REPORT TO: **MORAY COUNCIL ON 27 SEPTEMBER 2023**

SUBJECT: **CLODDACH BRIDGE**

BY: **DEPUTE CHIEF EXECUTIVE (ECONOMY, ENVIRONMENT AND FINANCE)**

1. REASON FOR REPORT

1.1 To inform Council of the findings of the Pre-feasibility Study undertaken on the potential repair of Cloddach Bridge.

1.2 This report is submitted to Council in terms of Section III (F) (15) of the Council's Scheme of Administration relating to management and implementation of the requirements of the Roads (Scotland) Act 1984.

2. REASON FOR URGENCY

2.1 This report is submitted to Committee in terms of the Local Government (Access to Information) Act 1985, on the Chair certifying that, in his/her opinion it requires to be considered on the grounds of urgency in order to give early consideration to progressing a Full Business Case, by 1 February 2024, required to secure grant funding to repair Cloddach Bridge.

3. RECOMMENDATION

3.1 **It is recommended that Council**

(i) notes the findings of the pre-feasibility study; and

(ii) agrees that a full business case for the repair of Cloddach Bridge should not be funded, as this work is contrary to the decision of Economic Development and Infrastructure Services Committee on 7 February 2023 (para 11 of the minute refers) and does not comply with the Council policy on Bridge Maintenance Prioritisation.

4. BACKGROUND

4.1 On 2 May 2023, the Economic Development and Infrastructure Services Committee approved the Council's Policy on Bridge Maintenance Prioritisation, (paragraph 12 of the minute refers). The policy sets out the procedure for prioritising bridge maintenance works, which is based on the condition of each bridge and its network criticality. Network criticality is split into three categories, Vital, Important and Standard. As a significant

percentage of the Council's bridge stock is classed as Standard, this category has been sub-categorised into Standard – high, medium and low. Cloddach Bridge is categorised as Standard – low. The full prioritisation list was distributed to members on 5 September 2023 and is provided in **Appendix A.**

4.2 Cloddach Bridge was built in 1905 with an estimated design-life of between 100 and 120 years, after which it would require significant refurbishment or replacement. This bridge is located on the C2E road and a traffic survey undertaken in 2020 showed the average number of vehicles crossing the bridge each day was less than 800.

4.3 Based on the findings of a Special Inspection undertaken in February 2022, Cloddach Bridge was closed to vehicular traffic in the interest of public safety. The condition of the bridge was confirmed in the findings of a Principal Inspection and Structural Assessment undertaken by an independent structural engineer in March 2022.

4.4 On 7 February the Economic Development and Infrastructure Services Committee (paragraph 11 of the minute refers) agreed to;

(i) keep Cloddach Bridge closed to vehicular traffic but open to pedestrians and cyclists with regular inspections to monitor the condition of the bridge;
(ii) when the bridge condition deteriorates further and it is not safe for any user, this route is closed permanently and the bridge is removed; and
(iii) To note the Chair's commitment, in conjunction with his Group, to pursue alternative funding sources with a view to keeping Cloddach Bridge open.

4.5 On 15 March 2023, the UK Government announced £1,500,000 grant funding for the repair of Cloddach Bridge, which is available subject to a business case and match funding of 50%.

4.6 Officers have been in consultation with officials from the Department for Transport, which has been appointed as the lead agency from UK Government, regarding the terms and conditions of the grant funding. These conditions are listed below.

1. The grant funding available is to provide vehicular access. No weight threshold is specified.
2. This funding is up to a maximum of £1,500,000 and is subject to 50% match funding being provided.
3. A Full Business Case (FBC) must be submitted to secure the grant funding.
4. No funding is available from the UK treasury to develop the business case.
5. The grant will be limited to the amount stated in the business case, i.e. the UK Government will not underwrite any risk that costs associated with the bridge works exceed £3m.

   The grant funding is available for drawdown this financial year (2023/24).

4.7 At a meeting of Moray Council on 28 June 2023 the Council agreed to commission and fund a Pre-feasibility Study to ascertain if investment in a FBC, as required to secure the UK government grant funding to repair the bridge, would be of value (paragraph 8 of the minute refers).

The Pre-Feasibility Options

4.8 The Pre-feasibility Study considered 4 options to reopen the bridge to vehicular traffic. Details of these options are provided below, full details are provided in **Appendix B**. The consultant has estimated the capital cost of each option using average construction costs for the UK and adding Optimism Bias. The costs provided considered the lower range, most likely and upper range costs. These costs have been tested using one of the Council's framework contractors and the upper range cost is considered to be closest to current market prices. However, these costs will need to be further defined as part of the FBC, including quantified risks and should be treated with caution.

4.9 **Option 1 Do Minimum** – this option would maintain the current status of the bridge, which is closed to vehicular traffic but open to pedestrians and cyclists and provides a baseline case for comparison with other options. The bridge would be monitored to assess its condition and suitability for continued use by pedestrians and cyclists. It is likely that after 5 to 10 years the bridge would need to be fully closed and thereafter demolished. The cost of demolition, ongoing monitoring and minor maintenance works is included in the whole life cost for this option. The whole life costs for options that do not involve demolition of the bridge allow for ongoing monitoring and maintenance required throughout the servicalble life of the structure. A long term road closure would be required for this option, with ancillary works such as signage and turning facilities for motor vehicles.

Capital Cost	Whole Life Cost	Total Cost
£83,000	£747,078	£830,078

4.10 **Option 2 Repairs to existing bridge** – this option would fully refurbish the existing bridge, including breakout and replacement of existing elements. There is significant amount of risk associated with this option. The condition of the existing structural elements is not fully known, so the extent to which they can be retained or strengthened is also unknown.

Capital Cost	Whole Life Cost	Total Cost
£3,957,378	£309,208	£4,266,586

4.11 **Option 3 Overbridge** – this option retains the existing structure with a pre-fabricated structure installed over the existing deck. The overbridge can either span the top of the existing abutments to rest on new supports or be installed onto the existing foundations in combination with repair works or modifications to the existing abutments. Overall the maintenance requirements for this type of bridge are higher than would be required for a new integral structure. The level of ongoing maintenance will depend on which of these options is constructed and this has been allowed for in the estimated costs.

Option	Capital Cost	Whole Life Cost	Total Cost
4 a) demolish substructure	£3,677,494	£279,208	£3,956,702
4 b) re-use substructure	£3,337,022	£309,208	£3,646,230

4.12 **Option 4 New Integral Structure** – this option would involve full demolition of the existing structure and construction of a new bridge. This option would require significantly less ongoing maintenance than the other options considered to open the bridge to vehicular traffic. The consultant has considered two factors when costing this option, a minimised width of bridge and an improved width of bridge. The minimised bridge would allow passage of one standard sized vehicle up to 40 tonnes at a time, agricultural vehicle in excess of 3.5m wide would not be able to use this bridge safely. The improved width of bridge would allow two way traffic for standard size vehicles.

Option	Capital Cost	Whole Life Cost	Total Cost
4 a) wider bridge	£3,514,804	£84,850	£3,599.654
45 b) minimum width bridge	£2,868,375	£84,850	£2,953,225

Socio-Economic Benefits and BCR(Benefit Cost Ratio)

4.13 The socio-economic benefits associated with reopening the bridge to vehicular traffic cannot be defined at this time as there is insufficient data to inform this assessment. Should members decide to progress a FBC, the traffic surveys and traffic modelling proposed as part of the FBC development will be sufficient to clearly define these benefits. Specific socio-economic benefits or a BCR are not used within the bridge prioritisation policy, they are however used by government to determine the value of investing in particular schemes.

4.14 While specific socio-economic benefits cannot be calculated at this time, it is clear that, assuming a capital cost in the region of £3million, the value of socio-economic benefits would need to be greater than £50,000 per year to result in a BCR of greater than 1. The indicative number of vehicles and potential for benefit in journey time is highly likely to result in benefits of greater than this number. Therefore, while there would be a positive business case at this level of capital spend (noting the caveats on this above), there are too many unknowns to provide a definitive BCR with confidence at this stage. The decision of Economic Development and Infrastructure Services Committee on 7 February 2023 was for Cloddach Bridge to remain closed to vehicular traffic and if the recommendation in Section 3.1 (ii) of this report is accepted this decision will be adhered to. Should members choose to support the preparation of a FBC, the option then likely to be preferred would be Option 4b, new integral bridge with minimum width.

Costs and Timeline to Develop FBC

4.15 The pre-feasibility study provides an estimate of the costs involved in developing a FBC to repair the bridge and how long this is likely to take. The estimated cost of developing the FBC is £187,000 and it is estimated it will take 26 weeks to complete. Based on this estimate, if the contract is awarded at the start of October 2023, the FBC will be ready for submission to Department for Transport (DfT) on 5 April 2024. To achieve this submission date the contract will need to be awarded directly through one of the Council's frameworks. Although this appears a lengthy process it is necessary to carry out traffic modellilng to accurately assess the benefits of reopening the bridge to vehicular traffic. It is also necessary to undertake intrusive surveys and outline design to reduce risk and assess costs as accurately as possible at this early stage of the project, outline design and intrusive surveys in order to conclude design and accurate costing.

4.16 The DfT will need to review and approve the FBC prior to any draw down of funding. If the FBC does not establish a case to the satisfaction of the DfT in terms of value for money then the case may be referred to a member of the ministerial team to consider whether a Ministerial Directive would be issued on other strategic grounds. The DfT has indicated that to achieve timely approval the FBC would need to be submitted to them by 1 February 2024. This is to enable the DfT to review the FBC, prepare their own papers, submit the case for review by the DfT's investment board, ministers and Treasury officials. The current estimated date for completion of the FBC is 5 April 2024 and while it may be possible to reduce this, it is unlikely that it could be reduced by the 5 weeks required to meet the DfT deadline. Council may wish to be mindful of this risk, noting that schemes of this scale ordinarily take 12 months or more to develop to the stage of an approved business case, whereas this project would have had less than 11 months from the Chancellor's budget announcement on 15 March 2023.

4.17 At this point the advice received from the DfT is that Treasury remains firm that any release of funding must be this financial year.

4.18 The business case would follow the five case model set out in the Green Book, which includes the Financial Case. The Financial Case must set out how the bridge repair will be funded. As such, the source of the 50% match funding currently estimated at £1.45m required to construct the bridge will need to be identified before submission of the FBC. It should be noted that council officers are already looking to reduce the council's capital commitments going forward as they are unaffordable.

4.19 **Match Funding**

A meeting was held with Heldon Community Council on 2 August 2023, to discuss progress and funding required to repair Cloddach Bridge. Heldon Community Council has advised it intends to submit an application for funding to the Fred. Olsen Renewables Rothes 1- fund. The closing date for applications is 3 October and the application will be considered on 17 October. The level of funding, if any, that would be made available from this source will not be known until after 17 October, although it should be noted that the Community Council has already indicated that any funding is likely to be partial rather than full match funding.. The Community Council also intends to petition Scottish Government to explore potential funding streams from this source.

Summary

4.20 In summary, should there be a decision to proceed further, the process would be as follows:

a. preparation of FBC – including identification of match funding
b. submission of FBC to DfT for approval by 1 February 2024, if possible. DfT has advised that HMT position is that the funding must be released in 2023/24.
c. If FBC demonstrates a positive BCR, approval of FBC for funding drawdown is within the remit of the DfT
d. If FBC does not demonstrate a positive BCR the case may be referred for a ministerial direction to approve funding
e. drawdown of funding on agreed terms with DfT in line with delivery of project

4.21 Notwithstanding the information set out above in this report, and the concern of local residents, it remains the case that there is already a standing Council decision to close Cloddach Bridge to vehicular traffic. The council has also approved the prioritisation policy that determines the order in which these bridges are brought forward for funding and Cloddach bridge is classified as standard – low, meaning that notwithstanding other financial pressures on the council there are a significant number of other bridges in Moray that have a higher funding priority for the council. These bridges are brought forward in a managed way each year for inclusion in the capital budget to enable an affordable and deliverable programme of works to maintain network bridges across Moray.

5. SUMMARY OF IMPLICATIONS

(a) Corporate Plan and 10 Year Plan (Local Outcomes Improvement Plan (LOIP))

"Building a better future for our children and young people in Moray"

(b) Policy and Legal

In policy terms Cloddach Bridge is classed as Standard: Low in terms of its priority level. In terms of the Short to Mdeium term Financial Strategy also on the agenda for this meeting (item 8), reducing the Capital Plan is a key contributor to achieving a balanced budget by the end of 2025/26.

(c) Financial implications

There is no committed budget to fund a FBC or undertake works on Cloddach Bridge. It is noted that Council on 28 June 2023 (para 10 of the minute refers) carried forward £1.5m capital from the 22/23 capital budget into 23/24 provisionally in relation to Cloddach Bridge, but agreeing that any firm commitment would be subject to further decision making. As set out in para 4.20 and 4.21 above and in the risk implications below, given the other calls on council funding and the requirement to make significant financial savings for 2024/25 and 2025/26 there are clear financial impacts in committing funding to this project.

When the Council approved the budget for 2022/23 on 22 February 2022 (paragraph 3 of the Minute refers) it balanced only by using reserves and one-off financial flexibilities. The indicative 3 year budget showed a likely requirement to continue to make savings in the order of £20 million in the next two years. All financial decisions must be made in this context and only essential additional expenditure should be agreed in the course of the year. In making this determination the committee should consider whether the financial risk to the Council of incurring additional expenditure outweighs the risk to the Council of not incurring that expenditure, as set out in the risk section.

(d) Risk Implications

The pre-feasibility study has indicated that there would be a positive BCR to fund the repair works required to re-open Cloddach Bridge to vehicular traffic. However, this cannot be confirmed until further traffic survey and modelling work has been undertaken to define the benfits reopening the bridge would provide. Officials from the Department of Transport have indicated that the grant funding could be made available through a Ministerial Directive if there is no positive benefit cost ratio (based on socio-economic benefits). However, this is not guaranteed and the funding required to deliver the business case could be abortive spend.

There is a risk that should it make funding available to support this project notwithstanding the earlier decision in February this year, the Council is seen as departing from its established Bridge Maintenance Prioritisation Policy. While it could be suggested that the offer of government funding makes this project exceptional, any funding contributed by the Council would still be applied to a bridge which would not otherwise be accorded priority status, and given the current projected funding gap of £15m for 2024/25, this may ultimately be to the potential detriment of other bridges and communities across Moray, particularly in the context of a reducing Capital Plan.

As set out in para 3.16, should there be a decision to proceed with developing the FBC there are risks in achieving a timely submission of the FBC in order to achieve drawdown of funding, which could lead to abortive expenditure.

(e) Staffing Implications

There are no staff resources available within the Consultancy Section to undertake the work required to deliver the business case. As such this work will need to be outsourced at a cost of approximately £187,000 Some staff time would be required to manage the contract for the business case and this is likely to impact on the Consultancy Team's delivery of its revenue programme for 2023/24.

(f) Property

Cloddach Bridge currently vests with Moray Council in its role as Road Authority. If the bridge is closed and the road is Stopped Up, the land on which is has been constructed must be reinstated and returned to the landowner.

(g) Equalities/Socio Economic Impact

If the bridge remains closed to vehicular traffic, a maximum diversion of 6 miles may affect some car users.

(h) Climate Change and Biodiversity Impacts

Where possible we would seek to recycle and / or reuse the waste material generated through demolition of the existing bridge.

(i) Consultations

Depute Chief Executive (Economy Environment and Finance), Head of Environmental and Commercial Services, Chief Financial Officer, Legal Services Manager, Equal Opportunities Officer and the Democratic Services Manager have been consulted and their comments incorporated into the report.

6. CONCLUSION

6.1 A decision not to progress works on Cloddach Bridge was made by Economic Development and Infrastructure Services Committee on 7 February 2023.

6.2 To receive grant funding from DfT to repair Cloddach Bridge the Council must submit a FBC, which should demonstrate value for money and must identify how the match funding of £1,434,187 will be sourced.

6.3 It is likely that a positive BCR can be achieved over the serviceable life of the new bridge but this cannot be confirmed until traffic survey and modelling work is undertaken during development of the FBC.

6.4 A commitment to progress with development of a FBC given the Council's stated policy positions, uncertain match funding and extremely challenging timescales is not recommended given the risks which this would present for the Council.

Author of Report: Debbie Halliday Consultancy Manager

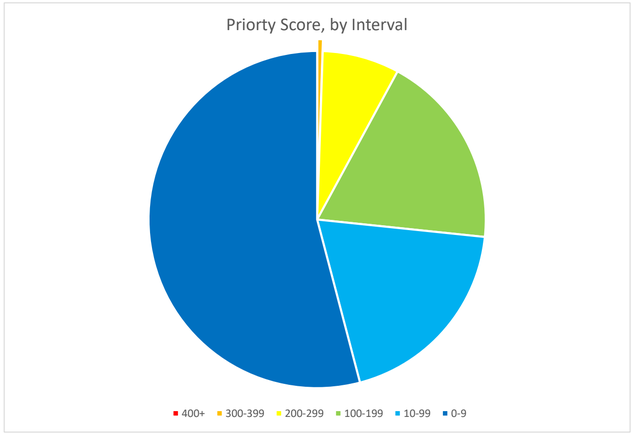
Background Papers:

Ref: SPMAN-524642768-970

Moray Council Bridges Prioritisation

Year: Q1 2023

This sheet draws data by reference to other sheets. Do not edit the contents of this sheet.

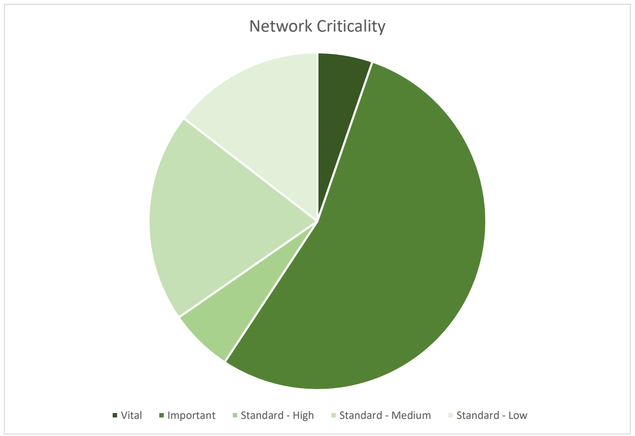


Priority Scoring Matrix						
Bridge Alert Status		Black	Red	Amber	Yellow	Green
Network Criticality		7	5	4	2	0
Vital	7	490	350	280	140	7
Important	5	350	250	200	100	5
Standard - High	3	210	150	120	60	3
Standard - Medium	2	140	100	80	40	2
Standard - Low	1	70	50	40	20	1

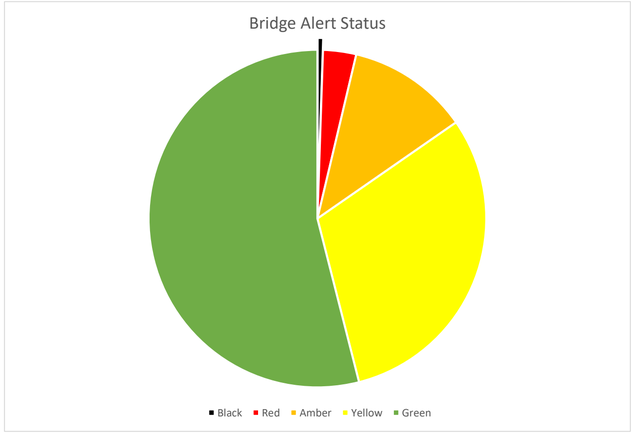
Priority Frequency							
Bridge Alert Status		Black	Red	Amber	Yellow	Green	Total
Network Criticality		7	5	4	2	0	
Vital	7	0	1	2	6	11	20
Important	5	1	4	22	54	123	204
Standard - High	3	0	1	6	9	7	23
Standard - Medium	2	1	3	7	28	37	76
Standard - Low	1	0	3	7	19	27	56
Total		2	12	44	116	205	379

Priority Score Frequency		
Priority Score Interval	Freq.	
400+	0	0%
300-399	2	1%
200-299	28	7%
100-199	71	19%
10-99	73	19%
0-9	205	54%
Total	379	100%

Priority Scoring Matrix						
Bridge Alert Status		Black	Red	Amber	Yellow	Green
Network Criticality		7	5	4	2	0
Vital	7	Vital / Black	Vital / Red	Vital / Amber	Vital / Yellow	Vital / Green
Important	5	Important / Black	Important / Red	Important / Amber	Important / Yellow	Important / Green
Standard - High	3	Standard - High / Black	Standard - High / Red	Standard - High / Amber	Standard - High / Yellow	Standard - High / Green
Standard - Medium	2	Standard - Medium / Black	Standard - Medium / Red	Standard - Medium / Amber	Standard - Medium / Yellow	Standard - Medium / Green
Standard - Low	1	Standard - Low / Black	Standard - Low / Red	Standard - Low / Amber	Standard - Low / Yellow	Standard - Low / Green



Network Criticality (NC)		
Number of bridges appraised	**378**	**100%**
Of which...		
Vital	20	5%
Important	204	54%
Standard	154	41%
Of which...		
Standard - High	23	6%
Standard - Medium	76	20%
Standard - Low	55	15%



Bridge Alert Status		
Number of bridges appraised	**378**	**100%**
Of which...		
Black	2	1%
Red	12	3%
Amber	44	12%
Yellow	116	31%
Green	204	54%

Moray Council Bridges Prioritisation

Year: Q1 2023

Notes:
1. Bridges are sorted in order of priority score, highest priority at the top.
2. If changes are made to the input data the priorities may change and it will be necessary to re-sort.
3. To be read in conjunction with the Prioritisation Procedure Report (Moray Council, August 2023).
4. All data on this worksheet is drawn by reference from other sheets and should not be edited in this sheet. The sheet is password protected and only data filtering is permitted.

Bridge Code	Bridge Name	Bridge Alert Status, BAS	Network Criticality, NC	Priority Score	Priority Rank (1 = high)	Notes / Comments / Observations
U129E/20	BLACKHILLS CULVERT	Black	Important	350	1	... ...
U170E/20	KIRKHILL DRIVE LHANBRYDE	Red	Vital	350	1	Refurbishment works planned in 2023. ... No known assessment. ...
A941/320	ASHGROVE CULVERT	Amber	Vital	280	3	... Deemed 40T in source spreadsheet but not recorded on WDM so not taken into account for prioritisation. Some indications of structural distress in 2015 PI report. ...
A941/340	NEW BISHOPMILL	Amber	Vital	280	3	... ...
B9012/30	UNTHANK CULVERT	Red	Important	250	5	... BCIcrit score given as -999, denotes erroneous input. Condition information not reliable, provisionally high alert score. Inspection recommended to improve reliability of priority score.
B9015/30	SOURDEN	Red	Important	250	5	... No known assessment. Steep, sustained fall in BCIcrit score since 2016. Structural review recommended. ...
B9102/50	UPPER KNOCKANDO	Red	Important	250	5	... ...
B9103/20	ARTHUR'S BRIDGE	Red	Important	250	5	... Monitoring recommended in 2020 Fairhurst Assessment Report ...
A920/190	KEITHMORE	Amber	Important	200	9	... ...
A941/70	KING'S FORD	Amber	Important	200	9	... No known assessment. Large single-span concrete arch with masonry-clad concrete spandrels, enveloping earlier masonry arch. ...
B9008/10	AUCHRIACHAN	Amber	Important	200	9	... ...
B9008/60	NEVIE CULVERT	Amber	Important	200	9	... ...
B9016/50	ENZIE	Amber	Important	200	9	... ...
B9022/20/JAC	BRIDGE OF ISLA	Amber	Important	200	9	... Joint bridge with Aberdeenshire Council. Moray is the maintainer. Concrete bridge built c.1930. Repair scheme undertaken winter 2009/10. ...
B9102/10	PITCHROY	Amber	Important	200	9	... ...
B9102/60	POOLFLASGAN	Amber	Important	200	9	... 2012 assessment by Jacobs concluded bridge capacity of 3 tonnes GVW, limited by shear in the carriageway and footway beams. ...
B9115/40	EAST OF FORKINS	Amber	Important	200	9	... No known assessment. ...
B9116/20	RIVER ISLA BRIDGE	Amber	Important	200	9	... ...
B9117/50	BRIDGE OF MILLEGIN	Amber	Important	200	9	... ...
C12E/10	DOUAL BRIDGE	Amber	Important	200	9	... ...
C15E/10	CARRON BRIDGE	Amber	Important	200	9	... ...
C37E/10	ORCHARD ROAD BRIDGE	Amber	Important	200	9	... No known assessment. ...
U142½/10	WILLOWBANK	Amber	Important	200	9	... Although the BCIcrit is currently very low it is considered, on review, that the condition of the bridge is not very poor. ...
U142½/20	CULACH BURN	Amber	Important	200	9	... ...
U171E/40	ASHGROVE BRIDGE	Amber	Important	200	9	... No known assessment. ...
U57H/10	MacDOWALL	Amber	Important	200	9	This bridge has had work since the last PI so the BCICRIT score should increase to 40 once the 2023 PI report is complete and signed off. ... BCIcrit expected to improve following completi
U57H/11	SOUTH ARNDILLY	Amber	Important	200	9	... ...
U60E/10	Asleisk	Amber	Important	200	9	... ...
U68E/10	EARNHILL	Amber	Important	200	9	... ...
B9115/70/JAC	BLAIRMOON	Amber	Important	200	9	Is in joint ownership with MC and Aberdeenshire Council - AC are the lead maintenance authority and approve/disapprove abnormal load movements. Propose remove from list. ... Joint b
U138H/10	BRIDGE OF CANTLY	Red	Standard - High	150	31	Structural review recommended. Assessment likely due. ... Structural assessment in progress. ...
A941/210	NEW CRAIGELLACHIE	Yellow	Vital	140	32	... ...
C20H/15	CLASHNOIR C20H-15	Yellow	Vital	140	32	... No known assessment. ...
C60H/10	DRUMIN BRIDGE	Black	Standard - Medium	140	32	... ...
U168E/10	KINLOSS CULVERT	Yellow	Vital	140	32	... ...
U170E/10	KIRKLAND HILL CULVERT	Yellow	Vital	140	32	... ...
U171E/50	MOYCROFT	Yellow	Vital	140	32	... No known assessment. ...
U173E/20	SANQUHAR BRIDGE	Yellow	Vital	140	32	... Assessed in 2008 by Halcrow, self-weight capacity only. 3T weight restriction imposed. Recommend structural review and monitoring as minimum. ...
U115H/10	TOMBAE	Amber	Standard - High	120	39	... ...
U117H/10	BRIDGE OF SLATEFORD	Amber	Standard - High	120	39	... ...
U128H/20	AILNACK	Amber	Standard - High	120	39	... ...
U26H/10	ROEHILL	Amber	Standard - High	120	39	... ...
U57H/30	KILLIEMORE	Amber	Standard - High	120	39	... ...
U93H/10	BALVENIE GARDENS RAILWAY	Amber	Standard - High	120	39	... ...
A939/220	WESTER FODDERLETTER	Yellow	Important	100	45	... No known assessment. Armco-type culvert, masonry headwalls. ...
A920/180	FIDDICH (AUCHINDOUN)	Yellow	Important	100	45	... WDM records BD21 assessment by Jacobs, 2012. ...
A939/170	BRIDGE OF LEACHD	Yellow	Important	100	45	... ...
A939/210	NEW BRIDGE OF AVON	Yellow	Important	100	45	... ...
A941/110	ARDLUIE	Yellow	Important	100	45	... ...
A941/190	BURNSIDE	Yellow	Important	100	45	... ...
A941/80	BAZAAR MEMORIAL	Yellow	Important	100	45	... ...
A941/90	BLACK WATER BRIDGE	Yellow	Important	100	45	... ...
A95/70	BRIDGE OF CLERKSEAT	Yellow	Important	100	45	... ...
A95/90	MONTGREW 1	Yellow	Important	100	45	... ...

Worksheet purpose: Input basic data and calculate BA1, NC, and priority score. The sheet is password protected to avoid accidental changes.

STAGE 0.5 PRIORITY DETERMINATION

STAGE 0.8 BRIDGE ALERT STATUS DETERMINATION

N.B. See foot of table for explanatory notes.

STAGE 1.0 NETWORK CRITICALITY DETERMINATION

NC 1 - Vital / Important / Standard

NC 2 - Standard High/Medium/Low

INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	INPUT	FORMULA	FORMULA	FORMULA	INPUT
Bridge Code	Bridge Name	Average bridge Condition Indicator, BCI_{Av}	Critical bridge Condition Indicator, BCI_{Cr}	Rating	Numbrig	HB result	NA result	Drilling priority (1 to 3)	Critical Link?	Bridge Alert Status, BA1	Network Criticality, NC	Priority Score	Priority Rank (1 = high)
A926/170	BOGHEAD	98	100	130337	159882	0	407 D/W	1	Yes	Green	Important	1	100
A926/180	FYDOCH (AUCHINDOUN)	89	91	105191	93981	30	48	1	Yes	Yellow	Important	100	45
A926/190	FYDOCH (AUCHINDOUN)	89	91	105191	93981	30	407 D/W	1	Yes	Yellow	Important	100	45
A939/170	BRIDGE OF LOCHD	91	98	92250	114851	0	407 D/W	1	Yes	Green	Important	1	100
A939/180	BLAIRNAMARROW	88	100	111144	151417	0	407 D/W	1	Yes	Green	Important	1	100
A939/190	BLAIRNAMARROW	88	100	111144	151417	0	407 D/W	1	Yes	Green	Important	1	100
A939/200	GLENMALLOCH CULVERT	100	100	100000	116700	0	407 D/W	1	Yes	Green	Important	1	100
A939/210	NEW BRIDGE OF AVEN	57	98	91905	81991	45	407 D/W	1	Yes	Green	Important	100	45
A939/220	NEW BRIDGE OF AVEN	57	98	91905	81991	45	48	1	Yes	Yellow	Important	100	45
A939/230	TOM-AT-DA CULVERT	98	100	91353	116900	0	407 D/W	1	Yes	Green	Important	1	100
A939/240/NE	BRIDGE OF BROWN	89	91	111988	120700	0	407 D/W	1	Yes	Green	Important	1	100
A939/SLE	SLEMMINGTON	100	100	100000	116700	0	407 D/W	1	Yes	Green	Important	1	100
A940/10	GLENFENZIE	83	91	97998	114351	0	407 D/W	1	Yes	Green	Important	1	100
A940/20	ILLOMOND	83	91	97998	114351	0	407 D/W	1	Yes	Green	Important	100	45
A940/30	WOODSIDE CULVERT	98	100	89417.5	104389.5	0	407 D/W	1	Yes	Green	Important	1	100
A940/40	KNOCKACH	89	91	111988	120700	0	407 D/W	1	Yes	Green	Important	1	100
A940/50	KNOCKACH	89	100	111988	131100	0	407 D/W	1	Yes	Green	Important	1	100
A941/110	ARDLUE	98	100	97787.5	101866.5	0	407 D/W	1	Yes	Green	Important	1	100
A941/130	BALLOCHFORD CULVERT	86	85	115995	153670	0	407 D/W	1	Yes	Green	Important	1	100
A941/140	BALLOCHFORD	86	85	115995	153670	0	407 D/W	1	Yes	Green	Important	1	100
A941/150	BROOMHOUSE	91	100	92250	114851	0	407 D/W	1	Yes	Green	Important	1	100
A941/180	BURNSIDE	89	85	103513	109501.5	30	407 D/W	1	Yes	Green	Important	1	100
A941/190	BURNSIDE OF CRAIGNE	89	85	103513	109501.5	30	407 D/W	1	Yes	Green	Important	1	100
A941/200	MALTRAIN BRIDGE	89	91	111988	140918	0	407 D/W	1	Yes	Green	Important	1	100
A941/230	BURNSIDE	83	91	111988	142362	45	407 D/W	1	Yes	Green	Important	100	45
A941/240	BURNSIDE PIPE	83	91	111988	142362	45	407 D/W	1	Yes	Green	Important	100	45
A941/250	NEW CRAGGALLOCHIE	57	100	89402.5	90171.5	30	407	1	Yes	Green	Important	1	100
A941/255	SOUTH CULVERT BLACK BURN	57	100	87986.5	88827.5	30	407	1	Yes	Green	Important	1	100
A941/260	SOUTH CULVERT BLACK BURN	57	100	87986.5	88827.5	30	407	1	Yes	Green	Important	1	100
A941/270	NETHER BLAIRN	57	100	89402.5	90171.5	30	407	1	Yes	Green	Important	1	100
A941/340	BACK BURN BRIDGE	91	100	107755	84961.5	0	407 D/W	1	Yes	Green	Important	1	100
A941/360	CUCHAN STRPR	89	100	103295	111400	0	407	1	Yes	Green	Important	1	100
A941/370	CUCHAN STRPR	89	100	103295	111400	0	407	1	Yes	Green	Important	1	100
A941/380	NETHER GLEN HOTEL	98	100	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/390	NETHERGLEN	98	100	107405	115678	0	407 D/W	1	Yes	Green	Important	1	100
A941/400	LONGHORN BRIDGE	98	100	111987	95850	0	407 D/W	1	Yes	Green	Important	1	100
A941/410	LONGHORN BRIDGE	98	100	111987	95850	0	407 D/W	1	Yes	Green	Important	1	100
A941/420	CAIRNHILL CULVERT	91	100	92250	114851	0	407 D/W	1	Yes	Green	Important	1	100
A941/430	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/440	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/450	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/460	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/470	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/480	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/490	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/500	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/510	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/520	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/530	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/540	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/550	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/560	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/570	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/580	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/590	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/600	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/610	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/620	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/630	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/640	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/650	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/660	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/670	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/680	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/690	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/700	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/710	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/720	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/730	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/740	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/750	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/760	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/770	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/780	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/790	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/800	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/810	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/820	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/830	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/840	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/850	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/860	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/870	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/880	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/890	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/900	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/910	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/920	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/930	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/940	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/950	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/960	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/970	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/980	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/990	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1000	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1010	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1020	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1030	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1040	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1050	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1060	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1070	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1080	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1090	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1100	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1110	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1120	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1130	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1140	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1150	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1160	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1170	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1180	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1190	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1200	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1210	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1220	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1230	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1240	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1250	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1260	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1270	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1280	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1290	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1300	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1310	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1320	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1330	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1340	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1350	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1360	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1370	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1380	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1390	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1400	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1410	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1420	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1430	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1440	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1450	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1460	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1470	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1480	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1490	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1500	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1510	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1520	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1530	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1540	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1550	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1560	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1570	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1580	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1590	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1600	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1610	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1620	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1630	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1640	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1650	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1660	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1670	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1680	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1690	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1700	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1710	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1720	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1730	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1740	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1750	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1760	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1770	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1780	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1790	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1800	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1810	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1820	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1830	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1840	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1850	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1860	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1870	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1880	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1890	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1900	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1910	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1920	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1930	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1940	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1950	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1960	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1970	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1980	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/1990	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2000	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2010	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2020	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2030	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2040	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2050	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2060	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2070	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2080	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2090	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2100	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2110	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2120	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2130	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2140	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2150	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2160	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2170	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2180	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2190	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2200	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2210	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2220	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2230	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2240	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2250	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2260	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2270	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2280	NEW BYWAY	71	91	107405	95250	45	407 D/W	1	Yes	Green	Important	1	100
A941/2290	NEW BYWAY	71	91	107405	95250

U170E/10	KIRKLAND HILL CULVERT	94	81	326981	861527	-	-	3	No	Yellow	Vital	140	32	
U170E/20	KIRKHILL DRIVE LHANBRYDE	75	28	326959.9	861354.6	-	18T GVW	3	No	Red	Vital	350	1	Refurbishment works planned in 2023.
U171E/40	ASHGROVE BRIDGE	74	50	322679	862457	-	-	1	No	Amber	Important	200	9	
U171E/50	MOYCROFT	84	100	323005.1	862669.7	-	-	3	No	Yellow	Vital	140	32	
U171E/60	BOW BRIDGE, ELGIN	81	74	320338	863251	12	40T GVW	3	No	Yellow	Standard - Low	20	156	
U172E/10	LOSSIEMOUTH CANAL	92	100	323696	870426	30	40T GVW	3	No	Green	Vital	7	175	
U172E/20	LOSSIEMOUTH SEATOWN	67	65	323816.5	870221.8	-	-	3	No	Green	Standard - High	3	309	
U173E/10	LEE BRIDGE	59	28	303424	859077	0	0 Tonnes	4	No	Red	Standard - Low	50	118	
U173E/20	SANQUHAR BRIDGE	90	100	303967	858053	0	40T GVW	2	No	Yellow	Vital	140	32	
U18E/10	BOW BRIDGE, GARMOUTH	89	100	334003	863241	0	40 GVW	3	No	Green	Standard - Medium	2	316	
U18E/20	CHURCH RAILWAY, GARMOUTH	93	100	334087	864187	30	40T GVW	3	No	Green	Standard - Medium	2	316	
U19E/20	WESTERTON	86	100	332321	856933	0	40T GVW	3	No	Green	Standard - Medium	2	316	
U19H/10	GRANGE JUNCTION	98	99	350532	850296	30	40T AW	3	No	Green	Standard - Low	1	353	
U23H/10	BURNEND CULVERT	83	100	348963	855850	0	40T GVW	3	No	Green	Standard - Low	1	353	
U26H/10	ROEHILL	71	39	345920	854863	-	-	3	No	Amber	Standard - High	120	39	
U27E/10	LONGHILL BURN	92	100	326991	862450	0	40T GVW	3	No	Green	Standard - Medium	2	316	
U30E/10	WOODPARK	86	81	327141	862091	0	40T GVW	3	No	Green	Standard - Medium	2	316	
U31E/10	CAPRIESHILL	64	28	326705	864409	0	40T GVW	2	No	Amber	Standard - Medium	80	102	
U33H/10	COLDHOME	75	78	342017.4	848859.3	-	-	3	No	Yellow	Standard - Low	20	156	
U34H/10	TARNASH BRIDGE	80	78	344374	848963	17	10T AW	3	No	Yellow	Standard - High	60	109	
U35H/10	DRUM BRIDGE	75	100	345578	851236	0	26T AW	3	No	Yellow	Standard - High	60	109	
U37H/10	ALLANBUIE CULVERT	76	65	341070	850804	0	-	3	No	Yellow	Standard - Medium	40	121	
U43BH/10	BACKMUIR	87.732	100	-	-	0	40T AW	3	No	Green	Standard - Low	1	353	
U44H/10	BRIDGE OF DUNNYDUFF - Temporary Bridge	100	98	344148.5	849627	0	40T GVW	3	No	Green	Important	5	186	This is a collapsed culvert overspanned by a Mabey Quickbridge. BCS score and capacity relate to the temporary span.
U47E/10	LOANHEAD CULVERT	88	100	317528	865437	0	N/A	3	No	Yellow	Standard - Low	20	156	
U57AL/10	DESKFORD BRIDGE	85	100	351065	861722	-	-	2	No	Yellow	Standard - Low	20	156	
U57H/10	MacDOWALL	71	28	329626	845787	30	40T GVW	3	No	Amber	Important	200	9	This bridge has had work since the last PI so the BCI_{CRIT} score should increase to 40 once the 2023 PI report is complete and signed off.
U57H/11	SOUTH ARNDILLY	66	55	329500	846700	-	-	3	No	Amber	Important	200	9	
U57H/20	BRIDGE OF ARNDILLY	73	74	329214.9	847207.5	0	40T GVW	3	No	Green	Important	5	186	
U57H/30	KILLIEMORE	78	9	329113.8	848598.3	45	40T GVW	3	No	Amber	Standard - High	120	39	
U57H/40	SANDYHILL BRIDGE	81	78	329175.8	849297.3	0	40T GVW	3	No	Green	Standard - High	3	309	
U58AL/10	BLOOMFIELD	78	81	348297.5	860952.8	-	-	3	No	Yellow	Standard - Low	20	156	
U59H/10	MULBEN	90	100	335240.6	851202.7	-	-	3	No	Yellow	Standard - Medium	40	121	
U59H/20	MALCOLMBURN	84	100	336252.7	851984.6	-	-	3	No	Yellow	Standard - Low	20	156	
U59L/10	BROXY BRIDGE	86	55	349931	863256	-	-	3	No	Amber	Standard - Low	40	121	
U60E/10	Asleisk	69	55	311044.5	860048.7	-	-	3	No	Amber	Important	200	9	
U61L/10	BUCKIE BURN	81	51	343560.2	862543.1	-	-	2	No	Amber	Standard - Medium	80	102	
U62E/10	MILL OF GRANGE	89	100	304105	860564	30	40T GVW	3	No	Green	Standard - Low	1	353	
U63H/20	BRIDGE OF LACKDHU	88	100	334380	851741	0	40T GVW	3	No	Green	Standard - Medium	2	316	
U63H/30	ALLT TERSIE	96	100	334368.7	851981.1	-	-	3	No	Yellow	Standard - Medium	40	121	
U63L/20	AUCHENTAE	84	78	341040	864124	0	40T AW	3	No	Green	Standard - Low	1	353	
U63L/30	DRYBRIDGE CULVERT	100	100	343460.8	862565.6	0	40T GVW	3	No	Green	Standard - Medium	2	316	
U66AL/10	PORTESSIE CULVERT	100	100	344025.6	866196	-	-	2	No	Yellow	Standard - Medium	40	121	
U68AH/20	HOWDOUP	76	52	340654	846864	0	7.5T AW	3	No	Amber	Standard - Medium	80	102	
U68AH/30	DRUMGRAIN	79	78	341105	846345	-	-	3	No	Yellow	Standard - Medium	40	121	
U68E/10	EARNHILL	87	58	301429	861002	-	-	3	No	Amber	Important	200	9	
U72L/10	ALLALOTH	83	100	340032	859558	0	40T GVW	3	No	Green	Standard - High	3	309	
U76E/10	BARLEYMILL	89	81	298711.5	857515.2	9	17T GVW	2	No	Yellow	Standard - Low	20	156	
U82H/10	Aldunie	100	100	336979.2	826899.7	-	-	3	No	Yellow	Standard - High	60	109	
U83H/10	MILLTOWN	81	100	338127	826896	12	40T GVW	3	No	Green	Standard - Medium	2	316	
U83H/20	WHITEHILLOCH (CABRACH)	66	22	338566.6	826746.6	0	13T GVW	3	No	Red	Standard - Medium	100	45	Changed to 13T GVW due to findings of 2022 PI and subsequent assessment by Kim MacGowan.
U85H/10	NEWTON	90	81	338741.9	831527.6	0	40T AW	3	No	Green	Standard - High	3	309	
U88E/20	BANTRACH BRIDGE	95.95	100	302687	846119	0	40	3	No	Green	Standard - High	3	309	Changed BCIs due to 2020-21 refurbishment contract. Strengthened 2004.
U88E/30	BRIDGE OF NEWTON	77	74	302897	845484	-	-	3	No	Yellow	Standard - High	60	109	
U89E/10	CLASHDHU	65	55	302943	852542	38	40T GVW	2	No	Yellow	Standard - Low	20	156	
U89E/40	PHORP	84	55	304749	851009	0	40T GVW	3	No	Yellow	Standard - High	60	109	
U8E/10	NETHER DALLACHY RAIL	77	58	336074	864161	30	40T GVW	3	No	Yellow	Standard - Medium	40	121	
U8E/15	MILL OF TYNET CULVERT	70	9	338343	861452	-	-	2	No	Red	Standard - Medium	100	45	
U8E/20	CHAPELFORD	85	78	339128	860377	0	40T GVW	3	No	Green	Standard - Low	1	353	
U93H/10	BALVENIE GARDENS RAILWAY	73	39	332001	842406	0	N/A	3	No	Amber	Standard - High	120	39	
U95E/10	SCOTSBURN	75	55	307822	859803	0	40T GVW	3	No	Yellow	Standard - Low	20	156	
U95H/10	MILLTOWN OF LAGGAN	91	78	328676	834548	0	40T GVW	3	No	Green	Standard - Low	1	353	
U97H/10	TOMLIATH	100	100	328399.2	833883.2	-	-	3	No	Yellow	Important	100	45	
U99H/10	DULLAN BRIDGE	97	100	330437.5	836809.7	45	40T AW	3	No	Green	Standard - Medium	2	316	
U99H/20	GIANT'S CHAIR	86	100	331897.6	838263.5	0	40T GVW	3	No	Green	Standard - Low	1	353	
	SPARE													
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	SPARE													
	SPARE													

Exceptions/Anomalies/Adjustments

U171E/70	BRAELOSSIE	66	40	320138	862882	0	40T GVW	3	No	Yellow	Standard - Low	20	156	Structure has been closed to vehicular traffic.
U171E/80/RFB	OLD BREWERY BRIDGE	-	100	322269	863104	-		3	No	Green	Standard - Low	1	353	Structure has been closed to vehicular traffic. Now NN151.
C2E/20	CLODDACH	55.433	22.12	320172	858398	0	7.5T GVW	2	No	Red	Standard - Low	50	118	Structure has been closed to vehicular traffic.
C18E/10	STONEWELLS	-	28.08	-	-	-	-	-	No	Red	Standard - Low	50	118	Access bridge to rear of former RAF Miltown - listed as Privately owned in WDM.
B9115/70/JAC	BLAIRMOON	-999	-999	-	-	0	40T GVW	1	No	Amber	Important	200	9	Is in joint ownership with MC and Aberdeenshire Council - AC are the lead maintenance authority and approve/disapprove abnormal load movements. Propose remove from lis
C6E/10	KINLOSS BURN BRIDGE	84	55	306810	861575	30	40T GVW	1	No	Yellow	Important	100	45	Missing from original list - added manually.
	SPARE													
	SPARE													
	SPARE													
	SPARE													
	SPARE													

