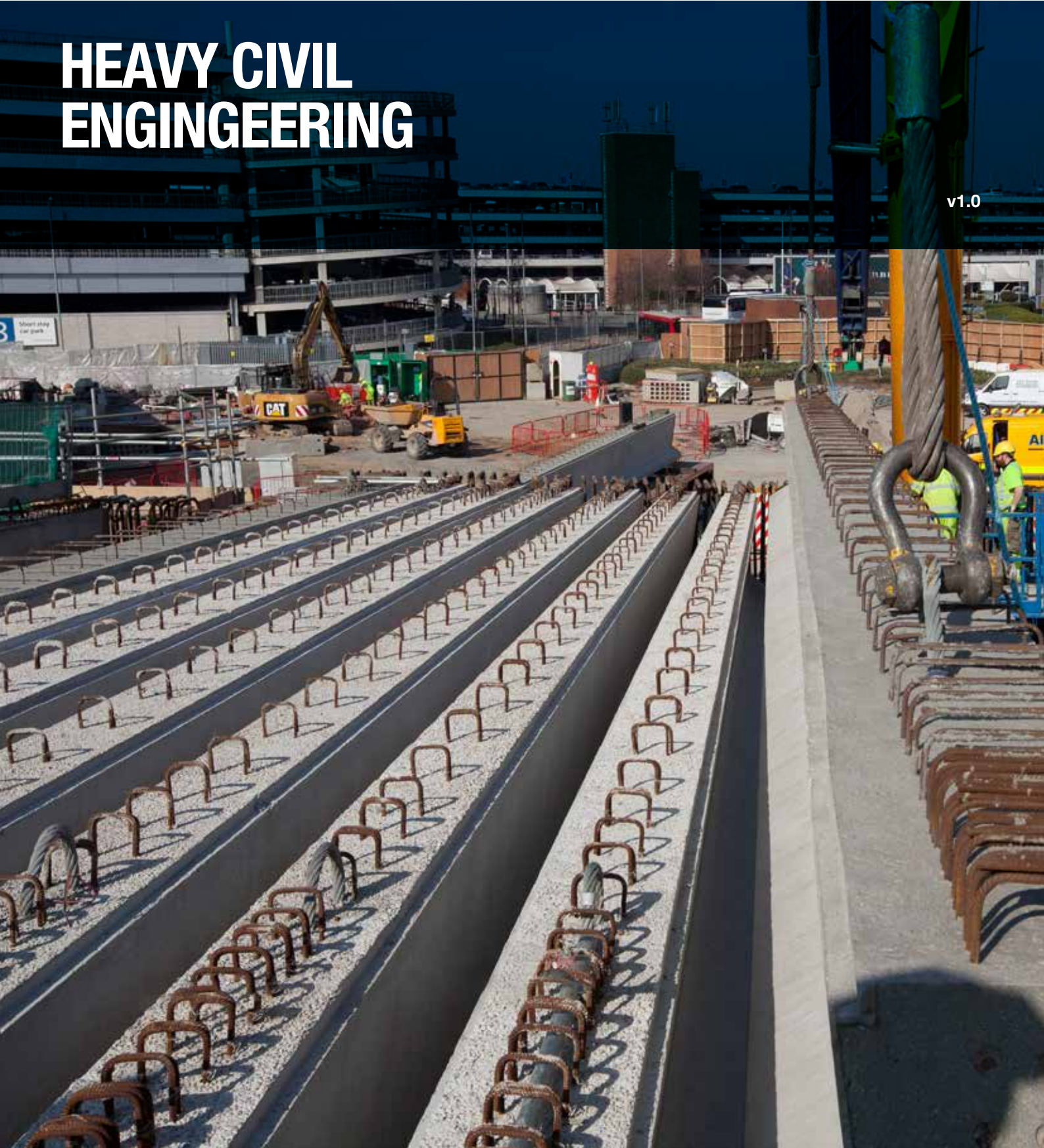




THINKING PRECAST?
THINK FP MCCANN

HEAVY CIVIL ENGINEERING

v1.0



OUR COMPANY

FP McCann is the UK's largest manufacturer and supplier of precast concrete solutions. We are committed to high quality, cost-effective and sustainable solutions tailored to meet clients' requirements.

From our seventeen UK manufacturing facilities, FP McCann offers solutions that include architectural and structural solutions, rooms, flooring, fencing, walling, shafts, tunnels, drainage, rail, power and agricultural products. FP McCann has worked on a large range of Design for Manufacture and Assembly (DfMA) projects across the UK. Our in-house Digital Engineering capability has grown in line with government and client expectations.

OUR COMPREHENSIVE PRECAST CONCRETE BUSINESS EXTENDS TO INCLUDE:

**AGRICULTURE | BOX CULVERTS | BRIDGES | BUILDING PRODUCTS | CONCRETE ROOF TILES
DOCK LEVELLER PITS | DRAINAGE | FENCING | FILTER BED SYSTEMS | FLOORING
POWER & INFRASTRUCTURE | PRECAST OFF-SITE BUILDING SOLUTIONS
RAIL | SPECIALIST PRECAST | TANKS & CHAMBERS | TUNNELS & SHAFTS | WALLING**

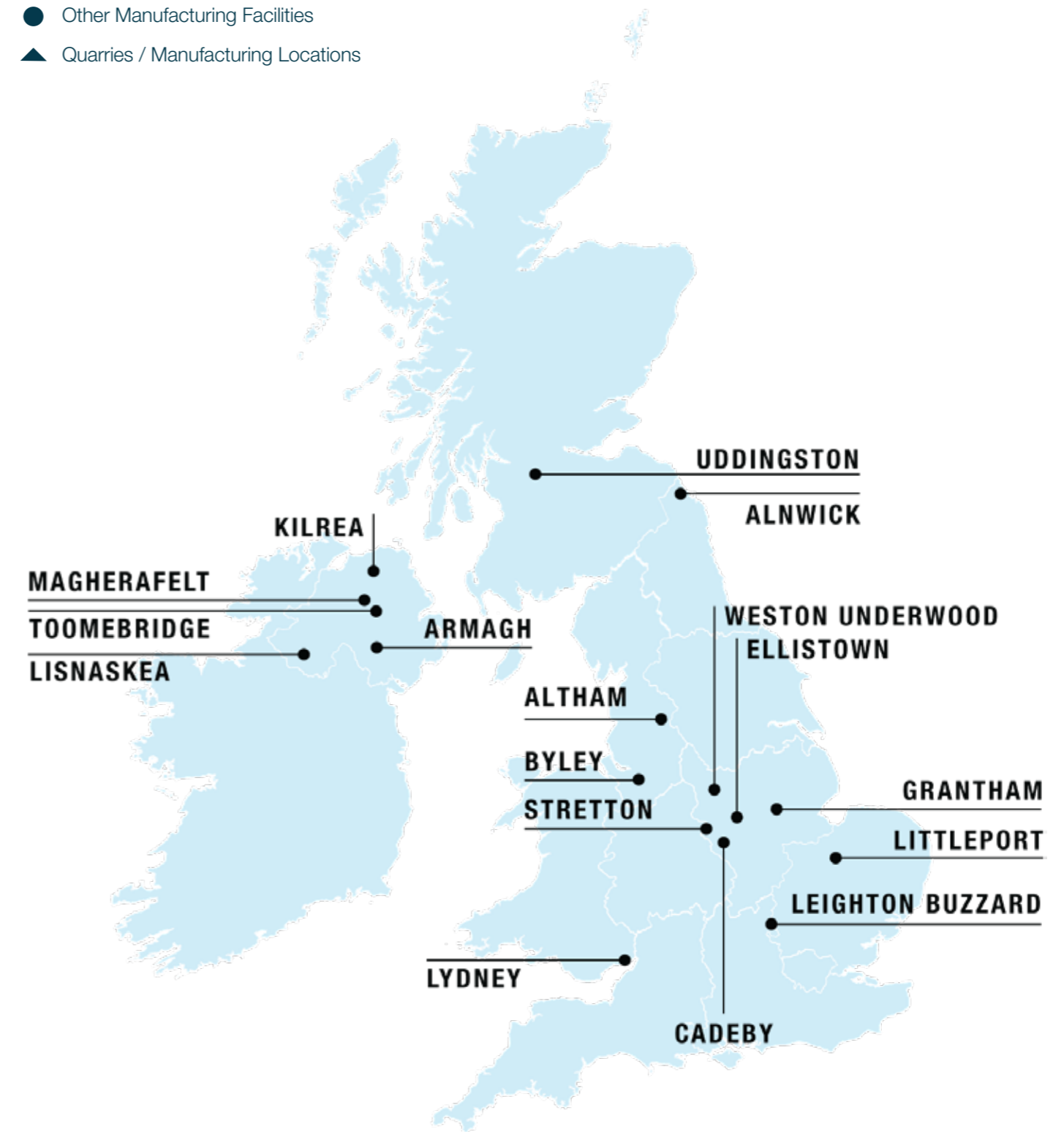
Modern manufacturing plants at Alnwick (Northumberland), Altham (Lancashire), Armagh (Northern Ireland), Byley (Cheshire), Cadeby (Leicestershire), Ellistown (Leicestershire), Grantham (Lincolnshire), Leighton Buzzard (Bedfordshire), Lisnaskea (Northern Ireland), Littleport (Cambridgeshire), Lydney (Gloucestershire), Magherafelt (Northern Ireland), Stretton (East Staffordshire), Toomebridge (Northern Ireland), Uddingston (Lanarkshire) and Weston Underwood (Derbyshire) incorporate the latest computerised batching, distribution, casting, curing and handling systems and are operated by skilled and experienced workforces to ensure consistency of quality. Their geographical spread gives us an unrivalled ability to serve the construction industry throughout the UK and Ireland.

By applying the DFMA principles, FP McCann's design engineers are able to evaluate individual precast concrete products part by part, in addition to documenting the assembly process step by step. This allows them to generate the cost, part count and assembly time to provide a benchmark to measure its success and identify the parts and process improvement opportunities. In turn, this has allowed FP McCann to design and manufacture more cost-effective and efficient high-quality precast concrete products with less wastage and greater on-site recycling. As a result, increased productivity, combined with a reduction in production time and costs, allows FP McCann to be more competitive within the marketplace.

OUR COMPANY

KEY

- Other Manufacturing Facilities
- ▲ Quarries / Manufacturing Locations





INTRODUCTION

BUILD FASTER, STRONGER, AND MORE COST-EFFECTIVE BRIDGES WITH FP MCCANN'S PRECAST CONCRETE BEAMS

Are you tired of costly delays and on-site complications? Our precast concrete bridge beams are the answer. We deliver precision-engineered, factory-quality beams directly to your site, enabling you to complete your infrastructure projects ahead of schedule and under budget.

THE SMARTER CHOICE FOR MODERN BRIDGE CONSTRUCTION

Discover the benefits of switching to a precast solution for your next bridge project:

- **Slash Construction Time:** Our beams are manufactured off-site and delivered ready for immediate installation, dramatically reducing on-site labour and project timelines. This is the core of Accelerated Bridge Construction (ABC).
- **Guarantee Superior Quality:** Factory production allows for rigorous quality control that is impossible to achieve on-site. This means a stronger, more durable, and more reliable final structure with a 120-year design life.
- **Reduce Project Costs:** Faster construction, reduced labour, and minimal on-site waste all contribute to significant cost savings over the lifetime of your project.
- **Minimise Public Disruption:** Get in, get out, and do the job faster. Less time on-site means fewer road closures and less disruption to the public.
- **Build Sustainably:** Our manufacturing process minimises waste and recycles resources. Precast concrete is a durable, long-lasting material that reduces the need for future repairs and replacements.



