The Highland Council

Agenda Item	**13**
Report No	**ECI/63/2023**

Committee: **Economy and Infrastructure**

Date: **16 November 2023**

Report Title: **Road Structures Annual Report**

Report By: **Executive Chief Officer Infrastructure, Environment & Economy**

1 Purpose/Executive Summary

1.1 This report provides an outline of the Council's bridge stock, its condition, the bridge inspection regime, and the works associated with maintaining road structures.

It provides recommendations for projects to be included in the “Major Bridges” line and the “Bridges, Retaining Walls and Culverts” line of the Roads and Infrastructure Capital Programme.

2 Recommendations

2.1 Members are asked to:-

i. **Approve** the updated ‘Structures Inspections’ policy;
ii. **Note** the position of the Bridge Stock Condition Indicators in Highland; and
iii. **Note** the current position in Highland in relation to the number of structures inspections undertaken.

3 Implications

3.1 **Resource** – The bridge maintenance plan is funded through the Capital Programme. The bridges, retaining walls and major culverts are prioritised by the risk and consequence of failure. This list is then used to inform the programme of maintenance and replacement works.

3.2 **Legal** – The Council has a duty to maintain structures to a reasonable standard and to manage risk effectively.

3.3 **Community (Equality, Poverty, Rural and Island)** – Due to the geographic nature of Highland, many structures are located in remote areas where failure may result in communities being cut off or having to travel significant distances via alternative routes.

3.4 **Climate Change / Carbon Clever** - There are no known Climate Change / Carbon Clever, implications arising as a direct result of this report. Although improving road structures is unlikely to have a significant effect on carbon emissions, keeping the road network in a condition which allows the free flow of traffic will assist in reducing them.

3.5 **Risk** - Although not specifically mentioned in Corporate Risk 10 (CR10) Condition of our Roads in the Corporate Risk Register, structures are a vital part of the road network and require active management.

3.6 **Health and Safety (risks arising from changes to plant, equipment, process, or people)** – The updated 'Structural Inspections' policy aligns the inspection programme closer to national guidance.

3.7 **Gaelic** – There are no known Gaelic implications arising as a direct result of this report.

4 Highland Council Road Structures Information

4.1 The Roads (Scotland) Act 1984 states that a local roads authority shall manage and maintain roads within their area that are included in the list of public roads, more commonly known as 'adopted roads'. As Members will already know, Trunk Roads are maintained by the Scottish Ministers through various contracts across Scotland.

4.2 Structures are part of the road asset. The term 'road structure' is used to describe bridges, culverts and retaining walls. Cattle grids are also included. Not all road structures which carry or hold up an adopted road are in the ownership of the Council.

4.3 A table showing the numbers and types of road structures the Council is responsible for is shown below (2022/23 figures from asset valuation calculations).

Structure Type	**Quantity**
Road Bridges	1732
Footbridges	34
Unusual Structures	102
Retaining Walls	1,076
Culverts	430
Cattle Grids	593
Total	**3,967**

(N**ote**: the majority of 'Unusual Structures' are listed bridges with 3 being post tensioned bridges.)

4.4 The Gross Replacement Cost (GRC) of the structures stock is £643,967,392. This figure fluctuates as data on the stock is refined.

4.5 Additionally, cattle grids are structures on roads which the Council also have a responsibility for. Traditionally, they have not been included in the structures budget but have been replaced using revenue money from the roads budget. There are currently 593 listed in the asset management database. Cattle grids are not included in the structures GRC figure above as they are accounted for separately due to the way Whole of Government Accounts requires it to be recorded. The GRC for grids is £6,567,000.

4.6 The figures contained in this report do not include other bridges the Council may be responsible for, only those considered to be 'adopted' under the Roads (Scotland) Act 1984. Other bodies may own or be responsible for structures which carry the public road. Network Rail and Scottish Canals are examples of organisations responsible for some bridges on the adopted road network.

5 Inspections

5.1 Members are asked to approve the updated 'Structures Inspections' policy within **Appendix 1**. This is a revision of the previous policy approved at committee in August 2019. The main changes are:-

- updating terminology to reflect recent changes in national standards;
- defining the required inspector competency levels required to undertake structural inspections for the Council, and;
- clarifications to text to reduce ambiguities.

