

Worcestershire County Council

Design Stage Non-Motorised User (Vulnerable Road User) report

CA 307/1049

Upton Upon Severn Flood Defence scheme – Phase 2 (Waterside)



July 2011





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The cover photograph shows the view looking west along Waterside towards the Kings Head public house.

1 Introduction

1.1 This report has been produced following a request by the Environment Agency and Worcestershire County Council to undertake an NMU (Non-Motorised User) Audit on proposals to install Phase 2 of the Flood Defence system in Upton upon Severn. The proposed 1.2m high glass topped wall will contain five pedestrian gates and one vehicular gate. The proposed Flood Defence System arrangements and proposed highway works are detailed in the agreed NMU Audit context report which can be found in Appendix A.

1.2 The audit was carried out by qualified non-motorised user auditors during July 2011 in accordance with HD42/05, 'Non Motorised Users Audits'.

1.3 An NMU context report was prepared in accordance with HD 42/05 by the design team in July 2011.

1.4 The audit team comprised of:

Des Greaves, Safety Engineering, Jacobs, Telford

Matt Powell, Traffic and Safety Engineering, Jacobs, Telford

1.5 The design team comprised of:

Nick Durman, Highways Design, Jacobs, Telford

Rob Emery, Highway Design, Jacobs, Telford

1.6 Contributions were also received from:

Sandy Banister, Disability Equality Advisor, Worcester County Council.

Ed Dursley – Sustainable Schemes manager, Worcester County Council.

Dave Clee – Accident Studies, Team Leader, Worcester County Council.

Mike Digger – Traffic Management Advisor, West Mercia Police (South Worc's)

1.7 The Audit consisted of an examination of the context report prepared by the design team, and approved by the Environment Agency and a site visit on Wednesday 13th July 2011 to establish any concerns with regard to vulnerable road user routes following the installation of the Flood Defence Scheme.

1.8 The NMU Audit was undertaken on the scheme detailed in the following drawings.

<i>Drawing number</i>	<i>Drawing Title</i>
B1297100/UUS/WS/SK12 Rev 0	Upton upon Severn FRMS Waterside section - General arrangement Planning/S278 design comparison.

B1297100/UUS/WS/600/01 Rev 0	Upton upon Severn FRMS Waterside section - Cross sections CH140 - 220.
B1297100/UUS/WS/700/01 Rev 0	Upton upon Severn FRMS Waterside section - Paving and footway details sheet 1 of 4.
B1297100/UUS/WS/700/02 Rev 0	Upton upon Severn FRMS Waterside section - Paving and footway details sheet 2 of 4.
B1297100/UUS/WS/700/03 Rev 0	Upton upon Severn FRMS Waterside section - Paving and footway details sheet 3 of 4.
B1297100/UUS/WS/700/04 Rev 0	Upton upon Severn FRMS Waterside section - Paving and footway details sheet 4 of 4.
B1297100/UUS/WS/700/05 Rev 0	Upton upon Severn FRMS Waterside section - Typical paving details.
B1297100/UUS/WS/1200/01 Rev 0	Upton upon Severn FRMS Waterside section - Road markings & Traffic signs sheet 1 of 4.
B1297100/UUS/WS/1200/02 Rev 0	Upton upon Severn FRMS Waterside section - Road markings & Traffic signs sheet 2 of 4.
B1297100/UUS/WS/1200/03 Rev 0	Upton upon Severn FRMS Waterside section - Road markings & Traffic signs sheet 3 of 4.
B1297100/UUS/WS/1200/04 Rev 0	Upton upon Severn FRMS Waterside section - Road markings & Traffic signs sheet 4 of 4.

1.9 The following supporting information was also provided to the audit team leader.

Non-Motorised User Audit – Context Report, dated July 2011

Stage 2 Road Safety Audit, dated April 2011

Waterside, Flood Defence – Upton upon Severn Technical Audit - Design submission. Author unknown.

Upton On Severn flooding signage, information & instructions. Author Worcester Highways.

Waterside & Dunn’s Lane Flood Defence Structure. Form TA1 Approval in principle. Author Jacobs.

