

BYRNELOOBY

IRELAND | UK | UAE | BAHRAIN | KSA

Arklow Flood Relief Scheme

Report on CPO at Arklow Town Marsh and South Quay

Wicklow County Council

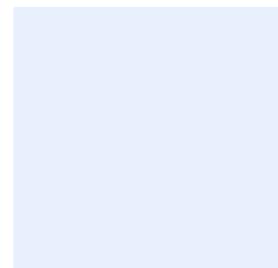
Report No. W3689-W-R002

17 January 2022

Revision: 00



OPW Oifig na nOibreacha Poiblí
Office of Public Works



Document Control

Document: Report on CPO at Arklow Town Marsh and South Quay

Project: Arklow Flood Relief Scheme

Client: Wicklow County Council

Report Number: W3689-W-R002

Document Checking:

Revision	Revision/ Review Date	Details of Issue	Authorised		
			Prepared By	Checked By	Approved By
00	17 January 2022	Re-issued for Review	K. Thornton	K. Selaledi	K. Thornton

Disclaimer: Please note that this report is based on specific information, instructions, and information from our Client and should not be relied upon by third parties.

Contents

1 Introduction 1

 1.1 Background 1

 1.2 List of Submissions..... 1

 1.3 Purpose of Report 1

2 Design Criteria 3

3 Embankment at Ticknock/ Ferrybank/Arklow Town Marsh..... 4

 3.1 Development Proposals at Ticknock/Ferrybank /Arklow Town Marsh..... 4

 3.2 Alternatives Considered..... 6

 3.3 Selection of Preferred Option 6

 3.4 CPO-1 Patrick and Patricia Ivory..... 7

 3.4.1 Issues 7

 3.4.2 The Extent of the Acquisition..... 8

 3.4.3 Permanent Instead of Temporary Acquisition..... 8

 3.4.4 Boundary Treatment..... 8

 3.5 CPO-8 Proinseas O’Brionn 8

 3.5.1 Issues 8

 3.5.2 Flood defence system (embankment instead of wall)..... 10

 3.5.3 Lack of access between remaining lands (effect on material asset)..... 10

 3.5.4 Tree Planting at SC1..... 11

 3.5.5 Alignment of embankment..... 11

 3.5.6 Permanent instead of temporary acquisition..... 11

 3.5.7 Location of site compound 1 12

4 CPO-3 Loss of Right-of-Way 14

 4.1 Graeme McWilliams and Crag Digital Avoca Ltd. 14

 4.1.1 Issues 14

 4.1.2 Response 15

5 Permanent Instead of Temporary Acquisition..... 16

 5.1 CPO-1 Patrick and Patricia Ivory..... 16

 5.2 CPO-2 Roadstone Holdings..... 16

 5.3 CPO-6 Arklow Slipway..... 16

 5.4 CPO-7 Estate of Malachy McDaniel Stone 16

 5.5 CPO-8 Proinseas O Brionn..... 17

6 Permanent Acquisition of Green Areas on South Quay 18

6.1 Development Proposals on South Quay 18

6.2 Alternatives Considered..... 19

 6.2.1 Tidal & River Barrages 19

 6.2.2 Removal of Pinch Point..... 19

 6.2.3 Retention of Quay Wall..... 19

 6.2.4 Construction of Walls 20

 6.2.5 Public Realm..... 20

6.3 Selection of Preferred Option 21

6.4 CPO-4 Elizabeth and Nicola Kenny 22

 6.4.1 Issues 22

 6.4.2 Occupiers of plot 120g 23

 6.4.3 Road closer to houses 23

 6.4.4 Amenity value of green area 23

 6.4.5 One-way traffic 25

 6.4.6 Hazard of new footpath 25

 6.4.7 Line of promenade by river edge..... 26

 6.4.8 Conflict with County Development Plan 26

6.5 CPO-5 Christine McElheron..... 27

 6.5.1 Issues 27

 6.5.2 Occupiers of plot 120h 28

 6.5.3 Amenity value of green area 28

 6.5.4 Traffic and Road Width..... 28

 6.5.5 Proposed New Footpath 29

 6.5.6 Surface Water Runoff 29

 6.5.7 Road closer to houses 29

6.6 CPO-9 Peir Leonard 29

 6.6.1 Issues 29

 6.6.2 Lack of Engagement from WCC/OPW 30

 6.6.3 Requirement for removal of green spaces 31

 6.6.4 Insufficient sightlines from adjoining properties..... 31

 6.6.5 Impact on house structure..... 31

 6.6.6 Surface Water Runoff 32

 6.6.7 Road closer to houses 32

 6.6.8 Removal of children’s play area..... 32

6.6.9 Road safety 33

6.6.10 Noise closer to house 33

6.6.11 Unnecessary cost 33

7 CPO of South Quay South of the Dock..... 35

7.1 Development Proposals on South Quay 35

7.2 CPO-6 Arklow Slipway Limited 35

7.2.1 Issues 35

7.2.2 Access to water..... 36

7.2.3 Access to retained lands following sale..... 37

8 Conclusion..... 38

1 Introduction

1.1 Background

On 31st May 2021, Wicklow County Council (WCC) made an application to An Bord Pleanála (ABP) pursuant to Section 226 of the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001 (as amended) for the proposed Arklow Flood Relief Scheme development. The ABP Case Number is ABP-310368-21.

On the same date, Wicklow County Council (WCC) made a separate application to An Bord Pleanála (ABP) regarding the Wicklow County Council Compulsory Purchase (Arklow Flood Relief Scheme) No. 2 Order 2021. 8no. objections were received by the Board against the above compulsory purchase order (CPO). The ABP Case Number is ABP-310377-21.

ABP has requested WCC to make any observations to the submissions by 5:30pm on 17th January 2022.

1.2 List of Submissions

The submissions received from ABP in relation to the compulsory purchase order ABP-310377-21 are listed below in Table 1.1. Also included is one submission relating to the Planning Application (ABP ref ABP-310368-21) which also includes an objection to the CPO.

Table 1.1: List of objections received for Case No ABP-310377-21 (CPO)

Reference	Plot No(s).	CPO Objections received for Case No ABP-310377-21
CPO-1	101,	Patrick and Patricia Ivory
CPO-2	125	Roadstone Limited
CPO-3	107a, 107b, 107c	Graeme McWilliams and Crag Digital Avoca Ltd
CPO-4	120g	Elizabeth and Nicola Kenny
CPO-5	120h	Christine McElheron
CPO-6	124a, 124d	Arklow Slipway Ltd
CPO-7	109	Estate of Malachy McDaniel Stone
CPO-8	102b, 103, 104, 106	Proinseas O Brionn
CPO-9	120k	Pier Leonard

1.3 Purpose of Report

This report addresses a number of issues raised in the objections to the proposed CPO and relating to the CPO. These are:

- Form of defence, location and size of embankment at Ticknock/Ferrybank/Arklow Town Marsh – CPO-1 (plot 101) and CPO-8 (plots 102b, 103, 104 and 106) .

- Permanent rather than temporary acquisition CPO-1 (plot 101), CPO-2 (plot 125), CPO-6 (124d), CPO-7 (plot 109) and CPO-8 (plot 103).
- Loss of Right-of-Way – CPO-3 (plots 107a, 107b and 107c)
- Permanent acquisition of green areas on South Quay – CPO-4 (plot 120g), CPO-5 (plot 120h) and CPO-9 (plot 120k)
- Permanent acquisition of South Quay to south of the Dock – CPO-6 (plot 124a)

Issues raised in the CPO objections relating to planning and environmental matters have been addressed separately in *Response to Submissions relating to Planning & Environmental Matters (ABP ref 310368-21 & 310377-21), January 2022*, submitted to ABP by Wicklow County Council.

2 Design Criteria

Arklow is vulnerable to fluvial flooding from the Avoca River and coastal flooding from the Irish Sea. The design of the Arklow Flood Relief Scheme (FRS) caters for the 1% Annual Exceedance Probability (AEP) fluvial flood event (also known as the 1 in 100-year fluvial flood event) and the 0.5% AEP coastal flood event (also known as the 1 in 200-year coastal flood event). The estimated flood extent resulting from the combination of the 1% AEP (1 in 100) fluvial event and the 0.5% AEP (1 in 200) coastal event for the current situation is shown in **Figure 2.1** below.

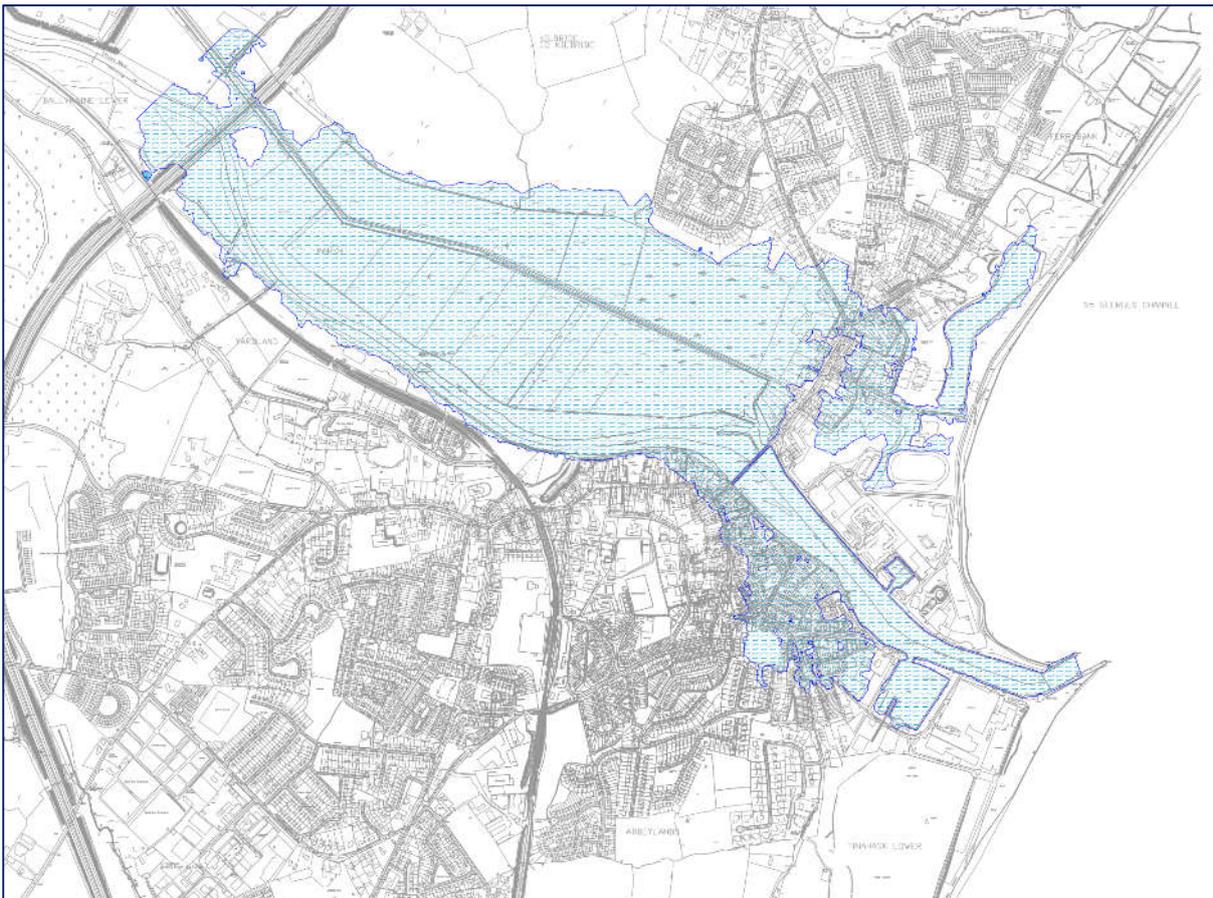


Figure 2.1 Existing Combined 1% AEP Fluvial and 0.5% AEP Coastal Flood Extent

Freeboard is an allowance in the design height of flood defence walls and embankments to account for uncertainties in the scheme design in the areas of hydrology (flow estimation and probability), hydraulic modelling (roughness of the river channel, afflux through bridge, etc.) and tidal and wave action. This standard is in line with the OPW national standard for constructing flood defence schemes in Ireland. An allowance for freeboard as described above has been incorporated into the design. In addition, freeboard for embankments was increased to allow for settlement.