5.2 The following figures describe structures inspection targets for 2023/24 and the progress towards those targets on 23 October 2023:-

Bridges, Culverts and Retaining Walls		
Inspections	**Due in 2023/24**	**Inspected (as at 23/10/23)**
Principal Inspection	122	45
General Inspection	445	238
Totals	**567**	**283**

The GI figures above include inspections routinely assigned to a Structures Technician.

Completion figures are low for the time of year as two of four Structures Technician posts are currently vacant. Recruitment is underway alongside additional short-term resourcing measures.

6 Bridge Stock Condition

6.1 A Principal Inspection on bridges 5m or more in length generates a Bridge Condition Index (BCI) for the inspected bridge. This is used to calculate the Bridge Stock Condition Index (BSCI), an indicator of the overall condition of the Councils bridge stock. Both these indexes have an Average based on the condition of the whole structure and a Critical based on the condition of the main structural elements.

The 2022/23 Highland BSCI average is 79.5 and BSCI critical is 65.7.

7 Performance Indicators

7.1 Highland completes and returns an APSE/SCOTS performance questionnaire annually. This questionnaire has evolved over the years and has been partly developed through the SCOTS Road Asset Management project.

7.2 The 2022/23 Highland results had not yet been submitted to APSE/ SCOTS at the time of writing this paper. Therefore, the previous 3 years data for some of the performance indicators relating to structures is shown in the table below, along with provisional 2022/23 results (all 4 years data for Highland).

APSE/ SCOTS PI	2019/20	2020/21	2021/22	Provisional 2022/23 Result
% of Principal Inspections carried out on time	100.0	99.1	96.8	93.3
% of General Inspections carried out on time	100.0	100.0	100.0	56.0
BSCI average	79.0	79.0	78.8	79.5
BSCI critical	64.0	64.0	64.7	65.7
% of Council owned bridges failing European standards	10.0	9.9	11.4	9.7
% of Council road bridges with unacceptable weight, height or width restriction	0.2	0.2	0.2	0.2

7.3 The table below shows the 2021/22 results for the SCOTS Family Group (Rural), and the Scotland averages. The 2022/23 results have not yet been verified by APSE/ SCOTS at the time of writing this report so are not currently available. The other rural family group members are Aberdeenshire, Angus, Argyll & Bute, Scottish Borders, Dumfries & Galloway, Moray and Perth & Kinross.

APSE/ SCOTS PI	Family Group Average	Scotland Average
% of Principal Inspections carried out on time	66.4	78.9
% of General Inspections carried out on time	74.4	76.8
BSCI average	83.5	86.6
BSCI critical	78.1	78.1
% of Council owned bridges failing European standards	2.6	2.5
% of Council road bridges with unacceptable weight, height or width restriction	0.8	2.02

Notes re the Performance Indicator results:-

- % of PIs on time: a higher percentage is a better result.
- % of GIs on time: a higher percentage is a better result.
- BSCI average: a higher value is better (this is not a percentage but a score out of 100).
- BSCI critical: a higher value is better (this is not a percentage but a score out of 100).
- % failing Euro standards: a lower percentage is better.
- % unacceptable restrictions: a lower percentage is better.

8 Works Programmes

8.1 Works on Council Road structures can be considered to fall into five streams, depending upon funding source:-

- minor works and maintenance;
- small and medium schemes;
- major bridge schemes;
- other schemes; and
- third party schemes

8.2 Minor Works and Maintenance

Minor works and maintenance of road structures are managed by the local Roads area offices and are funded from their individual revenue budgets, reported separately.

8.3 Small and Medium Schemes

Small and medium schemes are managed by the Structures Section and are paid for from the Roads Service's base Capital budget of £7.2m, to allow for prioritisation of works across the asset. The allocation is yet to be determined until the capital budget has been confirmed but is likely to be an average of £300k per year. These projects are accounted for under the 'Bridges, Retaining Walls and Culverts' line of the capital programme.

The Structures Section maintains a prioritised list of schemes for this budget, which is regularly reviewed and updated. New schemes are added from time to time, typically due to bridge deterioration or damage due to vehicle strikes. A full copy of the list is given in **Appendix 2** of this report.

