

A836 Naver Bridge Replacement Scheme

Draft Construction Environmental Management Plan (CEMP)

November 2021



FAIRHURST

CONTROL SHEET

CLIENT: THE HIGHLAND COUNCIL INFRASTRUCTURE,
ENVIRONMENT AND ECONOMY SERVICE




PROJECT TITLE: A836 NAVER BRIDGE REPLACEMENT SCHEME




REPORT TITLE: DRAFT CONSTRUCTION ENVIRONMENTAL
MANAGEMENT PLAN

PROJECT REFERENCE: 140891

DOCUMENT NUMBER: MJ/DW/140891/503

STATUS: Final Version

Issue & Approval Schedule	1	Name	Signature	Date
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	Approved by	Dominic Waugh		18/10/2021

Revision Record	Rev.	Date	Status	Description	Signature	
	1	29.11.2021	Final Version	Updated following Client Comments	By	
					Check	
					Approve	
	2				By	
					Check	
					Approve	

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Draft Construction Environmental Management Plan

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1.0 Introduction

- 1.1 Fairhurst have been appointed by The Highlands Council (THC) Infrastructure, Environment and Economy Service to prepare and submit a full planning application for the A836 Naver Bridge Replacement Scheme ("the Proposed Scheme") comprising of new carriageway and a three-span bridge, adjacent to the existing bridge over the River Naver, Naver, Bettyhill. This draft Construction Environmental Management Plan (CEMP) forms part of the planning application submission to outline at an early stage the relevant operational measures and procedures which will be implemented during construction of the proposed scheme. It is anticipated that if planning permission is granted for the Proposed Scheme then a condition would require the construction of the development to comply with the CEMP. The CEMP will apply to the whole application site and will be supported by bespoke Construction Method Statements (CMSs).
- 1.2 This Draft CEMP should be read alongside the Construction Methodology Statement (October 2021), which explains the construction sequence constraints and proposed construction methodology.
- 1.3 The Applicant is aware that the Contractor will be required to produce and agree a CEMP to describe how construction will be managed to avoid, minimise and mitigate any potential construction effects on the environment and existing surrounding communities. Therefore this draft CEMP has been provided in support of the application to help illustrate to the Local Planning Authority (LPA) the environmental measures, which will be considered suitable during the construction phase of the Proposed Scheme.
- 1.4 The Applicant is proposing to ensure that the arrangements in place are appropriate with regards to highway safety, amenity of sensitive receptors and the surrounding environment during the construction period. The scope of this draft CEMP covers the following issues:
- Site, Surroundings and Proposed Scheme;
 - Key Construction Stages/ Activities;

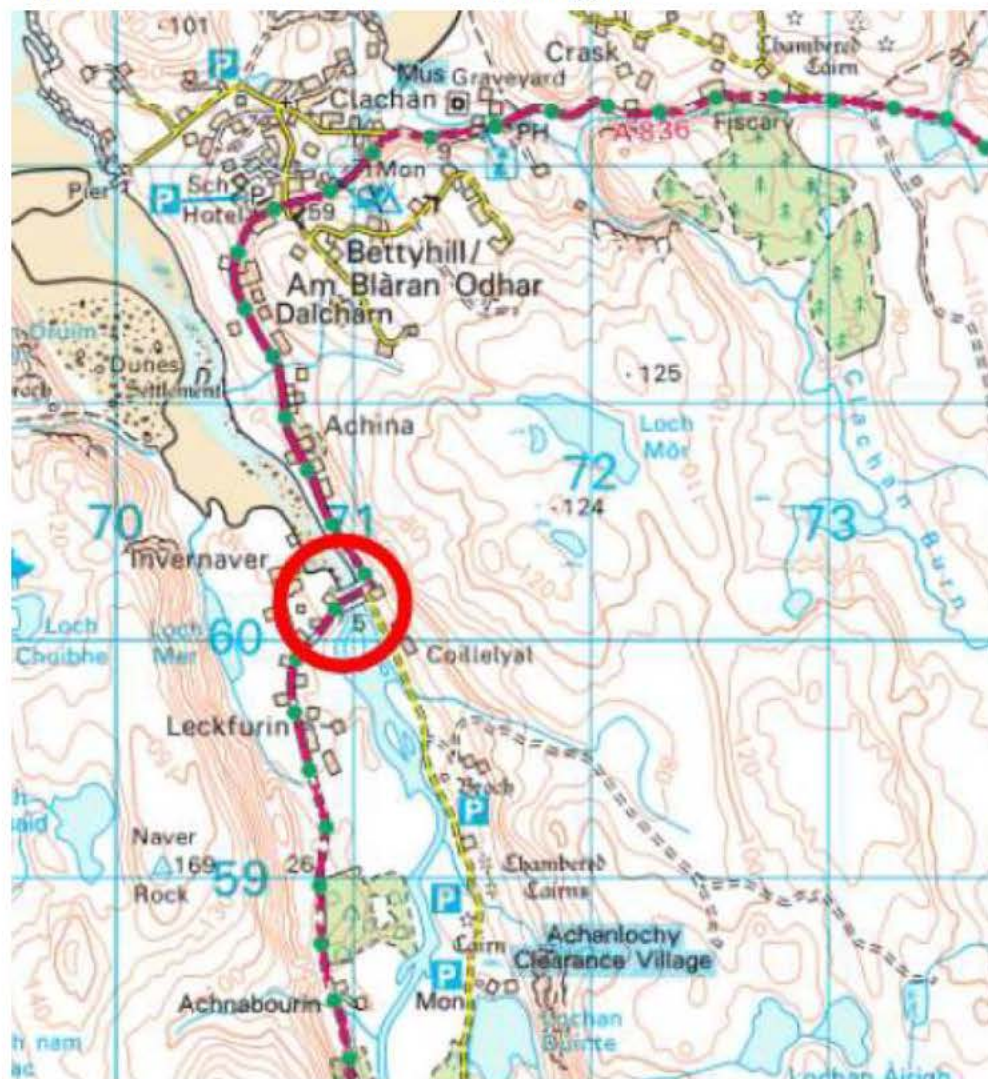
- Highway and Traffic Management;
- Environmental Control Measures;
- Site Management and Community Liaison; and
- Conclusions.

2.0 Site, Surroundings and Proposed Scheme

SITE AND SURROUNDINGS

- 2.1 The application site boundary (site extents) is shown on the attached 'Site Location Plan' drawing (Drawing Reference: 140891-FAI-NAV-DR-Z-0002) and extends to an area of approximately 2.5 hectares. The application site lies to the south east of the small hamlet Invernaver and to the south of the small village of Bettyhill. Bettyhill is identified as a growing settlement of the adopted Caithness and Sutherland Local Development Plan (LDP). The application site spans the River Naver, via the existing A836 Naver Bridge and includes land on both side of the river.

Figure 2.1 Location Plan - Scale 1:50,000 approx.



- 2.2 The A836 road begins at the South end of the Dornoch Bridge and ends at John o'Groats, passing through Lairg, Tongue and Thurso. Naver Bridge carries the Tongue to Bettyhill section of the A836 over the River Naver at Bettyhill. It forms part of the North Coast 500 tourist route. It is a mix of single carriageway and single track with passing places. The east approach to the bridge is single carriageway and the west approach is single track with passing places, and the bridge itself is single track with no verges.

PROPOSED SCHEME

- 2.3 The existing structure is a three span wrought iron through girder bridge with a total length of approximately 62m. The substructure comprises stone masonry abutments and piers which are situated within the River Naver. The bridge superstructure is in a poor condition and is considered to be of an age and structural type that any refurbishment scheme would be extensive and costly.
- 2.4 The bridge is narrow with only room for a single traffic lane and no provision for cyclists or pedestrians. The approach alignment is poor, particularly from the East, which coupled with the through girders means that forward visibility is substandard. The poor alignment combined with the poor condition of the structure means that a full replacement and realignment of the structure and approach roads is considered to be the most appropriate option. As part of this scheme the existing bridge would need to be demolished. It is anticipated that the superstructure could be lifted from the supports in three or more parts before being cut into smaller sections and removed from site.
- 2.5 The Proposed Scheme comprises over 450m of new carriageway and a 65m three span bridge. The new structure is situated to the south of the existing bridge over the River Naver, one mile south of Bettyhill. The alignment of the existing route is shown in Figure 2.1 above.
- 2.6 The Proposed Scheme will involve realignment of the existing carriageway and provision of a new bridge crossing which aims to provide a more compliant road geometry and visibility which will lead to a safer section of road.