3 Embankment at Ticknock/ Ferrybank/Arklow Town Marsh

3.1 Development Proposals at Ticknock/Ferrybank /Arklow Town Marsh

The proposed development at Ticknock, Ferrybank and Arklow Town Marsh is described in Section 4.4.6 of Chapter 4 (Description of the Proposed Scheme) of the Environmental Impact Assessment Report (EIAR). It comprises a flood defence embankment and wall running from the rear of the Presbyterian Church on the Dublin Road to the upstream abutment of Arklow Bridge at Ferrybank. See Figure 3.1 below.

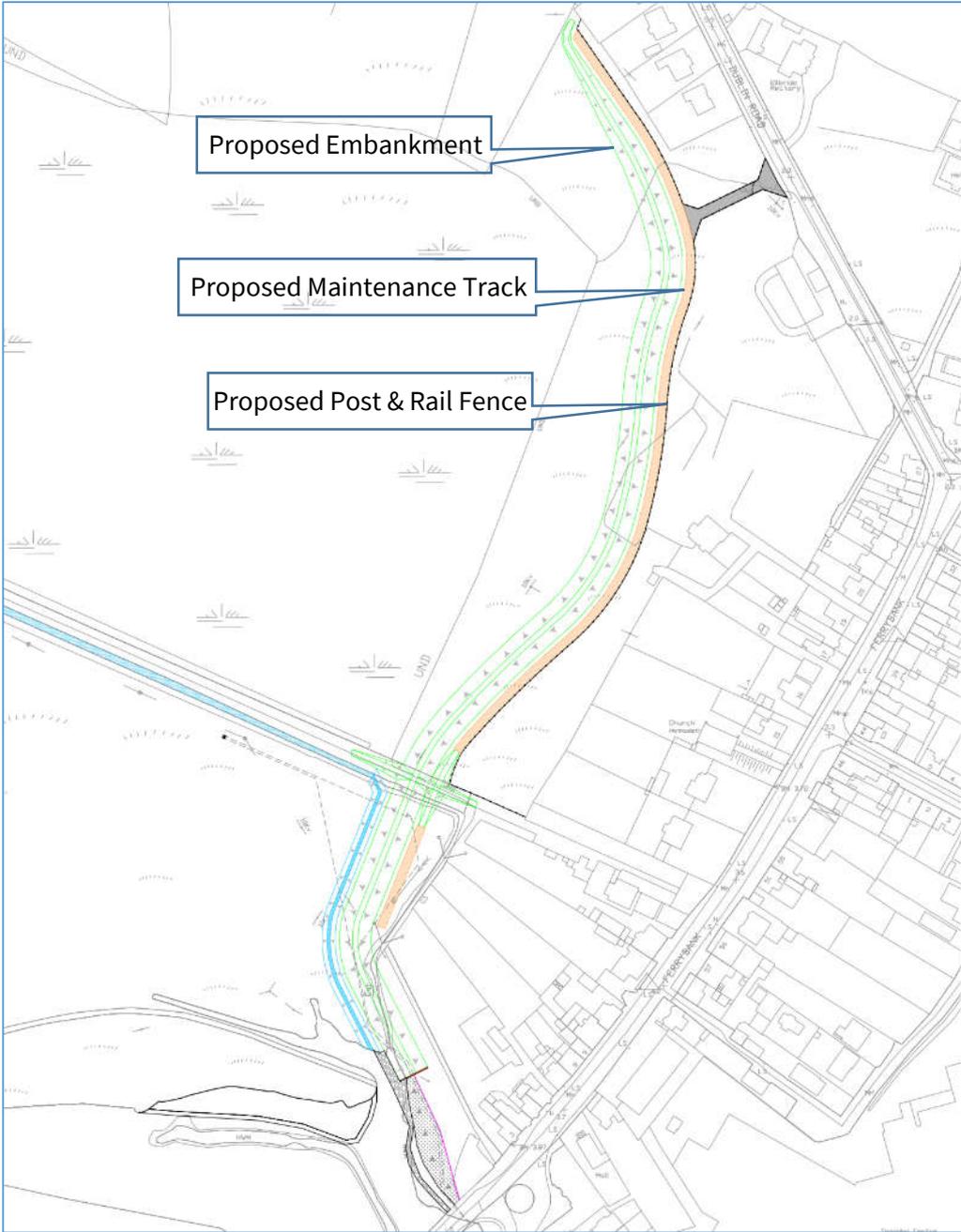


Figure 3.1 – Layout of Proposed Embankment and Wall

The heights of the embankment are shown on Drawing No. 88601-1034 with sections through the embankment shown on Drawing No. 88601-1035. The proposed levels for the top of the embankment are based on the design flood heights with an allowance for freeboard and for settlement. The top level of the embankment will vary from approximately 3.75mOD to 3.59mOD based on the design flood level. The resultant height will vary from 3.0m above existing ground level at its southern end and taper to existing ground level at its northern end and will be a maximum of approximately 4m high. The embankment will be constructed with side slopes of 1 vertical:2 horizontal with a 2.5m wide flat crest at the top of the embankment to facilitate routine inspection and maintenance. The width of the embankment will vary from a maximum of approximately 18.5m wide at its widest point to approximately 4.5m wide at the narrowest point at the northern end of the embankment. A french drain, outfalling to the Avoca River, will be constructed along the dry side of the embankment.

A 4m wide maintenance track is proposed to run along the majority of the embankment as alternative access is restricted by Arklow Town Marsh to the south and west of the embankment and residential and commercial properties to the north and east. As such, the access track will be the only means to have access for routine inspection and maintenance and possible repair. The access track will be suitable for use for heavy plant and machinery. The top of the embankment will allow pedestrian access for maintenance staff as well as for light machinery along the length to the embankment and allow the wet side of the embankment to be inspected and maintained.

The proposed boundary treatments are shown on Drawing Nos. 6545-303 to 6545-306 inclusive, included in Appendix 4.2 of the EIAR with an extract included below as Figure 3.2 below.



Figure 3.2 – Proposed Landscaping at Embankment

A post and rail fence is proposed along the edge of the maintenance track. Irish Native species rich grass and wildflower mixture is proposed along the length of the embankment. Planting with native woodland species of trees is proposed in the open areas on the dry side the embankment as shown on Drawing Nos. 6545-303 to 6545-306 inclusive. This planting is proposed in mitigation for planting removed, for visual screening and integration of the embankment structure, for habitat creation and mitigation and to support the national policy for 'No Net Loss' as outlined in the National Biodiversity Action Plan 2017-2021 (as set out in Chapter 10 of EIAR).

3.2 Alternatives Considered

The alternatives considered for the Arklow FRS are described in Chapter 3 (Alternatives) of the EIAR. Optioneering for the flood relief measures included the consideration of flood defence walls and embankments without other measures, but the required heights of flood defences were considered to be excessive. Therefore, increasing the conveyance capacity through Arklow Bridge by lowering the floor of the bridge, along with dredging upstream and downstream of the bridge, was adopted as a measure in combination with the flood defence walls and embankments.

Embankments are preferred to walls for flood defence purposes where space permits as they are more ecologically suitable, have a lower carbon footprint and have a more acceptable visual appearance. A wall up to 3.6m in height would be necessary along the edge of the marsh and was considered to have a significant visual impact.

The location of the proposed embankment was based on a consideration of properties along Ferrybank and the Dublin Road on the dry side (north and east) and Arklow Town Marsh, a proposed Natural Heritage Area, on the wet side (south and west) and maintaining a balance between the impacts on both.

Originally, the embankment proposed by the marsh ran in a series of straight lines. An alternative alignment comprising a series of curves closer to the rear of properties was developed in consultation with the project landscape architect to provide a more natural appearance.

3.3 Selection of Preferred Option

The preferred options arising from the consideration of alternatives described in Section 3.2 above are as follows:

- An embankment was selected as the form of flood defence to be utilised along the eastern and northern sides of Arklow Town Marsh on the north bank of the Avoca River.
- A sheetpiled wall with concrete capping was selected at the southern end of the flood defence due to limited space adjacent to properties at Ferrybank, proximity to the Avoca River and the nature of the soils at this location.

- The benefits associated with the introduction of a series of curves to soften its appearance led to the curved line being adopted. The benefits included reducing the impact on Arklow Town Marsh by moving the embankment farther from the marsh and a lower visual impact.

3.4 CPO-1 Patrick and Patricia Ivory

3.4.1 Issues

CPO-1 relates to plot 101 shown below in Figure 3.3 below. The Appellants, Patrick and Patricia Ivory, raised issues in relation to the proposed CPO with respect to:

- The extent of the land acquisition and the land requirements for the embankment.
- Permanent rather than temporary acquisition of lands.
- Boundary treatment.

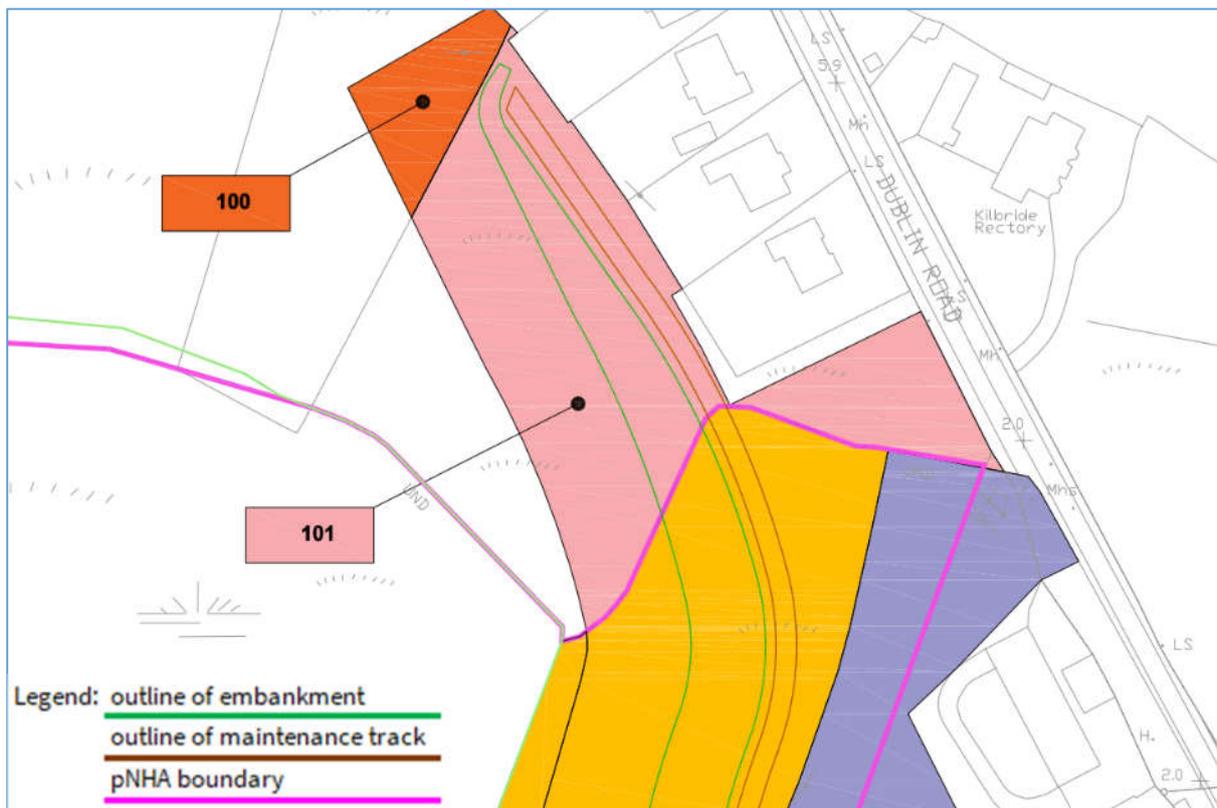


Figure 3.3 – Location of Plot 101

These issues are addressed below.

