To avoid potential congestion at the level crossing an alternative (non-classified) route to/from Canterbury city centre is available to traffic on the A291 Herne Bay Road through the village of Broad Oak via Sweechgate and Shalloak Road as illustrated in Figure 8.

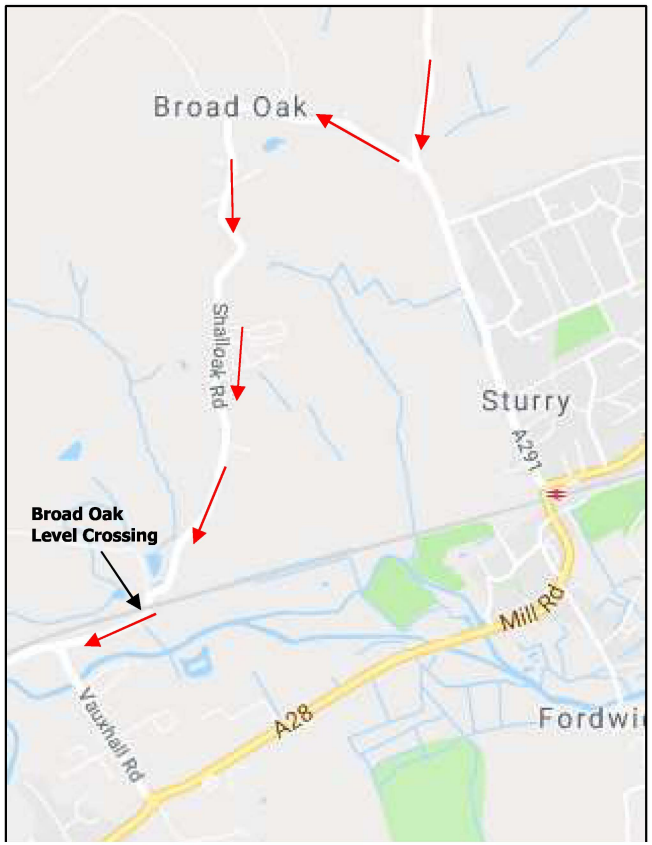


Figure 8 – Alternative route used by traffic to/from Canterbury

This route attracts significant traffic flows (circa 7000vpd) particularly during peak hours but is of a sub-standard nature with tight bends, poor visibility and narrow in places, a typical 'country lane'. Nonetheless, this 'rat-run' is well established has long been a concern and irritant to the residents of Broad Oak.

The route also crosses the railway line at a second level crossing, 'Broad Oak' level crossing, which has a lesser disruptive influence on traffic compared to the Sturry level crossing with barrier down times significant less, below 1 minute.

Incident data at the Broad Oak crossing has indicated a relatively high level of incidents for the current type of barrier (Automatic Half Barrier) and has been assessed by Network Rail to have a very high collective risk score. The crossing has a history of deliberate misuse incidents and is now fitted with 'misuse' cameras.

It is noted that Network Rail are currently assessing the implications of planned line speed improvements on the Canterbury to Ramsgate line, increasing the line speed from 70mph to 85mph. Network Rail has identified the Broad Oak level crossing as requiring assessment as the risk rating is likely to significantly increase. Potential measures/upgrades to the crossing may be required.

Public Transport

Rail

Sturry station is located adjacent to the level crossing and lies on the Network Rail high speed St Pancras – Ashford – Canterbury West – Ramsgate route. The line has both normal and High-speed (HS1) domestic services.

Bus Stops and Services

Bus stops are located throughout the study area, including along the A28 Island Road, A291 Sturry Hill, Sweechgate and Shalloak Road.

Sturry is well served by bus services travelling to and from nearby Canterbury City Centre. Stagecoach is the main operator within East Kent and provides services through Sturry as illustrated in Figure 9. The main services that run through the study area are Stagecoach's 'Triangle' via the A291 to Herne Bay and the 'Breeze' via the A28 to Thanet.