- 2.7 The new carriageway construction will likely be formed by cutting into the existing rock formation on the east side and onto new embankment and cutting on the west side. The proposed 65m structure comprises a prestressed and reinforced concrete composite beam and slab structure with three spans. Span length and support locations will be optimised during the developing design.

3.0 Key Construction Stages/ Activities

- 3.1 The main construction activities required for the Proposed Scheme are expected to include: Site Clearance; Pre-earthworks drainage and construction stage Sustainable Drainage Systems (SuDs); Utility Diversions; Earthworks (cut & fill); material transfer; rock cut; temporary materials stockpiling; road pavement; structures demolition; bridge construction; ancillary roadworks, such as road markings and signage; landforming and landscape works; site restoration (ecological and landscape mitigation works); and active traffic management.

Demolition

- 3.2 As part of this scheme the existing bridge would need to be demolished. It is anticipated that the bridge deck could be lifted from the supports in 3 or more sections before being cut into smaller parts and removed from site. The substructure will be dismantled to river bed level from barges or other methods. The masonry will be stored for possible re-use on other projects.

Construction of new Carriageway and three-span bridge

- 3.3 The Proposed Scheme comprises over 450m of new carriageway and a 65m three span bridge consisting of concrete beam and slab superstructure supported on piled reinforced concrete abutments and piers. The proposed bridge is adjacent to the south of the existing bridge over the River Naver, one mile south of Bettyhill.
- 3.4 The Proposed Scheme will involve realignment of the existing carriageway and provision of a new bridge crossing which aims to provide a more compliant road geometry and visibility which will lead to a safer section of road.
- 3.5 The new carriageway construction will likely be formed by cutting into the existing rock formation on the east side and onto new embankment and cutting on the west side. The proposed 65m structure comprises an integral 3 span concrete beam and slab superstructure supported on piled reinforced concrete piers and abutments.

Buildability

3.6 Buildability is a major consideration where there are severe constraints on approach to the east bridge abutment and access to the west side of the river. These constraints are listed as follows:

- Road levels to be raised in order of 2-3m to suit bridge level being raised to provide clearance to river and tidal flood levels, impacting both the A836 mainline carriageway and Skelpick Road junction;
- Steep sloping topography to the east of mainline and Skelpick Road carriageways;
- Location of property (Tigh-na-Bhrodan) immediately to east of Skelpick Road;
- Retention required along river bank side of Skelpick Road;
- The load carrying capacity of the existing bridge is assessed as being adequate for normal 40/44T Heavy Goods Vehicles. However the bridge is not certified for abnormal load vehicles and this restriction will be highlighted to tendering contractors.

3.7 A preliminary assessment of the buildability options in this area identified that it would provide a benefit to the Proposed Scheme if land west of a masonry retaining wall within the front garden of the adjacent property could be utilised as additional space for forming temporary or permanent offline carriageway construction adjacent to Skelpick Road.

3.8 There are less space constraints on the west side of the river for the construction of the west abutment, offline section of new A836 carriageway and side road access to farm and dwelling. However temporary access ramps will be required to provide access to the farm and dwelling from the new section of A836 carriageway while construction of the side road access will sever traffic flows on the existing A836 carriageway.

- 3.9 Further constraints relating to the buildability of the bridge arise due to the importance of the River Naver for Migratory fish notably Atlantic Salmon for which the site comprises an SAC. Construction of the bridge will need to enable unconstrained upstream and downstream migration of fish at different life stages. Key timings for fish migration have been identified in consultation with River Naver Fisheries.

Construction Programme

- 3.10 The exact programme for the construction of the Proposed Scheme has not yet been determined. However, it is important to note that the programme of works for the construction period of the proposed bridge is influenced by seasonal constraints relating to the need to maintain fish passage primarily in relation to the Special Area of Conservation (SAC) population of Atlantic Salmon, as discussed with the River Naver Fisheries. Seasonal constraints relate primarily in relation to in stream work elements. This topic is discussed further in the accompanying Ecological Impact Assessment (EclA) report (October 2021).
- 3.11 The same ecological constraints exist in relation to the demolition of the existing bridge and no agreed programme has been confirmed. However, it can be stated that the demolition period could be approximately 3 months following completion of the new bridge.
- 3.12 Utility companies have been contacted in accordance with new Roads and Streetworks Act 1991 and have been asked to submit proposals and costs for any diversionary works that maybe required as part of the works. Utilities who apparatus will be affected by the works are:
- Scottish Water – 2 no. 100mm dia. watermains to be diverted over the length of the new scheme;
 - British Openreach – 1 no. cable / duct to be diverted over the length of the new scheme; and
 - SSE – Localised works for relocation of 1 overhead pole

- 3.13 Detailed proposals for the works are still be finalised by the utility companies but will be implemented in the works contract either as advanced works or during the contract and to be co-ordinated by the appointed contractor.

4.0 Highway and Traffic Management

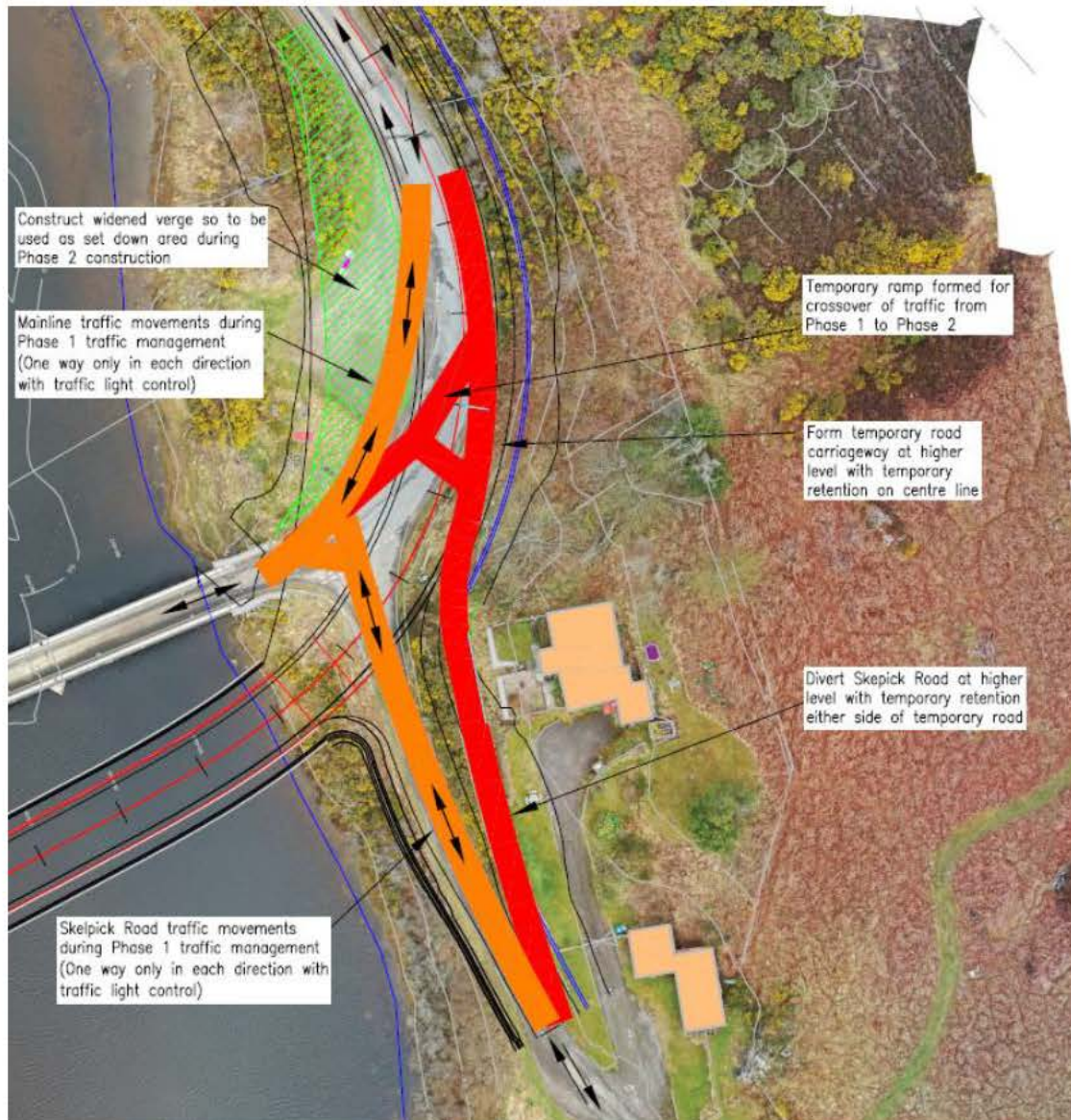
- 4.1 During the construction phase of the Proposed Scheme, temporary traffic management and restrictions will be put in place to allow safe access and a safe working environment for construction workers. Implementing a traffic management system will allow safe passage for both vehicles and Non Motorised Users (NMUs).
- 4.2 Such traffic management measures must be carefully planned and managed and will include temporary speed restrictions and temporary traffic signals.
- 4.3 Taking buildability constraints into consideration, the following preliminary 3 phase construction strategy has been identified east of the river

