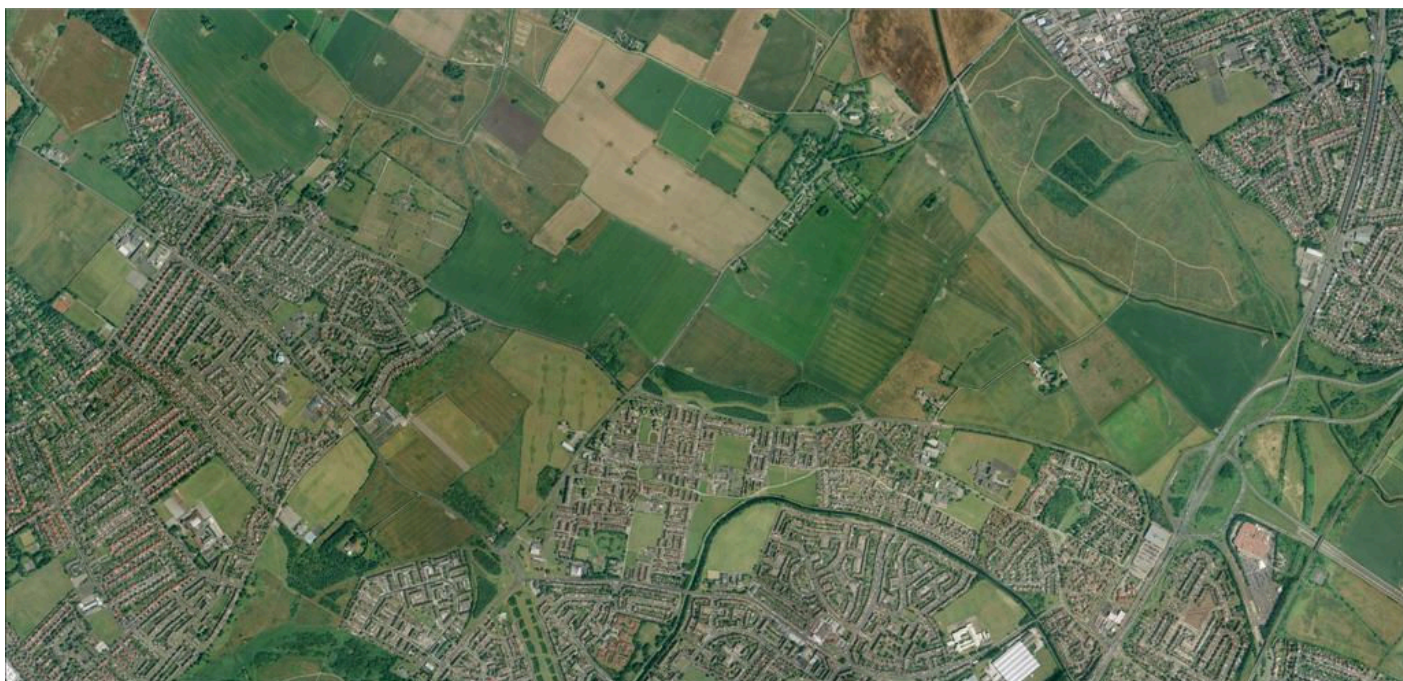


# Thornton to Switch Island Link

## LAYOUT APPROVAL REPORT



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# CONTENTS

<b>1</b>	<b>Introduction.....</b>	<b>1</b>
<b>2</b>	<b>Scheme Description .....</b>	<b>1</b>
<b>2.1</b>	<b>Standards.....</b>	<b>1</b>
<b>2.2</b>	<b>Highway Alignment.....</b>	<b>1</b>
<b>2.3</b>	<b>Highway Cross-section .....</b>	<b>2</b>
<b>2.4</b>	<b>Junctions .....</b>	<b>3</b>
<b>2.5</b>	<b>Drainage.....</b>	<b>5</b>
<b>2.6</b>	<b>Existing Bridleway and Footpaths .....</b>	<b>7</b>
<b>2.7</b>	<b>Environmental Mitigation .....</b>	<b>8</b>

## **Figure 1            Scheme Layout**

- Figure 2.1            Alignment (Sheet 1 of 3)**
- Figure 2.2            Alignment (Sheet 2 of 3)**
- Figure 2.3            Alignment (Sheet 3 of 3)**
- Figure 2.4            Switch Island Layout**

## **Figure 3            Typical Sections**

- Figure 4.1            Drainage (Sheet 1 of 2)**
- Figure 4.2            Drainage (Sheet 2 of 2)**