1.10 All signs and road markings are referenced in accordance with the ‘Traffic Signs Regulations and General Directions 2002’ (TSRGD) and relevant chapters of the Traffic Signs Manual (TSM). Tactile paving is referenced in accordance with the Department of the Environment, Transport and Regions (D.E.T.R) 1998. ‘Guidelines on the use of tactile paving surfaces’. Disabled access and mobility issues are referenced to the Department for Transport ‘Inclusive Mobility’ and the Disability Discrimination Act (DDA) 2005.

2 Objectives and Design features

Three key objectives were put forward in the NMU context report by the design team. These key objectives and the design features that have been incorporated to satisfy them have been included in the detailed design and are set out in the table below.

	Key Objective	Design feature
2.1	Ensure the continuity of the footway provision along the river adjacent to the proposed flood defence wall.	A footway will be installed along the northern side of West Waterside and Dunn's Lane as far as floodgate number 6.
2.2	Minimise vehicular and NMU conflicts along Waterside.	A short section of pedestrian only footway will be installed on Waterside and prevent through traffic. A loading bay will be installed for the Swan Hotel. Disabled bays will be relocated from the permit holder's only section of West Waterside.
2.3	Prevent flooding within the village of Upton upon Severn whilst still maintaining NMU access to the riverside when not under flood conditions.	Five pedestrian access gates will be installed within the flood defense wall.

The conclusion of this exercise confirms that the three key Objectives are broadly met by the proposed Design Features as set out above. Various issues were also raised as required by the Audit process set out in HD 42/05 and these are set out in section 3.

3 Items raised in this audit

During the course of the desk top review of the proposals and the NMU site inspection, various issues have been identified for action with respect to achieving the objective of the Audit.

3.1 NMU Comment

Issue

The widths of the proposed footways and areas of hardstanding adjacent to the carriageways are currently inconsistent and do not necessarily allow a minimum clearance of 1.2m. The proposed footway along West Waterside is 1.2m wide whilst the proposed footway alongside Waterside varies in width between 1.5m and 2.0m. The hard standing proposed adjacent to Dunn's Lane between proposed floodgate number 5 and proposed floodgate number 6 is 1m wide.

Action Taken

Where possible the footway along West Waterside will be increased in width in order to achieve a clear minimum distance of 1.2m between the edge of the footway and any street furniture located adjacent to the flood defence wall. The proposed hard standing on the northern side of Dunn's Lane will be increased to 1.2m wide.

3.2 NMU Comment

Issue

It is proposed to reinstall the large wooden planters along the new footway on West Waterside. It was considered that this would block the footway for pedestrians walking along West Waterside. Although there will be an alternative pedestrian route on the riverside of the flood defence wall, pedestrians approaching from Church Street may prefer to remain on West Waterside.

Action Taken

The large wooden planters will not be reinstated as part of these proposals and will be deleted from the current drawings.

3.3 NMU Comment

Issue

It was observed that there are currently three cycle stands between the ramp and the existing disabled parking bays. It is assumed that these cycle stands will be retained but will be between the flood defence wall and the existing pedestrian barrier and may well be inaccessible.

Action Taken

If suitable locations can be identified these cycle stands will be relocated to the carriageway side of the flood defence wall. If not, signing provision (to diagram number 2603 or 2604) will be installed to ensure that cyclists are informed of the location of the cycle stands and access will be maintained via floodgate number 3.

3.4 NMU Comment

Issue

The substandard disabled parking provision for five vehicles adjacent to the Kings Head on West Waterside is to be replaced with the provision of three disabled parking places on High Street. It was generally considered that the taxi bay and some of the limited parking could be used to at least maintain the same number of disabled parking bays. Increasing this number was considered by the group to be an advantage as there is adequate parking provision throughout the town for able bodied persons.

Action Taken

Worcestershire County Council (WCC) will be approached to determine if the existing taxi bay and some of the limited parking can be used to maintain the same number of disabled parking bays.

3.5 NMU Comment

Issue

The drawings indicate that there will be ramps, steps and seating facilities on the river side of the proposed flood defence wall. It was unclear if this section of the proposals would also be the subject to an NMU audit.

Action Taken

It will be recommended to the Environment Agency that this section of the proposals be the subject of a separate design stage NMU audit.