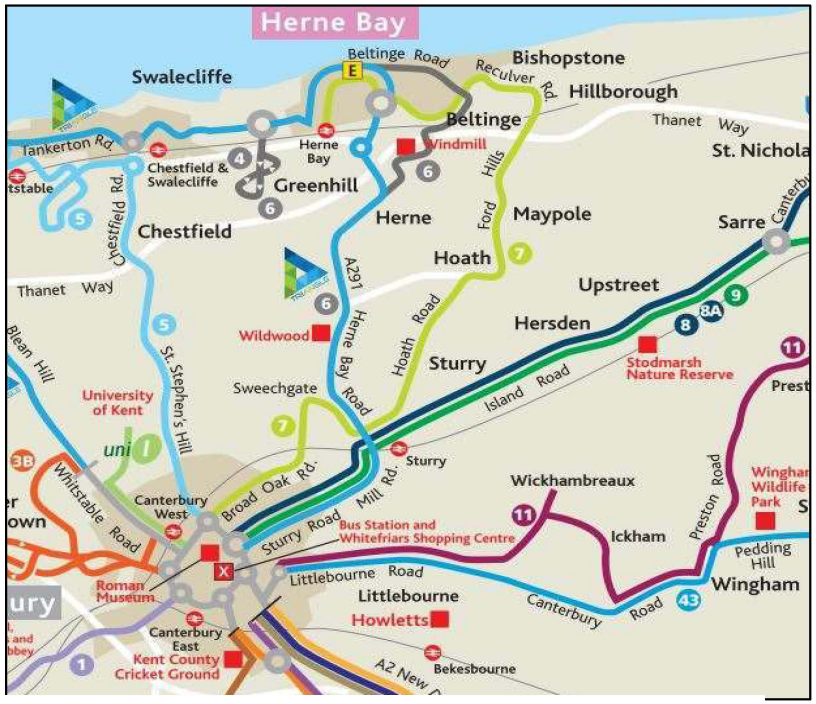


Figure 9: Bus routes (Source: https://www.stagecoachbus.com/maps, accessed: May 2021)

There are several School Days Only bus services that also serve the stops in the Sturry area and a Park and Ride site located off the A28 where 'Service P1' heads west towards the City Centre on the A28 Sturry Road.

Pedestrian and Cycle facilities

Footways are present along the A28 throughout the Sturry area. Pedestrians are restricted to the level crossing as no footbridge is present.

A footway is present on the western side of the A291 Sturry Hill until the junction with Sweechgate to the north of Sturry.

National Cycle Network (NCN) Route 1 is located south of the A28 running through Fordwich roughly parallel to which is an on-road local cycle route through the residential developments on the south of the A28. The route joins the A28 nearer Canterbury, approximately 2km from the scheme.

An off-road cycle path follows the path of the Great Stour river from Vauxhall Road westwards to the city centre. CCC are currently investigating the feasibility of an extension of this route eastwards from Vauxhall Road to Sturry to follow a route along the northern side of the Great Stour.

Along the A28 itself, advisory cycle lanes are provided on both sides of the road to the west of Sturry that link up to the Sturry Park and Ride site. Within Sturry, some very localised dedicated provisions are provided near the level crossing and the A28/A291 junction.

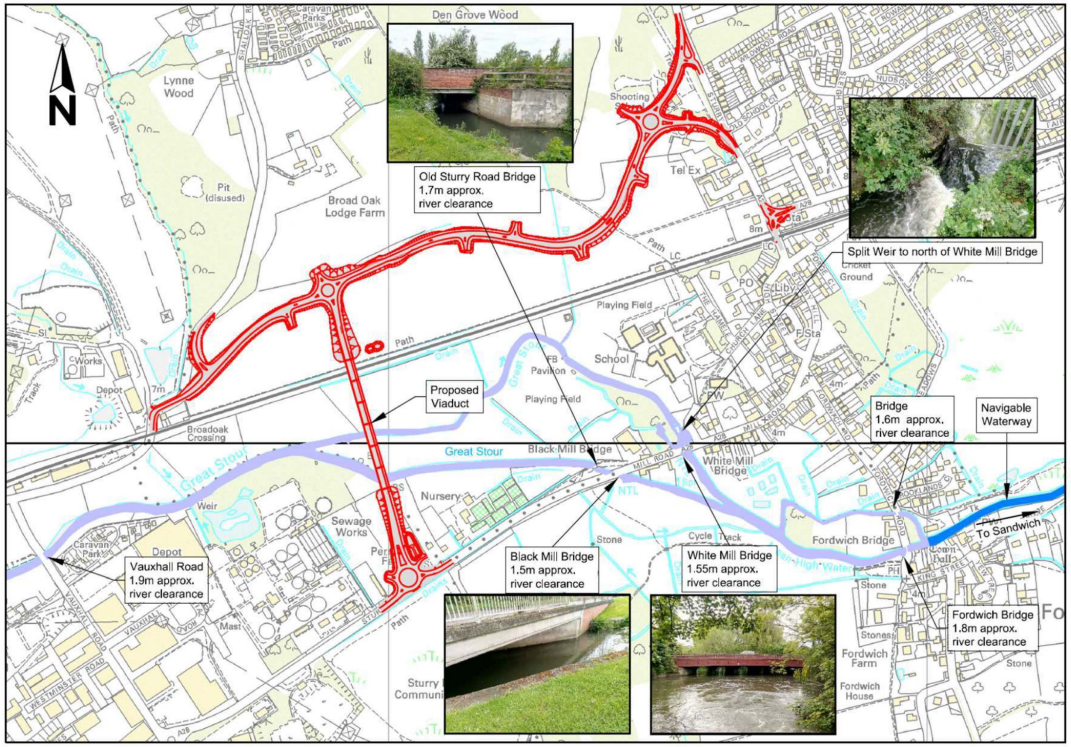
There are no dedicated cycle provisions on the A291 Sturry Hill.

Navigation of the Great Stour river

The majority of the River Stour is in private ownership, consequently, use of the river for boating and general access is significantly impacted. In Canterbury the only river navigation is by commercial punting companies but downstream of Canterbury from Fordwich in the tidal stretch of the river there is a right of navigation for 19 miles following the river along the rest of its course out to the English Channel at Pegwell Bay.