8.4 Major Bridge Schemes

Major bridge schemes are capital funded and include all bridge works that are too large to be funded from the budget for small and medium schemes. There are two places in the capital programme for funding these schemes; Named bridge schemes are proposed by the Structures Section, agreed at the Structures Capital Board and must be approved by Members before commencement. A generic "Major Bridges" line in the capital programme was added in December 2021 to cover major bridges schemes in the medium term.

There are currently three named schemes on the capital programme, which were approved at the Highland Council September 2022 meeting:-

- B863 Invercoe Bridge Replacement: Construction started on site in December 2021 and was completed in April 2023. A small capital allocation remains to close out land agreements and for the retention payment to the contractor once the defects period is completed;
- A836 Naver Bridge Replacement: Design work is essentially complete. The project is expected to go to tender in Jan 2024, with works commencing in early summer 2024; and

- Infirmary Bridge: The Structures Section intend to carry out essential repairs in 2023/24 and carry out a feasibility study to investigate the options for major repairs and strengthening, leading to an increased capacity, or replacement with a new structure. The results of which will be reported at a future committee.

The generic Major Bridges line will be used for the following schemes:-

- A831 bridge replacements/repairs: 2no. bridge replacements and 2no. bridge repairs on the A831 Drumnadrochit to Cannich. This scheme is "shovel ready" and is proposed to be constructed in 2023-2024; and
- A number of feasibility studies will be carried out on several bridges over 2023-24 and 2024-25. Once these feasibility studies are complete, the Structures Section will be able to recommend which schemes and options should be added to the Capital Programme. Feasibility studies may include, structural assessments, testing (both intrusive and non-destructive), cost estimates and options evaluation in order to determine the most effective option for the bridge.

A full list of approved and proposed major bridges is given in **Appendix 3**. Note the costs shown are the estimated construction costs. The cost for a feasibility study will be around £100k each.

8.5 **Other Schemes**

These are schemes that are not funded from the Councils capital programme. This includes schemes funded from external funding e.g. government grants. There are currently no alternatively funded structure schemes.

8.6 **Third Party Schemes**

Third party schemes are works on Council bridges that are carried out by others such as wind farm developers or the Strategic Timber Transport Scheme. Several such schemes may be carried out in a typical year. In all cases, the Council Structures Section carries out the role of Technical Approval Authority to ensure that designs are carried out to the standard required for public roads.

9 Structural Assessments

9.1 Structural assessments are required to determine the load bearing capacity of a structure in relation to carrying traffic loading, this will influence capital expenditure and works. These are different to inspections which identify defects. Assessments are not required for every load carrying structure and the programme will be determined on a technical needs' basis. Depending on the result of an assessment, restrictions such as a weight limit may need to be imposed on a structure prior to any further capital improvement works.

9.2 As part of the process for determining works required, it is proposed to include some additional structural assessments in the programme from the capital budget. Where possible, other funding for assessments is also utilised, which may be through developers, abnormal load movements or timber transport schemes. As assessments vary in complexity, a set amount of funding will not be indicated but the work will be determined from a list of assessments required and contained within the amended capital budget allocation.

Designation:	Executive Chief Officer Infrastructure, Environment & Economy
Date:	23 October 2023
Author:	Simon Farrow, Principal Engineer - Structures Andrew Tryon, Principal Engineer - Structures
Background Papers:	TEC 77/13 Cattle and Deer Grids Policy COM 58/15 Bridges and Road Structures EDI 23/17 Road Structures Annual Report EDI 81/18 Road Structures Annual Report EDI 83/19 Road Structures Annual Report ECI 18/20 Strategic Timber Transport Scheme 2020/21 ECI 38/20 Road Structures Annual Report ECI/53/2021 Road Structures Annual Report HCI/31/23 Capital Programme Review – General Fund
Appendices:	Appendix 1 - Structures Inspections Policy Appendix 2 – Small and Medium Schemes Priority List Appendix 3 – Major Bridges Priority List