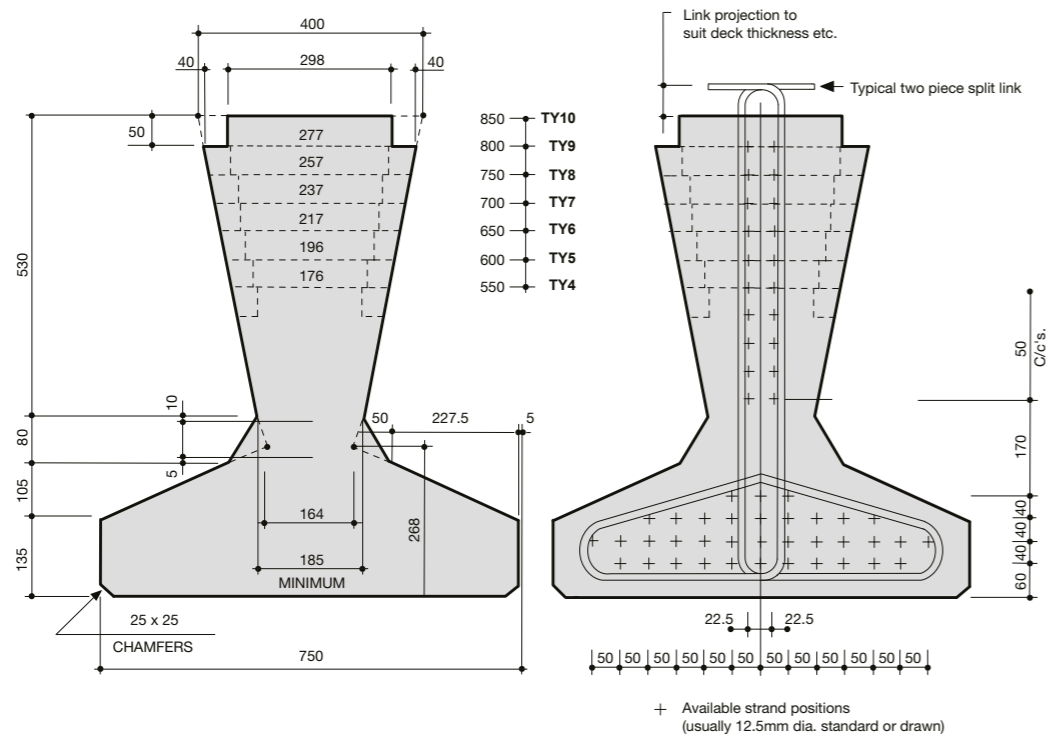
PRECAST BEAMS

Standard prestressed concrete bridge beam

TY Type 1 Beam Range

For use in beam and slab deck construction.

Simply supported spans up to 17.5m.



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Yb mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m |
|---------|----------|----------------------|---|--|-----------------|------------------------------|
| | | | | Top fibre Zt | Bottom fibre Zb | |
| TY4 | 550 | 221300 | 193.45 | 13.91 | 25.64 | 5.53 |
| TY5 | 600 | 235722 | 215.83 | 17.65 | 31.42 | 5.89 |
| TY6 | 650 | 251158 | 240.07 | 22.07 | 37.68 | 6.28 |
| TY7 | 700 | 267608 | 265.96 | 27.18 | 44.35 | 6.69 |
| TY8 | 750 | 285073 | 293.28 | 32.99 | 51.38 | 7.13 |
| TY9 | 800 | 303550 | 321.86 | 39.54 | 58.74 | 7.59 |
| TY10 | 850 | 323044 | 351.52 | 46.83 | 66.41 | 8.08 |

Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

| Span (m) | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|----------|---|---|---|----|----|----|----|----|----|----|----|----|
| TY4 | | | | | | | | | | | | |
| TY5 | | | | | | | | | | | | |
| TY6 | | | | | | | | | | | | |
| TY7 | | | | | | | | | | | | |
| TY8 | | | | | | | | | | | | |
| TY9 | | | | | | | | | | | | |
| TY10 | | | | | | | | | | | | |

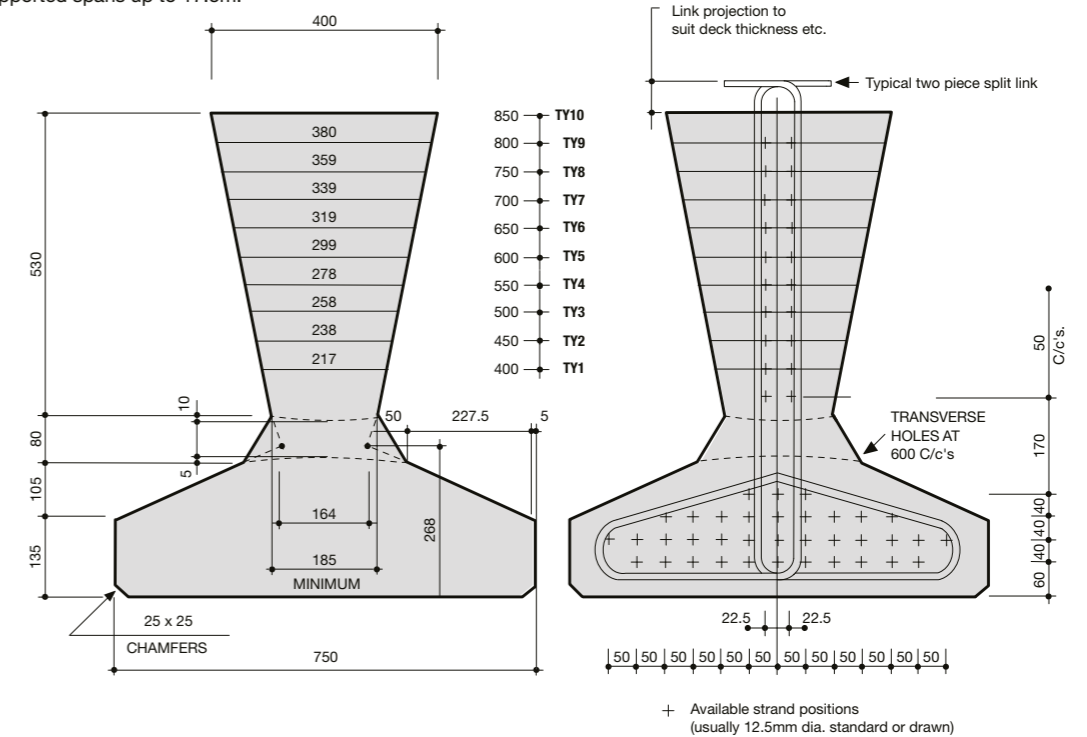
PRECAST BEAMS

Standard prestressed concrete bridge beam

TY Type 2 Beam Range

For use in solid infill deck construction.

Simply supported spans up to 17.5m.



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Yb mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m |
|---------|----------|----------------------|---|--|-----------------|------------------------------|
| | | | | Top fibre Zt | Bottom fibre Zb | |
| TY1 | 400 | 188790 | 145.55 | 7.69 | 13.45 | 4.72 |
| TY2 | 450 | 200170 | 161.46 | 9.71 | 17.34 | 5.00 |
| TY3 | 500 | 212560 | 179.77 | 12.34 | 21.99 | 5.31 |
| TY4 | 550 | 225970 | 200.27 | 15.61 | 27.27 | 5.65 |
| TY5 | 600 | 240390 | 222.78 | 19.54 | 33.09 | 6.01 |
| TY6 | 650 | 255830 | 247.07 | 24.14 | 39.36 | 6.39 |
| TY7 | 700 | 272280 | 272.94 | 29.42 | 46.03 | 6.81 |
| TY8 | 750 | 289740 | 300.21 | 35.40 | 53.04 | 7.24 |
| TY9 | 800 | 308220 | 328.69 | 42.11 | 60.38 | 7.70 |
| TY10 | 850 | 327710 | 358.23 | 49.56 | 68.04 | 8.19 |

Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

| Span (m) | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|----------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| TY1 | | | | | | | | | | | | | | | |
| TY2 | | | | | | | | | | | | | | | |
| TY3 | | | | | | | | | | | | | | | |
| TY4 | | | | | | | | | | | | | | | |
| TY5 | | | | | | | | | | | | | | | |
| TY6 | | | | | | | | | | | | | | | |
| TY7 | | | | | | | | | | | | | | | |
| TY8 | | | | | | | | | | | | | | | |
| TY9 | | | | | | | | | | | | | | | |
| TY10 | | | | | | | | | | | | | | | |

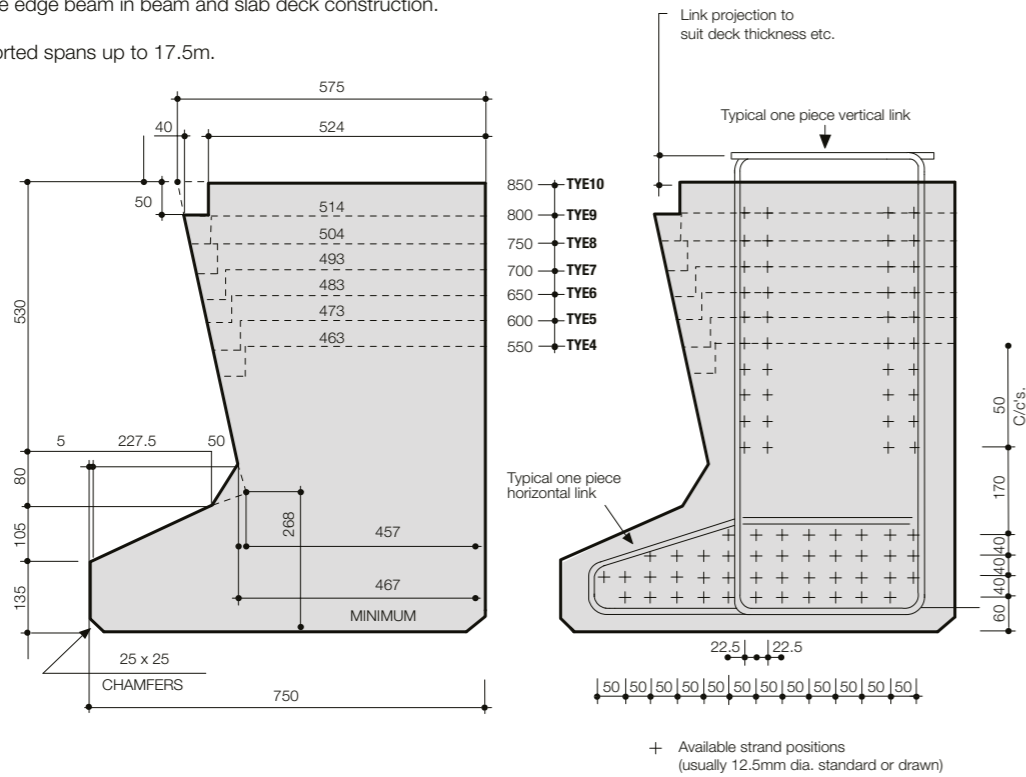
PRECAST BEAMS

Standard prestressed concrete bridge beam

TYE Beam Range

For use as the edge beam in beam and slab deck construction.