Sandwich Port and Haven Commissioners oversee Pegwell Bay to three quarters of a mile above Sandwich, but there is no navigation authority directly responsible from the rest of the stretch to Fordwich however the river is maintained for flood risk along here by the Environment Agency.

There are limited opportunities to navigate upstream (west) of Fordwich as the existing bridges in Fordwich and the Black Mill Bridge and White Mill Bridges on the A28 all have limited headroom less than 2m. Likewise, further west nearer to Canterbury the bridge at Vauxhall Road has limited clearance less than 2 metres



5 Previous Work Background + Outcomes

The concept of the strategic highway delivery of a Sturry Relief Road facilitated by development has been at the forefront of promotors of the Sturry and Broad Oak sites for over 10 years.

Throughout this period, many alignment options and variants have been considered and debated by county and district councils, various consultants and other key stakeholders' including Network Rail, Sturry Parish Council and other community groups.

The following provides a brief historical review of the SLR development up to the point where the route corridor and outline design of the SLR was established (April 2016) and subsequently submitted as part of the proposed Land at Sturry Master Plan planning application (Ref: CA/17/01383 and CA/20/02826).

In chronological order;

In 2006, during promotion of the Land at Broad Oak Farm site for inclusion as an allocation in the 2006 Canterbury Local Plan, the concept of a 'Broad Oak Bypass' emerged. The Land at Broad Oak Farm site, which represents the northern section of the 2017 adopted Local Plan strategic allocation, was promoted at the time on the basis of delivering infrastructure that would potentially overcome the well-established issue of rat-running through the village of Broad Oak.

Additionally, the bypass had the benefit of potentially allowing traffic to balance more evenly across the Sturry and Broadoak level crossings. The site was not ultimately allocated in the 2006 Local Plan although the distinct benefits of the 'Broad Oak Bypass' were recognised.

Promoters of the Land at Broad Oak Farm subsequently worked together with promotors of the southern Land at Sturry site to further promote and explore ways to secure wider infrastructure benefits. This culminated in a transport proposal (2012) prepared at the time by Odyssey Consulting Engineers in support of the allocation of the Land at Sturry and Broad Oak site for an east-west SLR through the southern section (Land at Sturry site) between Sturry Hill in the east and Shalloak Road in the west, all north of the railway.

The principle aim of the infrastructure at this stage was to seek a means to balance the utilisation of the level crossings without increasing undesirable increases in traffic through Broad Oak village.

Access arrangements feeding into the Land at Sturry development were explored at this time, including how to address the existing A28/A291 junction to support a partial but substantial reassignment of traffic from the A28 to the SLR, whilst keeping the Sturry level crossing open.

Junction forms taken forward included a priority junction arrangement at the tie in with Shalloak Road in the west, which was considered to contribute towards reducing Broad Oak rat-running and a roundabout solution to the east on A291 Sturry Hill.

The roundabout solution was sited at a more northerly location on A291 Sturry Hill with the intention of eliminating the challenges of proximity to the Sturry level crossing as well as utilising land within control of the site promotors. This new roundabout would effectively act as the new A28/A291 junction replacing the existing junction which became evident would need to be substantially altered to secure the transport benefits of the SLR.

Following representations to the Local Plan, Canterbury City Council (CCC) in cooperation with KCC continued to appraise site allocation options which identified the Sturry level crossing as a constraint to development in several areas of the district.

From this, the bridge crossing of the railway to the west of the Sturry level crossing emerged to support a broader allocation of development in the northern and eastern parts of the district. The principle of a diversion of the A28 on to the Land at Sturry development site was maintained but was now focused on the concept of providing a bridge broadly central between the level crossings and making a direct connection with the A28. Accordingly, this provided a complete alternative to the A28, allowing all traffic to divert from the existing route across the Sturry level crossing and would thus be strategic in nature.

CCC subsequently commissioned a study of a bridge option solely for costing purposes basing the route layout, which was developed by KCC in 1986, as illustrated in Figure 11.

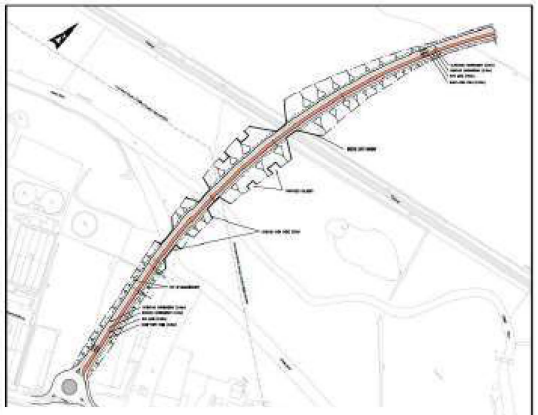


Figure 11: Initial bridge option alignment

This strategy of a bridge crossing was ultimately selected as the preferred option to be put forward in the draft Local Plan.

