Urban Drainage & Flooding

The risk of flooding is defined as a function of both the probability of a flood happening and its impact. In urban areas, the impact can be very high because the areas affected are densely populated and contain vital infrastructure. The reason for increased flooding in urban areas is twofold. Firstly, increased urbanisation has resulted in developments encroaching on floodplains, obstructing floodways and the loss of natural flood storage. Secondly, increased urbanisation has resulted in increased impervious areas such as roads, roofs and paving which create more rainwater water run-off.

To establish the flood risk associated with individual sites or catchments PUNCH Consulting Engineers can undertake Flood Risk Assessments in conjunction with River Flow Modeling.

Traditional drainage systems were designed to move rainwater as rapidly as possible from the point at which it has fallen to a discharge point, via a piped system to either a watercourse or soakaway. During periods of wet weather this approach can result in the increased risk of flooding downstream, sudden rises in water levels and flow rates in watercourses. By diverting rainfall to piped systems, water is stopped from soaking into the ground, depleting ground water and reducing flows in watercourses in dry weather. In addition, surface water run-off can contain contaminants such as oil, organic matter and toxic metals. Although often at low levels, cumulatively they can result in poor water quality in rivers and groundwater, affecting biodiversity, amenity value and potential water abstraction.

PUNCH Consulting Engineers recognise that the Sustainable Urban Drainage System (SUDS) approach to drainage reduces flood risk, minimises diffuse pollution, maintains or restores natural flow regimes and improves water resources while enhancing amenity. PUNCH have varied and extensive experience in the design of SUDS systems.

If you are interested in discussing any of the services we can provide please contact:

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In the planning of the development of numerous sites, PUNCH have prepared river and stream catchment assessments, flood event simulations and developed flood management and culverting solutions to address site development issues. These have included appropriate Section approvals from the OPW.

PUNCH has also undertaken and prepared Environmental Impact Assessments associated with the Fermoy Flood Relief Scheme and prepared preliminary reports on the Mallow Flood Relief Scheme.

PUNCH was the design team leader for 2 river modelling studies on the Ballynaclogh River undertaken to establish the viability and impact of the development of existing undeveloped land banks, currently protected behind OPW embankments.

With the introduction of the Guidelines “The Planning System and Flood Risk Management” by the OPW, PUNCH has prepared numerous river simulations and flood risk assessments to establish the appropriate flood risk zoning of development sites and the planning considerations which follow.

Our engineers are trained in HEC-RAS software for river simulations and Conveyance and Afflux Estimation System Software.

In addition to flood modelling consultancy work, PUNCH are consultants for Limerick County Council on the emergency bridge repair works, quay reconstruction works and landslide stabilisation works which were required following the July 2008 flood event in Newcastle West. PUNCH have also investigated remedial proposals (included temporary flood barriers, drainage improvements and retrospective water-proofing) for several flood damaged properties in Ennis, following the November 2010 flood events. PUNCH are currently monitoring Castleconnell Footbridge following the November 2010 flood events.

Coonagh Shopping Centre, Limerick 5500m³ storage lagoon

M7 Nenagh - Limerick Balancing / treatment ponds / constructed wetlands
PUNCH was engaged in July 2008 to review the drainage strategy in regard to balancing and treatment ponds required at a number of locations along the 37km dual carriageway. Subsequently we were commissioned to design and detail a number of the balancing ponds (volume typically circa 2500 cubic metres). The ponds incorporate sedimentation forebays then either infiltration basins, sedimentation / detention ponds or constructed wetlands.

Greenpark Redevelopment, Limerick Surface Water Lagoon
PUNCH was engaged to design and oversee the construction of the infrastructure required to facilitate development of 53 hectares of lands at the former Race Course at Dock Road Limerick.

The infrastructure works included construction of a lagoon, designed to accommodate run-off from an impermeable area of 39 hectares. The lagoon occupies a site area of approx. 2.4 hectares and the storage volume provided is 17,700 m³ with a permanent storage volume of approx. 1000 m³.

Ennis Road Retail Park, Limerick 21,000m² permeable paving
The project comprised a new retail warehouse development on the outskirts of Limerick City. PUNCH was employed as both Civil and Structural Engineers on the project from conception to completion of the works. All hardstanding areas - including roads, car parking and service yards are constructed using a proprietary tanked permeable paving system.