
- 6.2 The track will be supported on approximately 7.2 metre high embankments, and a new viaduct 9.5m to the top of the safety parapets. The southernmost embankment includes an under bridge crossing at Bellcroft Lane to provide access to severed land. Vehicular and safe walking routes will be provided to the new link for maintenance, and this will include the creation of a new railway access onto Joan Croft Lane. A number of statutory utilities services are affected by the development and will be diverted or protected as necessary.
- 6.3 The viaduct is likely to be constructed of steel beams with a concrete deck, and reinforced concrete piers and abutments on piled foundations. The new bridge superstructure will have main beams of plated steel girders with universal column cross beams composite with a reinforced concrete deck. Supports will be reinforced concrete bank seat abutments and intermediate piers.
- 6.4 The embankment will comprise in the order of 500,000 tonnes of granular imported fill suitable for construction of side slopes of 1 vertical to 2 horizontal. Approximately 60% of fill will be delivered by rail to temporarily reinstated sidings at Thorpe Marsh Power Station and moved to site on 'private' haul roads. The side slopes will be treated with a combination of calcareous grassland and planting of trees and shrubs to satisfy some of the environmental mitigation measures identified in the Environmental Statement. Deliveries of fill material required for the embankments will, in part, be using rail to the east of the ECML to help minimise the number of road deliveries needed. The highway bridge will utilise traditional reinforced concrete abutments and wing walls with an integral concrete deck on pre-cast concrete beams to minimise maintenance requirements.
- 6.5 The gradient of the new line will be 1 in 120 which is required to maintain an operational railway whilst minimising the length of embankments. The crown of the vertical alignment occurs over the ECML, dropping down to the tie-ins at existing track levels on the existing Skellow and Askern lines.
- 6.6 A new drainage channel has been included for both embankment and viaduct drainage and wider drainage system under the control of the IDB.
- 6.7 In order to construct the development temporary haul roads, passing places and junction enhancements will be built to connect parts of the work site with the existing road network. The haul roads will be connected to the local public roads at (Rockley Lane, Holme Lane and Storrs Lane) in agreement with DMBC. It has been agreed with DMBC that the junction enhancements at



Rockley Lane and Holme Lane with the A19 will be retained on completion to enhance the local road network.

- 6.8 The physical construction works necessitate the temporary stopping up of sections of the following; Joan Croft Lane; Holme Lane and Rockley Lane to allow the enabling works to be carried out. A short section of Joan Croft lane will be permanently stopped up following completion of the new road bridge (which maintains all existing access) and closure of Joan Croft Level crossing. To the northern end of the site where the new chord ties in to the Askern line a small section of (at Honey Lands lane) footpath 11 (at Honey Lands Lane) is re-routed due to the stopping up of Owston Grange farm crossing whilst a short section of Bridleway 13 will also be diverted where Honey Lands Lane meets Joan Croft Lane to meet the new alignment of the highway. The construction of the development will also require the temporary use of other areas of land for working areas, compounds etc.



**Fig 2. Visual representation of the North Doncaster chord (indicative only)**

- 6.9 The closure of Joan Croft level crossing will also have safety benefits by the removal of the interface between the highway and a heavily used, high speed railway line.
- 6.10 The horizontal alignment for the highway bridge replacing Joan Croft Level Crossing has been developed in close liaison with DMBC in order to preserve the rural nature of the local road network. It has a design speed of 30 mph. The height of the highway bridge is as low as possible following lowering of the ECML overhead electric wires facilitated by closure of the level crossing. The road bridge embankments will be constructed using imported granular fill with the side slopes top soiled and panted on completion. Barriers will be erected to prevent errant road vehicles leaving

the highway. The deck will be concrete beams with a concrete parapet and be approximately 8.5m wide. The road will be approximately 6 metres wide tarmac finish designed to an agreed remit with DMBC highways department.



**Fig 3. Visual representation of the highway bridge over the ECML (indicative only)**

## Figures

Figure 1	The location of the North Doncaster Chord
Figure 2	Visual representation of the North Doncaster chord (indicative only)
Figure 3	Visual representation of the highway bridge over the ECML (indicative only)

## Glossary

<b>DMBC</b>	Doncaster Metropolitan Borough Council
<b>ECML</b>	East Coast Main Line
<b>HLOS</b>	High Level Output Specification – The HLOS for England & Wales defines a number of specific schemes to increase capacity on key parts of the network. It also sets out capacity measures which are to be met for a wider range of specific cities and routes.
<b>LDHS</b>	Long Distance High Speed passenger services
<b>ORR</b>	Office of Rail Regulation – independent regulator of the rail industry
<b>RUS</b>	Route Utilisation Strategy – Sets out the plans on how the rail industry brings together plans by line of route and area to deal with growth, performance, capacity etc.