Following discussions with CCC and KCC, the concept of the promotors of Land at Sturry and Land at Broad Oak Farm delivering the infrastructure of the Sturry SLR, including the bridge, emerged. The site promotors subsequently explored and developed preliminary route alignment options both north and south of the railway as part of the masterplan for development. To the south, the focus was mainly based on varying permutations of land which would need to be secured. The preferred choice of a viaduct as opposed to separate bridges with adjoining embankments to minimise impact in the flood zone was also established. To the north, alignment options retained the principles established in the earlier work, namely that key areas of ancient woodland should be avoided.

Following further development of the design in discussion with KCC, final details of the preferred route choice and its primary form were established as shown in Figure 12.

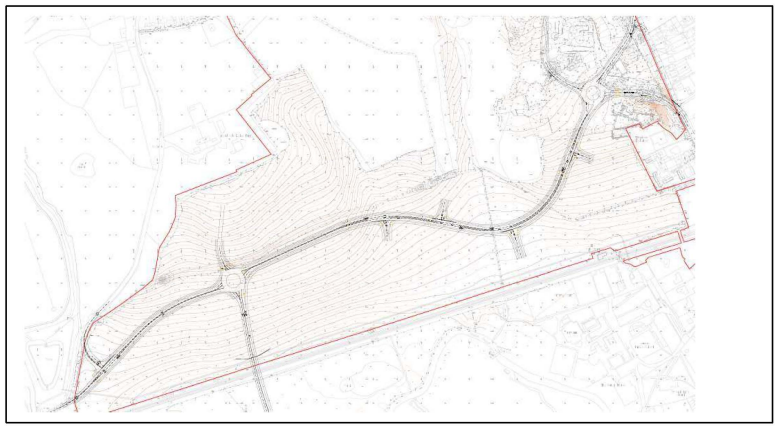


Figure 12: Preferred route choice and form

6 Design Scope and Constraints

To provide readers with context for why certain design decisions have been made, a broad overview of the key scheme elements and associated constraints is given below.

Key Scheme Elements

The scheme has five key component parts; the main route corridor, a local road connection, the form and scale of structure spanning the railway and Great Stour, alterations to the A28/A291 junction and widening of Shalloak Road as illustrated in Figure 13.

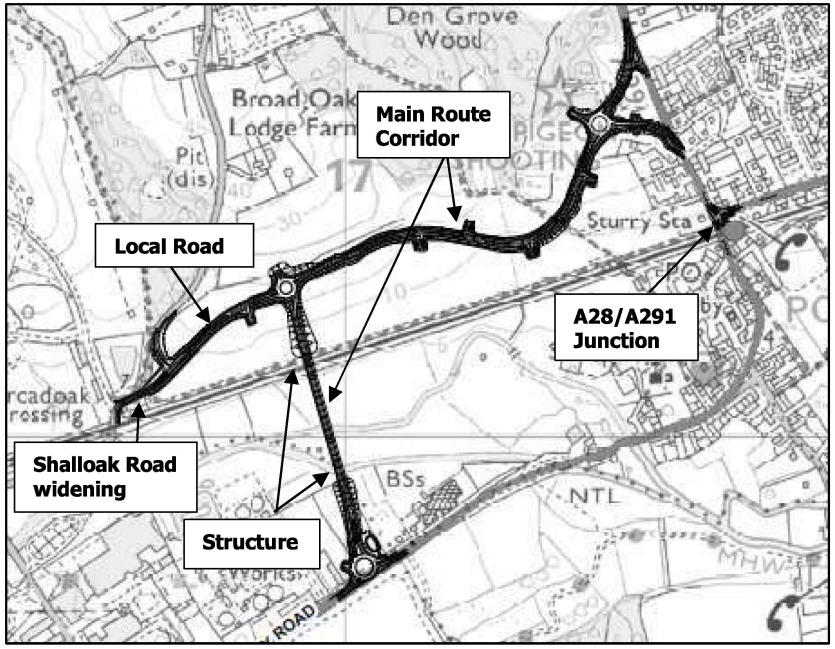


Figure 13: Location of key scheme elements

Route Corridor/Local Road

Key factors that affect the choice of route are:

- Environmental constraints
- Limited scope to connect to the A28
- How it impacts on the Great Stour flood plain
- Physical constraints including the need to bridge over the railway line and not prejudice National Grid's new 400Kv overhead power line in the west (currently under construction)
- Land use/boundaries (private/commercial)

These factors have driven the development of the route corridor as proposed in the Masterplan application ref CA/20/02826 for the Land at Sturry. This includes aligning the route to minimise its impact on ancient woodland, matching as far as practicable the challenging topography of the area and addressing the need to bridge over the railway.

This route has now been confirmed with the granting of the planning consent for Land at Sturry development in March 2021.

To the south of the railway the route corridor is slightly less constrained however with localised variations in road alignment limited because of the 90^0 crossing of the railway, the viaduct pier positions and the location of the new A28 roundabout.

Form and Scale of Structure

The scope for structure options to span the two arms of the Great Stour River and railway is primarily based on the requirements as set out by the Environment Agency (EA), Network Rail (NR) and the poor ground conditions.