3.4.2 The Extent of the Acquisition

The extent of the CPO in plot 101 has been determined by the land required for the embankment, the maintenance track and temporary working area. The width required for the permanent works is approximately 20m. The balance of the area is required for temporary working space.

The Proposed Development provides for the planting of c.1.37ha of Proposed Native Woodland on the north bank of the Avoca River as shown on Drawing Nos. 6545-304, 6545-305 and 6545-306. This planting is being provided in mitigation for planting removed, for visual screening and integration of the embankment structure, for habitat creation and mitigation and to support the national policy for 'No Net Loss' as outlined in the National Biodiversity Action Plan 2017-2021 (as set out in Chapter 10 of EIAR). This includes the remainder of plot 101 bounding the Dublin Road.

The majority of planting proposed for mitigation at Plot 101 is referred to as "*Native Woodland Planting Area 2*" on Drawing Nos. 6545-305 and 6545-306, with the remainder grassed as "*Irish Native Species Rich Grass and Wildflower Mixture*".

3.4.3 Permanent Instead of Temporary Acquisition

Wicklow County Council is agreeable to changing the acquisition of the land on the marsh side of the embankment from permanent to temporary so it will be returned to the Appellants following the completion of the Scheme. Permanent acquisition will be required for the proposed permanent development including the embankment, the maintenance track and the planting area.

3.4.4 Boundary Treatment

The proposed boundary treatments are described above in Section 3.1. As the height of the embankment is approximately 1m in the location of Plot 101, with minimal visual impact, it is considered that there is no requirement for further landscaping.

3.5 CPO-8 Proinseas O'Brionn

3.5.1 Issues

CPO-8 relates to plots 102b, 103, 104 and 106 shown in Figure 3.4 overleaf.

The Appellant, Proinseas O'Brionn, raised issues in relation to the proposed acquisition with respect to:

- Flood defence system (embankment instead of wall).
- Lack of access between remaining lands (effect on material asset).
- Tree Planting at SC1.
- Alignment of embankment.

- Permanent acquisition of land.
- Location of Site Compound (SC) 1.

These issues are addressed in the following sections.

Issues raised in relation to planning and environmental matters have been addressed separately in *Response to Submissions relating to Planning & Environmental Matters (ABP ref 310368-21 & 310377-21)*, January 2022, submitted to ABP by WCC.

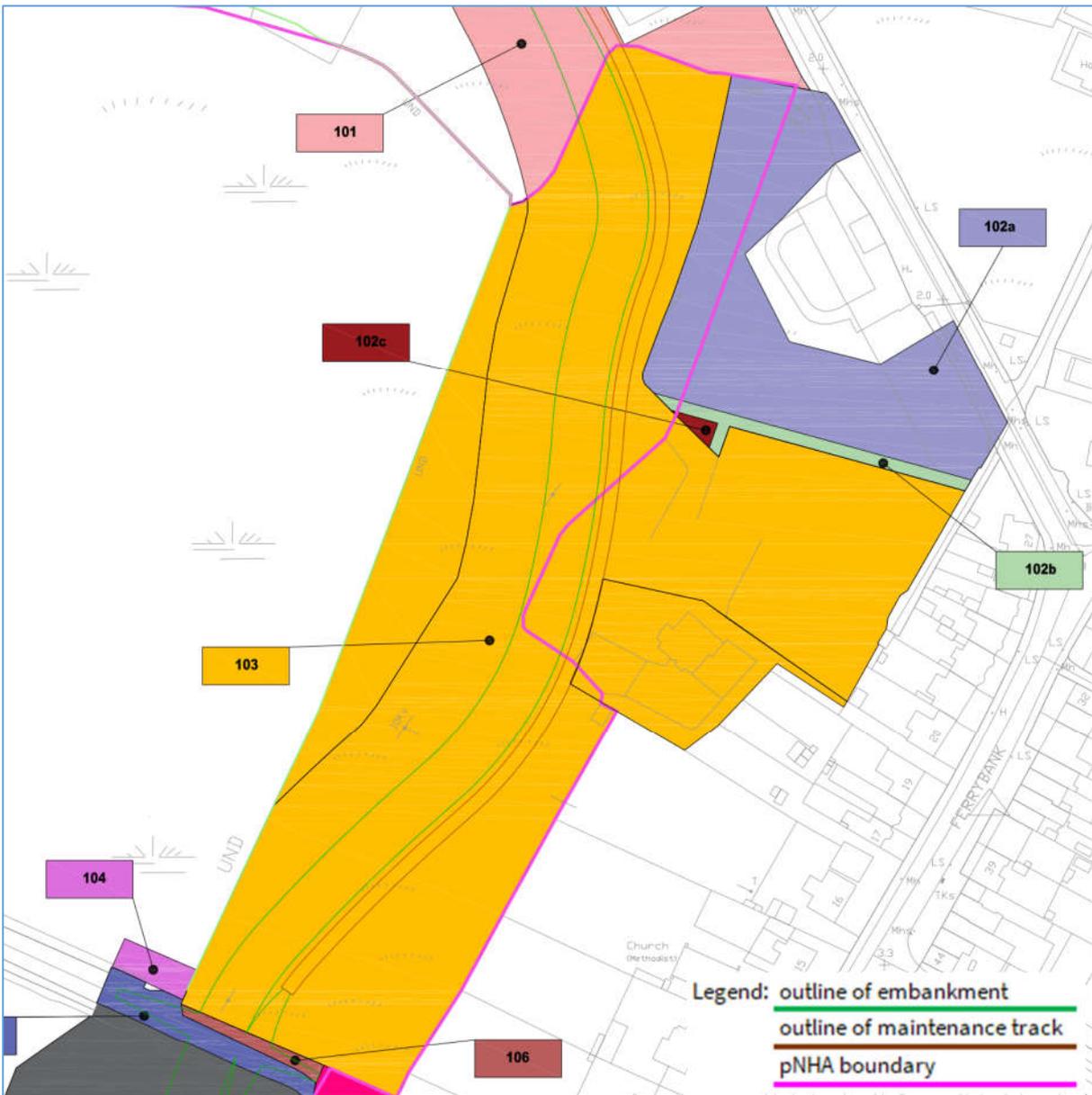


Figure 3.4 – Location of Plots 102b, 103, 104 and 106

3.5.2 Flood defence system (embankment instead of wall)

The rationale for preferring an embankment to a wall at Arklow Town Marsh is set out in Sections 3.2 and 3.3 above.

3.5.3 Lack of access between remaining lands (effect on material asset)

The lands belonging to Prionseas O’Brionn which will lie to the west of the embankment lie entirely within the Arklow Town Marsh proposed Natural Heritage Area (pNHA). See boundary of Arklow Town Marsh pNHA in Figure 3.5 below. If access is required, then provision can be made by granting a right-of-way along the access track over the embankment to connect the two parcels of land.



Figure 3.5 - Arklow Town Marsh pNHA Boundary (—————)

3.5.4 Tree Planting at SC1

The trees to be removed on the north side of the Avoca River as part of the development proposals are shown on Drawing Nos. 6545-304, 6545-305 and 6545-306 contained in Appendix 4.2 of the EIAR and summarised in Table 3.1 below.

Table 3.1 Tree Removal North of River

Tree Category	U (Poor Condition / Recommended for Removal)	C (Fair Condition)	B(Moderate Condition)	A (Good Condition)
Tree Nos.	T106; T107 + 3 SM Willows	T105; T109; T115 + 2 SM Willows plus c,5700 sqm of tree / scrub planting	T108;	None
	1 No.	9 No. + c.5,700 sqm	1 No.	0

Therefore, 11No. trees and c.0.57ha (1.41acres) of other plantings are to be removed on the north bank of the river and upstream of Arklow Bridge. In addition, the footprint of the proposed development, amounting to 3.5ha (8.65acrea), must be retained as grassland as any shrubs or trees may compromise the integrity of the embankment.

The habitats which will be directly impacted on the north side of the Avoca River as part of the development proposals are described in Section 10.4 and 10.5 and shown on Figures 10.6 and 10.7 of Chapter 10 *Biodiversity* of the EIAR.

The Proposed Development provides for the planting of c.1.37ha of Proposed Native Woodland as well as Irish Native Species Rich Grass and Wildflower Mixture, as shown on Drawing Nos. 6545-304, 6545-305 and 6545-306. This planting is being provided in mitigation for planting removed, for visual screening and integration of the embankment structure, for habitat creation and mitigation and to support the national policy for ‘No Net Loss’ as outlined in the National Biodiversity Action Plan 2017-2021 (as set out in Chapter 10 of EIAR).

The majority of planting proposed for biodiversity/visual mitigation at Plots 102b, 103, 104 and 106 is referred to as “*Native Woodland Planting Area 2*” on Drawing Nos. 6545-305 and 6545-306, with the remainder grassed as “*Irish Native Species Rich Grass and Wildflower Mixture*”.

3.5.5 Alignment of embankment

The preferred location of the embankment along the edge of the marsh was determined as described in Sections 3.2 and 3.3 above and in particular, was based on minimising the impact on Arklow Town Marsh pNHA.

3.5.6 Permanent instead of temporary acquisition

Wicklow County Council is agreeable to changing the proposed acquisition of the land on the marsh side of the embankment from permanent to temporary so it will be returned to the Mr

O’Brionn following the completion of the Scheme. Permanent acquisition will be required for the proposed permanent development including the embankment, the maintenance track and the planting area.

3.5.7 Location of site compound 1

Descriptions of the proposed site compounds are set out in Section 5.3.2 of Chapter 5 (Construction Strategy) of the EIAR, including the works proposed to develop them for their proposed uses and their reinstatement at the end of construction. Issues relating to planning and environmental matters have been addressed separately in *Response to Submissions relating to Planning & Environmental Matters (ABP ref 310368-21 & 310377-21), January 2022*, submitted to ABP by WCC. This includes a site compound layout drawing.

Potential locations of the construction site compounds were carefully assessed in the development of the scheme and as much as possible, suitable locations were identified based on getting a balance between the distances to work areas and proximity to residential development. The preference was to use greenfield rather than brownfield sites and to use lands in the control of Wicklow County Council (WCC) rather than private property, where possible; however, suitable lands in the ownership of WCC were not available in the vicinity of the work area for the proposed embankment.

Site compound 1 (SC1) is required for contractors’ site offices, welfare facilities, parking and storage. It will also be used for the archaeological monitoring and testing of the dredged material and for storing the dredged material to be reuse in the embankment. Sufficient land will be required to allow the dredged material to be spread in layers for inspection and metal detection. Based on the above requirements, the location of SC1 was selected , being a greenfield site close to the areas where dredging will be carried out and where dredged material will be reused. See Figure 3.6 below. This location will minimise construction traffic associated with transporting the dredged material from the Avoca River to a site for archaeological monitoring and testing and then to the embankment site for reuse. It also has minimal impact on existing activities at the site.