Appendix 2 – Small and Medium Schemes Priority List

ridge Code	Bridge Name	2020 Op Areas	Priority Score[1]	Index	Est £k	Cumulative Total (£k)	Scope of Work
A08320330	POOLEWE	Ross and Cromarty	64.6	1	250	250	Concrete investigation and repair
B08170051	AVERON FOOTBRIDGE	Ross and Cromarty	64.5	2	400	650	Assessment then Repair or Replacement
C11500020	BRACORA	Lochaber	59.3	3	85	735	Minor bridge deck replacement
U24000020	SLOCHD COTTAGES RAILWAY	Badenoch and Strathspey	58.8	4	100	835	Assessment and feasibility study
U28230010	LOWER FOYERS BAILEY	Inverness	58	5	150	985	Redecking of bailey bridge
B91540010	MOY	Inverness	56.4	6	150	1,135	concrete investigation and repair, assessment
C10940090	SCHOOL	Lochaber	56.1	7	300	1,435	Replacement
C11500010	LOIN	Lochaber	55.8	8	85	1,520	Minor bridge deck replacement
B80570050	FIREMORE	Ross and Cromarty	54.6	9	415	1,935	Minor bridge deck replacement
U19900010	LEALTY	Ross and Cromarty	53.6	10	330	2,265	Repair and possible widening
U19070010	DUBLIN	Ross and Cromarty	52.8	11	40	2,305	Tie bar repairs (consider Braeintra, Littlemill and Dublin as 1 project)
B91780010	DULNAIN	Badenoch and Strathspey	52	12	300	2,605	Repair of cantilever
A08320270	GRUDIE	Ross and Cromarty	51.3	13	250	2,855	Concrete repairs
A08960110	BALGY	Ross and Cromarty	49.7	14	67	2,922	Assessment of structure including half-joints
B90070040C93	AIRDRIE MILL BURN	Nairn and Cawdor	47.4	15	200	3,122	Repairs
C12230010	OLD SHIEL	Ross and Cromarty	47.1	16	300	3,422	Refurbishment
A08610230	RIVER GOUR	Lochaber	46.5	17	247	3,669	Repaint, waterproof, resurface, parapet replacement
C11190010	BALNAAN	Badenoch and Strathspey	45.9	18	67	3,736	Assessment of structure including half-joints
U14230010	ALLT CURRACHAN	Inverness	45.6	19	315	4,051	Investigate options for repair/replacement
A08350250	KNOCKAN	Sutherland	45.3	20	350	4,401	Parapet replacement, concrete investigation
B91610010	LITTLEMILL	Ross and Cromarty	45.2	21	40	4,441	Tie bar repairs (consider Braeintra, Littlemill and Dublin as 1 project)
U49480020	BRAEINTRA	Ross and Cromarty	44.9	22	40	4,481	Tie bar repairs (consider Braeintra, Littlemill and Dublin as 1 project)

Appendix 2 – Small and Medium Schemes Priority List

ridge Code	Bridge Name	2020 Op Areas	Priority Score[1]	Index	Est £k	Cumulative Total (£k)	Scope of Work
A08390010	PITTENTRAIL	Sutherland	44.1	23	125	4,606	Refurbishment
A08360180	VAGASTIE	Sutherland	43.5	24	75	4,681	Minor works
A08350270	LEDMORE	Sutherland	42.7	25	275	4,956	Parapet replacement, concrete investigation
A08320090	GRUDIE	Ross and Cromarty	41.6	26	200	5,156	Investigation to determine scope of repairs
U48090010	CHRACAIG	Eilean a' Chèo	40.8	27	400	5,556	Repair and refurbish
A08620090	LOVAT	Inverness	40.8	28	205	5,761	Masonry repair and scour protection
U21040030	SHERRAMORE	Badenoch and Strathspey	39.7	29	200	5,961	waterproofing / Joints / vegetation
B90900020	HOWFORD	Nairn and Cawdor	38.5	30	200	6,161	Steelwork repairs and repaint
C10870030	AN UILLT BHIG	Ross and Cromarty	38	31	360	6,521	Strengthening and refurbishment
U32670010	ACHVAICH	Sutherland	37.7	32	231	6,752	Replace structure. Options study.
A08360220	INCHKINLOCH	Sutherland	37.2	33	75	6,827	Partial repointing
A08380220	KYLE OF TONGUE	Sutherland	36.2	34	80	6,907	Movement joint replacement
B09700200	NETHY	Badenoch and Strathspey	36.1	35	140	7,047	Repointing
A08550010	RIVER LEASGEARY	Eilean a' Chèo	35.4	36	410	7,457	Strengthen edge, replace parapet, refurbishment
A08380080	ACHFARY	Sutherland	35.2	37	550	8,007	Waterproofing and resurfacing, concrete repairs
A08610350	CEOL NA MARA	Lochaber	31	38	60	8,067	Masonry repairs
A08630140	CAROY	Eilean a' Chèo	30.5	39	100	8,167	Waterproofing and resurfacing, parapet replacement
A08610340	CAMUSCHORK	Lochaber	30	40	60	8,227	Masonry repairs

[1]The priority score is out of 100 with higher scores being worse. The current highest score across the Highlands is 65.7 (Ness Bridge).