3.6 NMU Comment

Issue

During the course of the site visit, drivers were observed reversing back along Waterside. As this section of carriageway is to be permanently closed adjacent to the Swan Hotel, all drivers whether in cars or large delivery vehicles will be compelled to reverse along this section of carriageway due to there being insufficient space to install a turning head. This could lead to collisions with vulnerable road users particularly as many users in this area appeared to be elderly and/or mobility impaired. It is also understood that a coach that transports passengers to and from Severn Cruises has difficulty turning due to parked cars and is compelled to reverse along High Street.

Action Taken

Although vehicular access to some of the properties needs to be maintained this section of carriageway could be pedestrianised and access restricted. Nothing that is proposed in the current provisions prevents this being installed at a later date. However, a change to the approved planning design at this time would seriously compromise the delivery of the scheme.

WCC will be made aware of the outcome of the NMU audit.

3.7 NMU Comment

Issue

It is understood that some of the existing bollards are to be removed and reused within the carriageway/footway. These bollards are all black and may offer insufficient contrast for visually impaired users at night.

Action Taken

Any bollards installed in an area that can be accessed by pedestrians will have sufficient contrast and be fitted with reflective bands to ensure that they are easily visible at night.

3.8 NMU Comment

Issue

It is understood that the carriageway crossfalls will generally be the same as in the existing situation at 1 in 20. The only difference being that in the proposal the crossfall is reversed so that the gradient falls towards the properties instead of away from them as in the current situation. It was indicated that the crossfall gradient should not exceed 1 in 36 but may be reduced to 1 in 28.

Action Taken

The crossfall gradient of the carriageway will be installed at a maximum of 1 in 28 as suggested. Footway crossfalls will be maintained between 1 in 36 and 1 in 40.

3.9 NMU Comment

Issue

It is proposed to install four trees in the footway along Waterside. These could be an obstruction as it will not be possible to achieve a minimum clearance of 1.2m between the trees and the flood defence wall where the footway narrows to 1.5m. Additionally the trees are indicated as being located adjacent to the carriageway unlike the street furniture which is to be located adjacent to the wall.

Action Taken

The trees will be relocated to a wider section of the footway to ensure that a minimum clearance of 1.2m is achieved between the flood defence wall and the trunk of the tree. This will result in the trees not being located adjacent to the flood defence wall due to the width of the wall foundation.

3.10 NMU Comment

Issue

There is a proposal to install a 160mm high, 1200mm wide linear step within the closed section of Riverway adjacent to the Swan Hotel running parallel to the river. Although there is an existing 200mm step adjacent to the hotel, it was constructed in contrasting material (concrete) compared to the blacktop of the carriageway. As the new linear step is to be constructed in similar coloured material, it may not be obvious to visually impaired pedestrians. Additionally the hotel had installed tables and chairs within the carriageway that could be an additional hazard to visually impaired pedestrians.

Action Taken

A series of bollards will be installed along the length of the linear step. The bollards will be of a contrasting colour so that they are visible at night. Additionally the private footway area adjacent to the hotel will be constructed in contrasting coloured material.

WCC will need to enforce Highway Regulations to ensure that the tables and chairs are removed or licensed.

3.11 NMU Comment

Issue

It is proposed to install new lighting columns and other street furniture such as road signs within the footways. If installed towards the front of the footway they will require a minimum set back of 450mm to the edge of the sign which will position them where they could be a hazard to a visually impaired pedestrian.

Action Taken

All street furniture including lamp columns and road signs will be mounted in consistent locations. In order to prevent them from becoming an obstruction, they will be mounted at the rear of the footways where possible.

3.12 NMU Comment

Issue

There are no dropped crossing points/tactile paving indicated on the drawing across West Waterside at the point where Waterside joins High Street. Additionally there is a road gully near to the anticipated location of the dropped crossing point on the eastern side of West Waterside. The proposed footway on the eastern side of West Waterside is too narrow.

Action Taken

Dropped crossing points and tactile paving units will be installed in a suitable location to avoid the road gully and the footway on the eastern side of West Waterside will be widened to accommodate waiting pedestrians.

