Munster Blackwater River - Fermoy South Flood Relief Scheme

Fermoy South Protocol for Demountable Structures, Penstocks and Valves



Protocol - WORKING DRAFT

Office of Public Works

February 2022
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In the event that there is a failure of the pumping stations for any reason, provision has been made for the use of temporary tractor powered pumps. There are two of these available and are stored along with the Fermoy South equipment if required for use. If required for use, the Contractor shall bring into service and locate as required. 10

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1 INTRODUCTION

1.1 The scheme

The Munster Blackwater (Fermoy North, Fermoy South East and South West) Drainage Scheme, also known as the Fermoy Flood Relief Scheme, was constructed by the Office of Public Works under the Arterial Drainage Acts 1945 & 1995. These Acts require the OPW to maintain the scheme once constructed, this includes the operate element also.

The Fermoy Flood Relief Scheme consists of a number of flood alleviation elements which when all correctly operational will protect the North and South side of the River Blackwater against a flood with an annual probability of occurrence of 1% AEP.

The overall scheme is designed to protect the town from flooding from the River Blackwater. This Protocol deals with the Fermoy South Flood Relief Scheme and a layout drawing of this Scheme is included within Appendix 1.

1.1.1 Northside Scheme

The flood defences on the North side consist of earthen embankments, concrete retaining walls and demountable structures. The western boundary of the scheme connects to high ground at the N72, Mallow Road. At this location the existing brick wall is supported by a permanent concrete retaining wall protecting the grounds from Fermoy House. Near the River Blackwater this wall connects into an earthen embankment which runs over a length of 300m parallel to the river to Fermoy Bridge. Across the R639, Dublin Road, the flood defences consist of demountable barriers that are erected during extreme events.

The flood defences eastward of Fermoy Bridge consist mainly of an earthen embankment and concrete retaining walls. At two locations, the end of Lower Thomas Street and at the Rescue Centre, the flood defences consist of demountable barriers. At the eastern extent, the flood defences connect to higher ground at the R666, Rathealy Road.

1.1.2 Southside Scheme

The flood defences on the South side consist of earthen embankments, concrete retaining walls, demountable barriers and a combination of permanent walls and demountable barriers. At the western extent, the flood defences start with a short section consisting of a permanent wall and a section of wall in combination with demountable defences around the River Apartments. The next section of flood defences starts East of the Boat Club. Along Waterloo Lane a permanent wall is erected. When approaching the river this wall connects into a section of demountable barriers. Along the waterfront the flood defences consist of a low permanent wall which can be heightened by using the pull up posts and installing demountable barriers. At Fermoy Bridge the flood defence consists of a fully demountable barrier.

East of the bridge the flood defence continues as a low permanent wall which can be heightened by the use of the pull up posts and the installation of demountable barriers. Just

past Kent Street the flood defence is formed by a full height permanent wall which is interrupted by several short sections of demountable barrier to allow for access. The permanent flood defence wall crosses over a number of Mill Races. Openings are formed within the Mill Races and these are then closed during flood events. From the outlet of the Mill Race at the southern boundary of the Bupa Building, the defence line follows the property boundaries parallel to the new Mart Site. From there an earth embankment continues until it reaches the N72, Tallow Road. The N72, Tallow Road is raised locally to form a barrier and on the Southside of this road the scheme is closed off by connecting to higher ground.

100 year flood extent is shown on Drawing No. 2961-001-OVERVIEW OF PROJECT AREA as included in Appendix 1.

1.2 Flood defence elements

The scheme comprises of the following elements:
- Demountable defences;
- Pull up posts and demountable defences on low permanent flood walls;
- Flood walls;
- Embankments and land drains;
- Drainage collection systems;
- Foul and storm pumping stations including intake/outlet debris screens and non-return valves;
- Penstock closures;
- Mobile pumps.

1.3 What interventions are needed

The Office of Public Works have implemented a Flood Warning System for the River Blackwater that will provide the defence installers with at least 8 hours warning time to allow their staff to implement those works that are necessary to complete the defences.

In summary, for a predicted major flood event, the following interventions will be necessary:
- Erection of warning signs;
- Traffic diversion;
- Public preparedness & liaise with local authorities & Gardai;
- Erection of demountable defences;
- Opening / closing of penstocks;
- Installation of mobile submersible pumps.

In this document more information will be provided about the above mentioned interventions.

1.4 Roles and responsibilities

The key parties involved in the operation of the Fermoy Flood Defence and their main responsibilities are set out below. It is suggested that this document is forwarded to all parties involved and that they are included in practice drills at regular intervals, to ensure the operation of the defences runs as smoothly as possible during an actual event.

Office of Public Works: The Munster Blackwater (Fermoy) Drainage Scheme, also known as the Fermoy Flood Scheme, was constructed by the Office of Public Works under the Arterial Drainage Acts 1945 & 1995. These Acts require the OPW to maintain the schemes once constructed, this includes the operate element also The OPW are responsible for the setting up, operation and maintenance of the flood warning scheme designed for the Blackwater River. It is important that the data from this system is communicated successfully to the key contact in the defence installers organisation.

Cork County Council/ Fermoy Town Council: Following discussions at Steering Group meetings, Cork County Council agreed to act as agents of the OPW on part of the Operate & Maintain phase of the scheme for the Fermoy North Scheme. This arrangement has been formalised by the signing of a Service Level Agreement between the two bodies. The operation of the scheme consists of 2 elements (1) the monitoring of the Blackwater Flood Warning System and (2) erection of the demountable defences and associated works on the Northside of the river only.

The county and town councils are responsible for the regular inspection of the defences to ensure their ongoing suitability for the defence of the town. They are also responsible for any maintenance activities required. The councils must ensure they have the adequate resources and equipment to operate the defences and that they have suitably trained staff, who undertake regular trial runs to ensure the operation of the defences runs smoothly during a flood event. The councils will be responsible for both the operation of the defences upon receipt of a flood warning, as well as the management of traffic diversions and the public.

An Garda Síochána: The Gardai will be required to aid the councils during an event with traffic management, public management and public warning. Discussions and agreement has been made to ensure public safety is at the foremost during any flood event.

Southside Private Barrier Installation Contractor: The Contractor is responsible for the regular inspection of the defences to ensure their ongoing suitability for the defence of the town. They are also responsible for any maintenance activities required. They must ensure they have the adequate resources and equipment to operate the defences and that they have suitably trained staff, who undertake regular trial runs to ensure the operation of the defences runs smoothly during a flood event. They will be responsible for both the operation of the defences upon receipt of a flood warning, as well as the management of traffic diversions and the public.