Construction Phases and Associated Traffic movements east of river

Phase 1 Construction East of River (See Figure 4.1 below)

- Partly construct southbound mainline carriageway;
- Divert mainline traffic from existing bridge via open hardstanding area just east of bridge;
- Construct offline section of Skelpick Road utilising outer part of front garden of property; and
- Skelpick Road traffic routed along existing carriageway; and
- Form temporary ramp on mainline carriageway for routing Phase 2 traffic flows from Skelpick Road

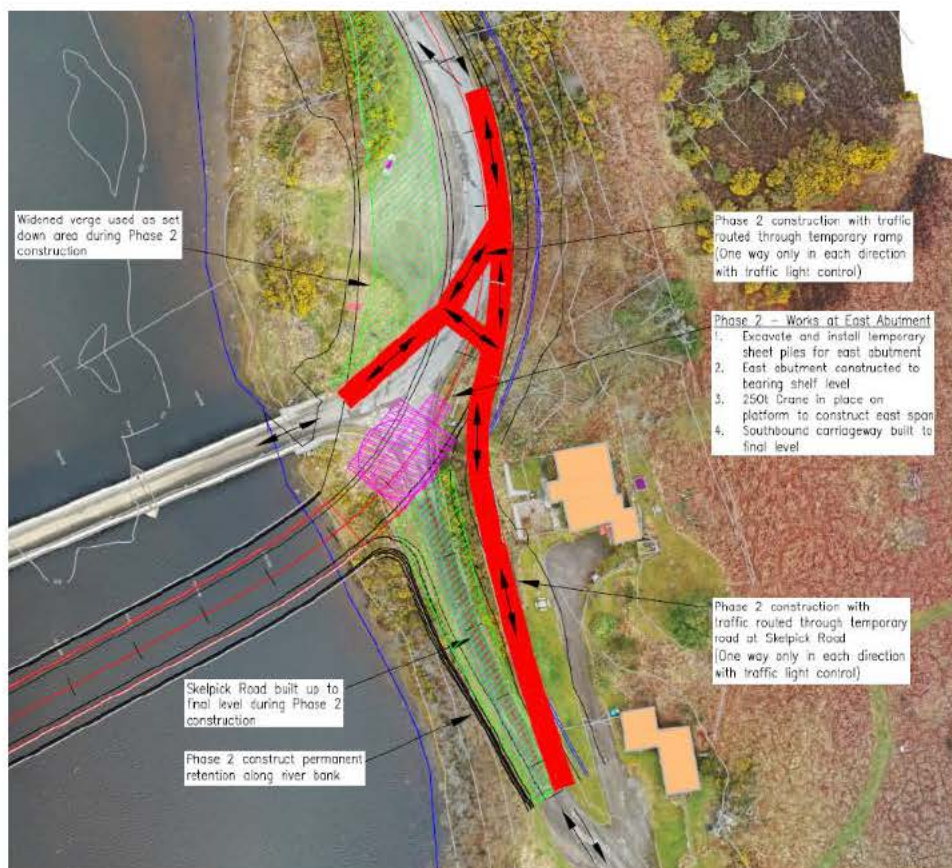
Figure 4.1 – Phase 1 Construction East of River



Phase 2 Construction East of River (See Figure 4.2 below)

- Phase 2 mainline traffic flows routed onto southbound carriageway via temporary ramp, flows will be restricted to single lane in each direction with traffic light control in operation;
- Move Skelpick road traffic to temporary road alignment with flows restricted to single lane in each direction and traffic light control in operation;
- Excavate and install temporary sheet piles for east abutment;
- East abutment constructed to bearing shelf level;
- Construct Skelpick road retaining wall;
- To allow installation of the east span prestressed beams a circa 250T crane will be required behind the east abutment;
- Install prestressed beams;
- Complete bridge except for ground bearing north east retaining wall; and
- Complete Skelpick Road carriageway and mainline south bound carriageway

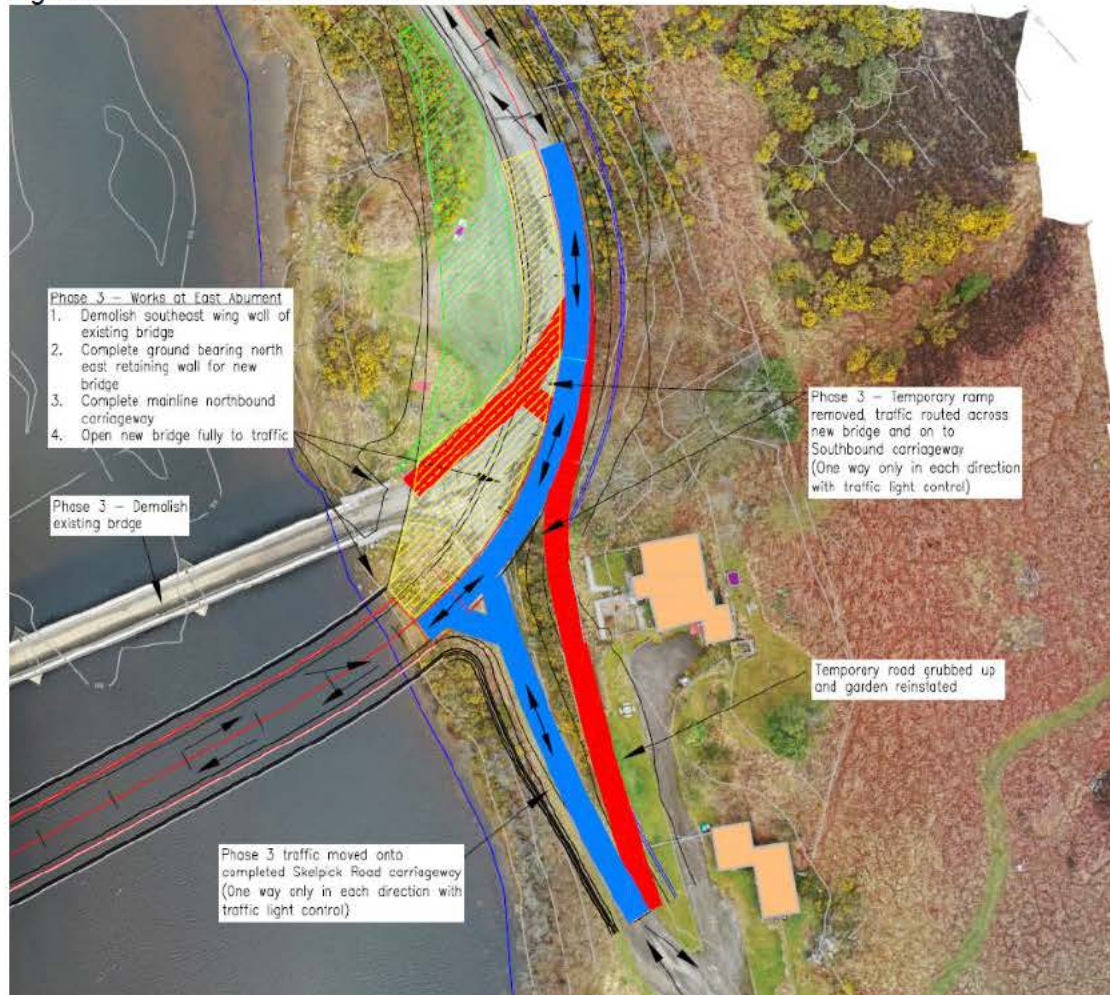
See Figure 4.2 – Phase 2 Construction East of River



Phase 3 Construction East of River (See Figure 4.3 below)

- Move mainline road traffic to south bound carriageway under traffic light operation and over new bridge;
- Skelpick Road traffic moved onto completed road and southbound main line;
- Demolish south east wing wall of existing bridge;
- Complete ground bearing north east retaining wall of new bridge;
- Complete mainline north bound carriageway;
- Open new bridge fully to traffic; and
- Demolish existing bridge.