3.13 NMU Comment

Issue

There is currently a sign next to the cycle stands indicating the location of the disabled toilets. This sign will be on the riverside of the new defence wall and may not be visible from Waterside.

Action Taken

This sign will be relocated onto Waterside. If possible this sign will post share with either TS03, TS04 or TS11.

3.14 NMU Comment

Issue

There is currently a kerb adjacent to the existing disabled parking bays (opposite the Kings Head) that is over 225mm high.

Action Taken

No new kerbing will exceed 125mm in height.

3.15 NMU Comment

Issue

The emergency access over the proposed flood defence wall adjacent to the road bridge (over the river) is stepped only. This would prevent certain vulnerable road users accessing the riverside/West Waterside at this location.

Action Taken

Appropriate signs will be installed on both sides of the flood defence wall to direct pedestrians to proposed floodgate number 1 which allows full access avoiding the steps.

3.16 NMU Comment

Issue

It is proposed to install a dropped crossing point adjacent to flood gate number 4 which is opposite Severn Leisure Cruises and Boathouse. However, there is a double gully proposed to be installed in the channel in the same location. Additionally the height of the dropped kerb in this location is to be 25mm which may present a problem for wheelchair users. Unless the parking along this section of Waterside is removed this dropped crossing point may often be blocked by a parked vehicle.

Action Taken

The dropped crossing height will be reduced to a maximum of 6mm and gullies will be located away from the crossing point if possible. Alternatively either a WCC approved drainage channel or 'pedestrian friendly' gully gratings will be detailed. WCC will be approached to determine if a 'keep clear' marking to diagram number 1026.1 can be installed adjacent to the dropped crossing.

4 Value+

The auditors have identified where cost savings can be made within the design without adversely affecting the safety of the design. Approximate anticipated cost savings have also been indicated if known.

4.1 Value+ Comment

Proposed sign TS04 could be mounted on the adjacent lamp column in order to reduce cost and street clutter. Approximate anticipated cost savings = £150.

Appendix A - NMU Context Report

NMU Context report Upton upon Severn, Worcestershire

Scheme Description

Upton has endured numerous floods from the adjacent River Severn no doubt since the Town was first founded in 897.

A trial of temporary defences in Upton was implemented by the EA in 2006. These defences have been deployed along the Waterside area 14 times since that time. However these defences could not be deployed in the severe July 2007 flood due to severe traffic disruption. Recorded river levels indicate that the temporary defence would have been overtopped during this event had they been deployed.



The Swan Hotel July 2007

Planning permission for a permanent flood defence was obtained in November 2010. The new permanent defence requires the construction of a defence wall. The wall will start alongside the River Severn A4014 road bridge and extend along the river frontage, adjacent to Waterside for a distance of approximately 250m. Pedestrian access through the wall will be provided by five closable flood gates, a sixth gate will close across Waterside between Bankside House and Crimond Rose during flood events. The top of the flood defence wall will be a constant height of 13.56m however the 'show' of the wall on the Highway side will vary due to longitudinal gradients; generally a height between 1.0m and 1.25m is maintained, locally increased at flood gate 5 where access for pleasure boat cruisers is provided. The wall will be constructed using reinforced concrete with a facing of brick, however the top 450 mm will be constructed from glass to ensure views of the River and waters edge are retained.

Waterside (West from High Street)

Here the existing highway is generally un-altered; some resident 'permit parking' is relocated due to defence construction (2 spaces). The existing 5 (undersized) disabled parking spaces, near to the Kings Head (PH) are also lost but 3 full sizes spaces are provided on High Street adjacent to the public toilets.

A footway is added adjacent to the defence wall with the existing flower planters positioned at regular intervals along this new route. Highway widths, gradients and materials are generally unchanged. Pedestrian access to the river bank is provided via a new short flight of steps, next to the bridge and a flood gate opposite the Plough public house, a further flood gate provides access to the King's Head beer garden.



