

Stirling Council

Agenda Item No. 3

Stirling Council

Date of Meeting: 16 December 2021

Not Exempt

Stirling Council Bridge Condition Report

Purpose & Summary

At a Special Council meeting on 21 October 2021 in relation to the Branshogle Bridge and Catter Burn Bridge Update report it was agreed that officers would bring forward a report to a Special meeting of Council in December 2021. This report provides Council with an overview on the condition of the Stirling Council Bridge assets associated with the adopted public road network, along with on-going work to develop a bridges and structures asset management plan.

Recommendations

Council is asked to:

1. note the contents of this report; and
2. agree that Environment & Housing Committee receive an annual update on the condition of Stirling Councils bridges and structures through an asset management plan.

Resource Implications

Budget provision has been made through the Council's revenue budget and capital programme for bridges and structures works. The annual revenue budget for the Bridges and Structures is £408k. This includes staffing, consultancy and payments to private contractors. A capital allocation of £348k is available for the 2021/22 financial year for major bridges. The Railway Station Bridge underpass was also allocated £650k.

The works contained in the programmes are undertaken in-house by the Roads Maintenance service or issued via tenders.

At present staff time is fully committed to managing both reactive and preventative maintenance to ensure the integrity of the bridge stock and the safety of highway users.

In 2021/22 the Structures and Flooding team had three Bridge Engineer vacancies. Structural engineers are in high demand and previous recruitments have not proven to be successful.

Recently two of the Bridge Engineer positions have been filled through the use of agency staff. However, it is recognised that this is not a long term solution and the Bridges and Structures team will move to a commissioning model where Technical Contract Officers will procure the relevant services and works on a prioritised risk based approach.

A review of procurement options will be undertaken to ensure that a best value is secured. This will include exploring collaborative opportunities with other local authorities and the use of suitable procurement frameworks.

Revenue funding has been reallocated from within the roads budget in 2021/22 to commission consultants via the Scotland Excel Framework to develop a risk based prioritisation inspection and structural review which will lead to the development of a bridges and structures asset management plan.

The information contained within the bridges and structures asset management plan will also be used by the Service to help inform the Councils future year's revenue and capital budgets.

Legal & Risk Implications

It is crucial that the road network is adequately maintained and under the Roads (Scotland) Act 1984 the Council, as local roads authority, is required to 'manage and maintain' the list of public roads in its area. This includes carriageways and footways and other integral infrastructure that supports local communities in their daily lives.

Bridges and other highway structures are fundamental to the transport infrastructure because they form essential links in the highway network. Failure to adequately maintain these structures can lead to the risk of significant disruption to the communities served by the infrastructure should it fail.

1. Background

- 1.1 The Council's road network and its supporting infrastructure is the largest and most visible community asset that the Council is responsible for. It is used daily by the majority of people, including residents, visitors and businesses and is fundamental to the economic, social and environmental wellbeing of our communities. Our road network and supporting infrastructure provides critical transportation links for our communities, businesses and visitors.
- 1.2 Bridges and other highway structures are fundamental to the transport infrastructure because they form essential links in the highway network. These structures require investment to ensure that carriageways and footways and other integral infrastructure is maintained, to minimise more expensive repairs and maintenance in the longer term.
- 1.3 As part of the roads network the council is responsible for maintaining 319 bridge assets associated with the adopted public road network. Maintenance is carried out in accordance with the Inspection Manual for Highway Structures (Volumes 1 & 2) and based on the Design Manual for Roads and Bridges (DMRB) Requirements of CS450 Inspection of Highway Structures.
- 1.4 Defects are caused by a range of factors. A summary of the cause and effect of defects can be seen in Appendix 1.
- 1.5 The management of the Council's bridges is undertaken in accordance with the Code of Practice, Well-managed highway infrastructure.

Principal Inspections

1.6 Principal Inspections of bridges and structures are required to be undertaken every 6 years. Principal Inspections comprise a close examination, within touching distance, of all accessible parts of the structure. At the same time as the Principal Inspection a structural review and / or scour assessment will also be undertaken. The Principal Inspection may highlight the need for further investigative work, such as an underwater dive survey. Suitable access and traffic management arrangements are made to enable access to be gained to all parts of the structure. Based on the number of bridges as of May 2021, 54 Principle Inspections should be undertaken every year. Due to available resources Principle Inspections have been focussed on bridges over the last two years with 66% achieved. Where a Principal Inspection has been carried out on a structure, a General Inspection will not be required for a further two year period.

General Inspections

1.7 General Inspections are required to be undertaken every 2 years and comprise a visual examination of all parts of the structure that can be inspected without the need for special access or traffic management arrangements. The structure and its surroundings are also examined for evidence of stability problems and scour. Based on the number of bridges as of May 2021, 105 General Inspections should be undertaken every year. In 2019 117 General Inspections were undertaken by the Council, with a further 99 undertaken in 2020. 124 General Inspections are projected to be undertaken in 2021.

Bridge Stock Condition Index

1.8 General Inspections are used to calculate a Bridge Stock Condition Index value, known as BCI. Rating bands are also used to further simplify the scoring. This can be seen in Table 1 below:

BCI Value	BCI Rating	Description
90-100	Excellent	No functional or structural defects.
80-89	Good	Some minor defects that have limited impact on the structure. Examples include localised flaking of paintwork and weather or stained concrete.
65-79	Fair	Minor to moderate defects that may impact on the durability of the structure and may impact function. Examples include small areas of exposed reinforcement and failed paint.
40-64	Poor	Moderate to major defects that are likely to impact on the function of the structure. Examples include large areas of exposed reinforcement and exposed and rusting metal.
0-39	Very Poor	Major structural defects and some components on the bridge may be failed, requires attention.

