

CARDIGAN TIDAL FLOOD RISK MANAGEMENT SCHEME

Volume 1: Environmental Statement

Chapter 5 - Population and Human Health

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5. Population and Human Health

5.1 Introduction

This chapter assesses the Likely Significant Effects from construction and operation of the Scheme, with respect to Population and Human Health. This chapter details the baseline environment, assessment of Likely Significant Effects, and where necessary, mitigation measures to avoid, reduce or minimise significant effects are proposed.

This chapter is not intended to be read as a standalone assessment, and references should be made to Chapters 1-4. In addition, this chapter should also be read in the context of the following topic chapters due to interactions between topics:

- Chapter 8: Landscape and Visual
- Chapter 9: Traffic and Transport.

The assessment within this chapter is informed by the following supporting information:

- Construction traffic noise and vibration assessment technical note (Appendix 5.1).
- 2021 Census Data from the Office for National Statistics (ONS).
- Public consultation responses.
- Navigational Risk Assessment (Appendix 5.2).

5.2 Competent expert evidence

Myles Harding (BSc (Hons), MSc, PISEP) has over 4 years' experience coordinating and working on technical and non-technical Environmental Statement (ES) chapters. Myles has experience working on a broad range of projects at Binnies including multiple flood defence projects.

David Johnson (BSc (Hons), MSc, CEnv) has over 14 years' experience coordinating and producing technical and non-technical Environmental Statement (ES) chapters, including on Population and Human Health, Land Use and Cumulative Effects. David authored the Socio-Economic chapter for the River Thames Scheme and the Land Use chapter for Bridgwater Tidal Barrier ESs.

The Noise and Vibration Impact Assessment has been prepared by suitably qualified acousticians with extensive experience in environmental noise and vibration assessments of construction. The lead author, Sarah Barnes, holds an MSc degree in Acoustics and is a corporate member of the Institute of Acoustics (IOA).

5.3 Planning policy and legislative context

This section describes the relevant legislation, policy and guidance that has been considered in developing the Scheme design, and in the assessment of effects with respect to Population and Human Health. This legislation, policy and guidance has been reviewed and where applicable has informed the assessment through the identification and categorisation of sensitive receptors, requirements for mitigation, and the scope and/or method of assessment.

5.3.1 International and national policy

The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017

The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 require Environmental Statements (ES) to consider Population and Human Health, where applicable.

- Regulation 4 & Schedule 4 (Information for Environmental Statements): Requires ES to include a description of the likely significant effects of the development on the environment, specifically listing Population and Human Health.

Planning Policy Wales (Edition 12, February 2024)

Planning Policy Wales (PPW) sets out the national land use planning policies of the Welsh Government. Its overarching purpose is to provide a policy framework which informs how planning decisions are made with regard to sustainable development, social well-being and the health of communities. The following principles are most relevant to Population and Human Health:

- **People and Places (Chapter 2)** – Introduces placemaking as a key concept for planning in Wales and highlights that the national sustainable placemaking outcomes should be used to inform the assessment of development proposals. The outcomes are key to assessing how a development may influence factors such as community health, access to services, active travel, environmental protection and general quality of life. Policy within this chapter directly promotes healthy, safe and inclusive communities which support physical and mental health.
- **Strategic and Spatial Choices (Chapter 3)** – Policy focusses on addressing strategic considerations and emphasises that the natural environment is a key determinant of health and well-being within communities. This principle draws attention to the need to focus on proactive and preventative action, reduction of community exposure to environmental hazards, and ensuring that developments likely to have significant effects on human health are properly assessed.
- **Active and Social Places (Chapter 4)** – Explores the themes of transport, housing, retail, commercial development, community facilities and recreational spaces. The policies around these themes focus on seeking opportunities to promote sustainable modes of active travel such as walking and cycling, reducing vehicle dependency, ensuring access to essential services is retained, and providing adequate access to recreational spaces which support physical and mental health.
- **Productive and Enterprising Places (Chapter 5)** – Covers policy which focusses upon the importance of economic development, employment, transport infrastructure, energy and the rural economy. The chapter explores links between economic opportunity and social and health inequality. Policies on energy and infrastructure highlight the importance of considering environmental health factors such as air quality and noise and encourage supporting local employment, delivering clean low carbon energy, and the provision of efficient infrastructure which can minimise adverse effects upon human health.
- **Distinctive and Natural Places (Chapter 6)** - Policy within this chapter links the natural environment (green infrastructure, biodiversity, landscape, flood risk and other

environmental factors) and human health outcomes and explores how the enhancement of the natural environment can provide opportunities to improve health. Key policies within this chapter highlight the importance of flood resilience infrastructure, clean air and promoting green infrastructure.

Well-being of Future Generations (Wales) Act 2015

The Act establishes legally binding duties on public bodies to improve social, economic, environmental, and cultural well-being. The following provisions are most relevant to Population and Human Health:

- The seven well-being goals (Section 4 of the Act) set a framework for achieving sustainable development. The assessment of Likely Significant Effects for Population and Human health incorporates well-being goals by considering health, equality and community cohesion.
- Sections 5, 6 and 7 highlight the responsibilities of public bodies to act in a way which ensures that the sustainable development principles and well-being goals are met and published.
- Section 11 requires the consideration of long-term trends in population, health and social change. Assessments should align with these projections to ensure resilience.

Natural Resources Wales' Well-being statement (NRW, 2023) sets out how NRW's Well-being objectives meet their statutory duty under the Well-being of Future Generations (Wales) Act 2015. The well-being objectives to 2030 are listed below and are intended to provide wider opportunities and benefits for mental and physical well-being, lifelong learning and creativity and job creation and skills. By focusing on these three well-being objectives together, NRW will protect and enhance the wider well-being of people and communities:

- Nature is recovering;
- Communities are resilient to climate change; and
- Pollution is minimised.

Future Wales – The National Plan 2040

Future Wales: The National Plan 2040 serves as Wales' overarching national development framework, guiding spatial planning and land use decisions by establishing a strategic vision for addressing key national challenges through the planning system. Policies aligning with Population and Human Health are outlined below.

Policy 1 – Where Wales Will Grow

National Growth Areas are complemented by Regional Growth Areas which will grow, develop and offer a variety of public and commercial services at regional scale. Mid Wales is listed as a regional growth area, and Cardigan is listed within the Teifi Valley region.

Policy 1 drives the delivery of the Future Wales Outcomes and ensures Future Wales' policies and the planning system in general are committed to their achievement. Key issues, including decarbonisation, health, prosperity and the Welsh language, are core elements of policy 1.

Policy 8 - Flooding

Policy 8 is a national approach to managing flood risk, emphasising the need to avoid development in flood-prone areas unless clearly justified. Where development is necessary, it must be resilient to flooding and informed by robust evidence. The Scheme supports this policy by delivering essential protection infrastructure to an existing community at high risk of tidal flooding as identified by the Wales wide Communities at Risk Register. The Scheme is justified by its public safety and climate adaption benefits and is informed by Flood Consequence Assessments, NRW flood mapping, and Shoreline Management Plan guidance.

Policy 9 – Resilient Ecological Networks and Green Infrastructure

Encourages the identification of opportunities where existing and potential green infrastructure could be maximised as part of placemaking, requiring the use of nature-based solutions as a key mechanism for securing sustainable growth, ecological connectivity, social equality and well-being. The Plan promotes access to green and blue spaces as vital for health and well-being.

Active Travel (Wales) Act 2013

The Active Travel (Wales) Act 2013 is a key piece of legislation supporting the protection and enhancement of walking routes in Wales. It requires local authorities to plan for, maintain, and upgrade active travel networks, including footpaths used for everyday journeys. As a result, footpaths form part of a strategically important network that underpins population connectivity, accessibility, and health. Any scheme affecting footpaths must therefore be assessed in the context of the Act's duties to promote and improve walking infrastructure, making the policy an important material consideration in evaluating significance of effects on public access and human health.

In the context of this assessment, footpaths designated as 'active travel routes' may carry greater sensitivity to change. Any scheme affecting footpaths should consider whether it aligns with the Act's objectives to deliver safe, comfortable, direct, and continuous walking routes, and whether mitigation or enhancement measures can be integrated.

5.3.2 Local policy

Ceredigion County Council Local Development Plan 2007-2022

The Ceredigion County Council Local Development Plan 2007-2022 (LDP) contains strategies, objectives and policies that are relevant to Population and Human Health, particularly those which address community safety, housing protection, health and well-being, and safeguarding vulnerable groups, these are summarised below:

- Objective 6 - To sustain and enhance a high-quality built environment which; allows for innovative design, reflects a sense of place, is easily accessible, useable, safe to live in and helps improve the health and well-being of its communities.
- Objective 7 - To enhance and help ensure the provision and protection of an appropriate level of and access to education, health, cultural, social, recreational, community, sport and leisure facilities and services.
- Objective 8 - To support the development of the Welsh language and promote inclusive bilingual communities within Ceredigion.

- Objective 16 - To assist in improving the potential for sustainable travel; equality of access; and the connectivity of the county for the sake of its economy, its communities and their health and well-being.
- Policy LU22: Community Provision - 2. Resisting the loss or change of use of an existing community provision unless: i: Alternative provision of at least equivalent local community value can be provided either within or adjoining the settlement or other settlements which are part of the Settlement Group. In relation to open space specifically, the alternative should be an enhanced provision which is preferably located.

5.4 Assessment guidance

Guidance utilised which is specific to the assessment of Population and Human Health is listed below:

- Institute of Sustainability and Environmental Professionals (ISEP) Social Impact Assessment in Environmental Impact Assessment in the UK and Ireland (ISEP, 2025).
- Institute of Environmental Management and Assessment (IEMA) (Now ISEP) Determining Significance For Human Health In Environmental Impact Assessment (IEMA, 2022).

5.5 Consultation

A meeting took place with Afon Teifi Fairways Ltd (ATFL), who operate the river, on Thursday 23rd October 2025, to provide input to the Navigational Risk Assessment. The primary outcome of the meeting was that there is very little activity on the stretch of the River Teifi (Afon Teifi) between Cardigan Bridge and the A487 bridge. ATFL advised that the only recreational activity on the river comprises use by canoes/kayaks and an occasional boat tour.