1.5 Structure of this document

This document has the following sections:

– Section 1 provides a general introduction to the scheme
– Section 2 provides more detailed information about the permanent elements of the Fermoy South Flood Relief Scheme
– Section 3 provides more detailed information about the non-permanent elements of the Fermoy South Flood Relief Scheme
– Section 4 identifies the elements that require ongoing routine maintenance

– Section 5 identifies the residual risks
– Section 6 sets out the operational protocol in case of a flood warning

1.6 Other Relevant Documentation

This document and Appendices provide the general information related to the Operation and Maintenance of the Demountable Structures, Penstocks, Valves, Embankment, etc. There are other documents relevant to the overall operation of the Fermoy South Flood relief Scheme as now listed and these are available from the OPW if consultation with these is required.

Following the completion of the Fermoy South Drainage Scheme Construction Contract, the PSDP handed over a copy of the scheme Safety File to the OPW containing extensive data on the scheme. The following is a list of some of the data included within the Safety File:

- Design Criteria
- As-Built Drawings
- Suppliers/Materials Information and data Sheets
- Progress Photographs
- M&E Manual

2 DETAILS OF PERMANENT ELEMENTS OF FERMOY SOUTH FLOOD RELIEF SCHEME

In this section a more detailed description of the permanent elements of the Fermoy South Flood Relief Scheme is provided. All embankments, permanent walls and temporary demountable barrier levels have been designed to provide a freeboard of 500mm above the predicted water level for a 1%AEP flood. The freeboard allows for wave action and for some space to allow for the limitations on the water levels predicted in the flood prediction models. A plan showing the different elements of the scheme has been provided in Appendix 1. A quick reference Plan, Drawing No.100, shows an overview of the defence wall references.

2.1 South side of River Blackwater

2.1.1 Flood embankments

The flood embankments typically have 1:3 slopes and a 3.0 m wide crest. They are constructed of clay and have grass slopes. At some locations a berm has been included at the landside of the embankment. As part of the design, the embankments have been checked to ensure there is sufficient seepage cutoff.

The embankments shall have regular grass cutting, be kept free from trees and bushes growth and the isolation fencing maintained by the landowner. Conditions have been imposed on the landowner with regard to acceptable farming and use of the land on and in the vicinity of the embankment and toe.

A landrain has been installed at the toe of the embankment and general maintenance is also required to be completed on this, as scheduled in Appendix 5.

2.1.2 Flood walls

The flood walls are permanent reinforced concrete walls with a limestone cladding. The walls are founded on sheet piles and/or bearing piles and also restrained by anchors. The walls are founded on sheet piles which act as a cut off to prevent seepage under the walls. The flood walls along Ashe Quay and O'Neill Crowley Quay are divided in several sections (no. 3 – 38), with each consisting of one of the following types of structure:

- Full height permanent wall (Walls no. 5, 13a, 20, 21, 23, 25, 27, 29, 31, 33, 35, 37 and 38);
- Permanent wall in combination with pull up vertical posts and horizontal demountable posts (Walls no. 3, 7, 9, 11, 13, 13b, 15 and 19). The pull up posts are housed within tubes cast into the permanent concrete walls to speed up the installation times and reduce the amount of lifting and transporting of the heavy prefabricated units;
- Permanent wall in combination with demountable posts and horizontal demountable posts (Walls no.15b, 19a). These were used where were it was not possible to use the pull up posts.
- Ground beams in combination with demountable posts and horizontal demountable posts (Walls no. 6, 8, 10, 12, 14, 17, 22, 24, 26, 28, 30, 32, 34, 36). These were used

where there was a requirements to maintain the passage of either pedestrian or vehicles outside of times of flooding.

Penstocks closures are present in walls no. 20, 29, 31 and 35.

2.1.3Drainage system and pumping stations

Four new pumping stations have been installed behind the line of flood defences to discharge surface water during high water condition in the river. The drainage system also includes flap valves and trash screens which form part of the flood defence scheme. Details of the pumping stations are as follows:

PS Ref	PS Type	No of pumps	Main Power Source	Other power	Control Panel	PS Source
Ashe Quay PS	Storm	Duty/duty/ standby	Generator No.1	Domestic Mains only	Ashe Quay Toilet Block	Storm Network
O'Neill Crowley Quay PS	Storm	Duty/Assist/ Standby	Generator No.1	Domestic Mains only	Mill Island PS Building	Storm Network
Mill Island PS	Storm	Duty/Assist/ Standby	Generator No.1	Domestic Mains only	Mill Island PS Building	Mill Race
Mill Road PS	Storm	Duty/Duty/ Standby/Standby	Generator No.2	Domestic Mains only	Mill Road PS Kiosk	Mill Race and Storm Network
	Foul	Duty/Standby	Generator No.2	Domestic Mains only	Mill Road PS Kiosk	900mm Main Sewer

There is a new alarm system installed at all pumping station buildings which notifies designated personnel in the event of a pump fault or fire/intruder alarm activation.

3 DETAILS OF NON-PERMANENT ELEMENTS OF FERMOY SOUTH FLOOD RELIEF SCHEME

This section contains information about the non-permanent aspects of the Fermoy South Flood Relief Scheme, i.e. those parts which will require an intervention in the occurrence of a flood event.

3.1 South side of River Blackwater

3.1.1Demountable barriers

The demountable barriers are formed by the IBS demountable system. This system consists of individual posts with or without a back support. On the South side additional pull-up posts which are integrated in the permanent wall defences are part of the defences. Between the posts beams are slotted in to form the flood barrier. Section 6.3.3 provides an overview of the demountable barriers at the different locations.

In Appendix 2 a special protocol is presented for every demountable structure on the South side of the River Blackwater. Appendices 3 and 4 contains the IBS operating manual and maintenance instructions.

The different components of the demountable defences are stored in a central location (Response Base), the location of which is shown on the drawing in Appendix 6. The demountable system of IBS is delivered in purpose made storage pallets or packets, allowing for appropriate ventilation and drying out of the system after usage, obviating any possibility of contact corrosion. The pallets are clearly labelled to provide information about the components stored on the pallet and their location of application in the scheme. Spare parts are stored alongside the main components along with the installation equipment and tools.

3.1.2Warning signs

The Southside Installation Contractor is responsible for formulating a Traffic and Pedestrian Management Plan. This will include design and provision of signs to warn the public about road closures, footpath closures, dangers of flood waters, etc. In addition, temporary signs have been procured and these are required to be placed on installed demountable barriers advising the public it is an offence to interfere with the installed barriers.

