

FILTER BED SOLUTIONS

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FP McCann offers a specialist design and build service for circular biological filter walls. The inherent flexibility of this well-proven system allows us to accommodate all ancillary requirements.

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Offering many advantages over ASP, Baff and Saff Treatment processes, the system uses zero energy, zero chemicals and has a very low carbon footprint.



FILTER BED WALL & TILE SYSTEMS

INTRODUCTION

Due to daily and seasonal temperature fluctuations; traditional brick, cast in-situ concrete and stiffly joined, freestanding filter bed structures have high levels of failure associated with the development of excessive circumferential stresses induced in the wall. During successive cycles of expansion and contraction, the passive pressures at wall/filter medium interface increase with time in a racking manner. This failure normally occurs suddenly, although it may take years to develop and even with thorough and regular visual inspection, it is difficult to predict.

As CIRA Report 58 states:

"The failure by ring tension is characterised by vertical cracks which progressively increase in width, but many years may lapse before the wall collapses".

HIGH STRENGTH/HIGH FLEXIBILITY SOLUTIONS

In designing for long-term serviceability, it is essential to understand the nature of the stress escalation.

FP McCann's filter beds incorporate a specially designed and patented panel-to-panel connection assembly. This assembly combines the unique features of high strength (to enhance structural integrity) and high flexibility (to prevent the development of excessive circumferential stresses due to temperature variations). These features make the assembly particularly durable and lead to longer life.

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DURABILITY

An important aspect of this assembly system is that passive pressures are reduced to acceptable levels and do not play a critical role in the structural performance of FP McCann's filter beds.

FP McCann has extensive experience in the design and construction of filter bed retaining walls of ring tension type. Many structures have been in service for over 40 years, with their expected lifespan much longer than this.

PATENTED AND RELIABLE

FP McCann's well proven and patented system incorporates neoprene washers, which prevent damage arising from thermal movement and overcome the problem of failure caused by passive resistance.

Used for many years by water companies and authorities nationwide, the FP McCann system not only offers total reliability, but also proven value and design flexibility in the construction of new and the repair of existing filter bed walls.

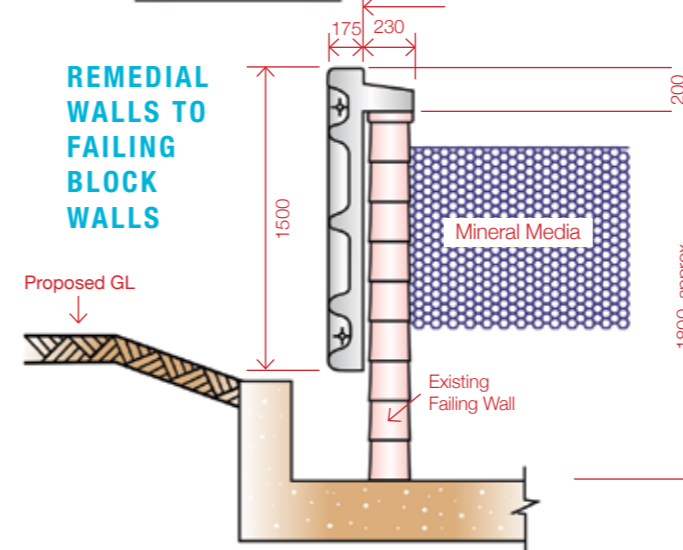
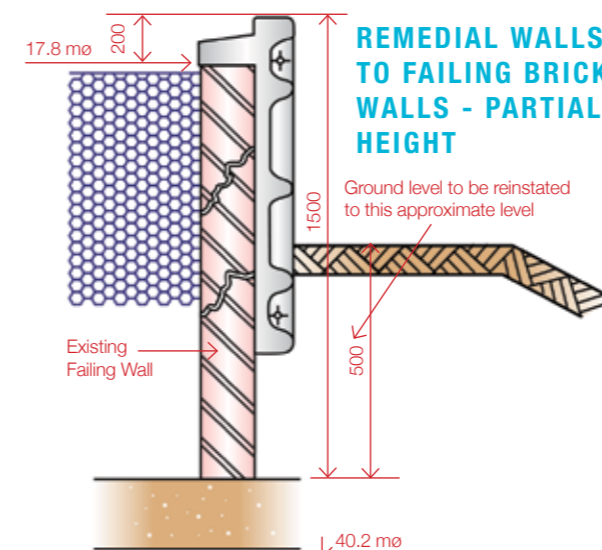
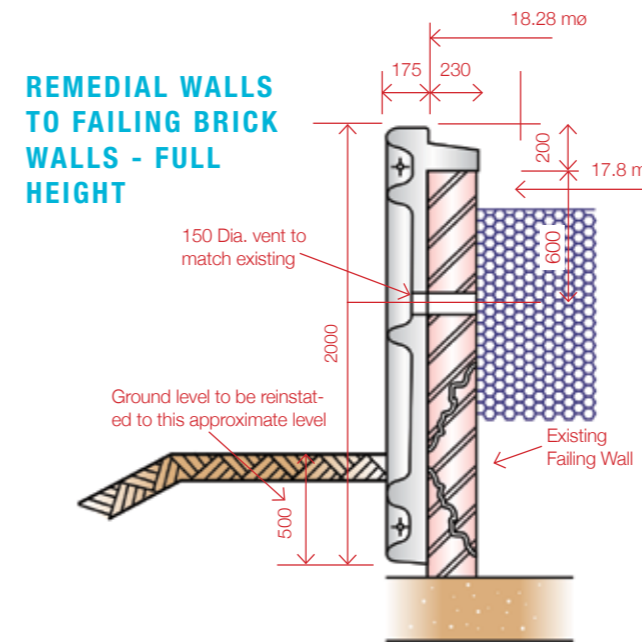
DESIGN / INSTALLATION