Table 1 - Bridge Condition Index Ratings

- 1.9 The BCI average for Stirling Council Bridges within 2020/21 was 75.3 and therefore remained within the boundary of a fair condition. However, the BCI scores for 2020/2021 also highlighted that the bridge stock has some poor condition scores. The BCI average score for all of Stirling Council bridges can be seen in Appendix 2.
- 1.10 The BCI Rating also contains a critical element scoring. The BCI Critical score takes the bridge elements with the grading "Very High Importance" into consideration. The critical scoring covers the following elements; primary deck element, transverse beams, secondary deck element, half joints, tie beam/rod, parapet beam or cantilever, pier/column and cross-head/capping beam. The BCI critical element scoring for Stirling Council Bridges within 2020/21 was 65.1.

Weight Restricted Bridges

- 1.11 Following previous assessments Stirling Council have identified 15 bridges that failed the assessment for 44 Tonne loading. These required a weight restriction to be applied to them in order to protect the structures from excessive loading. These bridges are inspected via Principal and General Inspection regimes. The list of weight restricted bridges can be seen in Appendix 3.
- 1.12 The weight limits applied to these bridges are permanent. The age, alignment, design and structure of the bridges dictate that in order to achieve a 44 tonne weight loading a full replacement would be required. For the majority of traffic, access is still permitted over these bridges. Diversion routes are in place for vehicles in excess of the weight limit. Where required, exemption to weight restriction applies to Fire Brigade and winter maintenance vehicles.
- 1.13 Others measures the Council have implemented on bridges include the reduction of lane width to protect parapets and installation of traffic lights to manage the flow of vehicles across the bridge structure.

Prioritised Bridge Maintenance

- 1.14 Programmed works represent good long term value if carried out on time; however if carried out later than desired this will represent a poor return on the investment made.
- 1.15 An increasing backlog of maintenance work results in a greater proportion of the available funding being used for reactive maintenance in order to maintain safety and serviceability.
- 1.16 In circumstances where there is a structural failure, this results in disruption to local communities through road closures and significant diversion routes being put in place. Officers are aware of the hardship such closures cause to the local community.
- 1.17 As part of the capital budget allocation for 2021/22 for major bridges the service had prioritised bridges requiring structural improvements. These were; Telford Bridge, Rosburn Culvert and Blanewater retaining wall.
- 1.18 The programme also included works to Hollowburn Bridge and the completion of the contract for the C3 bridge replacement project at the boundary with Falkirk Council.

- 1.19 In July 2021 the Service applied to the Scottish Governments local bridges maintenance fund. This was a £32 million fund split over this financial year (£12 million) and next year (£20 million).
- 1.20 The fund was for capital projects to rebuild or maintain lifeline bridges, with the criteria set out below:
- 1.21 Bids were invited to rebuild and maintain key lifeline bridges, where diversionary routes are not available or limited. Consideration was also given where although the bridge is not the only route, alternatives routes involve an unacceptable level of inconvenience, such as the journey time and/or the road capacity that would justify such a bridge being described as 'key lifeline'.
- 1.22 The number of bids per local authority was unrestricted, however a separate application had to be submitted for each project.
- 1.23 As the funding was limited at £32 million over the two year period the fund would provide a share of the total cost in the event the bids were oversubscribed.
- 1.24 In the event of the total value of the acceptable bids received exceeded the £32 million available, the support for each of the bids would be reduced on a pro rata basis.
- 1.25 The Service submitted 7 bids, totalling £5.9m on the basis of bridges that had a low BCI average and critical scoring and that they were determined to be classed as life line bridges by the Scottish Government fund.
- 1.26 The Services also had detailed investigative work in the form of Principle Inspections and/or scour surveys which allowed all defects to be highlighted to the Scottish Government, thus providing a robust form of evidence for prioritisation. On that basis bids were made for the following:
- 1.27 Catter Burn Bridge, Branshogle Bridge, Lunchikin Bridge, Cardross Bridge, Stevenson Bridge, River Forth Bridge and Bridge of Allan Station Bridge.
- 1.28 Due to the bridge closures at Branshogle and Catter Burn Bridges the team resources have been focussed on the rebuild of these bridges.
- 1.29 Therefore, spend against the 2021/22 capital budget relates to the completion of the contract for the C3 bridge replacement project. Through the General Services Capital Update Report for 2021/22 to Finance and Economy Committee on 25 November 2021 it was agreed that the remainder be carried forward to next financial year in order to progress with structural improvements to Telford Bridge, Rosburn culvert and Blanewater retaining wall.

Burghmuir Road Underpass

- 1.30 The Service is also working on the Railway Station Bridge underpass at Burghmuir Road which received £650,000 in the capital budget for 2021/22. As reported through the General Services Capital Update Report for 2021/22 at Finance Economy Committee on 23 September 2021, due to Network Rail carrying out work on the Railway Station it has not been possible to gain full access to the station forecourt to allow the waterproofing works to proceed.
- 1.31 The waterproofing works are now being carried out in conjunction with ScotRail forecourt works, and are anticipated to progress in 2022/23. Therefore, the concrete structural improvements on the underpass which were originally intended to be Phase 2 works are now being undertaken first. The works on the northbound carriageway have recently been completed with works on the southbound carriageway due to commence in January 2022.

Branshogle and Catter Burn Bridges

- 1.32 The Branshogle Bridge suffered a partial parapet collapse following a period of heavy rainfall on 19 February 2021. The B818 is closed as an essential public safety measure.
- 1.33 The parapet wall on Catter Burn Bridge on the A809 south of Croftamie collapsed on 30 September 2021. The structure remains closed for public safety.
- 1.34 At the Special Council meeting on 21 October 2021 an update on the Branshogle and Catter Burn Bridges was provided. Of relevance to this report it was agreed:
 - 1.34.1 to authorise the additional capital expenditure of the sum of £1.5m, such sums to be taken from reserves and added to the existing Major Bridges Capital budget;
 - 1.34.2 note that the financial position would be kept under review in light of final contract costs and the outcome of funding applications to the Scottish Government; and
 - 1.34.3 note that officers were in the process of preparing a Bridge Asset Management and Condition Report which sets the consideration for the Bridge Assets and agreed to a Special Meeting of Council in December for consideration of this report.