The 23rd December Scoping opinion included a response from Public Health Wales (PHW) which stated that no opinion on the need for EIA was held. However, it was noted that the potential for asbestos has been identified within the vicinity of the works. PHW advised that areas of land contamination resulting from historical deposits should be appropriately risk assessed and measures identified to control any potential public exposure. In addition, PHW recommended that a construction environmental management plan should be formulated to identify and mitigate any short-term nuisances (dust, odour, noise etc) that could occur during the construction phase.

Two public consultation events have been held by NRW in December 2022 and June 2025. The event in June 2025 aimed to gauge public opinion on the landscape design for Area 1 of the Scheme (Cardigan Bridge to Cardigan Bathroom Centre showroom). The general sentiments conveyed within the responses from the June 2025 event included a general preference towards the provision of wider pavements for accessibility purposes, and undertaking tree planting to provide amenity value and shade during warm weather. These preferences have since been incorporated into the Scheme landscape design to align with the desires of the local community.

5.6 Scoped in receptors and potential effects

The Population and Human Health topic was scoped into the EIA due to the potential for Likely Significant Effects during the construction and operational phases of the Scheme. Table 5-1 and Table 5-2 outline the Likely Significant Effects which are to be assessed within this chapter.

Table 5-1 – Scoped in Likely Significant Effects (construction)

Environmental Effect	Receptor
Potential for negative temporary construction effects relating to noise, vibration, pollution, dust, footpath closure and diversions, traffic disruption, reduced amenity access, reduced recreational capacity, and changes to water navigation.	Local residents, businesses, recreational users and all river users
Potential for positive effects on the local economy during construction through employment of a local contractor or contractors and an increase in trade for local shops and businesses.	Local residents and businesses.

Table 5-2 - Scoped in Likely Significant Effects (operation)

Environmental Effect	Receptor
Potential for permanent positive effects due to the reduction in flood risk.	Residential and business properties which are currently at risk of flooding.
Potential for permanent positive effects due to the provision of an area of public open space.	Public users.
Potential for permanent negative effects due to the changes in existing public amenity space. (Note: This effect has been added after EIA Scoping due to the need for the flood defence to be set back in Area 4)	Public users.

Sub-headings for the Assessment of Likely Significant Effects are derived from the scoped-in effects above. The sub-headings are split between construction and operation effects. The potential negative construction effects will be assessed under separate sub-headings which correspond to the relevant environmental factor for clarity.

Construction

- Noise and Vibration
- Pollution and Dust
- Footpath Closure/Diversion
- Traffic Disruption
- Amenity Access and Water Navigation
- Local Economy

Operation

- Reduction in Flood Risk
- Provision of Public Amenity Space.

5.7 Methodology

The purpose of this section is to describe how potential effects relating to Population and Human Health have been assessed. A more general explanation of assessment methodology used throughout the ES is provided in Chapter 2: EIA Methodology. The Population and Human Health assessment primarily relies upon the sources listed within Section 5.1.

There is no single widely accepted guidance document available for the assessment of Population and Human Health in the UK. However, guidance on determining significance for human health for EIA (IEMA, 2022) and social impact assessment in EIA (ISEP, 2025) have been consulted. The assessment within this chapter primarily utilises general EIA guidance alongside the guidance listed within Section 5.4. The assessment of Likely Significant Effects within this chapter relies upon the use of professional judgement. Within EIA, the use of professional judgement is always required. However, this is substantiated wherever possible with evidence which informs the opinion of the competent expert.

The terminology and definitions used to describe noise and vibration effects are as per the Noise and Vibration Impact Assessment, rather than the definitions given in the following sections.

5.7.1 Definition of study area

The study area is centred on the town of Cardigan and has been defined with reference to the potential for impact from the Scheme using professional judgement and available information. For Population and Human Health, the study area needs to be specific to the communities within the town of Cardigan as the town is the primary receptor for Population and Human Health effects.

Demographic data has been sourced from the Cardigan Teifi, Cardigan Rhyd-y-Fuwch and Cardigan Mwldan Lower Super Output Areas (LSOA) which combined, are representative of the wider Cardigan Town region. The entirety of the Scheme Area falls within the Cardigan Teifi LSOA, and the Cardigan Mwldan LSOA is located approximately 100m north of the Scheme Area, to the north of the Pont-Y Cleifion road.

Therefore, the three LSOA's define the study area for the assessment, and this area is shown within Figure 5.1.

5.7.2 Baseline information

The assessment of Population and Human Health requires an understanding of the community and characteristics of the town of Cardigan. Data sources that have been used comprise:

- Consultation Feedback
- Office for National Statistics Census Data
- Equality Impact Assessment (EqIA)

- Population profile and Health Impact Appraisal completed by NRW in 2023
- Navigational Risk Assessment (NRA)
- Ceredigion Local Development Plan 2007 – 2022 (Ceredigion County Council, 2013)
- Construction traffic noise and vibration assessment technical note
- Chapter 8: Landscape and Visual
- Chapter 9: Traffic and Transport.
- Green Infrastructure Statement (Binnies, 2026)

5.7.3 Significance

Significance is determined using a combination of sensitivity of the receptor and magnitude of change. When describing significance, effects have also been classified according to whether they are positive or negative, and whether they are temporary (short, medium, or long-term) or permanent. Effects are also classified as either direct or indirect. The terms and classifications used to determine and describe significance are outlined within Chapter 4: EIA Methodology. Table 5-3 outlines the criteria which have been used to classify the sensitivity of receptors, whilst Table 5-4 outlines the criteria which have been used to determine magnitude in relation to Population and Human Health. The criteria used to classify sensitivity and magnitude have been selected based on professional judgement, which has been informed by ISEP (formerly IEMA) guidance (IEMA, 2022), (ISEP, 2025) and standard practice.

Sensitivity criteria for Traffic and Transport and Noise and Vibration are outlined within Chapter 9: Traffic and Transport and Appendix 5.1 respectively.

For pollution and dust effects, the Institute of Air Quality Management (IAQM) 'Guidance of the assessment of dust from demolition and construction' (IAQM, 2024) document was used to gauge the sensitivity of the study area to increased dust generation.

Table 5-3 – Criteria used for classifying the sensitivity of Population and Human Health receptors

Sensitivity	Criteria
High	The residential receptors within the study area are classified as high sensitivity if the baseline data exceeds the given values for vulnerable groups which correspond to the capacity of a receptor to respond to change: – Elderly (Over 65) - >20% – Young children (0-4) - >20% – Bad or very bad health - >5% – Welsh Index of Multiple Deprivation (WIMD) - >10% most deprived areas in Wales. Receptors where people spend long periods, sleep (residential), or where high levels of concentration and speech intelligibility are essential. Disruption here causes significant impact on health and quality of life (residential dwellings, healthcare facilities, schools and educational facilities and places of worship). Communities with high unemployment rates (>5%), economic deprivation, or strong reliance on local contracting opportunities and trade.

Sensitivity	Criteria
	PRoW's or footpaths which regularly support high foot traffic or are key commuting routes or key to accessing certain areas of the town. Regular recreational/commercial users of the Afon Teifi who rely on a single location and are unable to relocate.
Moderate	The residential receptors within the study area are classified as moderate sensitivity if the baseline data exceeds the given values for vulnerable groups which correspond to the capacity of a receptor to respond to change: - Elderly (Over 65) - >15% to <20% - Young children (0-4) - >15% to <20% - Bad or very bad health - >3% to <5% - Welsh Index of Multiple Deprivation (WIMD) – >10% - <20% most deprived areas in Wales Receptors with a reasonable expectation of amenity, but where occupation is transient (Hotels/PRoW) or where the environment is less sensitive to external noise than a residential dwelling (Offices). Communities which do not have high unemployment rates (<5%), economic deprivation, or have a mixed economic base with some reliance on local contracting opportunities and trade. PRoW's or footpaths which regularly support moderate foot traffic but are not key routes used for commuting. Regular recreational/commercial users of the Afon Teifi who use a specific location but are able to reasonably re-locate to another area.
Low	The residential receptors within the study area are classified as low sensitivity if the baseline data exceeds the given values for vulnerable groups which correspond to the capacity of a receptor to respond to change: - Elderly (Over 65) - <15% - Young children (0-4) - <15% - Bad or very bad health - >3% - Welsh Index of Multiple Deprivation (WIMD) - >20% most deprived areas in Wales. Receptors where the ambient noise level is often higher, occupancy is transient, or the activity (e.g., shopping, manual work, restaurants and pubs) is not significantly disrupted by external construction noise. Economically resilient areas with diverse employment options. PRoW's or footpaths which are rarely used and do not provide key access routes within the town. Regular recreational or commercial users of the Afon Teifi, who do not rely on a specific location and can easily re-locate.

Table 5-4 – Criteria used for classifying the magnitude of change

Magnitude	Criteria
High	Where an effect has the potential to result in a substantial change (either negative or positive) to a receptor or resource. May include negative effects which result in fatality or serious physical/mental harm, closure or severe effect upon the viability of businesses and community facilities, the recreational/commercial use of the Afon Teifi or access to PRow/footpath networks. Substantial increase in local employment (> 100 jobs) or a long-term benefit (> 5 years) to employment and trade.
Moderate	Where the effect has the potential to result in a noticeable change (negative or positive) to a receptor or resource. May include negative effects which result in minor physical/mental harm, temporary closure or tangible effect upon the viability of businesses and community facilities, the recreational/commercial use of the Afon Teifi or access to PRow/footpath networks. Moderate increase in employment (20–100 jobs) or a medium-term benefit (1–5 years) to employment and trade.
Low	Where the effect has the potential to result in a barely perceptible change (negative or positive) to a receptor or resource. May include negative effects which result in temporary disturbance and nuisance, temporary disruption but no change to the viability of businesses and community facilities, the recreational/commercial use of the Afon Teifi or access to PRow/footpath networks. Minor increase in employment (< 20 jobs) or a short-term benefit (< 1 year) to employment and trade.
Very Low	Where the effect has the potential to result in no discernible change (negative or positive) to a receptor or resource. May include negative effects which result in temporary minor nuisance, no disruption or change to the viability of businesses and community facilities, the recreational/commercial use of the Afon Teifi or access to PRow/footpath networks. Minimal or no measurable benefit to local workforce or economy.