3.1.3 Traffic diversion and signage

The Southside Installation Contractor is responsible for formulating a Traffic and Pedestrian Management Plan. This will include design and provision of signs to warn and inform the public about road closures, footpath closures and diversions local to the barrier installation. The actual signage around the route of any diversions will be undertaken by Cork County Council or the Gardai in accordance with the Cork County Council Emergency Plan.

3.1.4Temporary submersible pumps

In the event that there is a failure of the pumping stations for any reason, provision has been made for the use of temporary tractor powered pumps. There are two of these available and are stored along with the Fermoy South equipment if required for use. As a result of ongoing reviews of the scheme operation, the use of temporary diesel back up pumps may be in used in lieu of the tractor powered pumps. If required for use, the Contractor shall bring into service and locate as required.

3.1.5Penstocks

There are a number of penstock, valves, emergency overflows to be operated at flood event times. Penstocks/valves will be opened/closed using portable handheld actuators supplied as part of the Fermoy South Scheme. The location of these are shown on the drawings included in Appendix 1. The details of the triggers for operation of these is included in Section 6.4.

3.1.6 Post Flood

Following a flood, all equipment shall be cleaned and left in a suitable working condition for the next flood event. After each flood event, a walkover shall take place to inspect the defences are not damaged e.g. flap valves stuck open, replace seals that may be damaged, no damage to hard defences etc.

4 ONGOING MAINTENANCE REQUIREMENTS

4.1 South side of River Blackwater

Ongoing maintenance will be required to be completed on the Scheme. A detailed schedule of maintenance is included within Appendix 5. The following is a summary of the elements requiring maintenance and the location of these elements is shown on the Drawings included within Appendix 1. Maintenance procedures for the demountable units are included within Appendix 3. For elements such as flap valves, penstocks etc. the maintenance documents these have been included within Appendix 9 and the scheduled maintenance included within Appendix 5. Details of Pumps and Control Panels are included within the Safety File.

Elements:

- Walls
- Embankments
- Demountable defences
- Pumps
- Flap valves
- Trash screens
- Sealed manholes
- Generator Maintenance
- Fuel Tank Observation and Filling
- Gullies

5 RESIDUAL RISKS

The completed Fermoy South flood scheme now provides a very high level of protection to personnel and property on the Southside of the River. However, residual risks could not be completely eliminated during the design of the works and mitigation measures are required to be in place to deal with these risks. The following main risks are outlined below but should not be considered complete. Responsibility for mitigating against these risks lies with the OPW, CCC, the Installation Contractor and the Emergency Services. It is up to each party to do their own risk assessment at the commencement of the operation phase.

A map showing the line of the 1% AEP has been included within Appendix 1.

5.1 Malfunction of Flood Warning System

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
System error, calibrating error, human error	Closure of structures not in time, resulting in flooding and (personal) damage. Unnecessary closing of structures causing disturbance to Fermoy people and businesses.	Regular testing, maintenance and upgrading (calibrating after high/low flows) of the system.	Cork County Council

5.2 Failure of pumps

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
System error, insufficient maintenance, power failure, vandalism	Water excess behind structures cannot be pumped back in the river, resulting in flooding	Regular testing, monitoring and maintenance of the pumps.	Cork County Council / OPW

5.3 ESB outage

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Power cut	Malfunctioning of pumps, lights, warning system.	Availability and usage of generators.	Cork County Council / OPW

5.4 Non availability of generators

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Generators are required at other locations and not available to hire	No backup power in case of ESB outage	Backup of ESB supply, arrange permanent generators.	Cork County Council / OPW

5.5 Failure of permanent elements of the flood defences or failure to implement non-permanent elements of the defences

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Town Council's emergency response programme not up & running	Closure of structures not in time, resulting in flooding and (personal) damage. Unnecessary closing of structures causing disturbance to Fermoy people and businesses.	Emergency response programme forms integral part of periodical safety exercise in town. Flood mitigation and response as local top priority.	Cork County Council

5.6 Flood event exceeding Design Flood Event due to large flood event or climate change

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Large flood event or climate change	Flooding of area behind defence structures, damage to humans, buildings, infrastructure and businesses.	Reliable flood warning system and flood response programme, providing early warning and detailed plans for evacuation of people in flood prone area. Prepare flood risk	Cork County Council

		maps for more extreme events.	

5.7 Breakdown of installation plant

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Insufficient maintenance, unprofessional use of plant	Closure of structures not in time, resulting in flooding and (personal) damage. Unnecessary long closed structures causing disturbance to Fermoy people and businesses.	Regular maintenance of plant, sufficient training of plant operators and installation teams.	Installation Contractor

5.8 Flood barriers not being stored properly resulting in delays to installation.

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Storage not according to protocol	Closure of structures not in time, resulting in flooding and (personal) damage.	Supervision during installation and de-installation of structures. Regular inspection of storage.	Installation Contractor

5.9 Parked vehicles or other objects preventing access to or installation of demountable defences

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Illegal parking, illegal storage of objects nearby flood structures	Closure of structures not in time, resulting in flooding and (personal) damage. Unnecessary long closed structures causing disturbance to	Strict rules and enforcement on parking zones. Regular surveillance in proximity of flood	Cork County Council

	Fermoy people and businesses.	structures. Have towing vehicle at standby or use fork lifts to remove objects.	

5.10 Health and Safety of staff during installations

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Working at heights, near waterfronts, on slippery surfaces under time pressure	Personal injuries	Health and Safety plan	Installation Contractor

5.11 Health and Safety of third parties during installations

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Walking near machinery, trucks, heavy steel elements	Personal injuries	Health and Safety plan	Installation Contractor

5.12 Blockage of roads between storage and flood structures

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Traffic accidents, illegal parking.	Flood structures cannot be reached by plant and/or equipment	Prepare backup routes to flood structures. Involve Garda for road clearance.	Installation Contractor

5.13 Unavailability of Installation Contractor at Time of Flood

Risk Description		Risk Management	
Cause	**Consequence**	**Control measure**	**Action Holder**
Installation Contractor can't or won't respond to a flood warning	Closure of structures not in time, resulting in flooding and (personal) damage.	Regular monitoring of Contractor's procedures and readiness in the event of a flood.	OPW

6 OPERATIONAL PROCEDURES - BLACKWATER FLOOD EVENT

This section details how the demountable defences should be operated and in what order. It provides details of the manpower and equipment requirements as well as erection times.