2. Considerations

- 2.1 An external consultant resource was commissioned in July 2021 to review the current condition of Stirling Council's Bridge Stock and develop an inspection prioritisation regime.
- 2.2 The data and information for the review was extracted from Stirling Council's records and the Bridges and Structures Management System.
- 2.3 The data was reviewed against current standards. This information was used to develop proposals for undertaking further inspections and structural reviews.

Proposed Inspection Regime

- 2.4 In order to update and complete the data it is proposed that a programme of data collection is undertaken as part of full 6-year inspection cycle.
- 2.5 The proposed inspection regime will allow Stirling Council to continue with a compliant inspection programme beyond the initial 6-year period. The inspection and structural review regime can be seen in Appendix 4.
- 2.6 In order to take a risk based approach across the network the Principal Inspections will be prioritised to ensure that the structures with higher risk profiles are inspected sooner.
- 2.7 As additional information is recorded and assessments completed, the order of inspections may require to be changed to ensure that risk is minimised as far as possible.
- 2.8 To prioritise Principal Inspections for Year 1, four risk categories have been used:
 - 2.8.1 Structures which are known to have scour related defects;

- 2.8.2 Structures where there is a severe defect on a critical element;
 - 2.8.3 Structures where the inspection is overdue; and
 - 2.8.4 Structures that currently have a weight restriction.
- 2.9 Bridges that fall into two or more categories or where the scour defect was previously found to be severe, the bridge asset is proposed for a Principal Inspection in Year 1. The 54 bridges that will be subject to a Principal Inspection in 2022/23 can be seen in Appendix 5.
- 2.10 In order to undertake the 54 principal inspections per annum additional external resources will be required either via consultancy or agencies. The Structural Review undertaken as part of the Principal Inspection may also trigger the requirement for a structural assessment. Additional costs may be required for further investigative work, such as an underwater dive surveys. The costs for the Principal Inspection, structural review and potential structural assessments are estimated at £200k for 2022/23.

Scottish Government Local Bridge Maintenance Fund

- 2.11 The Scottish Government received 131 applications to the Local Bridge Maintenance Fund from 25 local authorities, at a total estimated cost of £107.7 million, therefore the scheme was oversubscribed by £75.7 million.
- 2.12 Following assessment of the applications against the criteria set for the scheme by both Local Government and Transport Scotland officials, a total of 74 applications from 19 local authorities have been approved. Due to the level of remaining oversubscription for the reduced number of approved schemes, Scottish Government support has been reduced to 80 per cent.
- 2.13 Branshogle and Catter Burn Bridges were awarded £576k, therefore this draw down on reserves agreed at the Special Council meeting on 21 October 2021 can be reduced accordingly.
- 2.14 In relation to Cardross and Lurchikin, due to the level of over subscription to the fund, 80% of the funding was received totalling £270k.
- 2.15 The Scottish Government have not indicated at this stage whether future funding will be made available through the Local Bridge Maintenance Fund.
- 2.16 The successful and unsuccessful bids submitted by Stirling Council can be seen in Appendix 6.

Prioritised Bridge Maintenance

- 2.17 Based on the previously identified priority bridges through the 2021/22 major bridges capital allocation and the funding awards from the Scottish Governments, the priority in 2022/23 will be the projects carried forward from 2021/22 as listed in 1.29 and delivery of the structural improvements to Branshogle and Catter Burn Bridges.
- 2.18 Future years revenue and capital funding requirements will be informed by the bridges and structures asset management plan and applicable budget setting processes.

Branshogle and Catter Burn Bridge Updates

- 2.19 Following development of the tender documents for Branshogle Bridge, the quickest route to market that was identified was the use of the Roads Maintenance and Improvements Framework. A contractor has been appointed and commenced works on site on 29 November 2021. The structural improvements are anticipated to take 18 weeks.

- 2.20 Consultant Engineers have been on site to undertake an assessment of the Catter Burn Bridge structure. The Consultant Engineers are undertaking all necessary inspections, including environmental, topographical and ground investigations in order to produce detailed designs for repair.
- 2.21 To maximise competition and ensure value for money, the preferred route is to publish an open tender. To gauge interest, a Prior Information Notice (PIN) was published on 24 November 2021 with 22 notes of interest received. A contractor information session will be held in January which will provide the opportunity to share high level project information, identify and discuss project risks, and develop mitigation measures before the tender is published.
- 2.22 Due to the closure of both bridges, diversion routes are in operation. Between them these diversion routes have 99 structures including bridges, culverts and retaining walls. These structures are currently in the process of being assessed through a mixture of internal and external resources.
- 2.23 General Inspections have been commissioned on all structures pertaining to the formal diversion routes for both the B818 Branshogle Bridge closure as well as the A809 Catter Burn Bridge closures. These inspections will determine structural condition of assets and will identify short, medium and long term actions required to ensure these structures remain safe for use.
- 2.24 Cumulatively these diversion routes contain 91 structures. Other informal diversion routes surrounding these closure locations are also subject to inspection as it has been recognised that these also form key routes which are being utilised more heavily by locals. 20 further structures, on informal diversion routes have been identified as requiring general inspections. An overlap of 12 structures exists between both closures. Therefore, the total number of general inspections commissioned is 99. The current programme sets out to undertake all 99 general inspections prior to the end of December 2021.
- 2.25 In the short term vegetation removal and verge clearance is being undertaken to improve drainage in and around bridges and structures.
- 2.26 A number of enquiries were received regarding the condition of the Blane Water Bridge. Structural improvements to the retaining wall had already been identified and funded through the 2021/22 capital allocation. In the interim, temporary traffic lights were installed at the bridge to regulate traffic flow and allow a precautionary extension to the existing barrier system which will ensure vehicles are able to safely cross the bridge and protect the retaining walls. This structure is being monitored on a weekly basis.
- 2.27 The diversion routes in the main are on priority 1 gritting routes. However, the Honeyholm Road near Branshogle Bridge was added to our Priority 1 gritting routes and will be treated any time action is required. This will be in place until the B818 road closure has been lifted.