Utilising highly skilled and experienced installation teams, the precast units are erected to the highest of standards. FP McCann offers a full design and build service anywhere in the country.



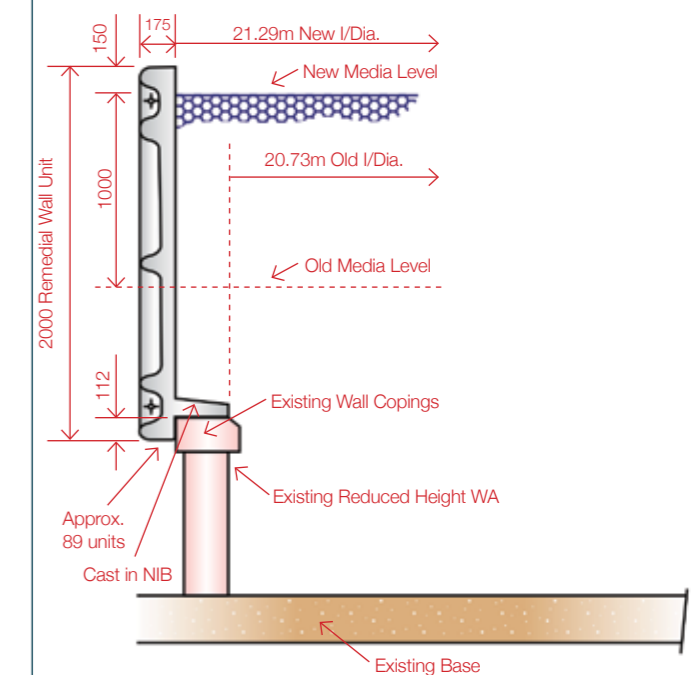
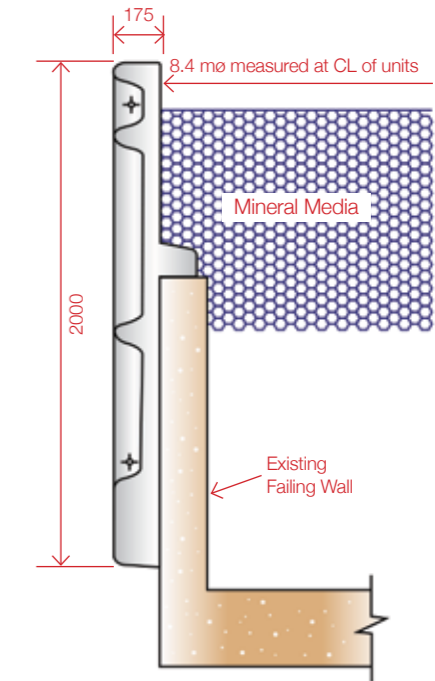
REMEDIAL MEASURES TO EXISTING FAILING FILTER WALLS

Wall heights for diameters 7.0m - 45.0m
1.00m, 1.25m, 1.50m, 1.75m, 2.00m



RAISING EXISTING WALL HEIGHTS

Wall heights for diameters 7.0m - 45.0m
1.00m, 1.25m, 1.50m, 1.75m, 2.00m, 2.50m, 3.00m, 3.50m



FILTER BED WALL UNITS

High strength, combined with a high degree of flexibility and a range of integrated fittings, makes filter bed wall units a durable, engineered solution for a wide range of projects.