This includes flood risk issues, including flood compensatory mitigation measures, ecology issues, vertical and horizontal clearances to the railway line and ground engineering considerations. Other factors such as visual intrusiveness, future maintenance aspects, buildability and costs have also influenced the preferred structure choice. It is noted that the river is not navigable on this section of the Great Stour as it is west of Fordwich which is the western most point of the navigable stretch of the Great Stour.

A291 Sturry Hill/A28 Island Road Junction

The primary aim of making alterations to this junction is to reduce traffic flow across the adjacent level crossing by encouraging through traffic heading to and from Canterbury to use the SLR whilst maintaining access for local traffic, thus improving safety at the level crossing and easing congestion at this junction and through Sturry south of the railway.

The alterations will also provide the opportunity to;

- include controlled pedestrian crossing facilities at the junction which would help residents where a local shop and the station forecourt are present.
- ease intermittent but severe congestion at the junction during operation of the level crossing, allowing for greater free movement of traffic to relieve this long established undesirable situation and;

Figure 14 shows the existing junction arrangement and its unconventional layout.

Figure 14: A28/A291 Junction – showing unconventional right-turn 'hook' traffic movement

The impact of such alterations will be significant in terms of related impacts of the SLR, such as noise and air quality. For this reason, it is considered appropriate that the junction alterations should form an integral part of the planning process.

Shalloak Road (widening)

To improve safety at the Broad Oak level crossing and to mitigate the potential for increased traffic during peak hours at the level crossing with the development in place, widening of Shalloak Road, including provision of a shared pedestrian/cycle footway is proposed just to the north of the crossing where the road width narrows to less than 5.5m. Widening requires acquisition of private land.

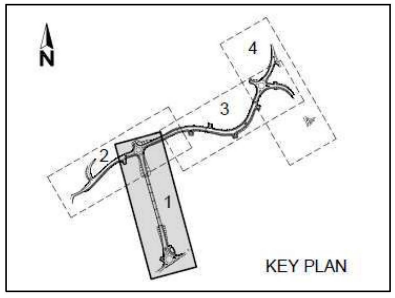
7 Scheme Design

Previous sections have described the evolution of the SLR design to April 2016 culminating with an indicative scheme proposal presented by C&A Consultants on behalf of the promotors of land allocated at Sturry and Broad Oak.

Subsequently, approvals of a concept design for the scheme proposals reported to the Environment & Transport Cabinet Committee (E&T) on 15 June 2017 allowed the scheme to progress to outline design. An update to the committee was given in July 2017 approving outline designs and a further update in May 2018 led to approval to amendments and refinements incorporated in the design following a public consultation exercise.

This chapter describes the development and refinement of the outline design including associated on-line improvements that make up this planning application.

The intent, character, scale and key design parameters & provisions of the scheme are initially explained followed by a more detailed description to explain specific issues that have dictated the layout design.



Scheme Drawings
Section Key Plan

As previously mentioned, to provide for greater context and continuity of the KCC proposals submitted with this application (i.e. *Section 1* as illustrated in the 'Section Key Plan' opposite), this DAS sets out to describe the design principles for the full route of the SLR.