Appendix 3 – Major Bridges Priority List

Bridge Code	Bridge Name	Area	Priority Score[1]	Index	Estimated Cost (£k)	Cumulative Total (£k)	Scope of Work
NAMED PROJECTS							
B08630010	INVERCOE	Lochaber	-	-	120	120	Job complete - retention fee payable April 2024
A08360290	NAVER	Sutherland	62.1	1	11,500	11,620	Bridge replacement (design complete and ready to tender)
F00000020	INFIRMARY	Inverness	62.6	2	550	12,170	Essential repairs, plus feasibility report into future of crossing
PROJECTS TO BE CONSTRUCTED UNDER GENERIC MAJOR BRIDGE LINE							
A083100XX	A831 Bridges	Inverness	43.7	3	1,800	13,970	2 No. deck replacements and 2no. deck repairs.
U51640010	WHITEBRIDGE	Nairn and Cawdor	27.8	4	233	14,203	Repairs to old structure (agreed as part of Whitebridge replacement)
FEASABILITY REPORTS TO BE STARTED UNDER GENERIC MAJOR BRIDGE LINE							
B08610010	NESS	Inverness	65.7	5	1,800	16,003	Half joint capacity mitigation, repairs and re-waterproofing
A08900080	STRATHCARRON	Ross and Cromarty	64.1	6	1,200	17,203	Major refurbishment (possible replacement)
C11520020	SPEY BRIDGE CROMDALE	Badenoch and Strathspey	64.1	7	2,175	19,378	Assessment and Refurbishment
B08630060	KINLOCHLEVEN VIADUCT	Lochaber	61.2	8	2,518	21,896	Assessment, feasibility study and refurbishment
A08360090	BONAR	Sutherland	58.9	9	1,425	23,321	Refurbishment
OTHER SCHEMES AWAITING FUNDING							
A088400XX	A884 BRIDGES	Lochaber	57.7	10	2,750	26,071	3no. bridge replacements
A08360260	BORGIE	Sutherland	54.1	11	750	26,821	Refurbishment
B80070070	GLENMORE	Lochaber	51.2	12	1,853	28,674	Replacement
C11540030	DULSIE	Nairn and Cawdor	50.3	13	459	29,133	Refurbishment
U46200010	WATERLOO	Inverness	49.7	14	2,600	31,733	Steelwork repairs and repaint
A08380010	TIRRY	Sutherland	49.7	15	4,764	36,497	Replacement
B91590010	WICK HARBOUR	Caithness	47.2	16	10,428	46,925	Replacement
C11080050	MAULD	Inverness	46.8	17	7,500	54,425	Replacement
A08310100	COMAR	Inverness	45.9	19	832	55,257	Refurbishment
A08840090	ACHNAGAVIN	Lochaber	44.4	20	900	56,157	Refurbishment
A08320060	MOY	Ross and Cromarty	44.4	21	12,000	68,157	Replacement
A08940030	KYLESKU	Sutherland	44.3	22	2,400	70,557	Refurbishment
A08840080	ACHARN	Lochaber	37.8	24	900	71,457	Refurbishment

[1]The priority score is out of 100 with higher scores being worse. The current highest score across the Highlands is 65.7 (Ness Bridge).

Draft – For Committee Approval

The Highland Council
Comhairle na Gàidhealtachd

Structures Inspection Policy

Roads and Infrastructure

Infrastructure and Environment

www.highland.gov.uk

Approval

	Name	Date
Prepared By:	E Maciver/M McLeod/S Farrow	
Approved By:	T Urry	

Responsible Officer:	Head of Roads and Infrastructure
Committee:	Economy and Infrastructure
Approval Date:	

Document Control

Version Number	Date	Comments
1.0	August 2019	
1.1	May 2023	

Contents

1. Introduction

1.1. The Highland Council has a duty under the Roads Scotland Act 1984 to manage and maintain their adopted roads, ensuring that they are safe for use and fit for purpose. The Highland Council will comply with this duty by ensuring an inspection regime is in place for all structures which form part of the adopted road and are maintained by them.