DESCRIPTION

FP McCann's precast concrete wall units are available in a variety of heights. They are manufactured using sulphate-resisting cement, with a minimum concrete strength of 60 N/mm² at 28 days. Utilising fibreglass moulds, the wall has a formed finish to all visible faces of the units, with the internal face receiving a simple textured finish.

DESIGN FLEXIBILITY

The design flexibility of the system means that services such as inlets, wash outs and peripheral drainage, or other special features can be accommodated. Walls are designed to be free-standing. Within the design parameters, figures-of-eight and clusters are acceptable. Please refer to our technical department with regard to external mounding and media infill.

PRODUCT DATA

- Concrete: Min 60 N/mm²
- SR cement, generally ex-fibre glass mould finish, brush finish to unformed face

REMEDIAL FILTER BED WALL UNITS

Where existing walls are cracked, decayed or have failed, FP McCann is able to provide a full survey and design a tailored quotation with proposed remedial measures.

The design of the system allows cracked or collapsed walls to be surrounded quickly and economically. In addition, existing walls can also be increased in height.

Generally, the beds will remain operational whilst the work is carried out, with disruption kept to a minimum; thus avoiding the high cost of rebuilding. This remedial service is available anywhere in the UK.

FILTER BED TILES

Relatively light, very strong and easy to lay, perforated concrete floor tiles are a major advance on traditional clay tiling. They are designed to maintain all outflow requirements.



TILE DESCRIPTION

The tiles are manufactured using sulphate resistant cement, with a mix which gives a minimum concrete strength of 60N/mm² at 28 days. With maximum drainage outflow, outlet channels in the floor up to 600mm can be spanned; the well proven tiling system allows for total coverage in any shaped bed (circular, figure of eight, square or rectangular).

Project specific drawings are provided to show layout of tiles, and can be installed either by the customer or by FP McCann.

Made for strength and durability, the tiles are capable of carrying higher than normal design loading. Their configuration makes them far more resistant to damage and moving during media placement than traditional tiles.

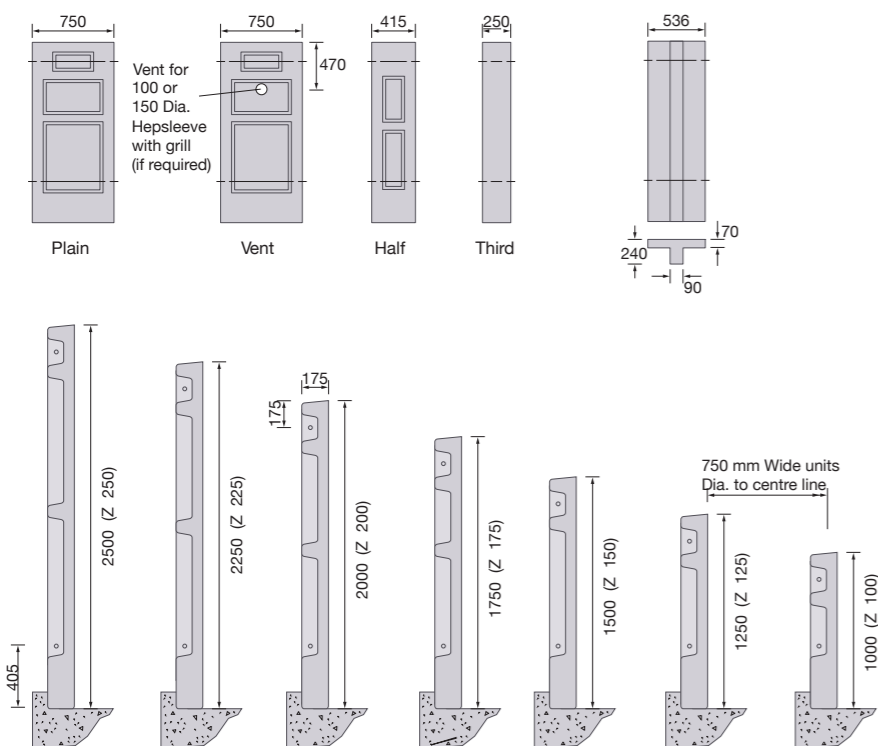
PRODUCT DATA

- Concrete strength: min 60N/mm²
- SR cement, generally ex-fibre glass mould finish, plain finish on top
- 10 mm granite aggregate: 1171kg/m³
- Water cement ratio: 0.45