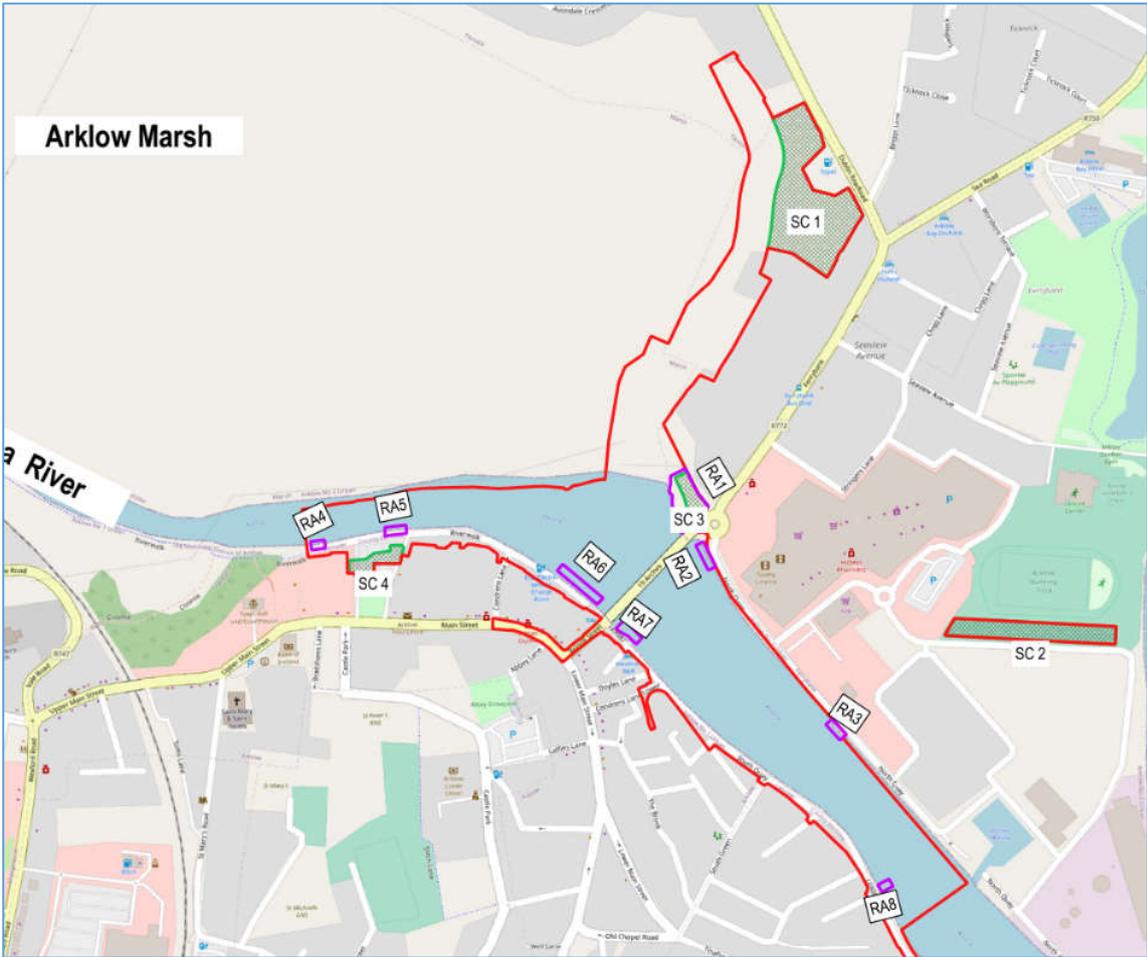


Figure 3.6 - Location of SC1

The permanent acquisition of the land is required in order to provide land for planting with native woodland species of trees in the open areas on the dry side the embankment as described in Section 3.5.4 above. This planting is proposed in mitigation for planting removed, for visual screening and integration of the embankment structure, for habitat creation and mitigation and to support the national policy for ‘No Net Loss’ as outlined in the National Biodiversity Action Plan 2017-2021 (as set out in Chapter 10 of EIAR).

4 CPO-3 Loss of Right-of-Way

4.1 Graeme McWilliams and Crag Digital Avoca Ltd.

4.1.1 Issues

CPO-3 relates to plots 107a, 107b and 107c shown in Figure 4.1 below .

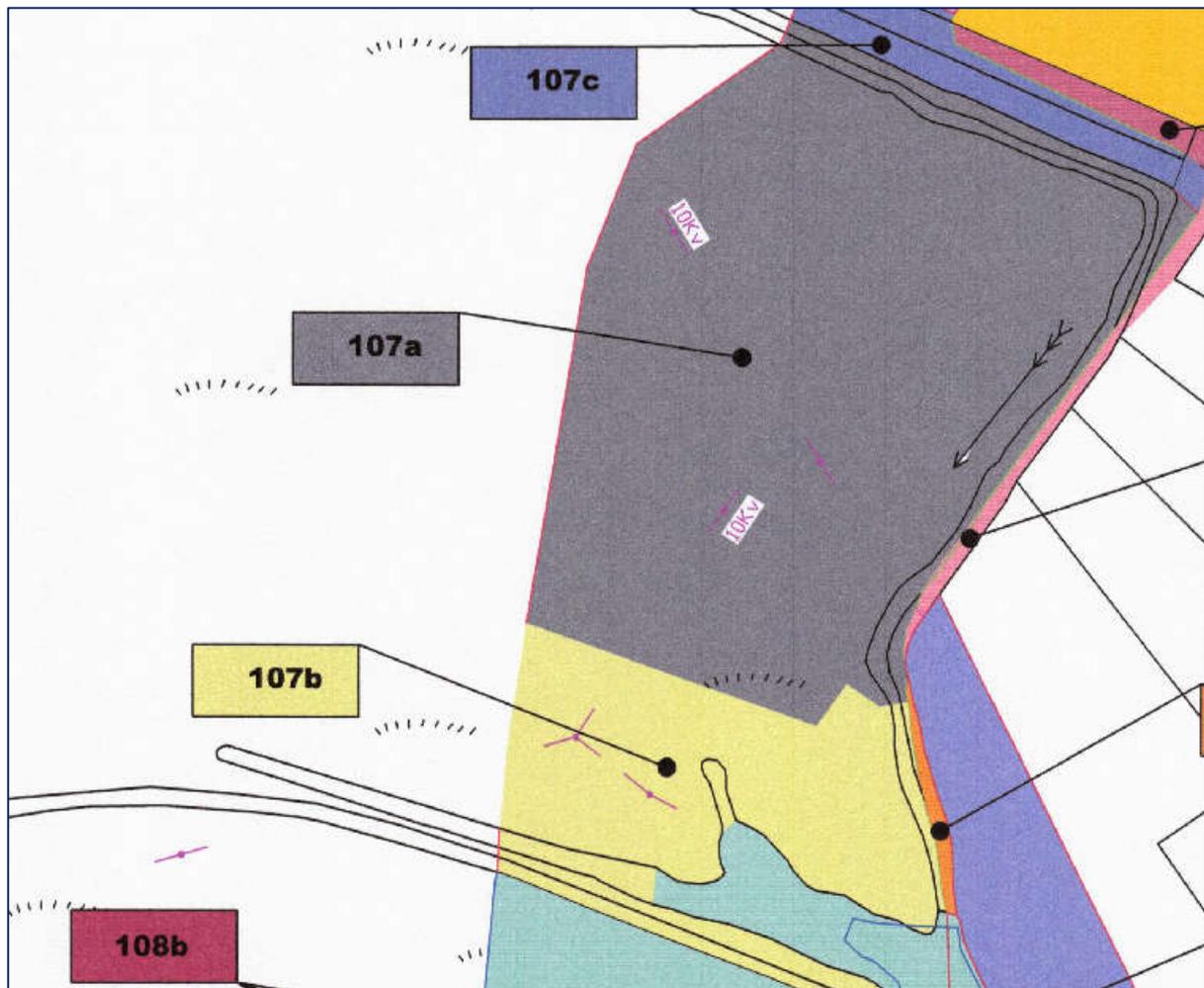


Figure 4.1 - Plots 107a, 107b and 107c

The Appellants, Graeme McWilliams and Crag Digital Above Ltd., raised issues in relation to the proposed acquisition with respect to:

- Acknowledgement of the existing right-of-way in favour of Crag Digital Avoca Ltd.
- Entitlement to alternative right-of-way on any new roadway if existing roadway is moved or altered.

4.1.2 Response

The proposed development at Ferrybank is shown on Drawing 88601-1032 in Appendix 4.1 of the EIAR. From submissions received to date from the Appellants, it is not clear as to the right-of-way they are referring to. The proposed embankment will cross the existing lane running from Ferrybank to Shelton Abbey. A ramp will be provided to cross the embankment at this location, ensuring access will be maintained along the lane on completion of the proposed development, as shown in Figure 4.2 below.

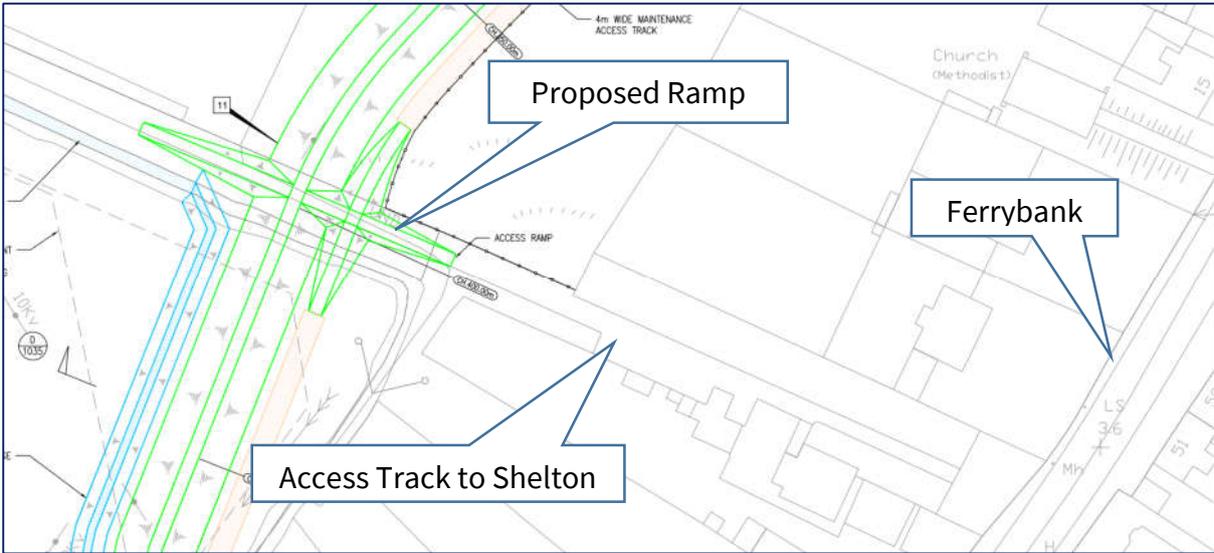


Figure 4.2 – Access Track to Shelton Abbey

WCC is not aware of any existing right-of way being extinguished but have been communicating with the Appellants to further investigate the matter. At the time of writing this report, the issue has not been clarified.

5 Permanent Instead of Temporary Acquisition

5.1 CPO-1 Patrick and Patricia Ivory

As stated in Section 3.4.3 above, Wicklow County Council is agreeable to changing the acquisition of the land on the marsh side of the embankment (part of plot 101) from permanent to temporary so it will be returned to Patrick Ivory following the completion of the Scheme. Permanent acquisition will be required for the proposed permanent development including the embankment, the maintenance track and the planting area.

5.2 CPO-2 Roadstone Holdings

The acquisition of Plot 125 by Wicklow County Council is proposed in order to provide land for site compound (SC) 6. SC6 will be used to accommodate contractors' offices, welfare facilities, parking and storage. It will also accommodate land for the archaeological monitoring and testing (metal detection) of dredged material. It is not required for the proposed permanent works. As such, Wicklow County Council is agreeable to changing the acquisition of plot 125 from permanent to temporary.

5.3 CPO-6 Arklow Slipway

The acquisition of Plot 124b by Wicklow County Council is proposed to accommodate the construction of the flood defence wall and ancillary works along the edge of the public road. Only a small strip is required for the proposed permanent works. As such, Wicklow County Council is agreeable to changing the acquisition of the remainder of plot 124b (outside the permanent works area) from permanent to temporary.

5.4 CPO-7 Estate of Malachy McDaniel Stone

The acquisition of Plot 109 by Wicklow County Council is proposed to accommodate the construction of the permanent works comprising the flood defence wall and embankment at the north side of the Avoca River, permanent access for the inspection and maintenance of the flood defence wall and embankment and for the planting with grass. This planting, shown on Drawing 6545-304 in Appendix 4.2 of the EIAR with an extract in Figure 5.1 overleaf, is being provided in mitigation for planting removed, for habitat creation and mitigation and to support the national policy for 'No Net Loss' as outlined in the National Biodiversity Action Plan 2017-2021 (as set out in Chapter 10 of EIAR).