1.2. Structures are inspected to monitor their condition and identify defects. The results of these inspections will be used to identify future works programmes and maintenance regimes including emergency repairs if required.

1.3. This Policy does not include structures owned by third parties or Services within the Council. Other parties may include, but are not limited to, Network Rail, Scottish Canals, and private landowners. Maintenance and inspection responsibilities for these structures are agreed between the third party and The Highland Council.

2. Scope

2.1. This policy shall apply to all structures which form part of the adopted road network and prospectively adoptable roads for which The Highland Council is the local roads authority. The following will apply in Highland for inspection purposes and have been derived from CS 450 Inspection of Highway Structures.

Asset	Dimension	Comment
Bridge, buried structure, subway underpass, culvert and any other similar structure	• All structures greater than or equal to 3m span • Culverts 2 – 3m span, or multi-cell culverts where cumulative span is greater than or equal to 5m • Corrugated metal culverts 0.9m or more in span • Pedestrian subways	Includes road bridges, subways, footbridges, cycle route bridges, bridleway bridges, underpasses, etc.
Earth retaining structure	• All structures with an effective retained height, i.e. the level of fill at the back of the structure above the finished ground level at the front of the structure, greater than 1.5m	

Reinforced/ strengthened soil/ fill structure with hard facings	• All structures with an effective retained height of greater than 1.5m	
Sign and/ or signal gantry	• Structural aspects of permanent large sign/signal gantries and large Variable Matrix Signs(VMS)	Not applicable for Highland Council.
Masts	• Structural aspects of all cantilever masts • Structural aspects of all lighting masts of 20m or greater, i.e. the vertical distance from top of post to bottom of flange • Structural aspects of mast for camera, radio, speed camera and telecommunication transmission equipment. Structural aspects of any signs defined as requiring technical approval (TA) in accordance with CG 300	Not included in this policy (Lighting Section organises any inspections necessary). Not applicable for Highland Council (none in Highland at the time of writing this policy).
Access gantry	• A moveable structure providing access to a road asset, typically for bridge inspection and maintenance.	Part of the existing structure.
Tunnels	• An enclosed length of road of 150m or more	Not applicable for Highland Council.

Other structures	• Other structures that are within the footprint of the road, e.g. service/ utility crossings	Will only apply to those owned and/ or maintained by Highland Council.
	• Any remaining structures defined as requiring technical approval in accordance with CG 300 or any agreed with the Overseeing Organisation.	Cattle grids.
Third Party structures	• Any of the above categories but owned by others, e.g. private owners or utility companies	See section 5.1 for more details.

Table 1: Structures Definitions

2.2. Notwithstanding the above, CG 300 Technical Approval of Highway Structures applies to all road structures with a clear span of 0.9m and above and to retaining walls greater than 1.5m high. This policy does not change those parameters and Technical Approval should be applied for as necessary.

2.3. Structure records will be maintained by Roads and Infrastructure.

3. Inspections

3.1. The inspection programme will be determined annually by the Structures Section and, depending on priorities identified or unforeseen circumstances, may change through the year.

3.2. We will:

- Follow the guidelines provided by the 'Well Managed Highway Infrastructure': A Code of Practice and CS 450 Inspection of Highway Structures.
- Apply the guidance within the Highland Council OP708 which details the process to be used for undertaking inspections of structures and any subsequent works ordering.

3.3. The individual roles within Roads and Infrastructure responsible for undertaking inspections are as follows:

Position Descriptions	Role
Supervising Engineer	The engineer who supervises the inspection programme and is ultimately responsible for inspections of road structures
Authorising Engineer	The engineer appointed by the Supervising Engineer who authorises inspection reports
Senior Inspector	A person appointed by the Supervising Engineer with the competence and qualifications to inspect road structures, (including complex structures)
Inspector	A person appointed by the Supervising Engineer with the competence and qualifications to inspect road structures (not including complex structures)

Table 2: Roads and Infrastructure roles responsible for undertaking inspections

3.3.1. The Supervising Engineer is the Principal Engineer (Structures Section).

3.3.2. Complex structures are defined as those with long spans, high skews, unusual or unconventional aspects, or high risk details such as half joints or post tensioning. Complex structures will be designated by the Supervising Engineer.

