

|   |  |  |                                     |
|---|--|--|-------------------------------------|
| <b>Location: Patrickswell, Co. Limerick</b>                       |  | <b>Unique ID: 240393</b><br>(from PFRA database) |                                     |
| <b>Initial OPW Designation</b>                                    | <b>APSR</b> <input type="checkbox"/>   | <b>AFRR</b> <input checked="" type="checkbox"/>  | <b>IRR</b> <input type="checkbox"/> |
| <b>Co-ordinates</b>   | <b>Easting: 152500</b>   |  | <b>Northing: 150000</b>             |
| <b>River / Catchment / Sub-catchment</b>                          | <b>Barnakyle River / Maigue Catchment</b>  |  |                                     |
| <b>Type of Flooding / Flood Risk</b><br>(identify all that apply) | <b>Fluvial non-tidal</b> <input checked="" type="checkbox"/> <b>Fluvial tidal</b> <input type="checkbox"/> <b>Coastal</b> <input type="checkbox"/> |  |                                     |

| <b>Stage 1: Desktop Review</b>   |  |
|--|--|
| <b>1.1 Flood History<br/>(include review of<br/>Floodmaps.ie)</b>                    | <b>River Flow Path</b><br><br>The Barnakyle River sources approx 3 km south of Patrickswell town, and flows through the centre of the town. This then merges with an unnamed stream northeast of the town.<br><br>Both watercourses are likely to have recent culvert structures as they pass under the new M20.<br><br>The Barnakyle River then flows northwest to the River Maigue (approx 5km downstream from the town).<br><br><b>Flood event records</b><br><br>No flood event records available from floodmaps.ie  |
| <b>1.2 Relevant<br/>information on<br/>flooding issues from<br/>OPW and LA staff</b> | <b>PFRA database comments (<i>in italics</i>):</b><br><br><b>OPW comments</b><br><i>Minor risk to residential development</i><br><br><b>LA comments</b><br><i>All agreed</i><br><br><b>Meeting / discussion summary comments:</b><br><br><b>OPW comments</b> <ul style="list-style-type: none"> <li>• Bridge/culvert under the R526 leads to flooding due to hydraulic constriction.</li> <li>• Bridge was to be replaced (before 1986) as part of the Maigue Scheme, but was only partly improved. The downstream end has a double culvert built 20-25 years ago (around mid 1980s).</li> <li>• If there are properties at risk it is possibly those on the left bank on the estate upstream of the bridge.</li> <li>• Development pressures west of graveyard (south of M20 and railway), and also north of Patrickswell town.</li> </ul> <b>LA comments</b> <ul style="list-style-type: none"> <li>• The area in the centre of the town d/s of the R526 (north of Belgard Grove) is a known pinch-point.</li> <li>• Limerick CoCo undertook a survey of services planned for this area. This was a study of the Southern Environs and included areas from Raheen towards Mungret and then back in towards Limerick City.</li> <li>• The Council is aware of frequent surface water problems</li> <li>• The flood risk at Patrickswell is considered more of a threat than an historic problem.</li> </ul> |

|   |   |                     |   |
|---|---|---------------------|---|
| <b>1.4 PFRA Data</b>  |   |                     |   |
| <b>1.4.1 PFRA hazard mapping</b>                                | <b>PFRA mapping available in GIS layer:</b>   |                     | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
|   | <b>PFRA mapping included on FRR map:</b>  |                     | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| <b>1.4.2 Summary of Principal Receptors</b>                     | <b>Type</b>   |                     | <b>FRI score (if available)</b>                                     |
|   | Monument (LV)   |                     | 10  |
|   | <b>Total:</b>   |                     | <b>276</b>  |
| <b>1.7 Stage 1 Evaluation</b>                                   | <b>Aspect</b>   | <b>Clearly APSR</b> | <b>Uncertain</b>  |
|   | <b>Flood History (1.1)</b>  |                     | <b>X</b>  |
|   | <b>OPW / LA Information (1.2)</b>   |                     | <b>X</b>  |
|   | <b>PFRA Evaluation (1.4)</b>  |                     | <b>X</b>  |
|   | <b>Overall Desktop Evaluation</b><br>(if any above aspect is uncertain then overall designation is uncertain) |                     | <b>X</b>  |
| <b>1.8 Proposed level of assessment for Stage 2 site visits</b> | <b>Level A Site Visit</b>   |                     | <b>X</b>  |
|   | <b>Level B Site Visit</b>   |                     |   |

