Appendix C
Typical Levee Types

EMBANKMENT LEVEE

CRIB WALL LEVEE

SHEET PILE WALL

CANTILEVER WALL

BAUER-IBS
K-SYSTEM

BAUER-IBS
K-SYSTEM

Flood Defence
Barriers

BAUER INNER CITY

Flood protection

Catastrophic flood events are expected to occur with greater frequency in the coming years, and with increasing levels of unpredictability. The high costs associated with flooding, both financial and emotional, can not always be supported by the victims. The BAUER-IBS Defence Systems enable the mitigation, or even avoidance, of the huge costs of flood damage.

Applications

- Domestic properties - community or stand alone
- Industrial installations
- Commercial properties
- Infrastructure

The International BAUER Organisation

- Global experience over hundreds of projects
- A 200 year tradition of providing engineering solutions
- High quality, field tested Systems and products
- Strictly applied quality and design procedures, assuring long term high performance
- Optimum quality and price by advanced value engineering
- Continued innovation and research provide effective solutions for todays problems

BAUER INNER CITY

BAUER Inner City Limited
Tannery Court, Tanners Lane,
Warrington, Cheshire WA2 7NR
United Kingdom
www.demflood.co.uk

Your Contact:

BAUER Inner City Limited

Tel: +44 (0)1925 428940
Fax: +44 (0)1925 244133
e-mail: info@bauerinnercity.co.uk

BAUER-IBS K-SYSTEM

Strong, mobile, rapidly deployed

Effective and Secure

Flood Defence System

Flood Defence System

Mobile protection system against flooding

System Description

BAUER INNER CITY

K-System

The K-System is a fully mobile flood defence concept. It does not require any pre-engineering on site (for instance permanent foundation elements cast into concrete groundworks) and so overcomes financial and technical drawbacks usually associated with major flood defence schemes. The System is therefore ideal for use in a wide range of locations, requiring only the minimum time and manpower resources.

Design Features

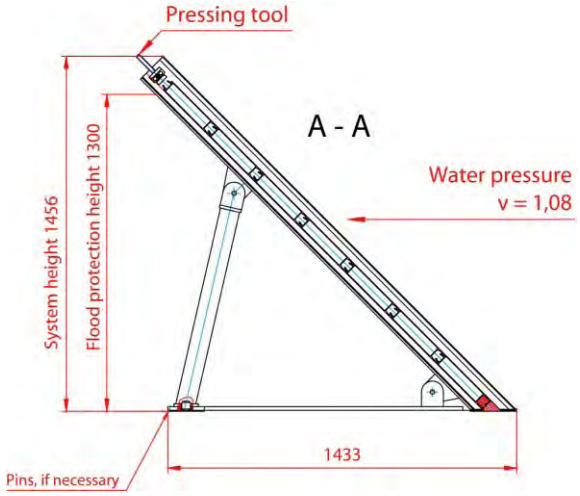
- The System is fabricated from robust and durable certified materials (aluminium or stainless steel)
- Rigorously tested for hydrostatic load conditions
- Designed to withstand flood heights of up to 1.5 metres
- Specially designed anchorage system

The major advantage of the System is that the pressure exerted by the flood water contributes to the stability of the System on the ground, due to the 45° inclination. The modular design provides enhanced flexibility to suit widely varying height conditions.

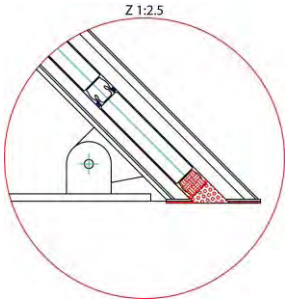
Lateral view - folded for storage

Key Benefits

- Preliminary ground engineering works are not required
- Modular design allows flexibility to suit various site conditions
- Rapidly deployed before a flood event
- Thoroughly tested under full hydrostatic load conditions
- Requires no specialist knowledge or training - simple instructions supplied are all that is required
- Very competitive capital cost, compared to permanent defences



The type of anchorage is chosen in accordance with ground conditions



Technical Specification

- Dam Beam: AlMgSi 0.5 F22
- Back Support: AlMgSi 0.5 F22
- Supporting Ground Plate: AlMgSi 0.5 F22
- Fixing: V2A 1,4301
- Pressing Tool: V2A 1,4301
- Seals: EPDM
- Ground Seal: IBS Special Seal
- Flood protection height:
  without anchoring = 1,200 mm
  with anchoring = 1,500 mm

BAUER-IBS

DEMFLOOD™ SYSTEM

The solution for flood defence applications

INTRODUCTION

The frequency and severity of flooding has increased dramatically over recent years, and is now a pan-European problem that requires increasing research and investment. The effects of global warming are now becoming measurable, these include the melting of polar ice caps and glaciers, increasing sea levels and severe storm events.

Today, experts suggest that extreme flood events will become more frequent in the coming years. It may not be possible to guard against all future events, particularly in light of the high cost of building hard-engineered defences, but there are realistic alternatives including **Demountable Flood Defence Systems.**

Although BAUER is well-known as a global provider of civil engineering technologies, such as secant pile, diaphragm and sheet pile wall systems, it was a logical step for the company to combine existing technologies with engineered systems that alleviate flooding, providing a total solution.