3.4. The various types of inspections, and the Council's strategy relating to them, are as follows:

Inspection Type	Definition	Council Strategy/ Inspection Frequency
Safety Inspection	Check of those parts of a road structure that are visible from the carriageway or footway to ensure the safe and efficient identification of safety related defects	Undertaken as part of routine Road Safety Inspections or as a result of notification of a defect by a third party
Call Out Inspection	Check of safety concerns by qualified inspection staff	As a result of a safety inspection or identification of safety defects by other members of staff in the course of their general duties a qualified inspector /engineer shall assess and prioritise

		the need for a call out inspection.
Inventory Update and Defect Check	Check Inventory details held in database and carry out visual survey for defects. If a serious defect is found, a GI shall be carried out.	Risk Based Interval
General Inspection	A visual inspection of all parts of the structure undertaken without the need for additional access equipment, using safe, ground level viewing positions.	Risk Based or 3 year intervals
Principal Inspection	A close examination, within touching distance, of all accessible parts of the structure.	Risk Based or 9 year intervals
Special Inspection	A special inspection shall provide detailed information on a particular element, part, area, or defect that is causing concern or inspection of which is beyond the requirements of the general and principal inspection regime.	Need determined by Supervising Engineer as a result of another inspection or event.
Inspection for Assessment	An inspection for assessment shall provide the information required to undertake a structural assessment.	Undertaken as determined by the need for an assessment as decided by the Supervising Engineer.

Acceptance Inspection	1. Pre-opening inspection	Undertaken in the form of a principal inspection approximately one calendar month before the issue of completion documentation or the opening/reopening of the structure to the public.
	2. Defects liability inspection	Undertaken in the form of a Principal Inspection just prior to end of the defects liability period.
	3. Transfer inspection	Prior to transfer between two parties where Highland Council takes over responsibility for the structure
	4. Handback inspection	Prior to handback between two parties where Highland Council takes over responsibility for the structure

Table 3: Inspection Types and Council Strategy

3.5. To fully implement a risk based approach for all structures, an initial principal inspection will be required on those that do not currently have one. This will take resource and time to achieve. There is no fixed timescale for implementing this but it is expected that information will be gathered on a continuing basis.

4. Inspection Frequency

4.1. The frequency of inspections adopted will be based on the data available, the implementation of a risk based approach and efficient use of resources. Existing intervals for General (3 years) and Principal Inspections (9 years)

will remain as is until a risk based approach has been implemented and as follows:

Asset	Principal Inspection	General Inspection
Bridges and Culverts ≥5.0m (overall length)	Risk Based	Risk Based
Bridges and Culverts between 3.0m and 5.0m (overall length)	No inspection	3/6/9 year cycle then implement Risk Based
Bridges and Culverts less than 3.0m	No PI Inventory update and defect check	No GI Inventory update and defect check
Retaining Walls >=5.0m (retained height), supporting the road	3/6/9 year cycle then implement Risk Based	3/6/9 year cycle then implement Risk Based
All other Retaining Walls	No PI Inventory update and defect check	No GI Inventory update and defect check
Cattle Grids	No inspection	3/6/9 year cycle then implement RiskBased

Table 4: Inspection Frequencies

4.2. The frequency of inspections will be maintained wherever possible but particular situations such as weather related responses may require resources to be used elsewhere. Where this occurs, the delay in completing inspections will be kept to a minimum and the original programmed regime resumed.

4.3. Principal Inspections are generally undertaken within a calendar year. General Inspections should also follow the calendar year but where circumstances do not permit this, delays should be contained to the financial year wherever possible. Inspections may require to be delayed for programming reasons, to take advantage of traffic management deployments or due to third party access requirements. It is therefore not practical to state a fixed tolerance limit for inspection dates.