|  |   |  |                |   |
|--|---|--|----------------|---|
| <b>Stage 2: Site Inspection</b>  |   | <b>Level A Assessment</b>                                  |                |   |
| <b>Date and Time of Inspection</b>   |   | <b>Date: 01/04/11</b>                                      |                |   |
|  |   | <b>Time: 09:30</b>   |                |   |
| <b>Names of inspection team<br/>(including OPW/LA staff if present)</b>  |   | <b>Iain Blackwell</b>                                      |                |   |
|  |   | <b>Kelly Kasperczyk</b>                                    |                |   |
|  |   |  |                |   |
|  |   |  |                |   |
| <b>2.1 Ground-truthing of Hazard Mapping</b>   | <b>Fluvial non-tidal</b> <input checked="" type="checkbox"/> <b>Fluvial tidal</b> <input type="checkbox"/> <b>Coastal</b> <input type="checkbox"/> <b>Not available</b> <input type="checkbox"/>  |  |                |   |
|  | Hazard mapping appears to show a relatively good correlation with observations made on site in terms of topography and broad flood outline. However, flood extents may be over-estimated, particularly over the left bank in the residential area at the upstream end of Patrickswell.  |  |                |   |
| <b>2.2 Spot check ground-truthing of selected receptor vulnerability</b>   | <b>Receptor Type</b>  | <b>Location description (if not obvious)</b>               | <b>Exists?</b> | <b>Overall Vulnerability / Risk (L / M / H)</b> |
| <b>(also note any key receptors noted during visit that are not identified by PFRA)</b>                                    | Houses  | Belgard Grove – left bank upstream of crossing of the R526 | Y              | L   |
| <b>2.3 Local knowledge - on-site comments</b><br><b>(OPW, LA and any info volunteered by local residents during visit)</b> | <b>Local Resident, Belgard Grove</b><br>Local resident of 14 years has no knowledge of flooding in the Belgard Grove housing estate or anywhere in Patrickswell.  |  |                |   |
| <b>2.4 Comments on hydraulic constrictions (bridges, etc.) and conveyance routes</b>                                       | River crossing under the main street - The river enters a small single arch bridge and under the road changes to a twin culvert. In flood conditions it is highly likely (and implied by OPW) that the u/s bridge section would back up. There are sand bags at the side door of the pizza shop on the left bank here.<br><br>In the event of backing up in this area, the flood plain on the right bank would take large amounts of storage before overtopping of the left bank affecting Belgard Grove. |  |                |   |

## 2.5 SVRS Assessment Matrix

### Weightings:

A - x1 - reasonable expectation of flooding

B - x2 - high expectation of flooding  
or flooding is tidal (any risk)

C - x5 - risk to life

| Approx. Number  | 1 to 4 |   |   |   | 5 to 20 |   |   |   | >20       |   |   |   |
|---|--------|---|---|---|---------|---|---|---|-----------|---|---|---|
| Weighting   |        | A | B | C |         | A | B | C |           | A | B | C |
| Property (domestic)   | 10     | X |   |   | 100     |   |   |   | 200       |   |   |   |
| Property (small retail or business)   | 20     |   | X |   | 200     |   |   |   | 400       |   |   |   |
| Property (large retail or business)   | 50     |   |   |   | 500     |   |   |   | 1000      |   |   |   |
| Road or Rail Infrastructure   | 30     |   |   |   | 300     |   |   |   | 600       |   |   |   |
| Critical Infrastructure (local)<br>[hospital, school, police/fire/ambulance station, substation, WTW/WWTW, gov bldg, other (specify)] | 50     |   |   |   | 500     |   |   |   | 1000      |   |   |   |
| Critical Infrastructure (national importance)   | 250    |   |   |   | 1000    |   |   |   | 2000      |   |   |   |
| Cultural Heritage Site  | 20     |   |   |   | 200     |   |   |   | 400       |   |   |   |
| Environmental Designated Site   | 20     |   |   |   | 200     |   |   |   | 400       |   |   |   |
| Hazardous Substances Site   | 50     |   |   |   | 500     |   |   |   | 1000      |   |   |   |
| <b>Total SVRS</b>   |        |   |   |   |         |   |   |   | <b>50</b> |   |   |   |

