Swindon Kennels Bridge
FEASIBILITY REPORT

Feasibility report prepared	Signed *(Design Engineer)*	Dated 30/08/2022
Feasibility report reviewed	Signed…… (*Project Manager)*	Dated……
Acceptance of feasibility study	Signed…….. (*Budget Manager)*	Dated……
Acceptance of feasibility study	Signed…….. (*Design Manager)*	Dated……

1 Executive Summary

Swindon Kennels Bridge is situated to the southwest of Hepple at OS Grid Reference 397333, 599684. The bridge is a single span concrete structure, comprising a simply supported concrete encased filler beam deck, carried by masonry abutments. The bridge carries the C180 over Grasslees Burn.

The location of the bridge is shown in Figure 1 below. Refer to Appendix A – Existing General Arrangement.

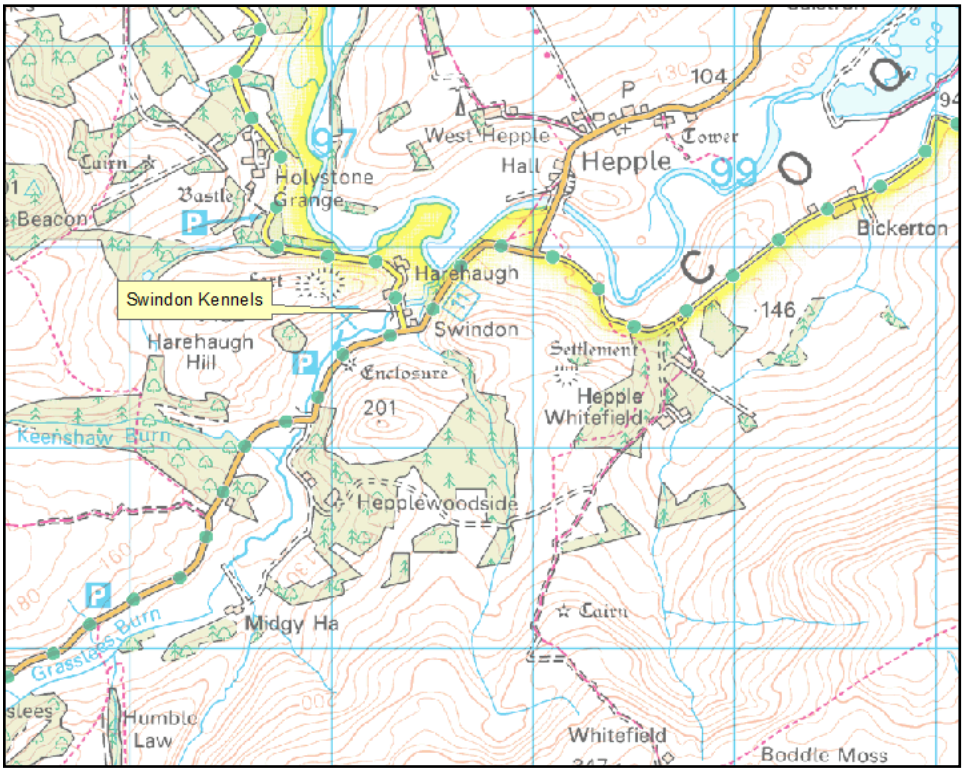

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Figure 1 – Location of Swindon Kennels Bridge.

The brief of this feasibility study is to explore options and recommend measures to be undertaken to address the risk presented by an under strength highway bridge. The proposal should also consider means of managing structural condition with the implementation of measures to control existing and limit the potential for future deterioration.

The inspection, survey and archive information review indicated that overall the bridge is in fair condition; however the substructure is in poor condition in parts.

Several options have been considered ranging from doing nothing to undertaking varying levels of maintenance to the existing structure.

The recommended solution is to install a prestressed beam deck with infill concrete, supported on reinforced concrete CFA bored piles.

2 Bridge Construction

2.1 Original Structure

Swindon Kennels Bridge comprises a single span filler beam deck which carries the C180, a single lane single carriageway over Grasslees Burn, a minor watercourse. The bridge is located southwest of Hepple, Northumberland. The construction form of the bridge consists of longitudinally spanning encased beams with an unreinforced concrete deck. The upstream elevation span being 6.323m and the downstream elevation span being 6.588m.