U170E/10	KIRKLAND HILL CULVERT	Unknown	-	-	No	81	Good	No	3		Low	No	No	Yellow	
U170E/20	KIRKHILL DRIVE LHANBRYDE	Unknown	-	18T GVW	No	28	Very Poor	No	3		Low	No	No	Red	No known assessment.
U171E/40	ASHGROVE BRIDGE	Unknown	-	-	No	50	Poor	No	1		High	No	No	Amber	No known assessment.
U171E/50	MOYCROFT	Unknown	-	-	No	100	Very Good	No	3		Low	No	No	Yellow	No known assessment.
U171E/60	BOW BRIDGE, ELGIN	Unknown	-	-	No	74	Fair	No	3		Low	No	No	Yellow	
U172E/10	LOSSIEMOUTH CANAL	Unknown	17	40T	Yes	100	Very Good	No	3		Low	No	No	Green	
U172E/20	LOSSIEMOUTH SEATOWN	Unknown	30	40T GVW	Yes	65	Fair	Yes	3		High	No	No	Green	
U173E/10	LEE BRIDGE	Unknown	-	-	No	28	Very Poor	Yes	4		High	No	No	Red	No known assessment. Armco-type culvert.
U173E/20	SANQUHAR BRIDGE	Unknown	0	0	No	100	Very Good	No	2		High	No	No	Yellow	Assessed in 2008 by Halcrow, self-weight capacity only. 3T weight restriction imposed. Recommend structural review and monitoring as minimum.
U18E/10	BOW BRIDGE, GARMOUTH	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U18E/20	CHURCH RAILWAY, GARMOUTH	Unknown	30	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U19E/20	WESTERTON	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U19H/10	GRANGE JUNCTION	Unknown	30	40T AW	Yes	99	Very Good	No	3		Low	No	No	Green	
U23H/10	BURNEND CULVERT	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U26H/10	ROEHILL	Unknown	-	-	No	39	Poor	No	3		Low	No	No	Amber	
U27E/10	LONGHILL BURN	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U30E/10	WOODPARK	Unknown	0	40T GVW	Yes	81	Good	No	3		Low	No	No	Green	
U31E/10	CAPRIESHILL	Unknown	0	40T GVW	Yes	28	Very Poor	No	2		High	No	No	Amber	
U33H/10	COLDHOME	Unknown	-	-	No	78	Fair	No	3		Low	No	No	Yellow	
U34H/10	TARNASH BRIDGE	Unknown	17	10T AW	No	78	Fair	No	3		Low	No	No	Yellow	WDM notes indicate dispute over capacity. Lower capacity quoted here as per WDM strucutre summary. Structural review recommended.
U35H/10	DRUM BRIDGE	Unknown	0	26T AW	No	100	Very Good	No	3		Low	No	No	Yellow	Assessed witrh COBRAS yield line method.
U37H/10	ALLANBUIE CULVERT	Unknown	0	-	No	65	Fair	No	3		Low	No	No	Yellow	
U43BH/10	BACKMUIR	Unknown	0	40T AW	Yes	100	Very Good	No	3		Low	No	No	Green	
U44H/10	BRIDGE OF DUNNYDUFF - Temporary Bridge	Unknown	0	40T GVW	Yes	98	Very Good	No	3		Low	No	No	Green	
U47E/10	LOANHEAD CULVERT	Unknown	0	-	No	100	Very Good	No	3		Low	No	No	Yellow	
U57AL/10	DESKFORD BRIDGE	Unknown	-	-	No	100	Very Good	No	2		High	No	No	Yellow	
U57H/10	MacDOWALL	Unknown	30	40T GVW	Yes	28	Very Poor	No	3		Low	No	No	Amber	BCI_{crit} expected to improve following completion of 2022/23 PI report, reducing BAS score and bridge priority. Although the BCI_{crit} is currently low it is considered, on review, that the condition of the b
U57H/11	SOUTH ARNDILLY	Unknown	-	-	No	55	Poor	No	3		Low	No	No	Amber	
U57H/20	BRIDGE OF ARNDILLY	Unknown	0	40T GVW	Yes	74	Fair	No	3		Low	No	No	Green	
U57H/30	KILLIEMORE	Unknown	45	40T GVW	Yes	9	Very Poor	No	3		Low	No	No	Amber	
U57H/40	SANDYHILL BRIDGE	Unknown	0	40T GVW	Yes	78	Fair	No	3		Low	No	No	Green	
U58AL/10	BLOOMFIELD	Unknown	-	-	No	81	Good	No	3		Low	No	No	Yellow	
U59H/10	MULBEN	Unknown	-	-	No	100	Very Good	No	3		Low	No	No	Yellow	
U59H/20	MALCOLMBURN	Unknown	-	-	No	100	Very Good	No	3		Low	No	No	Yellow	
U59L/10	BROXY BRIDGE	Unknown	-	-	No	55	Poor	No	3		Low	No	No	Amber	
U60E/10	Asleisk	Unknown	-	-	No	55	Poor	No	3		Low	No	No	Amber	
U61L/10	BUCKIE BURN	Unknown	-	-	No	51	Poor	No	2		High	No	No	Amber	
U62E/10	MILL OF GRANGE	Unknown	30	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U63H/20	BRIDGE OF LACKDHU	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U63H/30	ALLT TERSIE	Unknown	-	-	No	100	Very Good	No	3		Low	No	No	Yellow	
U63L/20	AUCHENTAE	Unknown	0	40T AW	Yes	78	Fair	No	3		Low	No	No	Green	
U63L/30	DRYBRIDGE CULVERT	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U66AL/10	PORTESSIE CULVERT	Unknown	-	-	No	100	Very Good	Yes	2		High	No	No	Yellow	
U68AH/20	HOWDOUP	Unknown	0	7.5T AW	No	52	Poor	No	3		Low	No	No	Amber	Assessment dated 1996. Structural review recommended.
U68AH/30	DRUMGRAIN	Unknown	-	-	No	78	Fair	No	3		Low	No	No	Yellow	
U68E/10	EARNHILL	Unknown	-	-	No	58	Poor	No	3		Low	No	No	Amber	
U72L/10	ALLALOTH	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U76E/10	BARLEYMILL	Unknown	9 & 14	17 & 40T	No	81	Good	No	2		High	No	No	Yellow	Two-span maosonry arch strucutre with differing Mexe results for each span. WDM records are ambiguous. Structural review recommended.
U82H/10	Aldunie	LM1+LM2+LM3(all SOV)	N/A	N/A	No	100	Very Good	No	3		Low	No	No	Yellow	Replaced by U82H/11 in 2022. Details here are for U82H/11.
U83H/10	MILLTOWN	Unknown	12	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	
U83H/20	WHITEHILLOCH (CABRACH)	Unknown	14	40T GVW	Yes	22	Very Poor	No	3		Low	Should be monitored	Yes	Red	Monitoring recommended in 2022 PI report.
U85H/10	NEWTON	Unknown	0	40T AW	Yes	81	Good	No	3		Low	No	No	Green	
U88E/20	BANTRACH BRIDGE	Unknown	0	40	Yes	100	Very Good	No	3		Low	No	No	Green	
U88E/30	BRIDGE OF NEWTON	Unknown	-	-	No	74	Fair	No	3		Low	No	No	Yellow	
U89E/10	CLASHDHU	Unknown	38	40T GVW	Yes	55	Poor	No	2		High	No	No	Yellow	
U89E/40	PHORP	Unknown	0	40T GVW	Yes	55	Poor	No	3		Low	No	No	Yellow	
U8E/10	NETHER DALLACHY RAIL	Unknown	30	40T GVW	Yes	58	Poor	No	3		Low	No	No	Yellow	
U8E/15	MILL OF TYNET CULVERT	Unknown	-	-	No	9	Very Poor	No	2		High	No	No	Red	
U8E/20	CHAPELFORD	Unknown	0	40T GVW	Yes	78	Fair	No	3		Low	No	No	Green	
U93H/10	BALVENIE GARDENS RAILWAY	Unknown	0	-	No	39	Poor	No	3		Low	No	No	Amber	
U95E/10	SCOTSBURN	Unknown	0	40T GVW	Yes	55	Poor	No	3		Low	No	No	Yellow	
U95H/10	MILLTOWN OF LAGGAN	Unknown	0	40T AW	Yes	78	Fair	No	3		Low	No	No	Green	
U97H/10	TOMLIATH	Unknown	-	-	No	100	Very Good	No	3		Low	No	No	Yellow	
U99H/10	DULLAN BRIDGE	Unknown	45	40T AW	Yes	100	Very Good	No	3		Low	No	No	Green	
U99H/20	GIANT'S CHAIR	Unknown	0	40T GVW	Yes	100	Very Good	No	3		Low	No	No	Green	

Exceptions/Anomalies/Adjustments

U171E/70	BRAELOSSIE	Unknown	12	40T GVW	Yes	40	Poor	No	3		Low	No	No	Yellow	Access to vehicular traffic currently prevented by removeable bollards. Assessmnt and strengthening early 2000s by Cintec/Gifford.
U171E/80/RFB	OLD BREWERY BRIDGE	Unknown	0	40T GVW	Yes	100	Very Good	No	3	Yes	High	No	No	Green	Now NN151. Out of scope. Access to vehicular traffic currently prevented by removeable bollards.
C2E/20	CLODDACH	Unknown	0	7.5T GVW	No	22.12	Very Poor	No	2		High	No	No	Red	Currently closed to all motorised traffic and way barred by concrete blocks. Pedestrian and cycle access permitted.
C18E/10	STONEWELLS	Unknown	-	-	No	28.08	Very Poor	No	-		Low	No	No	Red	Noted in WDM to be a private bridge some 400m beyond the end of the adopted road. Steel beam and slab bridge providing rear access to the disused Milltown Airfield.
B9115/70/JAC	BLAIRMOON	Unknown	0	40T GVW	Yes	-999	Very Poor	No	1		High	No	No	Amber	Joint bridge with Aberdeenshire Council. Aberdeenshire is the maintainer. No recent photos. Condition score not available so amended to -999. Structural review/contract with Aberdeenshire recor
C6E/10	KINLOSS BURN BRIDGE	Unknown	30	40T GVW	Yes	55	Poor	No	1	Yes	High	No	No	Yellow	

Notes:

1. If the loading the bridge was designed for is known, and current, state it here. Valid codes: "Full HA"; "Full HA+[x]HB" where [x] may be one of "30", "37.5", or "45"; "LM1+LM2", "LM1+LM2+LM3([y])" where [y] may be one of "SV80", "SV80+SV100" or "all SV". If design loading is not current, i.e. it is superseded by an assessment, then state "Superseded by assessment" and fill in the assessment cells to the right. If capacity not known, state "Unknown". If none of these descriptors applies, state "See notes, right" and add commentary at the right hand side of the table.
2. The BCI scores are those from a report run on WDM in early 2023. They do not take account of 2022/23 PI outcomes where these had not already been inputted to WDM and so may be slightly out of date. Straightforward exercise to check/update this, affecting around 60 lines of data. Repeat process each year once PIs programme is complete and then re-sort the Output Summary sheet.
3. Bridge prioritisation is based on BCI_{CRIT}. BCI_{AVE} is not used. Where a bridge has multiple spans and each span is assigned a separate BCI_{CRIT} value, the lowest value should be inputted to the sheet (NOT the average of the BCI_{CRIT} scores as reported by HIAMS).
4. Since the BAS and priority score are based on BCI_{CRIT}, this means that works to address durability issues and non-critical elements may not affect the priority of the structure. They will, however, usually be reflected in the BCI_{AVE} value.

U170E/10	KIRKLAND HILL CULVERT	No	22	no	Vital	
U170E/20	KIRKHILL DRIVE LHANBRYDE	No	26	no	Vital	
U171E/40	ASHGROVE BRIDGE	No	0	no	Important	
U171E/50	MOYCROFT	No	100	no	Vital	
U171E/60	BOW BRIDGE, ELGIN	No	0	no	Standard	
U172E/10	LOSSIEMOUTH CANAL	No	52	no	Vital	
U172E/20	LOSSIEMOUTH SEATOWN	No	3	no	Standard	
U173E/10	LEE BRIDGE	No	0	no	Standard	
U173E/20	SANQUHAR BRIDGE	No	50	no	Vital	
U18E/10	BOW BRIDGE, GARMOUTH	No	0	no	Standard	
U18E/20	CHURCH RAILWAY, GARMOUTH	No	0	no	Standard	
U19E/20	WESTERTON	No	0	no	Standard	
U19H/10	GRANGE JUNCTION	No	0	no	Standard	
U23H/10	BURNEND CULVERT	No	0	no	Standard	
U26H/10	ROEHILL	No	4	no	Standard	
U27E/10	LONGHILL BURN	No	0	no	Standard	
U30E/10	WOODPARK	No	0	no	Standard	
U31E/10	CAPRIESHILL	No	0	no	Standard	
U33H/10	COLDHOME	No	0	no	Standard	
U34H/10	TARNASH BRIDGE	No	2	no	Standard	
U35H/10	DRUM BRIDGE	No	4	no	Standard	
U37H/10	ALLANBUIE CULVERT	No	0	no	Standard	
U43BH/10	BACKMUIR	No	0	no	Standard	
U44H/10	BRIDGE OF DUNNYDUFF - Temporary Bridge	No	9	no	Important	
U47E/10	LOANHEAD CULVERT	No	0	no	Standard	
U57AL/10	DESKFORD BRIDGE	No	0	no	Standard	
U57H/10	MacDOWALL	No	12	no	Important	
U57H/11	SOUTH ARNDILLY	No	9	no	Important	
U57H/20	BRIDGE OF ARNDILLY	No	9	no	Important	
U57H/30	KILLIEMORE	No	2	no	Standard	
U57H/40	SANDYHILL BRIDGE	No	2	no	Standard	
U58AL/10	BLOOMFIELD	No	0	no	Standard	
U59H/10	MULBEN	No	0	no	Standard	
U59H/20	MALCOLMBURN	No	0	no	Standard	
U59L/10	BROXY BRIDGE	No	0	no	Standard	
U60E/10	Asleisk	No	8	no	Important	
U61L/10	BUCKIE BURN	No	0	no	Standard	
U62E/10	MILL OF GRANGE	No	0	no	Standard	
U63H/20	BRIDGE OF LACKDHU	No	0	no	Standard	
U63H/30	ALLT TERSIE	No	0	no	Standard	
U63L/20	AUCHENTAE	No	0	no	Standard	
U63L/30	DRYBRIDGE CULVERT	No	0	no	Standard	
U66AL/10	PORTESSIE CULVERT	No	0	no	Standard	
U68AH/20	HOWDOUP	No	0	no	Standard	
U68AH/30	DRUMGRAIN	No	0	no	Standard	
U68E/10	EARNHILL	No	18	no	Important	
U72L/10	ALLALOTH	No	2	no	Standard	
U76E/10	BARLEYMILL	No	0	no	Standard	
U82H/10	Aldunie	No	6	no	Standard	
U83H/10	MILLTOWN	No	0	no	Standard	
U83H/20	WHITEHILLOCH (CABRACH)	No	0	no	Standard	
U85H/10	NEWTON	No	5	no	Standard	
U88E/20	BANTRACH BRIDGE	No	4	no	Standard	
U88E/30	BRIDGE OF NEWTON	No	3	no	Standard	
U89E/10	CLASHDHU	No	0	no	Standard	
U89E/40	PHORP	No	5	no	Standard	
U8E/10	NETHER DALLACHY RAIL	No	0	no	Standard	
U8E/15	MILL OF TYNET CULVERT	No	0	no	Standard	
U8E/20	CHAPELFORD	No	0	no	Standard	
U93H/10	BALVENIE GARDENS RAILWAY	No	4	no	Standard	
U95E/10	SCOTSBURN	No	0	no	Standard	
U95H/10	MILLTOWN OF LAGGAN	No	0	no	Standard	
U97H/10	TOMLIATH	No	8	no	Important	
U99H/10	DULLAN BRIDGE	No	0	no	Standard	
U99H/20	GIANT'S CHAIR	No	0	no	Standard	

Exceptions/Anomalies/Adjustments

U171E/70	BRAELOSSIE	No	0	no	Standard	
U171E/80/RFB	OLD BREWERY BRIDGE	No	0	no	Standard	
C2E/20	CLODDACH	No	0	no	Standard	
C18E/10	STONEWELLS	No	0	no	Standard	
B9115/70/JAC	BLAIRMOON	No	0	no	Important	
C6E/10	KINLOSS BURN BRIDGE	No	0	no	Important	

U170E/10	KIRKLAND HILL CULVERT	No	22	0	No	Vital	
U170E/20	KIRKHILL DRIVE LHANBRYD	No	26	0	Yes	Vital	
U171E/40	ASHGROVE BRIDGE	No	0	1.4	No	Important	
U171E/50	MOYCROFT	No	100	0	No	Vital	
U171E/60	BOW BRIDGE, ELGIN	No	0	1	No	Standard - Low	
U172E/10	LOSSIEMOUTH CANAL	No	52	0	No	Vital	
U172E/20	LOSSIEMOUTH SEATOWN	No	3	0	Yes	Standard - High	
U173E/10	LEE BRIDGE	No	0	0.6	No	Standard - Low	
U173E/20	SANQUHAR BRIDGE	No	50	0	No	Vital	
U18E/10	BOW BRIDGE, GARMOUTH	No	0	4.9	Yes	Standard - Medium	
U18E/20	CHURCH RAILWAY, GARMC	No	0	1.4	Yes	Standard - Medium	
U19E/20	WESTERTON	No	0	2.1	Yes	Standard - Medium	
U19H/10	GRANGE JUNCTION	No	0	5.6	No	Standard - Low	
U23H/10	BURNEND CULVERT	No	0	6.2	No	Standard - Low	
U26H/10	ROEHILL	No	4	0	Yes	Standard - High	
U27E/10	LONGHILL BURN	No	0	3.2	Yes	Standard - Medium	
U30E/10	WOODPARK	No	0	2	Yes	Standard - Medium	
U31E/10	CAPRIESHILL	No	0	4	Yes	Standard - Medium	
U33H/10	COLDHOME	No	0	4.6	No	Standard - Low	
U34H/10	TARNASH BRIDGE	No	2	0	No	Standard - High	
U35H/10	DRUM BRIDGE	No	4	0	Yes	Standard - High	
U37H/10	ALLANBUIE CULVERT	No	0	4.6	Yes	Standard - Medium	
U43BH/10	BACKMUIR	No	0		No	Standard - Low	
U44H/10	BRIDGE OF DUNNYDUFF - T	No	9	0	No	Important	
U47E/10	LOANHEAD CULVERT	No	0	2.6	No	Standard - Low	
U57AL/10	DESKFORD BRIDGE	No	0	3.2	No	Standard - Low	
U57H/10	MacDOWALL	No	12	0	Yes	Important	
U57H/11	SOUTH ARNDILLY	No	9	0	Yes	Important	
U57H/20	BRIDGE OF ARNDILLY	No	9	0	Yes	Important	
U57H/30	KILLIEMORE	No	2	0	No	Standard - High	
U57H/40	SANDYHILL BRIDGE	No	2	0	No	Standard - High	
U58AL/10	BLOOMFIELD	No	0	2.1	No	Standard - Low	
U59H/10	MULBEN	No	0	2.6	Yes	Standard - Medium	
U59H/20	MALCOLMBURN	No	0	2.4	No	Standard - Low	
U59L/10	BROXY BRIDGE	No	0	4	No	Standard - Low	
U60E/10	Asleisk	No	8	0	Yes	Important	
U61L/10	BUCKIE BURN	No	0	2.3	Yes	Standard - Medium	
U62E/10	MILL OF GRANGE	No	0	3.8	No	Standard - Low	
U63H/20	BRIDGE OF LACKDHU	No	0	4.5	Yes	Standard - Medium	
U63H/30	ALLT TERSIE	No	0	4.6	Yes	Standard - Medium	
U63L/20	AUCHENTAE	No	0	3.7	No	Standard - Low	
U63L/30	DRYBRIDGE CULVERT	No	0	3.9	Yes	Standard - Medium	
U66AL/10	PORTESSIE CULVERT	No	0	1.4	Yes	Standard - Medium	
U68AH/20	HOWDOUP	No	0	5.6	Yes	Standard - Medium	
U68AH/30	DRUMGRAIN	No	0	5.5	Yes	Standard - Medium	
U68E/10	EARNHILL	No	18	0	No	Important	
U72L/10	ALLALOTH	No	2	0	No	Standard - High	
U76E/10	BARLEYMILL	No	0	1.5	No	Standard - Low	
U82H/10	Aldunie	No	6	0	Yes	Standard - High	Superseded by U82H/11.
U83H/10	MILLTOWN	No	0	3.3	Yes	Standard - Medium	
U83H/20	WHITEHILLOCH (CABRACH	No	0	3.3	Yes	Standard - Medium	
U85H/10	NEWTON	No	5	0	Yes	Standard - High	
U88E/20	BANTRACH BRIDGE	No	4	0	No	Standard - High	
U88E/30	BRIDGE OF NEWTON	No	3	0	No	Standard - High	
U89E/10	CLASHDHU	No	0	5.4	No	Standard - Low	
U89E/40	PHORP	No	5	0	No	Standard - High	
U8E/10	NETHER DALLACHY RAIL	No	0	1.3	Yes	Standard - Medium	
U8E/15	MILL OF TYNET CULVERT	No	0	1	Yes	Standard - Medium	
U8E/20	CHAPELFORD	No	0	1.7	No	Standard - Low	
U93H/10	BALVENIE GARDENS RAILW	No	4	0	Yes	Standard - High	
U95E/10	SCOTSBURN	No	0	3.1	No	Standard - Low	
U95H/10	MILLTOWN OF LAGGAN	No	0	3.9	No	Standard - Low	
U97H/10	TOMLIATH	No	8	0	No	Important	
U99H/10	DULLAN BRIDGE	No	0	4.1	Yes	Standard - Medium	
U99H/20	GIANT'S CHAIR	No	0	4.2	No	Standard - Low	

Exceptions/Anomalies/Adjustments

U171E/70	BRAELOSSIE	No	0	0.8	No	Standard - Low	
U171E/80/RFB	OLD BREWERY BRIDGE	No	0	0.4	No	Standard - Low	
C2E/20	CLODDACH	No	0	6.1	No	Standard - Low	
C18E/10	STONEWELLS	No	0	0	No	Standard - Low	
B9115/70/JAC	BLAIRMOON	No	0	9.6	Yes	Important	
C6E/10	KINLOSS BURN BRIDGE	No	0	4.2	Yes	Important	

DO NOT SORT OR FILTER THIS SHEET

N.B. See foot of table for explanatory notes.

		INPUT	INPUT
Bridge Code	**Name**	**School bus route, Yes/No**	**Notes / Comments**
A920/170	BOGHEAD	Yes	
A920/180	FIDDICH (AUCHINDOUN)	Yes	
A920/190	KEITHMORE	Yes	
A939/170	BRIDGE OF LEACHD	Yes	
A939/180	BLAIRNAMARROW	Yes	
A939/181	LURGH DUBH	Yes	
A939/191	GLENMULLIACH CULVERT	Yes	
A939/210	NEW BRIDGE OF AVON	Yes	
A939/220	WESTER FODDERLETTER	No	
A939/230	TOM M'OR CULVERT	No	
A939/32	GLENMULLIE	Yes	
A939/33	BADNAFRAVIE	Yes	
A939/240/JHC	BRIDGE OF BROWN	No	
A939-250	ALLT FRAOCHACH	Yes	
A940/20	GLENERNIE	Yes	
A940/30	WOODSIDE CULVERT	No	
A940/40	KNOCKACH	No	
A941/100	BRIDGEND	Yes	
A941/110	ARDLUIE	Yes	
A941/130	BALLOCHFORD CULVERT	Yes	
A941/140	BALLOCH	Yes	
A941/150	BRIDGEHAUGH	Yes	
A941/160	BURNEND	Yes	
A941/170	BRIDGE OF CRACHIE	Yes	
A941/180	MALTKILN BRIDGE	Yes	
A941/190	BURNSIDE	Yes	
A941/200	GLENBURNIE PIPE	Yes	
A941/210	NEW CRAIGELLACHIE	Yes	
A941/225	SOUTH CULVERT BLACK BURN	Yes	
A941/226	NORTH CULVERT BLACK BURN	Yes	
A941/230	ROTHES BURN	Yes	
A941/240	BACK BURN BRIDGE	Yes	
A941/260	CAOCHAN STRIPE	Yes	
A941/270	BIRCHFIELD	Yes	
A941/280	ROTHES GLEN HOTEL	Yes	
A941/290	NETHERGLEN	Yes	
A941/300	LONGMORN BRIDGE	Yes	
A941/310	BIRKENHILL BRIDGE	Yes	
A941/320	ASHGROVE CULVERT	Yes	
A941/340	NEW BISHOPMILL	Yes	
A941/360	SPYNIE CANAL	Yes	
A941/51	DYKESIDE	Yes	N.B. This structure replaces A941/50 at Dykeside - see correction row at the bottom of this table.
A941/60	AUCHMAIR	Yes	
A941/80	BAZAAR MEMORIAL	Yes	
A941/90	BLACK WATER BRIDGE	Yes	

A941/70	KING'S FORD	Yes	
A942/20	REIDHAVEN STREET	Yes	
A95/50	BRIDGE OF FOWLWOOD	Yes	
A95/60	BRIDGE OF BRACO	Yes	
A95/70	BRIDGE OF CLERKSEAT	Yes	
A95/80	BRIDGE OF AUCHINHOVE	Yes	
A95/90	MONTGREW 1	Yes	
A96	ALEXANDERA WAY FOOTBRIDGE (COOPER PARK FOOTBRIDGE)	Yes	
A96	SUENO'S CYCLEBRIDGE	Yes	
A97/10/JAC	BRIDGE OF MARNOCH	No	
A98/310	SEATOWN BRIDGE	Yes	
A98/320	BOGS OF RANNAS	Yes	
A98/330	RANNAS BRIDGE	Yes	
A98/340	INCHGOWER	Yes	
A98/345	INCHGOWER CULVERT	Yes	
A98/350	STONIE'S CULVERT	Yes	
A98/351	STONIE'S PIPE	Yes	
A98/360	TYNET	Yes	
A990/20	PORTGORDON	No	
A990/30	BUCKPOOL	Yes	
B9007/10	LOGIE - NOT SUITABLE FOR ABLOADS	Yes	
B9008/10	AUCHRIACHAN	Yes	
B9008/20	CARTACH CULVERT	Yes	
B9008/30	BRIDGE OF TOMNAVOULIN	Yes	
B9008/40	BRIDGE OF LIVET (NEW)	Yes	
B9008/60	NEVIE CULVERT	Yes	
B9008/70	AUCHBRECK CULVERT	Yes	
B9008/80	TOMBRECKACHIE	Yes	
B9008/90	TOMMORE CULVERT	Yes	
B9009/10	CONVAL	Yes	
B9009/100	CRAIGHEAD	Yes	
B9009/11	BRIDGE OF AUCHGORUM	Yes	
B9009/110	MORINSH	Yes	
B9009/120	SHENVAL	Yes	
B9009/20	LETTOCH	Yes	
B9009/30	CONVALLEYS	Yes	
B9009/40	ALLAMICHIE (LYNEMORE)	Yes	
B9009/50	BRIDGE OF GLACK	Yes	
B9009/60	BALMERION	Yes	
B9009/70	AULTBEG	Yes	
B9009/80	TOMACHLAVEN	Yes	
B9009/90	ALLT LOAN	Yes	
B9010/100	FORD BRIDGE	No	
B9010/20	PALMERSCROSS	Yes	
B9010/35	PITTENDREICH (ALLARBURN)	Yes	
B9010/50	WESTER PITTENDREICH	Yes	
B9010/70	MAINS OF KELLAS	Yes	
B9010/90	CRAIGMILL	No	
B9011/20	KINLOSS BRIDGE	Yes	
B9011/5	CASTLE BRIDGE	Yes	
B9012/10	WATERTON	Yes	
B9012/20	CROSSLOTS	Yes	

B9012/30	UNTHANK CULVERT	Yes	
B9014/10	BRIDGE OF POOLINCH	Yes	
B9014/100	LOWER TOWIE BRIDGE	Yes	
B9014/110	BRIDGE OF TOWIEMORE	Yes	
B9014/130	MILLTOWIE CULVERT	Yes	
B9014/140	BRIDGE OF AUCHINDACHY	Yes	
B9014/150	BRIDGE OF MAISLEY	Yes	
B9014/20	PARKMORE RAILWAY BRIDGE	Yes	
B9014/70	BRIDGE OF BURNEND	Yes	
B9014/90	BRIDGE OF TOWIEBEG	Yes	
B9015/10	ROTHES GREEN	Yes	
B9015/100	LEIN BRIDGE	Yes	
B9015/20	CROFT FARM	Yes	
B9015/30	SOURDEN	No	
B9015/40	GARBITY	No	
B9015/70	ORBLISTON	Yes	
B9015/80	GARMOUTH RAILWAY	Yes	
B9016/10	FORGIESIDE	Yes	
B9016/20	TARRYCROYS	Yes	
B9016/30	RYERIGGS	Yes	
B9016/50	ENZIE	Yes	
B9017/10	NEWMILL WEST	Yes	
B9017/20	NEWMILL BRIDGE	Yes	
B9017/30	CROSSBURN - CLOSED TO ABLOADS	No	
B9018/100	SWELLEND	Yes	
B9018/110	BERRYHILLOCK CULVERT	Yes	
B9018/120	NETHER BLAIROCK	Yes	
B9018/130	LINTMILL 1	Yes	
B9018/140	LINTMILL 2	Yes	
B9018/20	BRIDGE OF CROFTGIBB	Yes	
B9018/30	BALNAMOON	Yes	
B9018/40	BURNEND BRIDGE	Yes	
B9018/60	WINDYHILLS	Yes	
B9018/70	LANGLAN BURN	Yes	
B9018/80	UPPER CRAIBSTONE	Yes	
B9018/90	CRAIBSTONE	Yes	
B9022/60	KNABBY GATES	Yes	
B9022/20/JAC	BRIDGE OF ISLA	No	
B9089/20	WARDS CULVERT	No	
B9102/10	PITCHROY	No	
B9102/100	LYNES CULVERT	Yes	
B9102/110	ARCHIESTOWN	Yes	
B9102/120	SANDYHILLOCK	Yes	
B9102/20	MAINS OF KIRDELLS	No	
B9102/30	BRIDGE OF CALLY	Yes	
B9102/50	UPPER KNOCKANDO	Yes	
B9102/60	POOLFLASGAN	Yes	
B9102/70	CARDOW	Yes	
B9102/90	BRACKENHOWES	Yes	
B9103/10	SPYNIE CANAL BRIDGE	No	
B9103/100	BOAT O'BRIG	No	
B9103/110	AUCHROISK	Yes	

B9103/120	AUCHROISK DISTILLERY	Yes	
B9103/20	ARTHUR'S BRIDGE - CLOSED TO ABLOADS	No	
B9103/21	ARTHUR'S CULVERT	No	
B9103/30	CAYSBRIGGS	No	
B9103/40	COXTON RAILWAY NO 1	Yes	
B9103/50	LOCH NA BO	Yes	
B9103/60	CLATTERINGBRIG	Yes	
B9103/70	ALTONSIDE	Yes	
B9103/80	DEANS HILLOCK	Yes	
B9103/90	ORTON RAILWAY BRIDGE	Yes	
B9104/20	NETHER DALLACHY SOUTH	Yes	
B9115/40	EAST OF FORKINS	Yes	
B9115/70/JAC	BLAIRMOON	Yes	
B9116/20	RIVER ISLA BRIDGE	Yes	
B9117/30	SHORTBANK BRIDGE	Yes	
B9117/50	BRIDGE OF MILLEGIN	Yes	
B9117/60	FARMTOWN	Yes	
B9118/10	WOODSIDE BRIDGE	Yes	
B9136/10	RUTHVEN BRIDGE	Yes	
B9136/30	BALLCORACH	Yes	
B9136/40	ALLTGLANDER	Yes	
B9136/50	GLENLIVET BRIDGE	No	
B9136/60	DRUMIN SMITHY	No	
B9138/10	BLACKSBOAT MAIN BRIDGE	Yes	
B9138/20	BLACKSBOAT FLOOD SPAN	Yes	
B9138/30	BLACKSBOAT RAILWAY BRIDGE	Yes	
C10E/10	DALVEY	No	
C10E/30	EARLSMILL	No	
C11E/10	ESS BRIDGE	Yes	
C11E/40	WHITEMIRE	Yes	
C11E/20/JHC	DALTULICH	No	
C11L/10	WESTON	No	
C12E/10	DOUAL BRIDGE	Yes	
C12E/20	BLACKBURN BRIDGE	Yes	
C12E/30	REED	No	
C13E/10	BRIDGE OF LOSSIE	Yes	
C13E/20	AULTAHUISH	No	
C13E/30	YELLOWBOG	No	
C13E/40	STRONDOW	No	
C14E/10	WARDEND	Yes	
C14E/20	MARCASSIE RAILWAY BRIDGE	Yes	
C14E/5	MARCASSIE CULVERT	Yes	
C15E/10	CARRON BRIDGE	Yes	
C15E/30	DALUAINE	Yes	
C16E/10	OLD RAILWAY PORTGORDON	No	
C16E/20	BONE MILL BRIDGE	No	
C17E/10	BURNSIDE OF ENZIE	No	
C17E/30	CAIRNFIELD	Yes	
C17H/10	EDINVILLIE	Yes	
C17H/20	LYNETIAN	No	
C17H/30	BLAIRNAIN	No	
C18E/10	STONEWELLS	No	

C19E/10	WAULKMILL CULVERT	Yes	
C19E/20	MEFT	Yes	
C1E/10	EASTER LOCHS	No	
C1E/20	LHANBRYDE OLD	No	
C1E/30	EASTER COXTON	No	
C1E/40	LHANBRYDE RAILWAY BRIDGE	Yes	
C1E/50	FOGWATT CULVERT	Yes	
C1H/30	BROOMHEAD	No	
C1H/60	CALTERNACH	No	
C1H/70	LITTLE NEWTON	Yes	
C20E/10	LINKWOOD	Yes	
C20H/10	CULRAGGIE (REFREISH)	Yes	
C20H/15	CLASHNOIR C20H-15	Yes	
C21H/10	GARRALBURN	Yes	
C22E/11	LANDSHUT	No	
C22E/20	BAREFLAT HILLS RAILWAY	No	
C22E/30	Calcots Bridge	Yes	
C24E/10	GILSTON CULVERT	Yes	
C24E/20	NORTH GILSTON	Yes	
C24E/30	SALTERHILL	Yes	
C25E/20	WARDS ARMCO	Yes	
C26E/20	MOSSTOWIE	Yes	
C29E/10	TOREHEAD	No	
C2E/20	CLODDACH - CLOSED TO ABLOADS	No	
C2E/30	GLENLOSSIE DISTILLERY	Yes	
C2E/40	FOTHS BURN	Yes	
C2E/50	BIRNIE CULVERT	Yes	
C2E/60	RASHCROOK	Yes	
C31L/10	VICTORIA BRIDGE	No	
C34H/10	KNOCKBURN	Yes	
C37E/10	ORCHARD ROAD BRIDGE	Yes	
C3E/10	MONAUGHTY FOREST	Yes	
C3E/30	COWIES BRIDGE	Yes	
C3E/40	STONEYFIELD	No	
C3E/50	HELDON WOOD	No	
C3E/70	BRIACH CULVERT	No	
C3E/90	BOGNIE JUNCTION	No	
C40E/10	REIKET LANE RAILWAY (NEW)	No	
C43L/10	FREUCHNY	No	
C43L/30	RATHVEN	No	
C44L/10	BOGSIDE CULVERT	No	
C44L/20	GLENBURN BRIDGE	No	
C46L/10	BRIDGE OF CRANNACH	Yes	
C47H/10	GARROWOOD	No	
C47H/20	BRACO CULVERT	No	
C47H/40	BERRYHILLOCK	Yes	
C48H/10	BRIDGE OF BRIDGEND	Yes	
C49H/10	DALMANY	No	
C4E/20	MOSSTOWIE CANAL	Yes	
C4L/10	BERRYHILLOCK BRIDGE	No	
C54H/10	CROOKSMILL	Yes	
C54H/20	BRIDGE OF ROSARIE	No	

C59H/11	BUSH BRIDGE	Yes	
C5E/10	GRANGE HILL	Yes	
C5E/30	EAST GRANGE	Yes	
C60H/10	DRUMIN BRIDGE	Yes	
C62L/20	BLEACHFIELD	No	
C62L/30	MILTON BURN	No	
C67L/11	BIRKENBUSH RAILWAY	Yes	
C68L/10	STRATHLENE RAILWAY	No	
C6E/10	KINLOSS BURN BRIDGE	Yes	
C72H/10	OLDTOWN	No	
C72H/20	KINMINITIE BRIDGE	No	N.B. replaced with concrete box culvert ca.2015, renumbered C72H/21. See correction row at foot of this table.
C72H/30	BURN OF HAUGHS BRIDGE - closed to abnormal loads	Yes	
C72H/50	MILTON BRIDGE	Yes	
C73H/10	MILLTOWN OF ROTHIEMAY	No	
C73H/20	BURN OF FOURMANHILL BRIDGE	No	
C7E/10	MAINS OF MOY	Yes	
C7E/20	DYKE	Yes	
C7L/10	CRAIBSTONE CULVERT	No	
C7L/20	BROADRASHES	No	
C80H/10	FITTIE	No	
C8E/10	DALVEY SMITHY RAILWAY	No	
C8E/20	DALVEY RAILWAY BRIDGE	No	
C8E/30	BANARACH	Yes	
C8E/40	ABBOTSHILL	Yes	
C8H/10	BRIDGE OF FORTEATH	No	
C8H/20	BRIDGE OF GUESTLOAN	No	
C8H/30 J AC	BRIDGE OF ARDGALLIE	No	
C8H-30 J AC	BRIDGE OF HAUGH	No	Assume this is meant to be C8H/40/JAC Bridge of Haugh as per the main list. See correction row at foot of this table.
C9E-20	CARISVILLE	No	
U102H	ABERLOUR HOUSE BRIDGE	Yes	
U105E/20	CLOVES BRIDGE	Yes	
U106H/10	BIRKENBUSH BRIDGE - CLOSED TO ABLOADS	Yes	
U108E/10	CANTSFORD	No	
U109H/10	DALUAINE DISTILLERY	Yes	
U111E/10	CROY	Yes	
U112E/10	MILTONDUFF	Yes	
U113E/10	DOWERY	No	
U115H/10	TOMBAE	Yes	
U117H/10	BRIDGE OF SLATEFORD	Yes	
U118E/10	SHOUGLE	Yes	
U123E	COXTON RAILWAY BRIDGE NO 2	Yes	
U124E/10	TROCHAIL	No	
U124H/10	TERVIE (MILLTOWN OF TOMBRECKACHIE)	Yes	
U124H/20	TROCHEIL	No	
U125AH/10	BALLACHURN	No	
U128E/10	LONGMORN CULVERT	No	
U128H/10	DELNABO	No	
U128H/20	AILNACK	No	
U128H/30	DELAVORA	No	
U129E/10	GREENSIDE	No	
U129E/20	BLACKHILLS CULVERT	No	
U131E/20	BROADBURN	Yes	

U131E/30	AUCHINROATH	No	
U132H/10	INVERLOCHY	Yes	
U132H/20	KINARDOCHY	Yes	
U132H/30	SILVER BRIDGE	Yes	
U132H/5	EASTER FODDERLETTER	Yes	
U135H/20 NR	MEIKLE CANTLY RAILWAY	Yes	
U135H/100	U135H/100 GAMHAINN CULVERT	No	
U138E/10	RINGORM BRIDGE	No	
U138H/10	BRIDGE OF CANTLY	Yes	
U139E/10	BRACKEN HOWES	Yes	
U139E/20	BRIDGE OF BALLINTOMB	Yes	
U13E/10	MALCOLM BRIDGE	No	
U142½/10	WILLOWBANK	Yes	
U142½/20	CULACH BURN	Yes	
U142½/30	NETHER TOMDOW	Yes	
U144E/10	ALDAVONNIE	No	
U144E/20	LYNE OF KNOCKANDO	No	
U146H/10/JAC	MARKETHILL BRIDGE	No	
U149E/10	CHARLOTTE STREET BRIDGE	No	
U149E/21	WEST STREET FOCHABERS	Yes	
U14E	BOAT O'BRIG RAILWAY BRIDGE	Yes	
U14E/20	DELFUR BRIDGE	Yes	
U14E/30	EAST STREET, FOCHABERS	No	
U168E/10	KINLOSS CULVERT	Yes	
U169E/10	HARBOUR STREET HOPEMAN	Yes	
U170E/10	KIRKLAND HILL CULVERT	No	
U170E/20	Kirkhill Drive Bridge	Yes	
U171E/40	ASHGROVE BRIDGE	No	
U171E/50	MOYCROFT	No	
U171E/60	BOW BRIDGE, ELGIN	No	
U171E/70	BRAELOSSIE	No	
U172E/10	LOSSIEMOUTH CANAL	No	
U172E/20	LOSSIEMOUTH SEATOWN	Yes	
U173E/10	LEE BRIDGE	No	
U173E/20	SANQUHAR BRIDGE	No	
U178L	CULLEN STATION BRIDGE	Yes	
U179E/10	STATION STREET, ROTHES	Yes	
U18E/10	BOW BRIDGE, GARMOUTH	Yes	
U18E/20	CHURCH RAILWAY, GARMOUTH	Yes	
U19E/20	WESTERTON	Yes	
U19H/10	GRANGE JUNCTION	No	
U23H/10	BURNEND CULVERT	No	
U26H/10	ROEHILL	Yes	
U27E/10	LONGHILL BURN	Yes	
U30E/10	WOODPARK	Yes	
U31E/10	CAPRIESHILL	Yes	
U33H/10	COLDHOME	No	
U34H/10	TARNASH BRIDGE	No	
U35H/10	DRUM BRIDGE	Yes	
U37H/10	ALLANBUIE CULVERT	Yes	
U42H	CORSAIRTLY RAILWAY BRIDGE	Yes	
U43BH/10	BACKMUIR	No	

U44H/10	BRIDGE OF DUNNYDUFF	No	
U47E/10	LOANHEAD CULVERT	No	
U57AL/10	DESKFORD BRIDGE	No	
U57H/10	MacDOWALL	Yes	
U57H/11	SOUTH ARNDILLY	Yes	
U57H/20	BRIDGE OF ARNDILLY	Yes	
U57H/30	KILLIEMORE	No	
U57H/40	SANDYHILL BRIDGE	No	
U58AL/10	BLOOMFIELD	No	
U59H/10	MULBEN	Yes	
U59H/20	MALCOLMBURN	No	
U59L/10	BROXY BRIDGE	No	
U60E/10	ASLEISK	Yes	
U61L/10	BUCKIE BURN	Yes	
U62E/10	MILL OF GRANGE	No	
U63H/20	BRIDGE OF LACKDHU	Yes	
U63H/30	ALLT TERSIE	Yes	
U63L/10	GOLLACHY RAILWAY	Yes	
U63L/20	AUCHENTAE	No	
U63L/30	DRYBRIDGE CULVERT	Yes	
U66AL/10	PORTESSIE CULVERT	Yes	
U68AH/20	HOWDOUP	Yes	
U68AH/30	DRUMGRAIN	Yes	
U68E/10	EARNHILL	No	
U72L/10	ALLALOTH	No	
U74E/10 NR	ELLANDS RAILWAY	No	
U76E/10	BARLEYMILL	No	
U82H/11	ALDUNIE	Yes	N.B. This structure replaces U82H/10 at Aldunie - see correction row at the bottom of this table.
U83H/10	MILLTOWN	Yes	
U83H/20	WHITEHILLOCH (CABRACH)	Yes	
U85H/10	NEWTON	Yes	
U88E/20	BANTRACH BRIDGE	No	
U88E/30	BRIDGE OF NEWTON	No	
U89E/10	CLASHDHU	No	
U89E/40	PHORP	No	
U8E/10	NETHER DALLACHY RAIL	Yes	
U8E/15	MILL OF TYNET CULVERT	Yes	
U8E/20	CHAPELFORD	No	
U93H/10	BALVENIE GARDENS RAILWAY	Yes	
U95E/10	SCOTSBURN	No	
U95H/10	MILLTOWN OF LAGGAN	No	
U97H/10	TOMLIATH	No	
U99H/10	DULLAN BRIDGE	Yes	
U99H/20	GIANT'S CHAIR	No	
U97H-20	UNKNOWN	No	
U97H-30	UNKNOWN	No	
A95/360	UNKNOWN	No	
c56H-10JAC	UNKNOWN	No	
c11E-25 hc	UNKNOWN	No	
U&&L-10 RPL	UNKNOWN	No	

Below this line: manually added corrections/additions to the list above			**Comment**
A941/50	Dykeside	Yes	Superseded by A941/51 due to redeck in 2022. A941/51 is "yes" for school transport.
U82H/10	ALDUNIE	Yes	Superseded by U82H/11 due to redeck. U82H/11 is "yes" for school transport.
C72H/21	KINMINITIE BRIDGE	No	Supersedes C72H/20 due to reconstruction as a box culvert ca.2015. C72h/10 is "no" for school transport.
C8H/40/JAC	Bridge of Haugh	No	Assumed to be the same as C8H-40 J AC in the main table above, which is a "no" for school transport.
U171E/80/RFB	OLD BREWERY BRIDGE	No	Closed to vehicular traffic. Now NN151.

Notes:

1. This data is manually generated by taking a full list of structures and consulting Moray Council's Public Transport Manager to determine which structures form part of routes *currently* used for school transport.
2. The routes used for school transport changes to some extent from year to year, particularly in sparsely -inhabited areas of Moray, due to demographic change facos such as opening/closing of schools and changes to catchment areas.
3. It is recommended that this information is reviewed and updated, ideally annually, after the beginning of the new school year.
4. This data was last updated in May 2023.

Prefeasibility Study

Cloddach Bridge, Elgin

September 2023

FAIRHURST

CONTROL SHEET

CLIENT: **The Moray Council**

REPORT TITLE: **Prefeasibility Study**

PROJECT REFERENCE: **140163F – Cloddach Bridge, Elgin**

Issue and Approval Schedule: 1

ISSUE 1 **Draft**	Name	Signature	Date
Prepared by	M Walejewska S Slater		15/06/2023
Reviewed by	E Halkon		15/09/2023
Approved by	R Gray		15/09/23

Revision Record:

Issue	Date	Status	Description	By	Chk	App
1	29/09/2023	Final	Minor clarifications	SS	EH	EH

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Contents

Appendices

Executive Summary

Constructed in 1905, Cloddach Bridge carries a single carriageway road over the River Lossie to the south of Elgin. The bridge is in poor condition and following a number of structural surveys and a load assessment, the bridge was closed to vehicular traffic in February 2022.

Following a petition by local residents, this study was commissioned to review the requirements for the preparation of a full Business Case for the permanent replacement of Cloddach Bridge. This study describes a range of replacement and repair options that would permit the reopening of the bridge to all vehicular traffic up to and including 40 Tonnes. As a comparison, a baseline option that does not enable reopening the bridge to vehicular traffic has also been assessed:

Option 1	Baseline - Do Minimum - retain bridge for pedestrian and cyclist
Option 2	Repairs to the existing bridge
Option 3a	Prefabricated steel overbridge with demolition of the existing bridge
Option 3b	Prefabricated steel overbridge with retention of the existing bridge
Option 4a	New wider integral bridge structure
Option 4b	New minimum width integral bridge structure

High level cost estimates and risk assessments for each option have been undertaken. Risk assessments include an assessment of both reputational risk and cost/programme risk. These assessments indicate that the best option to take forward for further development would be a single lane, fully Eurocode compliant integral concrete structure. Costs have been estimated on a most likely basis, with a range included related to overall risk scores.

A review of the available traffic information has been undertaken and concludes that, although more information is required in order to fully quantify benefits, any of the proposed options would deliver a sufficient return in terms of journey time savings resulting in a positive Benefit Cost Ratio over a 60 year forecast period.

An estimated scope, fee and programme for the full business case has been developed and included in this study. In order to fully inform the full business case it is recommended that site surveys are undertaken and the development of a transport model is progressed. This should be undertaken alongside other site activities and reports including flood risk assessment, geotechnical investigation and preliminary ecological appraisal in order to further develop estimates of the likely costs of a replacement structure.

1 Introduction

1.1 Project Background and Site History

Cloddach Bridge is a three span structure carrying a single carriageway road over the River Lossie. The bridge is located on an unnamed road to the west of the B9010, south of Elgin.

Cloddach Bridge was constructed in 1905. The bridge comprises three simply supported spans of approximately 7m. Each span is formed from 7 No. steel beams at approximately 715mm centres. A concrete jack arched slab spans between the steel beams with a corrugated steel shuttering to the underside. The substructure includes mass concrete abutments and intermediate mass concrete piers. The carriageway is approximately 3.9m wide which restricts vehicular passage to a one direction at a time. There is no separate verge or demarcation for pedestrians over the existing structure.

Following a number of structural surveys and the completion of a load assessment, the bridge was closed to vehicular traffic in February 2022.

1.2 Brief

Following a petition by local residents, this study has been commissioned to review the requirements for a full Business Case to be prepared for the permanent replacement of Cloddach Bridge. This study considers the following;

- High level development of options available to re-open Cloddach Bridge to all vehicular traffic up to and including 40 Tonnes.
- Specification for site investigation and additional survey works required to inform the design of the replacement bridge.
- Estimated cost and time, including site investigation, for preparing a full business case for the replacement of Cloddach Bridge, based on The Green Book (2022) issued by HM Treasury.