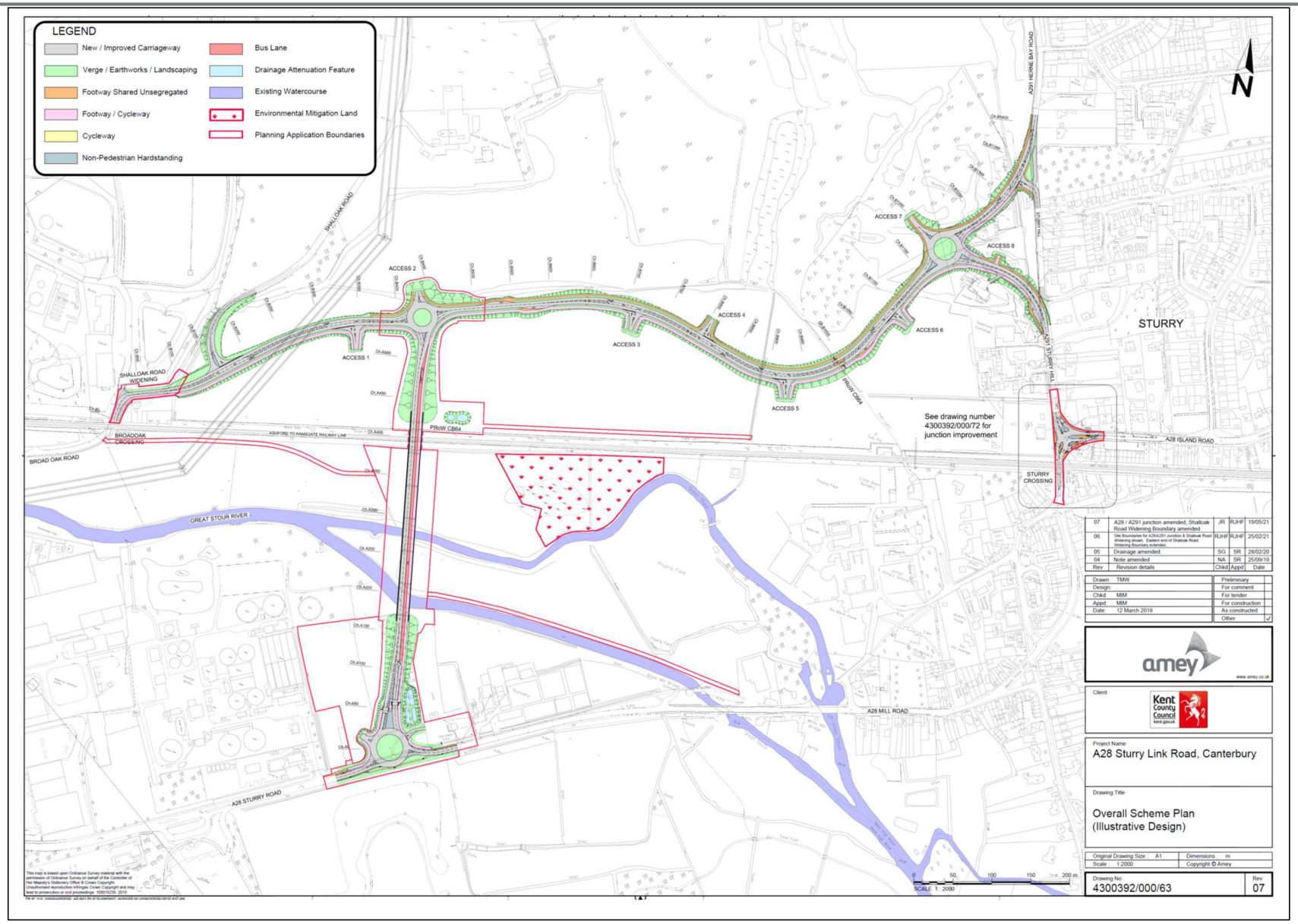
It is however reiterated that the promoters of Land at Sturry and Broad Oak, and CCC, have continued to engage and assist KCC & Amey throughout this latest scheme development stage. It is therefore noted that the details given in this DAS that fall outside the Application Site, reasonably reflect those submitted as part of the promotors of the Land at Sturry application (CA/20/02862).

Scheme Drawings

Details of the scheme design are provided on the following drawings which have been submitted as part of this application. The Scheme Plan is shown opposite.

Drawing Number	Drawing Title
4300392/000/63	Scheme Plan
4300392/000/64	Scheme Design (***Section 1*** – this application)
4300392/000/65	Scheme Design (***Section 2*** – this application in part - Shalloak Road improvements)
4300392/000/66 & 67	Scheme Design (outside this application)
4300392/000/68	A28 /A291 Junction Improvement
4300392/1700/ID/01	General Arrangement - Viaduct
4300392/000/74	Landscape Proposal (***Section 1*** – this application)*)*

Extracts from the scheme drawings are provided in this document as appropriate.


LEGEND
New / Improved Carriageway
Verge / Earthworks / Landscaping
Footway Shared Unsegregated
Footway / Cycleway
Cycleway
Non-Pedestrian Hardstanding
Bus Lane
Drainage Attenuation Feature
Existing Watercourse
Environmental Mitigation Land
Planning Application Boundaries
N
A291 HERNE BAY ROAD
SHALLOAK ROAD
ACCESS 1
ACCESS 2
ACCESS 3
ACCESS 4
ACCESS 5
ACCESS 6
ACCESS 7
ACCESS 8
STURRY
STURRY HILL
SHALLOAK ROAD WIDENING
BROADOAK CROSSING
BROAD OAK ROAD
ASHFORD TO RAMSGATE RAILWAY LINE
PRoW CB64
See drawing number 4300392/000/72 for junction improvement
A28 ISLAND ROAD
STURRY CROSSING
GREAT STOUR RIVER
A28 MILL ROAD
A28 STURRY ROAD
07 A28 / A291 junction amended; Shalloak Road Widening Boundary amended JR RJHF 19/05/21
06 Site Boundaries for A28/A291 Junction & Shalloak Road Widening shown. Eastern end of Shalloak Road Widening Boundary extended. RJHF RJHF 25/02/21
05 Drainage amended. SG SR 28/02/20
04 Note amended NA SR 25/09/19
Rev. Revision details Chkd Appd Date
Drawn: TMW
Design:
Chkd: MIM
Appd: MIM
Date: 12 March 2018
Preliminary
For comment
For tender
For construction
As constructed
Other
amey
Client
Kent County Council
Project Name
A28 Sturry Link Road, Canterbury
Drawing Title
Overall Scheme Plan (Illustrative Design)
Original Drawing Size: A1
Scale: 1:2000
Dimensions: m
Copyright © Amey
Drawing No. 4300392/000/63
Rev. 07
SCALE 1 : 2000