The substructure consists of masonry abutments, each with stone masonry wing walls at the upstream and downstream sides.

Edge protection is provided for the structure in the form of a steel parapet. There is a small grassed verge to either edge of the carriageway. There is no pedestrian footway over the bridge.

The bridge has a current assessed live load capacity of 17 tonnes (t), please see **2.3 Previous Assessments** for discussion on this result. The speed limit over the bridge is 60mph, although due to the rise in road level over the bridge, this speed is impractical.

The bridge is generally in fair condition for its age; however parts of the substructure are poor.

The bridge has a current BCI Critical score of 55.48 and a BCI Average score of 72.97, based on the most recent SPI in July 2022.

2.2 Archive Information

There is no construction date available for the structure, however there is a 1932 drawing available for the (not undertaken) reconstruction of the structure.

The following archive information is available for this structure:

- Diving inspection dated 2019.
- 34 Interim measures inspections between September 1994 and July 2022.
- Site access and safety document.
- Site visit photos from 2018
- GI inspection & photos from March 2016
- GI inspection & photos from February 2019
- GI inspection & photos from June 2020
- GI inspection & photos from July 2022
- GI inspection March 2011.
- Bridge Card

2.3 Previous Assessments

Previous assessment information is as follows:-

An assessment was carried out in 1993 by Northumberland County Council (NCC) and calculated that the encased beams had a capacity of 17t. The critical effect is bending of the RSJs.

In addition there is no evidence of transverse spanning reinforcement and limited assessment calculations referring to it.

Upon further review of the 1992/3/4 assessments, the following comments are made:-

1992 by GP and DH

Capacity 25t based on an estimated RSJ section size and bending capacity of RSJs

The assessment has not checked accidental wheel load on the transverse spanning slab.

1993 by WF

Capacity 7.5t + Group1 FE based on bending capacity of RC slab under verge

This was the only assessment to give a 17t rating, for the slab element under the carriageway. Therefore it is assumed this has been the assessment result adopted.

Page 5 – Shear capacity of the RC slab is based on the web area of the RSJs not the RC slab;

1994 by MGH

Capacity 3t based on bending capacity of RC slab under carriageway and verge

Page 5 – Bending Moment capacity of the RC slab (170.77kNm) is based on the capacity of the RSJ not the RC slab.

Page 5 – Shear capacity of the RC slab (352.21kN) is based on the web area of the RSJs not the RC slab.

It is the opinion of the reviewer that all of the assessments are incomplete and unconservative. Given modern assessment standards, the unreinforced transverse spanning RC slab will not pass 40T as it will be unable to carry hog and sag bending effects. Therefore the structure should be rated as Dead Load only.

3 Site Constraints

3.1 Vehicular/Pedestrian.

Swindon Kennels Bridge carries the C180 single carriageway over Grasslees Burn; it provides access to local farmers and residents. The proposed works are required to improve the assessed capacity of the bridge and ensure that the structure can accommodate the required traffic loadings.

Any work to the bridge beyond minor maintenance will require a road closure; there is a diversion route available of an equal standard. This being via the B6341 and C172. The diversion route is approximately 14.5km.

The road is a designated cycleway, NCN 68.

There is no footpath over the structure.

There is a School Transport route over the structure, MOR012. Closure of the road for works will have an implication on this route.

3.2 Environmental

Grasslees Burn, the watercourse spanned by the bridge is an Ordinary Watercourse. Depending on the scope of the works, Land Drainage Consent may be required from FCERM.

The current clear waterway must be maintained in order to ensure FCERM consent is received for any changes to the bridge. This is to ensure there is no change to the risk of flooding in the locale.

Following discussion with the Grasslees Cottage homeowner, it was ascertained that the field opposite the house was flooded. Please refer to *section **3.8 ECI*** for details of the meeting in August 2019.