2 Location Plans

2.1 Location Plan

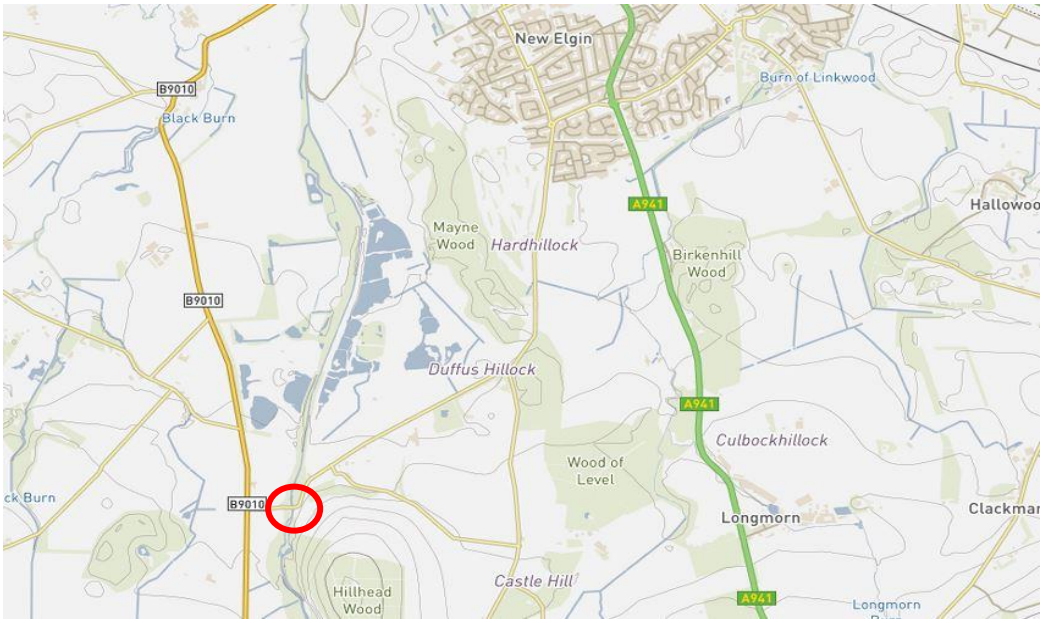


Figure 1: Bridge Location Plan

Contains OS data © Crown copyright and database rights (2020)

Figure 2: Bridge Aerial View

3 Site Information

3.1 Site description

The bridge is approximately 300m east of the B9010 on the C2E road south of Elgin in Moray, Scotland. Record information available for the bridge is limited to previous inspection and assessment reports. No record drawings are available other than the drawings produced by Fairhurst as part of the Inspection for Assessment in 2022.

The road alignment is relatively flat and straight on approach to the structure from the west. To the east of the bridge the road level rises slowly and the road turns to the north with a left hand curve of approximately 40m radius. There are no available records suggesting that the road alignment in this area has contributed to historic accidents.

In order to progress any option to reopen the bridge, a full topographical survey will be required. An allowance for this has been included in the cost estimates presented in this study.

3.2 Existing utilities

A desk study of the potential utilities within the scheme extents using Line Search Before U Dig (LSBUD) identified the services listed in the table below.

Utilities within Scheme Extents are included in Table 3-1:

Utility	Location
Scottish Water	South Verge of Bridge
BT Openreach	Overhead line immediately to the north of the bridge

Table 3-1 Utility Information

To ensure that a robust allowance is included within the cost estimate, it has been assumed that these services would have to be relocated if the bridge is demolished.

3.3 Existing traffic

Traffic flow information in the form of a survey, undertaken from 30th November to 6th December 2020, has been supplied by Moray Council. Observations from the survey, carried out on the C2E between Cloddach Bridge and the B9010 / C2E junction, shown below in Figure 3, have been utilised to establish an estimate of annualised traffic flows of vehicle use of Cloddach Bridge, from when it was open to vehicle use (subject to a 3T weight restriction).

Establishing annual traffic flows was undertaken by establishing an average hour count for each peak time period (AM peak/Inter peak/PM peak) from the survey, then utilising conversion factors taken from the Moray Firth Transport Model to approximate annual traffic flows.

Using this approach it is estimated that approximately 250,000 vehicles used Cloddach bridge annually (2020).

Figure 3 Location of Traffic Survey

The bridge is currently available for use by pedestrian and cyclists. An edge protection system is in place, but in poor condition. This does not provide edge protection for vehicular, cycle, pedestrian nor equestrian traffic due to its condition and lack of compliance with design codes relating to strength, form and height.

The B9010 is not served by any public transport services and there are no public transport diversions affected by the closure of the bridge.

3.4 Current diversion

The bridge provides access to the B9010 north and southbound for residents in rural communities including Birnie, Thomshill, Glenlatterach and Bardon. While the bridge is closed, the alternative route for these residents includes travelling to the A941 to enter Elgin from the south and then taking the A96 west back to the B9010. It is estimated that this diversion adds up to 15 minutes onto journey times and has a length of approximately 6 miles.

Traffic from the B9010 northbound could also use the existing bridge as an alternative access to the South and East of Elgin, avoiding the town centre. The same possibility exists for traffic wishing to travel between South or East Elgin and the B9010 south towards Kellas.

3.5 Geotechnical Constraints

The 1:50,000 BGS mapping noted the superficial deposits at the site comprise Alluvium and River Terrace Deposits (Undifferentiated) Gravel, Sand, Silt and Clay and Glaciofluvial Ice Contact Deposits of Gravel, Sand and Silt. The BGS mapping shows there is no geological faulting located within the vicinity of the site.

A geotechnical investigation is required prior to any further design development of the scheme. A proposed specification and cost allowance for this activity is included in the estimates presented.

3.6 Ecological Constraints

No ecological information or reviews have yet been undertaken for this location. It is recommended that a Preliminary Ecological Appraisal is undertaken in order to determine constraints for both ground investigation and construction works. A preliminary ecological appraisal will include;

- Mapping of habitats on the site and immediate surrounds to a suggested minimum buffer of 50m upstream and downstream.
- A desk study undertaken with North East Scotland Biological Recording Center NES BReC to a search radius of 2km https://nesbrec.org.uk/services/
- An assessment of the site to support protected or notable species which will include a preliminary bat roost assessment (PBRA) of the Bridge Structure and any surrounding trees. The survey will also include a survey for Otter and Badger to a distance of 100m upstream and downstream of the bridge where access allows.

In order to obtain accurate habitat data and as much as possible in terms of good habitat and protected species data, surveying in September / October would be ideal. Bat surveys, if required, would need to be undertaken during spring.

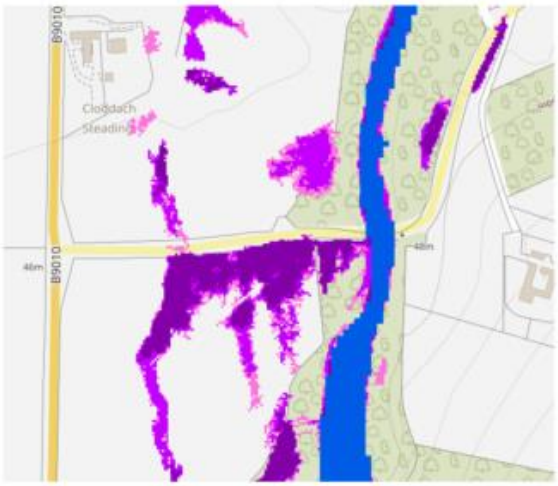
It is possible that there are species present in the vicinity of the bridge that would result in seasonal constraints on any work in and around the watercourse. The result of the Preliminary Ecological Investigation would be used to better inform the construction programme.

3.7 Flood Risk Constraints

Flood risk maps have been obtained from SEPA and are shown in in Figure 3 below. These plans indicate that the bridge and the area to the east as far as the B9010 is susceptible to flooding in a 1 in 200 year event. They also indicate that the area immediately adjacent to the bridge is subject to both river flooding and surface water flooding in the 1 in 10 year event.

The maps provided online by SEPA are indicative and it is not clear whether any account has been made for the existing structure. A full flood risk assessment, including topographical and bathymetric survey of the river both upstream and downstream of the bridge, would be required to establish the constraints.

Existing Bridge Location



High Risk (1 in 10 year) River and Surface Water Flooding

River Flooding - 1 in 200 and 1 in 10 year

Medium Risk Future Flooding (Refined Model)

Figure 4 SEPA Flood Risk Maps

3.8 Land Ownership

Assuming that any replacement structure is constructed on the same alignment as the existing bridge, land acquisition costs are not likely to form a significant as part of any construction works. For a widened structure some land acquisition may be required. District Valuer services should be used where required to establish land acquisition costs as part of the detailed design of any option.

For the purposes of this assessment it is assumed that the bridge would be closed to pedestrians and cyclists during any works and that any work compounds could be established within the highway boundary.

4 General Design Considerations

4.1 Health and Safety

A Principal Designer has not been appointed at this pre-construction stage. Nevertheless, the Construction Design and Management (CDM) Regulations 2015 apply to the project.

Health and safety risks have been considered during the production of this study, with each option being reviewed and assessed in terms of construction, maintenance, and demolition.

It is recommended for the next stage of the project that a Principal Designer be appointed to carry out the duties as set out in the Construction (Design and Management) Regulations 2015 including:

- Plan, manage, monitor, and coordinate health and safety in the pre-construction phase. In doing so the designer must take account of relevant information that might affect design work carried out both before and after the construction phase has started.
- Help and advise the client to bring together pre-construction information and provide the information designers and contractors need to carry out their duties.
- Work with any other designers on the project to eliminate foreseeable health and safety risks to anyone affected by the work and, where that is not possible, take steps to reduce or control those risks.
- Ensure that everyone involved in the pre-construction phase communicates and cooperates, coordinating their work wherever required.
- Upon commencement of the construction phase, liaise with the principal contractor, keeping them informed of any risks that need to be controlled.

4.2 Design Requirements

The proposed design will adhere to the Design Manual for Roads and Bridges (DMRB) by the Department for Transport. Key design requirements considered for this structure include the bridge having a design working life category 5, which results in a design working life of greater than or equal to 120 years, in accordance with CD 350, Table 7.1. A new or modified bridge should be designed where possible to resist the effects from both permanent and variable actions over a 120-year design life.

The current carriageway width is 3.9m with no separate verge or demarcation for pedestrians over the existing structure. Local guidance published by The Moray Council recommends a road width for rural single track roads of 3m, so the road width provided by any replacement structure must achieve a minimum of 3m. There is an opportunity to improve safety and provide future resilience by providing a bridge which supports two way running traffic and a footway. In order to establish the potential costs and benefits of these options, both single carriageway and two lane carriageway are considered options for this prefeasibility study.

Any option taken forward will be subject to Technical Approval Authority requirements as detailed in CG300.

4.3 Statutory Processes

The replacement of the bridge would not benefit from permitted development rights under the Town and Country Planning (General Permitted Development) (Scotland) Order 1992. Therefore, planning permission in accordance with the Town and Country Planning (Scotland) Act 1997 (as amended) will be required. A planning application will need to be submitted to the Local Planning Authority, which in this case is Moray Council.

Environmental deliverables (e.g. Phase 1 habitat survey) will be required for the validation of the application to Moray Council.

In addition to the planning application a Simple Licence may be required from SEPA. The proposed works are situated in close proximity to inland water and thus requires authorisation for both the restoration and enhancement works, including removal of structures and construction of a new bridge. It is recommended that confirmation is obtained via pre-application discussions, as it may be established that SEPA are content to control this activity though appropriate planning conditions.

4.4 Maintenance Requirements

Throughout the 120-year design life of the structure, routine inspections and maintenance activities will be required to keep the bridge structure and link road in a serviceable condition. Several maintenance activities may be required to be undertaken annually.

Depending on the type of replacement structure selected, maintenance activities could include re-painting and/or renewal of bridge deck surfacing, waterproofing, bearings and bridge deck joints, all of which deteriorate over time.

Specific maintenance requirements for each option are included in the option appraisal section.

To allow for the detection of defects, inspections of the principal elements are recommended as in CS 450 as follows:

- General Inspection – every 2 years
- Principal Inspection – every 6 years

Operation and maintenance cost estimates have been included within the costing estimates.

4.5 Demolition

As discussed in the Inspection and Assessment Report issued in March 2022, demolition could either involve removal of the superstructure, or removal of both the substructure and superstructure. Limiting the demolition works to the superstructure minimises costs and programme duration. It also minimises works within the watercourse including associated licensing requirements from SEPA. However, leaving the existing piers in place would result in the Moray Council retaining liability for these elements. As the scour issues associated with the piers would remain, there is a potential that

the substructure could collapse and impact the watercourse, leading to exacerbation of local flooding.

Demolition of the bridge in the near future significantly reduces risk. It removes the asset from the Moray Council's list of liabilities but also allows for a planned demolition and diversion of services in a controlled way.

5 Options

Option 1 has been included for comparison purposes. This option does not permit the bridge to reopen to vehicular traffic:

Option 1 Baseline Do Minimum

Three further options have been developed to enable Cloddach Bridge to reopen to all vehicular traffic up to and including 40 Tonnes:

Option 2 Repairs to the existing bridge
Option 3a New Overbridge including demolition of existing bridge
Option 3b New Overbridge including retention of existing bridge
Option 4a New integral bridge structure two lanes
Option 4b New integral bridge structure single lane

5.1 Option 1 – Do Minimum

5.1.1 Description

This option allows the bridge to remain open for an additional period of time for use by pedestrians and cyclists only subject to ongoing inspections and monitoring.

Although this option does not allow the bridge to be reopened to traffic, it does however provides a baseline for comparison against all other options.

The likely risks associated with no action being undertaken have also been considered.

In March 2022, Fairhurst's Inspection and Assessment Report discussed an ongoing inspection and monitoring programme and stated:

> "Without further measures and subject to ongoing inspections, this could allow the bridge to be used by pedestrians and cyclists for a further 2 years to allow a scope and budget for demolition to be developed."

This study is being compiled eighteen months into the two year period mentioned above.

5.1.2 Details

This option includes the following details, assumptions and exclusions:

- Installation of bollards and signage on the approach to the structure to prevent vehicle access.
- Road Order to legally 'stop up' the road.
- Scour survey required as soon as possible, the results of which may impact the ability to re-open the bridge for longer than the initial two year period.
- River bed training or repairs may be required following scour survey. Included as a risk cost.

- Liaison with SEPA including associated programme and costs will be required.
- Ongoing general inspections on a monthly basis and after heavy rainfall, to monitor the condition of the steelwork, scour and edge deterioration for up to ten years.
- Monitoring of the measured flange thicknesses every three months to ensure residual thickness does not reduce by more than 2mm.
- No allowance has been included for grit blasting, repainting or other refurbishment activities.
- No allowance has been included for re-assessment of the structure.
- It has been assumed that after ten years, the bridge will need to be permanently closed and demolished. Demolition costs including cost of legal 'stopping up' processes, the introduction of a turning head, signage and bollards have been included in the whole life costs.
- Whole of life costs include inspection and monitoring over the next 10 years

5.1.3 Risks

Appendix B contains a full risk assessment for this option. In this option, the bridge remains a liability without the benefits of reopening it to vehicular traffic. A key risk is therefore reputational damage due to protests relating to the bridge not being reopened to vehicular traffic.

Much of the risk associated with this option is as the result of failure of the structure and/or damage to the services potentially resulting in the emergency demolition of the bridge. In addition, the scour to the river bed and its impact on the stability of the substructure presents an unknown level of risk with potentially catastrophic consequences. A scour survey is recommended as soon as possible to understand more about the current situation. This in turn will inform the possibility of extending the initial two year period discussed above. It is likely that the scour survey will determine the need for scour protection, river re-training or underpinning works, all of which would significantly increase the option cost.

5.2 Option 2 - Repairs to the existing bridge

5.3.1 Description

This option combines repairs to and replacement of elements of the existing structure in order to re-open the bridge to all vehicular traffic up to and including 40 tonnes.

This is a complex process that will involve significant breaking out and careful refurbishment of existing elements in combination with the installation of replacement elements.

5.3.2 Details

This option includes the following details, assumptions and exclusions:

Items included in this option are:

- Bridge strengthening would allow the bridge to be used by normal traffic up to 40t, but not abnormal loads
- Topographical Survey
- A budget cost for extensive intrusive investigation works
- Preliminary Ecological Appraisal Flood Risk Assessment
- Scour survey required as soon as possible, the results of which may impact the final decision to adopt this option.
- River bed training or repairs, possibly underpinning, to existing substructure may be required following scour survey
- Extensive river bank protection.
- Due to significant work in the river, extensive liaison with SEPA will be required. Licensing requirements are likely be highly restrictive.
- Ground Investigation and Reporting
- Development of strengthening scheme including cleaning, overplating or replacement and then painting of all steel beams.
- Breaking out and replacing poor quality concrete elements in substructure. Extensive repairs and or complete replacement may be required.
- Removal of concrete jack arches and replacement with new structural slab.
- Installation of a new vehicle, pedestrian, cyclist and equestrian compliant parapet.
- Residual design life following repair work approximately 50 years.
- Maintenance costs include repainting of the structure every 15 years.

5.3.3 Risks

The key risk relating to this option is the unknown condition of hidden elements of the structure. The extent to which they can be retained or strengthened is therefore also largely unknown. It is likely that very significant repairs will be required to extend the life of the structure using this method.

Considering the concrete elements of the sub structure, it is likely that breaking out activities will reveal areas of additional deterioration. In cases like this where the concrete quality is poor, the extent of breaking out can also be difficult to control on site. The full substructure may need reconstructed in situ.

There is also a similar risk with the superstructure. It is very likely that the majority of the girders will require over-plating or replacement. The repaired structure is likely to require load restrictions for abnormal load vehicles and there will be an ongoing durability risk related to any retained parts of the structure. In order to achieve a structure with a design life of up to 50 years the repairs are likely to require complete dismantling and reassembly of the bridge. This adds the complexity of ensuring the stability of the existing structural elements during the refurbishment works. This is likely to require extensive temporary works and highly constrained sequencing which in turn further increases costs.

In addition to the inherent risks associated with the poor condition of this structure, the scour to the river bed and its impact on the stability of the substructure presents an unknown level of risk with potentially catastrophic consequences. A scour survey is recommended as soon as possible to understand more about the current situation. This in turn will inform the ongoing scour related risk and retraining or repair work required which may be extensive.

Refer to Appendix B for a full risk assessment for this option.

5.3.5 Construction Works Programme

The construction programme for this option is likely to be the longest of any option considered. This is due to the piecemeal nature of the works, likely requirement to prop the bridge during works or impose extensive construction sequencing constraints in order to ensure stability, and the extent of works required in the river.

5.3 Option 3a Overbridge with Demolition of Existing

5.4.1 Description

This option comprises a prefabricated superstructure supported by the existing abutments. This requires the demolition of the existing superstructure and piers, modification of the existing abutment, but only minor changes to the existing road alignment. While this is likely to comply with road alignment standards, because this is a non-integral bridge it fails to meet current standards for maintainability and will attract a higher whole life cost.

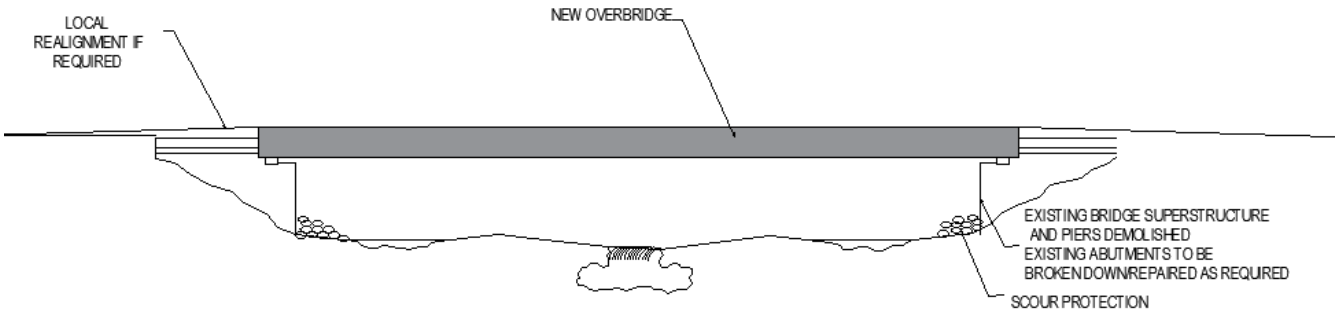


Figure 5 Option 3A Steel Overbridge with Demolition of Existing

5.4.2 Span arrangement

The overbridge will comprise a single span between the existing abutments. This will require significant repair works and/or modification to the existing abutments. Comparing this to option 4b where new abutments are built behind the existing abutments, this option will allow a shorter overbridge span with potentially reduced cost. It is worth noting that "off the shelf" prefabricated bridge decks tend to be modular units so there will be less flexibility with dimensions. For example, the units may only be available in spans to the nearest metre.

5.4.3 Material Type

In order to span the existing abutments, a steel beam bridge or through truss will be required. As the through truss will require more maintenance, a pre-fabricated steel beam bridge has been considered for this option. Concrete structures would only be considered for a full replacement structure.

Figure 6 Typical Jansen MultiGirder Bridge

5.4.4 Alignment

As this options assumes the demolition of the existing piers and superstructure, little modification to the vertical alignment of the road will be required.

5.4.5 Cross Section

The existing bridge comprises a carriageway of approximately 3.9m width which allows the passage of vehicles over the bridge in one direction at any one time. A prefabricated superstructure is available in a limited range of widths due to its modular form. A cross section of 5m, based on 2 x 2.5m sections has been chosen for the purposes of this option study. The cross section can be specified with surfacing and footway arrangement to suit requirements within the available width, but traffic will still be limited to one direction at a time.

5.4.6 Foundations

Ground investigations (GI) are required in order to design modifications to the existing abutments. The outline specification for GI is included in Appendix A.

5.4.7 Articulation

The new superstructure will be installed on permanent bearings forming a simply supported span.

5.4.8 Maintenance

Although the simply supported span has benefits in simplicity of construction, these benefits are potentially outweighed by additional maintenance costs including a requirement to repaint the structure every 15 years and replace bearing every 25 years throughout the 120 year design life for a new structure. Other assets that may need to be renewed over the design life of the structure include the surfacing, waterproofing and parapets. The costs associated with maintaining a bridge of this description are included in the cost estimate as part of the whole life cost.

This option involves the demolition of the existing piers and superstructure. Although there are capital costs associated with this, there are longer term benefits to ongoing inspection and maintenance costs. There are also benefits in making the overbridge easier to inspect and maintain and avoiding road realignment costs.

5.4.9 Details

This option includes the following details, assumptions and exclusions:

Items included in this option are:

- Bridge would be designed for normal traffic up to 40t
- Topographical Survey
- Minimal road realignment and earthworks.
- Extensive intrusive investigation works to abutments
- Preliminary Ecological Appraisal
- Flood Risk Assessment
- Scour survey
- River bed training or repairs, possibly underpinning, to existing substructure may be required following scour survey.
- Extensive river bank protection.
- Due to significant work in the river, extensive liaison with SEPA will be required. Licensing requirements are likely be highly restrictive.
- Ground Investigation and Reporting
- Demolition of existing superstructure and piers and associated service diversions and relocations.
- Maintenance costs include repainting every 15 years and bearing replacement every 30 years.

5.4.10 Risks

Refer to Appendix B for a full risk assessment for this option.

Re-using any part of the existing structure carries a risk relating the anticipated condition. In this case, there is a high cost and programme risk associated with the extent of works required to re-use the existing abutments.

5.4.12 Construction Works Programme

The construction programme for this option is likely to be the second shortest of options considered as although demolition and modification of the existing structure is required, the new bridge will arrive fully fabricated and just needs to be lifted or launched into place.

5.4 Option 3b New Overbridge with Existing Structure Retained

5.5.1 Description

This option comprises a prefabricated superstructure supported by a new substructure built behind the existing abutments. The full existing structure is retained, but demolition is likely to be required in the future.

This option requires more consideration of the existing alignment than others. Because the new structure is installed over the top of existing there could either be higher resulting realignment costs or a non-compliant ramp detail that will require speed limits.

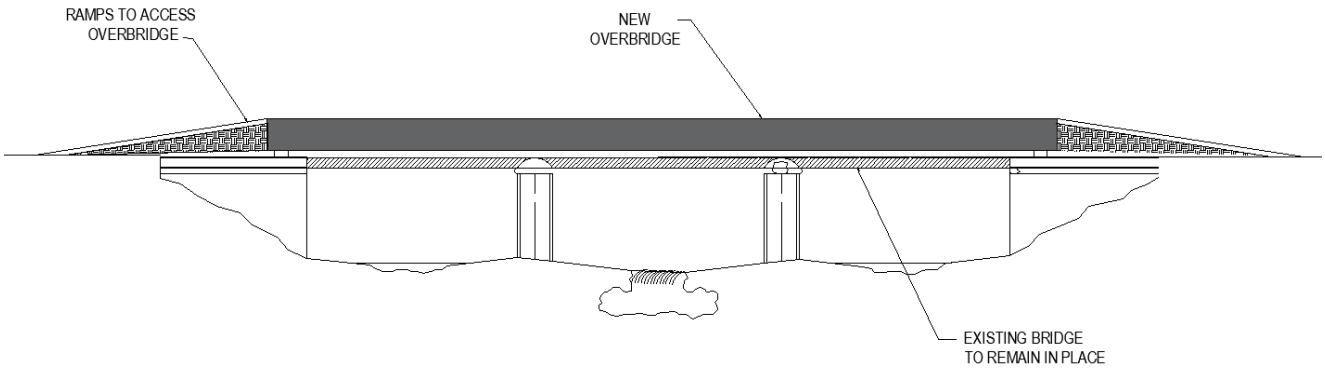


Figure 7: Option 3b Steel Overbridge with Retention of Existing Structure

5.5.2 Span arrangement

The overbridge spans over the top of existing abutments to rest on new supports. This will require vertical realignment of the road over the top of overbridge and associated earthworks and/or retaining structures.

5.5.3 Material Type

In order to span the full distance over the existing abutments, a steel beam bridge or through truss will be required. As the through truss will require more maintenance, a pre-fabricated steel beam bridge has been considered for this option. Structural forms including timber and fibre reinforced plastic are not generally suitable for this span range and have not been considered.

5.5.4 Alignment

Prefabricated steel bridge decks are available from a number of suppliers as an 'off the shelf' product that require bespoke foundations. In order to progress this solution, a topographical survey is required to determine the modifications required to the vertical alignment of the road to allow the carriageway to pass over the top of the existing structure. The road level would typically be in the order of 1.2m higher than existing. This level difference could be achieved in

the form of a ramp, or through more extensive realignment works. An allowance for new alignment and earthworks is included in the cost estimate for this option.

5.5.5 Cross Section

The existing bridge comprises a carriageway of approximately 3.9m width which allows the passage of vehicles over the bridge in one direction at any one time. A prefabricated superstructure is available in a limited range of widths due to its modular form. A cross section of 5m, based on 2 x 2.5m sections has been chosen for the purposes of this option study. The cross section can be specified with surfacing and footway arrangement to suit requirements within the available width, but traffic will still be limited to one direction at a time.

5.5.6 Foundations

Ground investigations (GI) are required in order to develop a suitable foundation arrangement for the bridge. The outline specification for GI is included in Appendix A. In order to provide a robust cost estimate, piled foundations have been assumed for this study.

5.5.7 Articulation

The new superstructure will be installed on permanent bearings forming a simply supported span.

5.5.8 Maintenance

Although the simply supported span has benefits in simplicity of construction, these benefits are potentially outweighed by additional maintenance costs including a requirement to repaint the structure every 15 years and replace bearing every 25 years throughout the 120 year design life for a new structure. Other assets that may need to be renewed over the design life of the structure include the surfacing, waterproofing and parapets. The costs associated with maintaining a bridge of this description are included in the cost estimate as part of the whole life cost.

Because the existing substructure is to be left in place it will require maintenance, inspection and potentially require repairs which would add to the total cost associated with this option.

5.5.9 Details

This option includes the following details, assumptions and exclusions:

Items included in this option are:

- Bridge would be designed for normal traffic up to 40t
- Topographical Survey
- Road realignment and earthworks.
- Preliminary Ecological Appraisal
- Flood Risk Assessment

- Scour survey
- River bed training or repairs, possibly underpinning, to existing substructure may be required following scour survey.
- Extensive river bank protection.
- Reduced amount of work in the river, so less liaison with SEPA required.
- Demolition and utility diversion work for services over bridge not required.
- Ground Investigation and Reporting -
- Maintenance costs include repainting every 15 years and bearing replacement every 30 years

5.5.10 Risks

Refer to Appendix B for a full risk assessment for this option.

While this option will be comparatively quick to construct, delaying the demolition of the existing structure and the associated utility diversions presents significant risk exposure. This is related to the ongoing deterioration of the existing structure and also the risk of scour damage to the foundations.

It has been assumed that the existing bridge will eventually need to be demolished and the utilities diverted onto the new structure. This is likely to be a more complicated operation as it will need to take place under the new structure.

Because the new structure is dropped in over the existing, the vertical road alignment over the bridge will need to be significantly adjusted. There is a risk that a non-standard vertical alignment will need to be adopted due to space constraints.

5.5.12 Construction Works Programme

The construction programme for this option is likely to be the shortest of options considered as the new bridge will arrive fully fabricated and just needs to be lifted or launched into place and minimal reliance is made on the existing structure.

5.5 Option 4a – New Wide Integral Structure

5.6.1 Description

This option considers the full demolition of the existing bridge and replacement with a new fully Eurocode compliant structure. The width of this structure option provides two traffic lanes plus a verge so provides a betterment on the existing bridge.

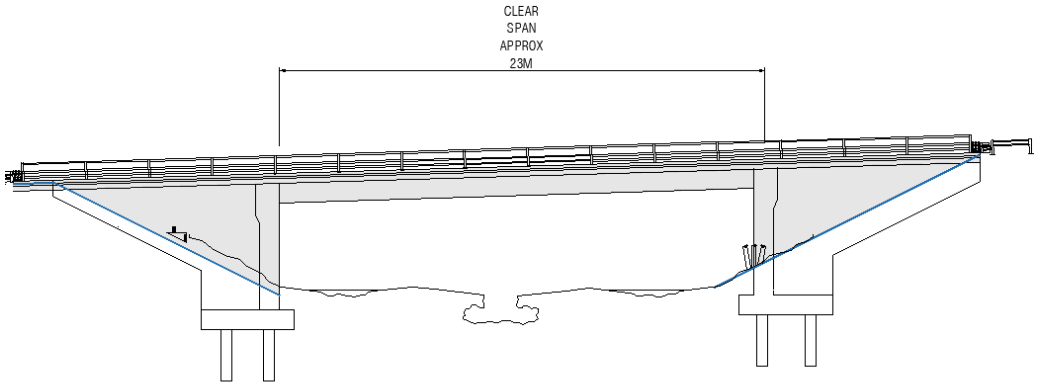


Figure 8 Elevation on Typical Integral Bridge Arrangement

5.6.2 Bridge location and span arrangement

Although there are several options for a new crossing location, it is likely that these would result in an increased span and significantly increased costs due to the required realignment of the carriageway. There would also be significant disadvantages from an ecological and environmental standpoint. A straighter alignment that eliminates the tight curve may provide benefits in terms of forward visibility and overall safety, but the lack of recorded accidents in this location means that that it is unlikely to provide value for money. This option therefore considers a new structure on the same alignment as the existing.

The new structure is a single span structure of approximately 23m. This reduces complications and risk associated with working in the watercourse. For this span range a suitable permanent replacement is an integral bridge. Integral bridges are generally required by current DMRB standards for smaller spans without a significant skew because the ongoing maintenance requirements are significantly less than a simply supported bridge on bearings. Because integral bridges do not have bearings, costs associated with bearing replacement are avoided. Joints between the superstructure and substructure are also avoided which should lead to a more durable structure overall.

5.6.3 Material Type

An integral bridge of this size can be formed with either steel beams or precast prestressed concrete beams each with a reinforced concrete deck slab. Simpler construction in reinforced concrete would not be feasible for this span range. It is not considered that the aesthetic

requirements for this bridge would be a priority, which increases the suitability of either a steel composite or prestressed concrete structure.

Steel composite bridge decks can have a slight advantage over prestressed concrete beams in terms of structural depth. In addition, their lower weight compared with concrete beams can lead to advantages in buildability through the use of a smaller crane for lifting. Traditional steel composite beams would require painting, typically every 15-20 years which can have a dramatic influence on whole life costs. Weathering steel can be used as an alternative where no painting is required. In weathering steel a stable patina develops forming a protective barrier to the steel underneath, resulting in a much lower corrosion rate compared to normal steel. Although there is no requirement to paint a weathering steel bridge, specific inspection monitoring points need to be agreed during the construction stage to ensure that the patina is developing as expected.

Prestressed concrete beams designed and manufactured in accordance with current standards should require no maintenance over the 120 year lifespan. There are a range of suppliers available and a range of standard beam types to ensure that a structurally efficient solution can be developed. For a span of this range a 'Y' beam would likely be the preferred choice.

For the purposes of this study, precast prestressed beams have been selected.

5.6.4 Cross Section

The existing bridge comprises a carriageway of approximately 3.9m width which allows passage of one vehicle over the bridge at any one time. For this option, it is proposed that the new bridge is wide enough to accommodate two traffic lanes plus a verge.

The bridge is likely to be used by cyclists and equestrians and therefore a parapet height of 1.8m above verge would be required for any compliant replacement structure. A separate verge area is of benefit as a refuge point for crossing pedestrians but will add to the cost.

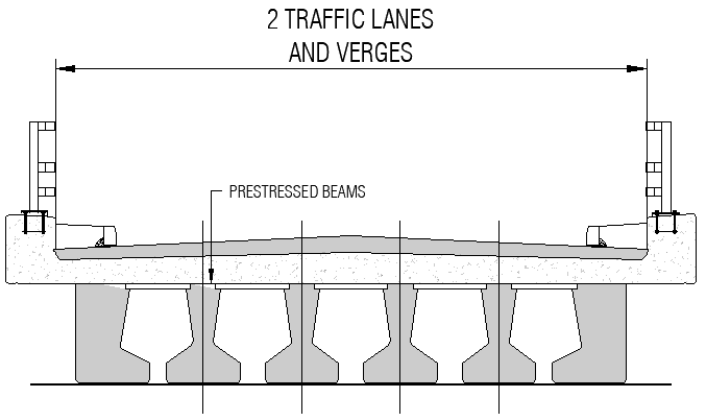


Figure 9 Wider Bridge Cross Section

5.6.5 Foundations

Ground investigations (GI) are required in order to develop a suitable foundation arrangement for the bridge. The outline specification for GI included in Appendix A. For the purposes of this study, piled foundations have been assumed.

5.6.6 Maintenance

A prestressed concrete beam bridge designed and manufactured in accordance with current standards should require no maintenance over a 120 year lifespan. A steel composite bridge from weathering steel would have slightly higher maintenance costs and a painted option would be significantly higher. The costs associated with maintaining a prestressed beam bridge of this description are included in the cost estimate as part of the whole life cost.

5.6.7 Details

In addition to the description sections above, this option includes the following details, assumptions and exclusions:

Items included in this option are:

- Bridge would be designed for normal traffic up to 40t plus any required abnormal loads
- Topographical Survey
- Road realignment and earthworks.
- Preliminary Ecological Appraisal
- Flood Risk Assessment
- Extensive river bank protection.
- Reduced amount of work in the river, so less liaison with SEPA required.
- Demolition and utility diversion work for services
- Ground Investigation and Reporting -
- Maintenance costs limited to inspections

5.6.8 Risks

The risk profile for this option is significantly lower than previous options discussed above. Moderate risks remain relating to risks common to any major contract in terms of weather delays, susceptibility to price rises and measures required for protected species. As these are all factors that can be managed through provisions in the construction contract, this option generally presents a lower risk profile to the Council.

Refer to Appendix B for a full risk assessment for this option.

5.6.1 Construction Works Programme

The construction programme for this option is likely to be one of the longer options. This is due to the increased size of the structure alongside demolition constraints associated with in channel river works. Full construction of new foundation and substructure will also increase time required to build this option.

5.6 Option 4b – New Integral Structure – Minimal Width

5.7.1 Description

This option considers the full demolition of the existing bridge and replacement with a new integral bridge structure. The width of this structure provides a single traffic lane plus a verge.

Much of the detail provided above for Option 4a applies to this option.

5.7.2 Cross Section

The existing bridge comprises a carriageway of approximately 3.9m width which allows passage of one vehicle over the bridge at any one time. For this option, it is proposed that the new bridge is wide enough to accommodate one traffic lanes plus a verge.

The bridge is likely to be used by cyclists and equestrians and therefore a parapet height of 1.8m above verge would be required for any compliant replacement structure. A separate verge area is of benefit as a refuge point for crossing pedestrians but will add to the cost.

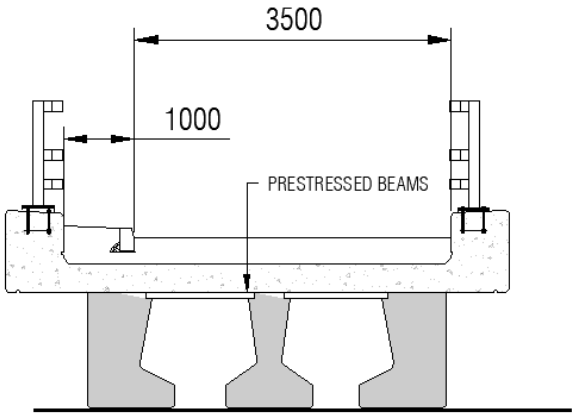


Figure 10 Typical Cross Section through 4b Prestressed Beam Bridge

5.7.3 Details

In addition to the description sections above and in Option 4a, this option includes the following details, assumptions and exclusions:

- Bridge would be designed for normal traffic up to 40t plus any required abnormal loads
- Topographical Survey
- Road realignment and earthworks.
- Preliminary Ecological Appraisal
- Flood Risk Assessment
- Extensive river bank protection.

- Reduced amount of work in the river, so less liaison with SEPA required.
- Demolition and utility diversion work for services
- Ground Investigation and Reporting -
- Maintenance costs limited to inspections

5.7.4 Risks

As with Option 4a, the risk profile for this option is significantly lower than previous options discussed above. Moderate risks remain relating to risks common to any major contract in terms of weather delays, susceptibility to price rises and measures required for protected species. As these are all factors that can be managed through provisions in the construction contract, this option generally presents a lower risk profile to the Council.

Refer to Appendix B for a full risk assessment for this option.

5.7.6 Programme

The construction programme for this option is likely to be one of the longer options, although will be shorter in duration than option 4a. This is due to demolition constraints associated with in channel river works and time required to install new foundation and substructures.

This option provides a fully compliant new structure that will minimise ongoing maintenance costs whilst providing a crossing that provides at least the same benefits as the existing bridge for traffic capacity. It is recommended that this option is considered for further development.

6 Risk

6.1 Introduction

A high level risk assessment has been developed for the key risks associated with each option. This has been developed in accordance with the guidance in the Scottish Government Risk Management Guide published in April 2021. Key risks are discussed in each option section and full risk matrices are included in Appendix B.

6.2 Risk Assessment

For each option discussed in this study the risks have been scored based on likelihood of occurrence and risk impact over 4 categories: financial, time, reputation and performance. The resulting risk ranking ranges from minor to significant.

It has not been possible to undertake a detailed quantitative risk assessment at this stage, but risk costs have been included in the cost estimates through a suggested range of uplifts to the basic estimates. These uplifts have been increased where greater cost risks have been recognised in the risk registers. While not quantifiable, reputational risks are also included in the analysis as these represent an important factor in decision making.

6.3 Summary of risk registers

Overall risk allowances for each option are summarised below:

	Option	Maximum reputational risk score	Maximum cost/prog risk score	Recommended cost range
1	Minimum	100	150	+100%, -10%
2	Repair Existing Structure	100	150	+100%, -10%
3a	Steel Overbridge/Reuse abutments. Demolish existing piers and superstructure	20	150	+100%, -10%
3b	Steel Overbridge with new abutments. Retain whole of existing structure beneath new structure	100	100	+100%, -10%
4a	New integral bridge – 2 lanes of traffic	10	50	+50%, -20%
4b	Minimum width integral bridge – 1 lane of traffic	20	50	+50%, -20%

Table 6-1 Summary of Risk Registers

6.4 Quantitative Risk

As part of the full business case, it is recommended that a cost quantitified risk analysis is undertaken. An assessment of the minimum, most likely and maximum impact each risk could have will be agreed and converted into a cost range where possible. Some risks are not quantifiable, for example reputational risks. Once each risk has been assessed for each option, a quantitative risk allowance can be calculated and incorporated into the cost estimates.

It is also recommended that a s multi-party risk workshops is also undertaken as part of the full business case process.

7 Cost

7.1 Introduction

With reference to the Association for the Advancement of Cost Engineering (AACE) document 98R-18: "Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Road and Rail Transportation Infrastructure Industries", this pre-feasibility stage of a project is categorised as a Class 5 estimate. The typical expected accuracy range for such cost estimates is -50% to +100%.

For options that comprise a complete replacement of the bridge, it is recommended that a range of -20% to +50% is applied to the cost estimate. As discussed above, due to the high number of unknowns relating to the condition of the existing structure it is recommended that for Options 1, 2 3a and 3b a range of -10% + 100% is applied to the cost estimates. Once more detailed cost estimates and fully quantified risk assessments have been completed, these ranges can be reduced. Cost estimates for each option are included in Appendix C.

7.2 Capital Cost

7.1.1 Pre-construction Costs

The pre-construction cost heading includes elements associated with the design and delivery of the scheme prior to any construction.

The preliminary and detailed costs account for a multi-disciplinary team to undertake the analysis, design and specification of the proposed bridge structure. This cost will include the production of the necessary deliverables to enable the procurement of a contractor to undertake the construction works.

To facilitate the detailed design of the proposed scheme, allowances have been included within each estimate for geotechnical and environmental surveys to take place during the preliminary design period.

As options are limited to replacement of the structure on the same alignment, no cost associated with land purchase have been included. Typical planning costs have been included.

7.1.2 Cost of Construction

The Direct Works element of the capital cost estimate has been produced based on the Method of Measurement for Highway Works (MMHW) and covers the elements of works from Series 0200 Site Clearance, to Series 3000 Landscape and Ecology

A Bill of Quantities (BoQ) was produced for the Direct Works, which covered each of the items identified as being required for the construction of the proposed bridge and east link road. Rates were then taken from Spons 2023, which accounted for the labour, plant and materials associated with each item on the Bill of Quantities to calculate an estimated Direct Works cost.

The Preliminaries, measured within Series 0100 in the MCHW, includes costs for project overheads and method related costs. The project overheads include allowances for the cost of site compounds, construction management on site, along with ancillary costs incurred during construction such as the testing of materials, site security, site transport and safety equipment. The method related costs include allowance for the transport/erection works required to construct the proposed bridge. An allowance of 25% of the total construction cost has been included for preliminaries for all options except Option 2. For Option 2 the temporary propping and increase work in the river channel is likely to both extend the programme and require increased temporary works. For this option the allowance has been increased to 60%.

7.1.3 Other Cost

To ensure that a robust allowance is included within the cost estimate, it was assumed that the water main and BT overhead line would have to be relocated at a budget cost of £100,000.

7.1.4 Optimism Bias

An allowance for optimism bias in line with recommendations in the HM Treasury Green Book has been provided within each of the capital cost estimates. Due to the early stage of the design, an allowance of 66% of the estimated base cost was provided and applied to each of the major cost headings.

7.1.5 Inflation

To present costs in real terms, the impact of inflation has been considered within the outputs included in this feasibility study. The estimates were produced at a 2023 price base, with a 3% annual rate of inflation assumed.

7.1.6 Cost Estimate Summary

Full cost estimates for each option are included in Appendix C. Overall budget capital costs including risks and 66% optimism bias for each option are summarised in Table 7-1.

7.3 Whole Life Cost (WLC)

A whole life cost analysis of the structure was carried out in accordance with CD 355 'Application of whole life costs for design and maintenance of highway structures'.

- The evaluation period is taken over 60 years as recommended in CD 355, rather than the entire expected life of the structure.
- The analysis evaluation period of 60 years was considered, with an inflation rate of 3.5% up to 30 years of service life and then 3% for the subsequent years of service. The costs have then been discounted in accordance with The Green Book.
- The maintenance cost associated with regular General and Principal Inspections at an interval of 2 and 6 years respectively according to CS 450 was applied to all options.
- Option 3a/3b – it is assumed that the maintenance cost for structural steel will require regular reapplying of a proprietary paint protective system with an interval of 15 years.

Option			Without 66% Optimism Bias				With 66% Optimism Bias		
			Lower Range	Likely Cost	Upper Range		Lower Range	Likely Cost	Upper Range
1	Do Minimum		£22,500	£25,000	£50,000		£37,350	£41,500	£83,000
2	Repair Existing Structure		£1,090,786	£1,211,984	£2,495,358		£1,810,704	£2,011,893	£3,957,387
3a	Overbridge/ Demolish		£1,122,911	£1,247,679	£2,495,358		£1,864,032	£2,071,147	£3,677,494
3b	Overbridge/ Retain		£940,614	£1,045,127	£2,090,254		£1,561,419	£1,734,911	£3,337,022
4a	New wider integral bridge		£1,129,254	£1,411,568	£2,117,352		£1,874,562	£2,343,203	£3,514,804
4b	Minimum width integral bridge		£921,566	£1,151,958	£1,727,937		£1,529,800	£1,912,250	£2,868,375

Table 7-1 Summary of Capital Costs

	Option		Whole Life Cost Estimate
1	**Do Minimum (inc demolition in 10 years)**		**£747,078**
2	**Repair Existing Structure**		**£309,208**
3a	**Overbridge/Demolish**		**£279,208**
3b	**Overbridge/Retain**		**£309,208**
4a	**New wider integral bridge**		**£84,840**
4b	**Minimum width integral bridge**		**£84,840**

Table 7-2 Summary of Whole Life Costs

8 Cost Benefit Analysis

8.1 Transport Analysis

A Transport Economic Efficiency (TEE) analysis covers the benefits ordinarily captured by standard cost-benefit analysis including: traffic volumes, journey times, driver frustration and travel time reliability.

Scottish Transport Appraisal Guidance (STAG) further details TEE analysis as a process that captures the main impacts of an option in terms of economic welfare, as represented by the main costs and benefits of users and operators of the transport system. These impacts are expressed in terms of monetary values, by Cost-Benefit Analysis (CBA), which are added together and discounted to produce a Net Present Value (NPV).

Based on the information provided, approximately 250,000 vehicles are estimated to have used Cloddach Bridge in 2020. A Department for Transport 'High' growth factor of was applied to the 2020 approximate annualised traffic flows to approximate future year traffic flows for 2031. This results in the prediction that traffic flows of over 280,000 vehicles could use Cloddach Bridge annually by 2031.

For a cost benefit analysis, traffic forecasts would include up to 15 years of traffic growth from year of opening in assessing benefits of a scheme, following that no growth in traffic would be used up to the horizon year (60 years beyond opening). However, current transport policy objectives, such as 20% reduction in car kilometres by 2030, should offer some mitigation.

Whilst there may be transport users whose travel patterns do not change but who enjoy time saving and/or other benefits, this study does not take these into account. The main benefits will be from diverting users, who switch from other routes because of changes in relative (generalised) costs.

It should be highlighted that the appropriateness of the supplied traffic flow information should be borne in mind, as the survey was undertaken during the COVID-19 pandemic, in the run up to Christmas, and is likely to be non-representative of neutral traffic conditions.

8.1.1 Traffic Routes & Distribution

In the absence of traffic surveys/modelling of the network, a desktop exercise was undertaken, utilising Google maps/directions, to establish details of traffic routing in scenarios where Cloddach Bridge remains closed (do-nothing / do-minimum) versus open (do-something). Edgar Road was used as a proxy origin/destination for Elgin, given its central location, employment/retail nature and proximity to local amenities and facilities (including primary and secondary schools). While the A941/Rashcrook Road junction was assumed as the origin/destination for journeys to / from the south, both of which would benefit from the re-opening of Cloddach Bridge.