Simply supported spans up to 17.5m.



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Y _b mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m | Distance from vertical face to centroid Y _c mm |
|---------|----------|----------------------|---|--|-----------------------------|------------------------------|---|
| | | | | Top fibre Z _t | Bottom fibre Z _b | | |
| TYE4 | 550 | 316670 | 246.79 | 28.87 | 33.01 | 7.91 | 300.01 |
| TYE5 | 600 | 342630 | 271.33 | 32.48 | 39.34 | 8.56 | 296.88 |
| TYE6 | 650 | 369100 | 296.39 | 38.70 | 48.17 | 9.23 | 294.50 |
| TYE7 | 700 | 396070 | 321.90 | 45.55 | 53.50 | 9.90 | 292.54 |
| TYE8 | 750 | 423550 | 347.79 | 53.02 | 61.31 | 10.59 | 291.54 |
| TYE9 | 800 | 451540 | 374.03 | 61.13 | 69.62 | 11.29 | 290.77 |
| TYE10 | 850 | 480040 | 400.57 | 69.89 | 78.41 | 12.00 | 290.37 |

Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

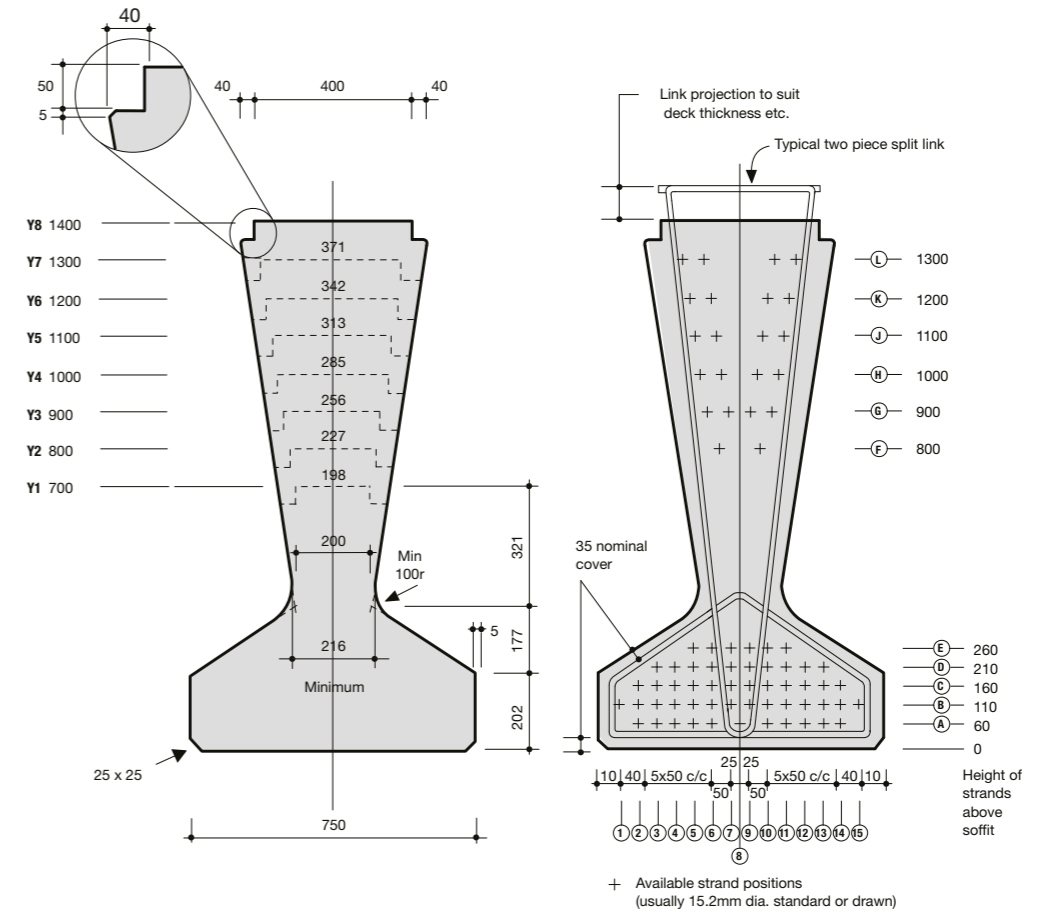
| Span (m) | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|----------|---|---|---|----|----|----|----|----|----|----|----|----|
| TYE4 | | | | | | | | | | | | |
| TYE5 | | | | | | | | | | | | |
| TYE6 | | | | | | | | | | | | |
| TYE7 | | | | | | | | | | | | |
| TYE8 | | | | | | | | | | | | |
| TYE9 | | | | | | | | | | | | |
| TYE10 | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

Y Beam Range

Simply supported spans up to 32.0m. Allows inspection and maintenance of bearings.



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Y _b mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m |
|---------|----------|----------------------|---|--|-----------------------------|------------------------------|
| | | | | Top fibre Z _t | Bottom fibre Z _b | |
| Y1 | 700 | 309202 | 255 | 24.85 | 43.40 | 7.73 |
| Y2 | 800 | 339882 | 299 | 35.02 | 58.78 | 8.50 |
| Y3 | 900 | 373444 | 347 | 47.88 | 76.27 | 9.34 |
| Y4 | 1000 | 409890 | 400 | 63.53 | 95.41 | 10.25 |
| Y5 | 1100 | 449220 | 456 | 82.06 | 116.02 | 11.23 |
| Y6 | 1200 | 491433 | 515 | 103.58 | 138.00 | 12.29 |
| Y7 | 1300 | 536530 | 576 | 128.15 | 161.31 | 13.41 |
| Y8 | 1400 | 584708 | 639 | 155.98 | 186.01 | 14.62 |

Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

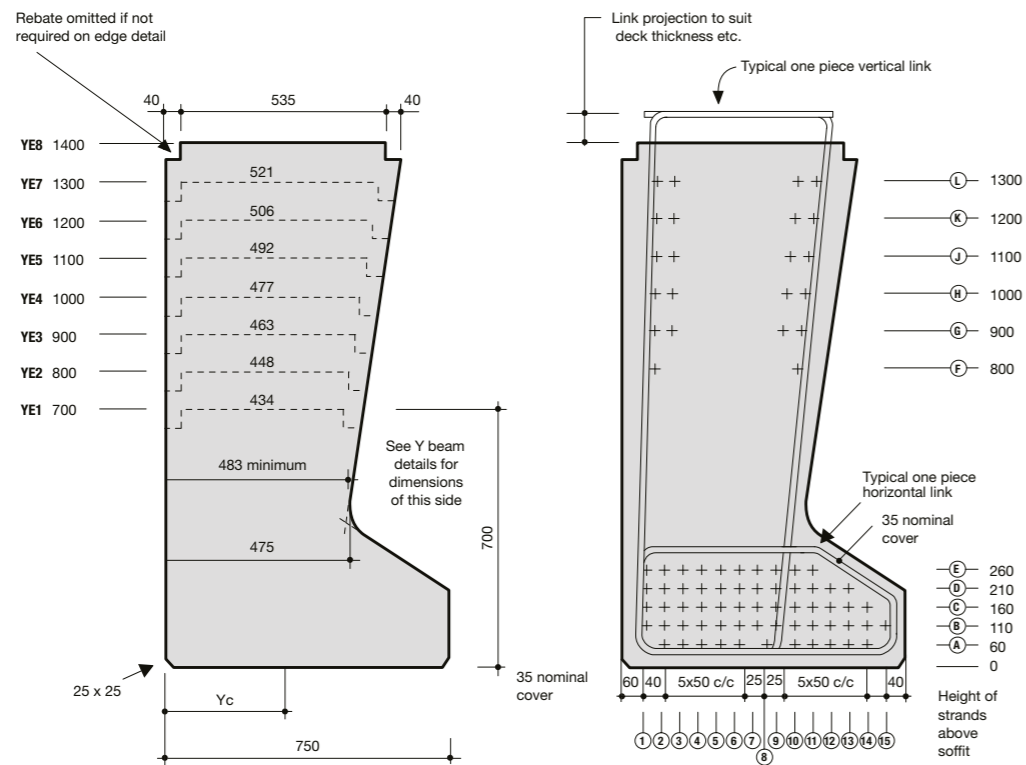
| Span (m) | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| Y1 | | | | | | | | | | | | | | | | | | | | |
| Y2 | | | | | | | | | | | | | | | | | | | | |
| Y3 | | | | | | | | | | | | | | | | | | | | |
| Y4 | | | | | | | | | | | | | | | | | | | | |
| Y5 | | | | | | | | | | | | | | | | | | | | |
| Y6 | | | | | | | | | | | | | | | | | | | | |
| Y7 | | | | | | | | | | | | | | | | | | | | |
| Y8 | | | | | | | | | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

YE Beam Range

Simply supported spans up to 32.0m.



+ Available strand positions (usually 15.2mm dia. standard or drawn)

Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Yb mm | Section moduli mm ² x 10 ⁶ | | Approximate self weight kN/m | Distance from vertical face to centroid Yc mm |
|---------|----------|----------------------|---|--|-----------------|------------------------------|---|
| | | | | Top fibre Zt | Bottom fibre Zb | | |
| YE1 | 700 | 414820 | 313 | 43.54 | 53.71 | 10.37 | 310 |
| YE2 | 800 | 467669 | 362 | 58.24 | 70.52 | 11.69 | 305 |
| YE3 | 900 | 521960 | 412 | 75.42 | 89.39 | 13.05 | 302 |
| YE4 | 1000 | 577692 | 463 | 95.12 | 110.29 | 14.44 | 299 |
| YE5 | 1100 | 634867 | 515 | 117.37 | 133.18 | 15.87 | 298 |
| YE6 | 1200 | 693483 | 568 | 142.24 | 158.08 | 17.34 | 298 |
| YE7 | 1300 | 753541 | 622 | 169.78 | 184.98 | 18.84 | 298 |
| YE8 | 1400 | 815041 | 677 | 200.06 | 213.93 | 20.38 | 298 |