3.3 Ecology

An Extended Phase 1 Habitat Survey was undertaken by Total Ecology in June 2018, and has concluded that the works may impact or cause disruption to protected species or local wildlife, depending on the nature of works; and therefore care must be taken to avoid this.

The following was noted:

- Birds – Multiple records of birds within 2km. Bridge is unsuitable for nesting birds but surrounding vegetation does provide suitable nesting habitats. There are also multiple records of Schedule 1 birds.
- Bats – 65 Records of bats within 2km, however structure offers negligible roost potential and surrounding trees offer low potential.
- Badgers – There are no records of badgers within 2km of the site. No evidence suggests badger activity at the bridge.
- Otter – There are 7 records of otter in the area.
- Water Vole – There are no records of water vole in the area. The banks of Grasslees Burn have been identified as suitable for water voles.
- Fish – There are 30 records of fish within 2km of the watercourse.
- White-Clawed Crayfish – 1 record within 2km.

The following recommendations were made:

- Birds – Any works affecting scattered trees on site, with the exception of minor pruning, should avoid the nesting season (March – September) or if undertaken during this time preceded with a nesting bird check.
- Otter – The site provides potential for otter resting places in the form of overhanging trees on the banks of the burn. It will therefore be necessary to carry out a dedicated otter survey.
- Water Voles - Banksides are considered suitable for water vole. It will therefore be necessary to carry out a dedicated water vole survey.

- White-clawed crayfish – As Grasslees Burn flows into the River Coquet and the watercourse is deemed suitable for white-clawed crayfish, further survey effort is recommended (stone turning survey to establish presence of white-clawed crayfish).
- Pollution – Due to the identified fish population it is recommended that general pollution prevention guidance is adopted during works where necessary to prevent pollutants entering the watercourse.

There is no evidence of invasive flora at the site.

The results from the MAGIC search revealed 3 no. statutory designated sites within 2km of the bridge; River Coquet and Coquet Valley Woodlands Site of Special Scientific Interest (SSSI) approximately 185m north, Simonside Hills SSSI and Simonside Hills Special Area of Conservation (SAC) both 1.4Km south of site.

Additional ecological surveys recommended in the Extended Phase 1 Study relating to white-clawed crayfish, water vole and otter were undertaken on 28th August 2019. Three otter spraints were found as well as otter tracks. No evidence of water vole or white-clawed crayfish were noted.

It is therefore deemed that these species provide a negligible constraint to the proposed work and no further action is required. However, should any otters, water voles or white-clawed crayfish be encountered during the works then work should stop and an ecologist informed.

General pollution prevention is recommended throughout the works. It is also recommended that works take place outside of the fish migratory season.

The ecology report was update in 2022 by the NCC ecology team and it was found that the findings from the previous reports were still valid and no change or additional work was required at this stage.

3.4 NNP, EA/FCERM & Conservation

The structure is located on the East boundary of the Northumberland National Park, therefore the Northumberland National Park Authority (NNPA) must be consulted regarding any planning permission requirements.

Following consultation with NNPA, if the chosen scheme is a replacement there will be a requirement for planning permission for this scheme. Following acceptance of this Feasibility Study, planning permission for the final solution will be submitted to the NNPA.

Grasslees Burn is not designated as a main river and as such works in, on, over, under or within 5m of it will require consultation with and consent from FCERM as the LLFA. Since the bridge has been identified as being within 2km of SSSI and SAC sites, as part of the Land Drainage Consent, a HRA and CEMP will be required.

A search on the Northumberland County Council digital mapping services returned no conservation areas will be affected by any of the proposed remedial works options.

3.5 Utilities

There are no known Statutory Undertakers apparatus within the bridge however there is a BT overhead cable which crosses the Burn in line with the structure. Initial informal consultation with BT as part of the ECI process has indicated that, depending on the chosen scheme, the works may be possible without a diversion (utilising strict RAMS and an experienced site foreman for large vehicle movements). The process of formalising this with BT is currently being undertaken.

3.6 Timing

Consultation with the local elected member and local parish councils suggests that there are unlikely to be any issues relating to the timing of the works providing a diversion is in place. This consultation will be continued as the details of the scheme are finalised.