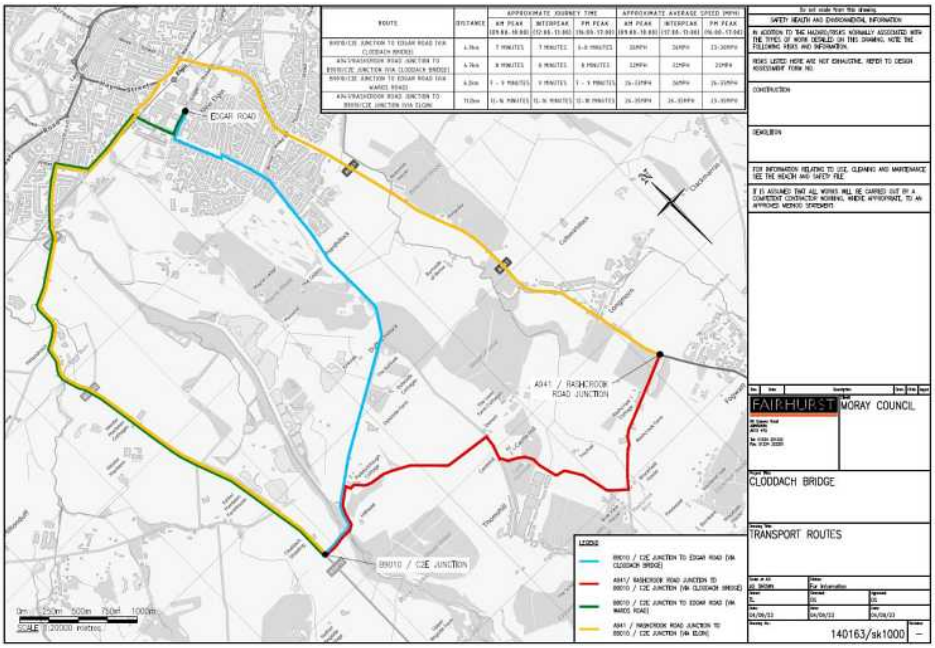


Figure 11 Traffic Routing Details

In the absence of traffic surveys of the surrounding road network, to estimate origins/destinations, traffic flow data, from 2019, was obtained from the Department for Transport for the A96 and A941. These flows were used as a proxy to estimate potential traffic distribution, shown below in Figure 12, and infer an eastbound traffic distribution of 88% to the A96 and 12% to the A941. This distribution was assumed to apply to westbound traffic in reverse, again, in the absence of traffic surveys of the local road network or any other relevant data.

DfT Traffic Flows A941 - (North St - Thornhill Rd junctions)			
2019 (Estimated)			
Northbound (westbound)	2695	Combined	**5191**
Southbound (eastbound)	2496		
DfT Traffic Flows A96 - East (Greyfriars St - Reiket Lane junctions)			
2019 (Estimated)			
Eastbound	11361	Combined	**22549**
Westbound	11188		
DfT Traffic Flows A96 - West (Morriston Rd - A941 junctions)			
2019 (Estimated)			
Eastbound	8045	Combined	**16847**
Westbound	8802		
Assumed traffic distribution (eastbound to bridge) to Elgin/A941 & (Westbound to B9010) B9010/C2E			
Total traffic	44587		
Northbound A96 (Elgin)	39396		**0.88** %
Southbound A941	5191		**0.12** %

Figure 12 Traffic distribution

8.1.2 Journey Times

In the absence of any traffic surveys/modelling, average journey times were estimated, utilising Google maps. Average journey times for the AM/Inter/PM peak periods were generated. Route distances were also established through use of Google maps in the absence of any alternative data.

To provide context, according to the Moray Council Active Travel Strategy, 2016-2021, 64.6% of all journeys within Moray are 5km or less. For the do-nothing scenario (bridge remains closed to traffic) represents at least a 6.5km additional journey distance for origins/destinations to the south and 1.3km additional journey distance for trips to/from Edgar Road, that are considered significant increases.

Annualised traffic flows for 2020 and 2031 were applied to the identified traffic routing options. This provides an estimate of vehicle kilometres travelled annually for each route. This methodology forecasts the distance travelled by vehicles increasing by up to 480,000km annually in 2020, due to Cloddach Bridge being closed. This increases to an additional approximate 546,000 km annually travelled by vehicles in the 2031 forecast.

8.1.3 Journey Time Savings

A high-level journey time savings assessment, utilising WebTag Data Book (May 2023 v1.21) values to monetise working time was undertaken for Option 4A. As the costliest option under consideration, this will act as a sense check for the potential for sufficient benefits to be derived to generate value for money of the other options being considered. Route average journey travel time differences between Cloddach Bridge remaining closed (do-nothing) versus being re-opened (do-something) were taken from the Google map journey time estimates.

This high-level journey time savings assessment has made use of several assumptions including:

- Use of average daily figure is robust for car mode, with business journey purpose proportion greater in the morning and midday periods;
- Traffic growth has only been applied until an opening year of 2025;
- NRTF low growth factor has been used, local growth is currently unknown;
- 12-hour traffic flows are derived from the available traffic count information;
- Journey time savings are based on 2023 estimates;
- No account of do nothing & do minimum costs nor future increases in journey times on alternative routes has been considered;
- Traffic annualising figure have been taken from the Transport User Benefit Appraisal (TUBA) manual and doesn't take account of any local factoring;
- Maintenance of existing road infrastructure cannot be estimated at this time.

The results of this high-level journey time savings comparison against the construction costs show a near 60 year pay-back period for the investment, which can be confirmed through a formal calculation of benefits to cost ratio.

8.2 Discussion of Benefits

A review of the available traffic survey information has been undertaken. While it is not possible to provide definitive cost benefit analysis at this stage, the presented high-level assessment would suggest that the closing of Cloddach Bridge affected a substantial number of vehicles, likely increasing year on year with background traffic growth. The assessment concludes that those previously observed using the bridge in 2020 are now travelling an additional annual travel distance of approximately 480,000km, with the average rerouting distance of around 1.92km per vehicle

When considering benefits in terms of saved travel time alone, if a replacement structure has a cost in the region of £2,800,000 (such as Option 4a), the benefits over 60 years would likely exceed the cost of construction for any replacement bridge option under consideration, as indicated by the high-level journey time savings assessment. The full potential users' benefits associated with the construction of a replacement bridge have not been fully investigated and does not include vehicle operation cost (VOC) benefits. Improved VOC would come from reduced fuel consumption levels associated with a reduced travel distance with a replacement bridge at Cloddach, likely reducing the time period for benefits to outweigh construction costs. Similarly, active travel benefits have not been investigated at this stage.

It is considered that the benefit to cost ratio for any of the options discussed is very likely to be favourable, with specific cost benefit calculations to be undertaken as part of the next stage of the project.

9 Recommendations

9.1 Business Case Development

In order to fully assess the benefits to the local community of opening the new bridge, it is recommended that a full business case is undertaken. This business case development should be undertaken in conjunction with the detailed surveys required in order to further develop the design. Undertaking these surveys will allow the risk of current unknown aspects to be more fully understood and quantified for the full business case.

9.2 Engineering Options

Option 1 could be a workable solution to extend the life of the bridge for pedestrians and cyclists if a scour survey is undertaken in near future and results support continued use.

There may be benefits to Option 2 in terms of re-use of materials, this option provides the lowest assurance for long term service life, along with the longest programme, highest risk of unknowns in breakout and repair of the existing structure. This option does not provide any benefits in improvement of the existing situation in terms of width or flood alleviation. It is therefore not recommended that this option is progressed.

As per option 2 benefits in terms of re-use of materials, option 3a provides the lowest assurance for long term service life, along with the longest programme, highest risk of unknowns in breakout and repair of the existing structure. This option does not provide any benefits in improvement of the existing situation in terms of width or flood alleviation. It is therefore not recommended that this option is progressed.

Option 3b appears to be attractive due to the short construction programme. However, as a non-integral structure this bridge form would require increased inspection and maintenance compared with other. The 'off the shelf' nature also means it is less flexible to project specific requirements including specific span and width requirements. Leaving the existing structure in place in the short/medium term also means it is retained as a liability and will require ongoing inspection before eventual demolition. Demolition will also be more complex due to the presence of the overbridge. It is therefore not recommended that this option is taken forward.

Although a fully compliant wider bridge option 4a is an attractive solution, however there is little evidence that this is required from a safety perspective. A minimum width bridge may be seen to better meet the balance of public need and capital cost to functionality.

Option 4b provides a fully compliant new structure that will minimise ongoing maintenance costs whilst providing a crossing that provides at least the same benefits as the existing bridge for traffic capacity. It is recommended that this option is considered for further development.

9.3 Transport Assessment and Modelling

The surrounding road network affected by the closure of Cloddach Bridge is not contained within the existing Moray Firth Traffic Model or Aberdeen Sub Area Model areas. In order to undertake

a formal benefit to cost ratio for all options under consideration, in accordance with STAG guidance associated with TEE analysis, it is recommended that the following work is undertaken as part of a full business case:

- Undertake a review to identify the location and number of required junction turning count and automatic traffic surveys to be carried out of the surrounding local/strategic road networks, including routing through Elgin, to suitably inform data entry to a traffic model;
- Identifying of Origin-Destination data to inform the traffic model of trip generation zones and likely redistribution of traffic under open versus closed Cloddach bridge options;
- Undertake contemporary journey time surveys to accurately determine alternative routing times;
- Calibration and validation of a traffic model;
- Use of the TUBA manual for calculating user benefits associated with the TEE analysis;
- Undertaking a Walking Cycling and Horse-riding assessment, in accordance with DMRB GG 142 'small highway scheme', to establish potential impacts on option selection and inform non-motorised user benefits and community accessibility impacts.
- The current Department for Transport (DfT) data workbook should be used to assign the traffic to appropriate classes and the costs used to quantify the associated benefits over the lifetime of the bridge.

This additional modelling and analysis will allow the quantification of benefits with enough confidence to develop a quantified benefit-cost ratio for the replacement of the bridge.

9.4 Site Investigations

The following surveys and investigations are recommended as part of the full business case:

- Topographical Survey
- Bathymetric/Flood Risk Survey
- Scour survey local to the bridge
- Preliminary Ecological Appraisal with further specific surveys as required.
- Geotechnical Investigation

9.5 Programme and Cost

9.4.1 Business Case Costs

Budget costs associated with the recommended surveys and traffic modelling for the completion of a full business case are included in Table 9-1. This includes all recommended surveys and the full scope of traffic modelling recommended in order to fully inform a business case.

Business Case Estimated Costs		Cost	Duration	Notes
Transport Surveys		£20,000	3 weeks	Should be undertaken during school term time and avoid extreme weather.
Transport Modelling and completion of quantitative Cost Benefit Analysis		£50,000	18 weeks	
Site Investigations: Budget Costs	Topographical Survey (including bathymetric/ flood survey scope)	£20,000	2 weeks	
	Geotechnical Investigation	£40,000	3 months	
	Geotechnical Reporting	£7,000	1 week	
	Flood Study	£15,000	4 weeks	
	Preliminary Ecological Assessment	£10,000	4 weeks	
Outline Bridge Design		£10,000	4 weeks	Update to cost estimates informed by other SI results
Business Case Compilation		£25,000	4 weeks	
TOTAL		**£187,000**		

Table 9-1 Summary of Business Case Costs

9.4.2 Business Case Programme

The lack of existing traffic information in this region of Moray means that extensive survey and modelling is likely to be required in order to fully inform the potential benefits of a bridge replacement and therefore the business case. This aspect of the business case is the principal factor in extending the programme duration. An estimated programme is illustrated in Figure 13.

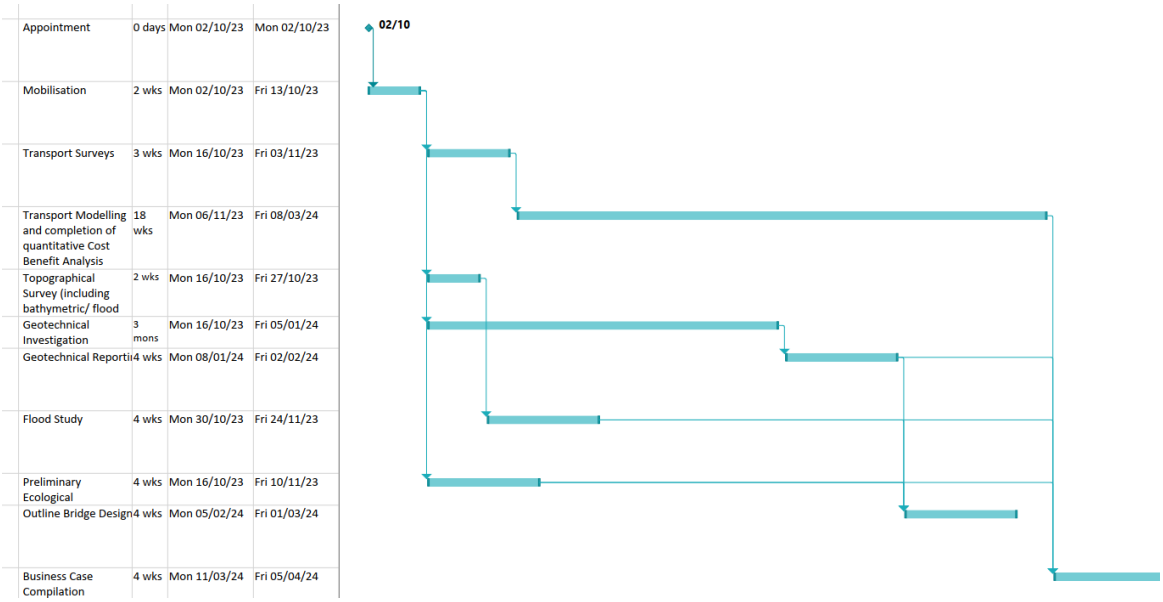


Figure 13 Estimated Business Case Programme

9.6 Conclusion

The study has examined various options available to reopen Cloddach Bridge to traffic. It is recommended that Option 4b is taken forward to full business case as the next stage of this project.

Appendix A – GI Specification

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GROUND INVESTIGATION AT CLODDACH BRIDGE, ELGIN

SPECIFICATION & BILL OF QUANTITIES

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Employers:

Moray Council

Council Office
High Street
Elgin
IV30 1BX

Engineer:

Fairhurst

Westerton of Craigie
Southampton Road
Dundee
DD4 7PN

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CONTRACT FOR GROUND INVESTIGATION AT CLODDACH BRIDGE, ELGIN

SPECIFICATION & BILL OF QUANTITIES (APPENDIX 1)

Contract Document Ref: 140136 DOC 02			
	Name	**Signature**	**Date**
Prepared by	Ross McIlrath	R. McIlrath	August 2023
Reviewed by	Andrew Kram	Andrew Kram	August 2023
Approved by	Andrew Kram	Andrew Kram	August 2023

Revision Record	Rev.	Date	Status	Description	Signature	
	1				Prepared By	
					Checked	
					Approved	
	2				Prepared By	
					Checked	
					Approved	

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CONTENTS

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SPECIFICATION &
PREAMBLE TO BILL OF QUANTITIES

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SPECIFICATION

The Specification shall be **Specification for Ground Investigation** published by Thomas Telford Services Ltd in 1993, with information, amendments and additions as described in the Schedules.

Schedule 1.	Information
Schedule 2.	Exploratory holes
Schedule 3.	Engineer's facilities
Schedule 4.	Specification amendments, additions and deletions
Schedule 5.	Specification for further items of work (divided into Annexes A to I as required)

SCHEDULES

Schedule 1: Information

S1.1 Name of Contract

The Contract is to be called:

Ground Investigation at Cloddach Bridge, Elgin

The Client's name and address are:

Name (s): ***Moray Council***

Address (s): *Council Office, High Street, Elgin IV30 1BX*

Access to the site should be arranged through:

Fairhurst, Westerton of Craigie, Southampton Road, Dundee, DD4 7PN

S1.2 Description of Site

The Cloddach Bridge is located at National Grid Reference NJ 20173 58396. The bridge is a single track road bridge (currently closed) located approximately 3km to the south-west of the town of Elgin and crossing the River Lossie Burn in an approximate East-west direction. A ground investigation Plan is presented **Drawing 140136/9000**, **Appendix 4**.

S1.3 Purpose of this Contract

This is seen as the *'Design'* investigation under BS 5930:2015+A1:2020 and BS EN 1997-2:2007, consisting of boreholes and trial pits and insitu testing locations as exploratory positions. At locations of trial pits and boreholes, ground conditions through visual assessment and obtain bulk soil samples for laboratory testing and perform in-situ geotechnical testing and record groundwater strike levels in order to provide relevant data to inform the design foundations and earthworks of the proposed development.

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S1.4 Scope of Investigation

The scope of this investigation is anticipated to be in two phases, as summarised below;

Phase 1 (Site Walkover & Ecology Consultation)

- Site walkover to assess safe access routes to proposed borehole and trial pit positions
- Consultation with Ecologist to approve temporary access works design and proposed fieldworks to be undertaken adjacent to the existing watercourse (River Lossie) and areas of existing Woodland.

Phase 2 (Main Ground Investigation Fieldworks)

- 4 no. Rotary Percussive Boreholes (BH01 – BH04) to 15.0mbgl including minimum 6.0m rock core should solid geology be encountered within scheduled drilling depth of 15.0m;
- 4 no. Trial Pts (TP01 – TP04) targeted to areas of river bank adjacent to exiting bridge foundation to confirm foundation strata.

Boreholes BH01 and BH04 will be followed by the installation of monitoring standpipes for Groundwater level monitoring purposes.

Phase 2 (Post Fieldwork Groundwater Level Monitoring)

- 4 no. Groundwater Level monitoring visits over a 1 month monitoring period at boreholes BH01 and BH04.

A Ground Investigation Plan is presented in **Drawing 140163/9001**, **Appendix 4**.
A groundwater monitoring method statement is presented in **Appendix 6**.

S1.5 Geology and ground conditions

Superficial Geology

The 1:50,000 BGS mapping noted the superficial deposits at the site comprise Alluvium and River Terrace Deposits (Undifferentiated) Gravel, Sand, Silt and Clay and Glaciofluvial Ice Contact Deposits of Gravel, Sand and Silt.

Solid Geology

The 1:50,000 BGS mapping noted the solid geology comprises the Spey Conglomerate Formation - Conglomerate. The BGS mapping shows there is no geological faulting located within the vicinity of the site.

S1.6 Schedule of drawing(s) and documents

Appendix 1

- 140163 DOC 01 Bill of Quantities Issue 1

Appendix 2

- Laboratory Limits of Detection (Soils, Leachate and Water)

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Appendix 3
- 140163 DOC 03 CDM Design Assessment Form

Appendix 4
- 140163/9001 Ground Investigation Layout

Appendix 5
- Public Utilities
- Site Walkover Photographs

Appendix 6
- Groundwater Monitoring Methodology

S1.7 Particular Contract restrictions

Entry to the site will not be possible until specific method statements, risk assessment and copies of insurance documents are provided and approved.

S1.8 Particular general requirements (Section 3)

Work may take place on site between the hours of 8am and 6pm, Monday to Friday. Work outside these hours may take place only with the prior agreement of the Engineer (Clause 3.8).

All reinstatement shall be to the requirements of Clause 3.9.

The Contractor is responsible for providing their own supervision to ensure the requirements of the Specification are met (Clause 3.12).

The accuracies specified for setting out (Clause 3.14) and levelling (Clause 3.15) are appropriate.

There are special traffic management requirements with regard (Clause 3.22).

The Contractor is required to work to a Quality Management system established in accordance with BS 5750 (Clause 3.23). Details shall be provided prior to the commencement of work on site.

Drillers employed on the Contract shall be BDA accredited (or equivalent) or else the supervision requirements of Clause 3.24 (2) shall be followed.

S1.9 Particular borehole requirements (Section 4)

At ground level before boring commences, the initial casing diameter shall be sufficiently large to ensure that the borehole can be completed to its scheduled depth.

Backfilling of boreholes with soil arisings is not permitted (Clause 4.6), unless otherwise agreed with the Engineer. All boreholes shall be backfilled as instructed by the Engineer.

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A borehole remaining open overnight shall be covered. Before the first sample of the new day is taken the boring shall be advanced for at least 0.3m.

S1.10 Particular pit and trench requirements (Section 6)

The Contractor will require excavating inspection pits of sufficient size for the location of underground services if it is believed they are necessary (Clause 6.1).

The use of mechanical plant is permitted (Clauses 6.2 and 6.3).

Trial pits and Observation pits shall have the minimum dimensions specified in Clause 6.4.

Pits and trenches shall be backfilled using excavation plant in the manner specified in Clause 6.7

Artificial lighting shall be used where necessary when taking photographs of pits and trenches (Clause 6.9).

S1.11 Particular sampling requirements (Section 7)

Special sampling required under Clause 7.7 is specified in Schedule 5, Annex A. Samples shall not be disposed of until 28 days after submission of the approved final report. The Engineer shall be given notice of at least 1 week before the disposal of samples. The notice shall be in writing (Clause 7.13).

Environmental sampling will not be required however any visual olfactory evidence of soil or groundwater contamination should be reported to the engineer and recorded in detail within the engineer's logs.

Geotechnical sampling will be required as well as laboratory analysis to assess the physical nature and geotechnical properties of the encountered materials. This will comprise;

- Bulk sampling at 1.0m intervals from all trial pit and borehole positions
- Large Bulk sampling at 1.0m intervals from all trial pits
- Undisturbed open tube (U100) samples in cohesive superficial deposits in each borehole location at alternating 1.5m intervals with SPT tests. First SPT test to be undertaken 1.20mbgl.

Open tube and piston samples are to have a 98mm internal diameter (Clause 7.3). Soil samples shall be at least 300mm long.

S1.12 Particular in situ testing requirements (Section 8)

The following in situ tests scheduled in Clause 8.3 shall be carried out:

- In-situ Hand Shear Vane testing at 1.00m intervals in cohesive deposits where encountered.

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- In-situ SPT tests are to be undertaken at 1.50m intervals (commencing at 1.20mbgl) or alternating with U100 samples at 1.00m/1.50m intervals where appropriate in cohesive deposits in all boreholes.

S1.13 Particular instrumentation and monitoring requirements (Section 9)

- Groundwater level monitoring is required (2 visits over 1 month)
- Ground Gas/Vapour and groundwater sampling is not required, however, this will be reviewed following findings from the initial ground investigation works.

The Groundwater Level monitoring will be required in all boreholes (BH01 – BH04).

S1.14 Particular daily report requirements (Section 10)

- Daily Engineers logs must be sent to the engineer via e-mail or fax at the end of each drilling shift.
- Grid north may be taken as magnetic north (Clause 10.2).
- The Engineer should be contacted immediately following the completion of each trial pit.

S1.15 Particular laboratory testing requirements (Section 11)

For the chemical testing schedule

The Contractor is required to prepare a blank test schedule for both chemical and geotechnical testing (Clause 11.1), giving on one axis the following information:

- Borehole and Trial pit number
- sample number
- sample type
- sample depth

For the geochemical schedule on the other axis the following standard laboratory tests shall be listed

- Arsenic
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Copper
- Nickel
- Zinc
- Sulphate – water soluble, 2:1 extract
- pH value
- TPH
- PAH (USEPA 16 speciation)
- Asbestos Screen (identification)
- Asbestos Quantification

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- Organic Matter

For the geotechnical schedule on the other axis the following standard laboratory tests shall be listed

- Moisture content
- Atterberg Limits
- Particular size distribution by Wet sieving
- Particular size distribution by pipette
- Specific gravity of soil particles
- Organic matter content
- California Bearing Ration (CBR): Recompacted
- Moisture Condition Value (MCV)
- Sulphate and pH of water sample
- Sulphate and pH of soil sample (with BRE 363 dependent option of water: soil extract)
- Small direct shear box (60mm x 60mm box) test (leave space for pressure range to be specified)
- Quick triaxial test on 100mm diameter specimen (leave space for cell pressure to be specified)
- Oedometer (leave space for pressure range to be specified)
- Natural Moisture Content of rock materials
- Bulk Density of rock by linear measurement
- Uniaxial Compressive Strength (UCS) test on rock
- Point Load Test (PLT) on rock
- Three blank columns for other tests

These draft schedules sheets are to be submitted to the Engineer with the preliminary logs, required under Clause 12.1.

There are no further requirements for rock tests (Clause 11.4). No laboratory testing is to be carried out on site (Clause 11.6). Special laboratory test requirements under Clause 11.7 are specified in Schedule 5, Annex C.

S1.16 Particular reporting requirements (Section 12)

The locations of the exploratory holes should be related to National Grid Coordinates (Clause 12.2.2).

Digital data are required (Clause 12.4 and Appendix III). In accordance with Clause AIII.4, preliminary digital data is to be issued to correspond with preliminary paper records.

An interpretative report is not required (Clauses 12.5 and 12.7). No additional information is required in the factual report (Clause 12.6). Where an interpretative report is required, it should include the information specified in Schedule 5, Annex I.

One fast-bound copy of the final factual report is required (Clause 12.8). In addition the Contractor shall provide one digital master of all pages and drawings in the Report. The copyright of the Report shall be deemed to be vested in the Employer.

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S1.17 Particular requirements relating to potentially contaminated land

The investigation is over potentially contaminated made ground materials. Details concerning the suspected hazards are given below (Clause H.2.1)

The presence of contaminated made ground (visual and olfactory) must be reported to the engineer via telephone or e-mail when encountered or at the end of the excavation of that particular exploratory position.

The Contractor shall provide hygiene and decontamination facilities appropriate for a BDA **YELLOW** classified site to control the risks to health and safety of site operatives and site visitors (Clause H.2.2). These shall as a minimum include protective clothing and dust masks. The wheel wash can comprise a powered spray, with which all equipment leaving the potentially contaminated land shall be cleaned.

The Contractor must ensure that no vertical migration of contamination into the natural ground occurs during the drilling process.

All equipment shall be thoroughly cleaned before being used on site. Jet washing equipment shall be provided to wash down equipment and tools before starting each exploratory hole. At the instruction of the Engineer, it may be necessary to clean the equipment and tools between strata, specifically at the boundary between made ground and natural strata.

Full time attendance of an environmental scientist with a minimum of four years relevant experience shall be provided during all work in connection with the potentially contaminated land. The Contractor shall provide the Engineer with the CV of the proposed environmental scientist for approval before work commences on site.

Soil and water samples shall be taken by the environmental scientist. All sampling protocols, preservation techniques, sample containers and time to analysis shall comply with EN ISO 5667-3: 1996 BS 6069: Section 6.3: 1996, Guidance on the preservation and handling of samples.

Samples for organic testing shall be stored in borosilicate glass jars (Clause H.5.1). Samples for metals analysis shall be stored in plastic containers and shall be fixed on site where necessary. All testing shall be started within 48 hours of sampling.

Upon completion of each exploratory hole, the Contractor shall give the Engineer a schedule of samples taken. The Engineer will then specify which samples are to be analysed and which analyses are to be undertaken. The range of analyses anticipated is indicated below along with the required level of detection. Details of dependent options are given below.

The final results of the chemical analysis of samples shall be reported to the Engineer within fourteen days of sampling, in a draft report.

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Schedule 2: Exploratory positions

Location	Item description	Scheduled Depth	Location
BH01 – BH04	Rotary Percussive Borehole	15.00mbgl (+ 6.00m rock core sample should solid geology be encountered within scheduled drilling depth)	**140163/9001, Appendix 4**
TP01 – TP04	Mechanically Excavated Trial Pits	4.00mbgl	

Schedule 3: Engineer's facilities

S3.1 Accommodation

Accommodation for the Engineer's Representative shall not be required.

S3.2 Furnishings

Not applicable.

S3.3 Services

Not applicable.

S3.4 Equipment

Not applicable.

S3.5 Transport

Not applicable.

S3.6 Protective clothing for Engineer

Not applicable.

Schedule 4: Specification amendments, additions and deletions

Clause 1.1

Add new paragraph:

"Where there is conflict between the information given in the Schedules and the Specification or standards referred to in the Specification, the requirements of the Schedule shall take precedence".

Clause 3.1

Add:

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"If an equivalent standard is to be used, full details are to be provided to the Engineer at least 3 working days prior to the commencement of work on site".

Clause 3.10

Insert in line 2 after "reported".

"immediately and under no circumstances longer than 24 hours from the receipt of the complaint".

Clause 3.26

Add: new Clause 26 **Standing Time**

"The Engineer shall be notified immediately that standing time starts to be incurred. The duration of standing time shall be agreed with the Engineer."

Clause 12.4

Insert in line 2 after "Appendix III".

"if required in Schedule 1"

Clause 12.8

Add:

"The number of copies of the final factual report which are required are specified in Schedule 1".

Appendix I

AI.3 Pneumatic or Vibrating wire piezometers

"Pneumatic or vibrating wire piezometers may be installed in boreholes. Only proprietary products specifically designed as piezometers by the manufacturer shall be used. The method of installation shall follow that for standpipe piezometers, except where there is conflict with the manufacturer's recommendations in which case the manufacturer's recommendations shall be followed. The porous piezometer tip shall be maintained so as to be completely saturated when it is installed in the borehole. The operation of the piezometer shall be verified before installation (where possible) by measuring the water pressure it records as it is installed in the borehole."

"For vibrating wire piezometers, the Contractor shall record the atmospheric pressure at the time of the water pressure reading and shall correct his reading to allow for atmospheric pressure".

Schedule 5: Specification for further items of work

The following annexes are used:
Annex H : Ground investigation on potentially contaminated land

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PREAMBLE TO BILL OF QUANTITIES

BILL OF QUANTITIES FOR GROUND INVESTIGATION

Preamble

1. In this Bill of Quantities the sub-headings and item descriptions identify the work covered by the respective items. The text in bold italics is intended to identify amendments made to the standard preamble. The exact nature and extent of the work to be performed shall be ascertained by reference to the Conditions of Contract, the Specification and the Schedules and Appendices to the Specification, as appropriate. The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the work covered by the several items, including the following unless stated otherwise.

   a) Supervision, labour and all costs in connection therewith.
   b) The supply of materials, goods, storage, facilities and services, and all costs in connection therewith, including wastage and delivery to site.
   c) Plant and all costs in connection therewith.
   d) Fixing, erecting and installing or placing of materials and goods in position.
   e) All temporary works.
   f) All general obligations, requirements, liabilities and risks involved in the execution of the investigation as set forth or implied in the documents on which the tender is based.
   g) Establishment charges, overheads and profit.
   h) Bringing plant and sampling and in situ testing equipment to the site of each exploratory hole; erecting, dismantling and removing on completion.
   i) Removal of all equipment and services from site on completion.
   j) Reinstatement.
   k) Washing down of equipment as required to prevent cross contamination.
   l) Protection of the ground to prevent contamination from arisings as required.

2. All items not deleted from section A of the Bill of Quantities (General items and provisional sums) shall be priced and all items in subsequent sections against which quantities are entered shall be priced.

3. Where rates are not priced they shall have £0.00 placed against them.

4. Professional attendance associated with the description of cores and samples, ***the logging of pits and trenches*** and other duties as required by the Contract shall be included in the appropriate rates. When full time professional attendance on site is required in accordance with Clause 3.12 this shall be paid for under Appendix A of the Bill of Quantities.

5. The item for photograph shall allow for the standing time of associated plant, and supply of CD containing all digital photographs, prints and bound volume.

6. Rates for moving plant and equipment to the site of each exploratory hole shall allow for the formation of access routes, and making - good access routes and working areas on completion as required by the Contract.

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7. The rates for moving rotary drilling plant to the site of each hole shall include for setting up over a previously formed borehole.

8. Payment for forming exploratory holes shall be based on:

a) full thickness of strata investigated and described in accordance with the Specification
b) depths measured from ground level
c) depth measured from original ground level where an inspection pit has been excavated.
d) that part of a drillhole below the bottom of a borehole where a drill hole has been ordered to continue from the bottom of a borehole
e) core recovery of at least 90% in any core run, unless the Engineer is satisfied it cannot be achieved
f) volume calculated as measured length x measured depth x specified width for trial and observation trenches.

9. Rates for forming exploratory holes shall allow for:

a) casing installation where necessary, and removal ***and for any casing not recovered, including that necessary to prevent cross contamination as required***
b) dealing with surface water ***and the formation of temporary grout plugs***
c) backfilling with arisings
d) supply of daily report and preliminary log
e) additional site supervision of non-accredited drillers
f) disposal off site of excavated material not required for reuse ***but excluding material regarded as hazardous or special waste***
g) washing down of equipment as specified
h) measures to prevent cross-contamination between strata.

10. Standing time shall be measured as the duration of time for which plant, equipment and personnel are standing on the instruction of the Engineer or in accordance with the Contract. Standing time shall be paid for interruption of the formation of exploratory holes to record groundwater entry in accordance with Clause 9.1.1. The rates for standing time shall allow for:

a) plant equipment and personnel
b) consequential costs
c) changes in the programme of working
d) recording information and preparing daily report.

11. The rates for hourly provision of pitting and trenching crews and equipment at locations as directed by the Engineer shall allow for compliance with the requirements of the Contract, including preparation of records.

12. The rates for sampling and in situ testing shall allow for the standing time of associated plant. Where in situ testing is paid for on an hourly basis, the time measured shall be the actual time taken to carry out the test in accordance with the Engineer's instruction and/or the Specification but excluding the time taken to erect and dismantle test equipment where this is itemised separately.

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13. The rates for installation of instruments shall allow for:

a) clearing and keeping hole free of unwanted materials
b) all costs associated with equipment, installation, specified seals, surround, backfill materials excluding backfill below the instrument ***and surface terminal (if appropriate)***
c) proving correct functioning
d) delays due to installation.

14. The rates for testing shall include for:

a) the supply of a copy of the preliminary test results to the Engineer
b) the cost of moisture content or density determinations where they form part of the test
c) the time of the personnel carrying out the test.

15. The rates for recording of water level or gas measurement shall allow for notices of re-entry to the Engineer, owners or occupiers affected by the location or access route.

16. Appendix A to the Bill of Quantities (Rates for geotechnical and other personnel) shall be priced. The rates given will be used by the Engineer to make an initial estimate of costs where applicable of employing the Contractor's staff in accordance with Clause 3.13 of the Specification.

17. Items for the supply of the master and copies of the interpretative report shall exclude costs covered by Appendix A to the Bill of Quantities.

<u>Units of measurement</u>

18. The following abbreviations shall be used for the units of measurements:

Millimetres	:	mm
Metre	:	m
Kilometres	:	km
Square millimetres	:	mm^2
Square metre	:	m^2
Cubic metre	:	m^3
Square metre per day	:	m^2/day
Kilogramme	:	kg
Tonne	:	t
Sum	:	sum
Number	:	nr
Hour	:	h
Week	:	wk
Vehicle week	:	v.wk
Item	:	item
Day	:	day
Specimen day	:	sp.day

19. The rates for observation pits and trenches shall allow for all necessary shoring and shoring crew. For all hand-dug pits and trenches, the rates shall allow for working

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within a properly shored excavation. The size of a hand-dug pit or trench shall be sufficient to allow the excavation to be progressed to its scheduled depth. The rates for all pits and trenches should allow for the excavator, driver and technical assistant to log the pit and trench, take samples and carry out tests, and any washing down of equipment between locations.

20. The rates for performing laboratory tests of long duration shall include for all costs incurred whilst working outside normal hours.

21. Quantities associated with Items A7 and A8 will be reimbursed at cost on production of receipts.

22. The rate for provision of an environmental scientist on site shall include provision of all equipment for taking of samples and for performing all the in situ testing and measurements specified. The rate shall be per 8-hour day.

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Appendix 1

Bill of Quantities

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Westerton of Craigie
Southampton Road, DUNDEE, DD4 7PN
Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	
Client:	Moray Council	**Date:**	
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
A	**General Items**				
A1	Offices and stores for the Contractor/Engineer including set up of a compound and welfare facilities	1	sum		£ -
A2	Establish on site all plant, equipment and services including full time supervision by an engineering geologist	1	sum		£ -
A2.1	Vibration monitoring equipment to be utilised at locations specified by the engineer during all drilling works	Rate Only	sum		
A3	Establish the location and elevation of the ground at each exploratory hole (mAOD)	1	sum		£ -
A4	Facilities for the engineer	Rate Only	sum		
A5	One master copy of the fieldwork report	1	sum		£ -
A6	Additional copies of the fieldwork report	Rate Only	nr		
A7	Digital data (AGS format)	1	sum		£ -
A8	Mobilisation of site safety equipment (YELLOW)	1	sum		£ -
A9	Maintenance of onsite safety equipment	1	day		£ -
A10	Disposal offsite of arisings	Rate Only	sum		
A11	Provide facilities for decontamination of equipment/plant between borehole (YELLOW)	Rate Only	sum		
A12	Decontamination at the end of field work (YELLOW)	Rate Only	sum		
A13	PAS 128 Type C Survey (review porposed positons against current public utility plans and visible surface features and CAT scan positions prior to breaking ground)	1	Sum		£ -
A14	Formation of Access/Egress and Drive on / Drive off accessiblty to proposed GI locations (TP01 - TP04) **Including site visit to assess possible plant access routes** - any temporary ramps/tracks required to gain access are to be reinstated following completion of works.	1	Sum		£ -
A15	Ecological Clerk of Works (ECoW). A suitably qualified specialist Ecology consultant requires to approve temporary access design for TP postions adajcent to the exisitng woodland & watercourse and investigation fieldworks adajcent to the woodland & watercourse	1	Sum		£ -
A16	Reinstatement of trial pit locations on like-for-like basis	Rate Only	sum		

Section A sub-total	**£ -**

(carried to summary)

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Southampton Road, DUNDEE, DD4 7PN
Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
B	**Light Hydraulic Precussive Boring**				
B1	Move boring plant and equipment to the site of each exploratory hole and set up rig including excavation of hand dug pit to 1.20mbgl	Rate Only	nr		
B2	Extra over item B1 for setting up on a slope of gradient greater than 20%	Rate Only	nr		
B3	Break out surface obstruction where present at exploratory borehole	Rate Only	nr		
B4	Advance borehole from below concrete slab to 10m depth	Rate Only	m		
B5	As item B4 but between 10m and 20m depth	Rate Only	m		
B6	As item B4 but between 20m and 30m depth	Rate Only	m		
B7	As item B4 but between 30m and 40m depth	Rate Only	m		
B8	As item B4 but between 40m and 50m depth	Rate Only	m		
B9	Advance borehole through hard stratum or obstruction	Rate Only	hr		
B10	Backfill borehole with cement/bentonite grout	Rate Only	m		
B11	Standing time for borehole plant, equipment and crew	Rate Only	hr		
B12	Bring hand auger equipment to the position of each exploratory hole	Rate Only	nr		
B13	Bore with hand auger from existing ground level to 2m depth	Rate Only	m		
B14	As item B13 but between 2m and 4m depth	Rate Only	m		
B15	Standing time for hand auger equipment and crew	Rate Only	h		

Section B sub-total	**£ -**

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Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
C	**Rotary Boring**				
C1	Move boring plant and equipment to the site of each exploratory hole and set up rig including excavation of hand dug pit to 1.20mbgl	4	nr		£ -
C2	Extra over item B1 for setting up on a slope of gradient greater than 20%	Rate Only	nr		
C3	Break out surface obstruction where present at exploratory borehole	Rate Only	nr		
C4	Advance borehole between GL and 10m depth (Dynamic Sampling)	40	m		£ -
C4.1	Advance borehole between GL and 10m depth (Air Flush Rotary Coring)	Rate Only	m		
C5	As item B4 but between 10m and 20m depth (Dynamic Sampling)	20	m		£ -
C5.1	As item B4 but between 10m and 20m depth (Air Flush Rotary Coring)	24	m		£ -
C6	As item B4 but between 20m and 30m depth	Rate Only	m		
C7	As item B4 but between 30m and 40m depth	Rate Only	m		
C8	As item B4 but between 40m and 50m depth	Rate Only	m		
C9	Advance borehole through hard stratum or obstruction	Rate Only	hr		
C10	Backfill borehole with cement/bentonite grout	2	nr		£ -
C11	Standing time for borehole plant, equipment and crew	Rate Only	hr		
C12	Bring hand auger equipment to the position of each exploratory hole	Rate Only	m		
C13	Bore with hand auger from existing ground level to 2m depth	Rate Only	m		
C14	As item C13 but between 2m and 4m depth	Rate Only	h		
C15	Standing time for hand auger equipment and crew	Rate Only	nr		
C16	Decommisioning of borehole monitoring well instaltions in accordance with SEPA Guidance. Date to be informed by the Engineer.	2	nr		£ -

Section C sub-total	**£ -**

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COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
D	**Pits and Trenches**				
D1	Excavate inspection pit by hand to 1.20m depth	Rate Only	nr		
D2	Extra over item D1 for breaking out surface obstructions	Rate Only	nr		
D3	Move mechanical excavation equipment to the site of each trial pit and trial trench	4	nr		£ -
D4	Excavate trial pit between existing ground level and scheduled depth (4.0mbgl)	16	m		£ -
D5	Break out surface obstructions where present at exploratory trial pit / DCP test	Rate Only	m		
D10	Extra over item D4 for breaking out hard strata or surface obstructions	Rate Only	hr		
D11	Standing time for excavation plant, equipment and crew for machine dug pit or trench	Rate Only	h		

Section D sub-total	**£ -**

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COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
E	**Sampling**				
E1A	Small disturbed sample (environmental)	Rate Only	nr		
E1B	Small disturbed sample (geotechnical)- 1.0m intervals	30	nr		£ -
E2	Bulk disturbed sample- 1.0m intervals	30	nr		£ -
E3	Large bulk disturbed sample	Rate Only	nr		
E4	Open tube sample	Rate Only	nr		
E5	Piston sample	Rate Only	nr		
E6	Groundwater sample	Rate Only	nr		
E7	Gas sample	Rate Only	nr		
E8	Core sub sample	Rate Only	nr		

Section E sub-total	**£ -**

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COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
F	**In-Situ Testing**				
F1	Standard Pentration Test in all boreholes (1.5m intervals commencing at 1.2mbgl)	20	nr		£ -
F3	Plate Load Test (100kPa, 200kPa, 400kPa, 100kPa)	Rate Only	nr		
F4	California Bearing Ratio Test	Rate Only	nr		
F8	Hand Vane test where applicable in cohesive deposits in all trial pits	1	nr		£ -
F9	Continuous Dymanic Penetration Tests to 1.20m below topsoil and production of results (including topsoil thickness)	Rate Only	nr		
F10	Infiltration test as per BRE 365	Rate Only	nr		
F11	PID required for field screening of all environmental soil samples for duration of site works	Rate Only	nr		

Section F sub-total	**£ -**

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Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
G	**Instrumentation and Monitoring**				
G2	Standpipe (slotted)	20	m		£ -
G4	Standpipe (plain)	2	m		£ -
G5	Protective cover (flush)	2	nr		£ -
G6	Protective cover (raised)	Rate Only	nr		
G8	Reading of water level in standpipe, or standpipe piezometer during fieldwork period	2	nr		£ -
G10	Gas valve	2	nr		£ -

Section G sub-total	**£ -**

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COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
H	**GEOTECHNICAL LABORATORY TESTING**				
H1.1	Moisture Content	6	nr		£ -
H1.2	Liquid Limit, Plastic Limit, Plasticity Index - 4 point	Rate Only	nr		
H1.3	Liquid Limit, Plastic Limit, Plasticity Index - 1 point	6	nr		£ -
H1.5	Density - linear measurement	Rate Only	nr		
H1.8	Particle Density (Gas Jar)	Rate Only	nr		
H1.9	Particle Size Distribution - wet sieving only	6	nr		£ -
H1.10	Particle Size Distribution - dry sieving	Rate Only	nr		
H1.11	Particle Size Distribution - sedimentation by pipette method	6	nr		£ -
H2.1	Organic Matter Content	Rate Only	nr		
H2.2	Mass Loss on Ignition	Rate Only	nr		
H2.3	Sulphate content of soil - acid extractable	Rate Only	nr		
H2.4	Water soluble sulphate content of soil	12	nr		£ -
H2.5	Sulphate content of groundwater	Rate Only	nr		
H2.8	Water soluble chloride content	Rate Only	nr		
H2.12	$_{P}$H Value	12	nr		£ -
H3.1	Dry Density / moisture content relationship (2.5kg rammer)	Rate Only	nr		
H3.2	Dry Density / moisture content relationship (4.5kg rammer)	4	nr		£ -
H3.3	Dry Density / moisture content relationship (vibrating hammer)	Rate Only	nr		
H3.9	California Bearing Ratio (CBR) - re-compacted	Rate Only	nr		
H4.1	One dimensional consolidation (up to 5 days)	Rate Only	nr		
H4.2	One dimensional consolidation (additional day)	Rate Only	nr		
H6.2	Shear strength by hand vane	Rate Only	nr		
H6.14	Quick Undrained Tri-axial - Single	Rate Only	nr		
H6.15	Quick Undrained Tri-axial - Multi	Rate Only	nr		
H6.17	Quick Undrained - Set of 3 x 38mm	Rate Only	nr		
H6.18	Remoulding charge for preparation of tri-axial tests from disturbed samples	Rate Only	nr		
H6.8	60mm Shear Box Test - 3 stages	6	nr		£ -
H6.9	100mm Shear Box Test - 3 stages	Rate Only	nr		
H6.10	300mm Shear Box Test - 3 stages	Rate Only	nr		
H6.13	Undrained Tri-axial without pore water pressure measurement (multistage)	Rate Only	nr		
H3.6	Moisture Condition Value (MCV)	Rate Only	nr		
H3.7	Moisture Condition Value (MCV) / Moisture Content Relationship	Rate Only	nr		
H8.1	Natural water content of rock sample	Rate Only	nr		
H8.2	Density of rock sample by linear measurement	Rate Only	nr		

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H8.21	Determination of Point Load strength (PLT) of rock specimen - 3no determinations	24	nr		£ -
H8.14	Uniaxial Compressive Strength (UCS) of rock specimen	12	nr		£ -

Section H sub-total	**£ -**

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Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
I	**GEOCHEMICAL LABORATORY TESTING**				
	Chemical Testing For Contaminated Ground				
I1	Arsenic - total	Rate Only	nr		
I2	Barium	Rate Only	nr		
I3	Beryllium	Rate Only	nr		
I4	Cadmium - total	Rate Only	nr		
I5	Chromium - total	Rate Only	nr		
I5B	Hexavelant Chromium - total	Rate Only	nr		
I6	Lead - total	Rate Only	nr		
I7	Mercury - total	Rate Only	nr		
I8	Selenium - total	Rate Only	nr		
I9	Boron - water soluble	Rate Only	nr		
I10	Copper - total	Rate Only	nr		
I11	Nickel - total	Rate Only	nr		
I12	Vanadium	Rate Only	nr		
I13	Zinc - total	Rate Only	nr		
I14	Cyanide - complex	Rate Only	nr		
I15	Cyanide - free	Rate Only	nr		
I16	Cyanide - total	Rate Only	nr		
I17	Phenols - total	Rate Only	nr		
I18	Nitrate	Rate Only	nr		
I19	Sulphate - water soluble, 2:1 extract	Rate Only	nr		
I20	Sulphide	Rate Only	nr		
I21	Sulphur	Rate Only	nr		
I22	Chloride	Rate Only	nr		
I23	$_{P}$H Value	Rate Only	nr		
I24	Total Petroleum Hydrocarbons (screen)	Rate Only	nr		
I25	Total Petroleum Hydrocarbons (CWG suite)	Rate Only	nr		
I26	BTEX (including MTBE)	Rate Only	nr		
I27	PCB ICES 7	Rate Only	nr		
I27B	PCB WHO 12	Rate Only	nr		
I28	Speciated VOC`s	Rate Only	nr		
I29	Speciated SVOC`s	Rate Only	nr		
I30	Poly Aromatic Hydrocarbons (USEPA 16 Speciation)	Rate Only	nr		
I31	Diesel Range Organics (DRO)	Rate Only	nr		
I32	Gasoline Range Organics (GRO)	Rate Only	nr		
I33	Asbestos Screen (identification)	Rate Only	nr		
I33B	Asbestos Quantification	Rate Only	nr		
I34	Thiocyanate	Rate Only	nr		
I35	Organolead	Rate Only	nr		
I35B	Organochlorides	Rate Only	nr		
I35C	Metal Carboxylates	Rate Only	nr		