5.8 Baseline environment and likely future evolution

This section describes the baseline environment and its likely future evolution. The current baseline environment scenario refers to the current state of environmental characteristics within the study area. The description of the baseline environment relies on secondary data gathered from the sources listed in section 5.7.2. The description of the likely future baseline explains how the current baseline is expected to evolve naturally without the Scheme, based on the available environmental information and scientific knowledge. It reflects changes that can be reasonably predicted with the data available.

5.8.1 Scheme Area overview

The town of Cardigan is located on the southwestern edge of Ceredigion County, with Pembrokeshire being located to the south of the town. Existing infrastructure in the Scheme Area includes the current flood defences, residential and commercial buildings along the northern riverbank, Gloster Row car park and the existing slipway/river access point at Gloster Row car park. Strand and Castle Street are roads located within the Scheme Area which provide access for local traffic to the town centre. Strand is a one-way road constrained by Cardigan Castle Scheduled Monument and the Afon Teifi. Perpendicular to Strand is Castle Street / Cardigan Bridge which is a narrow two-way road crossing the Afon Teifi.

These following sections describe the multiple environmental factors relevant to the effects which have been scoped into the assessment, as outlined within Table 5-1 and Table 5-2.

5.8.2 Flood risk

The Strand area of Cardigan on the north bank of the Afon Teifi, which includes residential and commercial properties, is vulnerable to flooding. Flood events occurred in 2007, 2008, 2012 and 2014. In 2007 the lower quayside, including Strand and Cattle Market flooded with flood depths exceeding 0.5m. A tidal flood on 3 January 2014 inundated 29 properties on St Mary's Street. Low-lying residential and commercial properties, particularly along Strand, are highly vulnerable, with thresholds below 3.1m AOD and exposure to annual tidal flooding. The Scheme Area would become increasingly vulnerable with predicted future sea levels rise.

Community concern is high: the 2021 Populations and Communities report (Binnies, 2021) found that around 45% of Ceredigion residents worried about flooding to their local area, and around 32% had investigated risks to their homes. National Survey for Wales data from 2022-2023 indicates that the proportion of residents worried about flooding to their local area has not changed significantly and there is no more recent data for those who had investigated the risk to their homes.

5.8.3 Population

2021 Census data (Table 5-5) indicates that the population of Cardigan Teifi LSOA remained broadly stable between 2011 and 2021, while Cardigan Mwldan LSOA recorded a 4% increase and the Cardigan Rhyd-y-Fuwch LSOA recorded a 3.6% decrease. In contrast, the wider Ceredigion population declined by 5.8% over the same period. The total population in Cardigan Mwldan is consistently higher than in Cardigan Teifi and Cardigan Rhyd-y-Fuwch, reflecting greater population density in the northern part of the town.

Age structure data within Table 5-6 shows broadly comparable profiles between the three LSOAs, with the exception of older age groups. Cardigan Mwldan has a higher proportion of residents aged 65–74 and 75+, with the proportion of over-75s exceeding the Ceredigion average.

Within Cardigan Teifi, which encompasses the Scheme Area, 6% of residents are aged 0–4 and 14.8% are aged 65+. In Cardigan Rhyd-y-Fuwch 4.7% of residents are aged 0–4 and 25.4% are aged 65+. In Cardigan Mwldan, 3.8% are aged 0–4, while 34.7% are aged 65+, highlighting a markedly older population to the north of the town.

Based upon past population change data, the population of Cardigan is likely to either remain stable or decrease slightly.

Table 5-5 – Total population and % change between 2011 – 2021

Area	2011	2021	% Change
Cardigan Teifi LSOA	1,174	1,174	0
Cardigan Rhyd-y-Fuwch LSOA	1,226	1,182	-3.6
Cardigan Mwldan LSOA	1,784	1,862	+4
Ceredigion	75,922	71,475	-5.8

Table 5-6 – Age structure 2021

Age groups	Cardigan Teifi (%)	Cardigan Rhyd-y-Fuwch (%)	Cardigan Mwldan (%)	Ceredigion (%)
0-4	6.0	4.7	4.3	3.8
5-19	20.9	15.0	15.4	16.1
20-29	14.1	12.5	7.5	14.0
30-44	18.5	17.0	12.9	13.8
45-59	19.6	18.8	17.7	19.3
60-64	6.0	6.7	7.5	7.2
65-74	8.2	12.1	15.6	13.9
75 and over	6.6	13.3	19.1	11.8

5.8.4 Employment and economic status

Table 5-7 presents the economic activity status within the three LSOA's, alongside Ceredigion. 2021 Census data shows that, including those unemployed, 51.7% of residents in Cardigan Teifi, 47.7% in Cardigan Rhyd-y-Fuwch and 42.7% in Cardigan Mwldan were economically active. These figures are broadly consistent with Ceredigion overall, though they indicate higher economic activity in the southern part of the town which may be a result of the greater proportion of residents aged 65+ in the northern Mwldan region.

The dominant employment sectors only differ slightly between the three LSOA's. In Cardigan Teifi, the largest industries are hotels and restaurants (28.9%), public administration, education and health (26.4%), and finance, real estate, professional and administrative activities (11.6%). In Cardigan Rhyd-y-Fuwch the top three industries are hotels and restaurants (29.5%) followed by public administration, education and health (25.5%) and finance, real estate, professional and administrative activities (12%). In Cardigan Mwldan, public administration, education and health is the largest sector (33.2%), followed by hotels and restaurants (24.7%) and finance, real estate, professional and administrative activities (11.4%). This would not be expected to change significantly in the future.

The 2021 Populations and Communities Report (Binnies, 2021) noted that Ceredigion has higher proportions of small employers, own-account workers, and full-time students compared with Wales as a whole, and lower proportions of residents who have never worked or are long-term unemployed.

2021 Census data indicates that 64.3% of households in Cardigan Teifi experience deprivation in at least one dimension, compared with 65.7% in Cardigan Rhyd-y-Fuwch, 57.6% in Cardigan Mwldan and 52.9% across Ceredigion.

The Welsh Index of Multiple Deprivation (Welsh Government, 2019) identifies Cardigan Teifi LSOA, which contains the Scheme Area, as being ranked 125 out of 1,909 LSOA's in Wales, placing it within the 10% most deprived nationally. Table 5-8 shows that Cardigan Teifi is more deprived in almost every multiple deprivation category compared to the other two LSOA's, with particularly high levels of income deprivation, employment deprivation, and community safety and housing concerns. The only multiple deprivation category which is not ranked the highest in Cardigan Teifi is employment deprivation as Cardigan Rhyd-y-Fuwch has greater employment deprivation. In comparison to Cardigan Teifi, Cardigan Rhyd-y-Fuwch and Cardigan Mwldan fall within the 11–20% most deprived areas in Wales.

In November 2025, the latest WIMD became available as shown within Table 5-8. Cardigan Teifi's is now ranked as having greater multiple deprivation compared to 2019 with an overall ranking of 90. In contrast, multiple deprivation within Cardigan Rhyd-y-Fuwch and Mwldan has decreased, with updated rankings of 427 and 827 respectively. The new data indicates that deprivation is increasing within Cardigan Teifi and Mwldan whilst decreasing within Cardigan Rhyd-y-Fuwch. It is unclear whether these recent trends will continue in the future. However, in the absence of the Scheme, certain categories such as community safety and physical environment could decline further if flood events become more prevalent.

Table 5-7 – Economic activity status

Economic activity status	Cardigan Teifi		Cardigan Rhyd-y-Fuwch		Cardigan Mwldan		Ceredigion
Unit	No.	%	No.	%	No.	%	%
Economically active (in employment)	437	46.9	446	45.1	637	40.7	46.8
Economically active (unemployed)	44	4.7	26	2.6	32	2.0	1.8
Economically inactive	434	46.6	499	50.4	877	56.0	47.9
Retired	154	16.5	258	26.1	616	39.3	27.7
Student	61	6.6	40	4.0	62	4.0	10.0
Caretaker	74	7.9	48	4.8	64	4.1	3.5
Long term sick/disabled	95	10.2	131	13.2	109	7.0	4.4

Table 5-8 – Welsh Index of Multiple Deprivation rankings

Category	Cardigan Teifi		Cardigan Rhyd-y-Fuwch		Cardigan Mwldan	
Year	2019	2025	2019	2025	2019	2025
Overall deprivation	125	90	370	427	899	827
Income deprivation	66	59	340	264	756	634
Employment deprivation	117	65	101	234	601	653
Health deprivation	383	256	641	401	1,007	1,012
Education deprivation	663	471	1,046	881	886	635
Access to services	333	523	1167	1397	483	463
Community safety	127	54	321	417	1,163	1,223
Physical environment	683	148	1,708	1,225	1,770	1,474
Housing	115	253	393	1,222	1,585	1,599

5.8.5 Homes and land use

2021 Census data shows notable variation in housing tenure across Cardigan. In Cardigan Teifi LSOA, 39.1% of homes are privately owned, with private rentals accounting for 34.9% and social rentals 25.3%. Within Cardigan Rhyd-y-Fuwch LSOA 69.4% of homes are privately owned, with private rentals accounting for 12.3% and social rentals accounting for 18.2% of properties. Similarly, within Cardigan Mwldan LSOA private ownership at 69.4% also accounts for a much higher percentage of properties, with private rentals at 12.3% and social rentals at 18.2%. At the county level, Ceredigion reports 68.6% private ownership, 20.6% private rentals, and 10.5% social rentals. These figures highlight that private home ownership is significantly lower in Cardigan Teifi compared to the other two LSOA's and Ceredigion overall.

Cardigan contains three educational facilities: Ysgol Uwchradd Aberteifi (primary and secondary), Ysgol Gynradd Aberteifi (primary), and Coleg Ceredigion – Cardigan Campus. All are located in the northern half of the town and lie more than 300m from the main works area on the northern bank of the Afon Teifi.