3.7 Land

The works are, in the main, to be carried out within the highway boundary. There may be a requirement for site cabins to be located in adjacent fields; therefore consultation with the land owner may be necessary. From previous ECI in 2019 it was identified that the field to the south west is owned by the house opposite and they were amenable with the idea of it being used during the works when it was discussed at that time. They did note that the field is liable to flooding.

If deck replacement is the preferred option, the removal of trees along the line of the Grasslees Burn will also be required to permit removal of large boulders to the invert under the bridge. This will permit construction of a crash deck prior to the demolition of the bridge.

3.8 ECI

An ECI meeting was conducted in 2019 on site between NCC Lead Contractor (LC), NCC Project Manager (PM) and NCC Lead Designer (LD).

The outcome of this meeting was that the following items must be considered during the feasibility and design stages of the project:

- Requirements before works
  - Vegetation clearance required to facilitate access;
  - Removal of boulders from Grasslees Burn for crash deck standards – this will require LDC;
  - Erection of temporary pedestrian walkway not required;
  - A site investigation would be required to facilitate design;
- Requirements during works
  - Crash deck required to prevent debris entering the watercourse during demolition and construction;
  - Crane pad required to facilitate deck removal and installation;
- Other considerations
  - Any work, beyond minor maintenance will require a road closure; there is a diversion route available, of an equal standard which is considered acceptable.
  - The home owner on the adjacent land advised that water levels were high following heavy rainfall in August 2019. This has been confirmed by checking the water level records. It was noted that the bridge was submerged and the field opposite the house (which has been identified as a possible site compound location) was underwater.
  - BT suggested during informal talks that it may be possible to undertake the construction works without diverting the overhead cable. This needs to be formalised with BT by Tony Bell (contractor).

4 Condition of structure

4.1 Site Inspection

The structure is generally in a fair condition, however there is evidence of cracking to one of the deck downstand beams and settlement in the substructure which could have implications for the overall structural integrity of the structure:-

- Longitudinal crack to downstand beam adjacent west elevation *(Figure 5)*
- Vertical step fracture at north abutment (*Figure 6)*
- Possible rotation of south wing walls (*Figure 7*)

A diving inspection was undertaken in May 2019. The inspection and report found that the south abutment was free from damage and defects with no scour or undercutting to the base of the abutment. It was however noted that two vertical cracks ran beneath the deck of the bridge measuring 30mm at the top of the wall on the east end down to 0mm at the bed level. The vertical crack at the west end of the abutment was also found to run the full height and measured 40mm at the widest point at the top. The masonry was noted to have rotated 30mm at the top, with the crack tapering from the top to the bottom (*Figure 7*).

The north abutment was noted to have a small area of scour at the bed. It was noted that a vertical crack ran beneath the deck of the bridge at the west side measuring 20mm down to 0mm at the bed. At the east end a crack ran from the top of the wall for 2.3m and measured 5mm at the widest point down to 0mm. At the west end of the abutment a small area of scour was noted on the return corner.

The invert is made up of sand and various size rocks. The level was taken from the underside of the soffit on the north abutment and was measured as 3.1m to the water level.

The bridge has a current BCI Critical score of 55.48 and a BCI Average score of 72.97 (July 2022 SPI).

The 2020 GI identified:

- Abutments and wing wall gaps unchanged except north west wing wall which has increased 2mm to 14mm at top;
- Spalling to east plinth on-going in 5 no. locations, all of which have a little loose concrete;
- Carriageway has slight loss of surface dressing and transverse cracking at abutments;
- Gullies becoming overgrown.

As the structure has been identified as substandard, it has been subject to Interim Measures inspections. There are 34 no. Interim Measures' Reports. The reports are summarised thus: the first report is dated September 1994 and inspections have taken place generally twice yearly, with the most recent report dated July 2022. The reports chart the overall decline in condition of the structure, with no sudden significant changes. The first report of wing wall rotation and separation (as part of the interim measures inspections) was noted in July 2003. However, the bridge card has reports of settlement cracks in the wing walls as far back as July 1971.