Figure 5.1 – Proposed Planting at Ferrybank.

5.5 CPO-8 Proinseas O Brionn

As stated in Section 3.5.6 above, Wicklow County Council is agreeable to changing the acquisition of the land on the marsh side of the embankment (part of plot 103) from permanent to temporary so it will be returned to the Mr O’Brionn following the completion of the Scheme. Permanent acquisition will be required for the proposed permanent development including the embankment, the maintenance track and the planting area.

6 Permanent Acquisition of Green Areas on South Quay

6.1 Development Proposals on South Quay

The proposed development at South Quay is described in Sections 4.4.5 and 4.4.7 of Chapter 4 (Description of the Proposed Scheme) of the Environmental Impact Assessment Report (EIAR) and is detailed on Drawing Nos. 88601-1040 to 88601-1049 inclusive contained in Appendix 4.1 and Drawings Nos. 6545-301 to 6545-303 inclusive of Appendix 4.2 of the EIAR. It comprises flood defence walls running from the downstream abutment of Arklow Bridge to the Dock as shown in Figure 6.1 below.

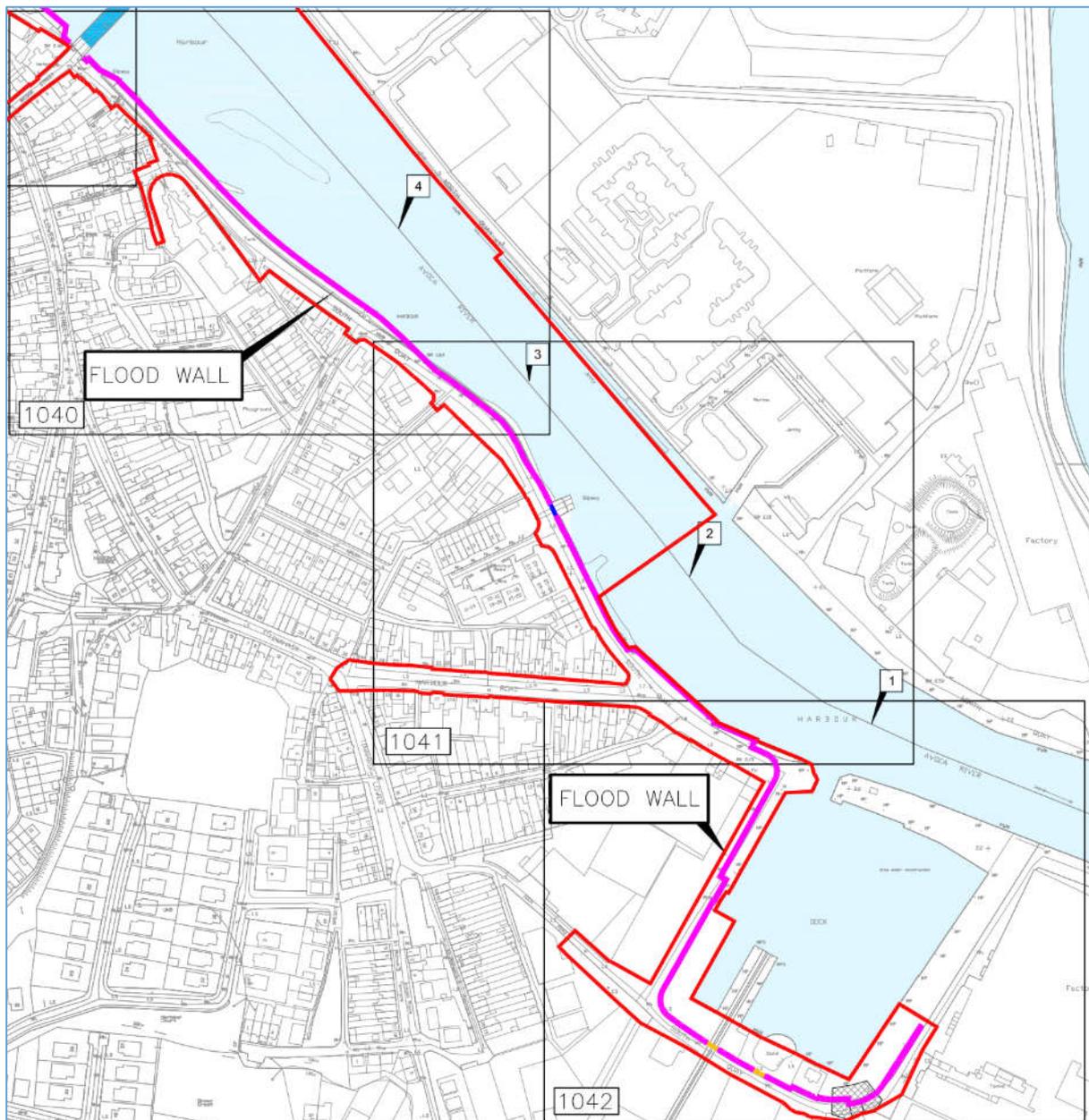


Figure 6.1 – Location of Flood defence Walls on South Quay

The section of flood defence wall from Arklow Bridge to approximately Ch 310 on South Quay will take advantage of the widening of South Quay proposed as part of the Arklow WWTP and be constructed c. 5m out into the river channel. Significant public realm works and urban landscaping are proposed in conjunction with the flood defence walls as shown on Drawing Nos. 6545-301, 6545-302 and 6545-303 contained in Appendix 4.2 of the EIAR

6.2 Alternatives Considered

6.2.1 Tidal & River Barrages

The alternatives considered for the Arklow FRS are described in Chapter 3 (Alternatives) of the EIAR. Early optioneering for the flood relief measures included the consideration of a tidal barrage at the mouth of the Avoca River and a river barrage located upstream of Arklow Town. These measures would require a bypass channel through Arklow and embankments around Arklow Town Marsh. During times of flood, both barrages would be closed and river waters would be diverted into the marsh and then through the bypass when storage at the marsh was full.

These measures are screened out due to the significant environmental impact related to Arklow Town Marsh, significant landscape and visual impacts, impacts on private property to accommodate the bypass channel and the estimated costs of these measures.

6.2.2 Removal of Pinch Point

At Feasibility Report stage, the preferred option entailed reducing the pinch point in the river channel by South Quay. This would have involved widening the river channel by up to 10m with the removal of approximately 130m of the existing quay wall and the existing slipway on South Quay. This would have reduced flood levels slightly but would have resulted in more uniform river velocities with consequent reduced sedimentation in the estuary.

A subsequent detailed study on the hydrogeomorphology of the Avoca River along this stretch found that the widening of the channel resulted in only minor benefits in reducing deposition of sediment. In addition, in consultation with heritage specialists, public representatives and local residents, the maritime heritage and the value of the general setting of the existing quay wall and slipway were considered to be worth preserving if possible. As such, the reduction of the pinch point was removed from the scope.

6.2.3 Retention of Quay Wall

As mentioned above, the maritime heritage and general setting value of the existing quay wall and slipway were considered to be worth preserving if possible. As such, the line of the flood defence wall in this area is now to run parallel to and approximately 2m behind (on the land side) of the existing quay wall to allow space for construction without impacting on the quay wall.

6.2.4 Construction of Walls

The alternative forms of flood defences are set out in Section 3.5.4 of Chapter 3 (Alternatives) of the EIAR. The standard forms of permanent flood defences are embankments where space permits and walls in urban areas where there is restricted space. Walls are typically of concrete construction, sometimes faced with masonry, or sheetpiles clad with concrete or masonry.

Glass walls have been used as part of flood defence walls in a number of locations in Ireland with varying success. Selective use can enhance a view and mitigate impacts caused by long lengths of high concrete walls. There are negative aspects to the use of glass walls. These include:

- Increased capital costs.
- Increased routine maintenance requirements to keep the glass clean.
- Vulnerability to vandalism including graffiti and damage.

Vandalism and anti-social behaviour are often associated with public walkways including riverside paths and boardwalks.

In the Arklow FRS, glass panels were included in the proposed flood defence walls along the south bank of the Avoca River in areas where the proposed wall heights above existing ground level were greatest and where public seating was proposed.

Subsequently, in the response to submissions relating to the Planning Application for the FRS (ABP ref 310368-21), additional glass panels have been included in the flood defence walls along South Quay, as described in Section 3.1 of *Response to Submissions relating to Planning & Environmental Matters (ABP ref 310368-21 & 310377-21), January 2022*.

6.2.5 Public Realm

The alternatives for public realm works on South Quay are described in Section 3.5.5 of Chapter 3 (Alternatives) of the EIAR, informed by public realm and amenity as well as by traffic movements. A continuous promenade from River Walk to Arklow Harbour quickly became the most beneficial solution, providing high quality amenity value for local residents and also making a significant contribution to future tourism potential of the town. The proposal for a continuous promenade also became the driver for other design decisions further downstream, with realignment of the roadway to maximise amenity value along the river edge and establishment of a series of connected riverside public spaces. The new pedestrian environment will be further enhanced by the provision of raised tables at each of the road junctions, slowing down traffic and also providing safe places to cross the road. The cross-section of the new South Quay includes designated on-street parking alternately on one or both sides of the road, with some sections of potential parking given over to increased amenity space in the form of grass verges and new tree planting.

The promenade from chainage 310 to chainage 440 could have followed the road alignment with green space between it and the flood relief wall, or as is proposed, the promenade will follow the

flood relief wall and river edge with green space and trees between it and the road, so as to maximise the amenity value of the promenade and respect the heritage value of the original quay.

6.3 Selection of Preferred Option

The preferred option following the assessment of alternatives comprised:

- A flood defence wall along South Quay to defend against fluvial and coastal flooding.
- Retention of the existing quay wall from chainage 310 to chainage 440.
- The line of the flood defence wall from chainage 310 to chainage 449 to be set approximately 2m behind the existing quay wall.
- A continuous promenade along the river side from Arklow Bridge to the harbour.
- New footpaths along the front of houses from South Green to Anchor Mews.

The preferred options listed above require the development of the green areas in front of the properties on South Quay between South Green and Anchor Mews.

The preferred option for the proposed development in this area is shown in Figure 6.2 below.