Land use within the town comprises a mix of residential, commercial, and mixed-use allocations. The Ceredigion Local Development Plan (CCC, 2013) identifies four housing allocations within Cardigan (H0201, H0202, H0203 and H0204), totalling 5.19 ha gross area and 146 residential units. Allocations H0203 and H0204, located south of the Afon Teifi, remain undeveloped as of November 2025. Allocations H0201 and H0202 are situated to the northwest of the town; development has commenced only within H0201. None of the current residential allocations fall within the Scheme Area.

It is likely that new housing will continue to be developed gradually in the future within Cardigan to meet housing demands. There is no data which indicates that the type of housing tenure would be likely to change in the future. There is one known mixed-use development (Application number: A240176) which will contain residential units and is located at the site of the former Cardigan and District Hospital. The development includes office workspace, café, residential development, storage building, was approved in 2024 and must begin by September 2029.

5.8.6 Human health

Human health effects within Cardigan, in relation to the Scheme, are primarily influenced by environmental factors including air quality, noise, vibration, water quality, and access to recreation and amenity areas. Potential health effects arising from these factors are assessed within the relevant topic chapters and appendices as listed below, with cross-referencing provided where interactions occur:

- Noise and Vibration - Construction noise and vibration assessment (Appendix 5.1)
- Local Amenity – Chapter 8: Landscape and Visual
- Construction Traffic – Chapter 9: Traffic and Transport.

This chapter focuses specifically on potential significant effects to vulnerable groups within Cardigan.

2021 Census data indicates that in Cardigan Teifi LSOA, 27.4% of residents are classed as disabled under the Equality Act, and 13.4% report that their day-to-day activities are limited by health. Overall, 74.2% of the population reported being in good or very good health, while 8.1% reported being in bad or very bad health. In Cardigan Rhyd-y-Fuwch LSOA, 29.7% of residents are classed as being disabled under the Equality Act, and 16.2% report that their day-to-day activities are limited by health. Overall, 69% of the population reported being in good or very good health, while 12.3% reported being in bad or very bad health. In Cardigan Mwldan LSOA, 25.7% of residents are classed as disabled, 12.4% report activity limitations, 74% report good or very good health, and 7.6% report bad or very bad health.

The 2021 Populations and Communities Report (Binnies, 2021) highlights that physical activity levels in Ceredigion (58.2%) are higher than the Welsh average (53.1%), although 26.6% of adults remain inactive. Rates of mental health conditions and self-declared disabilities are slightly lower in Ceredigion compared to Wales overall; however, 19.9% of adults have a GP-recorded mental health condition and 17.8% report a self-declared disability.

Healthcare provision in Cardigan is limited. One GP surgery is located in the northwest of the town, with several pharmacies in the central area. No GP surgeries or pharmacies are present south of the Afon Teifi. There is no evidence of any plans for additional GP capacity in the near future.

5.8.7 Footpaths, recreation and local amenity access

Cardigan offers a range of natural recreational facilities, including the Afon Teifi and its frontage, alongside numerous footpath routes throughout the town. The 2021 Populations and

Communities Report (Binnies, 2021) noted that access to green space in Ceredigion is relatively limited, with only 55% of households located near accessible green space compared to 77% nationally. Despite this, local attitudes towards green space are positive and slightly more favourable than the Welsh average. Green space provision in Cardigan correlates with the WIMD. Cardigan Teifi, with the highest levels of deprivation, is also the ward with the poorest access to green space.

Cardigan benefits from 40ha of sports grounds, 6ha of playing fields and 9ha of village green. Whilst this is a comparatively high proportion of sports grounds, it is a low quantity of playing fields per population compared to other major towns in Ceredigion (Binnies, 2026). When compared to other major towns in Ceredigion, Cardigan is noted as having a high proportion of coastal paths and active travel routes, but poor provision of accessible greenspace, and a lack of connectivity between greenspaces.

Tree Cover in Wales' Towns and Cities (NRW, 2016) notes that towns in Ceredigion have an urban tree canopy cover of 15.7%, and Cardigan town of 15.5%. Both are slightly below the Welsh national average of 16.3%, which itself has decreased from 17.0% recorded in 2009. Canopy cover in Ceredigion and Cardigan are both also noted as having decreased; county canopy cover fell by 1.5% between 2009-2013, and 0.8ha of woodland appeared to have been lost in Cardigan between 2011-2014.

The majority of recreational facilities and footpaths within Cardigan are considered to be amenity features which provide benefits to the general public and local community. The availability and access to amenity features contributes to the social well-being, public health and economic prosperity of a town. As noted within Chapter 8: Landscape and Visual, the sense of place in Cardigan is strongly influenced by views of the Afon Teifi and various heritage assets, including Cardigan Castle, Cardigan Bridge and the town walls. As such, it is important that access to these views is retained.

Figure 5.2 shows the Public Rights of Way (PRoW), pedestrian footpaths, active travel routes and cycleways in Cardigan which are popular with walkers, runners and cyclists. No PRoW fall within the Scheme Area, though several notable routes are located nearby:

- National Cycle Network Route 82 runs along a section of the Afon Teifi at Cardigan on the southern landward bank, before heading southwest towards Fishguard.
- The Wales Coast Path runs along the right bank of the Afon Teifi before crossing Cardigan Bridge (Castle Street) and moving in land before heading west towards the coast.
- There are a number of PRoW located within Cardigan with the following routes located near the Scheme Area:
 - Route 78/23 (coastal path) runs along the southern landward bank for approximately 930m before joining St Dogmaels Road to the west of Castle Street bridge. This also links to Route 78/27 (bridleway) which runs for 1,020m and connects to other public rights of way to the southwest of Cardigan.
 - Route 78/49/C (footpath) runs for approximately 100m in the southeast corner of the High Street, off Quay Street on the northern landward bank.

- Route 78/16 (footpath) runs for approximately 100m off Middle Mwldan, across the River Mwldan, to the north of Route 78/49/C.
- Route 78/48 (footpath) runs for approximately 26m between Priors Street and Pwlhai.
- Route 78/17 (footpath) runs along the northern landward bank for approximately 790m to link up with Route 78/16/C.

Ceredigion County Council have defined a number of active travel routes and there are existing routes located along Strand (CCC-CAR10-FW, walking route) and along the southern bank of the Afon Teifi (CCC-CAR02-SUP, walking and cycling routes). There are also aspirational routes in the same locations to include a cycle route on Strand (CER-FR-CA-021) and upgrade the route on the southern bank of the Afon Teifi.

The Afon Teifi supports a variety of recreational activities such as sailing, canoeing, power boating, and yacht racing. Local recreational groups include the Cardigan and District Ramblers, Sea Scouts, Teifi Boating Club, and Llandysul Angling Association. Outdoor activity providers such as Cardigan Bay Active and Adventure Beyond also operate in the area and utilise the scout hut buildings. The Old Forge Crafts shop is located within the Scheme Area.

Access to the Afon Teifi from within the Scheme Area is currently facilitated by the two slipways located near to the Cardigan Bay Active (Sea Scouts Slipway) and Gloster Row car park (Gloster Row / St Mary's Street Slipway). There are also other slipways within Cardigan as shown on Figure 5.2. Slipways as well as mooring points and other river access points are listed below:

- Netpool Road Slipway (use requires permission from mooring master)
- Quay Street car park Slipway (use requires permission from ATFL)
- Prince Charles Quay (public access but not a slipway – embarking/disembarking only)
- Sea Scouts Slipway (private use only)
- Gloucester Row / St Mary's Street Slipway (publicly accessible)
- ATFL Mooring Area (not a slipway, mooring only with ATFL permission)
- Ynys Marine Slipway (not publicly accessible).

The Navigational Risk Assessment (Appendix 5.2) highlights that as the Afon Teifi is primarily used for tourism and leisure, it is mostly used for recreation during the summer months. Larger vessels including those used for tourist boat trips depart from the Prince Charles Quay. These usually travel downstream towards the bay, but there is a tour operator whose preferred route is upstream and past the works area. Vessels are a mix of powered and non-powered. During the summer months, it is estimated that there are approximately 50 vessels per week using the river, although this is mainly downstream of Cardigan Bridge. ATFL have confirmed the Gloster Row Slipway is not used by emergency services, who instead use the slipway at Quay Street car park to launch when necessary.

There are two local events which are held in the vicinity of the works. The annual Cardigan River and Food festival takes place in and around the Quay Street car park to the west of the works area in August. This includes the following river activities:

- Boat Trips
- Coracle Demonstrations
- RNLI Rescue Demonstration
- Duck Race.

The second local event is the Mermaid Race, which is a rowing race involving approximately 80 boats. The race launches at the Ynys Marine Slipway on the southern bank of the Afon Teifi, opposite the Scheme construction works area, and the route continues downstream through Cardigan Bridge to Cardigan Island and back again. This event is held annually, usually in June or July.

There are no known future changes relating to the provision of footpaths, recreation and amenity areas in the absence of the Scheme.

5.9 Assessment of effects

The following sections contain assessments of the Likely Significant Effects which were scoped into the Population and Human Health assessment.

5.9.1 Construction effects

Sub-topics for the Assessment of Likely Significant Construction Effects are derived from the scoped-in effects listed within section 5.6. The potential negative construction effects have been assessed under separate sub-headings which correspond to the relevant environmental factor for clarity:

- Noise and vibration
- Pollution and dust
- Footpath Closure / Diversion
- Traffic Disruption
- Amenity Access and Water navigation.

A summary of the combined potential negative construction effects is provided following the 'Amenity Access and Water Navigation' section to provide assessment of the scoped-in effect as a whole.

Potential positive effects on the local economy are then assessed as a separate sub-topic.

Mitigation for negative effects and residual effects are set out within each sub-topic. All mitigation for negative effects to Population and Human Health are summarised in section 5.10, with all residual effects summarised in section 5.11.

Noise and vibration

Construction impacts related to Noise and Vibration have been assessed in full within the Noise and Vibration Impact Assessment (Appendix 5.1). This section provides a summary of the assessment outcomes but it should be read in conjunction with the full assessment.

Construction noise impacts have been assessed in accordance with BS 5228: Part 1. As a baseline noise survey has not been carried out, a worst-case baseline scenario has been assumed for all receptors. The specific criteria applied differ for residential and non-residential properties.