4.2 Ground Investigation

Coast Consulting Engineers were commissioned by Northumberland County Council to undertake ground investigation at Swindon Kennels Bridge in 2021. The findings were issued in a report issued on 17th August 2021. The ground investigation works carried out consisted of the following:

- Drilling of 2 No. cable percussion boreholes to depths of 15.5m.
- Rotary follow on drilling in each of the cable percussion boreholes, terminating at 18.0-20.95m depth.
- In-site testing comprising Standard Penetration Tests (SPTs).
- Obtaining soil samples for laboratory analysis.

- Installation of 2 No. groundwater monitoring standpipes.
- Geotechnical testing of soils, including water soluble sulphate, soil pH, Atterberg Limits, particle size distribution.
- Contamination testing of Made Ground comprising a suites of metals, metalloids, nonmetals, Polyaromatic hydrocarbons (PAH) and asbestos.

The borehole logs found that the strata encountered to a depth of ~10m below ground level was 'Loose sand and very sandy clay' with an average SPT values of 7. It was noted that due to the low SPT values and soft clay being found in this zone, there was a high for potential excessive settlement.

The 10-20m below ground level strata was found to be medium-dense to dense sand and gravel, with an average SPT value of 37. The recommendations for the piling design were based on this stratum providing both end bearing and skin friction resistance. Whereas the upper 10m of stratum was ignored due to the low SPT values.

Differential settlement between the wing walls and abutments has been noted as far back of 1971 (on the bridge card) and has been noted throughout the duration of being in interim measures. During the interim measures period, a number of changes to the crack width measurements have been noted. This change in crack width indicates movement of the substructures. The poor SPT values for the strata to a depth of 10m below ground level could explain this movement if the foundations for the substructures were in this zone (which they are likely to be).

Based on the findings from the ground investigation, it should be noted that any solution to strengthen the bridge should either have new substructures designed to adequately support the superstructure, a comprehensive assessment of the existing substructures and the founding material to quantify their ability to support a new substructure or some form of ground stabilisation to ensure that the existing substructures are founded on material that can quantifiably support existing substructures and new superstructure.

4.3 Photographs

Figure 2 - East Elevation

Figure 3 - View over structure (looking north)

Figure 4 - View downstream, looking east

Figure 5 - View of longitudinal crack to downstand beam adjacent west elevation

Figure 6 - Vertical step fracture at north abutment

Figure 7 - Possible rotation of south wing walls

5 Land Ownership and Affected Residents.

The bridge and associated highway are owned by NCC. The surrounding area consists of a private residential dwelling and privately owned fields. Permission will have to be obtained by NCC before any works can be undertaken off the carriageway.

The local residents may not be able to cross the bridge during site operations, as the work involves the possible removal of the bridge deck. This disruption is unavoidable due to the nature of the works. Liaison will be undertaken with the local residents to keep them informed of the scheme and to address any concerns that they may have. An appropriate diversion route (14.5km long) four use by affected residents has been identified in section 3.1.

6 Options Considered

6.1 Do nothing.

This option is ruled out upon the basis that the existing structure does not have the capacity to accommodate the required level of highway loading thus continued unrestricted use by motor vehicles will lead to continued deterioration and eventual failure.

6.2 Permanent road closure.

Closure of the road to motor vehicles is not a viable solution given that the road carried by the structure provides vital local access to residential properties as well as access to adjacent pastures. The C180 is also a diversion route for the C172 providing access to the Upper Coquet valley. Maintaining the C180 provides redundancy in the road network to maintain the C172.

6.3 Strengthen Existing Superstructure.

This option is viable for particular elements, as strengthening could be achieved by plate bonding applied to the soffit of the existing deck. This would provide additional bending capacity to the longitudinal members; however it would have no effect on the unreinforced transverse spanning slab. This solution also does not address the ongoing issues of differential settlement between the wing walls and abutments. The proposed superstructure is likely to be heavier than the existing, so will exacerbate the differential settlement between the wing walls and the abutments, which are most likely founded in the weak ground noted in the ground investigation report as having an average SPT vaule of 7.

Therefore this option is discounted.