Figure 6.2 – Proposed Development at South Quay (South Green – Anchor Mews)

6.4 CPO-4 Elizabeth and Nicola Kenny

6.4.1 Issues

CPO-4 relates to plot 120g shown in Figure 6.3 overleaf. The Appellants, Elizabeth and Nicola Kenny, raised issues in relation to the proposed CPO with respect to:

- Occupiers of plot 120g
- Road closer to houses
- Amenity value of green area
- One-way traffic
- Hazard of new footpath
- Line of promenade by river edge
- Conflict with County Development Plan
- Removal of trees

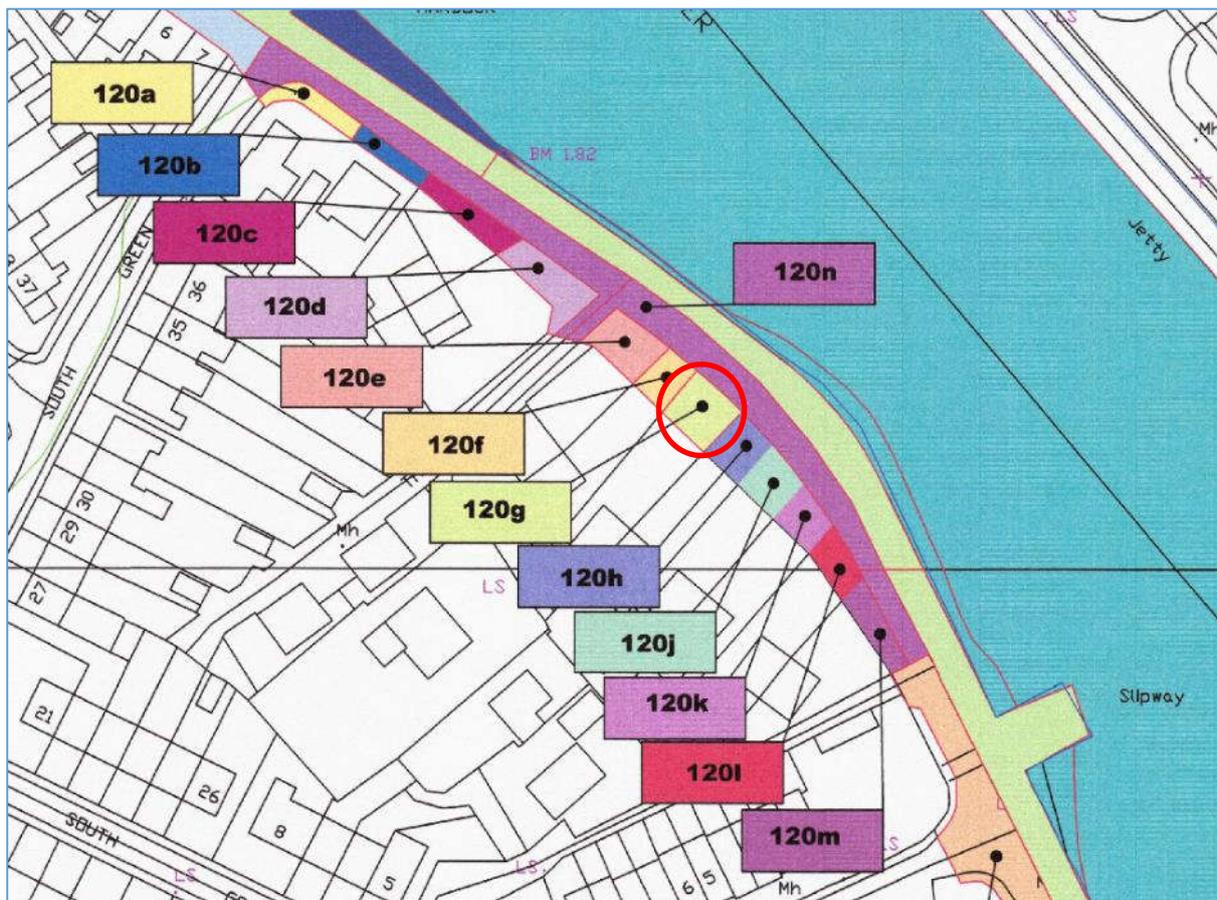


Figure 6.3 – Location of Plot 120g (circled red)

These issues are addressed in the following sections.

Issues raised in relation to planning and environmental matters were addressed separately in *Response to Submissions relating to Planning & Environmental Matters (ABP ref 310368-21 & 310377-21), January 2022*.

6.4.2 Occupiers of plot 120g

The Appellants, Nicola and Elizabeth Kenny, are not the registered owners of plot 120g. The green areas are currently considered to be in public ownership and will remain in public ownership following completion of the Scheme. It is acknowledged that the Appellants do have private right of access from their property over plot 120g to the public road.

6.4.3 Road closer to houses

The edge of the public road is currently approximately 29m from the front of the Appellants' house. The proposed development will result in the edge of the road being approximately 23m from the front of the house and this is considered to be a significant distance in an urban environment.

6.4.4 Amenity value of green area

At present, there is very little green space along South Quay. For much of its length between Doyle's Lane and South Green, there is no footpath and the existing road extends right up to the quayside or existing low wall. In several places there is car parking right beside the existing wall (see 16.3.1.2 of chapter 16 of the EIAR). The claims by the Appellants referring to a loss of green space in front of properties on South Quay are acknowledged. The green space forms a further barrier between road and properties in addition to the properties' front gardens. It is acknowledged that this environment would be changed by the proposed new landscaping, however the new landscaping is intended to enhance the amenity of the riverside and to improve the public realm, and not to diminish it. It will include a promenade for walking, retention of green areas, tree planting and seating. The road will be transformed into a more pedestrian-friendly environment and will be subject to a 30km speed limit. This will also permit more space for landscaping beside the river and for more pedestrian connectivity. Refer Figures 6.4 and 6.5 overleaf.



Figure 6.4 – Proposed Amenity Areas-Plan



Figure 6.5 – Proposed Amenity Areas-Section 4-4

6.4.5 One-way traffic

Traffic is considered and discussed in Chapter 7 of the EIAR. It is preferable to provide two-way roadways in urban areas as it results in lower traffic speeds, a safer environment for pedestrians and cyclists and it provides more convenient access to local properties. (Reference Section 3.4.1 Vehicle Permeability; Design Manual for Urban Roads and Streets page 53).

The extension of the one-way system on South Quay is not considered necessary nor beneficial as it would potentially result in longer overall journeys for local residents, increase traffic flows on neighbouring streets such as Lower Main Street, South Green, Harbour Road, Bridge Street, etc. and potentially result in higher traffic speeds along the South Quay. There is sufficient width available along the majority of the South Quay to provide the required enhancement in public realm and retain two-way traffic. The currently proposed two-way road will cater for cyclists in a low flow-low speed environment and will be an attractive environment.

6.4.6 Hazard of new footpath

The Appellants state that the green area in front of their house is used by children and that it’s removal and replacement with a 2m wide footpath will result in a hazard for children, both in crossing the road and due to lack of line of sight for motorists and residents. The current situation by the Appellants’ house is shown in Figure 6.6. Clearly, the lack of a footpath on either side of the road must be considered a hazard, particularly if children are playing in the green areas immediately outside the gates of properties when vehicles are existing. The lack of formal parking could also lead to a nuisance. The unguarded edge of the river presents a hazard for motorists and pedestrians alike, including children.



Figure 6.6 – Current Situation on South Quay (©Google streetview image)

The development proposals in relation to the area will provide new footpaths on each side of South Quay. The provision of the new footpath along the existing property boundary walls, including drive-ways, is a standard provision in a suburban context. It will not result in any safety implications and there is clear visibility between drivers exiting the properties and pedestrians on the footpath. The 4m distance from the wall at the front of the houses to the edge of the road will ensure that there is more than sufficient line of sight for motorists. In addition, the provision of new footpaths will remove the need for pedestrians having to walk on the existing roadway or

along the grass verge and this new footpath will be a positive addition to Arklow and support increased active travel in the town.

Proposed traffic calming measures include the narrowing of the existing road carriageway, provision of footpaths and soft landscaping along both sides of the road, raised road levels at road junctions along South Quay and a raised crossing point. All of the foregoing will provide for a safer environment with respect to traffic and will help reducing the risk of traffic accidents. The new flood defence wall will guard against falls into the river.

It is considered, based on the above, that the overall environment will be considerably safer in terms of traffic following the completion of the development than exists at present.

6.4.7 Line of promenade by river edge

As noted in Section 6.4.4 above, the promenade will follow the flood relief wall and river edge with green space and trees between it and the road, so as to maximise the amenity value of the promenade and respect the heritage value of the original quay. The promenade by the river also accommodates the seating area and glass panels in a better manner.

6.4.8 Conflict with County Development Plan

The Appellants allege two contraventions of the County Development Plan; 1) minimising surface water runoff due to impermeable surfaces, and 2) enhancing open spaces and improving connectivity.

The policy of minimising surface water runoff from new developments can have positive impact on reducing peak flows in watercourses and consequently, reducing flood levels, though not significantly for the larger flood events. However, where surface water runoff is to a tidal or coastal area, as is the case along South Quay, there is no benefit of reduced flood levels which are driven by extreme tide levels, tidal surges and wave heights.

The public realm design for South Quay, as described in Section 4.7 of Chapter 4 (Description of the Proposed Scheme) of the EIAR, is based on integrating the flood defence elements on the proposed development with South Quay and re-inventing the public amenity value of the river edge for the town and its people.

The increase in width of South Quay to accommodate the Arklow WWTP interceptor sewer will provide the opportunity to enhance the public amenity. The retention of the existing quay wall, described in Section 6.2.3 above, respects the cultural heritage of South Quay. The proposed public realm development of the open spaces as described in Section 6.4.4 above is considered to be in compliance with the policy in the County Development plan to enhance open spaces, in the context of also providing flood relief measures along South Quay.

A new continuous riverside promenade will extend for over 1.0km from upstream of the town carpark along River Walk and South Quay to the Arklow Harbour. The promenade will be exclusively for pedestrians and will typically be a minimum of 3.0m in width but incorporating a series of wider terraces, green spaces and viewing platforms. The promenade will tie into the

existing riverine River Walk upstream of the carpark and will tie in with the existing environment at Arklow Harbour. This proposed promenade is entirely in keeping with the aspiration of the County Development Plan for improving connectivity. See Figure 6.7 below.



Figure 6.7 – Proposed promenade on South Quay

6.5 CPO-5 Christine McElheron

6.5.1 Issues

CPO-5 relates to plot 120h shown below in Figure 6.8. The Appellant, Christine McElheron, raised issues in relation to the proposed CPO with respect to:

- Occupier of plot 120h
- Amenity value of green area
- Traffic and Road Width
- New footpath
- Surface Water Runoff
- Road closer to houses

These issues are addressed in the following sections.

Issues raised in relation to planning and environmental matters were addressed separately in *Response to Submissions relating to Planning & Environmental Matters (ABP ref 310368-21 & 310377-21), January 2022.*

6.5.2 Occupiers of plot 120h

The Appellant is not the registered owners of plot 120h. The green areas are currently considered to be in public ownership and will remain in public ownership following completion of the Scheme. It is acknowledged that the Appellants do have private right of access from their property over plot 120g to the public road.

6.5.3 Amenity value of green area

The loss of the amenity value of the green area in front of the Appellant’s and neighbouring houses and the provision of new amenities are discussed in Section 6.4.4 above. It is considered, when the new amenities are taken into account, that there is an overall positive impact in terms of amenity in this area.

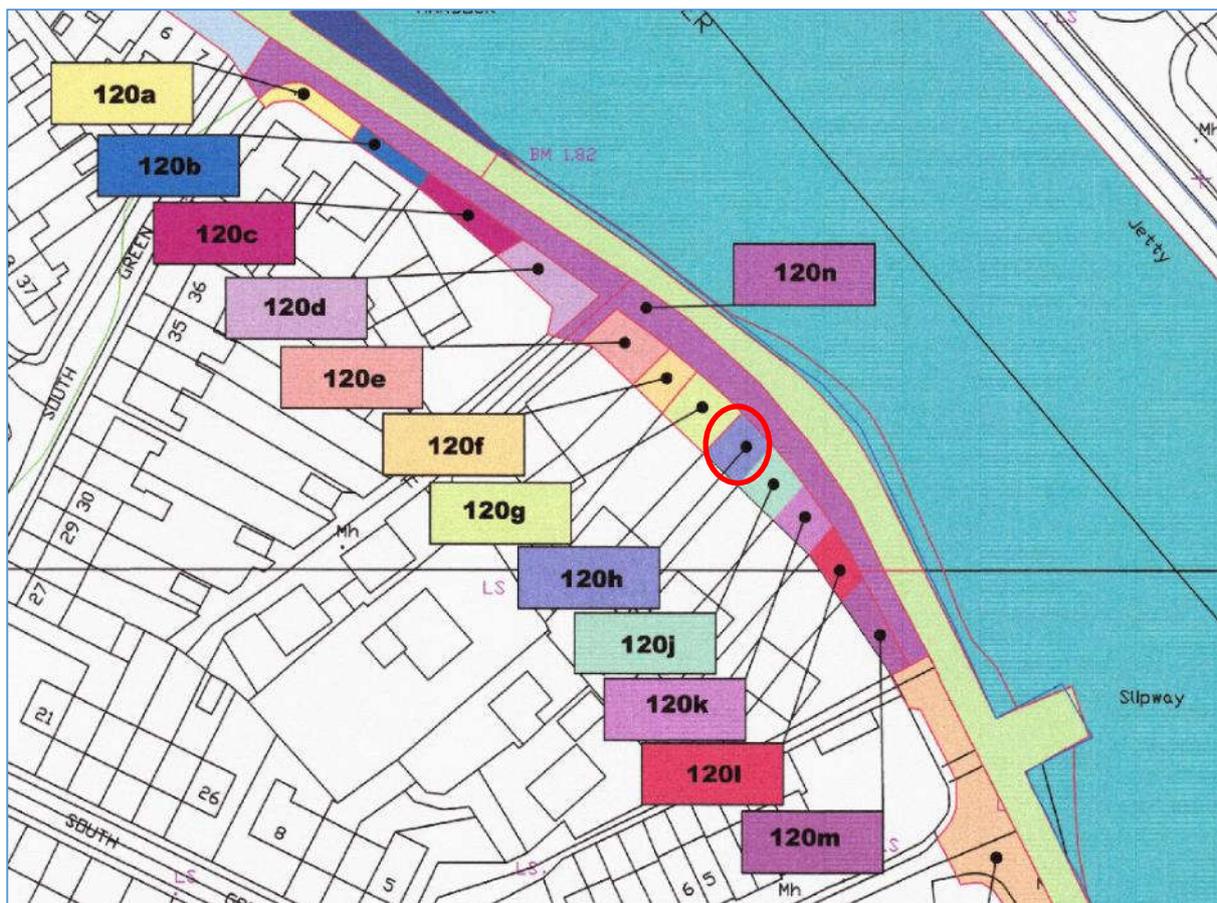


Figure 6.8 – Location of Plot 120h (circled red)

6.5.4 Traffic and Road Width

The proposed road will be narrower than the existing carriageway. The proposed public realm works including kerbs, green strips and footpaths will encourage slower traffic along South Quay. Also, the raised platforms at road junctions along South Quay will help to reduce traffic speeds.