Description of effect and embedded mitigation

Methodology for receptor selection

Sensitive receptors have been identified based on their proximity to the works and their potential to be affected by noise and vibration. An initial set of all receptors at all dwellings within 300m was used to understand the screening distance where effects would be minor / negligible. Properties further back from the riverfront, which are screened from the works by other buildings (e.g., rows of houses behind the front row), will experience significantly lower noise levels. Therefore, once a row is negligible, all other rows behind will also be negligible.

The receptor dataset was reduced in size to those receptors closest to the works or within the zone of influence from construction. The remaining receptors have been grouped by their use and location. Each receptor group represents a cluster of properties, with the assessment point placed at the façade of the dwelling or building closest to the construction works (the 'worst-case' location).

In total, 33 residential receptor groups (representing approximately 170 individual dwellings) and 14 non-residential receptor groups (including pubs, hotels, restaurants, retail, offices, a school, and a church) have been identified.

A description of the methodology and receptor selection was sent to Ceredigion County Council by email for comment in October 2025 but no response was received. The EIA scoping opinion in October 2025 confirmed that "the proposed qualitative assessment of temporary construction effects ... is appropriate" for the Population and Human Health topic which includes noise and vibration. It should be noted that due to the nature of the construction noise and vibration assessment where noise impact is assessed based on predicted levels exceeding fixed thresholds, it was considered that baseline measurements would be unlikely to change the outcome of the assessment and therefore were not required.

Assessment of predicted construction activity noise levels

Table 11 within the Noise and Vibration Assessment report (Appendix 5.1) highlights the significance of the 'worst' activity in relation to predicted noise levels in relation to each receptor group. The prediction methodology, when applied to the 47 identified sensitive receptor groups, indicates that significant negative effects (major or moderate effect) from construction noise are likely at several locations (Table 5-9). Receptors which may experience significant effects are shown to be located on the northern side of Areas 3 and 4, as shown within Figure 2 of the Noise and Vibration Assessment report.

Table 5-9 – Predicted noise levels for receptor groups subject to moderate or major noise effects

Group ID	Location name	Type	No.	Max construction level at façade (LAeq,T dB)	Duration above moderate threshold (weeks)	Significance	Worst activity
R23	Rear of 1-3 Riverside Mews	Residential	4	77	7	Moderate	Pre-auguring, removal of existing walls & sheet piling
R25	Rear of 26 - 32 St. Mary Street	Residential	7	73	4	Moderate	As per R23
R26	Teifi House, Gloster Row	Residential	1	78	13	Major	As per R23
R27	1-5 Gloster Row	Residential	5	77	10	Moderate	As per R23
R28	4 - 6 Church Street	Residential	3	76	8	Moderate	As per R23
R29	Caerhuan (adj. to St Mary's Church)	Residential	1	81	19	Major	As per R23

Major negative effects of construction noise (significant)

Two residential groups, representing 2 dwellings, where direct temporary (short-term) Major (significant) negative effects are predicted are:

- R26 (Teifi House, Gloster Row) representing 1 dwelling - A maximum construction noise level of 78 dB LAeq,T is predicted, exceeding the Moderate impact threshold for 13 weeks and the Major threshold for 5 weeks.
- R29 (Caerhuan (adj. to St Mary's Church)) representing approx. 1 dwelling - A maximum construction noise level of 81 dB LAeq,T is predicted, exceeding the Moderate impact threshold for 19 weeks and the Major threshold for 7 weeks.

Moderate negative effects of construction noise (significant)

Four direct temporary (short-term) Moderate (significant) negative effects are predicted at four residential receptor groups representing approximately 19 dwellings:

- R23 (Rear of 1-3 Riverside Mews) representing approx. 4 dwellings – exceeding the Moderate impact threshold for 7 weeks with the highest predicted noise level peaking at 77 dB LAeq,T. (reduced from Major due to duration).
- R25 (26 – 32 St. Mary's Street) representing approx. 7 dwellings - exceeding the Moderate impact threshold for 4 weeks with the highest predicted noise level peaking at 73 dB LAeq,T. (reduced from Major due to duration).
- R27 (1-5 Gloster Row) representing approx. 5 dwellings - A maximum construction noise level of 77 dB LAeq,T is predicted, exceeding the Moderate impact threshold for 10 weeks. (reduced from Major due to duration).
- R28 (4 – 6 Church Street) representing approx. 3 dwellings - A maximum construction noise level of 76 dB LAeq,T is predicted, exceeding the Moderate impact threshold for 8 weeks. (reduced from Major due to duration).

Minor and negligible negative effects of construction noise (not significant)

A total of 13 residential (representing 62 dwellings) and 4 non-residential receptor groups (representing 13 commercial properties) are predicted to experience direct temporary (short-term) Minor (non-significant) negative effects.

All other effects at the remaining receptors are predicted to be Negligible. These effects are not considered significant.

Negligible adverse effects due to construction traffic noise (not significant)

Construction traffic noise impacts were assessed by calculating the noise change between the baseline traffic flows and the worst-case peak weekly construction traffic flows. Table 14 within Appendix 5.1 shows the predicted calculated noise change due to the Scheme and concludes that construction traffic will result in direct temporary (short-term) Negligible (non-significant) effects on all road links.

Negative effects upon human receptors due to construction vibration (significant)

Calculations for vibratory piling were carried out in accordance with BS 5228 Part 2 to predict Peak Particle Velocity (PPV) levels at various distances. The sheet piling activity is expected to last for approximately seven weeks.

The predictions establish key screening distances for human perception:

- Receptors within 30m of piling may experience vibration levels above the 1.0 mm/s moderate impact threshold.
- Receptors within 5m of piling may experience levels above the 10 mm/s 'intolerable' threshold.

Based on these findings, direct temporary (short-term) Moderate (significant) negative effects are predicted for several residential groups located within the 30m screening distance. These receptors are likely to experience vibration exceeding the 1.0 mm/s moderate impact threshold for a duration of approximately one to four weeks (depending on how quickly piling moves across the site). The affected groups are:

- R18 – Castle View and 1-3 Carrier's Lane
- R21 – 13 Strand
- R23 – Rear of 1-3 Riverside Mews
- R25 – approx. 5 dwellings at 26 – 31 St. Mary's Street
- R26 & 27 – 6 dwellings on Gloster Row, including Teifi House
- R28 & 29 – 4-6 Church Street and Caerhuan.

Two non-residential groups (R17 and R22) are located within the 5m screening distance. However, due to the lower sensitivity of these commercial uses and the transient nature of the piling works as they pass these specific locations, the effect on human receptors here is not considered to be significant.

Negative effects upon buildings due to construction vibration (significant)

The two non-residential groups R17 (Cardigan Bathroom Centre) and R22 (Old Forge Crafts / Cardigan Bay Active) include buildings in very close proximity to the proposed vibratory piling works.

Predictions indicated that these buildings may experience PPV levels exceeding the guideline values for assessing risk of cosmetic building damage (per BS 7385). Therefore, it is recommended that a vibration risk assessment be undertaken for these specific buildings prior to piling works commencing.

All other receptor groups are located at a sufficient distance and predicted vibration levels are not expected to exceed the building cosmetic damage thresholds.

Incorporated Mitigation Measures

As part of the works, a Construction Environmental Management Plan (CEMP) will be developed to ensure that environmental impacts are avoided and minimised during construction, Best Practicable Means (BPM) mitigation measures for noise and vibration will be included in the CEMP.

Throughout the construction programme, the primary strategy for managing noise and vibration will be the application of BPM, as set out in section 5 of the Noise and Vibration Assessment (Appendix 5.1). BPM involves minimising site noise levels at all times, whilst having due regard to the practicability and economic implications of any mitigation measure. Examples of BPM measures include suitable plant selection, selection of appropriate working hours, site layout which minimises impacts from directional noise sources and shutting down plant when not in use.

BS 5228 does not set specific criteria for acceptable construction noise. The preferred approach is therefore to reduce noise at the source where possible. In some cases, a higher noise level may be acceptable if it significantly reduces the overall construction time and, consequently, the long-term duration of the disturbance.

Additional Mitigation Measures

Where significant effects are predicted after the application of standard BPM, additional mitigation measures should be adopted to reduce effects as far as practicable. The specific details of these measures will be finalised by the Principal Contractor and approved via the CEMP, or a specific Noise and Vibration Management Plan prior to works commencing. Any additional mitigation measures should also be detailed within any future Section 61 Consent.

The mitigation strategy follows a hierarchy of control, prioritising mitigation and management at the source before considering receptor-based measures. Further details of additional mitigation measures can be found within section 9 of the Noise and Vibration Assessment (Appendix 5.1).

Procedural and on-site measures

The following measures should be applied on-site prior to any receptor-based mitigation in order to reduce noise levels as far as practicable:

- **Community Liaison:** Proactive communication is essential. This includes notifying residents in advance of specific noisy and high-vibration activities (such as piling) and providing a dedicated point of contact for complaints or queries.
- **Localised Screening:** The contractor should install temporary noise barriers or enclosures around significant stationary noise sources, or at specific work areas close to dwellings.
- **Noise and Vibration Monitoring:** Implementation of attended or unattended monitoring at locations with the greatest potential for disturbance. This verifies that levels against predictions, allows for the use of trigger thresholds to help manage site noise and shows a proactive approach to noise management. Further information on the monitoring scope is outlined within section 9.3 of the Noise and Vibration Assessment (Appendix 5.1).
- **Piling and Vibration Management:** A vibration risk assessment for all piling and ground compaction activities should be undertaken prior to works commencing. This assessment should determine the need for continuous vibration monitoring at the closest buildings (e.g., R17 and R22) and worst-affected residential receptors and inform the selection of specific mitigation techniques (see section 9) of the Noise and Vibration Assessment (Appendix 5.1).
- **Section 61 Consent:** While planning permission grants consent for the development, the Contractor should apply for a Section 61 Consent under the Control of Pollution Act 1974. This voluntary process formally agrees on working methods, mitigation, BPM, predicted noise levels and site action triggers with the Local Authority Environmental Health Officer in advance. Obtaining this consent provides the project with protection against Section 60 Abatement Notices, provided the agreed conditions are met.