## 2.6 Defence Assets

### Formal and Informal Flood Defence Assets

(include effective and ineffective assets to inform asset survey and potential mitigation measures)

#### Open Channel Watercourses

Man-made river channel ☐ Flood relief channel ☐ Canal ☐  
Mill leat ☐ Drainage channels / back drains ☐

#### Bridges and Culvert crossings

Single Arch bridge ☒ Multi-Arch bridge ☐  
Single Span bridge ☐ Multi-Span bridge ☐  
Box culvert(s) ☐ Pipe culvert(s) ☐ Arch Culvert(s) ☐

#### Culverted Watercourses (culvert length is greater than just a crossing)

Box culvert(s) ☐ Pipe culvert(s) ☒ Arch Culvert(s) ☐ Irregular Culvert(s) ☒

#### Walls and Embankments

Embankment(s) ☐ Raised wall(s) ☐ Retaining wall(s) ☐

#### Control Structures – weirs, gates, dams

Fixed crest weir ☐ Adjustable weir ☐ Dam / Barrage ☐  
Sluice gates ☐ Lock gates ☐ Radial gates ☐

#### Storage

On-line storage (natural) ☒ On-line storage (artificial) ☐ Off-line storage ☐

|  |  |
|--|--|
|  | <b>Outfalls</b><br>Flapped outfall(s) into watercourse <input type="checkbox"/> Unflapped outfall(s) into watercourse <input type="checkbox"/><br><i>i.e. from smaller watercourses, drains etc. into river / estuary / sea</i><br>Tidal flap(s) <input type="checkbox"/> Tidal sluice(s) <input type="checkbox"/><br><i>i.e. from main watercourse into estuary / sea</i><br><b>Other</b><br>Pumping Station <input type="checkbox"/> Erosion Protection <input type="checkbox"/> Sand Dunes <input type="checkbox"/><br><b>Additional notes (if required):</b><br>Storage area is on the right bank at the upstream end of the town, between Patrickswell and the M20. |
|--|--|

## 2.8 Initial Potential Mitigation Measures

|                                |   |
|--------------------------------|---|
| <b>Non-structural measures</b> | Planning and Development control <input checked="" type="checkbox"/><br>Sustainable Urban Drainage Systems <input type="checkbox"/><br>Flood forecasting / warning <input type="checkbox"/><br>Change in Operating Procedures for water level control: <input type="checkbox"/><br>Public awareness campaign <input type="checkbox"/><br>Individual property protection <input checked="" type="checkbox"/><br>Land use management <input type="checkbox"/>   |
| <b>Structural measures</b>     | <b>Strategic development management for floodplain development:</b> <input type="checkbox"/><br><i>(integration of measures into strategic development proposals)</i><br><b>Storage:</b> On-line <input checked="" type="checkbox"/> Off-line <input type="checkbox"/><br><b>Flow diversion:</b> Flood relief channel <input type="checkbox"/> Flood relief culvert <input type="checkbox"/><br><b>Increase conveyance:</b> Bridge works <input type="checkbox"/> Channel works <input type="checkbox"/> Floodplain <input type="checkbox"/><br><b>Flood defences:</b> Walls <input checked="" type="checkbox"/> Embankments <input type="checkbox"/><br><b>Localised works:</b> Defence raising <input type="checkbox"/> In-fill gaps <input type="checkbox"/> Trash screen <input checked="" type="checkbox"/><br><b>Maintenance works:</b> Culvert / channel clearance <input checked="" type="checkbox"/> Asset maintenance <input type="checkbox"/><br><b>Relocation of properties:</b> <input type="checkbox"/><br><b>Improve existing defences:</b> <input type="checkbox"/> (describe)<br><b>Other (describe):</b><br>Culvert improvements under the R526. This is not a flood relief culvert <i>per se</i> but it would improve the conveyance through the town. |