6.5.5 Proposed New Footpath

The proposed new footpath at the front of the Appellant's property is discussed in Section 6.4.6 above. It is considered, based on the assessment in Section 6.4.6 that the overall environment will considerably safer following the completion of the development than exists at present.

6.5.6 Surface Water Runoff

The policy of minimising surface water runoff from new developments can have positive impact on reducing peak flows in watercourses and consequently, reducing flood levels, though not significantly for the larger flood events. However, where surface water runoff is to a tidal or coastal area, as is the case along South Quay, there is no benefit of reduced flood levels which are driven by extreme tide levels, tidal surges and wave heights.

6.5.7 Road closer to houses

The edge of the public road is currently approximately 28m from the front of the Appellants' house. The proposed development will result in the edge of the road being approximately 22.5m from the front of the house and this is considered to be a significant distance in an urban environment.

6.6 CPO-9 Peir Leonard

6.6.1 Issues

CPO-9 relates to plot 120k shown in Figure 6.9 overleaf. The Appellant, Peir Leonard, raised issues in relation to the proposed CPO with respect to:

- Lack of engagement from WCC/OPW.
- Requirement for removal of green spaces.
- Insufficient sightlines from adjoining properties.
- Impact on house structure.
- Surface water runoff .
- Road safety.
- Removal of children's play area.
- Noise closer to house.
- Unnecessary cost.

These issues are addressed in the following sections.

Issues raised in relation to planning and environmental matters were addressed separately in *Response to Submissions relating to Planning & Environmental Matters (ABP ref 310368-21 & 310377-21, January 2022.*

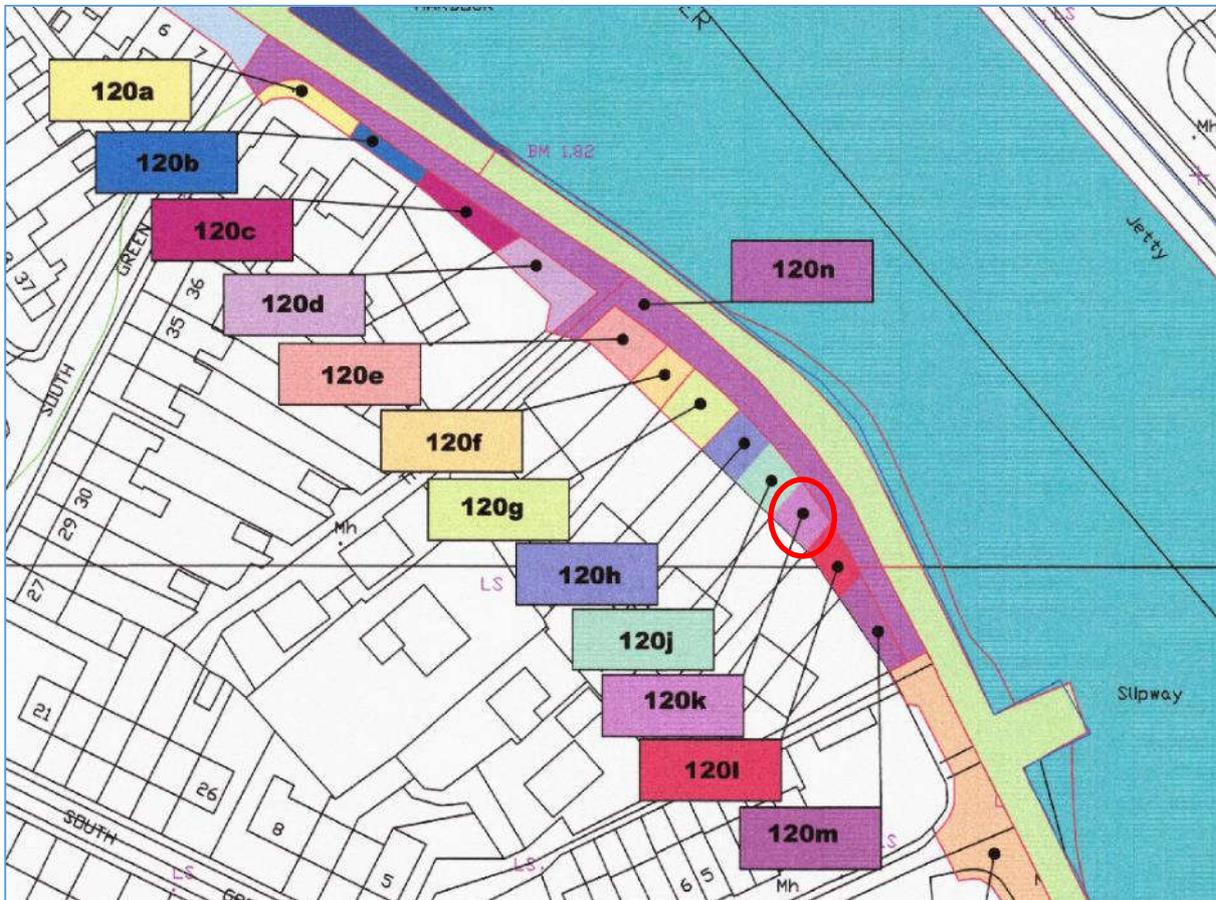


Figure 6.9 – Location of Plot 120k (circled red)

6.6.2 Lack of Engagement from WCC/OPW

Consultation undertaken in relation to the proposed Arklow FRS is described in Section 1.6 of Chapter 1 (Introduction) of the EIAR. Public information events in relation to proposals for the Arklow FRS were held in March 2007, August 2016, November 2016 and March 2021.

WCC consulted local elected representatives in the Arklow and wider Wicklow area throughout the design development stage of the scheme. Project updates were issued to elected representatives throughout with specific briefings provided to elected representatives in September 2020, November 2020 and March 2021.

The feedback from the above consultations fed into and informed the design development for the Scheme.

6.6.3 Requirement for removal of green spaces

The proposed development for South Quay, the alternatives considered and the selection of the preferred measures are described in Sections 6.1, 6.2 and 6.3 respectively above as well as in Chapters 3 (Alternatives) and 4 (Description of the Proposed Scheme) of the EIAR. Overall, the design of the Scheme sought to achieve a balance between the various competing interests while ensuring that technically the required level of flood defence is provided. The removal of the green space is required in order to provide space for:

- Retention of quay wall and 2m river edge to address requests from locals for retention of marine and cultural heritage .
- 3m wide promenade.
- Seating area by glass panels (change from original submission).
- Grass area between promenade and road.
- Grass area between road and new footpath.
- New footpath in front of houses.

6.6.4 Insufficient sightlines from adjoining properties

The development proposals in relation to the area will provide new footpaths on each side of South Quay. The provision of the new footpath along the existing property boundary walls, including drive-ways, is a standard provision in a suburban context. It will not result in any safety implications and there is clear visibility between drivers exiting the properties and pedestrians on the footpath. The 4m distance from the wall at the front of the houses to the edge of the road will ensure that there is more than sufficient line of sight for motorists. In addition, the provision of new footpaths will remove the need for pedestrians having to walk on the existing roadway or along the grass verge and this new footpath will be a positive addition to Arklow and support increased active travel in the town.

6.6.5 Impact on house structure

It is not clear from the Appellants submission what potential impact on the house structure is of concern. The Construction Strategy is described in Chapter 5 of the EIAR. Noise and Vibration are addressed in Chapter 9 of the EIAR.

As outlined in Section 9.6.1.1 of Chapter 9 (*Noise and Vibration*) of the EIAR, where considered necessary, structural surveys will be undertaken at sensitive receptors in close proximity to the works to establish their condition and tolerance for vibration impacts. In addition, as outlined in Section 9.6.2.1 of Section 9 of the EIAR, the Main Contractor(s) shall be required to carry out continuous noise and vibration monitoring at the three closest sensitive receptors to the proposed development works during the construction phase. Environmental noise monitoring will be undertaken only by suitably trained and

experienced staff. In the unlikely event of vibration limits being exceeded, works will cease, and alternative construction methods will be used.

The edge of the public road is currently approximately 25m from the front of the Appellant's house. The proposed development will result in the edge of the road being approximately 21.5m from the front of the house and this is considered to be a significant distance in an urban environment. In addition, proposed traffic calming measures include the narrowing of the existing road carriageway, provision of footpaths and soft landscaping along both sides of the road, raised ground levels at road junctions along South Quay and a raised crossing point. This will lead to lower traffic speeds with consequent vibration levels.

6.6.6 Surface Water Runoff

The policy of minimising surface water runoff from new developments can have positive impact on reducing peak flows in watercourses and consequently, reducing flood levels, though not significantly for the larger flood events. However, where surface water runoff is to a tidal or coastal area, as is the case along South Quay, there is no benefit of reduced flood levels which are driven by extreme tide levels, tidal surges and wave heights.

6.6.7 Road closer to houses

The edge of the public road is currently approximately 25m from the front of the Appellants' house. The proposed development will result in the edge of the road being approximately 21.5m from the front of the house and this is considered to be a significant distance in an urban environment. In addition, proposed traffic calming measures include the narrowing of the existing road carriageway, provision of footpaths and soft landscaping along both sides of the road, raised ground levels at road junctions along South Quay and a raised crossing point.

6.6.8 Removal of children's play area

The green area in front of the Appellant's and neighbouring houses does provide an amenity value. This amenity area will be replaced by alternative amenities as shown in Figures 6.4 and 6.5 above. These include:

- Retention of quay wall and 2m river edge.
- Wide promenade.
- Glass panels in wall (change from original submission).
- Seating area by glass panels (change from original submission).
- Grass area between promenade and road.
- Grass area between road and new footpath.
- New footpath in front of houses.

All of the above, as further described in Section 6.4.4 above, greatly enhance the amenity value along South Quay and it is considered, when all of the above are taken into account, that there is an overall positive impact in terms of amenity in this area.

6.6.9 Road safety

The development proposals in relation to the area will provide new footpaths on each side of South Quay. The provision of the new footpath along the existing property boundary walls, including drive-ways, is a standard provision in a suburban context. It will not result in any safety implications and there is clear visibility between drivers exiting the properties and pedestrians on the footpath. The 4m distance from the wall at the front of the houses to the edge of the road will ensure that there is more than sufficient line of sight for motorists. In addition, the provision of new footpaths will remove the need for pedestrians having to walk on the existing roadway or along the grass verge and this new footpath will be a positive addition to Arklow and support increased active travel in the town.