Receptor-based mitigation (Noise)

If on-site mitigation is insufficient to reduce noise levels below significant thresholds and noise levels remain high for long periods, off-site mitigation should be considered in the following order of preference:

- **Noise Insulation:** Where noise levels above 75 dB during the day persist at residential receptors for a prolonged period (typically defined as exceeding triggers for 10 or more days of working in any 15 consecutive days, or for a total number of days exceeding 40 in any 6 consecutive months), the project should offer noise insulation to affected qualifying properties. A noise insulation assessment should be undertaken once final plant and methodologies are known to determine whether any properties qualify.
- **Temporary Re-housing:** This is considered a measure of last resort. It should only be offered in exceptional circumstances where construction noise levels are predicted to be intolerable for a sustained period, and where neither BPM nor noise insulation can provide adequate mitigation.

Note that there are no receptors that would currently qualify for noise insulation or temporary re-housing based on the predicted levels. Whilst levels are above the noise insulation trigger level, the durations are not such that they would qualify based on the temporal requirements.

Receptor-based mitigation (Vibration)

Given that on-site mitigation (source control) is the primary method for reducing vibration, receptor-based measures focus on managing the human response to residual effects.

The assessment predicts 'Moderate' vibration effects (between 1.0 mm/s and 10 mm/s) at the closest receptors. While significant, BS 5228-2 states that vibration of this magnitude *"can be tolerated if early warning and explanation has been given to residents"*. Therefore, the primary mitigation will be a proactive notification strategy, ensuring residents are informed of the piling schedule and reassured that levels remain well below the thresholds for cosmetic building damage.

To further ease concerns, the Contractor may offer to undertake specific attended measurements or install long-term vibration monitors at individual properties where residents express particular anxiety or concern with vibration. Determining actual levels in the presence of the resident (or providing them with visible data) is often an effective way to demonstrate that vibration, while perceptible, is well below damage thresholds.

Temporary re-housing is considered a measure of last resort. It would generally only be offered if vibration levels are predicted to be 'Intolerable' (typically exceeding 10 mm/s) for a sustained period. As current predictions show levels remaining below this Major threshold, re-housing is not anticipated. However, it remains a residual option to be assessed on a case-by-case basis.

Conclusion of residual effects

Construction noise

Following the implementation of BPM measures and additional mitigation measures, assuming a conservative 5dB decrease in noise level is achieved, the remaining Major negative effects (R26 & R29) will likely reduce to Moderate negative as the duration above the Major threshold would reduce to under a month.

The reported Moderate negative effects (R23, R25, R27 & R28) would likely remain as moderate negative effects despite a reduction in absolute noise levels.

If the more typical 10 dB reduction is achieved on site, it is likely that the residual effects at several of these locations would be further reduced to Minor negative (not significant).

Construction vibration

The quantitative assessment presents a conservative 'worst-case' scenario assuming standard vibratory piling methods. Under these conditions, vibration levels at the closest residential receptors (R18, R21, R23, R25, R26, R27, R28 & R29) are predicted to exceed the moderate negative threshold.

However, the implementation of the piling and vibration management measures outlined in Section 9.1 (Appendix 5.1) (specifically the use of resonance-free rigs and pre-auguring) is expected to reduce vibration generation at the source. While these reductions cannot be accurately quantified prior to the contractor's final plant selection, it is anticipated that the effective application of these measures could reduce vibration levels below the moderate threshold at several locations.

Where the moderate threshold is still exceeded at residential receptors, levels will remain an order of magnitude below the criteria for cosmetic damage. In these instances, the residual effect is characterised by potential annoyance rather than physical impact. This will be managed through community liaison, monitoring and timing restrictions.

As stated previously, the two non-residential groups R17 and R22 include buildings which may experience PPV levels exceeding the guideline values for assessing risk of cosmetic building damage (per BS 7385). Therefore, it is recommended that a vibration risk assessment be undertaken for these specific buildings prior to piling works commencing. The measures described in section 9.1 of the Noise and Vibration Assessment (Appendix 5.1) are expected to reduce vibration generation at the source which would help minimise this risk.

Construction traffic

No significant effects are reported as a result of construction traffic, however, the use of a construction logistics plan can help ease local concerns and potentially reduce complaints.

Pollution and dust

Construction effects related to construction emissions have been scoped out of the assessment as in accordance with EPUK/IAQM Land-Use Planning and Development Control: Planning for Air Quality guidance, an air quality assessment is required where there is a change of Heavy-Duty Vehicle (HDV) flows of more than 100 per day measured as an annual average daily traffic flow (AADT), or more than 25 within an Air Quality Management Area (AQMA). There are no AQMAs within 1km of the Scheme Area and therefore the 100 per day change in HDV flow threshold applies. The construction of the Scheme would not generate sufficient HDV flows to warrant the need for further assessment.

Effects related to dust pollution have been scoped out of the assessment as appropriate mitigation has been derived from the recommended mitigation detailed within section 8 of the IAQM guidance document (IAQM, 2024). The selection of appropriate dust mitigation measures utilised a precautionary approach which involved the adoption of high-risk mitigation measures where appropriate, due to the scale of the works and sensitivity of receptors. All dust

management mitigation measures are outlined in full within the EAP (Appendix 13.1) and will also be referenced within the CEMP and accompanying Dust Management Plan (DMP).

Footpath closure/diversion

Sensitivity

Existing PRoW, active travel routes, the Wales Coastal Path and other footpaths throughout the town are used by local residents and tourists primarily for commuting or leisure. Users of these routes may include school children, the elderly and people with disabilities.

The PRoW throughout the town are likely to only be used for leisure and commuting. There are no PRoW which will be affected by the works due to distance from the Scheme Area, and therefore, PRoW are not considered further in this assessment. Whilst there are no other routes located adjacent to the main Scheme area, there are active travel routes and a national cycle route which are adjacent to the Northern and Southern compounds.

An active travel route for walking is located along Pont-Y-Cleifion, which passes the entrance to the proposed Northern compound. However, this route is likely to experience low foot traffic and access will not be restricted due to the presence the Northern compound. Signage and traffic management measures will be used to minimise disturbance to footpath users. Route 82 of the national cycle network and a shared use active travel route are located to the north of the Southern compound. However, there will be no loss of access to either of these routes as there is an existing fence separating to two areas.

Other footpaths throughout the town likely experience high foot traffic and provide key commuting routes, particularly for those who commute via Cardigan Bridge. Due to the location of the Scheme Area, the only footpath which is likely to be sensitive to the works are the pedestrian footways along Strand as construction activity will take place within this area. Whilst the footways along Strand are likely to experience moderate foot traffic, there are alternative routes in the area which will not be impacted by the works, and it is not considered that the footways will be particularly sensitive to change. Therefore, sensitivity is considered to be moderate.

Description of effect and embedded mitigation

There are a number of footpaths throughout the town which are used for commuting, accessing social infrastructure and recreational areas. During construction, access to pedestrian footways along Strand will be temporarily partially limited to facilitate the safe undertaking of works.

The following temporary footpath closures/diversions are planned:

- Part of the pedestrian footway on the riverward side of Strand will be temporarily closed between Cardigan Bridge and the Cardigan Bathroom Centre for the duration of the works for health and safety reasons. The opposite side of Strand will remain open to foot traffic throughout the works and crossing points will be provided.

All footpath closures required will be temporary in nature and there are no plans for permanent closures or diversions.

No footpath closures or major disruptions are associated with the proposed Northern or Southern compounds.

Magnitude

Partial temporary loss of the footpath on the riverward side of Strand will be limited in extent and duration. Throughout the remainder of the town, footpath closures are not expected and therefore, the extent and duration of the loss of access during construction will be low. Where temporary loss of footpaths are required along Strand, there is expected to be limited loss of access as diverted routes will be established.

The overall magnitude of change associated with the temporary (short-term) loss of public access to footpaths during construction will be low and limited to the construction phase.

Significance

Overall, there are likely to be limited effects related to footpath closures and diversions and a temporary (short-term) low magnitude of change resulting from the construction phase of the Scheme. Any negative effects will be temporary (short-term); however, the footpath improvements in Area 1 delivered through the Scheme would provide a permanent benefit to the town.

Based upon the moderate sensitivity of receptors and an overall low magnitude of temporary (short-term) negative change, it is the opinion of the competent expert that the Scheme would result in a direct temporary (short-term) minor (non-significant) negative effect.

Additional mitigation to reduce magnitude

No further mitigation is required as the effect is not significant.

Conclusion on residual effect

Assessment of residual effects is not required as no further mitigation is proposed. The effect remains minor and not significant.

Traffic disruption

Construction effects related to traffic disruption have been assessed in full within Chapter 9: Traffic and Transport. Table 9-14 from the Traffic and Transport assessment provides a summary of all likely traffic and transport effects and concludes that there are no likely significant effects. All effects were considered negligible and non-significant.

Amenity access and water navigation

Sensitivity

Public amenity areas include the Afon Teifi frontage, and the river itself which is used occasionally for recreational and commercial purposes and the publicly accessible areas of Strand and Gloster Row car park provide views to the river. Access to the Afon Teifi from within the Scheme Area is currently facilitated by the Gloster Row / St Mary's Street and Sea Scouts slipways. There are other slipways within Cardigan which are either publicly accessible or can be used with permission. Downstream of the town bridge, the mooring area south of Netpool Road is the only deep water mooring for the whole of the river.

There is on street parking along Strand and at parking space Gloster Row car park which may be used for amenity access, but other parking is available throughout the town, including the Quay Street car park which is also used for hosting local events.

Whilst access to green space in Ceredigion is relatively limited, with only 55% of households located near accessible green space compared to 77% nationally, access to green space in Cardigan is not considered to be particularly sensitive to change as Cardigan benefits from 40ha of sports grounds, 6ha of playing fields and 9ha of village green. Additionally, local attitudes towards green space are positive and slightly more favourable than the Welsh average indicating that this is not a major issue for local residents.

The slipway at Gloster Row is confirmed not to be used by the emergency services. The Sea Scouts Slipway is privately owned and unlikely to be used for emergency access due to the narrow roads and limited access behind the slipway itself. Access for emergency services is provided from the Quay Street car park slipway, which will remain unaffected by the works.