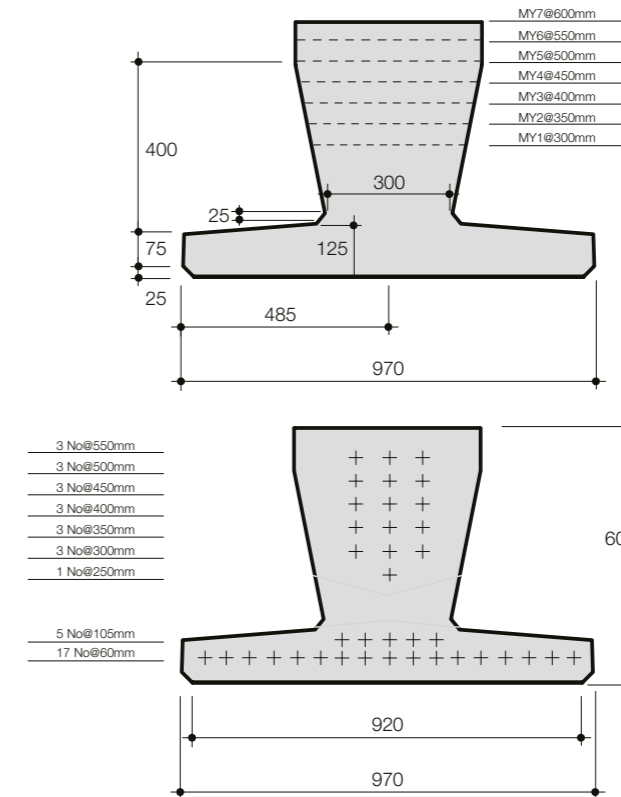
Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

| Span (m) | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| YE1 | | | | | | | | | | | | | | | | | | | | |
| YE2 | | | | | | | | | | | | | | | | | | | | |
| YE3 | | | | | | | | | | | | | | | | | | | | |
| YE4 | | | | | | | | | | | | | | | | | | | | |
| YE5 | | | | | | | | | | | | | | | | | | | | |
| YE6 | | | | | | | | | | | | | | | | | | | | |
| YE7 | | | | | | | | | | | | | | | | | | | | |
| YE8 | | | | | | | | | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

MY Beam Range



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Yb mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m |
|---------|----------|----------------------|---|--|-----------------|------------------------------|
| | | | | Top fibre Zt | Bottom fibre Zb | |
| MY1 | 300 | 170000 | 111.7 | 6.39 | 10.78 | 4.25 |
| MY2 | 350 | 188500 | 132.6 | 9.05 | 14.84 | 4.71 |
| MY3 | 400 | 208000 | 155.4 | 12.31 | 19.39 | 5.20 |
| MY4 | 450 | 228500 | 179.6 | 16.18 | 24.37 | 5.71 |
| MY5 | 500 | 250000 | 205.0 | 20.67 | 29.74 | 6.25 |
| MY6 | 550 | 272000 | 230.9 | 25.61 | 35.40 | 6.80 |
| MY7 | 600 | 294000 | 256.6 | 30.83 | 41.26 | 7.35 |

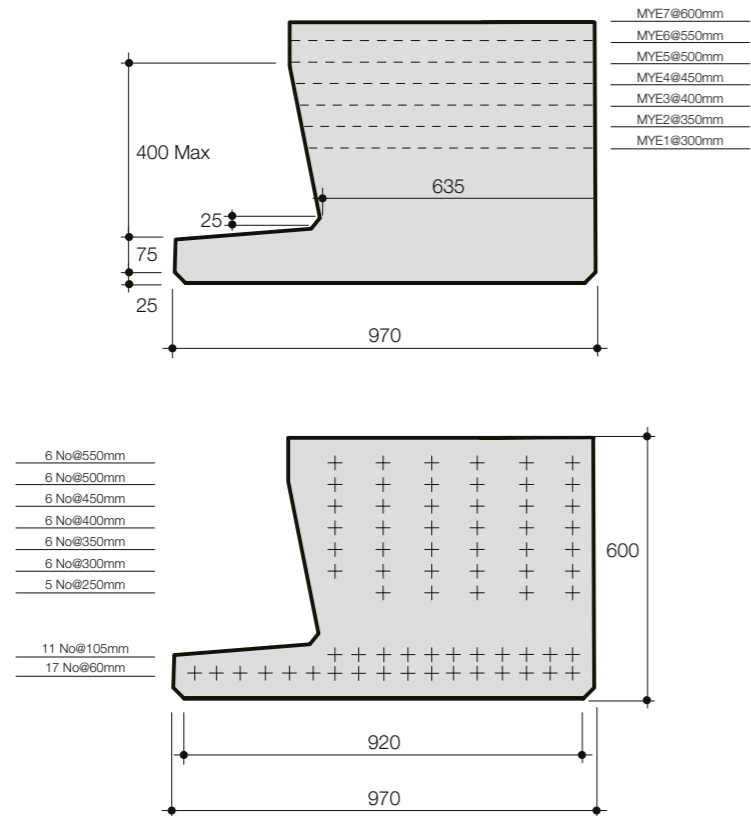
Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

| Span (m) | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|----------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
| MY1 | | | | | | | | | | | | | | | | |
| MY2 | | | | | | | | | | | | | | | | |
| MY3 | | | | | | | | | | | | | | | | |
| MY4 | | | | | | | | | | | | | | | | |
| MY5 | | | | | | | | | | | | | | | | |
| MY6 | | | | | | | | | | | | | | | | |
| MY7 | | | | | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

MYE Beam Range



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Yb mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m |
|---------|----------|----------------------|---|--|-----------------|------------------------------|
| | | | | Top fibre Zt | Bottom fibre Zb | |
| MYE1 | 300 | 230200 | 136.0 | 10.77 | 12.99 | 4.25 |
| MYE2 | 350 | 263700 | 160.0 | 14.84 | 17.61 | 4.71 |
| MYE3 | 400 | 297700 | 184.6 | 19.58 | 22.85 | 5.20 |
| MYE4 | 450 | 332200 | 209.6 | 25.01 | 28.69 | 5.71 |
| MYE5 | 500 | 367200 | 234.9 | 31.12 | 35.13 | 6.25 |
| MYE6 | 550 | 402400 | 260.3 | 37.85 | 42.13 | 6.80 |
| MYE7 | 600 | 437700 | 285.6 | 42.12 | 49.65 | 7.35 |

Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

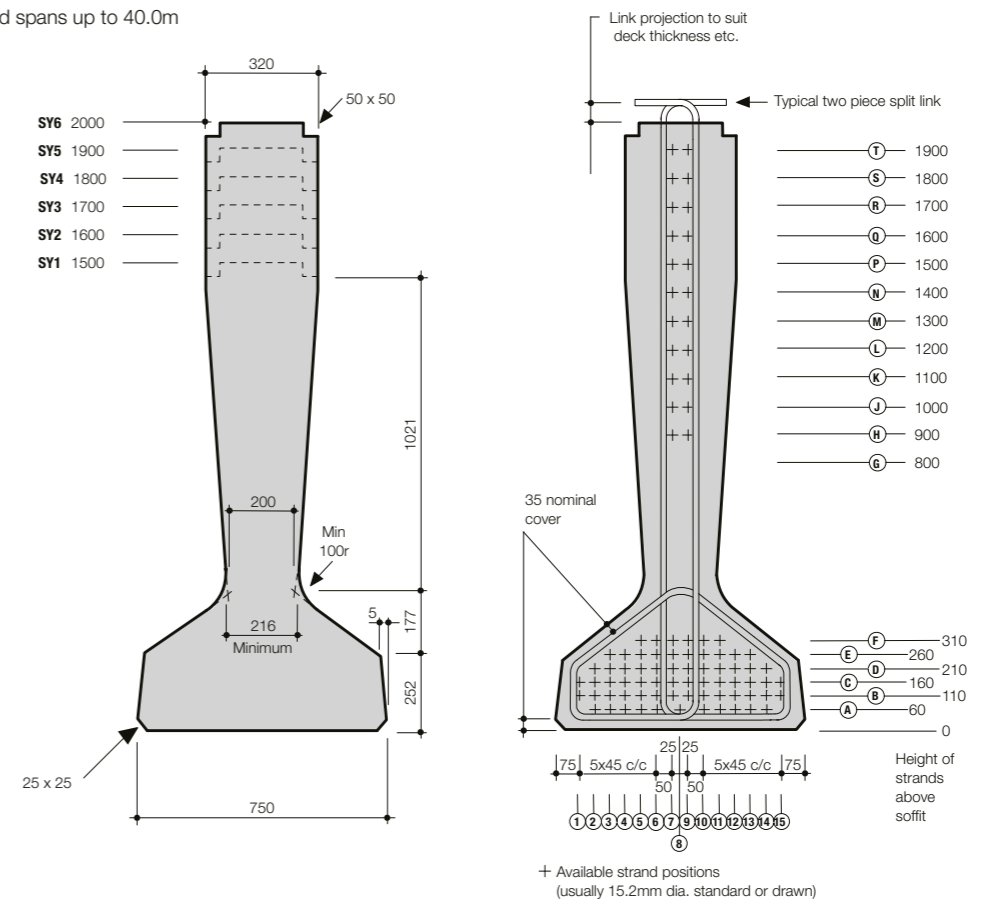
| Span (m) | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|----------|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
| MYE1 | | | | | | | | | | | | | | | | |
| MYE2 | | | | | | | | | | | | | | | | |
| MYE3 | | | | | | | | | | | | | | | | |
| MYE4 | | | | | | | | | | | | | | | | |
| MYE5 | | | | | | | | | | | | | | | | |
| MYE6 | | | | | | | | | | | | | | | | |
| MYE7 | | | | | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

SY Beam Range

Simply supported spans up to 40.0m



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Yb mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m |
|---------|----------|----------------------|---|--|-----------------|------------------------------|
| | | | | Top fibre Zt | Bottom fibre Zb | |
| SY1 | 1500 | 549158 | 598.35 | 132.59 | 199.81 | 13.73 |
| SY2 | 1600 | 581158 | 650.06 | 153.97 | 225.00 | 14.53 |
| SY3 | 1700 | 613158 | 701.59 | 176.16 | 250.69 | 15.33 |
| SY4 | 1800 | 645158 | 752.98 | 199.16 | 276.98 | 16.13 |
| SY5 | 1900 | 677158 | 804.23 | 223.09 | 303.97 | 16.93 |
| SY6 | 2000 | 709158 | 865.36 | 247.89 | 331.72 | 17.73 |

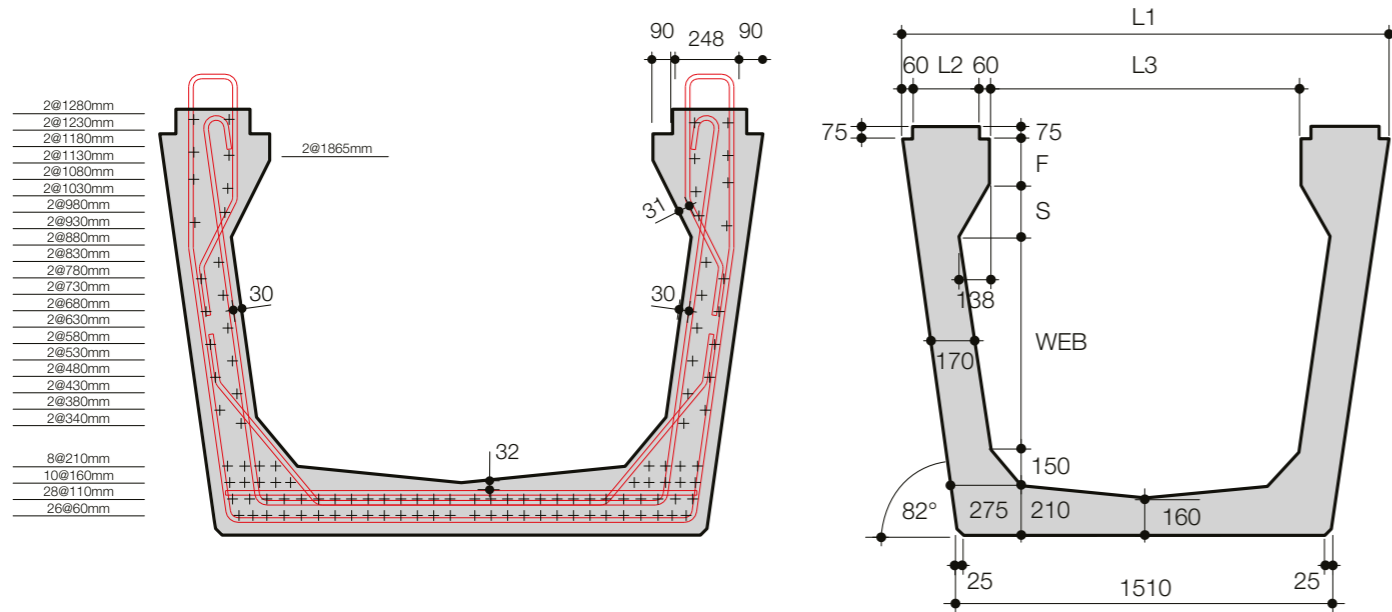
Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

| Span (m) | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| SY1 | | | | | | | | | | | | | | | |
| SY2 | | | | | | | | | | | | | | | |
| SY3 | | | | | | | | | | | | | | | |
| SY4 | | | | | | | | | | | | | | | |
| SY5 | | | | | | | | | | | | | | | |
| SY6 | | | | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