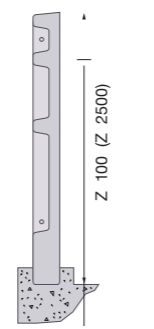
INSTALLATION

Laying the tiles on a concrete base is fast and efficient. Two men can lay at the rate of approximately 30m² per hour. Each 55kg tile covers an area of 0.5m², giving a large amount of coverage per tile.

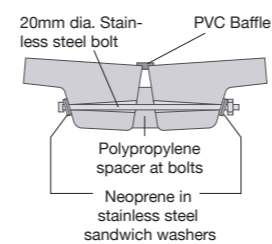
The tiles can also be machine laid with a vac-pad or by using a fork with modified tongs.



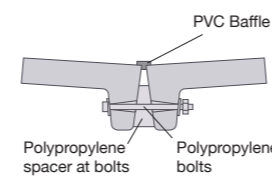
Special kicker detail for use with plastic media



Special kicker detail for use with plastic media



Top bolt assembly



Bottom fixing bolt (erection aid only)

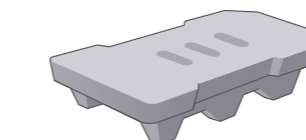
Restraint incorporated into base design to resist maximum thrust of 6.25 kN per metre run.

T SERIES TILES

Overall height of tiles: 125mm



T1: 707 x 707mm



T2: 700 x 347mm (Chamfered corners 70 mm @ 45° one end)



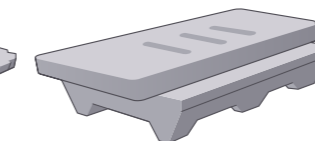
T3: 150 x 347mm



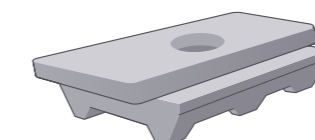
T4: 353 x 353mm

P SERIES TILES

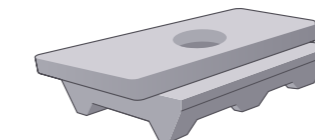
Overall height of tiles: 190mm



P1: 740 x 368mm with 3 slots



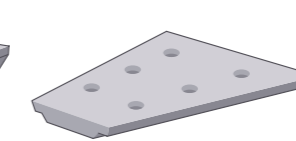
P2 (V): 740 x 368mm As P1 with 130 mm dia hole for ventpipe, no slots



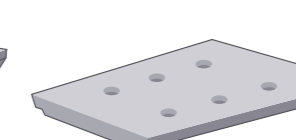
P1 (V4): 740 x 368mm As P1 with 130 mm dia hole for ventpipe, no slots
P1 (V6): 740 x 368mm As P1 with 130 mm dia hole for ventpipe, no slots

C SERIES TILES

Overall thickness of tiles: 63mm



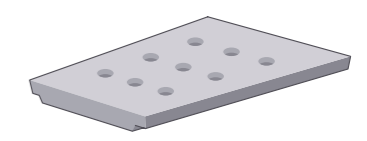
C1: 800x700mm reducing to 386mm



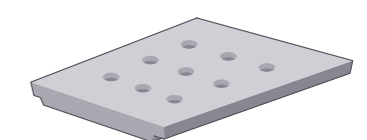
C3: 800x700mm reducing to 442mm
C3 lite: 800x591mm reducing to 345mm

S SERIES TILES

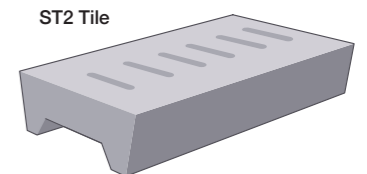
Overall thickness of tiles: 63mm



S22: 800x714mm reducing to 655mm



S45 lite: 700x728mm reducing to 693mm



ST2 Tile
ST2: 808 x 350 x 125mm
ST2 lite: 800 x 240 x 25mm