6.4 Replace superstructure only.

This option would result in an adequate superstructure; however the likelihood is that the substructures (both the abutments and wing walls) are founded in the weak ground identified in the ground investigation report as having an average SPT value of 7. So, although the superstructure would be adequate, the heavier superstructure arrangement would exacerbate the issue of differential settlement between the substructures. Even if the new superstructure could be designed to be the same weight as the existing inadequate one, the current arrangement has ongoing differential settlement issues which can't be ignored when designing a strengthening scheme for the bridge. Ground improvement techniques and a full assessment of the substructures could be undertaken to strengthen the founding material and quantify the adequacy of the existing substructures, however this would be a costly exercise in comparison to constructing new substructures.

Therefore this option is discounted.

6.5 Replace superstructure and substructure.

This option would provide a structure of adequate capacity, which would bear onto new substructure rather than onto the inadequate existing substructure. This option successfully addresses all of the areas of inadequacy of the other options. It maintains the C180 as a viable diversion route to give access to the Upper Coquet valley when the C172 is closed. It addresses the inadequacy of the existing substructures, ensuring that settlement is not an issue. It provides a solution that can be designed to Eurocode standards that has no weight restrictions on the bridge with a 120 year design life.

This solution will have semi-integral abutments, which will reduce maintenance requirements for the duration of the design life of the structure. The semi-integral nature will mean there is no maintenance requirement for inspecting or maintaining/replacing bearings or bearing pads and reduce the potential routes for water ingress.

The ground investigation report indicated that the 10m of strata below ground level are poor ground with an average SPT value of 7, thus any new structure would require piled foundations that extend in excess of 10m below ground level to the medium-dense to dense sandy gravel found at 10-20m below ground level.The new substructures being a piled

solution located behind the existing abutments will also eliminate the risk of scour and/or settlement.

This option is deemed the only viable option and the different options are discussed in section 6.5.1 to 6.5.5.

It should be noted that the costings assigned to each of these options (in 6.5.1 to 6.5.5 and table 7.1) were undertaken in 2019, and thus out of date. However, for comparative purposes they are deemed acceptable for the feasibility report. The preferred option has had updated costings undertaken in August 2022, these can be seen in section 7.2.

6.5.1 Install prestressed beams to provide a closed soffit.

This option would involve providing a prestressed beam deck with infill concrete and a thin slab to aid load dispersal. It would provide a superstructure with a construction depth of 600mm which is 40mm thicker than the existing structure, therefore would have minimal impact on the current road alignment or clear waterway.

This option would cost c. £265.19k and have a construction programme of 10 weeks.

6.5.2 Install a prestressed beam structure with transverse spanning slab.

This option would involve providing a prestressed beam structure comprising three longitudinal prestressed beams, with a transverse spanning RC slab. It would provide a superstructure with a construction depth of 700mm which is 140mm thicker than the existing structure, therefore would have some impact on the current road alignment or clear waterway.

This option would cost c. £261.68k and have a construction programme of 10 weeks.

6.5.3 Install a prestressed beam structure with transverse spanning slab.

This option would involve providing a prestressed beam structure comprising four longitudinal prestressed beams, with a transverse spanning RC slab. It would provide a superstructure with a construction depth of 700mm which is 140mm thicker than the existing structure, therefore would have some impact on the current road alignment or clear waterway.

This option would cost c. £264.09k and have a construction programme of 10 weeks.

6.5.4 Install a Composite weathering steel and concrete structure.

This option would be suitable as it would provide an adequate structure comprising of 2No. longitudinal steel beams with an RC transverse spanning slab. It would provide a superstructure with a construction depth of 606mm which is 46mm thicker than the existing structure, therefore would have minimal impact on the current road alignment or clear waterway.

This option would cost c. £274.21k and have a construction programme of 10 weeks.

6.5.5 Install a reinforced concrete portal frame structure.

This option would be suitable as it would provide an adequate structure comprising an RC portal frame. It would provide a superstructure with a construction depth of 500mm which is 60mm thinner than the existing structure, therefore would have minimal impact on the current road alignment or clear waterway.

This option would cost c. £271.18k and have a construction programme of 10 weeks.