W Beams Range



Section properties

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Y _b mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m | Beam Top Dimensions | | | | | |
|---------|----------|----------------------|---|--|-----------------------------|------------------------------|---------------------|-------|------|-----|-----|-----|
| | | | | Top fibre Z _t | Bottom fibre Z _b | | L1 | L2 | L3 | Web | S | F |
| W1 | 800 | 572360 | 305.3 | 71.88 | 116.46 | 14.31 | 1704.4 | 203.2 | 1058 | 100 | 220 | 70 |
| W3 | 900 | 606880 | 345.9 | 89.54 | 143.43 | 15.17 | 1732.4 | 203.2 | 1058 | 200 | 220 | 70 |
| W5 | 1000 | 641400 | 387.5 | 108.76 | 171.88 | 16.00 | 1760.4 | 203.2 | 1114 | 300 | 220 | 70 |
| W7 | 1100 | 692030 | 440.2 | 136.21 | 204.15 | 17.30 | 1788.4 | 210.2 | 1128 | 350 | 220 | 120 |
| W8 | 1200 | 726550 | 484.2 | 159.46 | 235.73 | 18.16 | 1816.4 | 210.2 | 1156 | 450 | 220 | 120 |
| W9 | 1300 | 761070 | 528.7 | 184.11 | 268.56 | 19.03 | 1844.4 | 210.2 | 1184 | 550 | 220 | 120 |

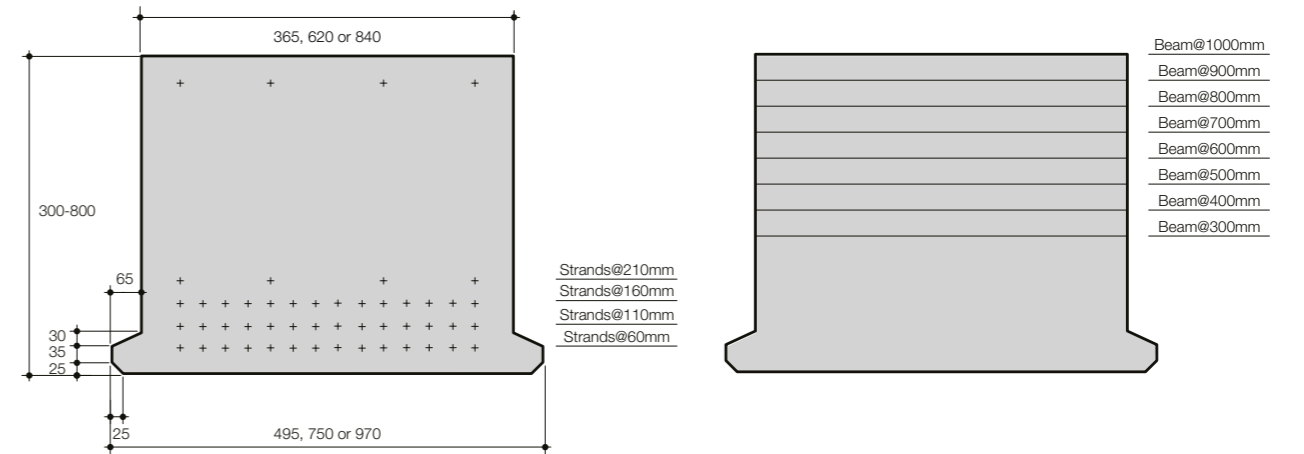
Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

| Span (m) | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| W1 | | | | | | | | | | | | | | | |
| W3 | | | | | | | | | | | | | | | |
| W5 | | | | | | | | | | | | | | | |
| W7 | | | | | | | | | | | | | | | |
| W8 | | | | | | | | | | | | | | | |
| W9 | | | | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

Box Beams Range



Section properties 495mm Wide

| Section | Depth mm | Area mm ² | Height of centroid above bottom fibre Y _b mm | Section moduli mm ³ x 10 ⁶ | | Approximate self weight kN/m |
|---------|----------|----------------------|---|--|-----------------------------|------------------------------|
| | | | | Top fibre Z _t | Bottom fibre Z _b | |
| SD1 | 300 | 118625 | 142 | 5.85 | 6.55 | 2.97 |
| SD2 | 400 | 155125 | 191 | 10.37 | 11.39 | 3.88 |
| SD3 | 500 | 191625 | 240 | 16.11 | 17.46 | 4.79 |
| SD4 | 600 | 228125 | 290 | 23.09 | 24.75 | 5.70 |
| SD5 | 700 | 264625 | 339 | 31.28 | 33.26 | 6.62 |
| SD6 | 800 | 301125 | 389 | 40.70 | 42.98 | 7.53 |

Section properties 750mm Wide

| | | | | | | |
|-----|-----|--------|-----|-------|-------|-------|
| SD1 | 300 | 195125 | 145 | 9.70 | 10.38 | 4.88 |
| SD2 | 400 | 257125 | 194 | 17.19 | 18.20 | 6.43 |
| SD3 | 500 | 319125 | 244 | 26.77 | 28.09 | 7.98 |
| SD4 | 600 | 381125 | 294 | 38.43 | 40.05 | 9.53 |
| SD5 | 700 | 443125 | 344 | 52.15 | 54.09 | 11.08 |
| SD6 | 800 | 505125 | 394 | 67.94 | 70.19 | 12.63 |

Section properties 970mm Wide

| | | | | | | |
|-----|-----|--------|-----|-------|-------|-------|
| SD1 | 300 | 261125 | 146 | 13.01 | 13.69 | 6.53 |
| SD2 | 400 | 345125 | 196 | 23.07 | 24.06 | 8.63 |
| SD3 | 500 | 429125 | 246 | 35.95 | 37.26 | 10.73 |
| SD4 | 600 | 513125 | 295 | 51.46 | 53.25 | 12.83 |
| SD5 | 700 | 597125 | 345 | 70.14 | 72.05 | 14.93 |
| SD6 | 800 | 681125 | 395 | 91.43 | 93.65 | 17.03 |

Span loading 45 Units HB loading (inc. 2.4 kN/m² for finishes)

| Depth (mm) | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
|------------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| 300 | | | | | | | | | | | | | | | | | | | | | | |
| 400 | | | | | | | | | | | | | | | | | | | | | | |
| 500 | | | | | | | | | | | | | | | | | | | | | | |
| 600 | | | | | | | | | | | | | | | | | | | | | | |
| 700 | | | | | | | | | | | | | | | | | | | | | | |
| 800 | | | | | | | | | | | | | | | | | | | | | | |

PRECAST BEAMS

Standard prestressed concrete bridge beam

Typical Specification

Concrete

Transfer cube strength 40 N/mm².
28 day cube strength 50 N/mm².
(Higher strengths can be accommodated where necessary).

Cement

Cement usually complies with B.S.12 - Portland.
The following may also be used:-
B.S.3892 - p.f.a.

Admixtures

Comply with B.S.5075 - Concrete admixtures.

Aggregates

Comply with B.S.882 - Concrete aggregates from Natural Sources.

Prestressing Strands

Comply with B.S.5896 with Class 2 relaxation.

12.5mm dia. standard at 123 kN max. initial force in inverted 'T' and 'TY' beams
(alternatively 12.7mm dia. drawn strand at 146.3 kN max. initial force can be used).

15.2mm dia. standard at 174 kN max. initial force in 'Y', 'YE', 'M', 'SY', 'U' and 'UM' beams
(alternatively 15.2mm dia. drawn strand at 210 kN max. initial force can be used).

Secondary Reinforcement

Complies with B.S.4449 or B.S.4482

Length shown on drawings

The length of beams shown on customers drawings is assumed to be the casting length of the beams and that the engineer has taken into consideration the effects of shrinkage and creep.

Tolerances

Unless specifically agreed otherwise beams will be made to the full tolerances shown in DTp specification. Clause 1710.8 (or B.S.8110 Part 1, Clause 6.11.3 and 6.11.4).

Surface Finish

Top. Rough as cast - DTp Class 2, Clause 1710.8.
Sides & Soffit. F5 - DTp Clause 1708.4 (or B.S.8110 Clause 6.1.3 Type A).

Camber

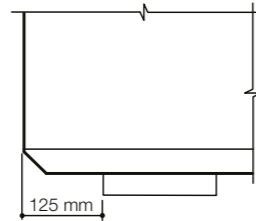
All prestressed beams will have an upward camber due to prestress.

Fixing, inserts, cast in sockets

In side, soffit and ends - should be avoided wherever possible.

Bearings

Bearings for bridge beams should be considered on the merits of each particular application. As a general rule, however, the edge of the bearing closest to the abutment should be detailed at least 125mm in from the end of the beam. (See sketch). Cast in items cannot project below the soffit line of prestressed units.



Weight

The customer should assume a concrete density of 2.5 t/m³.

Quality Assurance

We are a B.S.I. Registered Firm to BS.EN.ISO.9001

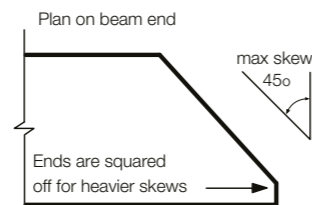
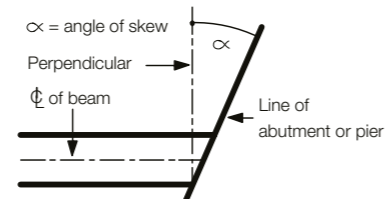
Quality Control

We carry out strict quality control procedures at all stages of manufacture. Copies of all necessary certificates on cement, aggregates, strand, stressing records, cube tests and beam tests are retained within our quality system.

Skews

Skewed ends to beams are expensive and should be avoided wherever possible. However, we are able to produce these details to any angle required, up to a maximum of 45°, beyond which there is a risk that, during manufacture, damage to beam ends may result. Reinforcement. Only reinforcement in the end zone of the beam should be skewed. All other reinforcement in the body of the beam should be detailed square to the section.

Note: A square deck has a zero skew



Stacking

Positions of stacking timbers should be approx. 500mm from the ends of a beam and projecting links should be positioned accordingly.