5. Inspection Requirements of Other Owners

5.1. Other owners such as Network Rail have the responsibility for some structures within the road boundary. Where the Council is confident that the responsible party has an inspection regime in place, it is not required to do its own inspections. However, where it is uncertain that a responsible owner has undertaken inspections, a General Inspection (GI) should be undertaken if it is in the interests of the wider public to do so. The requirement for these GIs will be determined by the Supervising Engineer or relevant Road Operations Manager, Roads and Infrastructure. The owner still retains the primary responsibility for the structure's integrity and public safety.

6. Defects

6.1. Defects found during inspections are recorded with appropriate responses. There are two sets of categories used for defect responses depending on the type of inspection undertaken.

6.2. For routine surveillance inspections undertaken as part of routine Road Safety Inspections, the structure defects found will be passed to the relevant Area Structures Technician. If necessary, the Road Inspector will categorise the defect using the currently applicable categories for road safety defects. However, the Structures Technician, or other appropriate staff member, will reassess the defect and categorise it according to the risk categories below.

Category	Description	Response
S1: Critical/ Emergency	A defect likely to deteriorate significantly in the immediate future to a point where it can cause serious harm to the public or result in structural collapse.	Immediate action to protect public if necessary. At least temporary repair or mitigation measures within 24 hours(1).
S2: High	Those not an emergency but requiring immediate attention as they may present a significant hazard to road users or short term structural deterioration.	Action within a reasonable timescale and within the budget available. Response could include adding to a rolling programme of works.
S3: Medium	Defects requiring attention to improve longevity of the asset.	No fixed timescale. Response could include adding to a rolling programme of works.
S4: Low	Minor defects unlikely to cause any significant deterioration or be of risk to the road user.	No fixed timescale. Response could include adding to a rolling programme of works.
S5: Negligible	No foreseen hazard to road users or integrity of a structure.	No action or planned work as resources permit.

Note (1): 24 hours will be interpreted as the end of the following day.
Table 5: Defect Risk Categories

6.3. The following 'S' category notes are intended as guidance and should not be taken to be definitive explanations for each response. Any defect can be put into any category, depending on the severity and hazard it may present.

6.3.1. **S1: Critical**

a) Elements in a Very Poor condition where the structure has either fully or partially collapsed, is in imminent danger of doing so, or is presenting a serious hazard to the public.
b) The Inspector should not leave the site until the structure is made safe, or the public are excluded from the danger area, using cones, barriers or signs as appropriate.
c) Examples include, severe deformations or movement under load, severe damage to load bearing elements, full or partial collapse of key elements, including parapets.

6.3.2. **S2: High**
a) Elements in a Poor or Very Poor condition, where there is no imminent danger to the public.
b) Examples include, severe loss of section, cracking in areas of high stress, significant scour etc.

6.3.3. **S3: Medium**
a) Elements in a Fair or Poor condition.
b) Examples may include moderate corrosion, spalling, cracking, bearing or joint replacements, clearing significant vegetation, clearing drainage, repointing, repainting etc.

6.3.4. **S4: Low**
a) Elements in Good condition.
b) Examples may include minor vegetation clearance, minor painting, minor pointing loss, etc.

6.3.5. **S5: Negligble**
a) Elements in Very Good condition.
b) Examples may include: Insignificant vegetation (e.g. minor weeds), graffiti removal, etc.

6.4. Definitive response times are not included for the defect response categories, with the exception of making safe S1 emergency ones. In the case of S1 defects, the severity of the defect will dictate the time taken to undertake a permanent repair. Where possible, permanent repairs will be undertaken as soon as is practicable. Alternatively, permanent repairs will be included in annual maintenance programmes.

6.5. Inspectors should inform the relevant Area Roads Operations Manager or Senior Engineer at the earliest possible opportunity of a defect which may present an immediate risk to public safety. The Supervising Engineer should also be notified.

6.6. Where a structure has been identified in a replacement or repair programme, defects may not be addressed and therefore left to decline, to prevent inefficient use of resources.

6.7. Other inspection types have their own reporting methods and defects may be rectified by other parties (such as during a maintenance period). Safety inspections are not the only means of identifying serious defects. Inspectors and other members of staff may also identify safety defects in the course of undertaking their general duties. These should be reported for repairs/ action as appropriate.

6.8. Other road users may also report defects to the Council and these will be processed for action as appropriate.