Bridges and Structures Asset Management Plan

- 2.28 With the information available at the moment, and from the Principal Inspections and Structural Reviews to be carried out, the consultants will continue to develop a bridges and structures asset management plan which will review how investment levels can improve the condition of bridges and structures in the medium to long term.

- 2.29 The development of the plan will include a review undertaken using proprietary software that has been developed by the consultant. The software uses the methodology that was originally developed for the Chartered Institute of Public Finance and Accountancy (CIPFA) Structures Toolkit. This methodology is recognised as the industry standard for Whole Life Cost Assessment of Structures Assets.
- 2.30 The whole life cost software utilises standard inventory, inspection and works programme data, along with deterioration rates, service life, treatment types and the effect of them to model the performance of the overall bridge stock. The software also utilises a Prioritisation module to ensure that budgets are targeted to minimise the risk to the network.
- 2.31 The review will look at two maintenance strategies – planned preventative and planned do minimum. The maintenance strategies determine how works are targeted and when works are triggered.
- 2.32 The planned preventative strategy looks to maintain all elements and assets before they deteriorate to contain severe defects.
- 2.33 The planned do minimum regime will only trigger works on critical elements and it will let other elements deteriorate without being repaired.

Bridges and Structures Annual Update

- 2.34 A similar exercise will also be undertaken on our other structural assets, including footbridges, culverts, retaining walls, rock face management and cattle grids. A priority bridge route assessment will also be undertaken to identify which bridges, if closed for a period time, would have the most detrimental impact on our communities due to a lack of alternative routes.
- 2.35 Updates to the indicative works programme and the overall condition of the bridge assets will also be provided. This will be incorporated into a bridges and structures asset management plan which will be reported to the Environment and Housing Committee in September 2022 and thereafter on an annual basis.
- 2.36 The bridges and structures asset management plan will include future years Principal Inspections, General Inspections and indicative maintenance programme which will inform future year's revenue and capital budgets.
- 2.37 The inspection and structural reviews and the indicative programme will continue to be developed on a risk based approach in order to minimise risk to the Council and its communities.

3. Implications

Equalities Impact

- 3.1 The contents of this report were assessed under the Council's Equality Impact Assessment process. It was determined that an Equality Impact Assessment was not required as this proposal will not have a negative impact in general, or to groups of those identified as having protected characteristics.

Fairer Scotland Duty

- 3.2 The contents of this report were considered in terms of the Fairer Scotland Duty and were determined not to be of strategic importance.

Climate Change, Sustainability and Environmental Impact

3.3 This report does not relate to a Plan, Policy, Programme or Strategy therefore Strategic Environmental Assessment does not apply.

Other Policy Implications

3.4 N/A.

Consultations

3.5 Public engagement exercises have been undertaken with communities impacted by the closure of Branshogle and Catter Burn bridges

4. Background Papers

4.1 Finance Economy Committee, General Services Capital Programme Update for 2021/22, 23 September 2021.

4.2 Special meeting of Stirling Council, Branshogle Bridge and Catter Burn Bridge Update, 21 October 2021.

4.3 Finance and Economy Committee, General Services Capital Update Report for 2021/22, 25 November 2021.

4.4 EqIA Relevance Check.

5. Appendices

5.1 Appendix 1: Cause and effect of defects.

5.2 Appendix 2: BCI average scores.

5.3 Appendix 3: Weight restricted bridges.

5.4 Appendix 4: Inspections and Structural Reviews.

5.5 Appendix 5: Prioritised Principal Inspections for 2022/23.

5.6 Appendix 6: Scottish Government Local Bridges Maintenance Fund Successful and Unsuccessful Bids.

Author(s)

Name	Designation	Telephone Number/E-mail
Maria Lucey	Bridges and Structures Team Leader	Luceym@stirling.gov.uk

Approved by

Name	Designation	Date
Bruce Reekie	Senior Manager, Environment and Place	07/12/21

Details of Convener(s), Vice Convener(s), Portfolio Holder and Depute Portfolio Holders (as appropriate) consulted on this report:	Cllr Jim Thomson Cllr Danny Gibson
--	---------------------------------------

Wards affected:	All
Key Priorities:	E - We will create & implement environment and infrastructure improvements; deliver new ownership & delivery methods around energy generation, public transport & internet access, ensuring profits & services work to community, not commercial priorities
Key Priority Considerations:	
Stirling Plan Priority Outcomes: (Local Outcomes Improvement Plan)	Resilient - People are part of safe and caring communities within an attractive and sustainable environment

Appendix 1

Cause and effect of defects

Cause	Description	Effect
Wear and tear/ageing	Action of vehicular traffic and weathering	Deterioration of structural components
Scour (flooding and/or blockage due to debris)	Abrasive action of water and debris	Partial collapse or failure of the of structure
Change in use from initial design	Excessive or unsuitable traffic loads and / or excess water leading to other effects such as scour	Deterioration of structure and reduced life expectancy
Climate change	Additional freeze/thaw events, flooding/scour, change in water tables	Acceleration of deterioration effects such as weathering of stone
Drainage and failure of waterproofing	Over saturation of the material due to excess water (i.e. statutory undertaker failure), inappropriate fill material	Liquefaction/ saturated backfill causing component failure, leading to structural failure
Vehicle/accident impact	Vehicle collisions with structure	Can cause damage to structures and leave them in an unsafe condition. Can result in temporary road closures and diversions until the necessary repairs can be made
Vegetation and root network disturbance	Growth of vegetation on the structure and roots infiltrating the structure	Acceleration of deterioration of the structure and reduced life expectancy