Figure 4.3 – Phase 3 Construction East of River



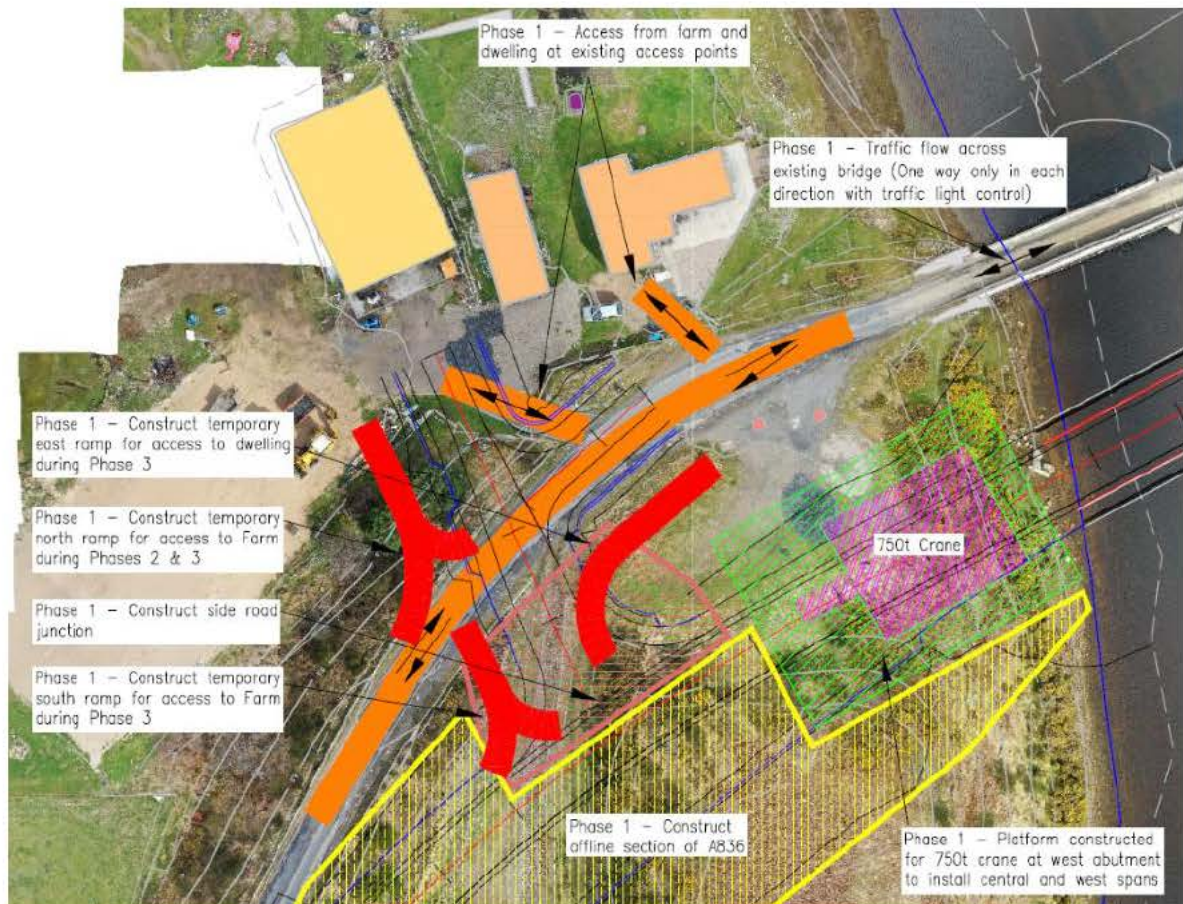
- 4.4 Taking buildability constraints into consideration, the following preliminary 3 phase construction strategy has been identified west of the river.

Construction Phases and Associated Traffic movements West of River

Phase 1 Construction West of River (See Figure 4.4 below)

- Existing access maintained to A836 from dwelling and farm with single lane traffic across existing bridge with traffic light control in operation;
- Construct structural platform for 750t crane adjacent to new bridge west abutment to construct middle and west spans;
- Construct offline section of new A836 carriageway and side road junction; and
- Construct temporary access ramps north, south and east for future access to farm and dwelling

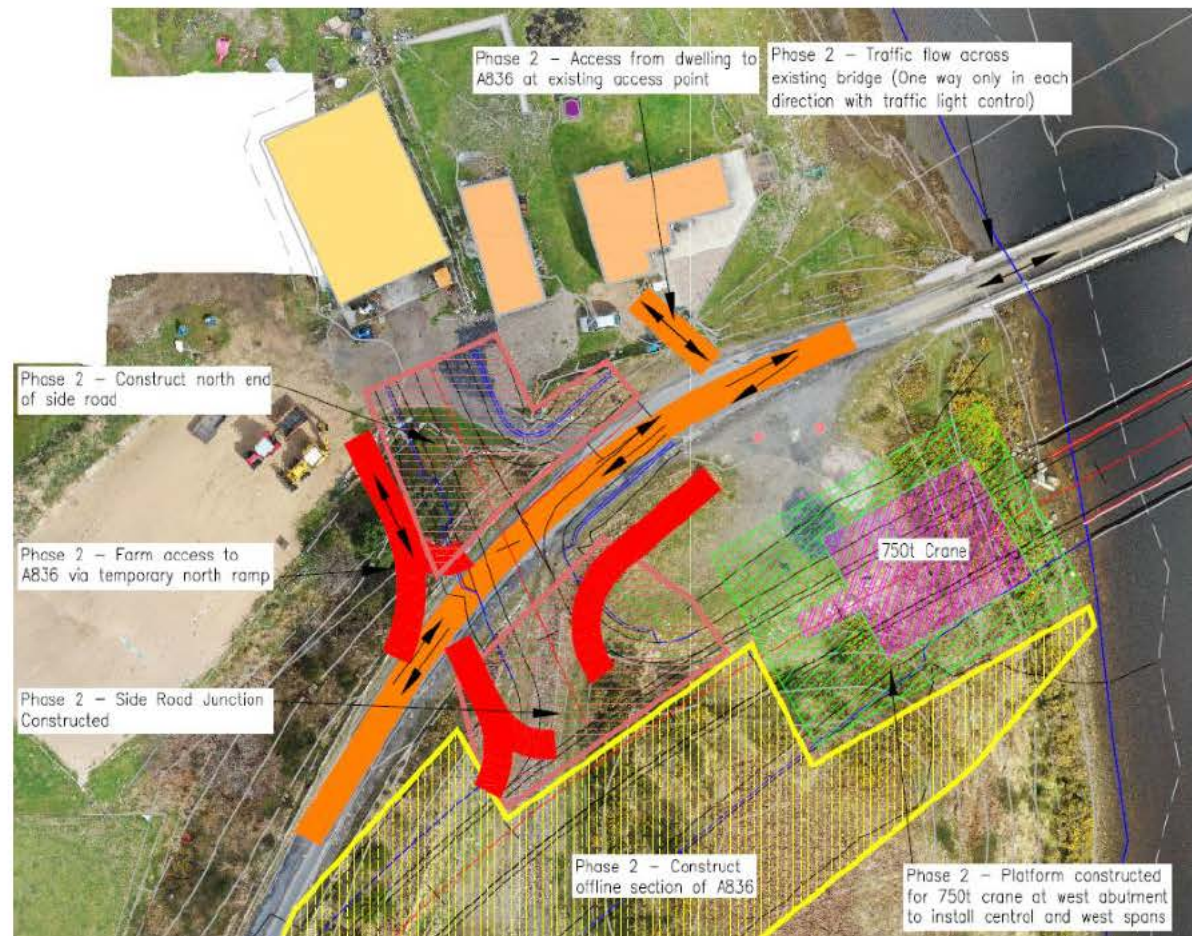
Figure 4.4 – Phase 1 Construction West of River