Proposed traffic calming measures include the narrowing of the existing road carriageway, provision of footpaths and soft landscaping along both sides of the road, raised road levels at road junctions along South Quay and a raised crossing point. All of the foregoing will provide for a safer environment with respect to traffic and will help reducing the risk of traffic accidents. The new flood defence wall will guard against falls into the river.

It is considered, based on the above, that the overall environment will be considerably safer in terms of traffic following the completion of the development than exists at present.

6.6.10 Noise closer to house

Noise and Vibration are addressed in Chapter 9 of the EIAR. It is expected that there will be a short-term negative impact due to increased noise levels during construction works. Post-construction, it is expected that noise levels will be lower as described below. The edge of the public road is currently approximately 25m from the front of the Appellants' house. The proposed development will result in the edge of the road being approximately 21.5m from the front of the house and this is considered to be a significant distance in an urban environment. In addition, proposed traffic calming measures include the narrowing of the existing road carriageway, provision of footpaths and soft landscaping along both sides of the road, raised ground levels at road junctions along South Quay and a raised crossing point.

6.6.11 Unnecessary cost

It is not clear from the submission what cost is being referenced; overall Scheme cost, the cost of the proposed public realm works on South Quay, or the cost associated with the CPO of the green spaces on South Quay.

The overall cost of the Scheme includes costs for direct flood risk management measures e.g., flood defence walls, etc., and works considered necessary to mitigate any potential negative impacts due to these measures. The public realm works as proposed for South Quay have been

designed in order to integrate the flood defence wall into the urban environment and provide enhanced public spaces. As such, all costs, including costs for the public realm work, are considered to be necessarily incurred to ensure the delivery of the Scheme.

The proposed acquisition of the lands on South Quay required to carry out the development are considered necessary and there are no reasonable alternatives available.

7 CPO of South Quay South of the Dock

7.1 Development Proposals on South Quay

The proposed development by the Dock at South Quay is described in Section 4.4.5 of Chapter 4 (Description of the Proposed Scheme) of the EIAR and is detailed on Drawing Nos. 88601-1042, 88601-1045 and 886-01-1049 contained in Appendix 4.1 of the EIAR . It comprises a low flood defence wall running along the western, southern and part of the eastern sides of the Dock.

7.2 CPO-6 Arklow Slipway Limited

7.2.1 Issues

CPO-4 relates to plot 124d shown below in Figure 7.1. The Appellant, Arklow Slipway Limited, raised issues in relation to the proposed acquisition with respect to:

- Denied access to water from plot 124d.
- Potentially denied access to retained lands following sale.

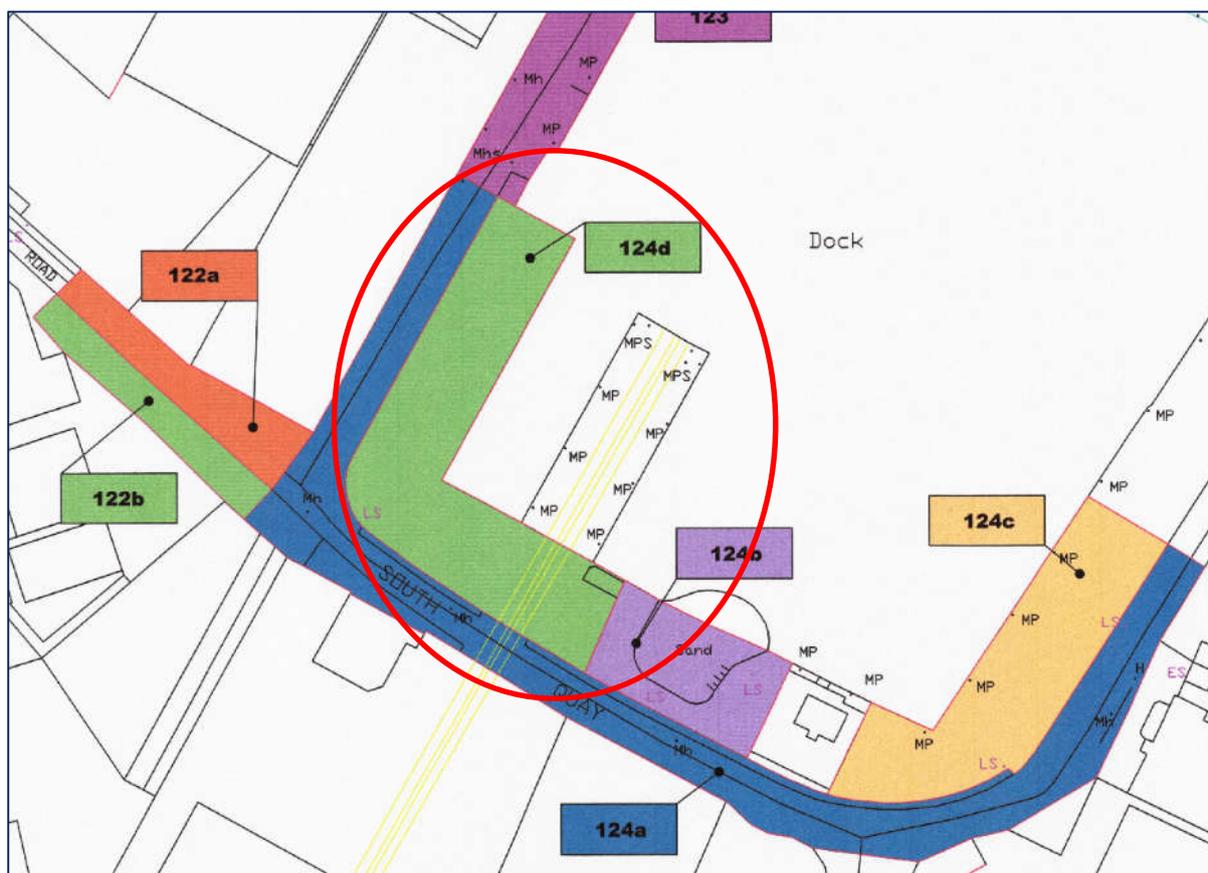


Figure 7.1 – Location of Plot 124d (circled red)

7.2.2 Access to water

As described in Section 5.3 above, Wicklow County Council is agreeable to changing the acquisition of plot 124b from permanent to temporary. Therefore, there will be no long-term impact on access to the Dock for the Appellant. The proposed development for the FRS provides for the existing access to plot 124d to remain at its current location and demountable flood barriers to be erected at the access, as identified in Drawing No. 88601-1042 in Appendix 4.1 of the EIAR, with extract shown in Figure 7.2 below.

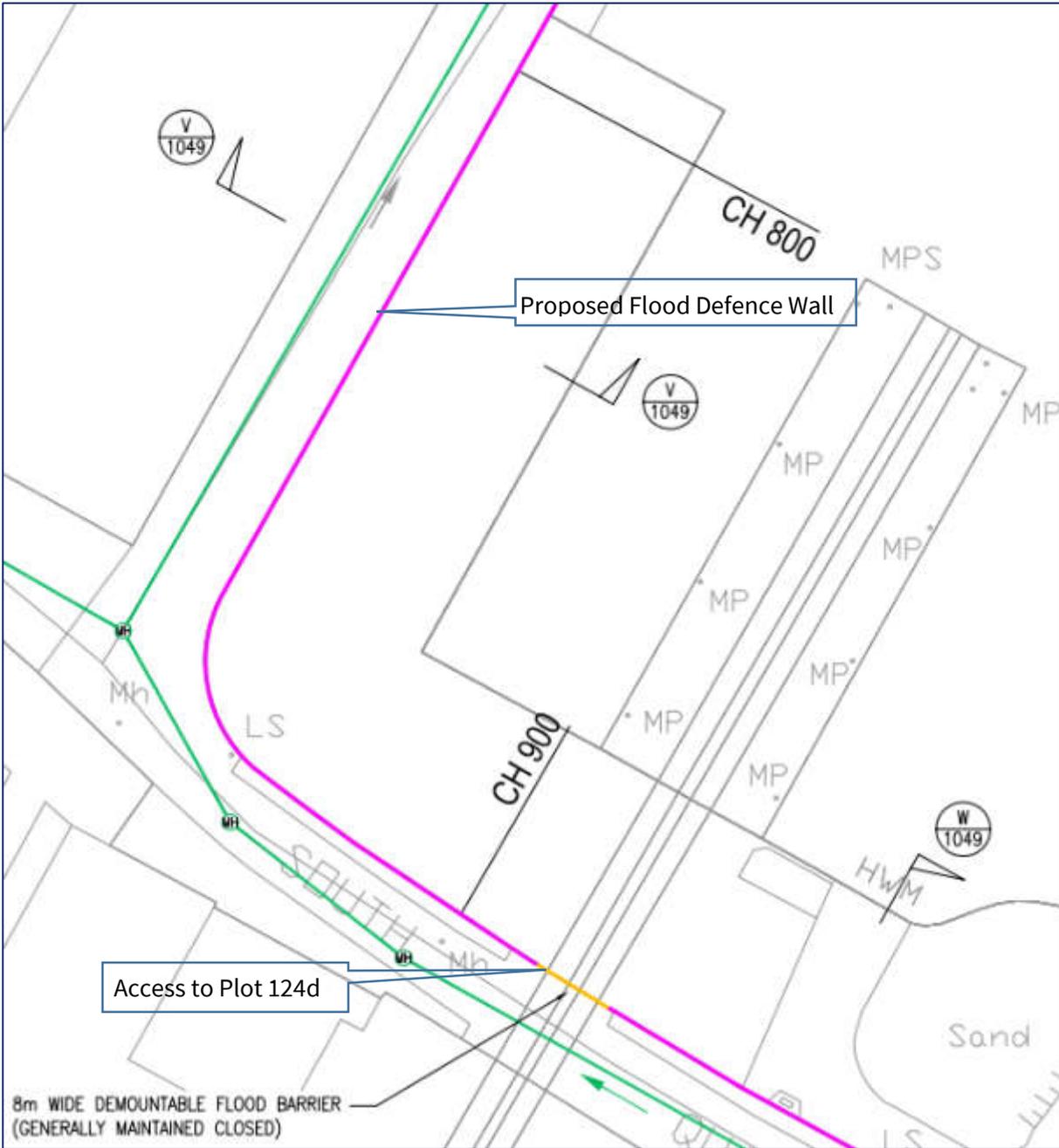


Figure 7.2 – Location of Plot 124d (circled red)

Based on the current use of the plot, this existing access is considered to be sufficient for the Appellant's business. It is noted that there is currently no planning permission in place for another access to this plot.

7.2.3 Access to retained lands following sale

The Appellant states in his submission that a sale of the majority of the site to SSE Airtricity is in progress with a small area, identified in Appendix A of the submission, to be retained by Arklow Slipway Ltd. It is understood that the sale to SSE Airtricity is not finalised and planning permission has not been granted for SSE Airtricity's proposals at this site.

If the proposal is granted planning and the sale to SSE Airtricity is finalised, then Arklow Slipway will require access to the retained site (Appendix A). This access can be accommodated through a number of arrangements, for example, by retaining a right-of-way through the land to be sold to SSE Airtricity or by means of a new properly authorised entrance to the public road. Any such proposals for a new entrance will have to take account of the proposed flood defence measures at this location.

8 Conclusion

In preparing the necessary documentation for the compulsory acquisition of lands, as amended by the revised proposals described herein, Wicklow County Council has taken account of the community need and public benefit for a flood relief scheme for Arklow.

As described in the Compulsory Purchase Order and further described herein, the lands to be temporarily and permanently acquired are suitable for their stated use as part of the proposed Scheme.

Alternatives have been examined and it has been found that there are no reasonable alternatives available.

The proposed Works to be carried out are in accordance with proper planning and sustainable development.



IRELAND | UK | UAE | BAHRAIN | KSA

BYRNELOOBY

www.byrneology.com

Email: info@byrneology.com