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135D	Pytheroids	Rate Only	nr		
I36	Organotin	Rate Only	nr		
I37	TOC	Rate Only	nr		
I38	FOC	Rate Only	nr		
I39	Organic Matter Content	Rate Only	nr		
I40	UKWIR full expanded suite	Rate Only	nr		
I41	Fluorocarbons	Rate Only	nr		
	Water Samples				
I39	Arsenic - total	Rate Only	nr		
I40	Barium	Rate Only	nr		
I41	Beryllium	Rate Only	nr		
I42	Cadmium - total	Rate Only	nr		
I43	Chromium - total	Rate Only	nr		
I44	Lead - total	Rate Only	nr		
I45	Mercury - total	Rate Only	nr		
I46	Selenium - total	Rate Only	nr		
I47	Nickel - total	Rate Only	nr		
I48	Vanadium	Rate Only	nr		
I49	Zinc - total	Rate Only	nr		
I50	Cyanide - complex	Rate Only	nr		
I51	Cyanide - free	Rate Only	nr		
I52	Cyanide - total	Rate Only	nr		
I53	Ammonia	Rate Only	nr		
I54	Biochemical Oxygen Demand	Rate Only	nr		
I55	Thiocyanate	Rate Only	nr		
I56	Redox potential	Rate Only	nr		
I57	Dissolved Oxygen	Rate Only	nr		
I58	Phenols - total	Rate Only	nr		
I59	Sulphate	Rate Only	nr		
I60	Sulphide	Rate Only	nr		
I61	Total TPH	Rate Only	nr		
I62	TPH (speciated aliphatic/aromatic)	Rate Only	nr		
I63	Diesel Range Organics (DRO)	Rate Only	nr		
I64	Gasoline Range Organics (GRO)	Rate Only	nr		
I65	$_{P}$H Value	Rate Only	nr		
I66	Poly Aromatic Hydrocarbons (USEPA 16 speciation)	Rate Only	nr		
I67	BTEX	Rate Only	nr		
I68	PCB ICES 7	Rate Only	nr		
I68B	PCB WHO 12	Rate Only	nr		
I69	Total Hardness	Rate Only	nr		
I70	Total Organic Carbon	Rate Only	nr		
I71	Total Dissolved Solids (TDS)	Rate Only	nr		
I72	SVOC`s	Rate Only	nr		
I73	VOC`s	Rate Only	nr		
I74	PCB	Rate Only	nr		
I75	Dioxins and Furans	Rate Only	nr		
I76	Organolead	Rate Only	nr		
I77	Organotin	Rate Only	nr		
I78	Fluorocarbons	Rate Only	nr		
	Leachability Testing				
I78	Preparation of each leachate sample	Rate Only	nr		
I79	Arsenic	Rate Only	nr		
I80	Cadmium	Rate Only	nr		
I81	Chromium	Rate Only	nr		
I82	Lead	Rate Only	nr		
I83	Mercury	Rate Only	nr		
I84	Selenium	Rate Only	nr		
I85	Copper	Rate Only	nr		
I86	Nickel	Rate Only	nr		

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I87	Zinc	Rate Only	nr		
I88	TPH	Rate Only	nr		
I89	TPH (CWG Suite)	Rate Only	nr		
I90	Cyanide - complex	Rate Only	nr		
I91	Cyanide - free	Rate Only	nr		
I92	Cyanide - total	Rate Only	nr		
I93	PCB ICES 7	Rate Only	nr		
I93A	PCB WHO 12	Rate Only	nr		
I94	Phenols	Rate Only	nr		
I95	Speciated Aromatic Hydrocarbons (USEPA 16)	Rate Only	nr		

Section I sub-total	**£ -**

(carried to summary)

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Southampton Road, DUNDEE, DD4 7PN
Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
J	**Ground Gas and Vapour Monitoring**				
J1	Undertake gas and vapour visit to monitor 2 no. monitoring wells (BH01 - BH04) to steady state (minimum time period 10 minutes per borehole) in line with CIRIA C665 Guidance.	Rate Only	nr		

Section J sub-total	**£ -**

(carried to summary)

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FAIRHURST engineering solutions, delivering results

Westerton of Craigie
Southampton Road, DUNDEE, DD4 7PN
Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

Item	Description	No.	Unit	Rate	Amount
K	**Water Monitoring**				
K1	Undertake water probing with oil water interceptor probe and record level(s) at 2 no. monitoring wells (BH01 - BH04)	Rate Only	nr		
K2	Develop 2 no. monitoring wells using down the hole purge pump and collect purge water (purge min 3x well volume)	Rate Only	nr		
K3	Obtain representative water samples from 2 no. wells using a peristaltic pump and flow through cell at steady state	Rate Only	nr		
K4	Obtain representative free product samples using a peristaltic pump (if present) from 2 no. montoring wells	Rate Only	nr		
K5	Disposal of purge water	Rate Only	sum		

Section J sub-total	**£ -**

(carried to summary)

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FAIRHURST engineering solutions, delivering results

Westerton on Craigie
Southampton Road, DUNDEE, DD4 7PN
Tel: 01382 453300 Fax: 0844 381 4412

COST ESTIMATE

Project:	Cloddach Bridge, Elgin	**Quote By:**	0
Client:	Moray Council	**Date:**	0
Reference:	140163		
Scope:	Ground Investigation Works		

SECTION	SUMMARY	AMOUNT
A	GENERAL ITEMS	£ -
B	HYDRAULIC PERCUSSIVE BORING	£ -
C	ROTARY BORING	£ -
D	PITS AND TRENCHES	£ -
E	SAMPLING	£ -
F	IN-SITU TESTING	£ -
G	INSTRUMENTATION AND MONITORING	£ -
H	GEOTECHNICAL LABORATORY TESTING	£ -
I	GEOCHEMICAL LABORATORY TESTING	£ -
J	GROUND GAS AND VAPOUR MONITORING TO CIRIA C665	£ -
K	WATER MONITORING	£ -

TOTAL ESTIMATE	
£	-

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Appendix 2

Laboratory Limits of Detection (Soils, Leachate and Water)

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	WAF Job Number : 07-38881				
	Matrix : Soil				
	Sample Reference	Method No	Units	LOD	Sample 1
	Sample Depth (m)				
	Date Sampled				
	Date Scheduled				
	Laboratory Reference No				
	Analysis				
METALS	METALS				
METALS	Aluminium	069S	mg/kg	10	
METALS	Antimony	069S[IM]	mg/kg	5	
METALS	Arsenic	069S[IM]	mg/kg	3	
METALS	Barium	069S[IM]	mg/kg	10	
METALS	Beryllium	069S[IM]	mg/kg	0.5	
METALS	Boron (W/S)	016S[IM]	mg/kg	0.5	
METALS	Cadmium	069S[IM]	mg/kg	0.5	
METALS	Calcium	069S	mg/kg	20	
METALS	Chromium	069S[IM]	mg/kg	10	
METALS	Chromium (Hexavalent)	007	mg/kg	5	
METALS	Cobalt	069S[IM]	mg/kg	2	
METALS	Copper	069S[IM]	mg/kg	5	
METALS	Iron	069S	mg/kg	200	
METALS	Lead	069S[IM]	mg/kg	10	
METALS	Lithium	069S	mg/kg	0.5	
METALS	Magnesium	069S[IM]	mg/kg	10	
METALS	Manganese	069S[IM]	mg/kg	20	
METALS	Mercury	069S[IM]	mg/kg	0.6	
METALS	Molybdenum	069S[IM]	mg/kg	6	
METALS	Nickel	069S[IM]	mg/kg	4	
METALS	Phosphorus	METS	mg/kg	2	
METALS	Potassium	069S	mg/kg	20	
METALS	Selenium	069S[IM]	mg/kg	2.5	
METALS	Sodium	069S	mg/kg	50	
METALS	Thallium	069S	mg/kg	2	
METALS	Titanium	069S	mg/kg	5	
METALS	Vanadium	069S[IM]	mg/kg	3	
METALS	Zinc	069S[IM]	mg/kg	10	
Inorganics	Inorganics				
Inorganics	Free Cyanide	061S[IM]	mg/kg	1	
Inorganics	Total Cyanide	061S[IM]	mg/kg	1	
Inorganics	Thiocyanate as SCN	061S[IM]	mg/kg	5	
Inorganics	pH	084S[IM]	pH Units	1	
Inorganics	Organic Matter (BS1377)	026[I]	%	0.1	
Inorganics	Organic Carbon	092[IM]	%	0.1	
Inorganics	Carbonate Content as CaCO3	023	%	1	
Inorganics	Sulphate (Total Acid Soluble) as SO4	025a[IM]	mg/kg	200	
Inorganics	Acid Soluble Sulphide	008[IM]	mg/kg	10	
Inorganics	W/S Sulphate as SO4	073S[IM]	g/l	0.02	
STANDARD	Asbestos (Screen)	001a			
Inorganics	W/S Chloride	073S[IM]	mg/kg	10	
Inorganics	W/S Bromide	073S	mg/kg	1	
Inorganics	W/S Fluoride	073S	mg/kg	1	

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Inorganics	W/S Nitrite as N	073S	mg/kg	1	
Inorganics	W/S Nitrate as N	073S[I]	mg/kg	2.2	
Inorganics	Total Nitrogen	BS3882	%	0.1	
Inorganics	Kjeldahl Nitrogen	BS3882	%	0.1	
Inorganics	Exchangeable Ammonium as N	018[IM]	mg/kg	40	
Inorganics	Extractable Phosphate	MAFF/ADAS	mg/l	10	
Inorganics	Elemental Sulphur	032[IM]	mg/kg	100	
Inorganics	Loss on Ignition (450ºC)	019[IM]	%	1	
STANDARD	Moisture Content (Wet Weight)		%	0.1	
STANDARD	Density	DEN	g/cm3		
CWG SUITE	*** * CWG SUITE * ***				
CWG SUITE	Aliphatic C5-C6	CWGS	mg/kg	0.01	
CWG SUITE	Aliphatic >C6-C8	CWGS	mg/kg	0.01	
CWG SUITE	Aliphatic >C8-C10	CWGS	mg/kg	0.01	
CWG SUITE	Aliphatic >C10-C12	CWGS	mg/kg	0.01	
CWG SUITE	Aliphatic >C12-C16	CWGS[I]	mg/kg	5	
CWG SUITE	Aliphatic >C16-C21	CWGS[I]	mg/kg	5	
CWG SUITE	Aliphatic >C21-C35	CWGS[I]	mg/kg	5	
CWG SUITE	Total Aliphatics (C5-C35)	CWGS	mg/kg	5	
CWG SUITE	Aromatic C6-C7	CWGS	mg/kg	0.01	
CWG SUITE	Aromatic >C7-C8	CWGS	mg/kg	0.01	
CWG SUITE	Aromatic >C8-C10	CWGS	mg/kg	0.01	
CWG SUITE	Aromatic >C10-C12	CWGS	mg/kg	0.01	
CWG SUITE	Aromatic >C12-C16	CWGS[I]	mg/kg	5	
CWG SUITE	Aromatic >C16-C21	CWGS[I]	mg/kg	5	
CWG SUITE	Aromatic >C21-C35	CWGS[I]	mg/kg	5	
CWG SUITE	Total Aromatics (C5-C35)	CWGS	mg/kg	5	
CWG SUITE	Volatile Hydrocarbons (C5-C12)	CWGS	mg/kg	0.01	
CWG SUITE	Extractable Hydrocarbons (C12-C35)	CWGS	mg/kg	5	
CWG SUITE	Total Hydrocarbons (C5-C35)	CWGS	mg/kg	5	
CWG SUITE	MTBE	CWGS[IM]	mg/kg	0.01	
CWG SUITE	Benzene	CWGS[IM]	mg/kg	0.01	
CWG SUITE	Toluene	CWGS[IM]	mg/kg	0.01	
CWG SUITE	Ethylbenzene	CWGS[IM]	mg/kg	0.01	
CWG SUITE	m,p-Xylenes	CWGS[IM]	mg/kg	0.01	
CWG SUITE	o-Xylene	CWGS[IM]	mg/kg	0.01	
CWG SUITE	1,3,5-Trimethylbenzene	CWGS[IM]	mg/kg	0.01	
CWG SUITE	1,2,4-Trimethylbenzene	CWGS[IM]	mg/kg	0.01	
VPH/BTEX SUITE	*** * VPH/BTEX SUITE * ***				
VPH/BTEX SUITE	MTBE	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	Benzene	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	Toluene	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	Ethylbenzene	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	m,p-Xylenes	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	o-Xylene	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	1,3,5-Trimethylbenzene	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	1,2,4-Trimethylbenzene	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	VPH Compounds (C5-C10)	068S[IM]	mg/kg	0.01	
VPH/BTEX SUITE	VPH Compounds (C10-C12)	068S	mg/kg	0.01	
VPH/BTEX SUITE	VPH Compounds (C5-C12)	068S	mg/kg	0.01	
PAH SUITE	*** * PAH SUITE * ***				
PAH SUITE	Naphthalene	022S[IM]	mg/kg	0.1	
PAH SUITE	Acenaphthylene	022S[IM]	mg/kg	0.1	
PAH SUITE	Acenaphthene	022S[IM]	mg/kg	0.1	
PAH SUITE	Fluorene	022S[IM]	mg/kg	0.1	

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PAH SUITE	Phenanthrene	022S[IM]	mg/kg	0.1	
PAH SUITE	Anthracene	022S[IM]	mg/kg	0.1	
PAH SUITE	Fluoranthene	022S[IM]	mg/kg	0.1	
PAH SUITE	Pyrene	022S[IM]	mg/kg	0.1	
PAH SUITE	Benzo(a)anthracene	022S[IM]	mg/kg	0.1	
PAH SUITE	Chrysene	022S[IM]	mg/kg	0.1	
PAH SUITE	Benzo(b)fluoranthene	022S[IM]	mg/kg	0.1	
PAH SUITE	Benzo(k)fluoranthene	022S[IM]	mg/kg	0.1	
PAH SUITE	Benzo(a)pyrene	022S[IM]	mg/kg	0.1	
PAH SUITE	Indeno(1,2,3-cd)pyrene	022S[IM]	mg/kg	0.1	
PAH SUITE	Dibenzo(a,h)anthracene	022S[IM]	mg/kg	0.1	
PAH SUITE	Benzo(g,h,i)perylene	022S[IM]	mg/kg	0.1	
PAH SUITE	PAH (Sum of EPA 16)	022S[I]	mg/kg	1.6	
PCB SUITE	*** * PCB SUITE * ***				
PCB SUITE	PCB Congener 28	039S[IM]	mg/kg	0.002	
PCB SUITE	PCB Congener 52	039S[IM]	mg/kg	0.002	
PCB SUITE	PCB Congener 101	039S[IM]	mg/kg	0.002	
PCB SUITE	PCB Congener 118	039S[IM]	mg/kg	0.002	
PCB SUITE	PCB Congener 138	039S[IM]	mg/kg	0.002	
PCB SUITE	PCB Congener 153	039S[IM]	mg/kg	0.002	
PCB SUITE	PCB Congener 180	039S[IM]	mg/kg	0.002	
PCB SUITE	PCB's (Sum of ICES Congeners)	039S[I]	mg/kg	0.002	
PHENOLS SUITE	*** * PHENOLS SUITE * ***				
PHENOLS SUITE	Phenol	020S[IM]	mg/kg	0.1	
PHENOLS SUITE	Phenol	020S[IM]	mg/kg	0.02	
PHENOLS SUITE	Cresols	020S[IM]	mg/kg	0.02	
PHENOLS SUITE	Xylenols & Ethyl Phenols	020S[IM]	mg/kg	0.02	
PHENOLS SUITE	Propyl or Trimethyl Phenols	020S[IM]	mg/kg	0.02	
PHENOLS SUITE	Butyl Phenols	020S[IM]	mg/kg	0.02	
PHENOLS SUITE	Phenols (Speciated Groups Sum)	020S[I]	mg/kg	0.02	
PHENOLS SUITE	Total Monohydric Phenols	020S[I]	mg/kg	1	
SVOC SUITE	*** * SVOC SUITE * ***				
SVOC SUITE	Naphthalene	053S[IM]	ug/kg	150	
SVOC SUITE	2-Chloronaphthalene	053S[I]	ug/kg	150	
SVOC SUITE	Acenaphthylene	053S[I]	ug/kg	150	
SVOC SUITE	Acenaphthene	053S[I]	ug/kg	150	
SVOC SUITE	Fluorene	053S[I]	ug/kg	150	
SVOC SUITE	Phenanthrene	053S[I]	ug/kg	150	
SVOC SUITE	Anthracene	053S[I]	ug/kg	150	
SVOC SUITE	Fluoranthene	053S[I]	ug/kg	150	
SVOC SUITE	Pyrene	053S[IM]	ug/kg	150	
SVOC SUITE	Benz(a)anthracene	053S	ug/kg	150	
SVOC SUITE	Chrysene	053S[I]	ug/kg	150	
SVOC SUITE	Benzo(b)fluoranthene	053S[I]	ug/kg	150	
SVOC SUITE	Benzo(k)fluoranthene	053S[I]	ug/kg	150	
SVOC SUITE	Benzo(a)pyrene	053S	ug/kg	150	
SVOC SUITE	Dibenzo(a,h)anthracene	053S[IM]	ug/kg	150	
SVOC SUITE	Indeno(1,2,3-cd)pyrene	053S[I]	ug/kg	150	
SVOC SUITE	Benzo(g,h,i)perylene	053S[I]	ug/kg	150	
SVOC SUITE	Phenol	053S[I]	ug/kg	150	
SVOC SUITE	2-Chlorophenol	053S[IM]	ug/kg	150	
SVOC SUITE	2-Methylphenol	053S[I]	ug/kg	200	
SVOC SUITE	4-Methylphenol	053S[IM]	ug/kg	200	
SVOC SUITE	2-Nitrophenol	053S[I]	ug/kg	300	
SVOC SUITE	2,4-Dimethylphenol	053S[IM]	ug/kg	250	

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SVOC SUITE	2,4-Dichlorophenol	053S[IM]	ug/kg	200	
SVOC SUITE	2,6-Dichlorophenol	053S[IM]	ug/kg	200	
SVOC SUITE	4-Chloro-3-methyl phenol	053S[IM]	ug/kg	150	
SVOC SUITE	2,4,6-Trichlorophenol	053S[I]	ug/kg	150	
SVOC SUITE	2,4,5-Trichlorophenol	053S[IM]	ug/kg	200	
SVOC SUITE	4-Nitrophenol	053S	ug/kg	300	
SVOC SUITE	2,3,4,6-Tetrachlorophenol	053S	ug/kg	250	
SVOC SUITE	Pentachlorophenol	053S	ug/kg	250	
SVOC SUITE	Dimethyl Phthalate	053S[IM]	ug/kg	200	
SVOC SUITE	Diethyl Phthalate	053S[I]	ug/kg	200	
SVOC SUITE	Di-n-butyl phthalate	053S[I]	ug/kg	150	
SVOC SUITE	Butyl benzyl phthalate	053S[IM]	ug/kg	150	
SVOC SUITE	Bis(2-chloroethyl)ether	053S[IM]	ug/kg	150	
SVOC SUITE	Bis(2-chloroisopropyl)ether	053S[I]	ug/kg	200	
SVOC SUITE	4-Chlorophenyl phenyl ether	053S[I]	ug/kg	150	
SVOC SUITE	Bromo phenyl phenyl ether	053S[IM]	ug/kg	200	
SVOC SUITE	1,3-Dichlorobenzene	053S[IM]	ug/kg	200	
SVOC SUITE	1,2-Dichlorobenzene	053S[IM]	ug/kg	150	
SVOC SUITE	1,4-Dichlorobenzene	053S[I]	ug/kg	200	
SVOC SUITE	Nitrobenzene	053S[IM]	ug/kg	150	
SVOC SUITE	1,2,4-Trichlorobenzene	053S[IM]	ug/kg	200	
SVOC SUITE	2,6-Dinitrotoluene	053S	ug/kg	200	
SVOC SUITE	2,4-Dinitrotoluene	053S	ug/kg	200	
SVOC SUITE	Azobenzene	053S[I]	ug/kg	200	
SVOC SUITE	Hexachlorobenzene	053S[IM]	ug/kg	200	
SVOC SUITE	Hexachloroethane	053S[I]	ug/kg	150	
SVOC SUITE	n-Nitro-n-propyl-1-propanamine	053S[I]	ug/kg	200	
SVOC SUITE	Isophorone	053S[IM]	ug/kg	200	
SVOC SUITE	Bis(2-chloroethoxy)methane	053S[I]	ug/kg	150	
SVOC SUITE	Hexachlorobutadiene	053S[IM]	ug/kg	150	
SVOC SUITE	Anthraquinone	053S	ug/kg	150	
SVOC SUITE	Aniline	053S	ug/kg	150	
SVOC SUITE	Di-n-octyl phthalate	053S	ug/kg	150	
SVOC SUITE	Hexachlorocyclopentadiene	053S	ug/kg	300	
SVOC SUITE	2-Methylnapthalene	053S[I]	ug/kg	150	
SVOC SUITE	2-nitroaniline	053S[I]	ug/kg	250	
SVOC SUITE	3-nitroaniline	053S	ug/kg	200	
SVOC SUITE	4-Chloroaniline	053S	ug/kg	200	
SVOC SUITE	4-nitroaniline	053S	ug/kg	250	
SVOC SUITE	Bis (2-ethylhexyl) phthalate	053S	ug/kg	300	
SVOC SUITE	Carbazole	053S[I]	ug/kg	100	
SVOC SUITE	Dibenzofuran	053S[IM]	ug/kg	150	
SVOC SUITE	Biphenyl	053S	ug/kg	150	
VOC SUITE	*** * VOC SUITE * ***				
VOC SUITE	Dichlorodifluoromethane	071S[IM]	ug/kg	25	
VOC SUITE	Chloromethane	071S[IM]	ug/kg	25	
VOC SUITE	Vinyl Chloride	071S	ug/kg	25	
VOC SUITE	Bromomethane	071S[I]	ug/kg	25	
VOC SUITE	Chloroethane	071S[IM]	ug/kg	25	
VOC SUITE	Trichlorofluoromethane	071S[IM]	ug/kg	25	
VOC SUITE	1,1-Dichloroethene	071S	ug/kg	25	
VOC SUITE	112-Trichloro-122-Trifluoroethane	071S[I]	ug/kg	25	
VOC SUITE	Dichloromethane	071S	ug/kg	50	
VOC SUITE	Carbon Disulfide	071S[IM]	ug/kg	25	
VOC SUITE	Trans-1,2 Dichloroethene	071S	ug/kg	25	

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VOC SUITE	MTBE	071S	ug/kg	25	
VOC SUITE	1,1 -Dichloroethane	071S	ug/kg	25	
VOC SUITE	Cis-1,2 Dichloroethene	071S[IM]	ug/kg	25	
VOC SUITE	Bromochloromethane	071S[IM]	ug/kg	25	
VOC SUITE	Chloroform	071S[IM]	ug/kg	25	
VOC SUITE	2,2-Dichloropropane	071S[IM]	ug/kg	25	
VOC SUITE	1,1,1-Trichloroethane	071S	ug/kg	25	
VOC SUITE	1,2-Dichloroethane	071S	ug/kg	25	
VOC SUITE	1,1-Dichloropropene	071S[IM]	ug/kg	25	
VOC SUITE	Benzene	071S	ug/kg	25	
VOC SUITE	Carbon Tetrachloride	071S[IM]	ug/kg	25	
VOC SUITE	Dibromomethane	071S[IM]	ug/kg	25	
VOC SUITE	1,2-Dichloropropane	071S[IM]	ug/kg	25	
VOC SUITE	Trichloroethene	071S[IM]	ug/kg	25	
VOC SUITE	Bromodichloromethane	071S[IM]	ug/kg	25	
VOC SUITE	Cis-1,3 Dichloropropene	071S[IM]	ug/kg	25	
VOC SUITE	Trans-1,3 Dichloropropene	071S[IM]	ug/kg	25	
VOC SUITE	1,1,2-Trichloroethane	071S[IM]	ug/kg	25	
VOC SUITE	Toluene	071S	ug/kg	25	
VOC SUITE	1,3 -Dichloropropane	071S[IM]	ug/kg	25	
VOC SUITE	Dibromochloromethane	071S[IM]	ug/kg	25	
VOC SUITE	1,2-Dibromoethane	071S[IM]	ug/kg	25	
VOC SUITE	Tetrachloroethene	071S	ug/kg	25	
VOC SUITE	1,1,1,2-Tetrachloroethane	071S	ug/kg	25	
VOC SUITE	Chlorobenzene	071S[IM]	ug/kg	25	
VOC SUITE	Ethyl Benzene	071S	ug/kg	25	
VOC SUITE	m,p-Xylenes	071S	ug/kg	50	
VOC SUITE	Bromoform	071S[IM]	ug/kg	25	
VOC SUITE	Styrene	071S[IM]	ug/kg	25	
VOC SUITE	o-Xylene	071S	ug/kg	25	
VOC SUITE	1,1,2,2 Tetrachloroethane	071S	ug/kg	25	
VOC SUITE	1,2,3-Trichloropropane	071S[IM]	ug/kg	25	
VOC SUITE	Isopropylbenzene	071S[IM]	ug/kg	25	
VOC SUITE	Bromobenzene	071S[IM]	ug/kg	25	
VOC SUITE	n-propylbenzene	071S[IM]	ug/kg	25	
VOC SUITE	2-Chlorotoluene	071S[IM]	ug/kg	25	
VOC SUITE	4-Chlorotoluene	071S[IM]	ug/kg	25	
VOC SUITE	1,3,5 Trimethylbenzene	071S	ug/kg	25	
VOC SUITE	tert-butylbenzene	071S[IM]	ug/kg	25	
VOC SUITE	1,2,4 Trimethylbenzene	071S	ug/kg	25	
VOC SUITE	sec-butylbenzene	071S[IM]	ug/kg	25	
VOC SUITE	1,3 Dichlorobenzene	071S	ug/kg	25	
VOC SUITE	1,4 Dichlorobenzene	071S	ug/kg	25	
VOC SUITE	4-Isopropyltoluene	071S[IM]	ug/kg	25	
VOC SUITE	1,2 Dichlorobenzene	071S	ug/kg	25	
VOC SUITE	n-butylbenzene	071S	ug/kg	25	
VOC SUITE	1,2,4-Trichlorobenzene	071S	ug/kg	25	
VOC SUITE	Tetra Methyl Lead	071S	ug/kg	20	
VOC SUITE	Tetra Ethyl Lead	071S	ug/kg	20	
VOC SUITE	1,2-Dibromo-3-Chloropropane	071S	ug/kg	25	
VOC SUITE	Hexachlorobutadiene	071S	ug/kg	50	
VOC SUITE	Acetone	071S	mg/kg	0.2	
VOC SUITE	1,2,3-Trichlorobenzene	071S	ug/kg	25	
ORGANOTIN SUITE	*** * Organotin Suite * ***				
ORGANOTIN SUITE	DiButylTin	083[IM]	mg/kg	0.1	

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ORGANOTIN SUITE	TriButylTin	083[IM]	mg/kg	0.1	
ORGANOTIN SUITE	TetraButylTin	083[IM]	mg/kg	0.1	
ORGANOTIN SUITE	TriPhenylTin	083[IM]	mg/kg	0.1	
OCL SUITE	*** * Organochlorine Pesticide Suite * ***				
OCL SUITE	Aldrin	076S[I]	mg/kg	0.1	
OCL SUITE	Triadimefon	076S[I]	mg/kg	0.1	
OCL SUITE	Isodrin	076S[I]	mg/kg	0.1	
OCL SUITE	Pendimethalin	076S[I]	mg/kg	0.1	
OCL SUITE	Cis-Heptachlor Epoxide	076S[I]	mg/kg	0.1	
OCL SUITE	gamma-Chlordane (trans)	076S[I]	mg/kg	0.1	
OCL SUITE	o,p-DDE	076S[I]	mg/kg	0.1	
OCL SUITE	alpha-Endosulphan	076S[I]	mg/kg	0.1	
OCL SUITE	alpha-Chlordane (cis)	076S[I]	mg/kg	0.1	
OCL SUITE	p,p-DDE	076S[I]	mg/kg	0.1	
OCL SUITE	Dieldrin	076S[I]	mg/kg	0.1	
OCL SUITE	o,p-TDE	076S[I]	mg/kg	0.1	
OCL SUITE	Endrin	076S[I]	mg/kg	0.1	
OCL SUITE	beta-Endosulphan	076S	mg/kg	0.1	
OCL SUITE	Iprodione	076S	mg/kg	0.1	
OCL SUITE	p,p-TDE	076S[I]	mg/kg	0.1	
OCL SUITE	o,p-DDT	076S[I]	mg/kg	0.1	
OCL SUITE	Propiconazole I	076S	mg/kg	0.1	
OCL SUITE	Endosulphan sulphate	076S[I]	mg/kg	0.1	
OCL SUITE	p,p-DDT	076S[I]	mg/kg	0.1	
OCL SUITE	Propiconazole II	076S	mg/kg	0.1	
OCL SUITE	o,p-Methoxychlor	076S[I]	mg/kg	0.1	
OCL SUITE	Fluroxypyr	076S[I]	mg/kg	0.1	
OCL SUITE	p,p-Methoxychlor	076S[I]	mg/kg	0.1	
OCL SUITE	Permethrin I	076S	mg/kg	0.1	
OCL SUITE	Permethrin II	076S[I]	mg/kg	0.1	
TRIAZINE SUITE	*** * Triazine Herbicide Suite * ***				
TRIAZINE SUITE	Atraton	075S	mg/kg	0.1	
TRIAZINE SUITE	Simazine	075S[I]	mg/kg	0.1	
TRIAZINE SUITE	Prometon	075S	mg/kg	0.1	
TRIAZINE SUITE	Atrazine	075S[I]	mg/kg	0.1	
TRIAZINE SUITE	Propazine	075S[I]	mg/kg	0.1	
TRIAZINE SUITE	Terbuthylazine	075S[I]	mg/kg	0.1	
TRIAZINE SUITE	Simetryn	075S[I]	mg/kg	0.1	
TRIAZINE SUITE	Ametryn	075S[I]	mg/kg	0.1	
TRIAZINE SUITE	Prometryn	075S[I]	mg/kg	0.1	
TRIAZINE SUITE	Terbutryn	075S[I]	mg/kg	0.1	
OPP SUITE	*** * Organophosphorus Pesticide Suite * ***				
OPP SUITE	Dichlorvos	077S[I]	mg/kg	0.1	
OPP SUITE	Mevinphos	077S	mg/kg	0.1	
OPP SUITE	Methacriphos	077S[I]	mg/kg	0.1	
OPP SUITE	Heptenophos	077S[I]	mg/kg	0.1	
OPP SUITE	Tributylphosphate	077S[I]	mg/kg	0.1	
OPP SUITE	Sulfotep	077S[I]	mg/kg	0.1	
OPP SUITE	Phorate	077S[I]	mg/kg	0.1	
OPP SUITE	Dimethoate	077S	mg/kg	0.1	
OPP SUITE	Propetamphos	077S[I]	mg/kg	0.1	
OPP SUITE	Fonofos	077S[I]	mg/kg	0.1	
OPP SUITE	Diazinon	077S[I]	mg/kg	0.1	
OPP SUITE	Phosphamidon I	077S	mg/kg	0.1	
OPP SUITE	Disulfoton	077S[I]	mg/kg	0.1	

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OPP SUITE	Phosphamidon II	077S	mg/kg	0.1	
OPP SUITE	Chlorpyriphos-methyl	077S[I]	mg/kg	0.1	
OPP SUITE	Methyl-Parathion	077S[I]	mg/kg	0.1	
OPP SUITE	Fenitrothion	077S	mg/kg	0.1	
OPP SUITE	Pirimiphos-methyl	077S[I]	mg/kg	0.1	
OPP SUITE	Malathion	077S[I]	mg/kg	0.1	
OPP SUITE	Fenthion	077S[I]	mg/kg	0.1	
OPP SUITE	Chlorpyriphos	077S[I]	mg/kg	0.1	
OPP SUITE	Parathion	077S[I]	mg/kg	0.1	
OPP SUITE	Chlorfenvinphos	077S[I]	mg/kg	0.1	
OPP SUITE	Ethion	077S[I]	mg/kg	0.1	
OPP SUITE	Triazophos	077S	mg/kg	0.1	
OPP SUITE	Carbophenothion	077S[I]	mg/kg	0.1	
OPP SUITE	Triphenylphosphate	077S[I]	mg/kg	0.1	
OPP SUITE	Phosmet	077S[I]	mg/kg	0.1	
OPP SUITE	EPN	077S[I]	mg/kg	0.1	
OPP SUITE	Phosalone	077S[I]	mg/kg	0.1	
OPP SUITE	Azinphos-methyl	077S	mg/kg	0.1	
OPP SUITE	Azinphos-ethyl	077S	mg/kg	0.1	
OPP SUITE	Coumaphos	077S[I]	mg/kg	0.1	
CARB & URON SUITE	*** * Carbamates & Uron Herbicide Suite * ***				
CARB & URON SUITE	Carbenazim	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Carbetamide	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Bromacil	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Cyanazine	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Methabenzathiazuron	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Carbaryl	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Propham	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Methiocarb	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Monuron	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Pirimicarb	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Isoproturon	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Chlortoluron	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Monolinuron	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Diuron	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Linuron	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Chlorbufam	079S[I]	mg/kg	0.1	
CARB & URON SUITE	Chlorpropham	079S[I]	mg/kg	0.1	
ACID HERB SUITE	*** * Phenoxy Acid Herbicide Suite * ***				
ACID HERB SUITE	Clopyralid	082S[I]	mg/kg	0.15	
ACID HERB SUITE	Picloram	082S[I]	mg/kg	0.1	
ACID HERB SUITE	2,3,6-TBA	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Dicamba	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Benazolin	082S[I]	mg/kg	0.1	
ACID HERB SUITE	4-CPA	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Bentazone	082S[I]	mg/kg	0.1	
ACID HERB SUITE	2,4-D	082S[I]	mg/kg	0.1	
ACID HERB SUITE	MCPA	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Bromoxynil	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Triclopyr	082S[I]	mg/kg	0.1	
ACID HERB SUITE	2,4,5-T	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Dichloroprop	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Mecoprop	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Ioxynil	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Flamprop	082S[I]	mg/kg	0.1	

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ACID HERB SUITE	Fenoprop	082S[I]	mg/kg	0.1	
ACID HERB SUITE	2,4-DB	082S[I]	mg/kg	0.1	
ACID HERB SUITE	MCPB	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Diclofop	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Pentachlorophenol	082S[I]	mg/kg	0.1	
ACID HERB SUITE	Flamprop-Isopropyl	082S[I]	mg/kg	0.15	
PYRETHROID SUITE	*** * Pyrethroid Suite * ***				
PYRETHROID SUITE	Permethrin	PEST	mg/kg	0.1	
PYRETHROID SUITE	Cyhalothrin	PEST	mg/kg	0.1	
PYRETHROID SUITE	Cyfluthrin	PEST	mg/kg	0.1	
PYRETHROID SUITE	Cypermethrin	PEST	mg/kg	0.1	
PYRETHROID SUITE	Fenvalerate	PEST	mg/kg	0.1	
PYRETHROID SUITE	Deltamethrin	PEST	mg/kg	0.1	

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	WAF Job Number : 07-38881				
	Matrix : Leachate				
	Sample Reference	Method No	Units	LOD	Sample 1
	Sample Depth (m)				
	Date Sampled				
	Date Scheduled				
	Laboratory Reference No				
	Analysis				
Metals	**Metals**				
Metals	Aluminium	080L[I]	mg/l	0.005	
Metals	Antimony	080L[I]	mg/l	0.001	
Metals	Arsenic (Dissolved)	080L[I]	mg/l	0.005	
Metals	Barium (Dissolved)	080L[I]	mg/l	0.005	
Metals	Beryllium (Dissolved)	080L[I]	mg/l	0.001	
Metals	Boron	080L[I]	mg/l	0.005	
Metals	Cadmium (Dissolved)	080L[I]	mg/l	0.001	
Metals	Calcium	062L[I]	mg/l	0.5	
Metals	Chromium (Dissolved)	080L[I]	mg/l	0.005	
Metals	Chromium (hexavalent)	007	mg/l	0.01	
Metals	Cobalt	080L[I]	mg/l	0.001	
Metals	Copper (Dissolved)	080L[I]	mg/l	0.005	
Metals	Iron	080L[I]	mg/l	0.02	
Metals	Lead (Dissolved)	080L[I]	mg/l	0.005	
Metals	Lithium	016L	mg/l	0.005	
Metals	Magnesium	062L[I]	mg/l	0.1	
Metals	Manganese	080L[I]	mg/l	0.005	
Metals	Mercury (Dissolved)	080L[I]	mg/l	0.00005	
Metals	Molybdenum	080L[I]	mg/l	0.005	
Metals	Nickel (Dissolved)	080L[I]	mg/l	0.005	
Inorganics	Orthophosphate as P	087L[I]	mg/l	0.05	
Metals	Potassium	062L[I]	mg/l	0.5	
Metals	Selenium (Dissolved)	080L[I]	mg/l	0.005	
Metals	Sodium	062L[I]	mg/l	0.5	
Metals	Thallium	080L[I]	mg/l	0.005	
Metals	Titanium	METS	mg/l	0.02	
Metals	Vanadium (Dissolved)	080L[I]	mg/l	0.005	
Metals	Zinc (Dissolved)	080L[I]	mg/l	0.005	
Inorganics	**Inorganics**				
Inorganics	Free Cyanide	061L[I]	mg/l	0.02	
Inorganics	Total Cyanide	061L[I]	mg/l	0.02	
Inorganics	Thiocyanate as SCN	061L[I]	mg/l	0.15	
Inorganics	Carbonate Alkalinity as CaCO3	096L[I]	mg/l	20	
Inorganics	Total Organic Carbon	010L[I]	mg/l	1	
Inorganics	Sulphide	055L[I]	mg/l	0.05	
Inorganics	Sulphate as SO4	086L[I]	mg/l	10	
Inorganics	Chloride	086L[I]	mg/l	10	
Inorganics	Bromide	086L[I]	mg/l	0.5	
Inorganics	Fluoride	086L[I]	mg/l	0.1	
Inorganics	Nitrite as N	086L[I]	mg/l	0.03	
Inorganics	Nitrate as NO3	086L[I]	mg/l	2.2	
Inorganics	Kjeldahl Nitrogen	BS3882K	mg/l	5	
Inorganics	Ammoniacal Nitrogen as NH4	057L[I]	mg/l	0.065	
Inorganics	Ammoniacal Nitrogen as N	057L[I]	mg/l	0.05	

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Inorganics	pH			
CWG SUITE	*** * CWG SUITE * ***			
CWG SUITE	Aliphatic C5-C6	CWGL	mg/l	0.01
CWG SUITE	Aliphatic >C6-C8	CWGL	mg/l	0.01
CWG SUITE	Aliphatic >C8-C10	CWGL	mg/l	0.01
CWG SUITE	Aliphatic >C10-C12	CWGL	mg/l	0.01
CWG SUITE	Aliphatic >C12-C16	CWGL	mg/l	0.01
CWG SUITE	Aliphatic >C16-C21	CWGL	mg/l	0.01
CWG SUITE	Aliphatic >C21-C35	CWGL	mg/l	0.01
CWG SUITE	Total Aliphatics (C5-C35)	CWGL	mg/l	0.01
CWG SUITE	Aromatic C6-C7	CWGL	mg/l	0.01
CWG SUITE	Aromatic >C7-C8	CWGL	mg/l	0.01
CWG SUITE	Aromatic >C8-C10	CWGL	mg/l	0.01
CWG SUITE	Aromatic >C10-C12	CWGL	mg/l	0.01
CWG SUITE	Aromatic >C12-C16	CWGL	mg/l	0.01
CWG SUITE	Aromatic >C16-C21	CWGL	mg/l	0.01
CWG SUITE	Aromatic >C21-C35	CWGL	mg/l	0.01
CWG SUITE	Total Aromatics (C5-C35)	CWGL	mg/l	0.01
CWG SUITE	Volatile Hydrocarbons (C5-C12)	CWGL	mg/l	0.01
CWG SUITE	Extractable Hydrocarbons (C12-C35)	CWGL	mg/l	0.01
CWG SUITE	Total Hydrocarbons (C5-C35)	CWGL	mg/l	0.01
CWG SUITE	MTBE	CWGL	mg/l	0.01
CWG SUITE	Benzene	CWGL	mg/l	0.01
CWG SUITE	Toluene	CWGL	mg/l	0.01
CWG SUITE	Ethylbenzene	CWGL	mg/l	0.01
CWG SUITE	m,p-Xylenes	CWGL	mg/l	0.01
CWG SUITE	o-Xylene	CWGL	mg/l	0.01
CWG SUITE	1,3,5-Trimethylbenzene	CWGL	mg/l	0.01
CWG SUITE	1,2,4-Trimethylbenzene	CWGL	mg/l	0.01
VPH/BTEX SUITE	*** * VPH/BTEX SUITE * ***			
VPH/BTEX SUITE	MTBE	068L	mg/l	0.005
VPH/BTEX SUITE	Benzene	068L	mg/l	0.005
VPH/BTEX SUITE	Toluene	068L	mg/l	0.005
VPH/BTEX SUITE	Ethylbenzene	068L	mg/l	0.005
VPH/BTEX SUITE	m,p-Xylenes	068L	mg/l	0.005
VPH/BTEX SUITE	o-Xylene	068L	mg/l	0.005
VPH/BTEX SUITE	1,3,5-Trimethylbenzene	068L	mg/l	0.005
VPH/BTEX SUITE	1,2,4-Trimethylbenzene	068L	mg/l	0.005
VPH/BTEX SUITE	VPH Compounds (C5-C10)	068L	mg/l	0.01
VPH/BTEX SUITE	VPH Compounds (C10-C12)	068L	mg/l	0.01
VPH/BTEX SUITE	VPH Compounds (C5-C12)	068L	mg/l	0.01
PAH SUITE	*** * PAH SUITE * ***			
PAH SUITE	Naphthalene	022L[I]	mg/l	0.0001
PAH SUITE	Acenaphthylene	022L[I]	mg/l	0.0001
PAH SUITE	Acenaphthene	022L[I]	mg/l	0.0001
PAH SUITE	Fluorene	022L[I]	mg/l	0.0001
PAH SUITE	Phenanthrene	022L[I]	mg/l	0.0001
PAH SUITE	Anthracene	022L[I]	mg/l	0.0001
PAH SUITE	Fluoranthene	022L[I]	mg/l	0.0001
PAH SUITE	Pyrene	022L[I]	mg/l	0.0001
PAH SUITE	Benzo(a)anthracene	022L[I]	mg/l	0.0001
PAH SUITE	Chrysene	022L[I]	mg/l	0.0001
PAH SUITE	Benzo(b)fluoranthene	022L[I]	mg/l	0.0001
PAH SUITE	Benzo(k)fluoranthene	022L[I]	mg/l	0.0001
PAH SUITE	Benzo(a)pyrene	022L[I]	mg/l	0.0001
PAH SUITE	Indeno(1,2,3-cd)pyrene	022L[I]	mg/l	0.0001

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PAH SUITE	Dibenzo(a,h)anthracene	022L[I]	mg/l	0.0001
PAH SUITE	Benzo(g,h,i)perylene	022L[I]	mg/l	0.0001
PAH SUITE	PAH (Sum of EPA 16)	022L[I]	mg/l	0.0001
PHENOLS SUITE	* * PHENOLS SUITE * *			
PHENOLS SUITE	Phenol	020L[I]	mg/l	0.01
PHENOLS SUITE	Phenol	020L[I]	mg/l	0.0005
PHENOLS SUITE	Cresols	020L[I]	mg/l	0.0005
PHENOLS SUITE	Xylenols & Ethyl Phenols	020L[I]	mg/l	0.0005
PHENOLS SUITE	Naphthols	020L[I]	mg/l	0.0005
PHENOLS SUITE	Propyl or Trimethyl Phenols	020L[I]	mg/l	0.0005
PHENOLS SUITE	Butyl Phenols	020L[I]	mg/l	0.0005
PHENOLS SUITE	Phenols (Speciated Groups Sum)	020L[I]	mg/l	0.0005
PHENOLS SUITE	Total Monohydric Phenols	020L[I]	mg/l	0.01
SVOC SUITE	*** * SVOC SUITE * ***			
SVOC SUITE	Naphthalene	053L[I]	ug/l	20
SVOC SUITE	2-Chloronaphthalene	053L[I]	ug/l	20
SVOC SUITE	Acenaphthylene	053L[I]	ug/l	20
SVOC SUITE	Acenaphthene	053L[I]	ug/l	20
SVOC SUITE	Fluorene	053L[I]	ug/l	20
SVOC SUITE	Phenanthrene	053L[I]	ug/l	20
SVOC SUITE	Anthracene	053L[I]	ug/l	20
SVOC SUITE	Fluoranthene	053L[I]	ug/l	20
SVOC SUITE	Pyrene	053L[I]	ug/l	20
SVOC SUITE	Benz(a)anthracene	053L[I]	ug/l	20
SVOC SUITE	Chrysene	053L[I]	ug/l	20
SVOC SUITE	Benzo(b)fluoranthene	053L[I]	ug/l	25
SVOC SUITE	Benzo(k)fluoranthene	053L[I]	ug/l	20
SVOC SUITE	Benzo(a)pyrene	053L[I]	ug/l	25
SVOC SUITE	Dibenzo(a,h)anthracene	053L[I]	ug/l	40
SVOC SUITE	Indeno(1,2,3-cd)pyrene	053L[I]	ug/l	40
SVOC SUITE	Benzo(g,h,i)perylene	053L[I]	ug/l	40
SVOC SUITE	Phenol	053L[I]	ug/l	20
SVOC SUITE	2-Chlorophenol	053L[I]	ug/l	20
SVOC SUITE	2-Methylphenol	053L[I]	ug/l	20
SVOC SUITE	4-Methylphenol	053L[I]	ug/l	20
SVOC SUITE	2-Nitrophenol	053L	ug/l	20
SVOC SUITE	2,4-Dimethylphenol	053L[I]	ug/l	20
SVOC SUITE	2,4-Dichlorophenol	053L[I]	ug/l	20
SVOC SUITE	2,6-Dichlorophenol	053L[I]	ug/l	20
SVOC SUITE	4-Chloro-3-methyl phenol	053L[I]	ug/l	20
SVOC SUITE	2,4,6-Trichlorophenol	053L[I]	ug/l	20
SVOC SUITE	2,4,5-Trichlorophenol	053L[I]	ug/l	20
SVOC SUITE	4-Nitrophenol	053L	ug/l	50
SVOC SUITE	2,3,4,6-Tetrachlorophenol	053L	ug/l	30
SVOC SUITE	Pentachlorophenol	053L	ug/l	60
SVOC SUITE	Dimethyl Phthalate	053L[I]	ug/l	20
SVOC SUITE	Diethyl Phthalate	053L[I]	ug/l	30
SVOC SUITE	Di-n-butyl phthalate	053L[I]	ug/l	30
SVOC SUITE	Butyl benzyl phthalate	053L[I]	ug/l	60
SVOC SUITE	Bis(2-chloroethyl)ether	053L[I]	ug/l	15
SVOC SUITE	Bis(2-chloroisopropyl)ether	053L[I]	ug/l	10
SVOC SUITE	4-Chlorophenyl phenyl ether	053L[I]	ug/l	15
SVOC SUITE	Bromo phenyl phenyl ether	053L[I]	ug/l	30
SVOC SUITE	1,3-Dichlorobenzene	053L[I]	ug/l	15
SVOC SUITE	1,2-Dichlorobenzene	053L[I]	ug/l	10
SVOC SUITE	1,4-Dichlorobenzene	053L[I]	ug/l	10