Being able to access the river and its frontage is important for some members of the community (e.g. Sea Scouts, individual river users) and businesses (e.g. Cardigan Bay Active and Adventure Beyond). However, there are multiple access points to the river and its frontage and multiple areas of greenspace throughout the town. Due to the proportions of vulnerable, disabled and elderly residents who may rely on existing on street parking and other car parking space close to facilities and amenity areas, sensitivity to change may be greater. Overall, the sensitivity of receptors is considered to be moderate.

Description of effect and embedded mitigation

The Afon Teifi is used for multiple recreational and commercial activities throughout the year, which primarily take place within the warmer summer months. The Scheme would require the temporary/permanent closure of the following amenity assets which may influence amenity access within the town:

- Suspension of on-street parking along construction access routes (Strand) to allow the safe passage and turning of delivery vehicles for the duration of the works. However, only one lane would be closed, allowing traffic to use the road.
- Gloster Row car park will be closed during construction. Site fencing will be erected to ensure the separation of the public and the ongoing works.
- Access to the Afon Teifi from the Scheme Area will not be possible during construction due to closure of Gloster Row / St Mary's Street slipway and the Sea Scouts slipway. Alternative slipways and river access points within Cardigan will remain accessible during the construction phase.
- Access to views of the Afon Teifi from Strand and Gloster row car park will be restricted during construction.

Within the Afon Teifi, exclusion zones will be established to ensure the safety of users during construction and the northern most arch of the bridge to prevent canoes and kayaks from entering the exclusion zone (see Navigational Risk Assessment, Appendix 5.2). The footprint of the exclusion zones will be minimal in comparison to the total width of the river, and therefore, it is not anticipated that the navigation of the river will be impacted by the works.

The Navigational Risk Assessment, included within Appendix 5.2, highlights the risks to vessels and mariners imposed by the Scheme during the construction phase and outlines appropriate mitigation measures to minimise risk.

Access to amenity areas will not be impacted by the proposed Northern or Southern compounds as they are both located on existing hardstanding.

Magnitude

Loss of access to the Afon Teifi due to the closure of the two slipways in the Scheme Area will be limited as access will still be possible through the use of alternate access points along the river. Businesses and local events which utilise the river are not anticipated to be restricted in their use of the river by the construction phase of the works and are only likely to experience minor inconvenience due to the establishment of exclusion zones. Similarly, whilst the number of parking spaces in the town will temporarily be reduced, alternative parking will still be available. Views of Afon Teifi from the Strand and Gloster Row car park will be obstructed during construction, but alternative viewpoints of the river through Cardigan will remain available.

The overall magnitude of change associated with the temporary (short-term) effects to amenity access and water navigation during construction will be low and limited to the construction phase.

Significance

Based upon the moderate sensitivity of receptors and an overall low magnitude of temporary (short-term) negative change associated with the loss of slipway and car park access during construction, it is the opinion of the competent expert that the Scheme would result in a direct temporary (short-term) minor (non-significant) negative effect due to the availability of access points, parking and amenity areas located elsewhere within the town.

Additional mitigation to reduce magnitude

A community liaison strategy will be implemented during construction which will include liaison with users of the existing slipways in the Scheme Area. Where necessary, measures to help current users use alternative slipways will be agreed and put in place.

Engagement with ATFL will be continued throughout the construction phase of the works, to ensure that the mitigation measures noted within the Navigational Risk Assessment are implemented effectively, in particular with regard to local events, such as the Cardigan River and Food Festival and Mermaid Race. This will include issuing a notice to mariners, warning of the works and the temporary exclusion zone.

Conclusion on residual effect

Community liaison will help manage the temporary reduction in amenity access, but there will still be a low magnitude of change during works and so the residual effects remain minor (non-significant).

Summary of potential negative temporary construction effects

Table 5-10 provides a summary of all potential negative construction effects prior to the consideration of additional mitigation. Pollution and dust were scoped out of the assessment

and so are not considered in the table. Traffic disruption and traffic noise were assessed as negligible so are not considered in the table.

Considering the combined effects to local residents, businesses, recreational users and all river users, the only negative significant effects are derived from construction noise and construction vibration (human receptors and buildings). All other effects have been assessed as non-significant. Based upon the assessment of potential for temporary negative construction effects relating to the environmental factors in Table 5-10, there would be a combined short-term negative significant effect upon receptors.

Mitigation and residual effects related to these significant negative effects derived from construction noise and construction vibration are summarised within section 5.10 and 5.11.

Table 5-10 – Summary of negative temporary construction effects

Environmental Factor	Effect	Significance of Effect
Noise and Vibration	Construction noise	• Direct temporary (short-term) major (significant) negative effects upon two residential receptor groups (4 dwellings); • Direct temporary (short-term) moderate (significant) negative effects upon four residential receptor groups (19 dwellings); • Direct temporary (short-term) minor (non-significant) negative effects upon 13 residential receptor groups (62 dwellings); and • Direct temporary (short-term) negligible (non-significant) negative effects upon all other receptor groups.
Noise and Vibration	Construction traffic noise	Direct temporary (short-term) negligible (non-significant) negative effects on all road links.
Noise and Vibration	Construction vibration (human receptors)	Direct temporary (short-term) moderate (significant) negative effects upon six residential receptor groups (22 dwellings) within the 30m screening distance).
Noise and Vibration	Construction vibration (buildings)	Two non-residential receptor groups R17 and R22 include buildings in very close proximity to the proposed vibratory piling works. Predictions indicated that these buildings may experience PPV levels exceeding the guideline values for assessing risk of cosmetic building damage (per BS 7385). Therefore, it is recommended that a vibration risk assessment be undertaken for these specific buildings prior to piling works commencing.
Footpath closure/diversion	Loss off access footways on Strand	Direct temporary (short-term) minor (non-significant) effect.
Amenity Access and Water Navigation	Loss of access to amenity and water	Direct temporary (short-term) minor (non-significant) effect.

Environmental Factor	Effect	Significance of Effect
	navigation from Strand	

Local economy

Sensitivity

Within the context of Population and Human Health, the receptors for effects related to the local economy are the businesses and employment within Cardigan. Unemployment rates within the Cardigan Teifi LSOA are higher than the average for Ceredigion and above the national average for Wales. Additionally, both LSOA's are subject to high multiple deprivation compared to other areas in Wales. Primary employment within Cardigan includes hotels and restaurants, public administration, education and health, and finance/real estate, professional and administrative activities and it was noted that there were greater percentages of small employers, own account workers and full-time students in Ceredigion compared to Wales nationally.

Due to the high levels of multiple deprivation in parts of Cardigan along with above average unemployment rates, the sensitivity of the receptors is considered to be high as there is greater potential for the town to benefit from positive change.

Description of effect and embedded mitigation

The construction phase of the Scheme would require an average workforce of approximately 6-10 workers, rising to an approximate peak workforce of 14-18 during overlapping activities. Whilst the proposed will provide employment opportunities, direct employment within the local area is expected to be minimal and therefore has not been subject to further assessment. During the construction phase, small local businesses will likely benefit from increased trade, supported by the additional workers in the town. This includes hotels and other accommodation, cafes and convenience stores which will be likely to experience an increase in business during the construction phase.

The appointed contractor for the Scheme would utilise, where possible, local businesses in the supply chain to support the local area.

Magnitude

The construction workforce will likely lead to increased trade for local businesses, however given the relatively low number of construction workers required, it is considered that the magnitude of positive change within the town would be a low.

Significance

Based upon the high sensitivity to change, and an overall low magnitude of positive temporary (short-term) change, it is the opinion of the competent expert that the Scheme would result in an indirect temporary (short-term) moderate (significant) positive effect upon the local economy.

Additional mitigation to reduce magnitude

No mitigation is required as the effect is positive.

Conclusion on residual effect

Assessment of residual effects is not required as no further mitigation is proposed due to the effect being positive.

5.9.2 Operation effects**Reduction in flood risk****Sensitivity**

During past flood events, properties have flooded which has caused damage and impacted the mental well-being of residents. The WIMD indicates that some areas of Cardigan (Cardigan Teifi LSOA) are among the 10% most deprived areas in Wales. Therefore, receptors are likely to be more sensitive due to a greater level of deprivation and a lower capacity to adapt to change. Additionally, there are greater percentages of small employers and vulnerable groups within the town which are also sensitive to change.

The sensitivity of these receptors is considered to be high primarily due to the number of small businesses, vulnerable groups and existing levels of deprivation in the area.

Description of effect and embedded mitigation

The main objective of the Scheme is to reduce the risk of tidal flooding to the town and community of Cardigan, taking account of predicted sea level rise. As described within Chapter 4: Project Description, the Scheme would comprise a series of flood defence structures designed to fit within the various constraints along the Afon Teifi frontage between Cardigan Bridge and Gloster Row car park. To provide the Scheme design standard of 1 in 200 AEP with allowance for climate change, the flood defences include structures up to approximately 2m above general ground level.

During operation, the Scheme would have a long-term positive effect to the identified receptors by reducing flood risk.

Magnitude

The Scheme would provide protection from up to 1 in 200 AEP flood events, thus reducing flood risk to approximately 90 properties currently at risk. This standard of protection accounts for future climate change to extend the length of protection into the future. Due to the standard of protection which would be provided, the future frequency of flooding for these affected properties and businesses will be reduced and can be considered to be very low as these properties would only be expected to flood during > 1 in 200 AEP flood event.

Based on the description of magnitude in relation to the influence of the Scheme, the magnitude of change from baseline conditions is considered to be high as there will be a substantial positive change to receptors.

Significance

The Scheme would deliver a positive high magnitude of change for receptors of high sensitivity. The Scheme would provide long-term protection from flood events up to 1 in 200 AEP which could otherwise result in property damage, displacement of residents, health risks and socio-economic impacts. By reducing flood risk for receptors, the Scheme enhances the resilience and quality of life within Cardigan.

Based upon the high sensitivity of receptors and an overall high magnitude of positive permanent change, it is the opinion of the competent expert that the Scheme would result in a direct permanent major (significant) effect.

Additional mitigation to reduce magnitude

No additional mitigation is required due to the positive nature of the effect.

Conclusion on residual effect

Assessment of residual effects is not required as no further mitigation is proposed due to the effect being positive.