This new System is the **BAUER-IBS "DEMFLOOD™" Demountable Flood Defence System**, a system designed and developed by the German manufacturer IBS and distributed all over the world by BAUER.

City of Lieser, Germany (River Mosel)

THE SYSTEM

The BAUER-IBS DEMFLOOD™ System comprises lightweight extruded aluminium profiles forming posts and dam beams, stainless steel cast in anchor plates - to which the demountable posts are fitted - and high performance synthetic water seals. The System has a well-proven flood defence record on main rivers in Germany, including the Rhine and Mosel.

Being an essentially simple system, it is also easy to install (a very important factor during a flood event) and there have been no operational difficulties for the 300 owners of the System over the last ten years.

STATISTICS

Maximum System Length – No limit
Maximum Defence Height – Currently 5 Metres
System axis (post-to-post) – typically 2.5 to 3.5 metres according to design criteria

City of Alf, Germany: Barriers In use while flooding from the Mosel river

INSTALLATION PROCEDURE

A) Installing the System

Foundations – (prepared in advance)
Cast-in items including anchor plates.
The anchor plate system is cast into a concrete ground beam, that is cast onto a sheet or secant pile wall or diaphragm cut-off wall. For small applications, such a cut-off wall may not be required.

Superstructure – (At the beginning of the flood season or as required for a specific flood event.)
The demountable central posts consist mainly of an aluminium support core that is permanently fitted to a post base. The post base has holes that match the threaded holes in the anchor plate, and is bolted to the anchor plate with M24 or M30 bolts, according to the hydrostatic load requirements of the System and design flood height.
Posts are typically at 2.5 to 3.5 metre centres (but they can be longer or shorter).

When the first supporting posts are put in place and bolted, and the covers removed from the permanently mounted end posts, then the team can begin inserting the dam beams.

Setting the System
The System uses a unique ground seal that requires no ground rail – it is highly compressible and seals against the existing ground between posts.
The System uses special pressing tools that push down on the dam beams and compress the base seal. All the dam beams are identical and the base seal will fit into any beam, saving time on site.

B) Removal of the System

When the flood event or warning is over, or the flooding season is finished, the DEMFLOOD™ System can be removed and stored until the next use.
The pressing tools are removed, the dam beams are extracted and the support posts are un-bolted. Only the anchor plates incl. the fixing bolts remain in position.

After removal of the superstructure elements, the only requirement is to wash down all components with clean water. All elements are then stored on the purpose-made storage racks that are supplied with the System.


Bewdley Bridge, UK: Trial Installation of Bauer-IBS Demflood System

Storage Recommendations

The System is stored on its storage racks under cover (ie. in a small warehouse). These ensure speed of recovery next time and prevent direct metal to metal contact between components avoiding contact corrosion and allowing proper circulation of air.

It is important that seals are protected from direct sunlight. Timber packings are specially profiled to ensure that posts and dam beams in storage retain their position whilst being transported.

Handling and transfer of the System to site can be carried out with appropriate mechanical equipment, for instance Hiab machines, for most applications.

Materials

The materials used in the production of the System include:

- Extruded aluminium – support post cores, end posts and dam beams
- Stainless steel – anchor plates
- Galvanised steel – post bases on some systems, rear buttresses, bolts

For more details please refer to our technical catalogue.

Closing off of a gate

Key Advantages of the BAUER DEMFLOOD™ System

- **Extremely low seepage** (Based on our experience it is possible to reach ≤10 litres/hour/m^2 installed System. Nevertheless, the seepage rate strongly depends upon the installation and handling.)
- **Fully demountable** – Install and dismantle as required, when required. Endlessly re-usable over the System's life
- **Rapidity** of installation
- **Simple** – All components are symmetrical and easy to handle
- **Flexibility** – Suitable for most flood defence applications (uneven ground conditions, steps, around corners, and in heights up to 5 metres)
- **Easy maintenance** – stainless steel and extruded aluminium are highly resistant to corrosion
- **Minimum surveillance** – Robust System, no moving or electronic parts
- **No requirement for specialised staff** – simple training is all that is needed
- **Successful Track Record** –no failure on any System installed by BAUER-IBS during 10 years of operation

If you require further information please contact us at the address below for full information pack and CD presentation.

Your CONTACT :

Hermann Schrattenthaler
Tel: +49 8252 97 1503
Fax: +49 8252 97 1493
Mobile: +49 171 6544 366
e-mail:Hermann.Schrattenthaler@bauer.de or Bauer.IBS@bauer.de

BAUER Spezialtiefbau GmbH
VU-V
P.O. Box 1260
86522 Schrobenhausen
GERMANY

The BAUER-IBS DEMFLOOD™ System

The definitive Demountable Flood Defence System
for domestic and commercial flooding problems

“DEMFLOOD” FLOOD GATE