Appendix 2

BCI average scores

Authority Owned Highway managed Structures - Reference	Structure Name	Owner	BCI (Av.)
A809/010	Garvel Bridge	SC	85.78933
A809/030	Dualt Bridge	SC	83.48536
A809/040	Finnich Glen	SC	83.37646
A809/050	Finnich Malaise	SC	84.44555
A809/060	Catter Burn	SC	75.14719
A81/002	Loch Ardinning	SC	79.05289
A81/004	Entrance To Country Club	SC	86.81152
A81/006	Back Entrance To Country Club	SC	66.99646
A81/010	Strathblane Edenkill	SC	83.1806
A81/020	Jenny's Glen	SC	65.74814
A81/030	Lunchikin Bridge	SC	74.67884
A81/040	Gardener's Culvert	SC	88.45843
A81/050	Dry Glen	SC	86.81286
A81/060	Blairquosh	SC	92.14538
A81/070	Dumgoyne	SC	83.4136
A81/080	Beechwood	SC	94.31878
A81/100	Sawmill	SC	95.50814
A81/120	Endrick Bridge	SC	84.44239
A81/200	Ward Burn	SC	74.74144
A81/220	Kelty Bridge	SC	79.57673
A81/230	Gartmore Bridge	SC	89.63265
A81/240	Gartmore Over Disused Railway	SC	76.2473
A81/250	Culvert at Lay-by	SC	72.64108
A81/260	Burnside Cottage	SC	85.24063
A81/270	Glenny Burn	SC	81.69884
A81/280	Rednock Burn	SC	82.00014
A81/290	Letter Burn	SC	81.92236
A81/300	Greenock Burn	SC	77.78549
A81/310	Mollands Burn	SC	81.06613
A81/320	Callander Bridge	SC	81.81342
A811/060	Touch Bridge	SC	66.50006
A811/140	Leckie Burn	SC	85.17173

A811/170	Boquhan Bridge	SC	91.74036
A811/178	Cuthbertson Burn	SC	51.81471
A811/190	Amnprior Bridge	SC	78.21748
A811/200	Easter Arngibbon Culvert	SC	73.96622
A811/210	Garden Bridge	SC	90.14407
A811/233	Culvert in lay by	SC	78.89445
A811/240	Buchlyvie Burn	SC	55.95257
A811/250	Cashley Burn	SC	68.39915
A811/270	Ballochneck Burn	SC	76.65041
A811/272	Garrel Culvert	SC	68.03604
A811/290	Ballat Smithy Culvert	SC	77.8341
A811/300	Altquhar Burn	SC	69.09418
A811/320	Drymen Bridge	SC	83.10345
A811/330	Nannies Bridge	SC	81.89417
A820/010	Balkerach Street Culvert	SC	75.67241
A820/020	Ardoch	SC	86.95852
A820/025	Glenhead Culvert	SC	81.47854
A821/020	Allt a' Mhangam 1	SC	89.03665
A821/030	Allt a' Mhangam 2	SC	75.16939
A821/040	Drunkie Bridge	SC	84.38462
A821/050	Allt Cham Ruidhe	SC	71.74842
A821/060	Achray Burn	SC	80.8104
A821/062	Corrie A'an Culvert	SC	100
A821/065	Allt Ardcheanacrochan	SC	92.6938
A821/070	Brig O' Turk	SC	87.95345
A821/080	Lendrick Bridge	SC	83.99299
A821/090	Milton Glen	SC	88.88857
A821/100	Coilantogle Culvert	SC	82.3475
A821/110	Leny Bridge	SC	78.78329
A821/120	Mill Lade Kilmahog	SC	91.77598
A827/010	Allt-lairaig Cheile	SC	74.03623
A827/020	Allt-na Lice Bridge	SC	85.09824
A827/040	Allt Glas	SC	82.57216
A827/060	Lochay Bridge	SC	68.74865
A827/070	Allt na Ceardaich	SC	71.41747
A872/005	Mill Lade	SC	72.72842
A872/010	Milton Bridge	SC	78.82019
A872/025	Crawhill Road Culvert	SC	71.51579
A872/026	Northfield Culvert	SC	79.36493
A873/010	Burnbank Burn Culvert No 1	SC	75.76003
A873/020	Burnbank Burn Culvert No 2	SC	85.8

A873/040	Boghall Culvert	SC	70.1087
A873/045	Cessintully Culvert (at Junction)	SC	67.73164
A873/050	Cessintully Burn Culvert	SC	78.79336
A873/100	Ruskie	SC	66.55373
A875/005	Mollinclerich	SC	83.22435
A875/020	Ballindalloch Field Bridge	SC	91.18864
A891/010	Ballagan Bridge	SC	77.45549
A9/090	Carbrook	SC	74.66075
A9/100	Old Mine	SC	68.43164
A9/110	Plean Church	SC	71.54832
A9/130	New Bannockburn	SC	76.14018
A9/170	Stirling Station	SC	33.26549
A9/180	Seaforth Bridge	SC	89.13457
A9/200	Stirling Bridge	SC	71.59614
A9/230	Bridge Of Allan Station	SC	70.14285
A905/010	Kerse Road Railway	SC	82.29523
A905/030	Crook Burn Bridge	SC	90.42171
A907/025	River Devon Bridge	SC	89.23039
A91/005	Skeoch Railway	SC	89.85152
A91/015	Acc.Underpass	SC	90.70667
A91/020	River Forth	SC	74.19392
A91/035	Stirling Alloa Railway SAA/043A	SC	97.60031
B8031/010	Goodie Water	SC	82.00496
B8032/010	George Street Culvert	SC	67.22941
B8032/030	Teith Culvert	SC	79.5387
B8032/040	Torrie Burn	SC	76.28798
B8033/010	Dunblane Railway	SC	88.63098
B8033/015	Access tunnel to abattoir	SC	83.4907
B8033/020	River Allan Bridge	SC	77.8133
B8033/032	Duthieston House Culvert.	SC	75.83739
B8033/040	Craigton	SC	86.64501
B8033/060	Allan Water Kinbuck	SC	81.59875
B8033/070	Park Burn Culvert	SC	82.26162
B8034/010	Kepp Bridge	SC	77.89406
B8034/030	Cardross Bridge	SC	73.27808
B8034/040	Goodie Water Bridge	SC	82.20346
B8037/005	Burnbank Cottage culvert	SC	78.13
B8037/010	Shirgarton Culvert	SC	67.11544
B8037/020	Arngomery Burn Culvert	SC	58.45519
B8037/030	Broich Bridge	SC	84.41682
B8037/040	Cemetery Culvert	SC	86.60716
B8037/050	Ladylands Culvert	SC	75.71415