Provision of public amenity space

Sensitivity

There are multiple areas of existing public amenity space within Cardigan which include the Afon Teifi frontage, the river itself, parks and other green spaces, footpaths and car parks. Whilst access to green space in Ceredigion is relatively limited, with only 55% of households located near accessible green space compared to 77% nationally, green space is relatively common throughout Cardigan. Cardigan is not considered to be particularly sensitive to change as Cardigan benefits from 40ha of sports grounds, 6ha of playing fields and 9ha of village green. Additionally, local attitudes towards green space are positive and slightly more favourable than the Welsh average indicating that this is not a major issue for local residents.

The Gloster Row and Sea Scouts slipways located within the Scheme Area are not the only slipways which provide river access in Cardigan. However, the Gloster Row slipway does permit public access, which will be lost. It is understood that the public use of this slipway is limited. Furthermore, these slipways are unlikely to be used by emergency services as access for emergency services is provided from the Quay Street car park slipway.

Parking space throughout the town is provided by on street parking and car parks. However, public consultation indicated that local residents feel that there is a lack of parking availability within the town. Therefore, receptors may be sensitive to changes in parking spaces.

Being able to access the river is important for some members of the community (e.g. Sea Scouts, individual river users) and businesses (e.g. Cardigan Bay Active and Adventure Beyond). However, as there are multiple access points to the river and its frontage and multiple areas of greenspace throughout the town for the community, the sensitivity of receptors is considered to be low.

Public amenity areas are common throughout Cardigan and there will be limited loss of river access. Therefore, sensitivity for these receptors is considered to be low. Due to the public

sentiment that parking is limited within the town, sensitivity to change regarding car parking space is considered to be moderate.

Description of effect and embedded mitigation

Due to the alignment of the Scheme defences, the existing footpath along Strand in Area 1 would be widened once the existing highway wall is removed. This existing footpath is a publicly accessible amenity area which would be made more accessible due to the increased width, likely benefiting wheelchair users and carers with push chairs. The alignment of the flood defence has been designed to be further away from Strand, create a more open space to maximise visibility of Cardigan castle and bridge. This approach aligns with public consultation responses which highlighted that respondents favoured tree planting and wider pavements to improve accessibility in the area and enhance public amenity areas alongside the river.

This area will be enhanced with ornamental planting. Planting design minimises separation from the river, by continuity through planting design. Some species from the planting palette used for the riverside plateau and upper engineered riverbank slope are brought into the roadside planting bed, to provide a link with the riverside setting.

In order to set the wall alignment back at Gloster Row, a small area of grassland will be partially lost which is currently accessible to the public and known to be incidentally used by dog walkers. Approximately half of this area will be lost due to setting back of the flood wall to facilitate intertidal habitat creation.

Due to the alignment of the flood defences which encroach on Gloster Row car park, the remaining car park area has been redesigned to minimise the reduction in car parking spaces. The car park currently consists of 23 spaces including one disabled space, this would reduce to 16 spaces including one disabled space, a loss of 7 car parking spaces.

The Gloster Row and Sea Scouts slipways will be permanently closed and will be replaced by a new up and over kayak/canoe ramp at the Old Foundry site. The new canoe ramp has been designed to be accessible with suitable gradients and rest platforms incorporated into the design. Whilst this will ensure access is retained for recreational groups, the closure of the Gloster Row slipway will lead to a loss of a publicly accessible slipway. However, other slipways in Cardigan will still permit public access to the river. It should be noted that it has been noted that the existing public use of the Gloster Row slipway is limited and it is not relied upon by emergency services.

Magnitude

Positive change associated with the enhancement of public amenity areas is expected to be beneficial to the local community. Due to its central location in a high foot traffic area, it is considered likely that accessibility and amenity improvements within Area 1 area would provide a tangible positive impact to the area. Overall, as these changes are considered to result in noticeable benefits to mental health and accessibility, the magnitude of positive change is considered to be moderate.

The loss of existing amenity space from the grass area adjacent to Gloster Row car park will likely be a noticeable change for dog walkers and other existing users of this space. However, this space will be partially retained and remain accessible during the operational phase of the Scheme, which will limit the perceived magnitude of change. The new up and over boat ramp will allow the Scheme to retain existing access for recreational groups but will not replace the

lost public access point at Gloster Row. As the public use of Gloster Row slipway is understood to be limited, it is considered that the changes to river access points will result in barely perceptible change. Whilst the Gloster Row car park will be reduced in size due to the flood defence alignment, the car park has been redesigned to minimise the loss of parking spaces. As a result of the redesign, only 7 parking spaces will be lost.

Overall, the magnitude of negative change associated with the provision of public amenity spaces is considered to be low.

Significance

Based upon the low sensitivity of receptors for changes to public amenity areas and river access, and an overall moderate magnitude of permanent positive change, it is the opinion of the competent expert that the Scheme would result in a direct permanent minor (non-significant) positive effect.

Based upon the moderate sensitivity of receptors for changes to parking availability, and an overall low magnitude of permanent negative change, it is the opinion of the competent expert that the Scheme would result in a direct permanent minor (non-significant) negative effect.

Based upon the low sensitivity of receptors for changes to other public areas of public open space, and an overall low magnitude of permanent negative change, it is the opinion of the competent expert that the Scheme would result in a direct permanent negligible (non-significant) negative effect.

Additional mitigation to reduce magnitude

No additional mitigation is required due to the positive nature of the effect and minor/negligible negative effects.

Conclusion on residual effect

Assessment of residual effects is not required as no further mitigation is proposed due to the effects being positive/minor/negligible.

5.10 Mitigation measures

A summary of mitigation required and applied by the assessment is provided below. Mitigation which is considered additional is described in full within section 9 of the Noise and Vibration Assessment (Appendix 5.1).

- Noise and Vibration – Throughout the construction programme, the primary strategy for managing noise and vibration will be the application of BPM, as set out in section 5 of the Noise and Vibration Assessment (Appendix 5.1). BPM involves minimising site noise levels at all times, whilst having due regard to the practicability and economic implications of any mitigation measure. The scope of noise and vibration monitoring can be found within Section 9 of the Noise and Vibration Assessment (Appendix 5.1).
- The community liaison strategy will include liaison with users of the existing slipways in the Scheme Area.

- Engagement with ATFL will be continued throughout the construction phase of the works, to ensure that the mitigation measures noted within the Navigational Risk Assessment are implemented effectively.

5.11 Significance and duration of residual effects

Table 5-11 summarises the significance and duration of residual effects for each scoped in effect. Pollution and dust were scoped out of the assessment and so are not included in the table. Traffic disruption and traffic noise were assessed as negligible and so are not included in the table.

Table 5-11 – Summary of significance and duration of residual effects

Scoped in Effect	Significance	Duration
Potential for negative temporary construction effects relating to noise, vibration, pollution, dust, footpath closure and diversions, traffic disruption, reduced amenity access, reduced recreational capacity, and changes to water navigation.	Construction Noise Direct temporary (short-term) moderate (significant) negative residual noise effects are predicted at approximately 21 dwellings (within receptor groups R23, R25, R26, R27, R28, and R29) during the most intensive works. Construction Vibration Direct temporary (short-term) moderate (significant) negative residual vibration effects are predicted at approximately 22 dwellings. However, these predictions assume standard impact/vibratory piling. The adoption of modern "resonance-free" piling rigs and pre-augering is expected to significantly reduce these levels in practice, potentially reducing the impact from 'Moderate' to 'Minor' at several locations. Two non-residential receptor groups may experience vibration levels exceeding the guideline values for assessing risk of cosmetic building damage. A vibration risk assessment should be undertaken for these specific buildings prior to piling works commencing. Footpath closure and diversions Direct temporary (short-term) minor (non-significant) negative effect from temporary closure of part of the Strand footway. Amenity Access and Water Navigation Direct temporary (short-term) minor (non-significant) negative effect from loss of slipway and car park access during construction.	Short-term (construction phase)

Scoped in Effect	Significance	Duration
Potential for positive effects on the local economy during construction through employment of a local contractor or contractors and an increase in trade for local shops and businesses.	Indirect temporary (short-term) moderate (significant) positive effects upon the local economy due to increased trade during construction.	Short-term (construction phase)
Potential for permanent positive effects due to the reduction in flood risk.	Direct permanent major (significant) positive effect in reduction to flood risk.	Permanent (operation phase)
Potential for permanent positive effects due to the provision of an area of public open space.	Direct permanent minor (non-significant) positive effect upon the provision of public open space at Strand).	Permanent (operation phase)
Potential for permanent negative effects due to the changes in existing public amenity space.	Direct permanent minor (non-significant) negative effect upon the provision of parking space (Gloster Row car park). Direct permanent negligible (non-significant) negative effect upon the provision of public amenity space (area adjacent Gloster Row car park).	Permanent (operation phase)

5.12 Difficulties and uncertainties

The following limitations have been identified:

- There are inherent interfaces between the Population and Human Health assessment and other topics assessed within this ES, therefore any relevant limitations identified by those topics may have implications on the respective associated effects within this assessment.
- The assessment of Likely Significant Effects within this chapter relies upon the use of professional judgement. Within EIA, the use of professional judgement is always required. However, this is substantiated wherever possible with evidence which informs the opinion of the competent expert.
- Most demographic data sourced for the purposes of this assessment relies on the 2021 ONS census data which may not accurately represent current demographics at the time of writing. However, at the time of writing, all third-party data is complete and up to date.
- The understanding of the frequency of use of footpaths within Cardigan is not based on survey data and is based purely upon observation and general understanding of use.

5.13 Summary of assessment

Whilst temporary residual negative significant effects are predicted during the construction phase of the works due to construction noise and vibration, these effects can be managed. It should be noted that there is no absolute legal noise limit that prohibits work; rather, the legislative requirement is to demonstrate that best practicable means (BPM) are being implemented to minimise disturbance.

Teifi House is a receptor which is likely to experience multiple nuisances during the construction phase the works due to the residual effects. Through the implementation of the EAP, CEMP, adherence to Control of Pollution Act 1974 Section 61 protocols, and a robust community liaison and monitoring strategy, the residual effects of the Scheme can be effectively managed.

The Scheme would provide significant positive effects related to the reduction of flood risk and the local economy.

5.14 References

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