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SVOC SUITE	Nitrobenzene	053L[I]	ug/l	20
SVOC SUITE	1,2,4-Trichlorobenzene	053L[I]	ug/l	10
SVOC SUITE	2,6-Dinitrotoluene	053L[I]	ug/l	30
SVOC SUITE	2,4-Dinitrotoluene	053L[I]	ug/l	20
SVOC SUITE	Azobenzene	053L[I]	ug/l	30
SVOC SUITE	Hexachlorobenzene	053L[I]	ug/l	20
SVOC SUITE	Hexachloroethane	053L[I]	ug/l	40
SVOC SUITE	n-Nitro-n-propyl-1-propanamine	053L[I]	ug/l	15
SVOC SUITE	Isophorone	053L[I]	ug/l	20
SVOC SUITE	Bis(2-chloroethoxy)methane	053L[I]	ug/l	15
SVOC SUITE	Hexachlorobutadiene	053L[I]	ug/l	10
SVOC SUITE	Anthraquinone	053L	ug/l	30
SVOC SUITE	Hexachlorocyclopentadiene	053L	ug/l	50
SVOC SUITE	2-Methylnapthalene	053L	ug/l	50
SVOC SUITE	2-nitroaniline	053L	ug/l	50
SVOC SUITE	3-nitroaniline	053L	ug/l	50
SVOC SUITE	4-Chloroaniline	053L[I]	ug/l	50
SVOC SUITE	4-nitroaniline	053L	ug/l	50
SVOC SUITE	Bis (2-ethylhexyl) phthalate	053L	ug/l	50
SVOC SUITE	Carbazole	053L	ug/l	50
SVOC SUITE	Dibenzofuran	053L	ug/l	50
SVOC SUITE	Di-n-octyl phthalate	053L	ug/l	50
SVOC SUITE	Aniline	053L[I]	ug/l	40
SVOC SUITE	Biphenyl	053L	ug/l	40
VOC SUITE	* * VOC SUITE * *			
VOC SUITE	Vinyl Chloride	040L	mg/l	0.01
VOC SUITE	Chloroethane	040L	mg/l	0.001
VOC SUITE	Trichlorofluoromethane	040L	mg/l	0.001
VOC SUITE	1,1-Dichloroethene	040L	mg/l	0.001
VOC SUITE	112-Trichloro-122-Trifluoroethane	040L	mg/l	0.025
VOC SUITE	Dichloromethane	040L	mg/l	0.05
VOC SUITE	Trans-1,2 Dichloroethene	040L	mg/l	0.001
VOC SUITE	MTBE	040L	mg/l	0.001
VOC SUITE	1,1 -Dichloroethane	040L	mg/l	0.001
VOC SUITE	Cis-1,2 Dichloroethene	040L	mg/l	0.001
VOC SUITE	Chloroform	040L	mg/l	0.001
VOC SUITE	1,1,1-Trichloroethane	040L	mg/l	0.001
VOC SUITE	1,2-Dichloroethane	040L	mg/l	0.001
VOC SUITE	Benzene	040L	mg/l	0.001
VOC SUITE	Carbon Tetrachloride	040L	mg/l	0.001
VOC SUITE	Trichloroethene	040L	mg/l	0.001
VOC SUITE	Bromodichloromethane	040L	mg/l	0.001
VOC SUITE	Cis-1,3 Dichloropropene	040L	mg/l	0.001
VOC SUITE	Trans-1,3 Dichloropropene	040L	mg/l	0.001
VOC SUITE	1,1,2-Trichloroethane	040L	mg/l	0.001
VOC SUITE	Toluene	040L	mg/l	0.001
VOC SUITE	Dibromochloromethane	040L	mg/l	0.001
VOC SUITE	Tetrachloroethene	040L	mg/l	0.001
VOC SUITE	Chlorobenzene	040L	mg/l	0.001
VOC SUITE	Ethyl Benzene	040L	mg/l	0.001
VOC SUITE	m,p-Xylenes	040L	mg/l	0.001
VOC SUITE	Bromoform	040L	mg/l	0.001
VOC SUITE	o-Xylene	040L	mg/l	0.001
VOC SUITE	1,1,2,2 Tetrachloroethane	040L	mg/l	0.001
VOC SUITE	1,3,5 Trimethylbenzene	040L	mg/l	0.001
VOC SUITE	1,2,4 Trimethylbenzene	040L	mg/l	0.001

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VOC SUITE	1,3 Dichlorobenzene	040L	mg/l	0.001
VOC SUITE	1,4 Dichlorobenzene	040L	mg/l	0.001
VOC SUITE	1,2 Dichlorobenzene	040L	mg/l	0.001
VOC SUITE	Tetra Ethyl Lead	040L	mg/l	0.001
VOC SUITE	Acetone	040L	mg/l	0.1
VOC SUITE	Tetra Methyl Lead	040L	mg/l	0.001
ORGANOTIN SUITE	* * VOC SUITE * *			
ORGANOTIN SUITE	DiButylTin	TINL	ug/l	0.02
ORGANOTIN SUITE	TriButylTin	TINL	ug/l	0.02
ORGANOTIN SUITE	TetraButylTin	TINL	ug/l	0.02
ORGANOTIN SUITE	TriPhenylTin	TINL	ug/l	0.02
OCP SUITE	* * Organochlorine Pesticide Suite * *			
OCP SUITE	Pentachloroethane	076L	ug/l	0.1
OCP SUITE	Hexachloroethane	076L	ug/l	0.1
OCP SUITE	1,3,5-trichlorobenzene	076L	ug/l	0.1
OCP SUITE	1,2,4-trichlorobenzene	076L	ug/l	0.1
OCP SUITE	1,2,3-trichlorobenzene	076L	ug/l	0.1
OCP SUITE	Hexachlorobutadiene	076L	ug/l	0.1
OCP SUITE	1,2,4,5-tetrachlorobenzene	076L	ug/l	0.1
OCP SUITE	Dichlobenil	076L	ug/l	0.1
OCP SUITE	Pentachlorobenzene	076L	ug/l	0.1
OCP SUITE	Tecnazene	076L	ug/l	0.1
OCP SUITE	Trifluralin	076L	ug/l	0.1
OCP SUITE	alpha-HCH	076L	ug/l	0.1
OCP SUITE	Hexachlorobenzene	076L	ug/l	0.1
OCP SUITE	beta-HCH	076L	ug/l	0.1
OCP SUITE	gamma-HCH (lindane)	076L	ug/l	0.1
OCP SUITE	Quintozene	076L	ug/l	0.1
OCP SUITE	Propyzamide	076L	ug/l	0.1
OCP SUITE	delta-HCH	076L	ug/l	0.1
OCP SUITE	Chlorothalonil	076L	ug/l	0.1
OCP SUITE	Triallate	076L	ug/l	0.1
OCP SUITE	Heptachlor	076L	ug/l	0.1
OCP SUITE	Aldrin	076L	ug/l	0.1
OCP SUITE	Triadimefon	076L	ug/l	0.1
OCP SUITE	Isodrin	076L	ug/l	0.1
OCP SUITE	Pendimethalin	076L	ug/l	0.1
OCP SUITE	Cis-Heptachlor Epoxide	076L	ug/l	0.1
OCP SUITE	gamma-Chlordane (trans)	076L	ug/l	0.1
OCP SUITE	o,p-DDE	076L	ug/l	0.1
OCP SUITE	alpha-Endosulphan	076L	ug/l	0.1
OCP SUITE	alpha-Chlordane (cis)	076L	ug/l	0.1
OCP SUITE	p,p-DDE	076L	ug/l	0.1
OCP SUITE	Dieldrin	076L	ug/l	0.1
OCP SUITE	o,p-TDE	076L	ug/l	0.1
OCP SUITE	Endrin	076L	ug/l	0.1
OCP SUITE	beta-Endosulphan	076L	ug/l	0.1
OCP SUITE	Iprodione	076L	ug/l	0.1
OCP SUITE	p,p-TDE	076L	ug/l	0.1
OCP SUITE	o,p-DDT	076L	ug/l	0.1
OCP SUITE	Propiconazole I	076L	ug/l	0.1
OCP SUITE	Endosulphan sulphate	076L	ug/l	0.1
OCP SUITE	p,p-DDT	076L	ug/l	0.1
OCP SUITE	Propiconazole II	076L	ug/l	0.1
OCP SUITE	o,p-Methoxychlor	076L	ug/l	0.1
OCP SUITE	Fluroxypyr	076L	ug/l	0.1

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OCP SUITE	p,p-Methoxychlor	076L	ug/l	0.1
OCP SUITE	Permethrin I	076L	ug/l	0.1
OCP SUITE	Permethrin II	076L	ug/l	0.1
TRIAZINE SUITE	* * Triazine Herbicide Suite * *			
TRIAZINE SUITE	Atraton	075L	ug/l	0.1
TRIAZINE SUITE	Simazine	075L	ug/l	0.1
TRIAZINE SUITE	Prometon	075L	ug/l	0.1
TRIAZINE SUITE	Atrazine	075L	ug/l	0.1
TRIAZINE SUITE	Propazine	075L	ug/l	0.1
TRIAZINE SUITE	Terbuthylazine	075L	ug/l	0.1
TRIAZINE SUITE	Simetryn	075L	ug/l	0.1
TRIAZINE SUITE	Ametryn	075L	ug/l	0.1
TRIAZINE SUITE	Prometryn	075L	ug/l	0.1
TRIAZINE SUITE	Terbutryn	075L	ug/l	0.1
OPP SUITE	* * Organophosphorus Pesticide Suite* *			
OPP SUITE	Dichlorvos	077L	ug/l	0.1
OPP SUITE	Mevinphos	077L	ug/l	0.1
OPP SUITE	Methacriphos	077L	ug/l	0.1
OPP SUITE	Heptenophos	077L	ug/l	0.1
OPP SUITE	Tributylphosphate	077L	ug/l	0.1
OPP SUITE	Sulfotep	077L	ug/l	0.1
OPP SUITE	Phorate	077L	ug/l	0.1
OPP SUITE	Dimethoate	077L	ug/l	0.1
OPP SUITE	Propetamphos	077L	ug/l	0.1
OPP SUITE	Fonofos	077L	ug/l	0.1
OPP SUITE	Diazinon	077L	ug/l	0.1
OPP SUITE	Phosphamidon I	077L	ug/l	0.1
OPP SUITE	Disulfoton	077L	ug/l	0.1
OPP SUITE	Phosphamidon II	077L	ug/l	0.1
OPP SUITE	Chlorpyriphos-methyl	077L	ug/l	0.1
OPP SUITE	Methyl-Parathion	077L	ug/l	0.1
OPP SUITE	Fenitrothion	077L	ug/l	0.1
OPP SUITE	Pirimiphos-methyl	077L	ug/l	0.1
OPP SUITE	Malathion	077L	ug/l	0.1
OPP SUITE	Fenthion	077L	ug/l	0.1
OPP SUITE	Chlorpyriphos	077L	ug/l	0.1
OPP SUITE	Parathion	077L	ug/l	0.1
OPP SUITE	Chlorfenvinphos	077L	ug/l	0.1
OPP SUITE	Ethion	077L	ug/l	0.1
OPP SUITE	Triazophos	077L	ug/l	0.1
OPP SUITE	Carbophenothion	077L	ug/l	0.1
OPP SUITE	Triphenylphosphate	077L	ug/l	0.1
OPP SUITE	Phosmet	077L	ug/l	0.1
OPP SUITE	EPN	077L	ug/l	0.1
OPP SUITE	Phosalone	077L	ug/l	0.1
OPP SUITE	Azinphos-methyl	077L	ug/l	0.1
OPP SUITE	Azinphos-ethyl	077L	ug/l	0.1
OPP SUITE	Coumaphos	077L	ug/l	0.1
CARB & URON SUITE	* * Carbamates & Uron Herbicide Suite* *			
CARB & URON SUITE	Carbenazim	079L[I]	ug/l	0.1
CARB & URON SUITE	Carbetamide	079L[I]	ug/l	0.1
CARB & URON SUITE	Bromacil	079L[I]	ug/l	0.1
CARB & URON SUITE	Cyanazine	079L[I]	ug/l	0.1
CARB & URON SUITE	Methabenzathiazuron	079L[I]	ug/l	0.1
CARB & URON SUITE	Carbaryl	079L[I]	ug/l	0.1
CARB & URON SUITE	Propham	079L[I]	ug/l	0.1

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CARB & URON SUITE	Methiocarb	079L[I]	ug/l	0.1
CARB & URON SUITE	Monuron	079L[I]	ug/l	0.1
CARB & URON SUITE	Pirimicarb	079L[I]	ug/l	0.1
CARB & URON SUITE	Isoproturon	079L[I]	ug/l	0.1
CARB & URON SUITE	Chlortoluron	079L[I]	ug/l	0.1
CARB & URON SUITE	Monolinuron	079L[I]	ug/l	0.1
CARB & URON SUITE	Diuron	079L[I]	ug/l	0.1
CARB & URON SUITE	Linuron	079L[I]	ug/l	0.1
CARB & URON SUITE	Chlorbufam	079L[I]	ug/l	0.1
CARB & URON SUITE	Chlorpropham	079L[I]	ug/l	0.1
ACID HERB SUITE	* * Phenoxy Acid Herbicide Suite* *			
ACID HERB SUITE	2,3,6-TBA	082L[I]	ug/l	0.1
ACID HERB SUITE	Dicamba	082L[I]	ug/l	0.1
ACID HERB SUITE	Benazolin	082L[I]	ug/l	0.1
ACID HERB SUITE	4-CPA	082L[I]	ug/l	0.1
ACID HERB SUITE	Bentazone	082L[I]	ug/l	0.1
ACID HERB SUITE	2,4-D	082L[I]	ug/l	0.1
ACID HERB SUITE	MCPA	082L[I]	ug/l	0.1
ACID HERB SUITE	Bromoxynil	082L[I]	ug/l	0.1
ACID HERB SUITE	Triclopyr	082L[I]	ug/l	0.1
ACID HERB SUITE	2,4,5-T	082L[I]	ug/l	0.1
ACID HERB SUITE	Dichloroprop	082L[I]	ug/l	0.1
ACID HERB SUITE	Mecoprop	082L[I]	ug/l	0.1
ACID HERB SUITE	Ioxynil	082L[I]	ug/l	0.1
ACID HERB SUITE	Flamprop	082L[I]	ug/l	0.1
ACID HERB SUITE	Fenoprop	082L[I]	ug/l	0.1
ACID HERB SUITE	2,4-DB	082L[I]	ug/l	0.1
ACID HERB SUITE	MCPB	082L[I]	ug/l	0.1
ACID HERB SUITE	Diclofop	082L[I]	ug/l	0.1
ACID HERB SUITE	Pentachlorophenol	082L	ug/l	0.1
ACID HERB SUITE	Flamprop-Isopropyl	082L[I]	ug/l	0.2
PYRETHROID SUITE	* * Pyrethroid Suite* *			
PYRETHROID SUITE	Permethrin	PEST	ug/l	0.1
PYRETHROID SUITE	Cyhalothrin	PEST	ug/l	0.1
PYRETHROID SUITE	Cyfluthrin	PEST	ug/l	0.1
PYRETHROID SUITE	Cypermethrin	PEST	ug/l	0.1
PYRETHROID SUITE	Fenvalerate	PEST	ug/l	0.1
PYRETHROID SUITE	Deltamethrin	PEST	ug/l	0.1

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	WAF Job Number : 07-38881			
	Matrix : Water			
	Sample Reference	Method No	Units	LOD
	Sample Depth (m)			
	Date Sampled			
	Date Scheduled			
	Laboratory Reference No			
	Analysis			
METALS	METALS			
METALS	Aluminium	080W[I]	mg/l	0.005
METALS	Antimony	080W[I]	mg/l	0.001
METALS	Arsenic (Dissolved)	080W[I]	mg/l	0.005
METALS	Barium (Dissolved)	080W[I]	mg/l	0.005
METALS	Beryllium (Dissolved)	080W[I]	mg/l	0.001
METALS	Boron (Dissolved)	080W[I]	mg/l	0.005
METALS	Cadmium (Dissolved)	080W[I]	mg/l	0.001
METALS	Calcium	062W[I]	mg/l	0.5
METALS	Chromium (Dissolved)	080W[I]	mg/l	0.005
METALS	Chromium (hexavalent)	007	mg/l	0.01
METALS	Cobalt	080W[I]	mg/l	0.001
METALS	Copper (Dissolved)	080W[I]	mg/l	0.005
METALS	Iron	080W[I]	mg/l	0.02
METALS	Lead (Dissolved)	080W[I]	mg/l	0.005
METALS	Lithium	016W	mg/l	0.005
METALS	Magnesium	062W[I]	mg/l	0.1
METALS	Manganese	080W[I]	mg/l	0.005
METALS	Mercury (Dissolved)	080W[I]	mg/l	0.0001
METALS	Molybdenum	080W[I]	mg/l	0.005
METALS	Nickel (Dissolved)	080W[I]	mg/l	0.005
METALS	Phosphorus (Dissolved)	METS	mg/l	0.05
METALS	Potassium	062W[I]	mg/l	0.5
METALS	Selenium (Dissolved)	080W[I]	mg/l	0.005
METALS	Sodium	062W[I]	mg/l	0.5
METALS	Thallium	080W[I]	mg/l	0.005
METALS	Titanium	METS	mg/l	0.02
METALS	Vanadium (Dissolved)	080W[I]	mg/l	0.005
METALS	Zinc (Dissolved)	080W[I]	mg/l	0.005
Inorganics	Inorganics			
Inorganics	Free Cyanide	061W[I]	mg/l	0.02
Inorganics	Total Cyanide	061W[I]	mg/l	0.02
Inorganics	Thiocyanate as SCN	061W[I]	mg/l	0.15
Inorganics	Carbonate Alkalinity as CaCO3	096W[I]	mg/l	20
Inorganics	pH	084W[I]	pH Units	1
Inorganics	Total Organic Carbon	010W[I]	mg/l	1
Inorganics	Sulphur (Total)	METS	mg/l	1
Inorganics	Sulphate as SO4	086W[I]	mg/l	10
Inorganics	Chloride	086W[I]	mg/l	10
Inorganics	Bromide	086W[I]	mg/l	0.5
Inorganics	Fluoride	086W[I]	mg/l	0.1

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Inorganics	Nitrite as N	086W[I]	mg/l	0.03
Inorganics	Nitrate as NO3	086W[I]	mg/l	2.2
Inorganics	Kjeldahl Nitrogen	BS3882K	mg/l	5
Inorganics	Ammoniacal Nitrogen as N	057W[I]	mg/l	0.05
Inorganics	Ammoniacal Nitrogen as NH4	057W[I]	mg/l	0.065
Inorganics	Sulphide	055W[I]	mg/l	0.05
CWG SUITE	*** * CWG SUITE * ***			
CWG SUITE	Aliphatic C5-C6	CWGW	mg/l	0.01
CWG SUITE	Aliphatic >C6-C8	CWGW	mg/l	0.01
CWG SUITE	Aliphatic >C8-C10	CWGW	mg/l	0.01
CWG SUITE	Aliphatic >C10-C12	CWGW	mg/l	0.01
CWG SUITE	Aliphatic >C12-C16	CWGW	mg/l	0.01
CWG SUITE	Aliphatic >C16-C21	CWGW	mg/l	0.01
CWG SUITE	Aliphatic >C21-C35	CWGW	mg/l	0.01
CWG SUITE	Total Aliphatics (C5-C35)	CWGW	mg/l	0.01
CWG SUITE	Aromatic C6-C7	CWGW	mg/l	0.01
CWG SUITE	Aromatic >C7-C8	CWGW	mg/l	0.01
CWG SUITE	Aromatic >C8-C10	CWGW	mg/l	0.01
CWG SUITE	Aromatic >C10-C12	CWGW	mg/l	0.01
CWG SUITE	Aromatic >C12-C16	CWGW	mg/l	0.01
CWG SUITE	Aromatic >C16-C21	CWGW	mg/l	0.01
CWG SUITE	Aromatic >C21-C35	CWGW	mg/l	0.01
CWG SUITE	Total Aromatics (C5-C35)	CWGW	mg/l	0.01
CWG SUITE	Volatile Hydrocarbons (C5-C12)	CWGW	mg/l	0.01
CWG SUITE	Extractable Hydrocarbons (C12-C35)	CWGW	mg/l	0.01
CWG SUITE	Total Hydrocarbons (C5-C35)	CWGW	mg/l	0.01
CWG SUITE	MTBE	CWGW[I]	mg/l	0.005
CWG SUITE	Benzene	CWGW[I]	mg/l	0.005
CWG SUITE	Toluene	CWGW[I]	mg/l	0.005
CWG SUITE	Ethylbenzene	CWGW[I]	mg/l	0.005
CWG SUITE	m,p-Xylenes	CWGW[I]	mg/l	0.005
CWG SUITE	o-Xylene	CWGW[I]	mg/l	0.005
CWG SUITE	1,3,5-Trimethylbenzene	CWGW[I]	mg/l	0.005
CWG SUITE	1,2,4-Trimethylbenzene	CWGW[I]	mg/l	0.005
VPH/BTEX SUITE	* * VPH/BTEX SUITE * *			
VPH/BTEX SUITE	MTBE	068W[I]	mg/l	0.005
VPH/BTEX SUITE	Benzene	068W[I]	mg/l	0.005
VPH/BTEX SUITE	Toluene	068W[I]	mg/l	0.005
VPH/BTEX SUITE	Ethylbenzene	068W[I]	mg/l	0.005
VPH/BTEX SUITE	m,p-Xylenes	068W[I]	mg/l	0.005
VPH/BTEX SUITE	o-Xylene	068W[I]	mg/l	0.005
VPH/BTEX SUITE	1,3,5-Trimethylbenzene	068W[I]	mg/l	0.005
VPH/BTEX SUITE	1,2,4-Trimethylbenzene	068W[I]	mg/l	0.005
VPH/BTEX SUITE	VPH Compounds (C5-C10)	068W[I]	mg/l	0.01
VPH/BTEX SUITE	VPH Compounds (C10-C12)	068W	mg/l	0.01
VPH/BTEX SUITE	VPH Compounds (C5-C12)	068W	mg/l	0.01
PAH SUITE	*** * PAH SUITE * ***			
PAH SUITE	Naphthalene	022W[I]	mg/l	0.0001
PAH SUITE	Acenaphthylene	022W[I]	mg/l	0.0001
PAH SUITE	Acenaphthene	022W[I]	mg/l	0.0001
PAH SUITE	Fluorene	022W[I]	mg/l	0.0001
PAH SUITE	Phenanthrene	022W[I]	mg/l	0.0001

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PAH SUITE	Anthracene	022W[I]	mg/l	0.0001
PAH SUITE	Fluoranthene	022W[I]	mg/l	0.0001
PAH SUITE	Pyrene	022W[I]	mg/l	0.0001
PAH SUITE	Benzo(a)anthracene	022W[I]	mg/l	0.0001
PAH SUITE	Chrysene	022W[I]	mg/l	0.0001
PAH SUITE	Benzo(b)fluoranthene	022W[I]	mg/l	0.0001
PAH SUITE	Benzo(k)fluoranthene	022W[I]	mg/l	0.0001
PAH SUITE	Benzo(a)pyrene	022W[I]	mg/l	0.0001
PAH SUITE	Indeno(1,2,3-cd)pyrene	022W[I]	mg/l	0.0001
PAH SUITE	Dibenzo(a,h)anthracene	022W[I]	mg/l	0.0001
PAH SUITE	Benzo(g,h,i)perylene	022W[I]	mg/l	0.0001
PAH SUITE	PAH (Sum of EPA 16)	022W[I]	mg/l	0.0001
PCB SUITE	* * PCB SUITE * *			
PCB SUITE	PCB Congener 28	039W[I]	mg/l	0.005
PCB SUITE	PCB Congener 52	039W[I]	mg/l	0.006
PCB SUITE	PCB Congener 101	039W[I]	mg/l	0.006
PCB SUITE	PCB Congener 118	039W[I]	mg/l	0.007
PCB SUITE	PCB Congener 138	039W[I]	mg/l	0.006
PCB SUITE	PCB Congener 153	039W[I]	mg/l	0.007
PCB SUITE	PCB Congener 180	039W[I]	mg/l	0.006
PCB SUITE	PCB's (Sum of ICES Congeners)	039W[I]	mg/l	0.005
PHENOLS SUITE	* * PHENOLS SUITE * *			
PHENOLS SUITE	Phenol	020W[I]	mg/l	0.01
PHENOLS SUITE	Phenol	020W[I]	mg/l	0.0005
PHENOLS SUITE	Cresols	020W[I]	mg/l	0.0005
PHENOLS SUITE	Xylenols & Ethyl Phenols	020W[I]	mg/l	0.0005
PHENOLS SUITE	Naphthols	020W[I]	mg/l	0.0005
PHENOLS SUITE	Propyl or Trimethyl Phenols	020W[I]	mg/l	0.0005
PHENOLS SUITE	Butyl Phenols	020W[I]	mg/l	0.0005
PHENOLS SUITE	Phenols (Speciated Groups Sum)	020W[I]	mg/l	0.0005
PHENOLS SUITE	Total Monohydric Phenols	020W[I]	mg/l	0.01
SVOC SUITE	*** * SVOC SUITE * ***			
SVOC SUITE	Naphthalene	053W[I]	ug/l	20
SVOC SUITE	2-Chloronaphthalene	053W[I]	ug/l	20
SVOC SUITE	Acenaphthylene	053W[I]	ug/l	20
SVOC SUITE	Acenaphthene	053W[I]	ug/l	20
SVOC SUITE	Fluorene	053W[I]	ug/l	20
SVOC SUITE	Phenanthrene	053W[I]	ug/l	20
SVOC SUITE	Anthracene	053W[I]	ug/l	20
SVOC SUITE	Fluoranthene	053W[I]	ug/l	20
SVOC SUITE	Pyrene	053W[I]	ug/l	20
SVOC SUITE	Benz(a)anthracene	053W[I]	ug/l	20
SVOC SUITE	Chrysene	053W[I]	ug/l	20
SVOC SUITE	Benzo(b)fluoranthene	053W[I]	ug/l	25
SVOC SUITE	Benzo(k)fluoranthene	053W[I]	ug/l	20
SVOC SUITE	Benzo(a)pyrene	053W[I]	ug/l	25
SVOC SUITE	Dibenzo(a,h)anthracene	053W[I]	ug/l	40
SVOC SUITE	Indeno(1,2,3-cd)pyrene	053W[I]	ug/l	40
SVOC SUITE	Benzo(g,h,i)perylene	053W[I]	ug/l	40
SVOC SUITE	Phenol	053W[I]	ug/l	20
SVOC SUITE	2-Chlorophenol	053W[I]	ug/l	20
SVOC SUITE	2-Methylphenol	053W[I]	ug/l	20

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SVOC SUITE	4-Methylphenol	053W[I]	ug/l	20
SVOC SUITE	2-Nitrophenol	053W	ug/l	20
SVOC SUITE	2,4-Dimethylphenol	053W[I]	ug/l	20
SVOC SUITE	2,4-Dichlorophenol	053W[I]	ug/l	20
SVOC SUITE	2,6-Dichlorophenol	053W[I]	ug/l	20
SVOC SUITE	4-Chloro-3-methyl phenol	053W[I]	ug/l	20
SVOC SUITE	2,4,6-Trichlorophenol	053W[I]	ug/l	20
SVOC SUITE	2,4,5-Trichlorophenol	053W[I]	ug/l	20
SVOC SUITE	4-Nitrophenol	053W	ug/l	50
SVOC SUITE	2,3,4,6-Tetrachlorophenol	053W	ug/l	30
SVOC SUITE	Pentachlorophenol	053W	ug/l	60
SVOC SUITE	Dimethyl Phthalate	053W[I]	ug/l	20
SVOC SUITE	Diethyl Phthalate	053W[I]	ug/l	30
SVOC SUITE	Di-n-butyl phthalate	053W[I]	ug/l	30
SVOC SUITE	Butyl benzyl phthalate	053W[I]	ug/l	60
SVOC SUITE	Bis(2-chloroethyl)ether	053W[I]	ug/l	15
SVOC SUITE	Bis(2-chloroisopropyl)ether	053W[I]	ug/l	10
SVOC SUITE	4-Chlorophenyl phenyl ether	053W[I]	ug/l	15
SVOC SUITE	Bromo phenyl phenyl ether	053W[I]	ug/l	30
SVOC SUITE	1,3-Dichlorobenzene	053W[I]	ug/l	15
SVOC SUITE	1,2-Dichlorobenzene	053W[I]	ug/l	10
SVOC SUITE	1,4-Dichlorobenzene	053W[I]	ug/l	10
SVOC SUITE	Nitrobenzene	053W[I]	ug/l	20
SVOC SUITE	1,2,4-Trichlorobenzene	053W[I]	ug/l	10
SVOC SUITE	2,6-Dinitrotoluene	053W[I]	ug/l	30
SVOC SUITE	2,4-Dinitrotoluene	053W[I]	ug/l	20
SVOC SUITE	Azobenzene	053W[I]	ug/l	30
SVOC SUITE	Hexachlorobenzene	053W[I]	ug/l	20
SVOC SUITE	Hexachloroethane	053W[I]	ug/l	40
SVOC SUITE	n-Nitro-n-propyl-1-propanamine	053W[I]	ug/l	15
SVOC SUITE	Isophorone	053W[I]	ug/l	20
SVOC SUITE	Bis(2-chloroethoxy)methane	053W[I]	ug/l	15
SVOC SUITE	Hexachlorobutadiene	053W[I]	ug/l	10
SVOC SUITE	Anthraquinone	053W	ug/l	30
SVOC SUITE	Aniline	053W	ug/l	40
SVOC SUITE	Hexachlorocyclopentadiene	053W	ug/l	50
SVOC SUITE	2-Methylnapthalene	053W	ug/l	50
SVOC SUITE	2-nitroaniline	053W	ug/l	50
SVOC SUITE	3-nitroaniline	053W	ug/l	50
SVOC SUITE	4-Chloroaniline	053W[I]	ug/l	50
SVOC SUITE	4-nitroaniline	053W	ug/l	50
SVOC SUITE	Bis (2-ethylhexyl) phthalate	053W	ug/l	50
SVOC SUITE	Carbazole	053W	ug/l	50
SVOC SUITE	Dibenzofuran	053W	ug/l	50
SVOC SUITE	Biphenyl	053W	ug/l	40
VOC SUITE	*** * VOC SUITE * ***			
VOC SUITE	Vinyl Chloride	040W[I]	mg/l	0.01
VOC SUITE	Chloroethane	040W[I]	mg/l	0.001
VOC SUITE	Trichlorofluoromethane	040W[I]	mg/l	0.001
VOC SUITE	1,1-Dichloroethene	040W	mg/l	0.001
VOC SUITE	112-Trichloro-122-Trifluoroethane	040W[I]	mg/l	0.025
VOC SUITE	Dichloromethane	040W[I]	mg/l	0.05

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VOC SUITE	Trans-1,2 Dichloroethene	040W[I]	mg/l	0.001
VOC SUITE	MTBE	040W[I]	mg/l	0.001
VOC SUITE	1,1 -Dichloroethane	040W[I]	mg/l	0.001
VOC SUITE	Cis-1,2 Dichloroethene	040W[I]	mg/l	0.001
VOC SUITE	Chloroform	040W[I]	mg/l	0.001
VOC SUITE	1,1,1-Trichloroethane	040W[I]	mg/l	0.001
VOC SUITE	1,2-Dichloroethane	040W[I]	mg/l	0.001
VOC SUITE	Benzene	040W[I]	mg/l	0.001
VOC SUITE	Carbon Tetrachloride	040W[I]	mg/l	0.001
VOC SUITE	Trichloroethene	040W[I]	mg/l	0.001
VOC SUITE	Bromodichloromethane	040W[I]	mg/l	0.001
VOC SUITE	Cis-1,3 Dichloropropene	040W[I]	mg/l	0.001
VOC SUITE	Trans-1,3 Dichloropropene	040W[I]	mg/l	0.001
VOC SUITE	1,1,2-Trichloroethane	040W[I]	mg/l	0.001
VOC SUITE	Toluene	040W[I]	mg/l	0.001
VOC SUITE	Dibromochloromethane	040W[I]	mg/l	0.001
VOC SUITE	Tetrachloroethene	040W[I]	mg/l	0.001
VOC SUITE	Chlorobenzene	040W[I]	mg/l	0.001
VOC SUITE	Ethyl Benzene	040W[I]	mg/l	0.001
VOC SUITE	m,p-Xylenes	040W[I]	mg/l	0.001
VOC SUITE	Bromoform	040W[I]	mg/l	0.001
VOC SUITE	o-Xylene	040W[I]	mg/l	0.001
VOC SUITE	1,1,2,2 Tetrachloroethane	040W	mg/l	0.001
VOC SUITE	1,3,5 Trimethylbenzene	040W[I]	mg/l	0.001
VOC SUITE	1,2,4 Trimethylbenzene	040W[I]	mg/l	0.001
VOC SUITE	1,3 Dichlorobenzene	040W[I]	mg/l	0.001
VOC SUITE	1,4 Dichlorobenzene	040W[I]	mg/l	0.001
VOC SUITE	1,2 Dichlorobenzene	040W[I]	mg/l	0.001
VOC SUITE	Tetra Methyl Lead	040W	mg/l	0.001
VOC SUITE	Tetra Ethyl Lead	040W	mg/l	0.001
VOC SUITE	Acetone	040W	mg/l	0.1
ORGANOTIN SUITE	* * Organotin Suite * *			
ORGANOTIN SUITE	DiButylTin	TINW	ug/l	0.02
ORGANOTIN SUITE	TriButylTin	TINW	ug/l	0.02
ORGANOTIN SUITE	TetraButylTin	TINW	ug/l	0.02
ORGANOTIN SUITE	TriPhenylTin	TINW	ug/l	0.02
OCP SUITE	* * Organochlorine Pesticide Suite * *			
OCP SUITE	alpha-Endosulphan	076W	ug/l	0.1
OCP SUITE	alpha-Chlordane (cis)	076W	ug/l	0.1
OCP SUITE	p,p-DDE	076W	ug/l	0.1
OCP SUITE	Dieldrin	076W	ug/l	0.1
OCP SUITE	o,p-TDE	076W	ug/l	0.1
OCP SUITE	Endrin	076W	ug/l	0.1
OCP SUITE	beta-Endosulphan	076W	ug/l	0.1
OCP SUITE	Iprodione	076W	ug/l	0.1
OCP SUITE	p,p-TDE	076W	ug/l	0.1
OCP SUITE	o,p-DDT	076W	ug/l	0.1
OCP SUITE	Propiconazole I	076W	ug/l	0.1
OCP SUITE	Endosulphan sulphate	076W	ug/l	0.1
OCP SUITE	p,p-DDT	076W	ug/l	0.1
OCP SUITE	Propiconazole II	076W	ug/l	0.1
OCP SUITE	o,p-Methoxychlor	076W	ug/l	0.1

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OCP SUITE	Fluroxypyr	076W	ug/l	0.1
OCP SUITE	p,p-Methoxychlor	076W	ug/l	0.1
OCP SUITE	Permethrin I	076W	ug/l	0.1
OCP SUITE	Permethrin II	076W	ug/l	0.1
TRIAZINE SUITE	* * Triazine Herbicide Suite * *			
TRIAZINE SUITE	Atraton	075W	ug/l	0.1
TRIAZINE SUITE	Simazine	075W	ug/l	0.1
TRIAZINE SUITE	Prometon	075W	ug/l	0.1
TRIAZINE SUITE	Atrazine	075W	ug/l	0.1
TRIAZINE SUITE	Propazine	075W	ug/l	0.1
TRIAZINE SUITE	Terbuthylazine	075W	ug/l	0.1
TRIAZINE SUITE	Simetryn	075W	ug/l	0.1
TRIAZINE SUITE	Ametryn	075W	ug/l	0.1
TRIAZINE SUITE	Prometryn	075W	ug/l	0.1
TRIAZINE SUITE	Terbutryn	075W	ug/l	0.1
OPP SUITE	* * Organophosphorus Pesticide Suite* *			
OPP SUITE	Dichlorvos	077W	ug/l	0.1
OPP SUITE	Mevinphos	077W	ug/l	0.1
OPP SUITE	Methacriphos	077W	ug/l	0.1
OPP SUITE	Heptenophos	077W	ug/l	0.1
OPP SUITE	Tributylphosphate	077W	ug/l	0.1
OPP SUITE	Sulfotep	077W	ug/l	0.1
OPP SUITE	Phorate	077W	ug/l	0.1
OPP SUITE	Dimethoate	077W	ug/l	0.1
OPP SUITE	Propetamphos	077W	ug/l	0.1
OPP SUITE	Fonofos	077W	ug/l	0.1
OPP SUITE	Diazinon	077W	ug/l	0.1
OPP SUITE	Phosphamidon I	077W	ug/l	0.1
OPP SUITE	Disulfoton	077W	ug/l	0.1
OPP SUITE	Phosphamidon II	077W	ug/l	0.1
OPP SUITE	Chlorpyriphos-methyl	077W	ug/l	0.1
OPP SUITE	Methyl-Parathion	077W	ug/l	0.1
OPP SUITE	Fenitrothion	077W	ug/l	0.1
OPP SUITE	Pirimiphos-methyl	077W	ug/l	0.1
OPP SUITE	Malathion	077W	ug/l	0.1
OPP SUITE	Fenthion	077W	ug/l	0.1
OPP SUITE	Chlorpyriphos	077W	ug/l	0.1
OPP SUITE	Parathion	077W	ug/l	0.1
OPP SUITE	Chlorfenvinphos	077W	ug/l	0.1
OPP SUITE	Ethion	077W	ug/l	0.1
OPP SUITE	Triazophos	077W	ug/l	0.1
OPP SUITE	Carbophenothion	077W	ug/l	0.1
OPP SUITE	Triphenylphosphate	077W	ug/l	0.1
OPP SUITE	Phosmet	077W	ug/l	0.1
OPP SUITE	EPN	077W	ug/l	0.1
OPP SUITE	Phosalone	077W	ug/l	0.1
OPP SUITE	Azinphos-methyl	077W	ug/l	0.1
OPP SUITE	Azinphos-ethyl	077W	ug/l	0.1
OPP SUITE	Coumaphos	077W	ug/l	0.1
CARB & URON SUITE	* * Carbamates & Uron Herbicide Suite* *			
CARB & URON SUITE	Carbenazim	079W[I]	ug/l	0.1
CARB & URON SUITE	Carbetamide	079W[I]	ug/l	0.1

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CARB & URON SUITE	Bromacil	079W[I]	ug/l	0.1
CARB & URON SUITE	Cyanazine	079W[I]	ug/l	0.1
CARB & URON SUITE	Methabenzathiazuron	079W[I]	ug/l	0.1
CARB & URON SUITE	Carbaryl	079W[I]	ug/l	0.1
CARB & URON SUITE	Propham	079W[I]	ug/l	0.1
CARB & URON SUITE	Methiocarb	079W[I]	ug/l	0.1
CARB & URON SUITE	Monuron	079W[I]	ug/l	0.1
CARB & URON SUITE	Pirimicarb	079W[I]	ug/l	0.1
CARB & URON SUITE	Isoproturon	079W[I]	ug/l	0.1
CARB & URON SUITE	Chlortoluron	079W[I]	ug/l	0.1
CARB & URON SUITE	Monolinuron	079W[I]	ug/l	0.1
CARB & URON SUITE	Diuron	079W[I]	ug/l	0.1
CARB & URON SUITE	Linuron	079W[I]	ug/l	0.1
CARB & URON SUITE	Chlorbufam	079W[I]	ug/l	0.1
CARB & URON SUITE	Chlorpropham	079W[I]	ug/l	0.1
ACID HERB SUITE	* * Phenoxy Acid Herbicide Suite* *			
ACID HERB SUITE	2,3,6-TBA	082W[I]	ug/l	0.1
ACID HERB SUITE	Dicamba	082W[I]	ug/l	0.1
ACID HERB SUITE	Benazolin	082W[I]	ug/l	0.1
ACID HERB SUITE	4-CPA	082W[I]	ug/l	0.1
ACID HERB SUITE	Bentazone	082W[I]	ug/l	0.1
ACID HERB SUITE	2,4-D	082W[I]	ug/l	0.1
ACID HERB SUITE	MCPA	082W[I]	ug/l	0.1
ACID HERB SUITE	Bromoxynil	082W[I]	ug/l	0.3
ACID HERB SUITE	Triclopyr	082W[I]	ug/l	0.1
ACID HERB SUITE	2,4,5-T	082W[I]	ug/l	0.1
ACID HERB SUITE	Dichloroprop	082W[I]	ug/l	0.1
ACID HERB SUITE	Mecoprop	082W	ug/l	0.1
ACID HERB SUITE	Ioxynil	082W[I]	ug/l	0.1
ACID HERB SUITE	Flamprop	082W[I]	ug/l	0.1
ACID HERB SUITE	Fenoprop	082W[I]	ug/l	0.1
ACID HERB SUITE	2,4-DB	082W[I]	ug/l	0.1
ACID HERB SUITE	MCPB	082W	ug/l	0.1
ACID HERB SUITE	Diclofop	082W[I]	ug/l	0.1
ACID HERB SUITE	Pentachlorophenol	082W	ug/l	0.1
ACID HERB SUITE	Flamprop-Isopropyl	082W[I]	ug/l	0.1
PYRETHROID SUITE	* * Pyrethroid Suite* *			
PYRETHROID SUITE	Permethrin	PEST	ug/l	0.1
PYRETHROID SUITE	Cyhalothrin	PEST	ug/l	0.1
PYRETHROID SUITE	Cyfluthrin	PEST	ug/l	0.1
PYRETHROID SUITE	Cypermethrin	PEST	ug/l	0.1
PYRETHROID SUITE	Fenvalerate	PEST	ug/l	0.1
PYRETHROID SUITE	Deltamethrin	PEST	ug/l	0.1

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Appendix 3

CDM Design Assessment

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DESIGN ASSESSMENT FORM

FAIRHURST

Project:	Job No.	140163
GROUND INVESTIGATION AT CLODDACH BRIDGE, ELGIN	Document Number	140163 DOC 03
	Prepared by/Date	RM 15/08/23
	Checked by/Date	AK 15/08/23
	Approved by/Date	AK 15/08/23

Fairhurst Scope of Works

Design and nominate approximate locations for excavation of Trial Pits and drilling of boreholes for geotechnical purposes to assess the ground conditions and engineering characteristics of the underlying materials through in-situ SPT testing, geotechnical soil and rock core sampling and laboratory testing and follow up Groundwater level monitoring works. The ground investigation has been designed in accordance with BS EN 1997-2:2007.

Design Philosophy

The investigation works are being undertaken as part of the proposed new River Lossie Road Bridge Crossing at the existing Cloddach Bridge, Elgin. The proposed new road bridge crossing development is anticipated to conform to Geotechnical Category 2 in accordance with BS EN 1997-1:2004+A1:2013.

Ground Investigation Scope

The Geotechnical ground investigation has been designed in accordance with BS EN 1997-2:2007 (*Eurocode 7 – Part 2*), BS5930:2015+A1:2020 (*Code of Practice for Ground Investigations*) and BS 8004:2015 (*Code of Practice for Foundations*). The borehole and trial pit positions will provide the geotechnical information required for proposed development of the site. The ground investigation layout is presented in **Drawing 140163/9001** and in summary comprises the following:

- *4 no. Rotary Percussive boreholes (BH01 – BH04) to approximately 15.0mbgl to obtain samples of superficial deposits and obtain 6.0m of rock core (if Solid Geology is present within the scheduled drilling depth)*
- *4 no. Mechanically Excavated Trial Pits (TP01 – TP04) to approximately 4.0mbgl*
- *4 no post fieldwork groundwater level monitoring visits*

It should be noted that the monitoring programme may be altered subject to the initial findings of the intrusive investigation fieldworks and/or the findings of the initial monitoring visits. Following the completion of all monitoring works, all boreholes require being backfilled and decommissioned in accordance with SEPA Guidance document '*SEPA Good Practice for Decommissioning Redundant Boreholes*'. The date of commencement of these works is to be confirmed by Fairhurst.

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Rev	Date	Description	By	Checked	Approved

DESIGN ASSESSMENT FORM

FAIRHURST

Potential Hazards	May Be Present	Key Significant* Hazards to be Addressed	Notes
Client operations			
Adjacent activities			
Restricted site (ecology)	✓	✓	
Traffic	✓	✓	
Interface with public			
Near to highways			
Near to railways			
Near to waterways	✓	✓	
Tidal working			
Ground instability	✓	✓	
Contamination			
Excavations	✓		
Groundwater			
Inundation			
Sewage			
Fuel tanks			
Services	✓	✓	
Overhead cables	✓	✓	
Demolition			
Unstable structures			
Explosives			
Bird droppings			
Dust			
Hazardous materials			
Radiation			
Hot working			
Confined spaces			
Working at height			
Manual handling			
Lifting operations			
Vibration			
Noise			
Other (state)			

1. *Identify all potential hazards by highlighting in the "may be present" column.*
2. *Filter the potential hazards to identify the Key Significant Hazards* for this project and this site.*
3. *Carry forward Key Significant Hazards to next page for further assessment.*

Significant Hazards are those hazards which:-

- would not be reasonably foreseen by a competent contractor
- are unusual
- are difficult to manage

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DESIGN ASSESSMENT FORM

FAIRHURST

Stage:-		**Sheet No.**
Hazard	**Action by Designer**	**Residual Hazard**
Restricted Site (Ecology)	1. To eliminate hazard	**Restricted Site (Ecology)**
	2.To reduce risk Ecological constraints may exist at the site due to existing woodland and watercourse (River Lossie) close to the proposed areas of investigation. An ecological survey of the site requires to be undertaken by a suitably qualified and experienced ecologist. The contractor must undertake all temporary access works and ground investigation fieldworks in accordance with the ecologists requirements.	
Ground Instability	1. To eliminate hazard	**Ground Instability**
	2.To reduce risk A temporary access track is likely to be required to access the proposed trial pit locations on the river bank (subject to confirmation from contractor pre-tender submission site walkover). Cognisance must be taken of potential slope instability and ground instability (slope failure) when undertaking temporary access works and investigation excavations works in close proximity to existing slopes and waterways.	
Traffic	1. To eliminate hazard	**Traffic**
	2.To reduce risk The Cloddach Bridge is currently closed to traffic. All positions are located off the road line and due to the bridge being closed traffic is not anticipated on the adjacent roadway	
Working Near to Waterways	1. To eliminate hazard	Working Near to Waterways
	2.To reduce risk 4 trial pits are located on the river banks adjacent to the watercourse. All tendering contractors must visit site to assess access and the risks of working near the watercourse and are provide safe methods of access and working and appropriate PPE to mitigate these risks.	

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DESIGN ASSESSMENT FORM

FAIRHURST

Services (including overhead services)	1. To eliminate hazard	**Services**
	2. To reduce risk All investigation positions have been located a safe distance from the location of public utilities as shown on the providers plans. The contractor requires to undertake PAS128 Type C survey (review proposed positons against current public utility plans and visible surface features and CAT scan positions prior to breaking ground). All boreholes are to be commenced with a 1.20m deep hand excavated pit.	