- Figure 5.1            Public Rights Of Way (Sheet 1 of 2)**
- Figure 5.2            Public Rights Of Way (Sheet 2 of 2)**

- Figure 6.1            Environmental Masterplan (Sheet 1 of 2)**
- Figure 6.2            Environmental Masterplan (Sheet 2 of 2)**



## 1 Introduction

The proposed Thornton to Switch Island Link Road scheme consists of the provision of a new single carriageway highway between the A565 Southport Road at Thornton and the M57, M58, A59 and A5036 (T) Switch Island Junction, bypassing an existing route (A5207) and the local communities of Thornton and Nethererton. The proposed scheme layout is shown on Figure 1.

Following the successful submission of a Major Scheme Business Case to the Department for Transport, the scheme was granted entry to the (DfT) Local Authority Major Schemes Programme.

Following this, in June 2009, Sefton Metropolitan Borough Council (MBC) appointed Balfour Beatty, using Jacobs as their Designer, to deliver the scheme. Sefton Council are supported by Capita Symonds as their Agent. Since then, the Project Team have reviewed the scheme included in the MSBC submission and undertaken preliminary design as described in this report, which is now being submitted to the Council for Layout Approval.

## 2 Scheme Description

The Thornton to Switch Island Link is approximately 4.3km long and is proposed as a wide single carriageway (WS2). This standard of highway has a cross-section consisting of a 5m wide running carriageway in each direction flanked by 1 m wide hardstrips and 2.5m wide grass verges, giving an overall width from back of verge to back of verge of 17.0m.

### 2.1 Standards

The highway has been designed in accordance with the Highways Agency "*Design Manual for Roads and Bridges*"; this is the accepted industry standard used for high standard new roads.

The new Link Road is intended to have a speed limit of 50mph throughout, continuing the present speed limit imposed on the adjoining part of the A565 at the western terminal; the geometry has been developed on this basis.

### 2.2 Highway Alignment

The road conforms to modern single carriageway road design requirements, using clear overtaking and non-overtaking sections, and avoiding curves with dubious overtaking opportunity; this improves driver safety. The vertical alignment has been designed to minimise the environmental impact of the road, by following the topography as close as possible, and by placing in cutting where close to property. With the existing topography being relatively flat, the vertical alignment has been developed to allow the road to be drained longitudinally into existing watercourses (drainage proposals are described further in section 2.5 below).



Figures 2.1, 2.2 and 2.3 show the highway alignment proposals, and Figure 2.4 shows the proposed layout at Switch Island.

Beginning on the A565 Southport Road, adjacent to the 'Jospice' at Thornton, the new road then leads off on a left hand curve, in a south-easterly direction, from Long Lane, to a new roundabout junction with Park View; which has been extended northwards by a new spur link (junctions are described in section 2.4 below). The road then continues in an easterly direction, on a right hand curve, passing to the north of Orchard House, towards the existing junction of Holgate and Back Lane, The road has been placed in cut adjacent to Orchard House to minimise the environmental impact (especially noise reduction).

Behind the Thornton Garden of Rest, the road continues approximately on the line of Back Lane. Here the road is at, or just above existing ground level, which is necessary to achieve a drainage outfall in the vicinity of Rakes Lane; then continues on a straight alignment, on shallow embankment, to a traffic signal junction at Brickwall Lane. This embankment reaches a maximum height of approximately 2.3m at chainage 2100, resulting from a low area in the existing ground at this location.

From Brickwall Lane the road continues initially on a left hand curve, and in slight cut, then on a right hand curve crossing Netherton Brook to Chapel Lane. Adjacent to the existing properties of 'The Lodge', 'Manor House Farm' and 'The Stables' the road is placed in shallow cut; again to mitigate the environmental impacts on these properties.

At Chapel Lane there is a traffic signal controlled junction located south of Brook House Farm, and from here the road continues on a large radius left hand curve to its junction with Switch Island. The road is at existing ground level over this section, but rises onto embankment to join the junction. The eastbound entry to Switch Island deviates from the mainline to tie-in with the north part of Switch Island. This approach entry is widened to provide sufficient traffic storage capacity at the signalised junction and to allow all traffic movements.

From Switch Island vehicles can enter the new road via one of two arms. The first, for traffic coming from the direction of the M57, which also caters for traffic entering from the M58 and from the A59 southbound direction; this arm travels straight across the existing VOSA site, allowing free flow onto the new road. The other arm caters for traffic travelling northwards along A59, and A5036 Dunnings Bridge Road; this arm is along the currently abandoned south west section of the former Switch Island roundabout and joins the other entry arm, at a Give Way priority junction.