Phase 2 Construction West of River (See Figure 4.5 below)

- Continue constructing west and middle bridge spans and offline section of new A836;
- Construct west abutment and piers to temporary bearing shelf level;
- Construct north end of side road;
- Access to farm from temporary north ramp; and
- Mainline traffic kept on existing A836 carriageway with single lane at existing bridge and traffic light control in operation

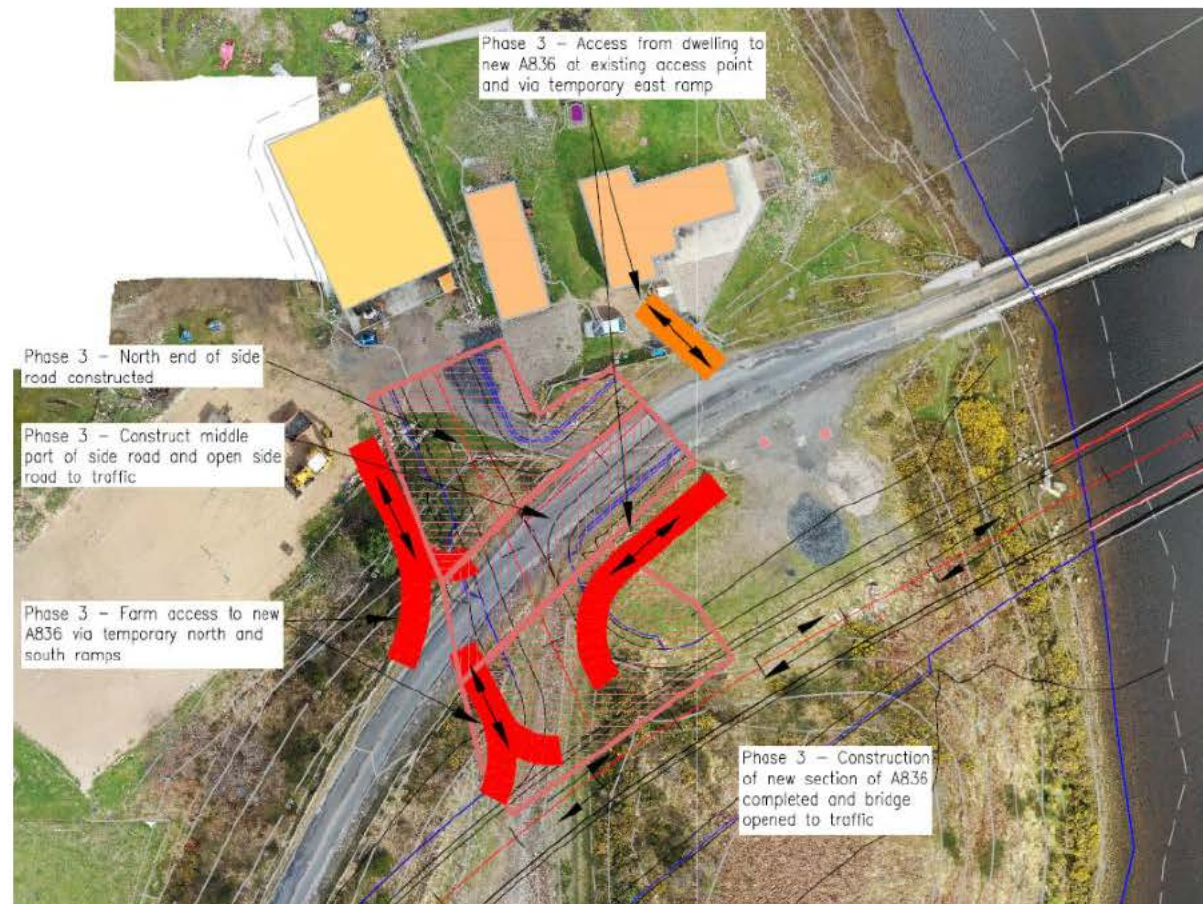
Figure 4.5 – Phase 2 Construction West of River



Phase 3 Construction West of River (See Figure 4.6 below)

- Bridge construction and offline section of A836 completed with new carriageway open to traffic;
- Existing A836 closed to traffic;
- Access from farm at temporary north and south ramps;
- Access from dwelling from temporary east ramp; and
- Construct middle section of side road and open for access to farm and dwelling.

Figure 4.6 – Phase 3 Construction West of River



4.5 To ensure safe operation of site and public road user traffic during the works the contractor will be responsible for the following:

- liaising with residents in the vicinity of the scheme so that access is maintained to all properties as required during the works;
- management of traffic flows on the A836 and Skelpick Road where they will be reduced to single lane with traffic light control for significant periods of the works;
- reduced speed limits will be introduced as appropriate where required in conjunction with traffic light operations or other works; and
- planning the temporary traffic management scheme such that any full road closures will be kept to an absolute minimum and that appropriate advance notice is given in accordance with The Highland Council requirements.

4.6 To maintain the safety of the surrounding highway network, the Applicant is aware that during the construction phase, it is essential to have appropriate measures in place regarding vehicle and road cleaning facilities. Therefore, this draft CEMP sets out below predicted procedures / arrangements to apply for temporary traffic routes on site for the duration of the construction works:

- The safety of the public and protection of pedestrians will be ensured at all times;
- Particular consideration is to be given to the ecological constraints identified within the Ecological Impact Assessment (EclA);
- All traffic and pedestrian routes will be clearly separated from each other by designated walkways, signage and suitable barriers;
- Wheel washing facilities for all construction related vehicles will be provided;
- Road crossing points will be clearly identified;
- All traffic and pedestrian management routes are detailed;
- Traffic will be subject to temporary 20 mph speed limits when using temporary road alignments or when in close proximity to the construction site;
- All delivery vehicles will sign in and security will notify the respective contractor of their presence before releasing it onto site;
- All delivery drivers will be advised of site issues on arrival including all pedestrian routes, crossing points, etc.;
- All traffic on site will be checked for cleanliness prior to leaving the site and if required, will pass through the wheel cleaning facility before entering the public road if required;
- Regular road cleaning outside the immediate site will be done by the contractor to ensure material is not left on the public road; and
- All Sub-Contractors will be responsible for providing 48-hour notice of any delivery to site to allow the main contractor to maintain control and coordinate construction traffic accordingly.

- Prevention of dirt, mud and debris on site and on the surrounding roads will be managed by:
 - i) Regular inspections and monitoring - appropriate road cleaning measures are to be agreed as necessary dependent on the climatic conditions;
 - ii) Reducing the number of vehicles leaving the site through adopting sustainable construction techniques which maximise the volume of suitable recoverable materials;
 - iii) Minimising the amount of mud generated on site by grading and maintaining site haul roads;
 - iv) Sheeting up of all lorries before leaving the site to prevent spillages of mud and debris. Having a road sweeper to clean and maintain the surrounding roads and footpaths and the site entrance weekly or at a greater frequency as site conditions dictate;
 - v) Inspecting and cleaning all vehicles leaving the site, ensuring that no vehicles leave site until their wheels, chassis, and external bodywork have been effectively cleaned and washed free of earth; and
 - vi) mud, clay, gravel, stones or any other similar substance. We will provide, install and operate a suitable wheel cleaning facility near the site entrance.
- Deliveries to be made outside the peak hours of the local highway network where practically possible to reduce potential congestion and nuisance to existing highway users;
- All materials to be loaded/unloaded within the site compound/boundary of the working zone to minimise impact on highway users
- Staff will be trained in the control of dust and will ensure the site is monitored for levels of surface dust. Should dust build up this will be damped down with hosepipes;
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book; and
- The access road into and out of the site will be monitored for excessive dust build up. Should surface dust build up the road will be swept.