The Plough Inn showing temporary flood defence March 2007

Waterside (East from High Street)

The existing highway width is again retained but the available width is quite narrow as existing properties on the right front directly onto the carriageway. The highway treatment is similar to the first section, with a new footway being provided adjacent to the new defence wall, the path varies in width from 2.0m to 1.5m. Two flood gates provide pedestrian access to the riverside and pleasure boats. To reduce the visual impact of the wall from the Town the crossfall on this section of Waterside is amended; the footpath will maintain a wall height of approximately 1.2m and therefore the adjacent carriageway levels are raised to suit. The current 1:20 and locally 1:15 crossfall, from properties towards the river will be reversed so that similar crossfalls are provided from footpath toward the properties.

The Highway will be resurfaced to suit these new levels and a new storm water drainage system will be installed.



Waterside from the A4014 Bridge, King's Head beer garden in foreground

Waterside Frontage to the Swan Hotel

This section of Waterside has recently been pedestrianised; the flood defence scheme enhances this current temporary arrangement. Cast Iron Bollards, reused from elsewhere, will be positioned to prevent vehicular access and the resulting 'footway' will be resurfaced using concrete block paving similar to that already used adjacent to the Plough and King's Head. Longitudinal gradients will be gentle 1 in 50 maximum with existing crossfalls of 1 in 20 retained.

It will also be necessary to retain the existing longitudinal step between the Swan and the Highway however rather than the existing 200mm step down as you exit the Swan, it is proposed that a reduced height 160mm (max) step 'up' will be provided as the level of the road is raised by approximately 360mm. New drainage will be provided as required.

Waterside into Dunn's Lane

A loading bay is detailed to allow deliveries to the Swan Hotel and another pair of cast iron bollards completes the 'no vehicular' access to the area fronting the Swan. Dedicated footways are provided on either side of the loading bay, directly fronting the Swan beer garden linking back towards Dunn's Lane and the Town Centre beyond and a new route adjacent to the flood wall.

On Street parking is retained on the river side of Dunn's lane with a narrow access route (1.0m wide) adjacent to the flood wall, providing access for both drivers and passengers. Dunn's Lane is resurfaced with traditional highway materials to just beyond flood gate 6, which when closed will physically prevent passage to the remaining properties along Waterside, rear pedestrian access however is retained.

New surface water drainage is provided as required.

NMU Activity

The design proposals ensure that the new flood defence will not greatly hamper existing pedestrian and vehicular activities along Waterside. Some inconvenience for residents and visitor is unavoidable as access to the river side will now be limited to flood gates or a short flight of steps, but these have all been positioned after extensive consultation so disruption should be minimal. Walking routes along Waterside have been enhanced, with dedicated footways now provided where previously there were none, path widths vary between 1.5 and 2.0m. Street furniture, lights and road signs have been located directly against the new wall to ensure the greatest available width is provided at all times. Pedestrian routes are shown surfaced with small unit concrete pavers to provide a smooth profile. Footbath levels match flood gate thresholds to enable easy passage too either side of the wall. A footway dropped crossing is provided adjacent to flood gate 4 to allow easy wheeled access to river boats which operate from the bank. Three full size disabled parking bays have been included to replace the existing five substandard bays, the new bays being as close as possible to the existing provision.

Cycle routes along Waterside are unaffected by the proposals. The formal creation of a pedestrian only zone fronting the Swan Hotel will provide a significant enhancement for all NMU's

Carriageway and Footway crossfalls are key to the success of these proposals. Planning Approval details approved a steeper than usual carriageway crossfall of 1 in 20, although it must be noted this matches and in some locations is an improvement over the existing carriageway gradients.

The effective wall height, as seen from the Town has been varied by ± 70 mm and the crossfall in one location steepened to 1 in 17, although steeper than the 1 in 20 stated on the Planning drawings this is still a slacker gradient than that which already exists at locations along Waterside.

NMU Objectives

Based on this background the objectives for this scheme are to minimise adverse affects of the new flood defence on the day to day activities and where possible enhance the NMU's experience and provision whilst not compromising the effectiveness of the flood defence or its possible visual impact on the Town. This was achieved by the following:

- Ensure the continuity of the footway provision along the river adjacent to the proposed flood defence wall.
- Minimise vehicular and MNU conflicts along Waterside.
- Prevent flooding within the village of Upton upon Severn whilst still maintaining MNU access to the riverside when not under flood conditions.

Appendix B - Scheme layout plan.