### 2.3 Highway Cross-section

As mentioned earlier, the road carriageway consists of two 5m wide lanes flanked by 1m hardstrips giving an overall paved width of 12m. The adjacent verges are 2.5m wide and are intended to be grassed. No footways are proposed on these

verges; to discourage pedestrian usage along the new link for safety reasons; the existing routes will cater for this requirement. Where existing footpaths are required to be diverted along the highway, these will be located away from the carriageway just inside the highway boundary.

The road will be kerbed on both channels, which will be used to collect highway run-off from the road surface. This will be consistent with other roads in Sefton Borough; which will give a similar appearance; and will be a provision familiar to the Council's maintenance section.

It is intended that the route will be lit with columns located on one side; and safety barrier will be provided where required in accordance with current highway standards. The indicative highway cross-sections are shown on Figure 3.

## **2.4 Junctions**

### **2.4.1 Ince Road / Long Lane Junction**

At the western end of the scheme a staggered ghost island junction with Ince Road and Long Lane will be provided. To achieve the staggered layout Long Lane is to be re-located approximately 75m west of its current location; with Ince Road remaining in its present position. There is a bend in Long Lane that lends itself to this re-alignment.

This layout, providing a ghost island for traffic turning right off the main line, is a safer provision than at present; and will allow for all movements. The existing bus stops close to the junction will be re-located in a similar location on the new road.

A skew junction similar to the present layout was also considered with some of the right turning movements restricted, but was rejected in favour of this safer layout allowing all turning movements.

### **2.4.2 Park View Junction**

This will be a roundabout junction with Park View; which is extended along a new spur link, approximately 300m long from the existing Park View. The roundabout will have a central island of 41m diameter with a circulatory carriageway 12m wide. Each entry arm will be three lanes wide.

Dedicated left turn lanes at the roundabout were also been considered for the east bound main line and for the Park View to Southport movements but rejected; the assessment did not demonstrate sufficient benefits. A traffic signaled controlled junction was also considered, rather than a roundabout, and although appropriate, on balance the assessment demonstrated better performance from the roundabout.

### **2.4.3 Holgate**

Although not a junction with the main line, a demand controlled traffic signalled crossing is to be provided, allowing safe crossing of the new road by all non

motorised users (pedestrians, cyclists, equestrians and the like); Holgate will be stopped up for vehicular traffic on the south side of the new road.

#### **2.4.4 Brickwall Lane Junction**

A traffic signal controlled junction will be provided where the new road crosses Brickwall Lane (B5422). The new road and Brickwall Lane will be widened on the approaches to give sufficient storage for queuing traffic. A pedestrian crossing phase will be incorporated into the junction to maintain the existing footway along the eastern verge of Brickwall Lane.

Where Brickwall Lane will be widened to accommodate the new junction, the widening will be on the west side of the existing road to retain the existing brick wall on its eastern boundary.

A roundabout was also considered but rejected on traffic grounds due to its poor performance over the signalised layout.

#### **2.4.5 Chapel Lane Junction**

A traffic signal controlled junction will be provided to allow vehicular access between the new road and the north part of Chapel Lane; for agricultural access and the property of Brook House Farm. Chapel Lane will be stopped up to vehicular traffic on the south side of the new road, with no vehicular access between the new road and the south part of Chapel Lane.

Chapel Lane is part of the “Trans Pennine Trail” and this important recreation facility will be maintained by the provision of non motorized users (NMU) facilities incorporated into the traffic signals; allowing safe crossing of the new road.

For the above provision, the traffic signals will be provided with phases for traffic pulling out of Chapel Lane, and for the NMU crossing. The phases for traffic pulling out of Chapel Lane, and for the pedestrian crossing will both be ‘on demand’, triggered by a detector in the road for traffic, or by the pedestrian crossing.

#### **2.4.6 Switch Island**

At its eastern end, the new link will be connected into the major Trunk Road traffic signal controlled junction at Switch Island. For traffic entering Switch Island from the new link road, the road will be widened to 7 lanes to provide adequate traffic storage at the traffic signals and allow the various turning movements.

A computer simulation of the amended Switch Island junction has been undertaken to model the predicted traffic flows within the junction area. Different scenarios have been considered; the proposed year of opening, both with and without the new road, and the future design year, again both with and without the new road. This work has both informed the proposed layout, such as the number of lanes required on the approach, and used to demonstrate the impact of the proposals to the Highways Agency (the Highway Authority for this junction).