6.1 Flood Forecasting System

A flood forecasting system for the Munster Blackwater River has been developed by the OPW to predict the peak levels and time that the predicted flood will arrive at. The system is operated by Cork County Council, acting as agents for the OPW. This system is set up to warn if any of the Modes requiring action will be reached. Details of the Flood Modes and required actions are outlined in 6.2 below. The Forecasting Manual is included within Appendix 8.

Once a flood warning is received the Flood Mode is advised to the relevant personnel to action the pre-determined response for the Mode predicted. The estimated advance warning is intended to be a minimum of 8 hours.

In addition to the official flood warning system data provided and updated at 15minute intervals, an awareness is also taken of the action flood levels being experienced upstream in Mallow which give an indication of the actual flood being experienced versus the peak and time of the flood predicted on the River. Furthermore, the barrier installation must be managed locally to take into account actual levels being experienced in Fermoy, e.g. Fermoy Bridge kept open until flood waters are actually seen rising towards predicted anticipated peaks.

The table below gives the estimated installation times for the main demountable and pull up post items within the flood defence scheme. It also specifies the target time for completion of the installation from the time that the order is given to the operator to install the barriers.

Flood Mode	Estimated Installation Time	Target duration to complete installation from time given to mobilise
1	2hr 20mins	4 hrs
3	4hrs	5 hrs 30mins
4	4hr 20mins	5 hrs 30mins
5	4hrs	5 hrs 30mins
7	6rs 20mins	7 hrs 30 mins

6.2 Flood Modes

Seven different flood modes have been set for erection of the structures. For each mode a different trigger level applies. Details of these modes are included below. Also included are details of the Fermoy North modes for information purposes.

Mode Number	Barriers that will be installed on North Side	Barriers to be installed on South Side - Phase 1	Barriers to be installed on South Side - Phase 2	Barriers to be installed on South Side - Phase 3	Trigger level on Gauge D/S of bridge (m)	Trigger level on Gauge D/S of bridge (mOD)
Mode 1	Heads up (erect Slipway Barriers as noted Mode 2)	Wall 8 up to 24.25mOD Wall 10 up to 24.25mOD Wall 12 up to 24mOD Wall 14 up to 24mOD			3.0	22.21
Mode 2	Slipway at Bridge Wall 8				3.2	22.41
Mode 3	Footpath at Downstream Side of Main Road Crossing Wall 8, & SubAqua Club (15/16)	Wall 6 up to 24.25mOD Wall 34 up to 24mOD (1.2m height) Wall 36 up to 24mOD (1.2m height)			3.5	22.71
Mode 4	Triangular Field and Lower Thomas Street, and Main Road crossing.	Wall 24 up to 24mOD (0.9m height) Wall 26 up to 24mOD (0.9m height) Wall 28 up to 24mOD (0.9m height) Wall 30 up to 24mOD (0.9m height) Wall 32 up to 24mOD (0.9m height)			3.85	23.06
Mode 5	None	Wall 16 & 17 footpaths up to 25mOD (Top of adjacent permanent wall) Wall 22 up to 24.5mOD (0.9m height min) Wall 26 up to 24mOD			4.3	23.51
Mode 6	None	Wall 7 up to 25.3mOD (1.05m height) Wall 9 up to 25.3mOD (1.05m height) Wall 11 up to 25.3mOD (1.3m height) Wall 13 up to 25.3mOD (1.3m height) Wall 15 up to 25.3mOD (1.3m height at upstream	Walls 6, 8, 10, 12, 14, up to 25.3 mOD (1.05m to be added to walls 6, 8 & 10, and 1.3m to be added to walls 12 & 14)		4.6	23.81

Mode Number	Barriers that will be installed on North Side	Barriers to be installed on South Side - Phase 1	Barriers to be installed on South Side - Phase 2	Barriers to be installed on South Side - Phase 3	Trigger level on Gauge D/S of bridge (m)	Trigger level on Gauge D/S of bridge (mOD)
		end and same level to Bridge) Wall 17 (part) up to 25.3mOD (up to about 0.1m above top of permanent wall at upstream end) Wall 19 up to 25.0 mOD (1.6m high at Mill Race end and same level to Bridge)	Walls 22, 24, 26, 28, 30, 32, 34, 36 up to 25.0mOD (1.0m to be added to all walls except 22, which needs 0.5m)			
Mode 7	None		Walls 7, 9, 11, 13, 15, 17 to full height	Walls 6, 8, 10, 12, 14, 22, 24, 26, 28, 30, 32, 34, 36 to full height N72 Road barrier (Near Hospital).	5.7	24.86
Q100	Design Flood – Plan for Exceedance of defence levels				6.12	25.28

6.3 Operation of demountable defences

6.3.1 Storage of demountable defences

The components of the demountable defences will be stored at a Response base. At present (Sept 2016) temporary housing for Fermoy North and Fermoy South elements are stored at AW Faber Castel and the layout of the defences is included within Appendix 6, which is assumed to be positioned within a 3km radius from the location of application of the materials. There are two adjacent storage units with the Fermoy North elements contained within one unit and the Fermoy South elements within the adjacent unit. The beams and posts of the demountable system will be stored on purpose-made labelled pallets, which allow for appropriate ventilation and drying out of the system after usage. The labelling will indicate the location of application of the beams.

6.3.2 Equipment requirements

The specific equipment required for each activity has been summarised in Appendix 7 (To be completed by Council / OPW / Installation Contractor based on requirements and actual equipment procured). The Installation Contractor shall ensure that all the necessary

equipment is well maintained and stored in the Response base. The following list, based on the information provided from the Trial Erection on the South side, provides an overview of the typical labour, plant and materials that are required for the timely erection of the demountable flood barriers, with the estimated breakdown of equipment and personnel in Appendix 7.

A spare generator is to procured as part of the procedures and back up for operating the generator powered pumping stations. The scheme operator will be required to store the generator on a flatbed truck and bring this trailer to site in the event of the duty generators malfunctioning. The general trailer specification requirements are included in Appendix 9.

- Labour
  - Ground operators
  - Plant operators
  - TPMS
  - Supervisors
- Plant:
  - 5t excavator
  - Telehandler
  - 40' flatbed Artic
  - V.M.S.
  - Tower lights
  - 2t T.M. trucks
  - Cones
  - Signs
  - Aluminium towers
  - Aluminium ladders
  - Pallet truck
  - Rakes
  - Manual winch
- Materials
  - Post
  - Beams
  - Ground Seals
  - Bolts
  - Pressing tools
  - 5m wide planks

6.3.3 Method of erection of demountable barriers

Table 6-1 provides information for the erection of the defences. The drawings in Appendix 1 show the location of the different elements of the Fermoy South Flood Relief Scheme.