4.7 The Proposed Scheme will include a Construction Traffic Management Plan (CTMP) to help co-ordinate traffic during the construction phase of the Proposed Scheme, which will help reduce the potential impacts from the construction phase activities in terms of safety and on local amenity. A draft CTMP has been prepared to accompany this application to outline at an early stage the predicted relevant operational measures and procedures which will be implemented during construction of the Proposed Scheme.

4.8 In terms of access and egress into the application site, it is considered that the following principles and items will be considered in a final CEMP to minimise impact to adjacent public highways:

- Site entrances will be maintained and kept clean and clear. There will be a road sweeper in operation when required and in line with the works activities to ensure no mud is left on the live highway as a direct result of the works;
- Site access and egress routes together with signage demonstrating safe access to the site taking cognisance of the surrounding land use and nearby properties;
- Arrangements and timing of deliveries to the site;
- Arrangements for the removal of waste;
- Vehicle and plant and equipment movement - An adequate turning area will be provided always to ensure that as no vehicle reverse out of the entrances of the site;
- Pedestrian Routes - Separate and dedicated pedestrian access routes and walkways will be provided around the site in order to provide safe access for site operatives and others around the site;
- Existing vehicular and pedestrian routes;
- Signage requirements;
- Banksman requirements for the co-ordination of movements into, around and off the site;
- Responsibilities;
- Traffic plan drawings; and
- Detailed methodology and designs will be submitted for approval prior to works commencing.

5.0 Noise Management

- 5.1 The Applicant and the appointed Contractor shall take reasonable steps to minimise any noise disruption to adjacent receptors during the construction phase. Where it is necessary to carry out noisy activities, they will be undertaken away from sensitive receptors where possible and advanced notice would be provided to neighbouring properties.
- 5.2 Construction best practices will be adopted to ensure that noise emissions are kept to a minimum. The preferred approach for controlling construction noise and vibration is to reduce levels at source where possible, but with due regard to practicality. Sometimes a greater noise level may be acceptable if the overall construction time, and therefore length of disruption, is reduced.
- 5.3 All work outside these hours will be subject to prior agreement of, and/or reasonable notice to the Local Planning Authority (LPA) as appropriate. Night-time working will be restricted to exceptional circumstances. By arrangement, there may be some out of hours construction deliveries made to the application site.
- 5.4 Mitigation measures may include the following provisions, which should be tied to the CEMP:
- Ensure all processes are in place to minimise noise before works begin and should ensure Best Practicable Means (BPM) are being achieved throughout the construction programme;
 - Ensure that modern plant is used, complying with the latest European Commission noise emission requirements;
 - Selection of inherently quiet plant where possible;
 - Use of hoarding around the work site perimeter, where practicable, to assist in the screening of noise generation from low-level sources by removing line-of sight to the existing sensitive receptors (ESRs);
 - Hydraulic techniques for breaking to be used in preference to percussive techniques where practical;
 - Use of rotary bored rather driven piling techniques, where appropriate;
 - Off-site pre-fabrication to be used, where practical;

- All plant and equipment to be used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use;
- Plant to be certified to meet relevant current legislation as defined by BS 5228 standards;
- All Contractors to be made familiar with current legislation and the guidance in BS 5228 (Parts 1 and 2), which should form a prerequisite of their appointment;
- Loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials around the site to be conducted in such a manner as to minimise noise generation and where practical to be conducted away from existing sensitive receptors;
- Careful consideration should be given to planning construction traffic haul routes within the Site and along local roads close to existing sensitive receptors, so as to minimise reversing movements and to minimise the number of construction vehicles during peak traffic flows on local roads; and
- Noise complaints should be reported to the Contractor and immediately investigated.

6.0 Dust Management

- 6.1 Various dust emitting activities (i.e. caused by construction work activities which commence on site) can be controlled by dust control measures and any potential adverse effects on local air quality can be greatly reduced or eliminated.
- 6.2 It is considered that a Dust Mitigation Plan (DMP) would be produced to help ensure that robust dust mitigation measures are incorporated into the construction phase activities within the site, and therefore should form part of the final CEMP.
- 6.3 Some of the measures may only be necessary during specific phases of work, or during activities with a high potential to produce dust. Measures which will be implement by the Applicant and appointed contractor include:

Table 6.1: Summary of General Mitigation Measures

Category	Mitigation Measures	
	Highly Recommended	Desirable
Communication	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager.	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
	Display the head or regional office contact information.	
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.	None.
	Make the complaints log available to the local authority when asked.	

Category	Mitigation Measures	
	Highly Recommended	Desirable
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.	
Monitoring	Carry out regular site inspections to monitor compliance with any DMP or CEMP prepared for the application site and record inspections results and make an inspection log available to the local authority when asked.	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of the site boundary, with cleaning to be provided as necessary.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	
Preparing and maintaining the site	Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	Keep site fencing, barriers and scaffolding clean using wet methods.
	Avoid site runoff of water or mud.	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
		Cover, seed or fence stockpiles to prevent wind whipping.

Category	Mitigation Measures	
	Highly Recommended	Desirable
Operating vehicle/ machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles.	Impose and signpost a maximum-speed-limit
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	Ensure equipment is readily available on site to clean any dry spillages - cleaning up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	None.
	Ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	
	Use enclosed chutes and conveyors and covered skips.	
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	
Waste Management	Avoid bonfires and burning of waste materials.	None.

Table 6.2: Mitigation Measures Specific to Earthworks, Construction and Trackout

Category	Mitigation Measures	
	Highly Recommended	Desirable
Earthworks (Low Risk Site)	None	None.
Construction (Low Risk Site)	None	Avoid scabbling (roughening of concrete surfaces) if possible.
		Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout (Low Risk Site)	None	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any materials tracked out of the site. This may require the sweeper being continuously in use. Materials cleared from the road surfaces will be diverted into construction stage SuDS and measures will ensure that arisings do not enter the River Naver directly
		Avoid dry sweeping of large areas.
		Ensure vehicles entering and leaving the sites are covered to prevent escape of materials during transport.
		Record all inspections of haul routes and any subsequent action in a site log book.
		Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

7.0 Water Management

- 7.1 This section of the draft CEMP sets out the methods of best practice construction methods and construction management processes by which construction will be managed to avoid, minimise and mitigate any adverse effects on the water environment. Protection of the water environment is imperative due to the status of the River Naver as a Special Area of Conservation SAC, designated for important populations of Atlantic Salmon and Freshwater Pearl mussel. Impacts on quality of the water environment could result in:
- Populations of SAC fish species being killed as a result of toxic shock from changes to pH relating to the release of cementitious materials;
 - Toxic effects of hydrocarbons on fish and other aquatic fauna; and
 - Excess sediment and turbidity affecting fish health and ability to migrate either upstream or downstream.
- 7.2 The contractor will be required to provide construction stage sediment controls, i.e. temporary SuDS such as settlement lagoons. The provision of sediment controls is a mandatory requirement as stated in the Scottish Environment Protection Agency (SEPA) Pollution Prevention Guidelines. Land required for such features has been considered within the assessment boundaries.
- 7.3 Wheel washing facilities and/or regular sweeping will ensure the build-up of dust and silts on haul roads will be kept to a minimum. Wheel washing facilities will be kept in a designated bunded impermeable area and surplus surface water disposed via the foul water system or adequately treated prior to discharge into a local watercourse. These facilities should be located at least 10m from any surface waterbody.
- 7.4 Concrete should be mixed off site where possible. Should this not be practicable, wastewater from concrete production/wastewater from lorry washing should be limited to a designated area, to be bunded over an impermeable surface to prevent runoff/infiltration elsewhere. Wastewater should either be directed into the foul sewer network or adequately treated prior to discharging into a watercourse. Where necessary units such as silt busters may be applied to ensure the pH of any filtered

water returning to any watercourses is comparable to the watercourse into which it is being discharged.