Consultation has also taken place with VOSA, who currently have a testing facility on the abandoned section of highway; previously used as the western segment of the former Switch Island roundabout. The new road will remove a large part of the area of the existing facility, which will be re-created in the remaining area between the arms of the new link road. A preliminary layout of the replacement VOSA facility has been developed that meets their requirements; the intended replacement area and access and egress points are shown on Figure 2.4.

## 2.5 Drainage

### 2.5.1 Highway Drainage

Drainage from the highway surface will be collected along the kerblines by gullies, and led by carrier pipe systems along the new road to outfall into existing natural watercourses. These outfall locations have been agreed with the Environment Agency (EA) who have also stipulated that the discharge flow rates from the highway drainage into these watercourses are restricted to the equivalent 'Greenfield Run-off' rates. This requires that ponds are provided prior to these outfalls to attenuate the run-off flows. Additionally the EA require that pollution control facilities be provided prior to the outfalls; these normally consist of oil interceptors, but the actual provision will be agreed later.

There are four such drainage systems throughout the scheme, and these are shown on Figures 4.1 and 4.2.

Other drainage collection methods were considered; such as surface water channels (1.2m wide concrete channels), but these were considered more appropriate for motorways; over-the-edge drainage into swales, but these are not applicable over long sections (mainly at the junction approaches and in the cuttings); and filter drains, again these are not appropriate on embankments and at junctions. With each of these alternatives still requiring kerbs to be used in the vicinity of the junctions for safety reasons, and with the maintenance of kerb and gully's being more suited to the present operation of the Council's Maintenance Department, kerb and gully provision throughout the scheme was adopted.

Catchment A, the first system, drains the surface water from the new road between the west end and a high point, east of Holgate. This system flows westwards, collecting water from the new road, Park View Roundabout and the new Park View spur and then into Pond A, adjacent to Long Lane. The flow from the pond outlet, restricted to the required 'Greenfield Rate', discharges via a pipe, installed alongside the A565, into Hunt's Brook, approximately 300m to the west

Catchment B, the second system, drains the new road from the highpoint near Holgate eastwards to discharge at the low point near Rakes Lane; and also from the highpoint west of Brickwall Lane westwards to the same outfall, and then into Pond B; located to the north of the new road. The outlet from this pond, restricted to the equivalent 'Greenfield Rate', will discharge into the existing ditch along the

western verge of Back Lane. This ditch flows northwards towards Lunt, into Harrison's Brook and then into the River Alt.

Catchment C, the third system, collects surface run-off from highpoint west of Brickwall Lane eastwards, collecting run-off from part of the Brickwall Lane junction area, and outfalls into Pond C, located to the south side of the new link road, adjacent to Netherton Brook. The outlet from the pond, restricted to the 'Greenfield Rate', discharges into Netherton Brook.

Catchment D, the fourth system, collects highway run-off from Netherton Brook eastwards to the low point on the new road, to the west of Switch Island junction, and also from the new roads between this low point and Switch Island, and outfalls into Pond D located to the north of the new road at this location. The outlet from the pond, restricted to the 'Greenfield Rate', discharges via an existing field ditch into Moorhey Brook which leads into the River Alt. Pond D is located so as not to infringe on the River Alt flood plain.

In addition to the surface water drainage for the new road, drains will also be provided to drain the road pavement, to collect surface water runoff onto the highway from adjacent land, and to prevent surface runoff onto adjacent lands from the highway.

### **2.5.2 Land Drainage**

There is extensive existing land drainage installed for agricultural purposes. Where these are encountered, or disrupted, 'cut off' drains will be installed alongside the new highway to intercept these drains and lead the drainage to suitable discharge points.

Similarly some of these existing land drainage systems have outfall pipes crossing the line of the new road and these will be protected, or diverted, as appropriate to protect and maintain the existing regime.

### **2.5.3 Existing Ditches**

Existing ditches crossing the line of the new road will be either maintained by piping under the new road to continue on the original path, or stopped up if suitable alternative provision is available. These measures will be with the agreement of the landowners where appropriate.

The new link road passes over Netherton Brook, which is a recognized watercourse; this will be culverted beneath the new road on its present line.

### **2.5.4 Existing Drainage**

Existing foul and surface water sewers run from Ince Road under the existing A565 and continue along Long Lane. The level of the new road will allow these to be left in their present position without diversion.

An existing highway drain runs along the eastern verge of Brickwall Lane; this will be replaced by a new system within the limits of the works and the area draining into this system will not be increased; some of the junction area drainage will be conveyed along the new road where achievable.