Table 6-1: *South demountable barriers erection information*

ID	Location	Erection Time	Type of structure	Posts (no. pallets)	No. of Panels
06	Barnane walk	1hr 30min	Demountable barrier	Posts: 10 (11)	138
07	Ashe Quay	1hr 10min	Permanent wall + demountable struct.	Posts: 1 (4) Pull up posts: 12	104
08	Ashe Quay	30min	Demountable barrier	Posts: 2 (2)	30
09	Ashe Quay	30min	Permanent wall + demountable struct.	Posts: 2 (1) Pull up posts: 4	40
10	Ashe Quay	30min	Demountable barrier	Posts: 3 (2)	30
11	Ashe Quay	1hr 30min	Permanent wall + demountable struct.	Posts: 2 (4) Pull up posts: 15	144
12	Ashe Quay	30min	Demountable barrier	Posts: 3 (2)	30
13	Ashe Quay	2hr	Permanent wall + demountable struct.	Posts: 1 (6) Pull up posts: 24	225
13b	Ashe Quay	25min	Permanent wall + demountable struct.	Posts: 1 Pull up posts: 2	27
14	Ashe Quay	20min	Permanent wall + demountable struct.	Posts: 3 (1)	15
15	Ashe Quay	1hr 50min	Permanent wall + demountable struct.	Posts: 5 (5) Pull up posts: 19	179
17	Pearse Square	2hr	Demountable barrier	Posts: 14 (6)	105
19	O'Neil Crowley Quay	2hr 30min	Permanent wall + demountable struct.	Posts: 14 (8) Pull up posts: 33	266
22	Ploemeur Place	50min	Demountable barrier	Posts: 4 (5)	50
24	Near mill	20min	Demountable barrier	Posts: 0 (1)	12
26	Near mill	25min	Demountable barrier	Posts: 1 (2)	22
28	Near mill	30min	Demountable barrier	Posts: 1 (2)	24
30	Near mill	20min	Demountable barrier	Posts: 0 (1)	17
32	Near mill	30min	Demountable barrier	Posts: 1 (2)	32
34	Near mill	30min	Demountable barrier	Posts: 1 (2)	28
36	Near mill	25min	Demountable barrier	Posts: 0 (1)	20

* *Excluding back supports*

Exact plant operator numbers and exact plant used to be added once the installation contractor provide their installation times and equipment used based on their latest method statements.

Note 1: Erection time is based on plant provider estimates and confirmed during the trial installation on the north side. The durations for each wall section have been estimated allowing for the bigger of 10 minutes erection time per demountable post or installation of 3 panels per minute. Time will depend strongly on accessibility, available manpower, available equipment, weather conditions etc. and can therefore only be considered an indication.

Note 2: Operator numbers are based on the results of the suppliers proposals and as confirmed during trial erection the defences on the southside. It is assumed that as a minimum 3 man are

required to erect a post and 2 man are required to place a beam. Per section of wall a crew of at least 3 people is required. Plant is required to erect the posts and install higher beams. For the latter purpose mobile scaffolding or other means may be used as recommended in the installation contractors method Statements. This number of operators is an estimate and will depend on the local conditions and the time available for erection of the defences.

Note 3: For details of required plant refer to Appendix 7.

The general procedure for setting up the defences is:

1. Assembly at central storage depot
2. Set up warning signs, and traffic diversions/signage
3. Loading of defences (per team)
4. Transport defences, equipment and operators to location of application of defences.
5. Unload defences and equipment at the appropriate location
6. Erect defences
7. Take down defences
8. Transport back to storage yard
9. Remove warning signs, and traffic diversions/signage
10. Complete cleaning and maintenance on equipment
11. Reload in storage depot

For each wall a detailed protocol has been included in Appendix 2 that can be used as guidance for setting up the defences. Each protocol refers to drawings in Appendix 1.

6.3.4Barrier Maintenance

The ongoing general maintenance of the barrier system is an important aspect to make sure all elements are in full working order when required during a flood event. Maintenance includes a general inspection for any wear and tear as well as bolts preventative maintenance requiring the greasing of ground points and cleaning for silt/debris. A schedule of regular required tasks are included in Appendix 5 and equipment and products to be used is included in Appendix 6. Only approved greasing products are permitted.

6.3.5K Posts

Given its unique location and defence height, the use of the K Barrier system was adopted on the N72, to the SE of the Scheme. This system is only required to be put in place during very low probability events. Details of the K barrier are included with the other barrier information. In order to securely fasten these in place, ground bolts will have to be drilled and fixed in place through the equipment holes down into the tarmac surface. Following a flood event, the bolts shall be removed and the holes sealed with the specified repair product which is suitable for drilling through on subsequent flood events. Details of the bolts and repair products are included in Appendix 4

6.4 Operation of additional elements of Fermoy South Flood Relief Scheme

This section sets out the operational protocol for other elements of the Fermoy South Flood Relief Scheme. The scheme and associated pumping stations, outfalls, flap valves etc. are all designed to operate automatically but in the event that anything goes wrong, details of the contingency measures are further outlined here. The location of these are shown on the Drawings included within Appendix 1.

6.4.1 Pumping Stations

During a flood event, the pumping station are designed to run automatically and will turn on once the water in the sumps reach the specified levels. If there is any fault an alarm should be sent to the Council supervisor. On receipt of an alarm and also if water appears to be building up in low lying areas or coming out through the sump lids, the supervisor should immediately contact the external pump operator to visit the site and fix the problem notified. If the pump operator is unable to fix the problem in time to allow the flood to be defended, there are two options available and should be acted upon in the order listed below. Similarly, if there is a power cut the same procedures shall be followed.

1. There is a 400KVA spare generator available for the Southside scheme which should be brought to the pumping station and set up and started by the pump operator.
2. If the spare generator is not available for any reason, the tractor pumps shall be put into operation by the pump operator, with the pump operator sourcing a tractor if possible. No tractor has been procured especially for the scheme. The pumps shall be used wherever the flood waters are seen to be building up on the dry side of the defences.

6.4.2 Flap Valves, Penstocks and Outlet Pipes

Following a flood notification and before there is any significant river rise, flap valves and inlet/outlet screens throughout the Fermoy South Flood Scheme shall be checked for blockages. If staff observe a flap valve stuck in an open position due to debris blockage then if safe to do so, the Contractor shall attempt to remove the blockages using a rake or similar equipment. However, if not safe to do so then the following procedures as listed in in Table 6-2 below shall be followed.

