Tideflex® Technologies

Check Valves
**Case Study**

# Series TF-1 Check Valve Protects Residents of Irish Town From Flood Prone River

In August 2008, the town of Carlow (located in southeast Ireland) was under almost 2m of flood water after the River Barrow burst its banks following exceptional heavy rainfall. Less than 3 years later, construction work on an £18 million flood relief scheme is nearing completion. Over 20 km of new pipe line, storage chambers, pumping stations and pressure lines have been constructed to increase the capacity of the existing network, making it more efficient. Much of this work has been done with minimal interruption to the busy town trade using advanced design and construction techniques.

Tideflex® TF-1 Check Valves were chosen as the NRV (Non Return Valve) throughout the project for their low cost of ownership and their reputation as the most reliable drainage check valve available today. The extremely low headloss of the TF-1 allowed the design to utilise much of the existing drainage, speeding the delivery of flood protection to the town's 21,000 residents. Unlike traditional flap valves, TF-1 valves work under the silt and sand deposits typically found in low lying area river beds.

Tideflex® Check Valves are a key design element in any flood relief scheme, delivering a low energy solution as gravity flows are maximized and pumping costs minimized. A combination of increased attenuation using CSO chambers and Tideflex® Check Valves often reduces the running time, size and number of pumps required to cope with exceptional rainfall events. The eccentric flat-bottom TF-1 Check Valve design can be installed close to the chamber floor or river bed, for greater use of the available system head, thus maximizing discharge capacity.

The very low cracking pressure (25mm) and self-clearing ability of these valves ensure that the designed stormwater attenuation is maintained over the years with minimal effort and cost on the part of the local council. Tideflex® Check Valves require no routine maintenance or repairs and have a long life span of 30 years. The valves operate using line pressure and backpressure to open and close, so no outside energy source is required, reducing the carbon footprint. Tideflex® Check Valves make excellent replacements for ineffective flap valves because they have no moving parts that can freeze solid in icy conditions, warp or corrode.

All Tideflex® TF-1 Check Valves over 450mm feature a patented Curved Bill as standard. The Curved Bill returns to a closed position more naturally when compared to the old straight bill design. This allows the valve to form a tighter seal around debris and solids typically found in stormwater and effluent discharge.

*A Tideflex® TF-1 Check Valve installed on the River Barrow to protect Carlow from flooding.*

From the outside, Tideflex® Check Valves appear to be a simple rubber valve in a duckbill shape. However, for each Tideflex® Check Valve there can be hundreds of layers of various natural and synthetic elastomers and fabric-reinforced plies. The valves are constructed similar to a truck tire. Each material has a different mechanical property. When combined into a unibody construction these materials produce specific hydraulic characteristics.

At the modern 25,000m² factory in North Carolina, highly trained teams build each valve by hand to exacting protocols. Tideflex® Engineers perform extensive hydraulic testing and backpressure testing to correlate the specific construction details with the hydraulic performance and back pressure rating of each valve. This performance data has been verified by over 70 independent hydraulic tests worldwide and in over 300,000 installations.

The all rubber construction of Tideflex® TF-1 Check Valve seals better and is tougher than metal for abrasive outdoor drainage service over decades. Tideflex® Check Valves never rust or require lubrication. For these reasons, Carlow choose to install the Tideflex TF-1 Check Valve.