West of Chapel Lane, two large foul sewers running approximately parallel in a northwesterly direction, cross the line of the road; these are sufficiently deep to allow them to remain without diversion.

To the west of Switch Island a large diameter surface water drain crosses the route, and discharges into Moorhey Brook; here the new road is on shallow embankment which will allow this to remain without the need for diversion.

## **2.6 Existing Bridleway and Footpaths**

### **2.6.1 Overview**

The new road is an all purpose highway and as such there is a legal right to walk along, and to cross the road. However, with the high volumes of traffic predicted, the high traffic speeds anticipated, and the wide width of pavement, during long periods of the day crossing the road may not be safe. Where existing Rights of Way cross the line of the new road consideration has been given to preventing uncontrolled crossings, by stopping up these routes where necessary, and diverting the route to a safe controlled crossing point.

To establish usage of the Footpath and Bridleway system, surveys have been undertaken on all the Rights of Way to inform the intended future provision. The proposed provision described below has been shown to the Sefton Rights of Way Forum and to Thornton Parish Council and have received a favourable response.

The existing Rights of Way and proposed changes are shown on Figures 5.1 and 5.2.

### **2.6.2 Rear of Thornton Garden of Rest**

There are four crossings in this area; Holgate, Rothwell's Lane, Thornton FP2 and Rakes Lane. It is intended to connect Rakes Lane (a bridleway), along the southern boundary of the new road to Holgate, with a new bridleway; the other two footpaths will connect to this new bridleway. Back Lane will be replaced along the northern boundary of the new road between Holgate and Rakes Lane by a similar bridleway provision. Crossing of the new road in this area will be discouraged by hedging or fencing along the new highway boundary; but to allow safe crossing a new traffic signal controlled crossing, incorporating equestrian provision, will be provided at Holgate. It is noted that Holgate will be stopped up to vehicular traffic on the south side of the new road, and it is also intended to stop up Back Lane to vehicular traffic up to its junction with Longdale Lane, but reclassify this section as Bridleway (with appropriate agricultural access); to prevent unsocial behaviour, such as fly tipping.

### 2.6.3 East of Brickwall Lane

The route is crossed by Sefton FP5 and Sefton FP3 in this area. It is proposed to stop up these two crossings, but provide safer alternatives by; a) diverting Sefton FP 5 along the north side of the new route westwards to the traffic signaled junction at Brickwall Lane, where pedestrian phases are incorporated to allow safer crossing; b) diverting Sefton FP 3 along the north side of the new road eastwards to the traffic signal controlled crossing at Chapel Lane, where safer crossing can be made; c) diverting Sefton FP3 westwards along the south side of the new road to join with Sefton FP5 to maintain the footpath network.

### 2.6.4 Chapel Lane

The Trans Pennine Trail is a National Recreational Route used by equestrians, cyclists, walkers and the like, and runs along Chapel Lane crossing the new road near Brook House Farm. Here a traffic signal controlled crossing will provide safe crossing of the new road.

### 2.6.5 Dunnings Bridge Road

Presently there are footway and cycleway provisions along the west verge of Dunnings Bridge Road running northwards to the A59. This provision will be crossed no less than four times by new roads; however this present provision will be maintained with pedestrian phases incorporated into the traffic signals at these new crossings.

## 2.7 Environmental Mitigation

The potential environmental issues associated with the impact of the link road on landscape and visual, ecology and nature conservation, noise and vibration, cultural and built heritage and land use have been reviewed. This has been based on the current level of preliminary assessment and has indicated potential areas of mitigation. These will be used to inform the detailed mitigation measures to be included on the Environmental Masterplan.

The main environmental issues are shown on Figures 6.1 and 6.2.

The issues identified by this preliminary work includes locations along the route where woodland planting is to be considered to screen the road from visual receptors and to integrate the road into the existing landscape; hedgerow planting along the road boundary to integrate it into the existing landscape, and to provide some level of screen planting; and subject to the agreement of landowners off-site planting may also be considered, especially in areas where listed buildings are located (The Lodge and Manor House Farm). Additionally, there are locations where the route crosses bat flight paths which may require some mitigation measures. The route will cause a loss of one pond (adjacent to Back Lane), and consideration will be given to the provision of two new ponds in this area where there is evidence of Great Crested Newts and water voles, to create habitats suitable for these species. A few locations have been identified in field corners

and small severed parts of fields, which may be unsuitable for future agricultural use, where habitat creation or enhancement may be considered.





## Figures