FP MCCANN'S BRIDGE BEAMS USED IN BRIDGE REPLACEMENT PROJECT FOR NETWORK RAIL IN AYLESBURY.

Project: A41 Rail Bridge Replacement at Aylesbury Vale.

Client: Network Rail

Main Installation Contractor: MPB Structures Limited

Products Supplied: 130t main deck beam and two cill beams.

The replacement of a Network Rail bridge crossing the main A41 adjacent to Aylesbury Vale station on the Aylesbury to Bicester section took place over the weekend of 6-8 February.

The complete span was precast by our Toomebridge depot and shipped as a three-component load consisting of 130t main deck beam and two cill beams, by sea from Warrenpoint to Heysham and then by road to site.

The base was cast first on a 12t steel cage, with projecting rebar protruding. Then the two upstand walls were provided as secondary casts to the main unit. In the site compound, the cill beams were fixed to the deck via a series of cast in bolts and props, with the steel walkways then installed to the deck unit walls.

Following removal of the old steel bridge structure during daylight hours of the weekend rail possession, the new structure was installed in the early hours of Sunday using a 32 wheel elevated crawler to transport it the short distance from the compound to the site as a single component.

Actual installation was without hitch and seemed to take place in moments.

The square span, face to face of abutment is 9.055m; the skew span from cill bearings is 14.55m; the skew angle of the bridge is 45 degrees.



PARAPETS

MODERN PARAPET SYSTEMS FOR BRIDGES & INFRASTRUCTURE

WHAT ARE PARAPETS?

Parapets are essential protective barriers installed along the edges of bridges, retaining walls, raised roadways, and other elevated structures. Their core purpose is to improve safety by preventing falls, guiding vehicle movement, and providing a defined containment line along the structure's edge.

TYPES OF PARAPETS

Standard Cast Parapets:

- Manufactured using consistent moulds for uniformity and structural performance.
- Strong durability suitable for most bridge and roadway applications.
- Cost-efficient with reliable finishes.

Secondary Cast Parapets:

- Ideal for bespoke designs or heritage matching.
- Offers flexibility in shape, texture, and architectural detailing.
- Suitable for complex or specialised project requirements.



Benefits of Modern Parapet Solutions

- Improved site safety through reduced onsite labour time.
- Enhanced architectural finish achieved through factory-controlled production.
- Faster installation with minimal disruption to road and rail users.
- Perfect for overnight or weekend construction windows.
- Sustainable off-site manufacturing reduces waste.
- Long-term durability ensures lower maintenance costs.



Why Choose Our Parapet Systems?

- Precision-engineered solutions suitable for bridges, highways, and retaining structures.
- Choice of Standard Cast and Secondary Cast systems.
- High-quality, consistent finishes.
- Fast installation and minimal site disruption.
- Designed for safety, sustainability, and long service life.

FP MCCANN'S BRIDGE SYSTEM WITH PARAPETS USED IN NETWORK RAIL ELECTRIFICATION SCHEME

Project: Wigan to Bolton Electrification Scheme, Chulsey Gate

Client: Network Rail

Main Contractor: Kier

Products Supplied: 2nr. Abutments; 2nr. Cill beams; 4 internal beams; 2nr. External beams with 7nr. Secondary cast parapet panels on each; 27nr. approach units with single, double and triple secondary cast parapet panels.

FP McCann's Toomebridge Depot manufactured a new replacement bridge structure made up of abutments, cill beams, edge beams (with secondary cast parapets) and approach units to Chulsey Gate, Bolton as part of the £100 million Wigan to Bolton Railway Electrification Scheme. The scheme focused on providing a more sustainable, quieter and faster service to support the broader Network Rail in the Northwest.

The bridge structure was a high priority short lead time project due to the original main contractor Buckingham entering administration.

The 14m clear span bridge consisted of 2nr. abutments, 2 nr. cill beams, 4 internal beams, 2 nr. external beams with 7 nr. secondary cast parapet panels on each, and 27nr. approach units with single, double and triple secondary cast parapet panels.

In order to ensure perfect fit and tolerance of all precast components, the bridge structure was temporarily erected for the first time in Northern Ireland at our Toomebridge Depot. Total weight of the precast was 463 tons.



ABUTMENTS

Precast concrete abutments are advanced bridge support structures manufactured off site in a controlled factory environment and delivered ready for rapid installation.

Key Features

Factory-Controlled Quality

Produced in climate controlled conditions to ensure optimal curing, precise mix designs, and consistently high quality.

Modular by Design

Available as interlocking or stackable units such as modular shells, T shaped gravity walls, or precast blocks for straightforward assembly.

Ready-to-Install Components

Elements can be supplied with embedded plates, lifting hoops, or grouted dowels pre-installed, allowing immediate connection to piles, foundations, and superstructure elements.

Flexible Material Options

Compatible with prestressed concrete, high tensile steel reinforcement, low carbon mixes, and other performance materials that are difficult to cast reliably on-site.

Precision Fit

Advanced digital modelling and standardized moulds deliver millimetre level tolerances for seamless integration with bearings and structural interfaces.

Key Benefits

Accelerated Construction

Manufacturing takes place while site works progress, dramatically reducing onsite timelines. Some bridges can be installed and reopened within 46 hours.

Long Term Durability

Precast units offer exceptional resistance to freeze thaw cycles, moisture, and corrosion, with design lives of up to 100 years and minimal maintenance needs.

Reduced Disruption

Shorter installation windows mean fewer traffic delays, less noise, and reduced environmental impact for nearby communities.

Cost-Effective Delivery

While material costs may be higher, overall project savings result from reduced labour requirements, shorter equipment rental periods, and minimal weather delays.

Improved Safety

Off site production lowers the number of workers exposed to hazardous conditions such as working at heights or beside live traffic.



FP MCCANN'S BRIDGE BEAMS USED IN RAIL REPLACEMENT PROJECT.

Project: Network Rail Bridge Replacements in Lancashire and Merseyside

Client: Network Rail

Products Supplied: Road Over Rail Bridge Package including Cill Beams, TY-Beams, edge beams with built in brick Parapets and coloured concrete.

FP McCann's Toomebridge Depot supplied four complete road over rail structures as part of Network Rail's Bridge replacements in Lancashire and Merseyside.

The packages in Lytham St. Annes, Kirkham and Birkenhead were prefabricated to precise dimensions and comprised of cill beams, TY-Beams and architecturally finished edge beams complete with factory-built brick parapets and coloured concrete to suit the existing bridge abutments.

Installation which entailed demolition of the existing structure followed by installation of the prefabricated units, was carried out during four weekend track possessions. 250t and 500t cranes were used to position the various components.



BOX CULVERTS



ADDITIONAL FEATURES

These are varied and can be added to any culvert, as per requirement. For example, end walls, access points, vent holes, inlets, outlets, angles and splayed ends. Starter bars and sockets can be added to facilitate any additional casting on-site, which may be required as part of the finished work.

BOX CULVERT APPLICATIONS

- Attenuation and storage tanks
- Water course diversion
- Open channels
- Road crossings
- Pedestrian and vehicle subways
- Shafts
- Service tunnels and ducts
- Conveyor protection

Designed and manufactured in accordance with all current design specifications and relevant standards, FP McCann's box culverts are available in span sizes from 1000mm to 6000mm and internal heights from 500mm to 3600mm.

With our extensive range of moulds, we also strive to accommodate non standard variances, along with any other internal features requested by the client.

Based in a modern production facility at Byley, Cheshire, FP McCann's experienced engineers and detailing team have the flexibility to quickly respond to meet any design criteria and deliver nationally to just-in-time requirements.

Supplied in either single or multiple runs, the use of precast concrete box sections in civil engineering projects is wide-ranging, from their use for directing/diverting watercourses to the provision of attenuation tanks and underpasses.

FP McCann is a member of the British Precast Drainage Association (BPDA) and their products comply with all relevant standards, as set out in accordance with ISO 9001 and ISO 14001.



BOX CULVERTS

TYPICAL CULVERT

Units are available in internal span sizes from 1000mm to 6000mm and internal heights from 500mm to 3600mm, with unit lengths to a maximum of 2000mm, dependent on final mould configuration (please refer to internal dimensions chart opposite).



DRY WEATHER FLOW CHANNELS

Half round (or equivalent) channels can be cast into the floor of the units at any position, we offer a choice of equivalent half round diameters.



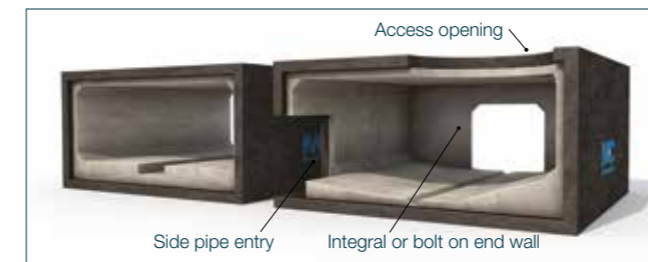
BENCHING

Combined with either a channel or cast as a "vee", benching improves self-cleansing flow rates.



MAMMAL LEDGES

Cast-in mammal ledges allow access through the culvert to wildlife without the requirement for extra site provisions.



SPECIALS

Bespoke units accommodating a variety of features can be manufactured to our customers' design requirements.

The proven strength and performance characteristics of precast concrete box culverts, together with their excellent service life, make them ideal for a wide variety of civil engineering and construction applications. Box culvert sections can be manufactured in a variety of internal profiles and sizes, offering exceptional versatility in the uses to which they can be applied.

In addition to the more common use for diverting water courses, box culverts have been used in an array of applications including balancing tanks, pedestrian subways, access shafts, service tunnels, sea outfalls, road crossings and many other situations where the whole life costing consideration requires strength, durability and economy to be of paramount importance.

Unlike other materials such as steel, precast concrete box culverts do not require additional treatments to prolong their life or improve performance. The concrete surface will not rust and the smooth internal finish of the box culvert ensures optimum flow of water through the concrete structure.

Precast concrete box culverts fulfil the current design life requirements for buried structures. With minimum maintenance and the ability to provide many years of service, precast concrete box culverts are the most cost-effective means of diverting water courses, especially with the ever present risk of corrosive elements in the water or soil.

Whilst the methods and procedures for the installation of precast concrete box culverts are familiar to contractors, careful attention to detail will lead to safer working, a smoother flow of operations and a higher standard of finished culvert. Box Culvert installation and jointing details can be downloaded from www.fpmccann.co.uk/box-culverts

This guide provides a reliable checklist for anyone engaged in the installation of box culverts. It is published to encourage good practice in the use of precast box culverts.