Table 6-2 below schedules the fittings to be checked / operated in the event of a flood event. The general maintenance of the Pumping Stations installed under the Contract is already covered under a standalone Contract. However, the operation of the Table 6.2 items during a flood event has not been included so are included here. Locations and numbers of these of these are as shown on the main Contract Drawings and detailed in Table 6-2 below. The exact timings for the opening/closing of these are documented below with the modes corresponding to those listed in Table 6-1 above. The Contractor shall be responsible for the return of the penstocks and sluice valves to their normal operating position after the flood event. If, for example, the Flood Mode Intervention Level is stated as Mode 1 then this means there is an action for all Modes of Mode 1 and higher.

Table 6-2: Schedule of Fittings to be operated during flood events

Ref	Size	Chamber/Manhole Reference and location	Action Required In Event of a Flood	Flood Mode Intervention Level
FV01	225mm	CH1/3 Barnane Walk	Check Flap valve is opening/closing and clear any debris	Mode 1
PS01	600mm	AQCC-01 - AQ - Opp River Walk Apts	Close Penstock	Mode 5 or if FV04 stuck open.
PS02	600mm	AQCC-01 - AQ - Opp River Walk Apts	Open Penstock	Mode 5 or if FV04 stuck open.
FV04	600mm	Board Walk AQPS	Check Flapvalve is opening/closing and clear any debris	Mode 1
FV05	700mm	Board Walk AQPS	Check Flapvalve is opening/closing and clear any debris	Mode 1
OFV01	700mm	Inside AQPS	Valve to be opened and high level overflow pipe work erected.	Mode 7, or if there are any difficulties with the main pumping station outlet.
OFV02	700mm	Inside AQPS	Valve to be closed.	Mode 7, or if there are any difficulties with the main pumping station outlet.
PS03	700mm	ONCQPS Inlet Chamber	Penstock to be closed.	Mode 5 or if FV06 stuck open.
PS04	700mm	ONCQPS Inlet Chamber	Penstock to be opened.	Mode 5 or if FV06 stuck open.
FV06	700mm	ONCQPS Riverside	Check Flapvalve is opening/closing	Mode 1
FV07	700mm	ONCQPS Riverside	Check Flapvalve is opening/closing	Mode 1
OFV03	700mm	Inside ONCQPS	Valve to be opened and high level overflow pipe work erected.	Mode 7, or if there are any difficulties with the main pumping station outlet.
OFV04	700mm	Inside ONCQPS	Valve to be closed.	Mode 7, or if there are any difficulties with the main pumping station outlet.
PS05	1000mm	Wall 20	Close Penstock	Mode 1
PS06	1000mm	Wall 20	Close Penstock	Mode 1
PS10	1000mm	Wall 29 - Mill Buildings	Penstock to be closed.	Mode 1
PS11	1000mm	Wall 31 - Mill Buildings	None. Penstock to be kept closed.	None
PS12	1000mm	Wall 31 - Mill Buildings	Penstock to be closed.	Mode 1
PS13	1000mm	Wall 35 - Mill Builidngs / MRPS	Penstock to be closed.	Mode 1
PS14	900mm	Inside MRPS	None. Only use in emergencies if required or if MIPS is down.	None

PS15	750mm	Inside MRPS in foul sump	Penstock to be opened.	Mode 5
PS16	900mm	Inside MRPS	Penstock to be closed.	Mode 5
PS17	600mm	CH4/1 at wall 38	None. Left Open	None
PS18	900mm	CH4/1 at wall 38	None. Left Open	None
FV13	450mm	CH4/1 at wall 38	Check Flapvalve is opening/closing and clear any debris	Mode 1
PS19	600mm	CH4/2 at wall 38	Open Penstock	Mode 1
PS20	500mm	CH4/2	Close Penstock	Mode 1
FV14	500mm	Outfall from CH4/2 - Wet side Wall 37	Check Flapvalve is opening/closing and clear any debris	Mode 1
FV15	600mm	Outfall from MRPS - Wet side Wall 37	None	None
PS21	225mm	CH1/3 Barnane Walk	None	None
EOF01	700mm	AQPS	Install Overflow pipe	Mode 7, or if there are any difficulties with the main pumping station outlet.
EOF02	700mm	ONCQPS	Install Overflow pipe	Mode 7, or if there are any difficulties with the main pumping station outlet.
IS01	900mm	MIPS	Inspect and clear debris	Mode 5
IS02	900mm	MIPS	Inspect and clear debris	Mode 5

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FV = Flap Valve

PS = Penstock

OFV = Overflow valve

EOF = Emergency Overflow Pipe

IS = Inlet screen

7 COLOPHON

Client	:	Office of Public Works
Project	:	Munster Blackwater River - Fermoy South Flood Relief Scheme
File	:	AD0075
Length of report	:	27 pages
Author	:	S. Schouten/N. McCaffrey
Contributions	:	J. Cirkel, J.J. van Sloten
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Project Manager	:	E. Fitzgerald
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APPENDIX 1 Main Scheme Drawings

APPENDIX 2 Fermoy South protocol for demountable defences

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (Boat club, **Wall no 06**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 180937 Y- coordinate: 98488
Type of Structure	Demountable Wall, 1 permanent Endpost + 8 Centre posts + 2 Corner posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Centre Posts, – Corner Post, – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 7x Centre Post MS 4 / 2x Corner Post WS13 / 1x Centre Post MS 3 (on pallet of wall 07) / 128x Standard Beams / 10x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 3	Wall 6 up to 24.25mOD	3.5	22.71
Mode 6	Wall 6 up to 25.3mOD (1.05m to be added to Wall 6)	4.6	23.81
Mode 7	Wall 6 to full height	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 07**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 180962 Y- coordinate: 98492
Type of Structure	Permanent wall + Demountable Wall, 1 demountable Centre post + 12 Pull up posts + 1 demountable Corner post	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Centre post – Corner post – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 12x Pull up Post / 1 demountable Centre Post MS3 / 1x demountable Corner Post WS11 / 91x Standard Beams / 13x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 6	Wall 7 up to 25.3mOD (1.05M height)	4.6	23.81