B8064/010	Allan Water	SC	84.33171
B8075/010	Gargunnoch Station	SC	78.15714
B8075/020	Kirk Lane Culvert	SC	83.28416
B818/050	New Carron Bridge	SC	92.6197
B818/060	Muirmill	SC	91.23692
B818/070	Easterton Culvert	SC	89.39052
B818/100	Randyford Bridge	SC	86.02271
B818/110	Gartcarron	SC	75.54044
B818/130	Walton Bridge	SC	72.36455
B818/140	Broomhole Bridge	SC	69.31499
B818/150	Low Bridge (Gonachan)	SC	75.4734
B818/170	Cooper's Burn	SC	69.78566
B818/180	Kilewnan Burn	SC	93.35983
B818/210	Clockburn Bridge	SC	88.2759
B818/220	Den Bridge	SC	80.41302
B818/225	Park Burn Culvert	SC	78.46697
B818/227	Drumfalloch Wood Culvert	SC	88.27208
B818/230	East Ballikinrain	SC	43.56741
B818/233	Sheep Creep.	SC	65.12135
B818/240	Ballikinrain	SC	87.52386
B818/250	Branshogle	SC	71.05244
B821/010	Cuilt Bridge Blanefield	SC	60.46524
B822/050	Clachieburn Bridge	SC	72.37614
B822/060	Gonachan Bridge	SC	79.60246
B822/070	Endrick Bridge, Fintry	SC	90.40137
B822/110	Provanstone Burn	SC	73.3549
B822/120	Lernock Bridge	SC	100
B822/130	Cubbiestone Bridge	SC	63.54492
B822/140	Bridge Of Frew	SC	71.36649
B822/150	Netherton Bridge	SC	83.51713
B822/155	Boquhappie Burn	SC	81.95452
B822/170	Greenock Burn	SC	69.7961
B829/020	Suisgill Culvert East	SC	85.67558
B829/035	Allt na Sgeith Culvert	SC	88.74026
B829/040	Ledard Burn	SC	91.89072
B829/050	Allt Tairbh Teapot	SC	82.52683
B829/070	Maggies Burn Culvert	SC	95.43802
B829/075	Stromarchlacher	SC	95.49254
B834/020	Blane Water	SC	80.78872
B834/030	Cattle Creep	SC	64.19212
B835/010	Ballochneck	SC	68.90208
B835/020	Arnfechlach Bridge	SC	86.807
B835/030	Garchell Culvert	SC	96.75934
B837/010	Millburn	SC	83.42779
B837/020	Doghouse Burn Culvert	SC	83.59375

B837/030	Whinnydrum Culvert	SC	77.84942
B837/040	Stuc-an-t-Sagairt	SC	75.22208
B837/050	Milton Mill	SC	80.94129
B837/060	Auchingyle	SC	86.27847
B9124/010	Clubs Tomb	SC	83.53516
B9124/030	Bullions Culvert	SC	43.7018
B9124/050	Accommodation	SC	85.24194
B9124/060	Cowie Over Railway	SC	92.79444
C10/010	Old Lade	SC	50.28841
C10/020	Bannock Burn	SC	76.08961
C10/030	Milneholme	SC	76.82391
C10/040	Loch Coulter Burn	SC	76.58567
C10/057	Loch Coulter Reservoir Culvert	SC	100
C10/060	Easter Buckieburn	SC	60.41301
C106/010	Edinample Bridge	SC	90.03394
C107/010	Cattle creep	SC	73.28777
C107/020	Achmore Burn	SC	79.64079
C107/030	Slab Culvert	SC	95.55962
C107/040	Firbush	SC	88.36246
C107/050	Allt Breachlaich	SC	93.92814
C107/060	Cloichran	SC	79.7441
C107/070	Culvert East of Cloichran	SC	81.90292
C107/080	Fiddlers Bay Culvert	SC	81.90896
C107/120	Tullochan	SC	90.09262
C107/130	Coille Chromadain	SC	81.90527
C107/140	Ardeonaig	SC	80.30733
C107/160	Culvert West of White House	SC	72.10276
C107/165	Culvert East Of White House	SC	77.32106
C107/170	The Old Manse Culvert No.1	SC	70.17657
C107/190	Margbeg Culvert	SC	77.06466
C107/210	Old Manse Bridge	SC	82.63429
C114/010	Gartchonzie	SC	72.78618
C21/010	Indians Dorp Culvert	SC	75.70728
C21/030	Sanctuary Wood Culvert No.2	SC	97.43719
C22/010	Dasherhead Farm	SC	89.81839
C22/015	School Entrance	SC	83.38115
C22/020	Gargunnock Burn	SC	88.83719
C23/010	Clachan Burn	SC	85.53049
C23/030	Dalfoil Wood Culvert	SC	76.37611
C23/050	Graystone Bridge	SC	86.5527
C23/060	Honeyholme	SC	80.80603
C3/010	Pow Burn	SC	89.4561
C3/020	South Bridgend	SC	62.70377
C3/030	Bridgend	SC	61.66578
C3/040	South Doll	SC	98.41452