| Outcomes  |  |                  |                              |                      |
|---|--|------------------|------------------------------|----------------------|
| <b>PFRA Designation</b>   | APSR <input type="checkbox"/> not an APSR <input checked="" type="checkbox"/> IRR <input type="checkbox"/> |                  | FRI Score: 276               |                      |
| <b>Site Ground-truthing of PFRA Assessment (hazard mapping and receptors)</b> | <b>High Confidence (good)</b>  | <b>Uncertain</b> | <b>Low Confidence (poor)</b> | <b>Not available</b> |
|   |  | X                |                              |                      |
| <b>Site Visit Review Score</b>  | 50   |                  |                              |                      |
| <b>Recommended Designation</b>  | APSR <input type="checkbox"/> not an APSR <input checked="" type="checkbox"/> IRR <input type="checkbox"/> |                  |                              |                      |
| <b>Summary Comments (if required)</b>   |  |                  |                              |                      |



**Photo 1:** Right bank flood plain opposite residential properties in Belgard Grove



**Photo 2:** Properties in Belgard Grove elevated on left bank, above right bank flood plain level



**Photo 3:** Culverted section u/s of road crossing



**Photo 4:** Culverted section u/s of road crossing





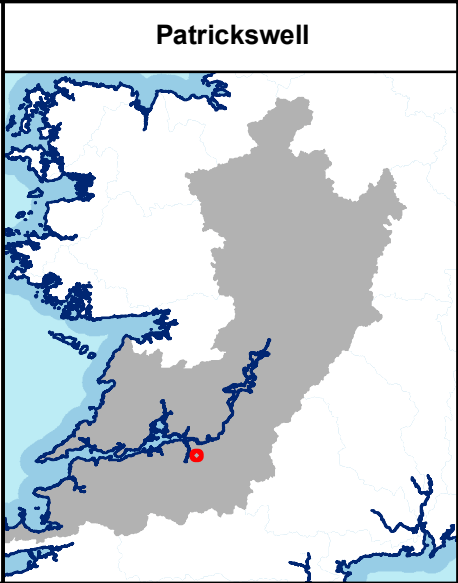
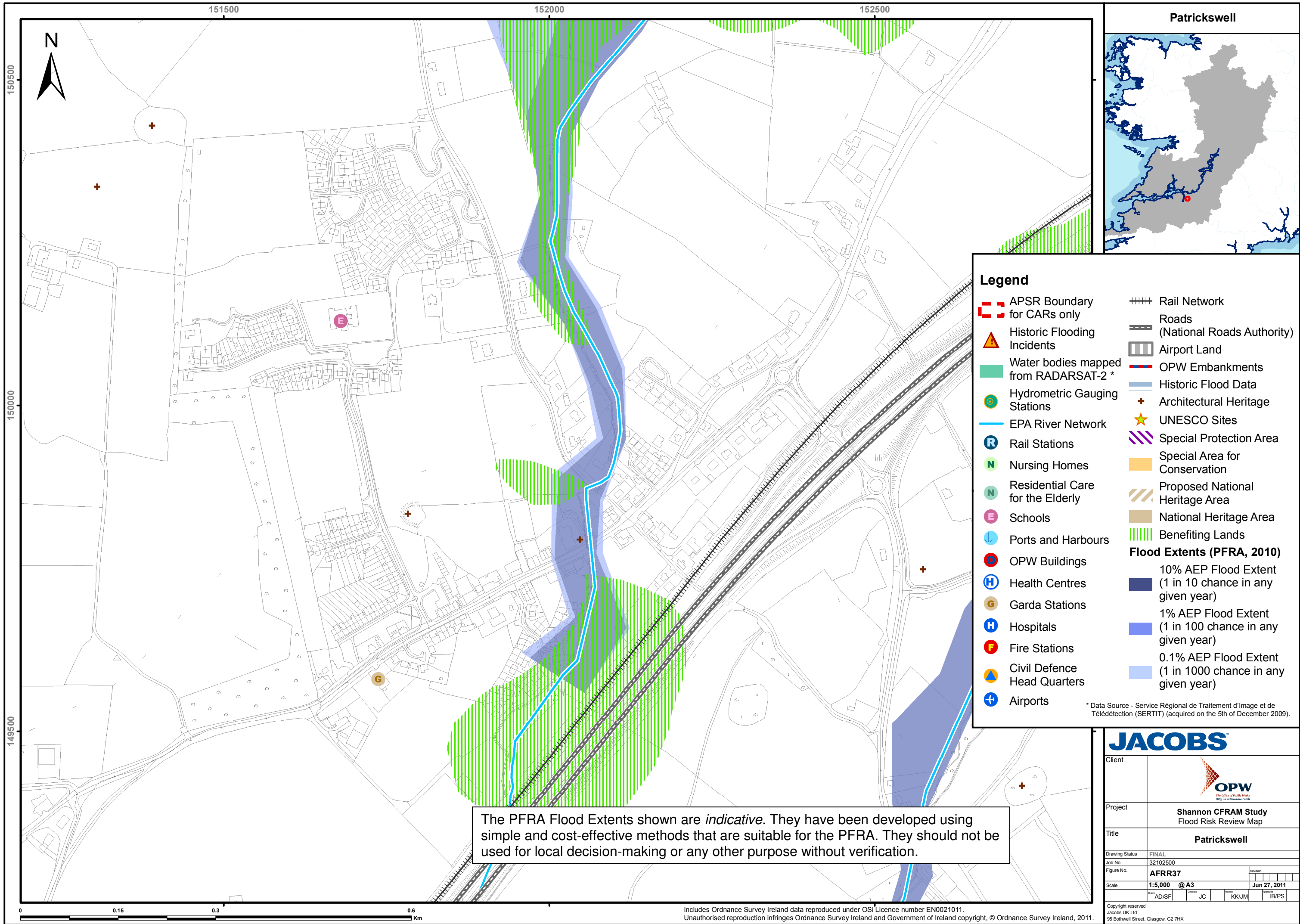
**Photo 5:** Single culvert entrance at Patrickswell main road crossing