POST CONSTRUCTION INFORMATION

Project:	**Job No.**	
	Document Number	
	Prepared by/Date	
	Checked by/Date	
	Approved by/Date	

Fairhurst Scope of Works

Design Philosophy & Significant Residual Hazards

Rev	Date	Description	By	Checked	Approved

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Appendix 4

Drawings

140136/9000	Site Location
140136/9001	Ground Investigation Layout

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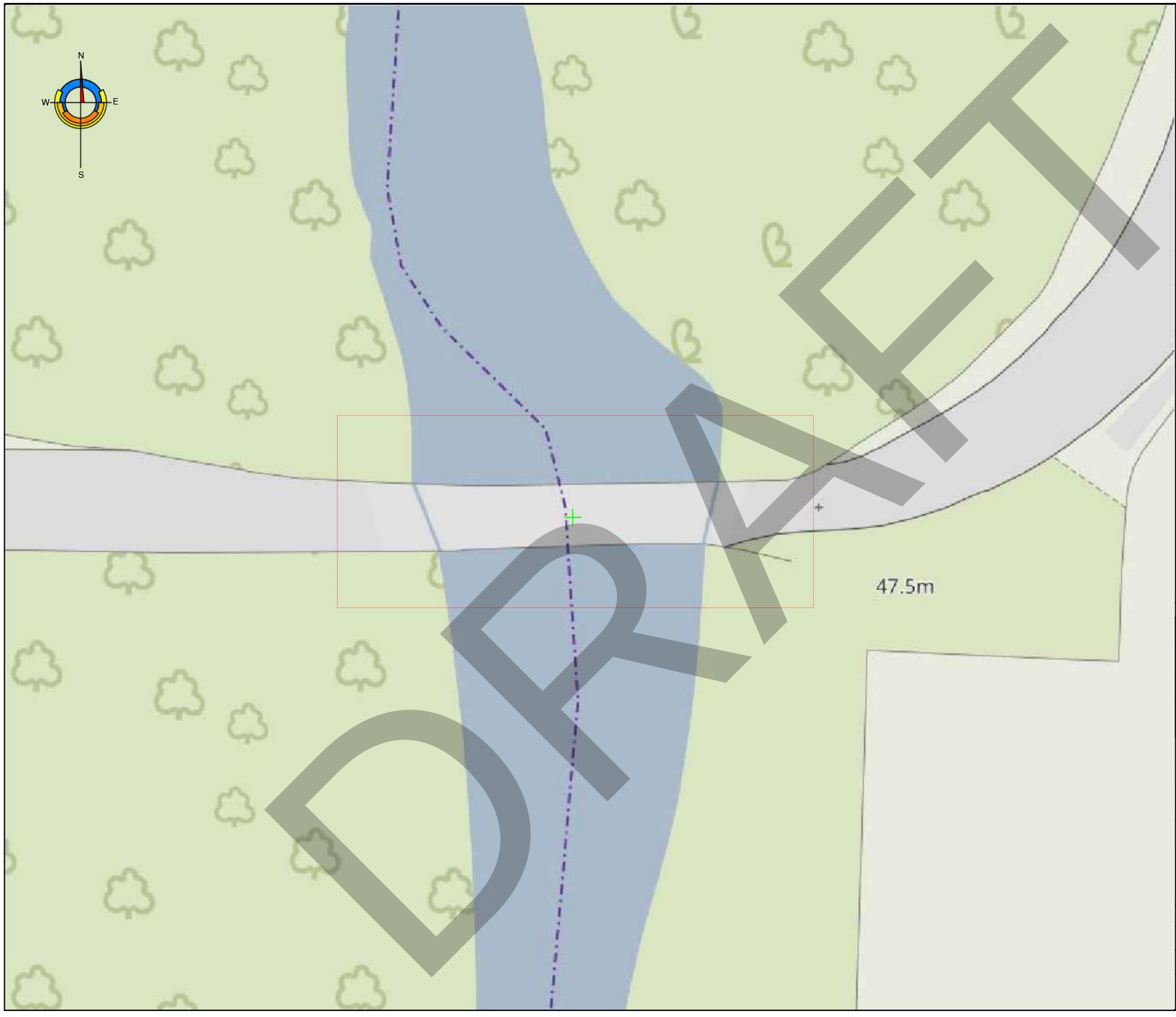


DRAFT

Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

LEGEND

APPROXIMATE SITE BOUNDARY

SITE CENTERED AT NGR:
NJ 20173 58396

Rev.	Date	Description	Drwn.	Chkd.	Appd.

FAIRHURST

Westerton of Craigie
Southampton Road
DUNDEE
DD4 7PN

Tel: 01382 453 300
Fax: 0844 381 4412

Client:

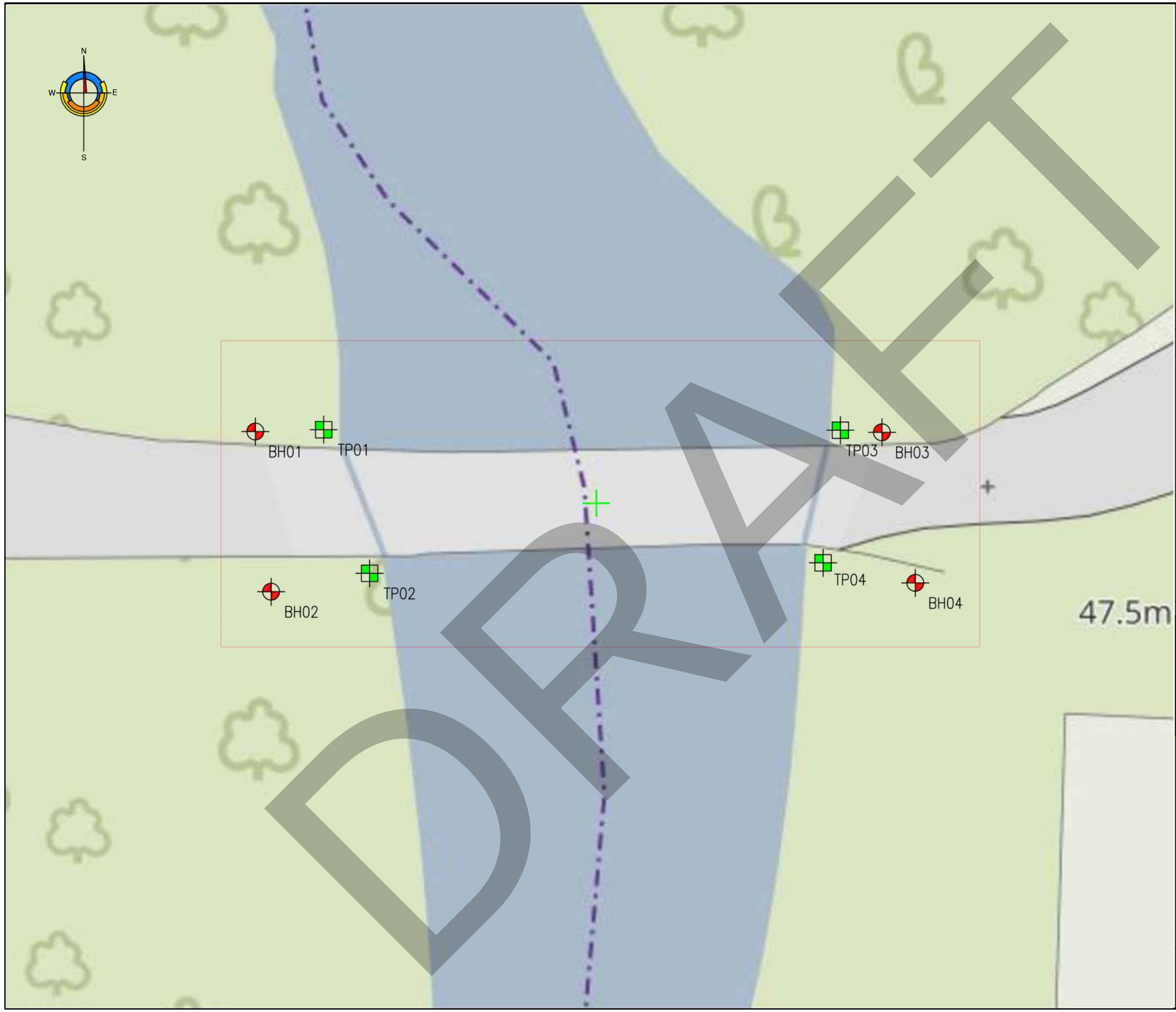
Project Title:
CLODDACH BRIDGE
ELGIN

Drawing Title:
SITE LOCATION PLAN

Scale at A3:	Status:	
1:500	For Information	
Drawn:	Checked:	Approved:
RM	AK	AK
Date:	Date:	Date:
14/08/23	15/08/23	15/08/23

Drawing No.: 140163/9000

Revision: –



DRAFT

Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO. 140163 DOC 03

CONSTRUCTION / GROUND INVESTIGATION:
- TRAFFIC
- LIVE SERVICES
- WORKING NEAR WATERCOURSE
- EXCAVATIONS

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

LEGEND

APPROXIMATE SITE BOUNDARY

SITE CENTERED AT NGR: NJ 20173 58396

GROUND INVESTIGATION LEGEND

ROTARY PERCUSSIVE BOREHOLE TO 15.0mbgl INCLUDING MINIMUM 6.0m ROCK CORE

TRIAL PIT TO 4.0mbgl OR REFUSAL

Rev.	Date	Description	Drwn.	Chkd.	Appd.

FAIRHURST
Westerton of Craigie
Southampton Road
DUNDEE
DD4 7PN

Tel: 01382 453 300
Fax: 0844 381 4412

Client: Moray Council

Project Title:
CLODDACH BRIDGE
ELGIN

Drawing Title:
GROUND INVESTIGATION LAYOUT

Scale at A3:	Status:	
NTS	For Information	
Drawn:	Checked:	Approved:
RM	AK	AK
Date:	Date:	Date:
14/08/23	15/08/23	15/08/23

Drawing No.: 140163/9001

Revision: –

Appendix 5

Public Utilities and Site Walkover Photographs

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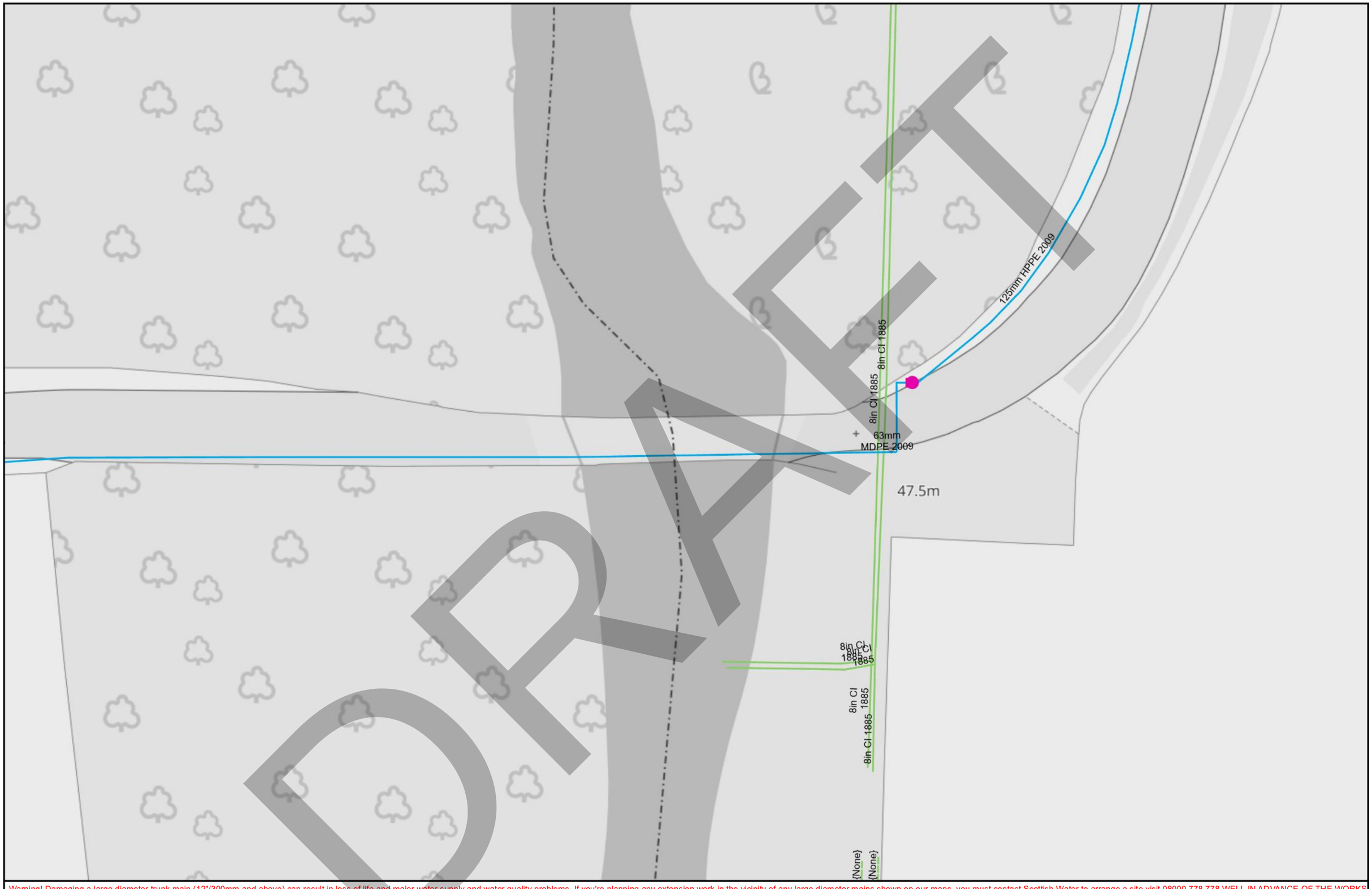

Warning! Damaging a large diameter trunk main (12"/300mm and above) can result in loss of life and major water supply and water quality problems. If you're planning any extension work in the vicinity of any large diameter mains shown on our maps, you must contact Scottish Water to arrange a site visit 08000 778 778 WELL IN ADVANCE OF THE WORKS

Plotted By: gavin.park@fairhurst.co.uk

N

The representation of physical assets and the boundaries of areas in which Scottish Water and others have an interest does not necessarily imply their true positions. For further details contact the appropriate District office.

Date: 15/08/2023

Cloddach Bridge

0 1.5 3 6 Meters

SCALE: 1:331

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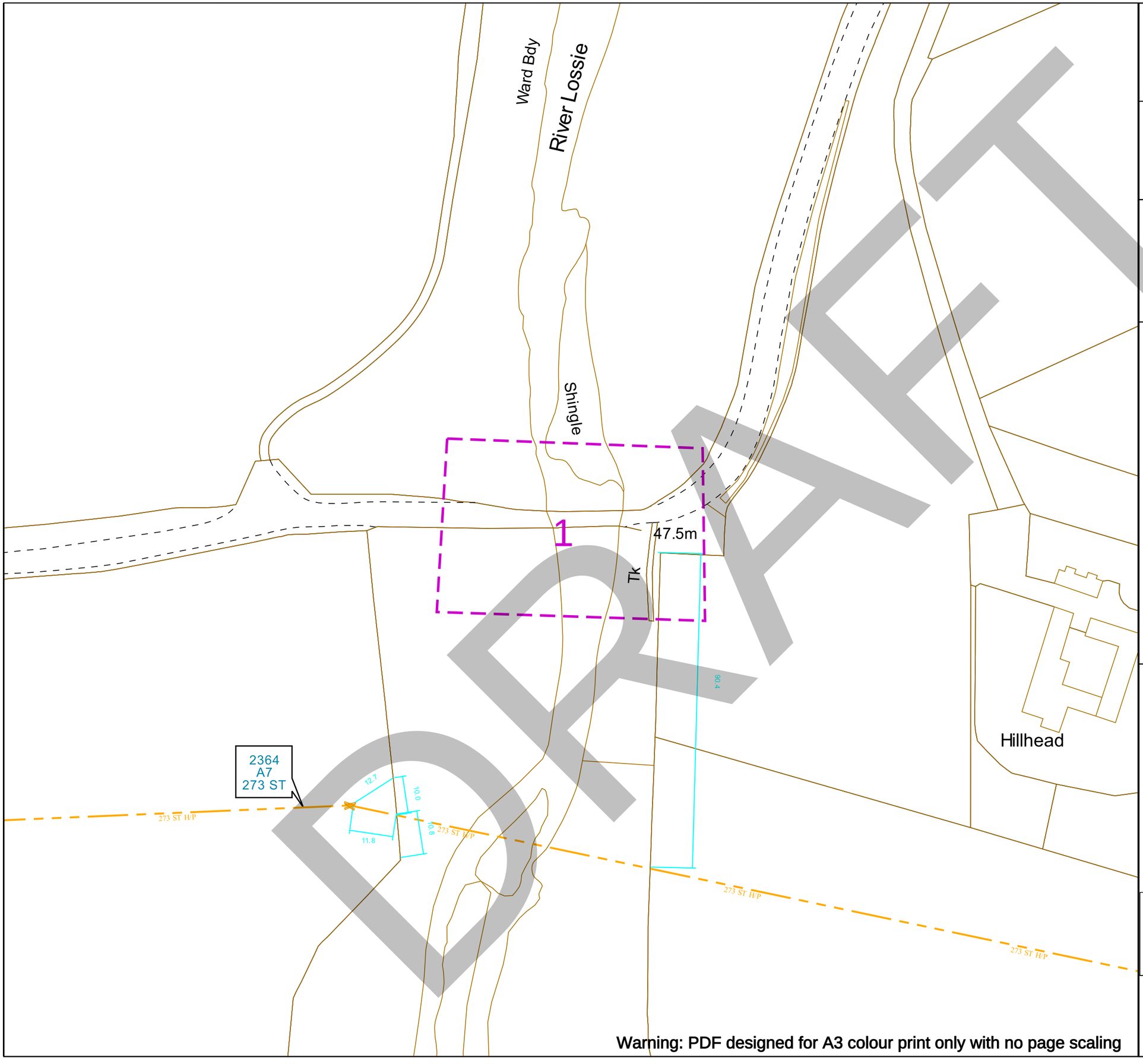
Scottish Water
Trusted to serve Scotland

The Bridge
6 Buchanan Gate
Stepps
Glasgow
G33 6FB

Tel No: 08000 778 778



N
W E
S

SGN
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Contact Us
SGN Safety Admin Team:
0800 912 1722
Email:
plantlocation@sgn.co.uk

Date Requested: 15/08/2023
Job Reference: 30514901
Site Location: 320171 858394
Requested by: Mr Shaun Craig

Your Scheme/Reference: 140163

Scale: 1:1000 (When plotted at A3)

This plan shows the location of those pipes owned by Scotia Gas Networks (SGN) by virtue of being a licensed Gas Transporter (GT). Gas pipes owned by other GTs or third parties may also be present in this area but are not shown on this plan. Information with regard to such pipes should be obtained from the relevant owners. No warranties are given with regard to the accuracy of the information shown on this plan. Service pipes, valves, siphons, sub-connections etc. are not shown but their presence should be anticipated. You should be aware that a small percentage of our pipes/assets may be undergoing review and will temporarily be highlighted in yellow. If your proposed works are close to one of these pipes, you should contact the SGN Safety Admin Team on 0800 912 1722 for advice. No liability of any kind whatsoever is accepted by SGN or its agents, servants or sub-contractors for any error or omission contained herein. Safe digging practices, in accordance with HS (G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that plant location information is provided to all persons (whether direct labour or sub-contractors) working for you on or near gas apparatus. Information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Report damage immediately – KEEP EVERYONE AWAY FROM THE AREA
0800 111 999

Low Pressure Mains
Medium Pressure Mains
Intermediate Pressure Mains
High Pressure Mains
LAs
GTs
SSSIs

Some Examples Of Plant Items
Valve | Syphon | Depth of Cover | Diameter Change | Material Change

Digsite: Line: Area:

Linesearch beforeUdig

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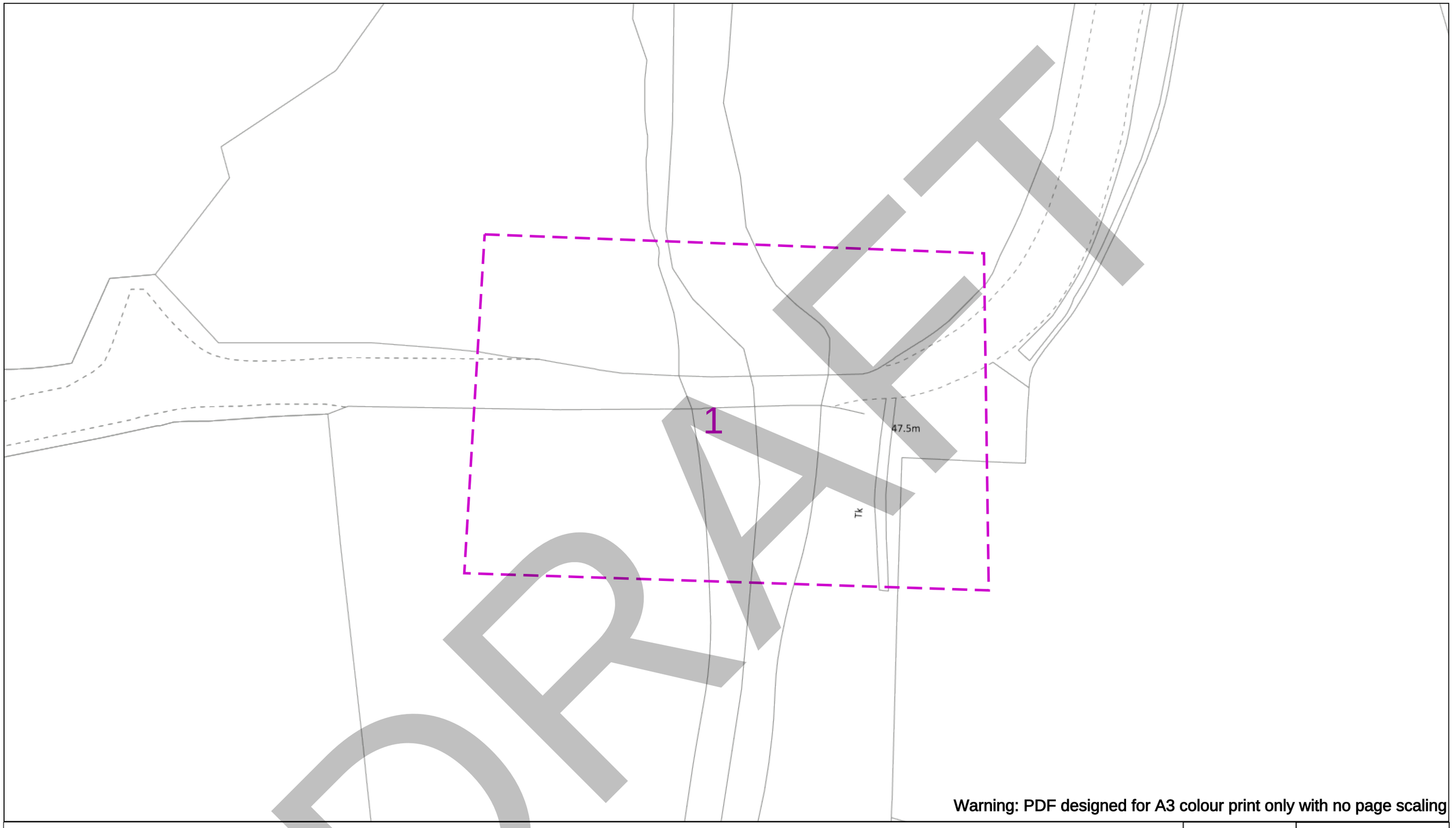
Warning: PDF designed for A3 colour print only with no page scaling



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Warning: PDF designed for A3 colour print only with no page scaling

0 ——— 50m Dig Sites Area: Line:

Date Requested: 15/08/2023
Job Reference: 30514901
Site Location: 320171 858394
Requested by:
Mr Shaun Craig
Your Scheme/Reference: 140163

Scale: 1:500 (When plotted at A3)

WARNING

There may have been subsequent alteration to the surface levels. Trial holes must be undertaken to determine position and depths of cables. HS (G) 47 Booklet from the Health and Safety Executive – Avoiding Danger from Buried Cables – should be consulted before commencing excavation work.

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTES GS6 SHOULD BE CONSULTED (AVAILABLE FROM THE HSE WEBSITE)

Voltages (V)

LV (Low Voltage) and Services	Up to 1,000V
HV (High Voltage)	Over 1,000V to 11,000V
EHV (Extra High Voltage)	22,000V to 132,000V
Transmission	275,000V and 400,000V

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID

	Services	LV	HV	EHV
Footpath/Unmade	0.45m	0.45m	0.6m	0.8m
Road Crossing	0.6m	0.6m	0.75m	0.9m
Agricultural	1m	1m	1m	1.1m

Legend

- Service Cable
- LV Mains
- 2 – 3.3kV
- 6.6kV
- 11kV
- 22kV
- 33kV
- 66kV
- 132kV
- 275kV
- 400kV
- Fibre Optic
- Pilot Cable

Distribution Structures [Electric]

- Pole, Existing Location
- Pole Structure, Existing Location - Single
- Pole Structure, Existing Location - H
- Duct Route
- Cross Section Route

N W E S

Scottish & Southern Electricity Networks

Southern Electric Power Distribution plc
Registered Office: No.1 Forbury Place
43 Forbury Road Reading RG1 3JH
Registered In England & Wales No.04094290

If you're unsure & need to seek advice before commencing excavations please contact:
General Enquiries: 0800 048 3516

Subject to revision – Master held by SSEN Asset Data Team:
Asset.Data@sse.com
01256 337 294

BASED UPON THE ORDNANCE SURVEY MAP WITH THE SANCTION OF THE CONTROLLER OF H.M STATIONERY OFFICE CROWN COPYRIGHT RESERVED.
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Enquiry Confirmation

LSBUD Ref: 30514901

Date of enquiry: 15/08/2023
Time of enquiry: 11:44

Enquirer

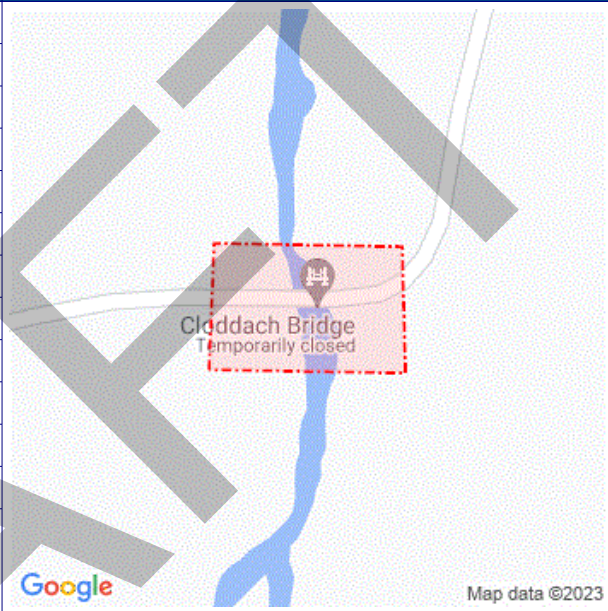
Name	Mr Shaun Craig	Phone	01382453300
Company	Fairhurst	Mobile	Not Supplied
Address	Westerton of Craigie, Southampton Road Dundee Tayside DD4 7PN		
Email	shaun.craig@fairhurst.co.uk		

Enquiry Details

Enquiry type	Initial Enquiry
Work category	Excavations Non Utility
Work type	Multiple excavations site (deeper than 1.5m)
Work type buffer*	50 metres
Start date	16/08/2023
End date	16/08/2023
Scheme/Reference	140163
Search location	XY= 320173, 858396
Confirmed location	320171 858394
Site size	3422 metres square
Site Contact Name	Not Supplied
Site Phone No.	Not Supplied
Description of Works	

* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.

Site Map



Please note that the above map only displays the location of the proposed work site and will not display any of the Members' pipes and cables. It is imperative that this area accurately reflects the proposed work site.

Affected LSBUD members

(LSBUD Members who have assets registered on LSBUD within the vicinity of your search area.)

Asset Owner	Phone/Email	Emergency Only	Status
Scottish and Southern Electricity Networks	08000483516	08000727282	Await response
SGN	08009121722	0800111999	Await response

Status explanation

Await Response means that the asset owner will contact you. This is typically by sending the plan response but they may ask for further information before being able to do so, particularly if any payments or authorisations are required.

Email Additional Info means that the asset owner needs further information about your works to assess your enquiry before providing a response. Please provide any details you have available including plans, method statements etc. if available.

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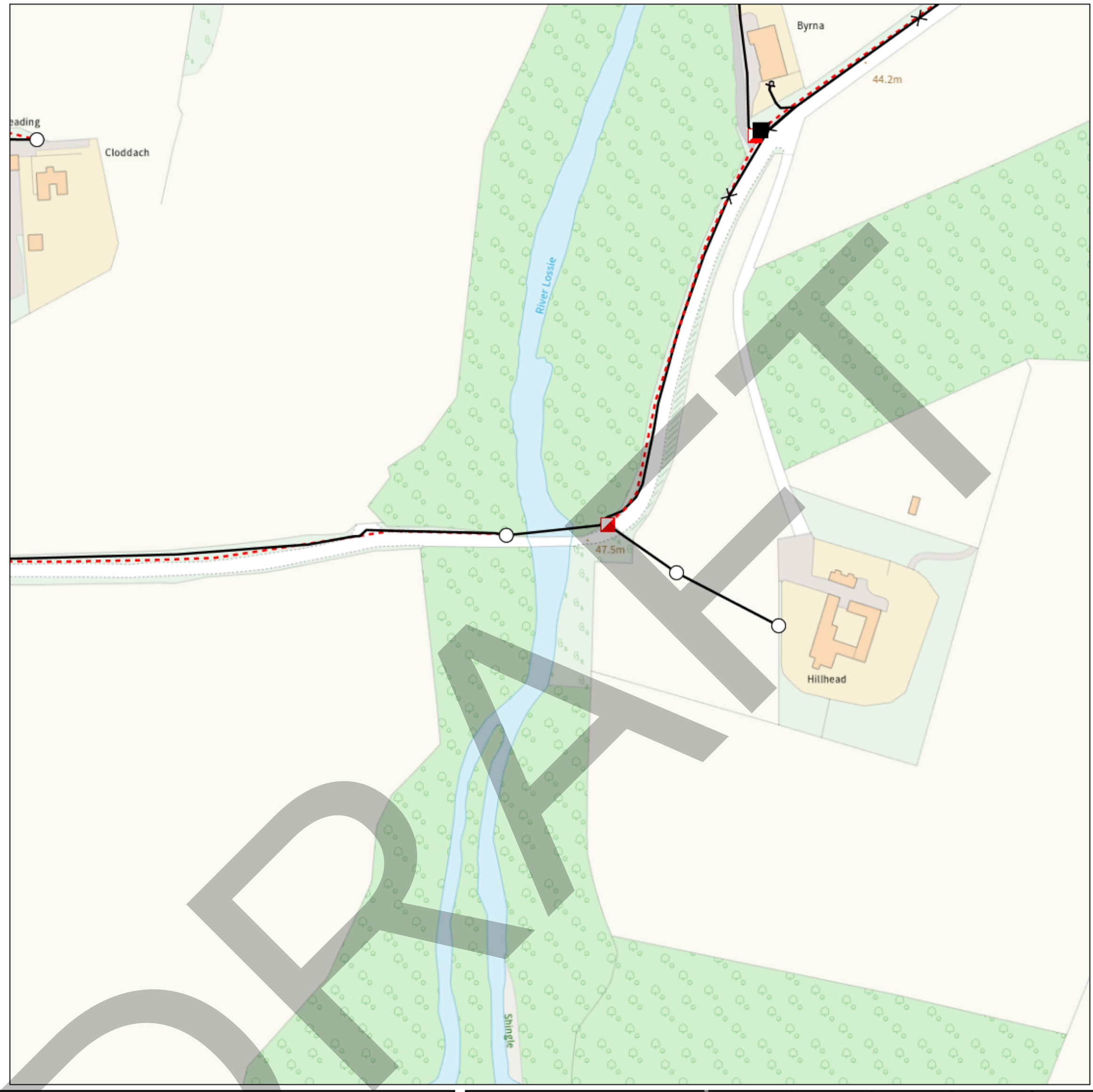
Maps by email Plant Information Reply



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IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

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Controller of Her Majesty's Stationary Office
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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : UIQ11455F
Map Reference : (centre) NJ2017358396
Easting/Northing : (centre) 320173,858396
Issued : 15/08/2023 11:45:30

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Enquiry Confirmation
LSBUD Ref: 30514901

Date of enquiry: 15/08/2023
Time of enquiry: 11:44

Important notices

It is very important that you correctly understand what the service does and the procedures in order for you to work safely. Please refer to the LSBUD Support Page (www.lsbud.co.uk/linesearchbeforeudig-support) for further guidance.
This information includes how to provide additional information to the LSBUD Members who request it to provide a response to your enquiry.
Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date and time of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LinesearchbeforeUdig (LSBUD) accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.
Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.lsbud.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

List of not affected LSBUD members
(LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area.)

Angus Energy	AWE Pipeline	B & D Energy Limited
Balfour Beatty Investments Limited	BOC Limited (A Member of the Linde Group)	Box Broadband
BP Exploration Operating Company Limited	BPA	Cadent Gas
Cambridgeshire County Council Climate Change and Energy Services	CATS Pipeline c/o Wood Group PSN	Cemex
Centrica Storage Ltd	CNG Services Ltd	Concept Solutions People Ltd
ConocoPhillips (UK) Teesside Operator Ltd	D.S.Smith	Diamond Transmission Corporation
DIO (MOD Abandoned Pipelines)	DIO (MOD Live Pipelines)	E.ON UK CHP Limited
EDF Energy Renewables Ltd	EirGrid	Eleclink Limited
Electricity North West Limited	Energy Assets Networks	ENI & Himor c/o Penspen Ltd
EnQuest NNS Limited	EP Langage Limited	ESB CCGT Power station (Carrington Gas Pipeline)
ESP Utilities Group	ESSAR	Esso Petroleum Company Limited
euNetworks Fiber UK Ltd	EXA Infrastructure	Exolum Pipeline System
Fulcrum Electricity Assets Limited	Fulcrum Pipelines Limited	Gamma
Gas Networks Ireland (UK)	Gateshead Energy Company	Gigaclear Ltd
Harbour Energy	Heathrow Airport LTD	Humbly Grove Energy
IGas Energy	INEOS FPS Pipelines	INEOS Manufacturing (Scotland and TSEP)
INOVYN ChlorVinyls Limited	INOVYN Enterprises Limited	Intergen (Coryton Energy or Spalding Energy)
Jurassic Fibre Ltd	Kensa Utilities	Last Mile
Mainline Pipelines Limited	Manchester Jetline Limited	Manx Cable Company
Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited	Moray East Offshore Windfarm
MUA Group Limited	National Gas Transmission	National Grid Electricity Distribution
National Grid Electricity Transmission	Neos Networks	Northern Gas Networks Limited
Northumbrian Water Group	NPower CHP Pipelines	NTT Global Data Centers EMEA UK Ltd
NYnet Ltd	Ogi	Oikos Storage Limited
Ørsted	Palm Paper Ltd	Perenco UK Limited (Purbeck Southampton Pipeline)
Petroineos	Phillips 66	Portsmouth Water
Premier Transmission Ltd (SNIP)	Redundant Pipelines - LPDA	RWE - Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)
RWEnpower (Little Barford and South Haven)	SABIC UK Petrochemicals	SAS Utility Services Ltd
Scottish Power Generation	Seabank Power Ltd	SES Water
Shell	Shell NOP	SP Energy Networks
Squire Energy Networks	SSE Generation Ltd	SSE Transmission

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Enquiry Confirmation
LSBUD Ref: 30514901

Date of enquiry: 15/08/2023
Time of enquiry: 11:44

SSE Utility Solutions Limited	Storengy	Tata Communications (c/o JSM Construction Ltd)
Total Colnbrook Pipelines	Total Finaline Pipelines	Transmission Capital
UK Power Networks	Uniper UK Ltd	University of Cambridge Granta Backbone Network
Vattenfall	Veolia ES SELCHP Limited	Veolia ES Sheffield Ltd
Voneus Limited	VPI Power Limited	Wales and West Utilities
West of Duddon Sands Transmission Ltd	Westminster City Council	Zayo Group UK Ltd c/o JSM Group Ltd

Non-LSBUD members (Asset owners not registered on LSBUD)
(The following Non-LSBUD Members may have assets in your search area. It is YOUR RESPONSIBILITY to contact them before proceeding.
Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.)

Asset Owner	Preferred contact method	Phone	Status
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08000232023	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
Equans	nrswa.uk@equans.com	0800 130 3600	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@ocugroup.com	02087314613	Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Moray Council	road.maint@moray.gov.uk		Not Notified
Scottish Water	https://www.scottishwater.co.uk/help-and-resources/contact-us	08000778778	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified

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Disclaimer
Please refer to LSBUD's Terms of Use for full terms of use available at www.lsbud.co.uk
The results of this Enquiry are personal to the Enquirer and shall not be shared with or relied upon by any other party. The asset information on which the Enquiry results are based has been provided by LSBUD Members, therefore LSBUD will provide no guarantee that such information is accurate or reliable nor does it monitor such asset information for accuracy and reliability going forward. There may also be asset owners which do not participate in the enquiry service operated by LSBUD, including but not exclusively those set out above. Therefore, LSBUD cannot make any representation or give any guarantee or warranty as to the completeness of the information contained in the enquiry results or accept any responsibility for the accuracy of the mapping images used. LSBUD and its employees, agents and consultants accept no liability (save that nothing in this Enquiry Confirmation excludes or limits our liability for death or personal injury arising from our negligence, or our fraud or fraudulent misrepresentation, or any other liability that cannot be excluded or limited by English law) arising in respect thereof or in any other way for errors or omissions including responsibility to any person by reason of negligence.

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engineering solutions, delivering results

Appendix 6

Groundwater Monitoring Methodology

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Groundwater/LNAPL Level Monitoring Methodology

Introduction

This document defines how the measuring of groundwater/hydrocarbon level within monitoring boreholes is to be undertaken. The following document is split into three major sections:-

1. **Level monitoring methodology**
2. **Health and Safety**
3. **Data Management**

Close adherence of which, should ensure quality data is gathered.

Due to the potential presence of Light Non Aqueous Phase Liquids on the groundwater monitoring boreholes at the site, it is imperative that the following procedure is adhered to. This will allow an accurate representation of any LNAPL plume.

1. Level Monitoring Methodology

PRELIMINARY CHECKS:

1. **Ensure the dual phase dip meter unit is fully operational (by means of the manufacturers recommended field test (record the results)), fully charged and does not require servicing. Check all parts for signs of wear and tear and general cleanliness.**
2. **Obtain borehole logs, installation details, latest site plan (with borehole numbers) and any previous monitoring data.**
3. **Ensure that access has been arranged with the site operator/owner.**
4. **Complete Health and Safety Risk Assessment for site.**
5. **Record antecedent weather conditions leading up to the monitoring visit.**
6. **During transportation, ensure that the monitoring equipment unit is not stored near any potential sources of contamination.**
7. **Prior to undertaking the monitoring. A simple inspection of the installation should be undertaken to note any quality issues and the status of the headworks also make note of the weather conditions (including air temperature) and any activities that are being undertaken prior to and during the monitoring. A note should be made of any maintenance that the installation requires.**

MONITORING OF LNAPL/Water Level

1. **Obtain Proforma for recording results.**
2. **Record the dip meter number/serial number and ensure that the unit passed the relevant preliminary checks.**
3. **Confirm monitoring location with use of the latest edition of the site plan or the on site indication given by the nomlencature on the bung or monitoring well cover.**
4. **Perform thorough cleansing of all equipment to be introduced into the well (inclusive of the tape section of the dip meter) with a suitable COSHH assessed cleaning solution and rinse (ensuring that rinse water is collected).**
5. **Carefully introduce the probe into the borehole and measure for the presence of LNAPL in accordance with the manufacturer (of the interface probe) guidelines. Record the levels of LNAPL relative to ground level (if the cover is upstanding, take the measurement from the ground level).**
6. **Repeat the LNAPL process for the water level ensuring that there is consistency in the level reading.**

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7. **Due to the dip meter having a limit of detection, the presence (or not) of LNAPL must be confirmed using a suitable (LNAPL/Water) bailer. The thickness, colour and consistency of the LNAPL (if recovered) must be recorded. Waste materials should be stored as per section 2.0 of this document.**
8. **Repeat for <u>All Boreholes</u> on site.**

2. Health and Safety

The monitoring program should be covered by a health and safety plan identifying:

- **The hazards likely to be encountered on site (physical and chemical)**
- **The means that they can be avoided**
- **The action to be taken in case of health and safety incident**

Personal protective equipment should be used during the monitoring activities. The type of protective equipment and its constituent materials should be selected based upon the anticipated risk on site and the nature of the contaminants that are likely to be encountered.

Waste materials generated at monitoring locations (water and oil generated from bailing, wipes, rinsate water, cleaning solution, gloves, bailers etc) should be segregated into non hazardous waste and potentially hazardous waste and stored in suitable labelled waste containers. The waste should be classified, carried by licensed carrier and disposed of by a suitably licensed contractor at a suitably licensed facility.

3. Data Management

On completion of the monitoring visit all data recorded and the comments (inclusive of the results of the preliminary checks) should be placed electronically within the proforma monitoring sheet and e-mailed/sent to the Project Leader for Quality Assurance checking and subsequently reported to the Consulting Engineer ASAP. The data should be stored and if required included in the factual reporting for the site.

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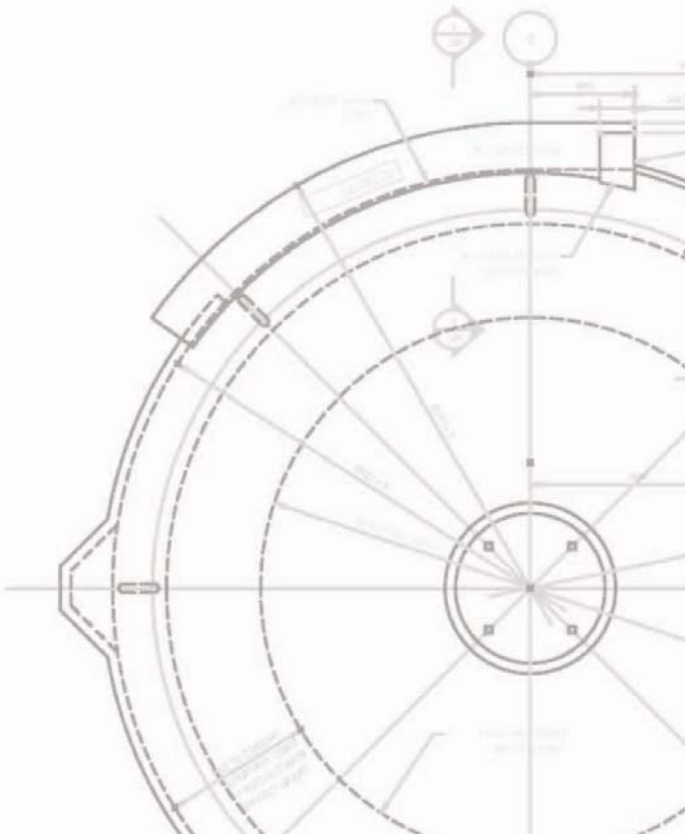

Appendix B – Risk Matrices

Cloddach Bridge Risk Categorisation and Scoring

Risk Likelihood Scoring

	Likelihood	Frequency	Probability
1 Rare	1-5% (Very Low)	Not expected to occur for years	Occur in exceptional circumstances
2 Unlikely	6-25% (Low)	Expected to occur at least annually	Unlikely to occur
3 Possible	26-50% (Medium)	Expected to occur at least monthly	Reasonable chance of occurring
4 Likely	51-75% (High)	Expected to occur at least weekly	The event will occur in most circumstances
5 Almost certain	Greater than 75% (Very High)	Expected to occur at least daily	Most likely to occur than not

Risk Impact Scoring

	Financial	Time	Reputation	Performance
50 Significant (Catastrophic)	Approx. 5%+ cost increase	A twelve month plus increase in project end date timescales	Widespread negative news profile and / or third party action or intervention Sustained headline news Some national coverage	Major failure to achieve key programme/project objectives
25 Major	Approx. 3 - 5% cost increase	A nine to twelve month increase in project end date timescales	High news profile and / or high embarrassment Widespread local news	Significant impact on the delivery of key programme/project objectives
10 Moderate	Approx. 1-3% cost increase	A six to nine month increase in project end date timescales	Moderate but limited public embarrassment and/ or moderate news profile Some local news	Moderate shortfalls in achieving key programme/project objectives
5 Minor	Approx.: 0.3-1% cost increase	A three to six month increase in project end date timescales	Low impact and / or low news profile Minor local media coverage	Minor shortfalls in achieving key programme/project objectives
1 Insignificant	Approx. 0.3% cost increase	A one to three month increase in project end date timescales	No impact of significance on reputation Minimal media coverage	Minimal impact on achieving key programme/project objectives

Risk Matrix

LIKELIHOOD	1 Rare	2 Unlikely	3 Possible	4 Likely	5 Almost certain
IMPACT	1-5%	6-25%	26-50%	51-75%	(>75%)
1 Insignificant	1 (Minor)	2 (Minor)	3 (Minor)	4 (Moderate)	5 (Moderate)
5 Minor	5 (Minor)	10 (Moderate)	15 (Moderate)	20 (Moderate)	25 (Moderate)
10 Moderate	10 (Minor)	20 (Moderate)	30 (Moderate)	40 (Moderate)	50 (Major)
25 Major	25 (Moderate)	50 (Major)	75 (Major)	100 Significant (Catastrophic)	125 Significant (Catastrophic)
50 Significant (Catastrophic)	50 (Moderate)	100 (Major)	150 Significant (Catastrophic)	200 Significant (Catastrophic)	250 Significant (Catastrophic)

Risk Severity Rating

Score	Risk	Action
1 - 5	**Minor**	Managed through normal control measures
6 - 30	**Moderate**	Review control measures
40 - 75	**Major**	Treatment plans to be developed, implemented and monitored
80 - 250	**Catastrophic**	Immediate action required. Treatment plans to be developed, implemented and monitored.