C31/010	School Burn	SC	74.53495
C31/020	Altquhar Burn	SC	77.31288
C31/030	Gartness Bridge	SC	84.10305
C33/010	Allt Stad Fhaodhail	SC	86.02535
C33/015	Allt Eas Dobhain (Auchleskine)	SC	78.85786
C33/020	Kirkton	SC	83.6185
C33/030	Tulloch Burn	SC	76.93996
C33/040	Tulloch Burn No.2.	SC	91.17812
C33/050	Allt Glean Crothie	SC	92.12107
C33/060	Monachyle Burn	SC	79.68268
C33/090	Allt Carnaig	SC	74.43186
C34/010	Glen Burn	SC	86.59462
C35/020	Wharry Burn	SC	73.38852
C36/010	Lintmiln	SC	89.7576
C36/020	Thorn Tree Culvert	SC	90.22521
C4/010	Culvert at King George's Field	SC	84.95796
C40/015	Westwood Culvert	SC	83.03913
C41/010	Carron Bridge	SC	74.89274
C5/010	Johnny's Burn	SC	65.27146
C5/020	Touch Bridge	SC	93.60178
C54/020	New Ballochruin Bridge	SC	92.78267
C55/020	Chartershall New	SC	86.87594
C56/010	Craigallion Bridge	SC	81.99456
C57/020	Ward Burn	SC	49.12619
C57/040	Chapelarroch	SC	95.64732
C57/050	Claggan's Burn.	SC	83.41875
C57/060	Cobleland	SC	77.34237
C6/010	Culvert At Car Park	SC	77.00953
C6/030	Millarochy Culvert	SC	64.85234
C6/040	Blair Burn	SC	78.45716
C6/050	Critreoch Farm Culvert	SC	81.44961
C6/060	Cashell Burn	SC	80.29778
C6/070	Anchorage Cottage(Tigh A Laoi	SC	88.2394
C6/080	Sallochy House	SC	91.4925
C6/100	Dubh Loch Cottage	SC	88.12518
C6/110	Blairvochie	SC	81.86598
C6/120	Wood Burn	SC	85.95287
C6/130	Culvert Car Park	SC	94.1631
C68/030	Corriarklet Burn	SC	77.49516
C68/050	Garrison Bridge	SC	91.07913
C83/020	Netherton	SC	82.15064
C83/050	Ardoch	SC	81.03322
C90/020	Glen Lochay Rd South	SC	72.05733
C90/030	Murlaganmore	SC	91.24404
C90/050	Duncroisk	SC	89.99954

C90/070	Allt Ghaordaidh	SC	78.99825
C90/080	Allt Lebhain	SC	80.99868
U010010/010	Dochart Bridge	SC	78.60069
U010010/030	Auchlyne West Bridge	SC	75.88951
U010010/040	Auchlyne East Bridge	SC	87.3412
U010075/010	Allt A Bhorland	SC	87.50553
U010140/010	Black Bridge	SC	53.6989
U010150/010	Stronvar Bridge	SC	81.19889
U010150/020	Calair Burn	SC	77.48366
U010150/030	Balvaig Bridge, Strathyre	SC	90.02392
U020045/020	Auchintek Culvert	SC	66.74259
U020075/010	Ballington Road Culvert	SC	76.94038
U020100/010	Brackland Road Over dis' Railwa	SC	87.07189
U020160/010	Struth Geal	SC	90.15235
U020210/010	Coillechat 1	SC	88.52976
U020210/020	Coillechat 2	SC	92.95158
U020210/030	Coillechat 3	SC	91.49178
U020340/010	Dullater Culvert	SC	90.24325
U020370/020	Torrance	SC	92.29198
U020370/030	Craigingilt Burn Culvert	SC	88.3642
U020412/010	Kirkton	SC	63.98793
U020412/020	Pow Burn	SC	91.97021
U020480/020	Briarlands cottage culvert	SC	68.71465
U020590/010	Stank Bridge	SC	75.81034
U030140/010	Buchlyvie Burn	SC	80.96041
U030160/010	Altquhar Burn	SC	97.19519
U030250/010	Ladylands	SC	67.53961
U030254/020	Mill Of Chon	SC	80.11425
U030310/010	Mye Road Culvert 1	SC	64.34467
U030310/020	Mye Road Culvert 2	SC	74.35778
U030310/030	Mye Road Culvert 3	SC	93.92561
U030361/010	School Burn	SC	91.28229
U030380/010	Whiteley's	SC	84.06187
U040190/010	Burnside	SC	83.40775
U040370/010	Moss Bridge	SC	88.87057
U040420/020	Access Bridge to King George's F	SC	49.90947
U040465/020	Dunglass View No.2	SC	95.46055
U040550/010	Burntown	SC	97.14243
U040550/030	Boquhan Burn	SC	51.33155
U040550/050	Glinns Road Culvert No.3	SC	80.57885
U040550/060	Glinns Road Culvert No.4	SC	66.2625
U040660/010	Kirkburn Road Strathblane	SC	92.51273
U040720/010	Lernock Bridge	SC	64.59207
U040770/010	Main Street, Gargunnock	SC	83.65701
U040780/010	Old Main, Dumbarton	SC	76.04671

U041030/030	Arnprior Burn Culvert	SC	96.78423
U050220/010	Auchinlay	SC	78.07253
U050220/020	Over Disused Railway	SC	46.78046
U050470/010	Dunblane Cemetery	SC	84.47869
U051176/010	Old Manor Powis	SC	83.29784
U051176/020	Old West Gogar	SC	74.37554
U051410/010	Cocks Burn	SC	80.58672
U051490/020	Old Wharry	SC	91.06567
U060775/010	Milneholme	SC	58.46036
U061605/010	Old Kerse Mill	SC	83.6771
U062300/010	Old Bannockburn	SC	90.28975
U062432/015	Drumshogle Burn Culvert	SC	61.36829
U062432/060	Earl's Burn	SC	66.02479
U062432/090	Culvert Polmaise	SC	97.3359
U070070/010	Chartershall Old	SC	72.31535
U070260/020	Plean Burn	SC	82.01528
U070260/030	Tor Burn/East Plean	SC	86.25399
U070360/010	Hayford Mill Culvert	SC	98.07309
U070515/010	Plean Mill Road	SC	83.14081
U070520/010	Rosehill	SC	79.3839
U070523/010	Small Burn Culvert	SC	89.85096