Design Approach

The intent of the scheme is to ease traffic congestion through the village of Sturry, reduce traffic crossing the Sturry level crossing and cater for the extra traffic generated from strategic new housing sites proposed in the adopted Local Plan at Sturry, Broad Oak, Hersden and beyond at Herne Bay. The scheme also aims to provide improved and appropriate provisions for pedestrians and cyclists

The proposals have therefore set out to achieve the following overarching scheme objectives;

- Encourage reassignment of traffic to avoid the Sturry level crossing
- Ensure carriageway and junction provisions are to appropriate road standards and proportionate to the traffic flows predicted
- Ensure an equitable balance between differing user requirements (i.e. pedestrian and cyclists as well as all forms of motor vehicles)
- Maintain and improve access to public transport
- Construct the scheme by 2024

In developing the proposals KCC officers and their consultants have been in liaison with key stakeholders including Canterbury City Council, affected landowners, Environment Agency, Network Rail, Southeastern trains, Stage Coach, Natural England and developers for Land at Sturry and Land at Broad Oak Farm developments.

The process has included consultation with community representatives and seeking public opinion through a Public Consultation event including local public exhibitions.

The outcome of a Stage 1 Road Safety Audit has also led to refinements of the final scheme proposals.

Through this process a thorough understanding of the current issues, needs and concerns have been established and taken forward in the development of the final scheme design as explained in the following sections.

Layout Design (General)

Brief description (SLR)

The scheme proposals will provide a new 1.5km single carriageway road to link the A28 Canterbury-Sturry Road in the south to the A291 Sturry Hill in the east.

At its southern end, a new four-arm roundabout is proposed off the A28 on undeveloped land between the existing Vikings car showroom and the property known as Perryfield Farm. From here, the SLR heads in a northerly direction for approximately 0.75km elevated on embankment and supported on a 250m long continuous bridge structure (viaduct) crossing the Great Stour, its floodplain and the Canterbury to Ramsgate railway.

Once over the railway a new 4-arm roundabout is proposed set within the southern slope of the Stour valley. Here, the main route changes to go in an easterly direction for 0.65km towards Sturry, skirting the southern edge of the Den Grove Wood Ancient Woodland to join the A291 Sturry Hill via another new roundabout. To the west of the railway crossing a new 0.35km section of road is proposed providing a direct link to Shalloak Road in the west, which is to be widened where it narrows

just north of the Broad Oak level crossing, offering an alternative route to travel into Canterbury via Broad Oak Road.

All new junctions will be at-grade including several 'T' junctions widened to include dedicated right turn lanes to allow main traffic streams to continue unimpeded and provide safe and direct access to the new development and connections to the existing road network.

Associated infrastructure will include; a continuous off-road cycleway shared with pedestrians, frequent formal pedestrian crossing points including some signalised, bus stop provisions, road lighting throughout except over the flood plain and surface water storage ponds.

Scheme Character and Scale

The SLR with the land at Sturry development in place will be predominantly suburban in character linking residential access roads and connecting with major traffic routes.

Fundamentally, its function and form relate to the road type; '*Local Distributer Road*' as set out in the Kent Design Guide[2] (KDG).

This is described as being; *a busy road linking other distributer roads and access roads within the primary residential districts of a town, generally serving over 300 dwellings and providing an opportunity for avenue planting and cycleways.*

Guidance in the KDG for this road type recommends a single carriageway with road widths between 6.00m to 10.50m, including features such as central islands as appropriate.

The constraints inherent on the local and wider road network will continue to hamper traffic heading to the SLR and effectively determine maximum traffic levels. As a basis for design, the Design Manual for Roads and Bridges (DMRB) Advise Note TA 79/99 (Traffic Capacity of Urban Roads) indicates that predicted traffic levels will remain within the traffic capacities derived for Urban-all-purpose UAP2 single carriageway road types (Table 2 in TA79/99 refers). A single carriageway road is therefore considered the appropriate choice of carriageway provision. It is noted that Advise Note TA 79/99 has recently been withdrawn however the assessment is still valid and proportionate with the existing highway network and the part of the link road approved in with the Land at Sturry development consent (CA/20/02862).

A typical road cross-section north of the railway, prior to any housing development, is shown in Figure 15 comprising one lane in each direction with added width to include protected right turn lanes, a footway on the north side and a shared footway/cycleway on the south side both separated from the carriageway by 2m soft verges.