**Photo 6:** Sand bags at side door to restaurant immediately u/s of single culvert main road crossing



**Photo 7:** Double culvert exit at Patrickswell main road crossing



### Legend

APSR Boundary for CARs only

Historic Flooding Incidents

Water bodies mapped from RADARSAT-2 \*

Hydrometric Gauging Stations

EPA River Network

Rail Stations

Nursing Homes

Residential Care for the Elderly

Schools

Ports and Harbours

OPW Buildings

Health Centres

Garda Stations

Hospitals

Fire Stations

Civil Defence Head Quarters

Airports

Rail Network

Roads (National Roads Authority)

Airport Land

OPW Embankments

Historic Flood Data

Architectural Heritage

UNESCO Sites

Special Protection Area

Special Area for Conservation

Proposed National Heritage Area

National Heritage Area

Benefiting Lands

#### Flood Extents (PFRA, 2010)

10% AEP Flood Extent (1 in 10 chance in any given year)

1% AEP Flood Extent (1 in 100 chance in any given year)

0.1% AEP Flood Extent (1 in 1000 chance in any given year)

\* Data Source - Service Régional de Traitement d'Image et de Télédétection (SERTIT) (acquired on the 5th of December 2009).

The PFRA Flood Extents shown are *indicative*. They have been developed using simple and cost-effective methods that are suitable for the PFRA. They should not be used for local decision-making or any other purpose without verification.

|  |  |
|--|--|
| JACOBS   |  |
| Client   |  |
| Project  | Shannon CFRAM Study<br>Flood Risk Review Map |
| Title  | Patrickswell                                 |
| Drawing Status   | FINAL  |
| Job No.  | 32102500                                     |
| Figure No.   | AFRR37                                       |
| Scale  | 1:5,000 @ A3                                 |
| Drawn  | AD/SF  |
| Checked  | JC   |
| Reviewed   | KK/JM  |
| Approved   | IB/PS  |
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