Cloddach Bridge Risk Register			Option 1 - Do Minimum										
Risk No	**Risk Type**	**Risk Description**	**Controls**	**Likelihood 1-5**	**Cost Impact 1-5**	**Time Impact 1-5**	**Reputation Impact 1-5**	**Performance Impact 1-5**	**Risk Rating Cost**	**Risk Rating Time**	**Risk Rating Reputation**	**Risk Rating Performance**	**Overall Risk Ranking**
Opt 1-1	Reputation/Cost	**IF** no action is taken to repair the bridge **THEN** avoidable damage to utility services occurs **RESULTING IN** reputational damage and costs	Regular inspections in place	2	50	1	25	10	100	2	50	20	100
Opt 1-2	Reputation	**IF** there is inadequate engagement with general stakeholders and the public **THEN** there is a threat that the general stakeholders and public are more inclined to make complaints about bridge being closed to vehicular traffic and/or bridge ultimately being demolished **RESULTING IN** reputational damage	Stakeholder Engagement Plan and Communications Strategy to be developed.	4	5	5	25	10	20	20	100	40	100
Opt 1-3	Reputation/Cost	**IF** scour survey is not undertaken to better understand the risk to the substructure **THEN** structure could collapse due to scour damage **RESULTING IN** reputational damage, cost for emergency removal of structure	Scour survey recommended	2	50	5	25	25	100	10	50	50	100
Opt 1-4	Cost	**IF** scour survey indicates river training works or underpinning repairs are required **THEN** work will need to be undertaken to keep bridge open to cyclists and pedestrians **RESULTING IN** additional cost	Scour survey recommended	3	50	5	10	10	150	15	30	30	150
Opt 1-5	Reputation	**IF** there is a combination of human error, organisational failures, planning failures, and/or lack of compliance with Health and Safety or environmental legislation **THEN** avoidable environmental or health and safety incidents occur **RESULTING IN** reputational damage	Regular inspections in place	2	5	1	5	5	10	2	10	10	10
Opt 1-6	Financial/ Time	**IF** Unknown services are identified during demolition **THEN** Construction productivity reduced while affected services are relocated or design amended **RESULTING IN** Increased costs and delay to completion	Initial utility search has identified BT and Scottish Water assets only in vicinity of bridge.	2	50	5	5	5	100	10	10	10	100

Cloddach Bridge Risk Register

Option 2 - Repair Existing Bridge

Risk No	Risk Type	Risk Description	Controls	Likelihood 1-5	Cost Impact 1-5	Time Impact 1-5	Reputation Impact 1-5	Performance Impact 1-5	Risk Rating Cost	Risk Rating Time	Risk Rating Reputation	Risk Rating Performance	Overall Risk Ranking
Opt 2-1	Reputation/Cost	**IF** condition of bridge is worse than anticipated **THEN** extent of repair will increase **RESULTING IN** increased costs and programme delay	Early investigation work to establish likely extent of works.	3	50	10	5	5	150	30	15	15	150
Opt 2-2	Reputation/Cost	**IF** scour survey is not undertaken to better understand the risk to the substructure **THEN** structure could collapse due to scour damage **RESULTING IN** reputational damage, cost for emergency removal of structure	Scour survey recommended	2	50	5	25	25	100	10	50	50	100
Opt 2-3	Cost	**IF** scour survey indicates river training works or underpinning repairs are required **THEN** work will need to be undertaken to keep bridge open to cyclists and pedestrians **RESULTING IN** additional cost	Scour survey recommended	3	50	5	10	10	150	15	30	30	150
Opt 2-4	Reputation	**IF** there is inadequate engagement with general stakeholders and the public **THEN** there is a threat that the general stakeholders and public are more inclined to make complaints **RESULTING IN** reputational damage	Stakeholder Engagement Plan and Communications Strategy to be developed.	2	5	5	10	10	10	10	20	20	20
Opt 2-5	Financial	**IF** delays occur prior to or during Contract Award **THEN** additional inflationary cost increases may occur **RESULTING IN** an increased final tender costs being received	Ensure that appropriate risk allowance is considered. Undertake an inflation assessment.	4	10	5	10	5	40	20	40	20	40
Opt 2-6	Financial/ Time	**IF** landowner negotiations are more protracted than anticipated **THEN** Legal and compensation costs are likely to increase **RESULTING IN** increased cost and delay	Early and ongoing communication with landowners	2	1	1	5	1	2	2	10	2	10
Opt 2-7	Reputation	**IF** there is a combination of human error, organisational failures, planning failures, and/or lack of compliance with Health and Safety or environmental legislation **THEN** avoidable environmental or health and safety incidents occur **RESULTING IN** reputational damage	Include requirements in Contract documents, e.g. qualifications, experience, duration of on site presence, etc. Agree suitable site supervision arrangements.	2	5	1	5	5	10	2	10	10	10
Opt 2-8	Financial/ Time	**IF** extreme weather events occur (flash flooding/prolonged or extreme winter events), possibly linked to climate change, beyond the historical average, which impact construction activity **THEN** critical path programme delays may occur **RESULTING IN** delay to completion of the package and increased cost	Programme construction to minimise risk. Residual risk that weather events occur that limit all site activity.	3	5	1	5	1	15	3	15	3	15
Opt 2-9	Financial	**IF** cost rates are different that those used for cost estimates **THEN** cost estimates to change **RESULTING IN** change in overall cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	4	5	1	10	5	20	4	40	20	40
Opt 2-10	Financial	**IF** Actual quantities change from those used for cost estimates **THEN** cost estimates change **RESULTING IN** increased cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	1	25	1	5	1	25	1	5	1	25
Opt 2-11	Financial	**IF** protected species are identified **THEN** Additional mitigation required **RESULTING IN** Increased costs to overall contract	Environmental and ecological surveys to maintain baseline dataset of protected species. Surveys will identify any species movement in advance of works and provide an opportunity to develop mitigation prior to commencement of works.	5	10	1	1	1	50	5	5	5	50
Opt 2-12	Financial	**IF** Uncharted archaeology found **THEN** additional mitigation and surveying required **RESULTING IN** programme delay and cost increase	Hold archaeological consultations prior to works commencing. Trial trenching to be considered before main works construction. Options considered use same/similar footprint to existing bridge so risk is considered to be low.	1	5	5	5	1	5	5	5	1	5
Opt 2-13	Financial	**IF** land made available is insufficient for works compounds and lay down areas **THEN** additional land and planning applications may be required **RESULTING IN** Increased costs for additional land	Allow sufficient land available within LMA for work compounds and stockpiles	1	5	1	1	1	5	1	1	1	5
Opt 2-14	Financial	**IF** utilities cannot be left in place during repair works **THEN** additional works required for diversions **RESULTING IN** increase utilities costs associated with BT OpenReach and Scottish Water	Early liaison with utilities. Early investigation work to structure to determine likely extent of works.	3	10	1	1	1	30	3	3	3	30
Opt 2-15	Financial	**IF** utility temnporary diversion scope more onerous than anticipated **THEN** additional works required for the diversion **RESULTING IN** increase utilities costs associated with BT OpenReach and Scottish Water	Early liaison with utilities.	5	1	1	1	1	5	5	5	5	5
Opt 2-16	Financial/ Time	**IF** Unknown services are identified during construction that are affected by the Works **THEN** Construction productivity reduced while affected services are relocated or design amended **RESULTING IN** Increased costs and delay to completion	Consultation with Statutory Undertakers during design process to identify any additional utilities.	2	5	10	5	5	10	20	10	10	20

Cloddach Bridge Risk Register

Option 3a - Steel overbridge
Re-use existing abutments
Existing superstructure and piers demolished

Risk No	Risk Type	Risk Description	Controls	Likelihood 1-5	Cost Impact 1-5	Time Impact 1-5	Reputation Impact 1-5	Performance Impact 1-5	Risk Rating Cost	Risk Rating Time	Risk Rating Reputation	Risk Rating Performance	Overall Risk Ranking
Opt 3a-1	Reputation/Cost	**IF** condition of bridge is worse than anticipated **THEN** extent of repairs to abutments will increase **RESULTING IN** increased costs and programme delay	Early investigation work to establish likely extent of works.	3	50	5	5	5	150	15	15	15	150
Opt 3a-2	Reputation	**IF** there is inadequate engagement with general stakeholders and the public **THEN** there is a threat that the general stakeholders and public are more inclined to make complaints **RESULTING IN** reputational damage	Stakeholder Engagement Plan and Communications Strategy to be developed.	2	5	5	10	10	10	10	20	20	20
Opt 3a-3	Financial	**IF** delays occur prior to or during Contract Award **THEN** additional inflationary cost increases may occur **RESULTING IN** an increased final tender costs being received	Ensure that appropriate risk allowance is considered. Undertake an inflation assessment.	4	10	5	10	5	40	20	40	20	40
Opt 3a-4	Financial	**IF** landowner negotiations are more protracted than anticipated **THEN** Legal and compensation costs are likely to increase **RESULTING IN** increased cost and delay	Early and ongoing communication with landowners	2	1	1	5	1	2	2	10	2	10
Opt 3a-5	Reputation	**IF** there is a combination of human error, organisational failures, planning failures, and/or lack of compliance with Health and Safety or environmental legislation **THEN** avoidable environmental or health and safety incidents occur **RESULTING IN** reputational damage	Include requirements in Contract documents, e.g. qualifications, experience, duration of on site presence, etc. Agree suitable site supervision arrangements.	2	5	1	5	5	10	2	10	10	10
Opt 3a-6	Financial/ Time	**IF** extreme weather events occur (flash flooding/prolonged or extreme winter events), possibly linked to climate change, beyond the historical average, which impact construction activity **THEN** critical path programme delays may occur **RESULTING IN** delay to completion of the package and increased cost	Programme construction to minimise risk. Residual risk that weather events occur that limit all site activity.	3	5	1	5	1	15	3	15	3	15
Opt 3a-7	Financial	**IF** cost rates are different that those used for cost estimates **THEN** cost estimates to change **RESULTING IN** change in overall cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	4	5	1	10	5	20	4	40	20	40
Opt 3a-8	Financial	**IF** Actual quantities change from those used for cost estimates **THEN** cost estimates change **RESULTING IN** increased cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	1	25	1	5	1	25	1	5	1	25
Opt 3a-9	Financial	**IF** protected species are identified **THEN** Additional mitigation required **RESULTING IN** Increased costs to overall contract	Environmental and ecological surveys to maintain baseline dataset of protected species. Surveys will identify any species movement in advance of works and provide an opportunity to develop mitigation prior to commencement of works.	5	10	1	1	1	50	5	5	5	50
Opt 3a-10	Financial	**IF** Uncharted archaeology found **THEN** additional mitigation and surveying required **RESULTING IN** programme delay and cost increase	Hold archaeological consultations prior to works commencing. Trial trenching to be considered before main works construction. Options considered use same/similar footprint to existing bridge so risk is considered to be low.	1	1	5	5	1	1	5	5	1	5
Opt 3a-11	Financial	**IF** land made available is insufficient for works compounds and lay down areas **THEN** additional land and planning applications may be required **RESULTING IN** Increased costs for additional land	Allow sufficient land available within LMA for work compounds and stockpiles	1	5	1	1	1	5	1	1	1	5
Opt 3a-12	Financial	**IF** utility temporary diversion scope more onerous than anticipated **THEN** additional works required for the diversion **RESULTING IN** increase utilities costs associated with BT OpenReach and Scottish Water	Early liaison with utilities.	5	1	1	1	1	5	5	5	5	5
Opt 3a-13	Financial/ Time	**IF** Unknown services are identified during construction that are affected by the Works **THEN** Construction productivity reduced while affected services are relocated or design amended **RESULTING IN** Increased costs and delay to completion	Consultation with Statutory Undertakers during design process to identify any additional utilities.	2	5	10	5	5	10	20	10	10	20

Cloddach Bridge Risk Register

Option 3b - Steel overbridge
New piled abutments behind existing
Existing structure retained beneath

Risk No	Risk Type	Risk Description	Controls	Likelihood 1-5	Cost Impact 1-5	Time Impact 1-5	Reputation Impact 1-5	Performance Impact 1-5	Risk Rating Cost	Risk Rating Time	Risk Rating Reputation	Risk Rating Performance	Overall Risk Ranking
Opt 3b-1	Reputation/Cost	**IF** scour survey is not undertaken to better understand the risk to the substructure of the existing structure retained beneath the new structure **THEN** old structure could collapse due to scour damage **RESULTING IN** reputational damage, cost for emergency removal of structure and utility diversions/repairs	Scour survey recommended	2	50	5	25	25	100	10	50	50	100
Opt 3b-2	Reputation/Cost	**IF** condition of existing structure not monitored once new bridge constructed **THEN** avoidable damage to utility services occurs **RESULTING IN** reputational damage and costs	Regular inspections recommended	2	1	1	25	10	2	2	50	20	50
Opt 3b-3	Reputation/Cost	**IF** vertical realignment over existing bridge cannot be achieved to standards **THEN** avoidable damage or safety incidents occur **RESULTING IN** reputational damage and costs	Ramps with speed restrictions or significant realignment required	4	1	1	25	1	4	4	100	4	100
Opt 3b-4	Financial	**IF** delays occur prior to or during Contract Award **THEN** additional inflationary cost increases may occur **RESULTING IN** an increased final tender costs being received	Ensure that appropriate risk allowance is considered. Undertake an inflation assessment.	4	10	5	10	5	40	20	40	20	40
Opt 3b-5	Financial	**IF** landowner negotiations are more protracted than anticipated **THEN** Legal and compensation costs are likely to increase **RESULTING IN** increased cost and delay	Early and ongoing communication with landowners	2	1	1	5	1	2	2	10	2	10
Opt 3b-6	Reputation	**IF** there is a combination of human error, organisational failures, planning failures, and/or lack of compliance with Health and Safety or environmental legislation **THEN** avoidable environmental or health and safety incidents occur **RESULTING IN** reputational damage	Include requirements in Contract documents, e.g. qualifications, experience, duration of on site presence, etc. Agree suitable site supervision arrangements.	2	5	1	5	5	10	2	10	10	10
Opt 3b-7	Financial/ Time	**IF** extreme weather events occur (flash flooding/prolonged or extreme winter events), possibly linked to climate change, beyond the historical average, which impact construction activity **THEN** critical path programme delays may occur **RESULTING IN** delay to completion of the package and increased cost	Programme construction to minimise risk. Residual risk that weather events occur that limit all site activity.	3	5	1	5	1	15	3	15	3	15
Opt 3b-8	Financial	**IF** cost rates are different that those used for cost estimates **THEN** cost estimates to change **RESULTING IN** change in overall cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	4	5	1	10	5	20	4	40	20	40
Opt 3b-9	Financial	**IF** Actual quantities change from those used for cost estimates **THEN** cost estimates change **RESULTING IN** increased cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	1	25	1	5	1	25	1	5	1	25
Opt 3b-10	Financial	**IF** protected species are identified **THEN** Additional mitigation required **RESULTING IN** Increased costs to overall contract	Environmental and ecological surveys to maintain baseline dataset of protected species. Surveys will identify any species movement in advance of works and provide an opportunity to develop mitigation prior to commencement of works.	5	10	1	1	1	50	5	5	5	50
Opt 3b-11	Financial	**IF** Uncharted archaeology found **THEN** additional mitigation and surveying required **RESULTING IN** programme delay and cost increase	Hold archaeological consultations prior to works commencing. Trial trenching to be considered before main works construction. Options considered use same/similar footprint to existing bridge so risk is considered to be low.	1	1	5	5	1	1	5	5	1	5
Opt 3b-12	Financial	**IF** land made available is insufficient for works compounds and lay down areas **THEN** additional land and planning applications may be required **RESULTING IN** Increased costs for additional land	Allow sufficient land available within LMA for work compounds and stockpiles	1	5	1	1	1	5	1	1	1	5
Opt 3b-13	Financial	**IF** utility temporary diversion scope more onerous than anticipated **THEN** additional works required for the diversion **RESULTING IN** increase utilities costs associated with BT OpenReach and Scottish Water	Early liaison with utilities.	5	1	1	1	1	5	5	5	5	5
Opt 3b-14	Financial/ Time	**IF** Unknown services are identified during construction that are affected by the Works **THEN** Construction productivity reduced while affected services are relocated or design amended **RESULTING IN** Increased costs and delay to completion	Consultation with Statutory Undertakers during design process to identify any additional utilities.	2	5	10	5	5	10	20	10	10	20

Cloddach Bridge Risk Register			Option 4a - New integral bridge - 2 traffic lanes										
Risk No	Risk Type	Risk Description	Controls	Likelihood 1-5	Cost Impact 1-5	Time Impact 1-5	Reputation Impact 1-5	Performance Impact 1-5	Risk Rating Cost	Risk Rating Time	Risk Rating Reputation	Risk Rating Performance	Overall Risk Ranking
Opt 4a-1	Financial	**IF** delays occur prior to or during Contract Award **THEN** additional inflationary cost increases may occur **RESULTING IN** an increased final tender costs being received	Ensure that appropriate risk allowance is considered. Undertake an inflation assessment.	4	10	5	10	5	40	20	40	20	40
Opt 4a-2	Financial	**IF** landowner negotiations are more protracted than anticipated **THEN** Legal and compensation costs are likely to increase **RESULTING IN** increased cost and delay	Early and ongoing communication with landowners	2	1	1	5	1	2	2	10	2	10
Opt 4a-3	Reputation	**IF** there is a combination of human error, organisational failures, planning failures, and/or lack of compliance with Health and Safety or environmental legislation **THEN** avoidable environmental or health and safety incidents occur **RESULTING IN** reputational damage	Include requirements in Contract documents, e.g. qualifications, experience, duration of on site presence, etc. Agree suitable site supervision arrangements.	2	5	1	5	5	10	2	10	10	10
Opt 4a-4	Financial/ Time	**IF** extreme weather events occur (flash flooding/prolonged or extreme winter events), possibly linked to climate change, beyond the historical average, which impact construction activity **THEN** critical path programme delays may occur **RESULTING IN** delay to completion of the package and increased cost	Programme construction to minimise risk. Residual risk that weather events occur that limit all site activity.	3	5	1	5	1	15	3	15	3	15
Opt 4a-5	Financial	**IF** cost rates are different that those used for cost estimates **THEN** cost estimates to change **RESULTING IN** change in overall cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	4	5	1	10	5	20	4	40	20	40
Opt 4a-6	Financial	**IF** Actual quantities change from those used for cost estimates **THEN** cost estimates change **RESULTING IN** increased cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	1	25	1	5	1	25	1	5	1	25
Opt 4a-7	Financial	**IF** protected species are identified **THEN** Additional mitigation required **RESULTING IN** Increased costs to overall contract	Environmental and ecological surveys to maintain baseline dataset of protected species. Surveys will identify any species movement in advance of works and provide an opportunity to develop mitigation prior to commencement of works.	5	10	1	1	1	50	5	5	5	50
Opt 4a-8	Financial	**IF** Uncharted archaeology found **THEN** additional mitigation and surveying required **RESULTING IN** programme delay and cost increase	Hold archaeological consultations prior to works commencing. Trial trenching to be considered before main works construction. Options considered use same/similar footprint to existing bridge so risk is considered to be low.	1	1	5	5	1	1	5	5	1	5
Opt 4a-9	Financial	**IF** land made available is insufficient for works compounds and lay down areas **THEN** additional land and planning applications may be required **RESULTING IN** Increased costs for additional land	Allow sufficient land available within LMA for work compounds and stockpiles	1	5	1	1	1	5	1	1	1	5
Opt 4a-10	Financial	**IF** utility temporary diversion scope more onerous than anticipated **THEN** additional works required for the diversion **RESULTING IN** increase utilities costs associated with BT OpenReach and Scottish Water	Early liaison with utilities.	5	1	1	1	1	5	5	5	5	5
Opt 4a-11	Financial/ Time	**IF** Unknown services are identified during construction that are affected by the Works **THEN** Construction productivity reduced while affected services are relocated or design amended **RESULTING IN** Increased costs and delay to completion	Consultation with Statutory Undertakers during design process to identify any additional utilities.	2	5	10	5	5	10	20	10	10	20

Cloddach Bridge Risk Register			Option 4b - New integral bridge - single traffic lane										
Risk No	Risk Type	Risk Description	Controls	Likelihood 1-5	Cost Impact 1-5	Time Impact 1-5	Reputation Impact 1-5	Performance Impact 1-5	Risk Rating Cost	Risk Rating Time	Risk Rating Reputation	Risk Rating Performance	Overall Risk Ranking
Opt 4b-1	Financial	**IF** delays occur prior to or during Contract Award **THEN** additional inflationary cost increases may occur **RESULTING IN** an increased final tender costs being received	Ensure that appropriate risk allowance is considered. Undertake an inflation assessment.	4	10	5	10	5	40	20	40	20	40
Opt 4b-2	Financial	**IF** landowner negotiations are more protracted than anticipated **THEN** Legal and compensation costs are likely to increase **RESULTING IN** increased cost and delay	Early and ongoing communication with landowners	2	1	1	5	1	2	2	10	2	10
Opt 4b-3	Reputation	**IF** there is a combination of human error, organisational failures, planning failures, and/or lack of compliance with Health and Safety or environmental legislation **THEN** avoidable environmental or health and safety incidents occur **RESULTING IN** reputational damage	Include requirements in Contract documents, e.g. qualifications, experience, duration of on site presence, etc. Agree suitable site supervision arrangements.	2	5	1	5	5	10	2	10	10	10
Opt 4b-4	Financial/ Time	**IF** extreme weather events occur (flash flooding/prolonged or extreme winter events), possibly linked to climate change, beyond the historical average, which impact construction activity **THEN** critical path programme delays may occur **RESULTING IN** delay to completion of the package and increased cost	Programme construction to minimise risk. Residual risk that weather events occur that limit all site activity.	3	5	1	5	1	15	3	15	3	15
Opt 4b-5	Financial	**IF** cost rates are different that those used for cost estimates **THEN** cost estimates to change **RESULTING IN** change in overall cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	4	5	1	10	5	20	4	40	20	40
Opt 4b-6	Financial	**IF** Actual quantities change from those used for cost estimates **THEN** cost estimates change **RESULTING IN** increased cost	Ensure adequate checks and reviews are undertaken. Where insufficient information is available, ensure that appropriate risk allowance is considered.	1	25	1	5	1	25	1	5	1	25
Opt 4b-7	Financial	**IF** protected species are identified **THEN** Additional mitigation required **RESULTING IN** Increased costs to overall contract	Environmental and ecological surveys to maintain baseline dataset of protected species. Surveys will identify any species movement in advance of works and provide an opportunity to develop mitigation prior to commencement of works.	5	10	1	1	1	50	5	5	5	50
Opt 4b-8	Financial	**IF** Uncharted archaeology found **THEN** additional mitigation and surveying required **RESULTING IN** programme delay and cost increase	Hold archaeological consultations prior to works commencing. Trial trenching to be considered before main works construction. Options considered use same/similar footprint to existing bridge so risk is considered to be low.	1	1	5	5	1	1	5	5	1	5
Opt 4b-9	Financial	**IF** land made available is insufficient for works compounds and lay down areas **THEN** additional land and planning applications may be required **RESULTING IN** Increased costs for additional land	Allow sufficient land available within LMA for work compounds and stockpiles	1	5	1	1	1	5	1	1	1	5
Opt 4b-10	Financial	**IF** utility temporary diversion scope more onerous than anticipated **THEN** additional works required for the diversion **RESULTING IN** increase utilities costs associated with BT OpenReach and Scottish Water	Early liaison with utilities.	5	1	1	1	1	5	5	5	5	5
Opt 4b-11	Financial/ Time	**IF** Unknown services are identified during construction that are affected by the Works **THEN** Construction productivity reduced while affected services are relocated or design amended **RESULTING IN** Increased costs and delay to completion	Consultation with Statutory Undertakers during design process to identify any additional utilities.	2	5	10	5	5	10	20	10	10	20

Appendix C – Cost Estimates

CLODDACH BRIDGE COST ESTIMATE SUMMARY

CAPITAL COST ESTIMATE SUMMARY - NO OPTIMISM BIAS	OPTION 1	OPTION 2	OPTION 3A	OPTION 3B	OPTION 4A	OPTION 4B
Topographical Survey	£5,000	£20,000	£20,000	£20,000	£20,000	£20,000
Geotechnical Investigation		-	£40,000	£40,000	£40,000	£40,000
Flood Study		£15,000	£15,000	£15,000	£15,000	£15,000
Scour Survey	£20,000					
Ecology		£20,000	£10,000	£10,000	£10,000	£10,000
Planning		-	£15,000	£15,000	£15,000	£15,000
Statutory Undertakers (Budget)		£100,000	£100,000	-	£100,000	£100,000
Detailed Design Fees (Budget)		£40,000	£25,000	£25,000	£60,000	£60,000
Contract/Procurement		£20,000	£20,000	£20,000	£20,000	£20,000
Construction Cost		£946,984	£515,679	£413,127	£1,081,568	£821,958
Site Supervision		£50,000	£20,000	£20,000	£50,000	£50,000
Overbridge Cost			£467,000	£467,000		

TOTAL Estimate	£25,000	£1,211,984	£1,247,679	£1,045,127	£1,411,568	£1,151,958
	-10%	-10%	-10%	-10%	-20%	-20%
TOTAL Low Estimate	£22,500	£1,090,786	£1,122,911	£940,614	£1,129,254	£921,566
	+100%	+100%	+100%	+100%	+50%	+50%
TOTAL High Estimate	£50,000	£2,423,968	£2,495,358	£2,090,254	£2,117,352	£1,727,937

Project:	140163F - Cloddach Bridge Replacement	Ref:	-
Structure:	Option 2 - Repair/Strengthen	Job No:	140163F
		Date:	15/09/2023
Made by:	Ioannis Fotiadis Checked by: MW	Sheet No:	

Capital Works Summary

Capital Works	MCHW Series	Initial Cost	
Preliminaries	100	£ 378,794	60.0%
Site Clearance	200	£ 48,252	
Road Restraint Systems (Vehicle and Pedestrian)	400	£ 23,645	
Drainage and Service Ducts	500	£ 10,083	100.0%
Earthworks	600	£ 53,381	100.0%
Pavements	700	£ -	100.0%
Kerbs, Footways and Paved Areas	1100	£ 18,337	100.0%
Traffic Signs and Road Markings	1200	£ -	0.0%
Piling and Embedded Retaining Walls	1600	£ -	
Structural Concrete	1700	£ 274,945	
Steelwork for Structures	1800	£ 166,791	
Protection of Steelwork Against Corrosion	1900	£ 23,823	
Waterproofing	2000	£ 12,066	
Additional Quantifiable Costs (e.g. utilities diversions)	-		

TOTAL FOR ALL SERIES **£ 1,010,116**

Project:	140163F - Cloddach Bridge Replacement	Ref:	-
Structure:	Option 3a - Overbridge Demolish	Job No:	140163F
		Date:	15/09/2023
Made by:	M. Walejewska Checked by: IF	Sheet No:	

Capital Works Summary

Capital Works	MCHW Series	Initial Cost	
Preliminaries	100	£ 103,136	25.0%
Site Clearance	200	£ 56,359	
Road Restraint Systems (Vehicle and Pedestrian)	400	£ -	
Drainage and Service Ducts	500	£ 9,828	100.0%
Earthworks	600	£ 13,636	100.0%
Pavements	700	£ 10,468	100.0%
Kerbs, Footways and Paved Areas	1100	£ -	100.0%
Traffic Signs and Road Markings	1200	£ -	0.0%
Piling and Embedded Retaining Walls	1600	£ 161,512	
Structural Concrete	1700	£ 160,740	
Steelwork for Structures	1800	£ -	
Protection of Steelwork Against Corrosion	1900		
Waterproofing	2000	£ -	

TOTAL FOR ALL SERIES **£ 515,679**

Project:	140163F - Cloddach Bridge Replacement	Ref:	-
Structure:	Option 3b Overbridge Retain	Job No:	140163F
		Date:	15/09/2023
Made by:	M. Walejewska Checked by: IF	Sheet No:	

Capital Works Summary

Capital Works	MCHW Series	Initial Cost	
Preliminaries	100	£ 152,783	25.0%
Site Clearance	200	£ 17,487	
Road Restraint Systems (Vehicle and Pedestrian)	400	£ -	
Drainage and Service Ducts	500	£ 26,332	100.0%
Earthworks	600	£ 298,810	100.0%
Pavements	700	£ 10,468	100.0%
Kerbs, Footways and Paved Areas	1100	£ -	100.0%
Traffic Signs and Road Markings	1200	£ -	0.0%
Piling and Embedded Retaining Walls	1600	£ 161,512	
Structural Concrete	1700	£ 61,076	
Steelwork for Structures	1800	£ -	
Protection of Steelwork Against Corrosion	1900	£ -	
Waterproofing	2000	£ 35,449	

TOTAL FOR ALL SERIES **£ 763,917**

Project:	140163F - Cloddach Bridge Replacement	Ref:	-
Structure:	Option 4a - Integral Prestressed Beam Bridge	Job No:	140163F
		Date:	15/09/2023
Made by:	M. Walejewska Checked by: IF	Sheet No:	

Capital Works Summary

Capital Works	MCHW Series	Initial Cost	
Preliminaries	100	£ 216,314	25.0%
Site Clearance	200	£ 56,359	
Road Restraint Systems (Vehicle and Pedestrian)	400	£ 30,999	
Drainage and Service Ducts	500	£ 26,332	100.0%
Earthworks	600	£ 147,313	100.0%
Pavements	700	£ 10,468	100.0%
Kerbs, Footways and Paved Areas	1100	£ 16,183	100.0%
Traffic Signs and Road Markings	1200	£ -	0.0%
Piling and Embedded Retaining Walls	1600	£ 161,512	
Structural Concrete	1700	£ 380,639	
Steelwork for Structures	1800	£ -	
Protection of Steelwork Against Corrosion	1900		
Waterproofing	2000	£ 35,449	

TOTAL FOR ALL SERIES **£ 1,081,568**

Project:	140163F - Cloddach Bridge Replacement	Ref:	-
Structure:	Option 4b- Integral Prestressed Beam Bridge	Job No:	140163F
		Date:	15/09/2023
Made by:	M. Walejewska Checked by: IF	Sheet No:	

Capital Works Summary

Capital Works	MCHW Series	Initial Cost	
Preliminaries	100	£ 164,392	25.0%
Site Clearance	200	£ 56,359	
Road Restraint Systems (Vehicle and Pedestrian)	400	£ 30,999	
Drainage and Service Ducts	500	£ 26,332	100.0%
Earthworks	600	£ 82,173	100.0%
Pavements	700	£ 10,468	100.0%
Kerbs, Footways and Paved Areas	1100	£ 8,091	100.0%
Traffic Signs and Road Markings	1200	£ -	0.0%
Piling and Embedded Retaining Walls	1600	£ 113,962	
Structural Concrete	1700	£ 296,058	
Steelwork for Structures	1800	£ -	
Protection of Steelwork Against Corrosion	1900	£ -	
Waterproofing	2000	£ 33,123	

TOTAL FOR ALL SERIES **£ 821,958**

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To: Ellen Halkon
Coy: Fairhurst Engineering
Tel: 07818 536062
Email: ellen.halkon@fairhurst.co.uk
From: Andrew Wilson
Date: 21st August 2023
Our Ref: JBUK3266

Ref: Cloddach Bridge

We refer to your enquiry for the above and have pleasure in attaching a quotation as requested.

The above image is an example of a JSB Girder bridge and not necessarily the same specification as the quotation. For illustrative purposes only.

A site visit must be carried out by Janson Bridging.

Assumptions have been made as to access to site and crane radius.

Loading details to be confirmed by Fairhurst.

Regards

By e-mail

Andrew Wilson

JANSON BRIDGING (UK) LTD.
Unit 5 Innovate Mews, Lake View Drive,
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Tel. 01767 641469
Mob: 07950 960257
e-mail: andrewwilson@jansonbridging.co.uk
Web site: www.jansonbridging.co.uk

Company overview:

- Founded in Holland in 1972, The Janson Bridging Group are the largest modular bridge manufacturing and building company in continental Europe and the largest bridge rental company in the world bringing this specialist knowledge to work with clients to provide safe, cost effective solutions.
- The Janson Group has over 25,000 tonnes of equipment in the rental fleet We continue to invest to grow with our clients providing market leading products and service to our customers.
- Janson Bridging (UK) serve the UK market from our base in Nottinghamshire using our specialist engineering and site teams to work collaboratively with our clients to focus on effective solutions using off site fabrication as far as possible to reduce programme times.
- We grow through enduring relationships with our customers and a passion for innovation that drives safety and efficiency into our own and our client's performance.

Capability:

- Janson design, supply and install bridges in the UK and throughout the world, we bring this experience to our client's teams. Focussed on off-site fabrication to minimise installation times.
- Working with pre-designed systems from stock or creating bespoke solutions Janson deliver projects ranging from single short span crossings to complex multi span and multi structure solutions providing the right solution for every project.
- Janson innovation and range now extends to FRP bridge solutions, ro-ro's, lift bridges and ferries.

Culture:

- Janson believe that the best solutions result from collaboration. We are at our best when working closely with our clients to fully understand the requirement and tailor a solution using our experience, product range and agility to produce safe, economic least intrusive solutions.
- We continue to invest in our future through innovation and developing our people to provide class leading products and services to our customers.

Rental Products:

- JSK – Simple to install Beam Bridge solution for single of spans up to 21m, unlimited road widths possible. Supplied to site complete with anti-skid surfacing and parapets. Suitable for multi span applications. Full Eurocode loading capability.
- JSB – Beam Bridge solution for single spans of up to 40m unlimited road widths possible. Minimal assembly on site minimises risk and programme time. Suitable for multi span applications. Full Eurocode loading capability.
- JPB – Panel bridge solution. Single spans of up to 80m, single and two-lane road widths. Assembled on site, can be launched or lifted into position to suit site restrictions. Provided with anti-skid surfacing. Suitable for multi-span applications.
- JFB – Panel footbridge solution. Single spans of up to 60m, 2.5m walkway. Standard stair solutions available

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Quotation:

24m x 5m JSB

The supply of a 24m span JSB (Girder) Bridge with a 5m width c/w an anti-skid deck surface and vehicle parapets. Bridge to be configured as per your requirements

Sales Price …… ……	**£ 400,000.00**
Delivery and Pre-assembly (During normal working hours) …… .	£ 30,500.00
Install (Including Cranes) ……	£ 16,500.00
Design ……	£ 20,000.00
Total Sales Price (including installation) ……	**£ 467,000.00**

Optional Extras:

Inspections (Recommended every 12 months) ……	£ 1,000.00 per bridge
Additional Engineering……	£ 75.00 per hour

Notes:

A. This quotation is valid for a period of 7 days from the date of issue due to the volatility in the global steel market and is subject to the availability of the specified equipment at the time of order. Janson Bridging reserves the right to raise the quotation to the customer in the event of significant price increases. Delivery times are indicative and can never be regarded as a strict deadline. Janson Bridging can't be held accountable for exceeding a delivery time beyond our control.

B. The quoted figures exclude VAT

C. Janson Bridging (UK) Terms and Conditions of business apply.

D. Payment terms are 30 days from invoice

E. Delivery – Approx. 30 weeks from order (subject to availability at time of placing order)

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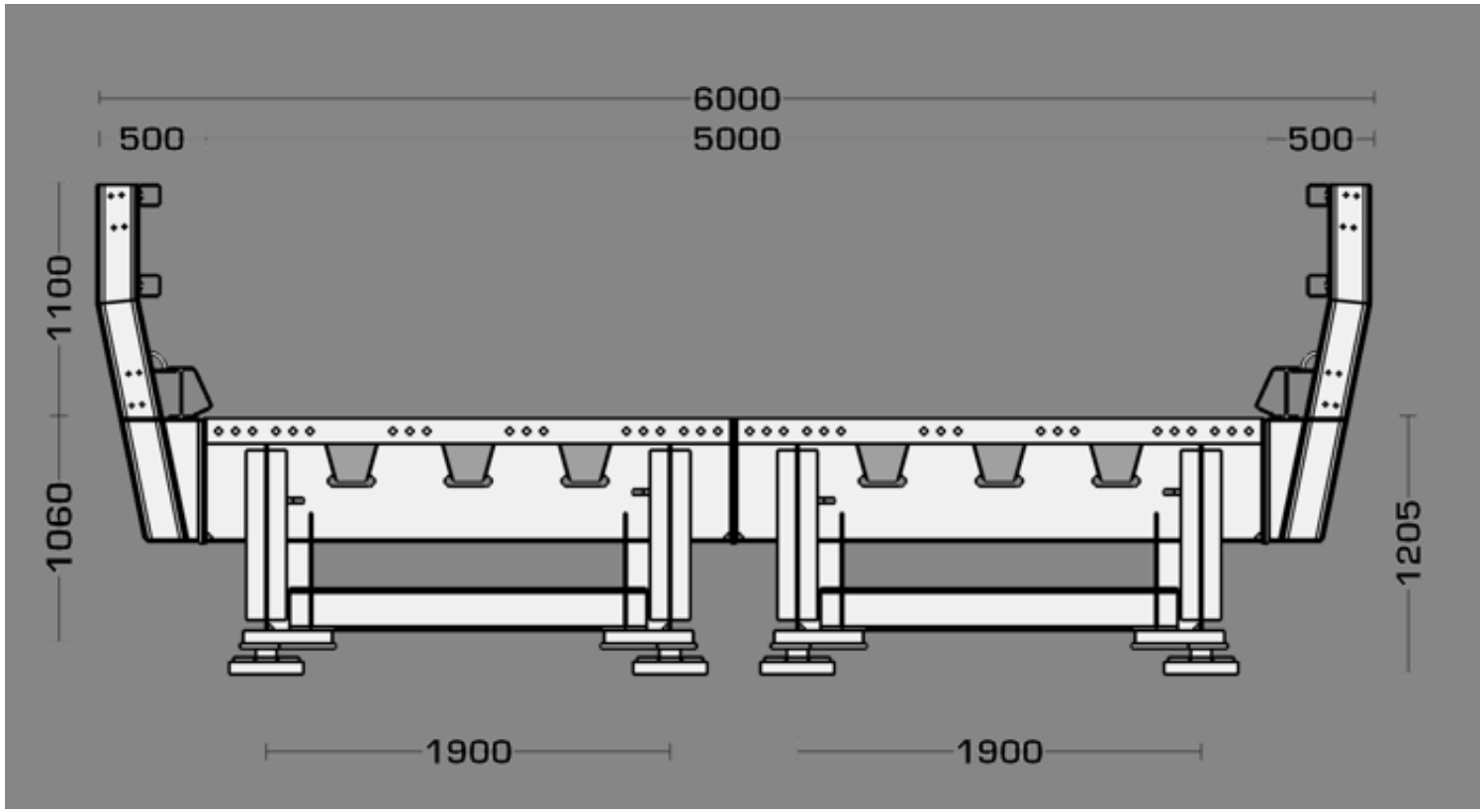
Configuration of 24m JSB

We have based our assumptions using the following



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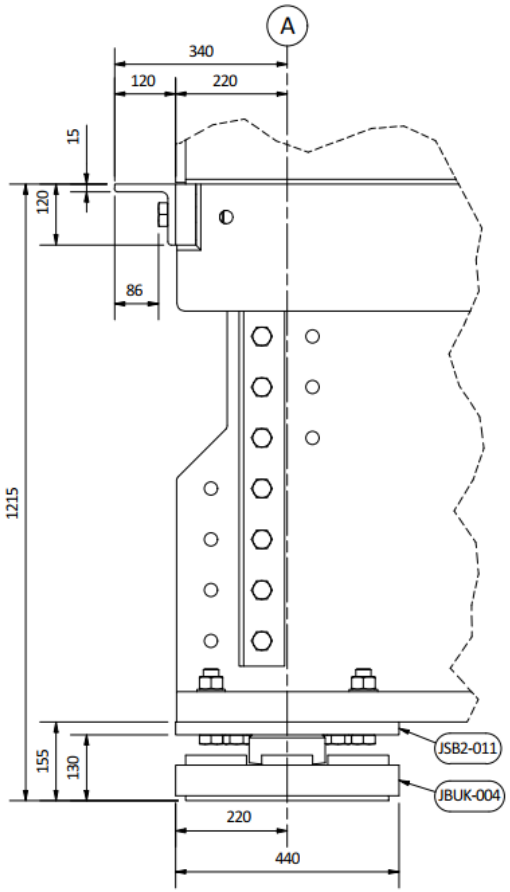

Detail 1, End of bridge Axis A
Scale 1 : 10

JANSONBRIDGING
COME ACROSS

EKFB

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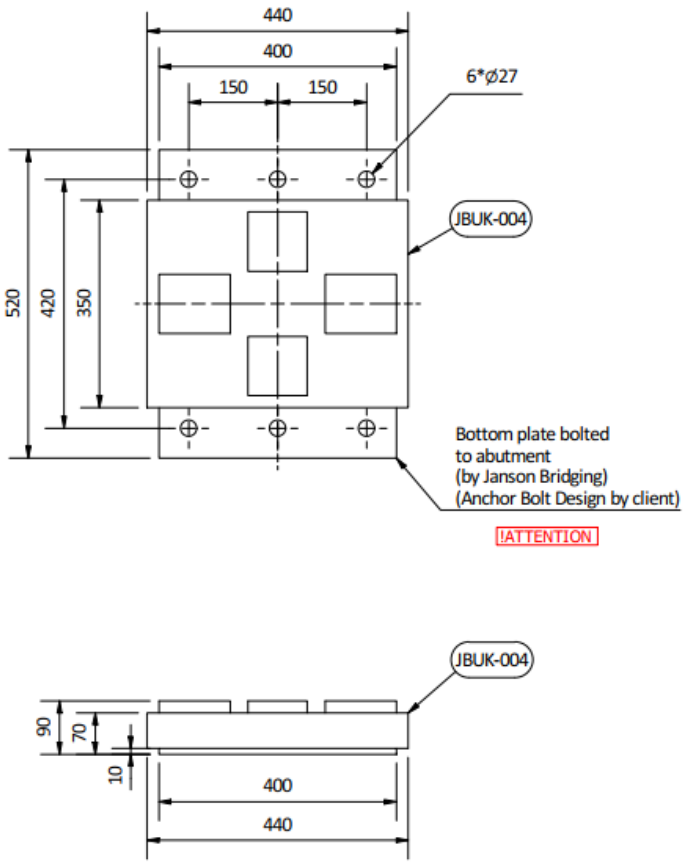
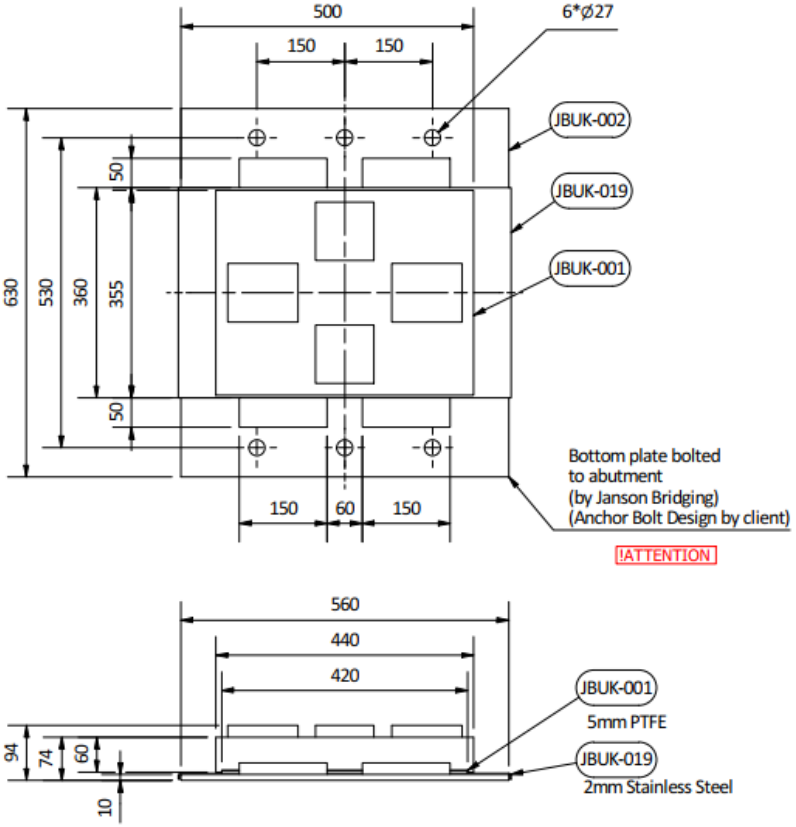


Detail 2, Typical Fixed Bearing
Scale 1 : 10



Detail 3, Typical Single Sliding Bearing
Scale 1 : 10

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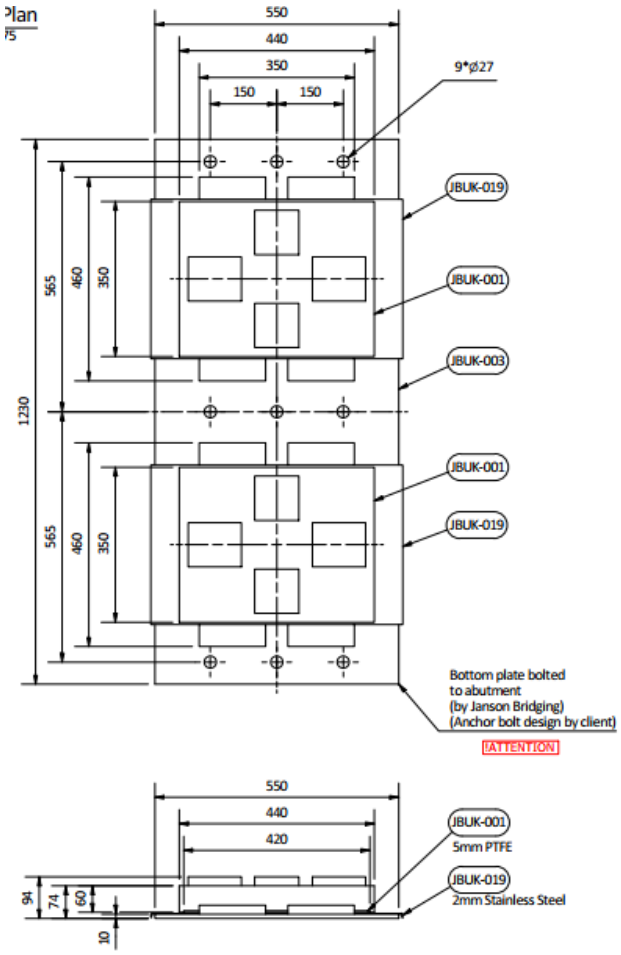
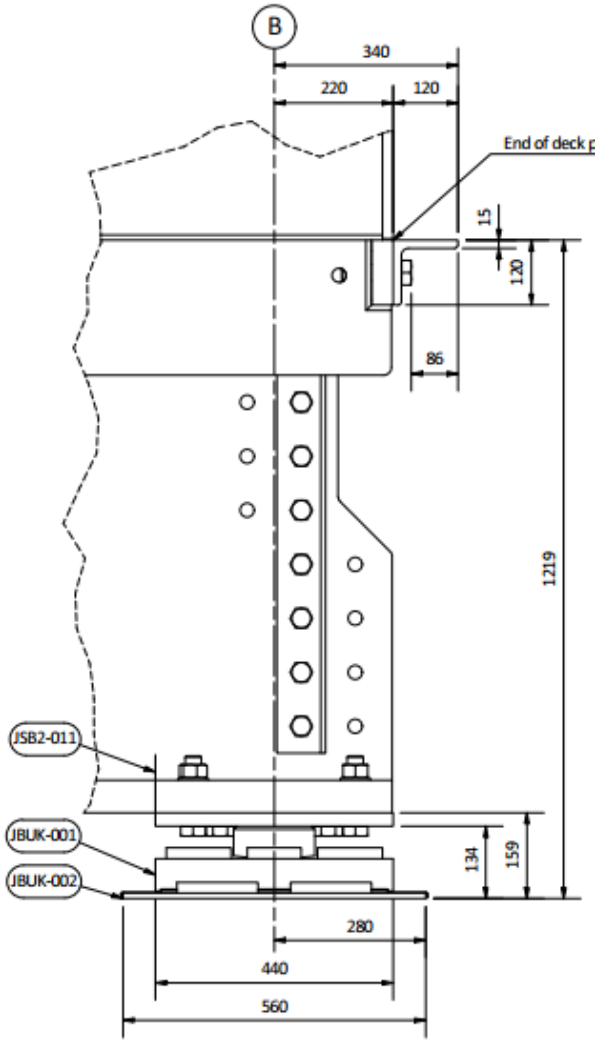


Detail 4, Typical Double Sliding Bearing
Scale 1 : 10



Detail 5, End of bridge Axis B
Scale 1 : 10

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Scheme Specific Assumptions & Limitations:

1. This quotation is subject to the availability of equipment at the time of order.

2. Hire charges commence on arrival of the equipment on site and cease on final removal. The hire period will be the time between these dates or the minimum period stated in the quotation whichever is the greater.

3. The installation date for the bridge is to be agreed at the time of order. A minimum of 8 weeks written notice is required for dismantling.

4. In the event that installation is delayed Janson will reserve the bridge free of charge for 2 weeks after which Janson reserve the right to recover the costs associated with storage and loss of opportunity for the period of delay.

5. The quotation includes an internal (CAT 2) design check. Should an external design check be required additional charges will be incurred.

6. Janson Bridging do not accept the withholding of retention monies.

7. Janson Bridging will accept liability for liquidated damages and consequential loss provided that our liability is limited, in total to 5% of our contract value.

8. The hirer is to insure the equipment whilst in use. Handover for insurance purposes is on completion of installation and ceases on commencement of dismantling.

9. Variations to our works will be valued at cost +20% for overhead and profit.

10. This offer does not include for the provision of a Performance Bond or Parent Company Guarantee.

11. In preparation of this quotation Janson Bridging have not included any provision for any weather delay risk associated with the use of mobile cranes. Should additional costs be incurred due to weather delays they will be passed, in full to our client.

12. Craneage as follows:
    250 tonne capacity crane for 1 day to lift the bridge at 19m radius

13. Our Insurances are as follows:
    a. PL is £5m
    b. EL is £10m

14. Should a sale and buy option be chosen it is offered subject to the following conditions:
    i. The bridge must be sold back to Janson Bridging, sale to others is not permitted.
    ii. Prior to dismantling the bridge will be jointly inspected by yourselves & Janson, any damaged equipment will be excluded from the buy back and the sum reduced.
    iii. The bridge may not be moved from its position for re use.
    iv. The bridge cannot be re-hired or sold by yourselves.

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Facilities & Attendances by Others:

The following are assumed to be provided by others without charge to Janson to facilitate the installation and removal of the bridge.

1. The design and construction of suitable foundations and ballast walls and approaches including the design and installation and removal of holding down bolts. Shims and grout for bearings and seating strips as required dependant on the bridge type.

2. The design, supply, installation and removal of any side screens, panelling and mesh if required. The design, supply, installation and removal of any services or service supports.

3. Assuming the roles of Principle Contractor and Principle Designer for the works in respect of the CDM regulations.

4. The provision of welfare facilities within a reasonable distance of the work site.

5. The identification, diversion, removal, isolation or protection of any over or underground services to facilitate the safe installation & removal of the bridge.

6. Safe routes of access and egress for delivery and collection vehicles and suitable area(s) of hard standing for Janson's exclusive use for the delivery, assembly, installation and removal of our equipment including loads from crane outrigger loadings.

7. The arrangement of any road, rail or river closures together with any traffic or pedestrian management necessary for the safe installation & removal of the bridge.

8. The provision of a manned safety boat or other suitable means of rescue if required.

9. The provision of background (safety) lighting should night work be included in the quotation.

10. Setting out attendance for the bridge and any associated crane positions.

11. Safe & suitable access to bearing and seating strip positions for personnel.

12. The design and provision of suitable protection to the anti-skid surfacing should tracked machines cross the bridge.