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 08**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 180983 Y- coordinate: 98495
Type of Structure	Demountable Wall, 1 demountable Centre post, 2 demountable Corner posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Center post, – Corner posts, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 2x demountable Corner Post MS3 (on pallet of wall 07) / 1x demountable Center Post MS4 / 28x Standard Beams / 2x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 1	Wall 8 up to 24.25mOD	3.0	22.21
Mode 6	Wall 8 up to 25.3mOD (1.05M to be added to wall 8)	4.6	23.81
Mode 7	Wall 8 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure *1 Detection and Notification of Mode*
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 09**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 180989 Y- coordinate: 98498
Type of Structure	Permanent Wall + Demountable wall, 2 demountable Corner post + 4 Pull up posts	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Corner posts – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 4x Pull up Post / 2x demountable Corner Post WS11 (on pallet wall 07) / 35 x Standard Beams / 5x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 6	Wall 9 up to 25.3mOD (1.05M height)	4.6	23.81
Mode 7	Wall 9 to full height	5.7	24.86

Procedure *1 Detection and Notification of Mode*
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 10**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 180996 Y- coordinate: 98496
Type of Structure	Demountable Wall, 2 demountable Centre post + 1 demountable Corner post.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Centre posts, – Corner post, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 1x demountable Centre Post MS3 (on pallet wall 07) / 1x demountable Centre Post MS3 (on pallet wall 11) / 1x demountable Corner Post WS12 / 28x Standard Beams / 2x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 1	Wall 10 up to 24.25mOD	3.0	22.21
Mode 6	Wall 10 up to 25.3mOD (1.05m height)	4.6	23.81
Mode 7	Wall 10 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 11**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181016 Y- coordinate: 98497
Type of Structure	Permanent Wall + Demountable Wall, 2 demountable Centre post + 15 Pull up posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Corner posts, – Centre posts, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 15x Pull up Post / 2x demountable Centre Post MS3 / 128x Standard Beams / 16x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 6	Wall 11 up to 25.3mOD (1.3m height)	4.6	23.81
Mode 7	Wall 11 to full height	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 12**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate:181041 Y- coordinate: 98497
Type of Structure	Demountable Wall, 2 demountable Centre posts + 1 demountable Corner post	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Centre posts, – Corner post, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 1x demountable Centre Post MS3 (on pallet wall 11) / 1x demountable Centre Post MS3 (on pallet wall 13) / 1x demountable Corner Post WS12 / 28x Standard Beams / 2x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Crane with pallet hook, toolboxes with tools for installing beams, Compressor with hose and nozzle

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 1	Wall 12 up to 24mOD	3.0	22.21
Mode 6	Wall 12 up to 25.3mOD (1.3m to be added to wall 12)	4.6	23.81
Mode 7	Wall 12 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 13**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181069 Y- coordinate: 98501
Type of Structure	Permanent Wall + Demountable Wall, 1 Centre post + 24 Pull up posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Centre posts, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 24x Pull up Post / 1x demountable Centre Post WS11 / 200x Standard Beams / 25x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 6	Wall 13 up to 25.3mOD (1.3m to be added to wall 13)	4.6	23.81
Mode 7	Wall 13 to full height	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 14**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181127 Y- coordinate: 98500
Type of Structure	Demountable Wall, 1 demountable Centre post, 2 demountable Centre posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Centre posts, – Bolts, – Pressing tools	

Materials

Storage Depot: Faber castell

Travel time: 5 minutes from depot

Special circumstances related to accessibility: none

Types and number per type: 2x demountable Centre Post MS3 (on pallet of wall 13) / 14x Standard Beams / 1x Beams with seal

Number of Spare parts per type: Spare parts in storage depot.

Transport: Crane Lorry

Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	Barriers that will be installed on South Side	Trigger level on Gauge D/S of bridge (m)	Trigger level on Gauge D/S of bridge (mOD)
Mode 1	Wall 14 up to 24mOD	3.0	22.21
Mode 6	Wall 14 up to 25.3mOD (1.3m to be added to wall 14)	4.6	23.81
Mode 7	Wall 14 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ash Quay (**Wall no 15**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181155 Y- coordinate: 98497
Type of Structure	Permanent Wall + Demountable Wall, 4 demountable Centre posts + 1 demountable Corner post + 19 Pull up posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Corner post, – Centre posts, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 19x Pull up Post / 1x demountable Centre Post MS3 (on pallet wall 13) / 3x demountable Centre Post MS2 / 1 demountable Corner Post MS4 / 156x Standard Beams / 23x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment:

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 6	Wall 15 up to 25.3mOD (1.3m height at upstream end and same level to Bridge)	4.6	23.81
Mode 7	Wall 15 to full height	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Fermoy Bridge (**Wall no 17**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181201 Y- coordinate: 98492
Type of Structure	Demountable Wall, 10 demountable Centre posts + 4 demountable Corner posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Corner posts, – Centre posts, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 10x demountable Centre Post MS3 / 2x demountable Corner Post WS11 / 1 demountable Corner Post WS14 (on pallet wall 15) / 1 demountable Corner Post WS10 (on pallet wall 19) / 94x Standard Beams / 11x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 5	Wall 17 footpaths up to 25mOD (Top of adjacent permanent wall)	4.3	23.51
Mode 6	Wall 17 (part) up to 25.3mOD (up to about 0.1m above top of permanent wall at upstream end)	4.6	23.81
Mode 7	Wall 17 to full height	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall O'Neill Crowley Quay (**Wall no 19**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181279 Y- coordinate: 98516
Type of Structure	Permanent Wall + Demountable Wall, 33 Pull up posts, 13 demountable Centre posts + 1 demountable Corner post + 1 permanent End post.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals, – Corner post, – Centre posts, – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 33x Pull up posts / 13x demountable Centre Post MS2 / 1 demountable Corner Post WS10 / 219x Standard Beams / 47x Beams with seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 6	Wall 19 up to 25.0mOD (1.6m high at Mill Race end and same level to Bridge)	4.6	23.81