BOX CULVERTS



INTERNAL DIMENSIONS

(Based on flat invert culvert units)

Key: Flow area m² / Discharge rate m³/sec

| | | Width mm (internal span) | | | | | | | | | | | | | | | |
|--------------------|------|--------------------------|--------------|--------------|--------------|--------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | 1000 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 | 3300 | 3600 | 3900 | 4200 | 4500 | 4800 | 5100 | 5400 |
| Internal height mm | 500 | 0.46 0.40 | 0.56 0.51 | 0.71 0.67 | 0.86 0.84 | 1.01 1.00 | - | - | - | - | - | - | - | - | - | - | - |
| | 600 | 0.56 0.53 | 0.68 0.67 | 0.86 0.89 | 1.04 1.11 | 1.22 1.33 | - | - | - | - | - | - | - | - | - | - | - |
| | 650 | 0.61 0.60 | 0.74 0.76 | 0.93 1.00 | 1.13 1.25 | 1.32 1.50 | 1.52 1.75 | 1.71 2.00 | - | - | - | - | - | - | - | - | - |
| | 800 | 0.76 0.81 | 0.92 1.03 | 1.13 1.33 | 1.37 1.67 | 1.61 2.01 | 1.85 2.36 | 2.09 2.71 | 2.33 3.06 | 2.57 3.42 | 2.81 3.77 | 3.05 4.12 | - | - | - | - | - |
| | 1000 | 0.96 1.10 | 1.16 1.40 | 1.43 1.84 | 1.73 2.32 | 2.03 2.80 | 2.33 3.29 | 2.63 3.79 | 2.93 4.29 | 3.23 4.79 | 3.53 5.30 | 3.83 5.80 | 4.13 6.30 | 4.43 6.81 | 4.73 7.32 | - | - |
| | 1200 | - | 1.37 1.76 | 1.73 2.37 | 2.09 3.00 | 2.45 3.64 | 2.81 4.29 | 3.17 4.95 | 3.53 5.61 | 3.89 6.28 | 4.25 6.95 | 4.61 7.62 | 4.97 8.29 | 5.33 8.97 | 5.69 9.64 | 6.05 10.32 | 6.41 11.00 |
| | 1500 | - | - | 2.18 3.21 | 2.63 4.09 | 3.08 4.98 | 3.53 5.89 | 3.98 6.81 | 4.43 7.74 | 4.88 8.68 | 5.33 9.62 | 5.78 10.57 | 6.23 11.52 | 6.68 12.48 | 7.13 13.44 | 7.58 14.40 | 8.03 15.37 |
| | 1800 | - | - | - | 3.17 5.21 | 3.71 6.38 | 4.25 7.57 | 4.79 8.78 | 5.33 10.00 | 5.87 11.24 | 6.41 12.48 | 6.95 13.74 | 7.49 15.00 | 8.03 16.27 | 8.57 17.54 | 9.11 18.82 | 9.65 20.10 |
| | 2100 | - | - | - | - | 4.34 7.83 | 4.97 9.31 | 5.60 10.83 | 6.23 12.36 | 6.86 13.92 | 7.49 15.49 | 8.12 17.07 | 8.75 18.67 | 9.38 20.27 | 10.01 21.89 | 10.64 23.50 | 11.27 25.13 |
| | 2400 | - | - | - | - | - | 5.69 11.11 | 6.41 12.94 | 7.13 14.81 | 7.85 16.70 | 8.57 18.62 | 9.29 20.55 | 10.01 22.50 | 10.73 24.46 | 11.45 26.44 | 12.17 28.42 | 12.89 30.41 |
| | 2700 | - | - | - | - | - | - | 7.22 15.11 | 8.03 17.32 | 8.84 19.57 | 9.65 21.84 | 10.46 24.14 | 11.27 26.46 | 12.08 28.80 | 12.89 31.16 | 13.70 33.53 | 14.51 35.91 |
| | 3000 | - | - | - | - | - | - | - | 8.93 19.89 | 9.83 22.50 | 10.73 25.15 | 11.63 27.83 | 12.53 30.54 | 13.43 33.27 | 14.33 36.03 | 15.23 38.80 | 16.13 41.59 |
| 3300 | - | - | - | - | - | - | - | - | 10.82 25.49 | 11.81 28.52 | 12.80 31.60 | 13.79 34.71 | 14.78 37.86 | 15.77 41.03 | 16.76 44.22 | 17.75 47.43 | |
| 3600 | - | - | - | - | - | - | - | - | - | 12.89 31.96 | 13.97 35.44 | 15.05 38.97 | 16.13 42.53 | 17.21 46.13 | 18.29 49.76 | 19.37 53.42 | |

Please note: These figures are a guide only and will be dependent on the mould configuration used in manufacture. Discharge rates are calculated using Colebrooke-White equation for a fully wetted perimeter under uniform flow conditions and assuming a flat invert culvert unit. The assumed laying gradient (s) is 1:1000 with a roughness coefficient (k) of 0.3. The hydraulic design of a box culvert should always be undertaken by the overall scheme designer, as they are able to take into account the upstream and downstream conditions and other parameters such as freeboard, restriction due to silt build-up and need for the culvert to be free flowing at all times. Due to the lack of this information, FP McCann will only give discharge rates for an idealised culvert, which may not suit the local conditions.

BOX CULVERTS STOCK TABLE

We maintain a stock of standard box culverts at our Byley Depot, ensuring rapid availability and reliable supply for your projects.



| Product Name | Flow Area (m ²) | Internal Width (mm) | Internal Height (mm) | Length (mm) | External Width (mm) | External Height (mm) | Thickness (mm) | Weight (t) |
|--------------|-----------------------------|---------------------|----------------------|-------------|---------------------|----------------------|----------------|------------|
| BC-1005 | 0.455 | 1000 | 500 | 2000 | 1350 | 850 | 175 | 3.59 |
| BC-1207 | 0.893 | 1250 | 750 | 2000 | 1600 | 1100 | 175 | 4.49 |
| BC-1510 | 1.428 | 1500 | 1000 | 2000 | 1850 | 1350 | 175 | 5.53 |
| BC-1515 | 2.178 | 1500 | 1500 | 2000 | 1850 | 1850 | 175 | 6.44 |
| BC-1707 | 1.268 | 1750 | 750 | 2000 | 2150 | 1150 | 200 | 6.23 |
| BC-2010 | 1.928 | 2000 | 1000 | 2000 | 2400 | 1400 | 200 | 7.41 |
| BC-2020 | 3.928 | 2000 | 2000 | 2000 | 2400 | 2400 | 200 | 9.47 |



PORTAL FRAMES



Portal frames either consist up of an n-shaped upper unit and two L-shaped footings per ring, or simply just an n-section. The portal frame system offers a quicker and more economical alternative to bridge beams and abutments that are cast in-situ. Units can be designed for specified loadings, and fulfil Eurocode requirements.

KEY FEATURES

- Alternative to bridge beam construction
- Ball and socket joint between wall and roof
- Designed per project requirements
- Reduced insitu works
- Used for road infrastructure
- Bitumen coating can be factory applied if required



UAN culverts consist of two U-shaped sections, which can then be assembled on-site. A ball and socket joint is used between the two parts of the finished section. This option can be offered for larger box culverts that are unsuitable for transport as a monolithic structure or if there are any site specific weight constraints.

The popularity of UAN culverts is growing, largely due to their immediate stability, quick installation, and the flexibility in being able to manufacture culverts for a wider range of applications. Key uses include as an underbridge for road or rail, and in other road infrastructure projects.

KEY FEATURES

- Adjustable moulds mean the product can be made to accommodate a range of projects
- Instant stability
- Mammal ledges can be added to allow wildlife to safely pass through the culvert
- The ball and socket joint is typically located mid-height.
- Used for road infrastructure
- Bitumen coating can be factory applied if required

UAN CULVERTS



WINGWALLS AND HEADWALLS



PRECAST BESPOKE HEADWALLS

FP McCann's bespoke headwalls deliver a robust and efficient alternative to traditional cast-in-situ construction. Produced in a controlled factory environment, they offer consistent quality and significantly reduced on-site labour demands.

Ideal Applications

- Culverts
- Bridge approaches
- Watercourse diversions
- Highway drainage systems

Key Benefits

- Rapid Installation

Precast units arrive ready for immediate placement, allowing teams to accelerate construction programmes and reduce overall project durations.

- Superior Quality & Durability

Manufactured under strict quality control, our wing walls provide long-term structural performance, improved dimensional accuracy, and enhanced resistance to weathering and erosion.

- Cost Efficiency

Reduced labour requirements, minimal formwork, and faster on-site assembly contribute directly to lower overall project costs.

- Enhanced Environmental Protection

Precast solutions help manage water flow effectively, reducing the risk of erosion, sediment displacement, and long-term maintenance issues.

- Site Versatility

Suitable for a wide range of ground conditions and structures, wing walls can be configured to suit both straight and angled alignments.

- Reduced Site Congestion

With fewer on-site activities, precast construction supports cleaner, safer, and more controlled working zones especially vital on constrained or high-traffic sites.

Headwalls

We supply also supply standard headwalls alongside our box culvert offering.

- XLT1 = Max Opening Size – 1800x1800
- XLT2 = Max Opening Size – 1800x1250
- XLT3 = Max Opening Size – 1800x1900
- XLT4 = Max Opening Size – 1800x550
- XXLT1 = Max Opening Size – 2450x2500
- XXLT2 = Max Opening Size – 2450x1750
- XXLT3 = Max Opening Size – 2450x1250
- XXLT4 = Max Opening Size – 2450x700



ROAD GULLIES



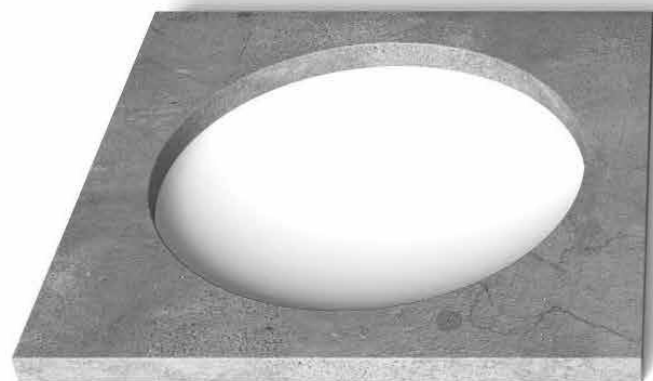
GULLIES

| Dimensions (mm) | | | Nominal Weight (Kg) | Approx. Capacity (litres) | No. per load |
|-------------------|-------|--------|---------------------|---------------------------|--------------|
| Diameter Internal | Depth | Outlet | | | |
| 375 | 750 | 150 | 180 | 51 | 66 |
| 375 | 900 | 150 | 200 | 67 | 66 |
| 450 | 750 | 150 | 215 | 71 | 60 |
| 450 | 900 | 150 | 255 | 95 | 60 |
| 450 | 1050 | 150 | 270 | 118 | 60 |
| 450 | 1200 | 150 | 280 | 142 | 60 |

PRODUCT BENEFITS

- The seal has been cast-in, thus preventing loss or damage on-site
- An integral seal and rodding eye for universal sealing characteristics
- The rodding eye closure has been recessed into the concrete to help eliminate dislodgment
- Reduced thickness, giving reduced weight and a smaller footprint for better vehicle utilisation
- Improved system that helps prevent any discharge of oil
- The gully is fully universal, suitable for all plastic and clay drainage products from 160mm to 186mm diameter
- Does not lose shape
- Does not float (self weight inhibits flotation)

STANDARD GULLY COVER



GULLY COVER SLABS

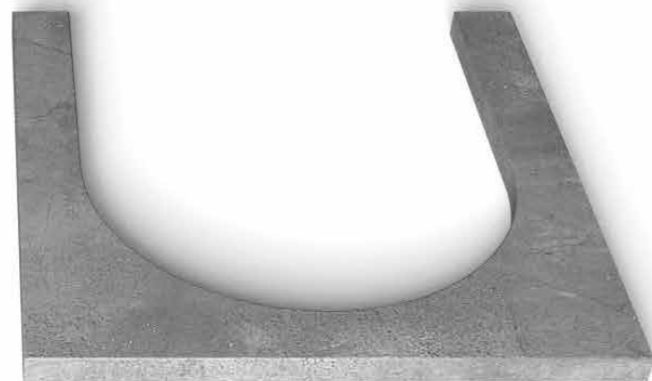
| Dimensions (mm) | Standard | Horseshoe | 65 Standard | 65 Horseshoe |
|-----------------|----------|-----------|-------------|--------------|
| Length (mm) | 750 | 600 | 750 | 600 |
| Width (mm) | 650 | 650 | 650 | 650 |
| Thickness (mm) | 100 | 100 | 65 | 65 |
| Weight (kg) | 70 | 58 | 51 | 37 |
| Hole Size (mm) | 450 | 450 | 450 | 450 |
| Qty/Pack | 12 | 12 | 12 | 12 |

The Gully Cover Slab is designed as seating for a gully grate

PRODUCT BENEFITS

- Quicker to lay, ensuring reduced labour costs
- Use on top of 450mm diameter gully
- Eliminates laying engineering bricks on-site
- Sits flush to kerb for enhanced stability
- 100mm and 65mm thick single piece units available
- Eliminates brickwork vertical joint 'weak spots'
- Greater stability than brickwork
- Quality product produced by vibration process
- Compressive strength similar to Class B.Eng. bricks

HORSESHOE GULLY COVER



STORMCHANNEL™

WHAT IS STORMCHANNEL™?