Appendix 3

Weight Restricted Bridges

Bridge name	Bridge Code	Weight Restriction
Allan Water Kinbuck	B8033/060	13
Cardross Bridge	B8034/030	10
Low Bridge Gonachan	B818/150	18
Gartchonzie	C114/010	13
Honeyholme	C23/060	13
Chapellaroch	C57/040	10
Cobleand	C57/060	7.5
Ardoch Bridge	U020200/010	13
Dunblane Cemetery	U050470/010	7.5
Old Wharry	U051490/020	7.5
Old Bannockburn	U062300/010	18
Chartershall	U070070/010	3
Gartcarron	B818/110	13
Calair	U010150/020	7.5
Carron Bridge	C41/010	10

Appendix 4

Inspection Regime

Year 1

- 17% (1/6th) of PI's
 - Structural Review
 - Parapet Risk Review
- 33% of GI's (50% minus 17% receiving PI's)
- 100% Stage 1 Scour Assessments

Year 2

- 17% (1/6th) of PI's
 - Structural Review
 - Parapet Risk Review
 - Stage 2 Scour assessments (where applicable)
- 33% of GI's (50% minus 17% receiving PI's)
- Inspections of Structures with additional monitoring
- Bridge assessments start based on structural reviews from year 1

Year 3

- 17% (1/6th) of PI's
 - Structural Review
 - Parapet Risk Review
 - Stage 2 Scour assessments (where applicable)
- 33% of GI's (same structures as year 1)
- Inspections of Structures with additional monitoring
- Bridge assessments start based on structural reviews from year 2

Year 4

- 17% (1/6th) of PI's
 - Structural Review
 - Parapet Risk Review
 - Stage 2 Scour assessments (where applicable)
- 33% of GI's (same structures as year 2)
- Inspections of Structures with additional monitoring
- Bridge assessments start based on structural reviews from year 3

Year 5

- 17% (1/6th) of PI's
 - Structural Review
 - Parapet Risk Review
 - Stage 2 Scour assessments (where applicable)
- 33% of GI's (same structures as year 1)
- Inspections of Structures with additional monitoring
- Bridge assessments start based on structural reviews from year 4

Year 6

- 17% (1/6th) of PI's
 - Structural Review
 - Parapet Risk Review

- Stage 2 Scour assessments (where applicable)
- 33% of GI's (same structures as year 2)
- Inspections of Structures with additional monitoring
- Bridge assessments start based on structural reviews from year 5

Year 7

- 17% (1/6th) of PI's (same structures as year 1)
- 33% of GI's (same structures as year 1)
- Inspections of Structures with additional monitoring
- Bridge assessments start based on structural reviews from year 6

Appendix 5

Prioritised Principal Inspections for 2022/23

Although some bridges are named culverts, given the scale of them they are defined as a Bridge Asset and are therefore included in the list below.

Bridge Code	Bridge Name
A81/006	Back Entrance To Country Club
A81/280	Rednock Burn
A81/320	Callander Bridge
A811/240	Buchlyvie Burn
A811/290	Ballat Smithy Culvert
A811/320	Drymen Bridge
A811/330	Nannies Bridge
A873/050	Cessintully Burn Culvert
B8032/040	Torrie Burn
B8033/010	Dunblane Railway
B8033/020	River Allan Bridge
B8033/060	Allan Water Kinbuck
B818/070	Easterton Culvert
B818/110	Gartcarron
B818/150	Low Bridge (Gonachan)
B818/230	East Ballikinrain
B834/020	Blane Water
B837/050	Milton Mill
C114/010	Gartchonzie
C3/020	South Bridgend
C33/015	Allt Eas Dobhain (Auchleskine)
C33/060	Monachyle Burn
U020412/010	Kirkton
U040550/030	Boquhan Burn
U040550/050	Glinns Road Culvert No.3

U040550/060	Glinns Road Culvert No.4
U040720/010	Lernock Bridge
U050220/010	Auchinlay
U051490/020	Old Wharry
U060775/010	Milneholme
U070520/010	Rosehill
U070523/010	Small Burn Culvert
A811/170	Boquhan Bridge
A811/210	Garden Bridge
A821/020	Allt a' Mhangam 1
A827/040	Allt Glas
A827/050	Dochart Bridge
A91/020	River Forth
B8037/020	Arngomery Burn Culvert
B8075/010	Gargunnock Station
B818/060	Muirmill
B818/100	Randyford Bridge
B818/180	Kilewnan Burn
B822/110	Provanstone Burn
B837/020	Doghouse Burn Culvert
B837/030	Whinnydram Culvert
B837/040	Stuc-an-t-Sagairt
C107/070	Culvert East of Cloichran
C107/120	Tullochan
C107/130	Coille Chromadain
C107/140	Ardeonaig
C107/190	Margbeg Culvert
C22/010	Dasherhead Farm
C23/010	Clachan Burn
C23/050	Graystone Bridge
C31/020	Altquhar Burn

C40/015

Westwood Culvert

Appendix 6

Scottish Government Local Bridges Maintenance Fund Successful and Unsuccessful Bids

Stirling Council has been awarded funding of **£0.846M** spanning this financial year and next from the Scottish Government Local Bridges Maintenance Fund and covers four of our bridges as follows:

	Bid 2021/22 £000	Bid 2022/23 £000	Total Bid £000	Awarded 2021/22 £000	Awarded 2022/23 £000	Total Awarded £000
A809 Catter Burn Bridge	35	510	545	72	361	433
B818 Branshogle Bridge	180	0	180	143	0	143
A81 Lunchikin Bridge	10	25	35	10	18	28
B8034 Cardross Bridge	45	260	305	58	184	242
Total	270	795	1,065	283	563	846

The bids which were unsuccessful were as follows:

Bridges Unsuccessful in Funding Bid	2021/22 £000	2022/23 £000	Total Bid £000
Stevenson Bridge	1,000	3,107	4,107
River Forth Bridge	20	230	250
Bridge of Allan Station Bridge	45	450	495
	1,065	3,787	4,852