- 7.5 To avoid hydrocarbons reaching the water environment from vehicles or the accidental spillage of fuels, vehicles used on the application site should be regularly inspected and maintained to reduce the risk of oil/fuel leakages. Vehicle washdown areas should be at least 10m from surface water bodies, and take place at bunded areas over impermeable surfacing, with runoff routed through oil interceptors and treated before discharge. Pump units or generators on site will be double bunded to avoid risks associated with hydrocarbon discharge.
- 7.6 Where oils or fuels are stored in bulk quantities on the application site, the storage facilities should be suitable for above ground oil storage tanks. Such facilities should be located within a bunded area which exceeds the maximum volume of storage by 20%.
- 7.7 Drip trays and or plant nappies will be stored under vehicles and other plant and machinery when not in use allowing any oil emitted to be collected and contained.
- 7.8 To mitigate the additional loads from construction staff, connections to the public sewers from welfare facilities should be controlled by sewer connection notices to the sewerage undertaker.
- 7.9 In stream works will require the installation of sheet piles round the perimeter of the pier foundations and to 3 sides of the abutment foundations. Within the cofferdams formed by the sheet piles the load bearing piling system will be installed, the type of piles employed is dependent on the results of the Ground Investigation work which is currently being undertaken. The abutments and piers are to be constructed from insitu concrete. The pouring of concrete in such areas creates a potential risk to the health of fish which may be present within the estuary at the time of works. To facilitate the construction of the bridge rock bunds within the river may be employed. The provision of sheet piled areas for piers and abutments and associated rock bunds will contain concrete and limit risks of concrete entering the water. To further

manage these risks the construction of the Proposed Scheme will also apply the following measures:

- The contractor will implement water quality monitoring throughout the construction phase. Throughout the in stream works the exact location of 'sondes' may vary according to the location of works being progressed. Sondes will be deployed which will ideally provide 'live data' submitted through telemetry as a minimum on water turbidity, water pH, water temperature conductivity. The availability of live data on key parameters will allow remedial measures to be implemented where necessary should issues arise;
- The Engineer will prepare Risk Assessments for the scheme as a whole and will in particular highlight the risks associated with using wet concrete in a river environment, These Risk Assessments will be provided to the contractor as part of the Pre-construction Information package; and
- The contractor will prepare their own detailed Risk Assessments and develop appropriate Method Statements in accordance with their Quality Management procedures. No work shall proceed without appropriate method statements being in place.

8.0 Waste Management

- 8.1 This section of the draft CEMP will set out suggested measures for the minimisation of waste, and measures to help encourage the re-use and recycling.
- 8.2 A suitably qualified person will be appointed to fulfil the Site Waste Management role (i.e. site manager) and will be responsible for overall waste management issues arising from the project.
- 8.3 The Proposed Scheme will be constructed to be environmentally responsible wherever possible.
- 8.4 The structure will be designed and constructed to a high standard utilising robust and durable materials. All materials specified will be recognised as having low environmental impact. All materials will be responsibly sourced, and waste generated will be kept to a minimum and recycled where possible. All imported fill will be locally sourced recycled demolition arisings.
- 8.5 Sources of potential waste generation within the construction process are:
- Packaging, for example plastics, pallets etc.;
 - Construction and Demolition Waste, for example concrete;
 - Waste materials generated from inaccurate ordering, poor usage, badly stored materials, poor handling, spillage etc.; and
 - Dirty water.
- 8.6 All relevant contractors involved throughout the construction process will be required to investigate opportunities to minimise the arising of waste at source, and where waste generation is unavoidable, to maximise the recycling and re-use the potential of construction materials where possible. The recycling of materials will be carried out off-site by a licensed waste management organisation, where noise and any other residual impacts of the recycling process are unlikely to have an effect on the surrounding area to the application site. There will also be no burning of waste materials on site and waste will be removed as soon as practicable rather than being stockpiled.

8.7 Throughout the construction phase of the Proposed Scheme, the Applicant and the appointed contractor are to fully implement the below Waste Hierarchy to prioritise the prevention, reuse and recycling of waste:

- Prevention – prevent waste generation;
- Preparing for reuse – reusing materials;
- Recycling – turning waste into new products;
- Other recovery- for example energy recovery; and
- Disposal – landfill and no energy recovery.

9.0 Ecology, Biodiversity & Landscape

9.1 An Ecological Precautionary Working Method Statement will sit alongside the CEMP and will detail the following ecological protection measures:

- In stream works (including construction and demolition) will be programmed to be undertaken outside the peak upstream (May – August inclusive) and where possible downstream (Mar - May) migration period for Atlantic salmon. This will prevent disruption and temporary barriers to movement. While these are peak timings for fish movement the assessment acknowledges that movement may occur at any time and a range of other relevant controls will be implemented to minimise impacts on fish species.
- In stream works in September / October may be considered in consultation with River Naver Fisheries and may be dependent on the progress / completion of the upstream migration of Atlantic Salmon upstream migration. Any in stream works in the period March – May will need to ensure that no disruption to downstream smolt migration occurs and will require specialist on site input and further consultation with River Naver Fisheries RNF.
- Any temporary in stream construction will be fully removed and riverbed re-instated to pre-construction conditions and levels on completion.
- A 'soft start' procedure will be implemented for piling operations in or immediately adjacent to the river channel to prevent sudden injury or harm to fish and allow mobile fish species present in the estuary to move away from works.
- Where in stream / piling works are required in the months of September / October (upstream migration) and or April and May (downstream migration) works will include periods of 'off time' where works are suspended to allow for any movements to occur off time will be included overnight and where necessary around high tide periods and the build up to high tide when fish movement is most likely. Works will be avoided during periods of higher flow which are likely to trigger upstream migration.
- During downstream smolt migration (if in channel works are required at that stage) to avoid impacts on Atlantic Salmon, works will be routinely

suspended for periods to allow fish passage specifically works will be avoided in periods of higher flow when migration is most likely. Fish movement will be monitored on site by an aquatic ecologist and ongoing consultation with River Naver Fisheries will be maintained throughout works to ensure that fish movement is not prevented.

- Construction stage lighting will avoid illuminating the watercourse to prevent disturbance / disruption of migratory fish.
- A detailed pollution prevention plan will be drawn up for all stages of the project as part of a more detailed CEMP for the proposed scheme - many measures are currently set out in sections 1-8 of this document. This will include but not be limited to:
 - Appropriately bunded storage will be provided and no fuels, oils or other materials will be stored within 10m of the watercourse;
 - Working methods will be developed when installing in steam piers and abutments, or when pouring casting the bridge deck that minimise the risk of construction materials entering the watercourse. This may include the use of constructed working platforms and pour areas being contained within formed sheet piles within the platforms, suitable bunding or other measures. In relation to bridge deck casting measures will be required to ensure that leakage into the watercourse will not occur during the casting process;
 - Water quality both upstream and downstream of works will be monitored throughout the construction phase so that changes in water pH potentially associated with inputs of cementitious materials can be detected rapidly;
 - No refuelling will take place within 10m of a watercourse unless a safe system of work can be implemented to avoid risk of spillages; and
 - Where extensive bare ground is present measure will be developed to prevent sediment run off.
- In stream works will be programmed to be undertaken outside the upstream (May – August) migration period.
- See control measures for Atlantic Salmon above

- Footprint of any temporary works required by the contractor within the SAC will be minimised where possible.
- Any temporary works within the SAC will be fully removed and riverbed reinstated to pre-construction conditions and levels on completion.
- Temporary works areas will be avoided in areas where restoration is likely to be more difficult to achieve such as saltmarsh.
- Following removal of the existing bridge structure measure will be completed to allow establishment of saltmarsh habitat in the footprint of lower sections of the former abutments
- Pre-construction badger survey and ongoing surveillance.
- Work at night will be minimised where possible.
- Open excavations will be fenced off to mammal fauna at night.
- Existing and future bridge structures to remain unilluminated at night to prevent disturbance
- Any site lighting scheme during construction will follow BCT lighting guidelines
- The roost site identified within the cottage at the east end of the bridge will be left unaffected by works throughout the project.
- Pre-construction otter survey and ongoing surveillance. Where necessary should resting places be identified in areas where they are at risk of disturbance a mitigation licence may be required from Nature Scot.
- Construction stage lighting will avoid illuminating the watercourse to prevent disturbance / disruption of migratory fish.
- Where highly disruptive works such as potential rock blasting are required the distribution of otter resting places (or other protected species) will be reviewed at the time and where required a protected species licence will be obtained from NatureScot to ensure that any disturbance complies with relevant wildlife legislation.
- All vegetation clearance / including grassland will be completed outside the breeding bird season (March – August Inclusive unless a specific area can be inspected by an Ecological Clerk of Works to confirm that no active nests are present.