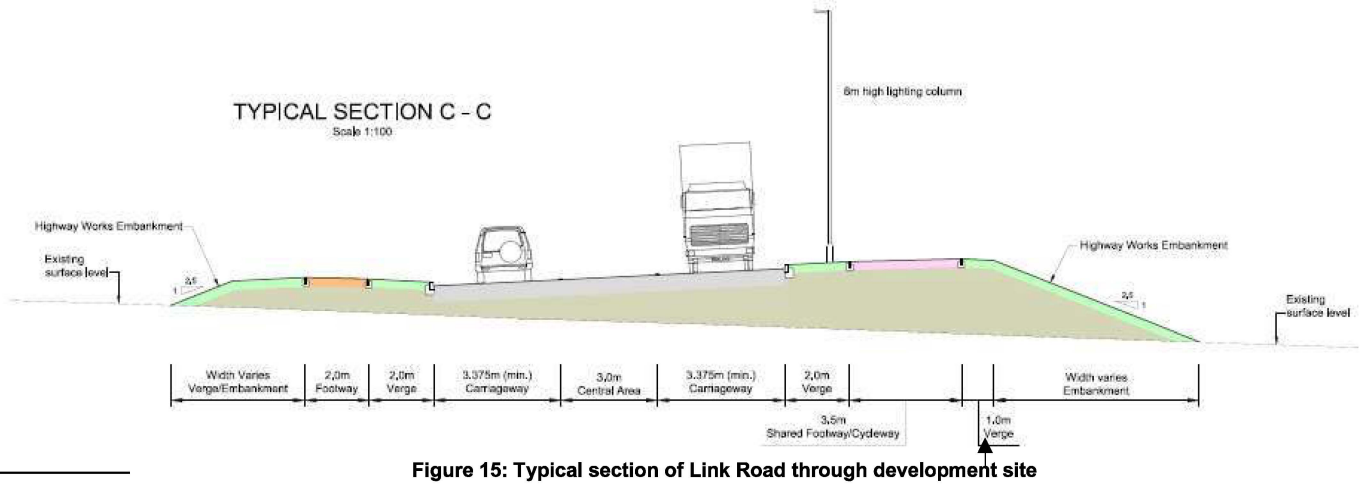


Figure 15: Typical section of Link Road through development site

[2] Kent Design Guide – Creating the Design – Step 3 – Designing for Movement

South of the railway line the SLR will be elevated on embankment and supported on a viaduct. An indicative representation of the viaduct is shown in Figure 16, looking south towards the new junction with the A28 and Figure 17, looking north towards the new Land at Sturry development.

The road is single carriageway, one lane in each direction with the addition of a southbound bus lane which has been included to align with CCC's future aspiration to provide a continuous bus lane route into Canterbury. A shared footway/cycleway is provided on the east side with no footway provision on the west side.

The height of the viaduct above the ground is dictated by minimum headroom requirements set by Network Rail and the Environment Agency for operation and safe maintenance; clearances of 5.1m above the rails and 2.65m above the river banks of the Great Stour. It should be noted that the Great Stour is not navigable at this point.

This sets proposed road levels in the range 4.8m AOD at the A28 in the south, rising to 8.8m AOD at the railway, which are above the maximum fluvial flood levels estimated to rise to 4.27m AOD (1 in 1000 storm event).

The Link Road has therefore a very low risk of fluvial flooding allowing the free flow of flood water beneath the viaduct and is deemed not to be at risk from any other sources of flooding including tidal, groundwater and sewer.

The highest point of the road above existing ground is just south of the railway on the viaduct where it will be 8.77m above the ground. At the southern end, the approach embankment will reach a height of 5m mid-way on the flood plain where it meets with the viaduct, beyond which the viaduct continues to rise at a constant gradient of 1.72% (1: 58) towards and over the railway.

Figure 16:
3D Visualisation of the viaduct viewed from north of the railway line, looking south

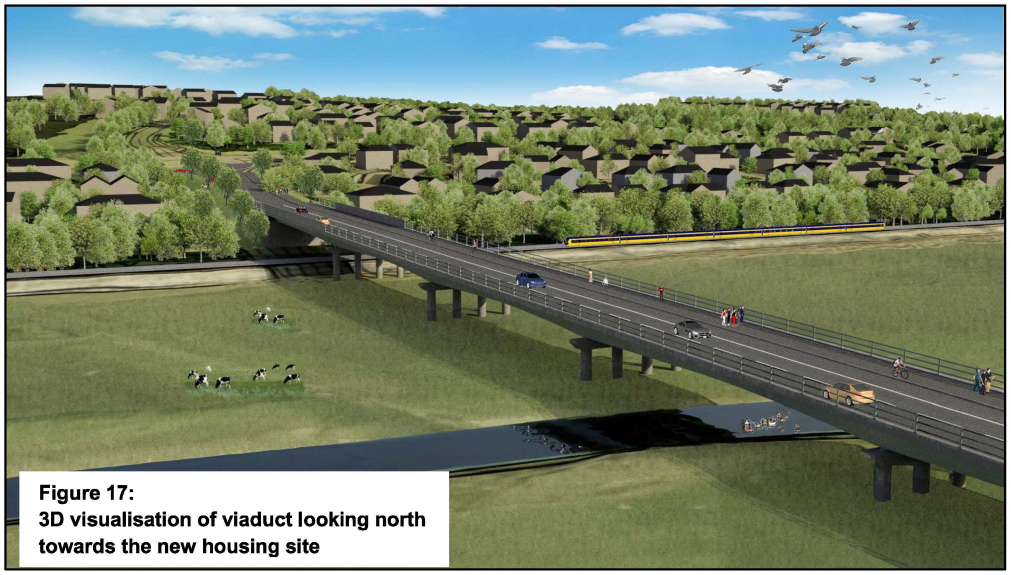


Figure 17:
3D visualisation of viaduct looking north towards the new housing site