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ploemeur Place Car entrance West (**Wall no 22**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181389 Y- coordinate: 98567
Type of Structure	Demountable Wall, 2 permanent Endpost + 4 Centre posts .	
Installation	By Forklift and by hand	
Closing material	Separate: – Centre Posts, – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 4x Centre Post MS4 / 2x End Post / 45x Standard Beams / 5x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 5	Wall 22 up to 24.5mOD (0.9m height min)	4.3	23.51
Mode 6	Wall 22 up to 25.0mOD (0.5m to be added to wall 22)	4.6	23.81
Mode 7	Wall 22 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ploemeur Place Foot bridge (**Wall no 24**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181504 Y- coordinate: 98651
Type of Structure	Demountable Wall, 2 permanent Endpost.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 2x End Post / 11x Standard Beams / 1x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 4	Wall 24 up to 24mOD (0.9m height)	3.85	23.06
Mode 6	Wall 24 up to 25.0mOD (1.0m to be added to wall 24	4.6	23.81
Mode 7	Wall 24 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Ploemeur Place Car entrance East (**Wall no 26**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181519 Y- coordinate: 98672
Type of Structure	Demountable Wall, 2 permanent Endpost + 1 Centre posts .	
Installation	By Forklift and by hand	
Closing material	Separate: – Centre Posts, – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 1x Centre Post MS4 / 2x End Post / 20x Standard Beams / 2x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 4	Wall 26 up to 24mOD height	3.85	23.06
Mode 5	Wall 26 up to 24mOD height (0.9m height)	4.3	23.51
Mode 6	Wall 26 up to 25.0mOD (1.0m to be added to wall 26)	4.6	23.81
Mode 7	Wall 26 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure *1 Detection and Notification of Mode*
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Bupa Building North (**Wall no 28**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181566 Y- coordinate: 98704
Type of Structure	Demountable Wall, 2 permanent Endpost + 1 Centre posts .	
Installation	By Forklift and by hand	
Closing material	Separate: – Centre Posts, – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 1x Centre Post MS4 / 2x End Post / 22x Standard Beams / 2x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 4	Wall 28 up to 24mOD height (0.9m height)	3.85	23.06
Mode 6	Wall 28 up to 25.0mOD (1.0m to be added to wall 28)	4.6	23.81
Mode 7	Wall 28 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Bupa Building South (**Wall no 30**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181588 Y- coordinate: 98696
Type of Structure	Demountable Wall, 2 permanent Endpost.	
Installation	By Forklift and by hand	
Closing material	Separate: – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 2x End Post / 16x Standard Beams / 1x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 4	Wall 30 up to 24mOD height (0.9m height)	3.85	23.06
Mode 6	Wall 30 up to 25.0mOD (1.0m to be added to wall 30)	4.6	23.81
Mode 7	Wall 30 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure *1 Detection and Notification of Mode*
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Bupa Building Car Parc entrance North (**Wall no 32**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181605 Y- coordinate: 98675
Type of Structure	Demountable Wall, 2 permanent Endpost + 1 Centre posts.	
Installation	By Forklift and by hand	
Closing material	Separate: – Centre Posts, – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 1x Centre Post MS4 / 2x End Post / 22x Standard Beams / 2x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 4	Wall 32 up to 24mOD height (0.9m height)	3.85	23.06
Mode 6	Wall 32 up to 25.0mOD (1.0m to be added to wall 32)	4.6	23.81
Mode 7	Wall 32 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure *1 Detection and Notification of Mode*
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Bupa Building Car Parc entrance South (**Wall no 34**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181616 Y- coordinate: 98657
Type of Structure	Demountable Wall, 2 permanent Endpost + 1 Centre posts .	
Installation	By Forklift and by hand	
Closing material	Separate: – Centre Posts, – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 1x Centre Post MS4 / 2x End Post / 26x Standard Beams / 2x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 3	Wall 34 up to 24mOD (1.2m height)	3.5	22.71
Mode 6	Wall 34 up to 25.0mOD (1.0m to be added to wall 34)	4.6	23.81
Mode 7	Wall 34 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure *1 Detection and Notification of Mode*
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

Fact sheet		
Name of Structure:	Demountable Wall Bupa Building - Embankement (**Wall no 36**)	
Flood defence authority:	Fermoy Town Council	
Location	River: Blackwater River Section: Fermoy Town - South	Dike: Right (South) X- coordinate: 181625 Y- coordinate: 98640
Type of Structure	Demountable Wall, 2 permanent Endpost.	
Installation	By Forklift and by hand	
Closing material	Separate: – Centre Posts, – Beams, – Beams with seals – Bolts, – Pressing tools	

Materials
Storage Depot: Faber castell
Travel time: 5 minutes from depot
Special circumstances related to accessibility: none
Types and number per type: 2x End Post / 19x Standard Beams / 1x Beams with Seal
Number of Spare parts per type: Spare parts in storage depot.
Transport: Crane Lorry
Equipment and tools: e.g. Fork lift or telehandler for loading pallets at the storage depot onto a lorry. Transport by lorry, unloading by telehandler, lifting posts by hook and strap, toolboxes with tools for installing beams and pull up posts, compressor with hose and nozzle.

Closing moment

Mode Number	**Barriers that will be installed on South Side**	**Trigger level on Gauge D/S of bridge (m)**	**Trigger level on Gauge D/S of bridge (mOD)**
Mode 3	Wall 36 up to 24mOD (1.2m height)	3.5	22.71
Mode 6	Wall 36 up to 25.0mOD (1.0m to be added to wall 36)	4.6	23.81
Mode 7	Wall 36 to full height N72 Road barrier (Near Hospital)	5.7	24.86

Procedure
1 Detection and Notification of Mode
Who (warns and monitors) Principal: # Assistant principal 1: # Assistant principal 2: #
What Observe and monitor (flood warning notifications or water level gauges): OPW Warning (Fermoy Town Council and partners): on closing the demountable structures Monitor and control: amount and quality of structures and demountable structures
How Observe and monitor: telemetrie / online gauges / Warn: telephone, fax, mobile phone, radiotelephone Control: visual
Details Partners: # Measures when structure malfunctions: big bags / sandbags / clay Possible repairs of defect demountables: spare parts of other demountable structures (with IBS system), big bags and sandbags

2 Order: to close the structure and monitoring of scheme
Who gives order Principal: # Assistant principal 1: # Assistant principal 2: #
What order and to who Order: transport the demountables, from the storage depot to the structure, to close the structure. To who: team / contractor
How Way of giving order: telephone and radiotelephone
Details Reaction time for finishing the closure order: 8 hours

APPENDIX 3 IBS operating manual demountable defences

APPENDIX 4 IBS maintenance manual demountable defences

APPENDIX 5 Maintenance Schedule

APPENDIX 6 Installation resources and installation checklist

The following is a list of the documents included in Appendix 6:

- Trial Installation record
- Draft resource scheduling for various Modes
- Installation checklist

APPENDIX 7 Location response base details

The following is a list of the documents included in Appendix 7:

- Layout Drawing
- Barrier Component Inventory Count
- Fermoy South Pallet Details (68 Drawings)

APPENDIX 8 Forecasting Manual (To be supplied by OPW)

APPENDIX 9 Equipment data Sheets

- Penstocks
- Flap Valves
- Sluice Valves
- Mobile Actuator