- Buffer zones around active nest sites will be agreed by the site ECoW to enable breeding activity to continue undisturbed for sensitive / scarce species where works progress during the breeding season.
- Restoration of temporary works areas will be targeted as suitable for breeding species affected by habitat loss.
- Should rock blasting be required (to be confirmed at the time of writing) where possible this will avoid the main breeding bird season (April – August).
- The distribution and abundance of non – breeding species will be monitored by an ECoW and any reactions to works recorded. Where necessary, in the event of significant disturbance during specific tidal states, works controls may be required.
- Areas which are suitable for reptile foraging will be managed through phased vegetation clearance in the active season.
- Areas which are suitable as hibernation areas which will be affected by works will be carefully removed during the active season and replaced in suitable areas close by which will remain unaffected by works.
- The contractor will develop and implement strict biosecurity protocols for all terrestrial and marine / aquatic plant arriving on site and personnel including footwear.
- Biosecurity protocol will also be applied to any temporary features such as bog mats, herass fencing and other temporary facilities arriving on site.
- Removal of invasive non-native species to be undertaken by a suitably qualified contractor and arisings to be removed off site by a licenced waste carrier to a licenced receiver site.

9.2 In addition to specific additional mitigation, it is anticipated that for the key period of the main construction an Ecological Clerk of Works (ECoW) will be appointed to monitor the implementation of mitigation and any change to the status of species present on site. It is also anticipated that for all works stages a detailed CEMP will be prepared in order to control potential effects such as pollution. During key sensitive period for fish species and where in stream works are required the ECoW should be a suitably qualified aquatic ecology specialist.

- 9.3 The construction works will be contained within a prescribed working corridor which will be clearly demarcated to avoid incursion into other areas. It is noted that at this stage an area has not been identified for a temporary construction compound if required.
- 9.4 As shown on the 'Landscape Planting and Seeding Plan' (Drawing number; 0001 Revision 01) provided in support of this application, a landscape mitigation strategy has been developed to avoid or reduce environmental impacts. The landscape strategy includes an outline specification, which relates in part to the construction phase of the Proposed Scheme. Some of the suggested construction measures relate to storage of soil, timing of shrub planting and seeding.
- 9.5 Monitoring will be carried out during the agreed contract landscape maintenance period, in tandem with normal maintenance supervision, with specific regard to monitoring the growth of any landscape planting that has a visual mitigation function.
- 9.6 The retained and newly-established landscape features within the application boundary will be managed in accordance with a Landscape and Habitat Management Plan (LHMP). This will ensure that the intentions of the landscape team for ecological mitigation and biodiversity are secured.

10.0 Ground Conditions

Physical Impacts

- 10.1 The likely areas of potential disturbance during the construction phase of the Proposed Scheme include earthworks relating to site levelling and bunding and soil stockpiling. Measures will be undertaken in these areas as appropriate, to minimise the potential for the movement of sediments into surface watercourses.
- 10.2 The final CEMP will set out the various measures to manage the impacts from earthworks. This will include measures such as minimising stockpile surface areas so as to reduce the area of surfaces exposed to wind pick-up. This will also help to minimise the effects of surface water run-off from stockpiles. The stockpiles will be located as far away from sensitive receptors as possible.
- 10.3 A topsoil management plan could be put into place to ensure that over compaction of excavated and stockpiled topsoil does not cause any adverse effect from changes in soil structure, which could potentially damage the soil and render them unsuitable for use as topsoil and require disposal.
- 10.4 The preliminary earthworks model will be developed to balance cut and fill volumes so that the need for offsite disposal of excavated material is minimised. The earthworks model will be informed by the results of intrusive investigation to classify the suitability of materials for reuse and set out the requirements for placement and compaction of soils.
- 10.5 Should contaminated soils be identified, their re-use should be covered in a Material Management Plan.
- 10.6 The results of the earthworks testing will be monitored throughout the course of the works.
- 10.7 To mitigate the potential risks associated with the generation of contaminated dusts during remediation activities (if required) and earthworks being undertaken in the study area, exposed areas will be dampened down during the construction work in order to help reduce the amount of dust generated.

- 10.8 Detailed piling design, and the associated methodology, remains subject to intrusive ground investigations, to be undertaken at the appropriate time. If required, piling should be undertaken in accordance with best practice, as agreed with the relevant parties ahead of commencement of works.

Soil and Groundwater Quality

- 10.9 Lubricants etc. will be positioned away from the most sensitive receptors as far as is practical (e.g. the River Naver) and stored in an appropriate manner, with secondary containment and contingency/emergency procedures in place should potential leaks or spillages occur. Such materials will be stored in accordance with The Water Environment (Miscellaneous) (Scotland) Regulations 2017.
- 10.10 It is considered that there will be an increased potential for direct exposure to potential contamination identified in shallow soils through ingestion, direct contact or inhalation of any contaminated soil or dust by construction workers in the short-term during the construction works. To mitigate against such potential risks, construction workers and services personnel shall wear appropriate personal protective equipment (PPE) and adhere to good hygiene practices during construction works.

11.0 Site Management and Community Liaison

- 11.1 This section explains the anticipated roles and responsibilities of the key parties involved in the construction works of the Proposed Scheme. However, it should be noted that all members of staff are responsible for ensuring the requirements of this draft CEMP are followed.
- 11.2 Responsibility for all environmental issues relating to building the Proposed Scheme falls with the Client, Principal Designer and Principal Contractor appointed for the development. The Principal Contractor and all subcontractors will have to implement the environmental control measures set out within the final CEMP.
- 11.3 The Contractor and the Applicant will appoint a Construction Site Manager for the construction phase of the development who will act as a point of contact for the local community. The Site Manager would record and respond to enquiries, complaints or feedback from the local community. The Site Manager would also inform and update the local community on construction activities and the associated complaints procedure.
- 11.4 Any complaints regarding site activity should be directed to the appointed Site Manager. Contact details will be made available at the site access as part of the Considerate Constructors Scheme.
- 11.5 All complaints will be recorded in the Site Complaints Log, a copy of which will be made available to THC on request. The following information will be recorded:
- Date and time of complaint;
 - Nature of complaint;
 - Name and contact details of complainant;
 - Result of investigation into complaint and any resulting actions taken; and
 - Date and time of response to complainant.

- 11.6 All complaints will be investigated and responded to within a reasonable timescale (typically not more than 30 days). The Site Complaints Log will be distributed amongst all site users and complaints and necessary improvements will be discussed as part of the construction management meetings.
- 11.7 A report summarising complaints and remedial actions, together with a copy of the complaints log, will be submitted to THC on request.

12.0 Conclusion

- 12.1 Fairhurst have been appointed by The Highlands Council Infrastructure, Environment and Economy Service to prepare and submit a full planning application for the A836 Naver Bridge Replacement Scheme (“the Proposed Scheme”) comprising of new carriageway and a three-span bridge, adjacent to the existing bridge over the River Naver, Naver, Bettyhill.
- 12.2 This draft Construction Environmental Management Plan (CEMP) forms part of the full planning application submission to outline at an early stage the relevant operational measures and procedures which will be implemented during construction of the proposed scheme. It is anticipated that if planning permission is granted for the Proposed Scheme then a condition would require the construction of the development to comply with the CEMP. The CEMP will apply to the whole application site and will be supported by bespoke Construction Method Statements (CMSs).
- 12.3 The final CEMP document will be a live document and will be reviewed in light of learnings from construction activity and any complaints or incidents. When this document is revised the up-to-date document will be made available to the Local Planning Authority or other interested parties on request.
- 12.4 The CEMP effectively allows for the construction of the Proposed Scheme whilst having regard to highway safety, amenity and mitigating impacts on the surrounding environment.