All of the costings for the above options (6.5.1 to 6.5.5) were done in 2019 and are kept in this report purely for comparative purposes between options. The revised costings for the preferred option using current rates are detailed in section 7.2.

All options within 6.5 require installation of a new piled substructure behind the existing abutments, as the existing substructure is in a poor condition and is unlikely to be adequate to support a new substantially heavier superstructure.

7. *Conclusions and Recommended Option to be Taken Forward to Detailed Design.*

7.1 Cost Comparison

Below is a summary of the total cost and construction programme durations for the replacement of the superstructure and substructure options:

Option reference	No of spans	Construction	Construction Estimate
6.5.1	1	Install prestressed beams to provide a closed soffit.	**£265.2k**
6.5.2	1	Install a prestressed beam structure with three prestressed beams with transverse spanning slab.	**£261.7k**
6.5.3	1	As option 6.5.2 but with four prestressed beams.	**£264.1k**
6.5.4	1	Install a Composite steel and concrete structure.	**£274.2k**
6.5.5	1	Install a reinforced concrete portal frame structure.	**£271.2k**

Note – Construction Estimate includes PRESITE WORKS, RISK and OPPORTUNITY.

Option 6.5.1 will best achieve the desired objectives. It will provide a new structural deck and substructure able to accommodate highway loading, designed in accordance with current standards, with a 120 year design life.

Option 6.5.1 is preferential to 6.5.2 and 6.5.3 due to the fact that it has lesser construction depth, this means the current waterway can be maintained without having to undertake significant re-profiling of the carriageway (which may not be possible due to adjacent residential property access). Additionally, options 6.5.1 uses the prestressed beams as permanent formwork, whereas 6.5.2 and 6.5.3 would need some formwork installed. This would mean increasing the amount of working at height and increasing the associated risks.

Option 6.5.1 is preferential to 6.5.4 due to the reduced construction cost. Additionally, option 6.5.1 uses the prestressed beams as permanent formwork, whereas option 6.5.4 would need either temporary or permanent formwork installed, thus increasing the amount of working at height and increasing the associated risks.

Option 6.5.1 is preferential to 6.5.5 due to the reduced construction cost.

The Works Cost Estimate and Risk Register Budget for Option 6.5.1 are shown in Appendix C of this Report and summarised below in section 7.2.

7.2 Preferred Option

For option 6.5.1:-

Activity	Estimate
Detailed design	£34,492
Supervision	£5,950
Construction costs	£301,079.41
Total Risk	*£282,690*
Risk forecast	£36,663
Opportunity	£0
TOTAL	**£378,184.41**

The main risks for this option, identified as part of the feasibility study are as follows:

- Overhead BT cable needing protection/diversion.
- Adverse weather.
- Inflation leading to increased material/labour/plant costs
- Damage to existing abutments whilst piling.
- Stability of existing abutments will need to be reviewed at every construction stage.

These risks are likely to change/be added to during the design process. It is anticipated that the high Risk Register costs shall significantly reduce during the design process due to:

- Design/further investigation eliminating existing unknowns;
- Early Contractor Involvement;
- Meetings arranged with external bodies to discuss the scheme.

8. *Outline Programme and Cost Estimate*

i. Close road;
ii. Establish site and erect temporary fencing;
iii. Site clearance;
iv. Erect crash deck;
v. Construct new substructure;
vi. Trim piles and construct pile cap/bearing shelf
vii. Remove existing deck;
viii. Install prestressed beams;
ix. Install formwork;
x. Pour concrete infill and deck;
xi. Install parapet;
xii. Apply waterproofing;
xiii. Backfill abutments;
xiv. Resurface carriageway approaches and over deck;
xv. Reinstate adjacent land where applicable;
xvi. Demobilise from site and open structure.

The construction works are estimated to cost in the order of £301k and have an 11 week construction programme.

APPENDIX A - DRAWING

- Existing General Arrangement
- Proposed General Arrangement (sketch)

APPENDIX B – PROGRAMME

- Design Programme
- Construction Programme

APPENDIX C – WORKS COST ESTIMATE AND RISK REGISTER

- Works Cost Estimate
- Risk Register Budget