FP McCann's StormChannel™ is a heavy duty, precast concrete slotted drainage channel designed to remove surface water from many areas, including roads, motorways, car parks, industrial, commercial and residential areas. This helps to prevent flooding and run-off.

FP McCann offers two types of StormChannel™:

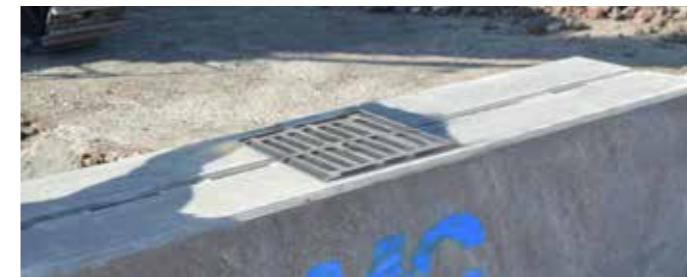
1. A precast concrete bullnosed kerb drainage channel has a linear slot drain and a profiled, oblong drainage channel.
2. A standard precast concrete drainage channel with an interrupted slot and stabiliser bars for increased stability.

FEATURES:

- Resilient up to classes D400, E600 or F900
- ED300 and ED400 Standard StormChannel™ tested to Class F900
- 2% surface slope to the slot
- Supplied with interrupted slot (slot width 30mm) and with cast-in inspection grate for cleaning and inspection
- Spigot and socket end for correct alignment and joining

Additional connections can be provided on request. Junction box sump unit also available in all sizes.

CAST IN GRATING



RANGE OF SIZES



300 Standard

400 Standard

400 Kerb

500 Standard

600 Standard

BENEFITS:

- Quick installation
- Minimal maintenance
- Excellent flow rates at shallow gradients
- Modular system
- Robust product
- Economical product
- Integrated watertight seal
- No concrete surround required
- Conforms to EN 1433

| StormChannel™ | Length (mm) | Height (mm) | Weight (kg) | Width (mm) | Drainage Cross Section (m²) |
|-----------------|-------------|-------------|-------------|------------|-----------------------------|
| ED300 Standard | 2500 | 555 | 1400 | 520 | 0.0707 |
| ED400 Standard | 2500 | 745 | 1700 | 520 | 0.1262 |
| ED400 Kerb | 2500 | 795 | 1700 | 520 | 0.1262 |
| ED500 Standard* | 2500 | 805 | 2300 | 700 | 0.1973 |
| ED600 Standard* | 2500 | 995 | 2600 | 700 | 0.2828 |

*DN500 & DN600 are only available on request.



8 GOOD REASONS WHY YOU SHOULD USE CONCRETE DRAINAGE

1 SUSTAINABILITY

Concrete pipes outperform other types of pipeline solutions in a number of the environmental impact categories, such as human toxicity levels and chemical / hazardous waste generated. The CO2 emissions from concrete and cement production are relatively small compared to other building materials. Some 95 to 99% of ingredients used in the production of concrete pipes are sourced locally, so a considerable positive impact on the carbon footprint and fuel consumption associated with transporting these materials can be achieved.

2 STRENGTH

Concrete is much more durable than any other kind of pipe. Hence, it can carry more load at any given time and gains strength over time. It cannot be weakened by heat, moisture, mould or pests, nor will it rust. Underground concrete pipes have the ability to resist chemical attacks and massive impacts such as jetting, so blockages can be cleared easily.

3 QUALITY

Since precast concrete pipes are produced in highly controlled plant environments under rigid production standards and testing specifications, they achieve consistent high quality levels of performance.

The pipe production process will normally include computer-controlled mixing systems, computer-controlled weighing and proportioning systems, absorption testing and automated recording systems.

FP McCann's concrete pipes are manufactured in accordance with BS EN 1916 and BS 5911, and certified by Quality Assessment under the Kitemark Scheme and ISO 9001.

4 WHOLE LIFE VALUE

Due to its amazing structural properties and functional benefits, precast concrete pipes tend to attract lower insurance premiums than those built from other construction materials. The natural strength of precast concrete pipes enables recycled aggregate to be used as a bedding material, significantly reducing installation costs and the elimination of waste disposal costs.

5 FIRE-RESISTANCE

Being naturally fire-resistant, concrete forms a highly effective barrier to fire spread and it does not emit any toxic fumes when affected by fire. It will not produce smoke or drip molten particles. Therefore, in the majority of applications, concrete can be described as virtually 'fireproof'. Due to its inbuilt fire resistant properties, concrete not only maintains an airtight construction that stops smoke spreading, but also has the ability to keep its strength during a fire.

6 BEDDING PERFORMANCE

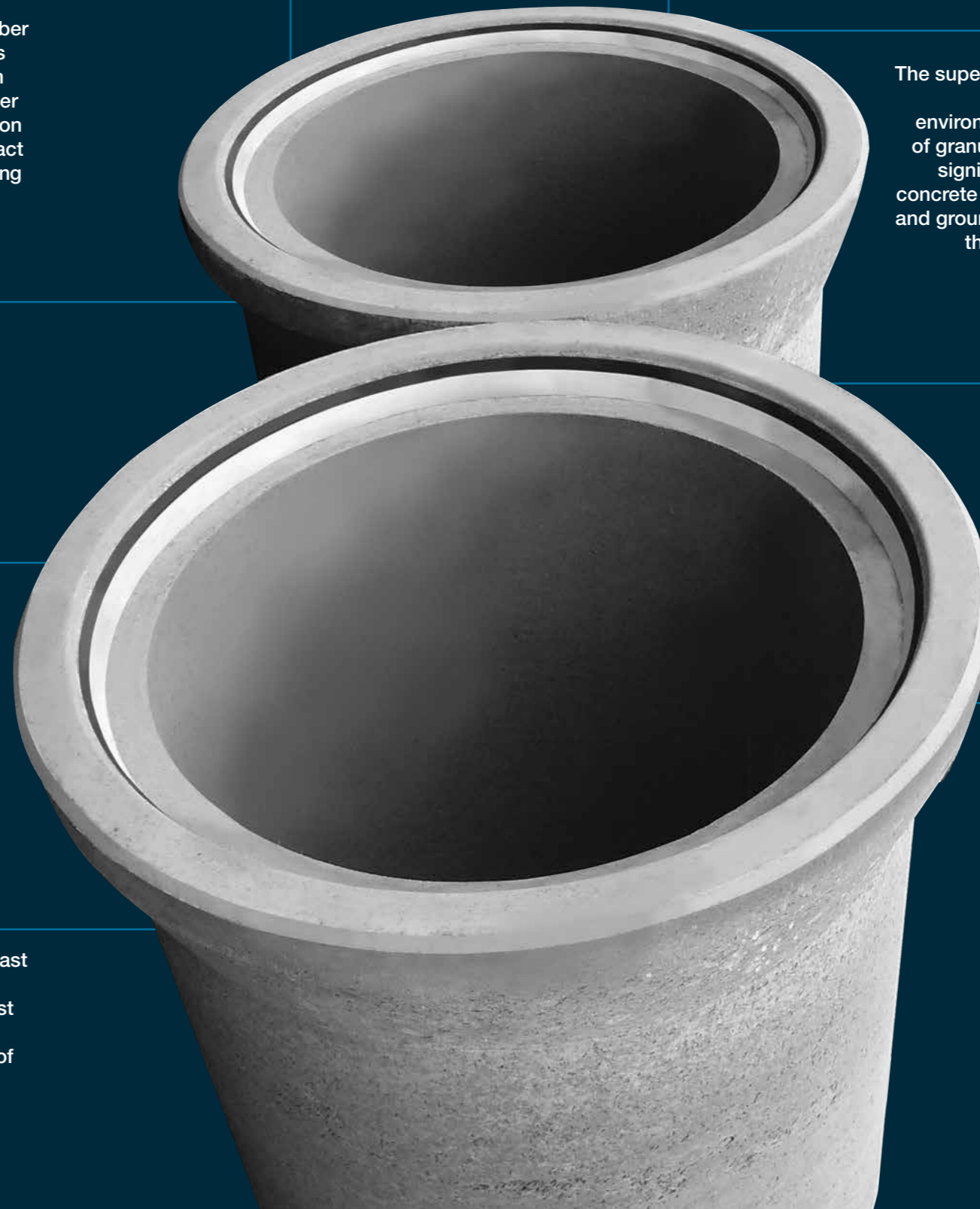
The superior strength of concrete pipes enables recycled aggregate to be used as a bedding material, thus reducing costs and environmental impact during installation. Since a full trench depth of granular material can actually be more expensive than the pipe, significant pipe bedding savings can be achieved when using a concrete pipe instead. FP McCann can advise on the optimum soil and ground conditions from geotechnical reports, to establish when this sustainable and cost-efficient solution can be deployed.

7 CHEMICAL RESISTANCE

Concrete pipes and manholes are resistant to sulphate and chemical attack. Concrete pipeline products with higher design chemical classes of DC3 and DC4 are capable of withstanding attack from the vast majority of aggressive ground environments in the UK.

8 HYDRAULIC EFFICIENCY

The rigidity and mass of concrete pipes (both within the pipe and pipe joints) allows it to retain its shape over its long service life, preserving structural integrity and hydraulic efficiency, by minimising the resistance to water flow that often occurs when the shape or integrity of a flexible pipe is compromised through deformation.



SPIGOT AND SOCKET PIPES

All of our spigot and socket pipes are manufactured and CE marked in accordance with European Standard BS EN 1916, the specification for unreinforced and reinforced concrete pipes (including jacking pipes) and fittings with flexible joints. They are also designed to meet BS 5911 for concrete pipes and ancillary products.



STANDARD PIPES

| Nominal Size | DN | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 | *1350 | *1500 | *1800 | *2100 | *2400 |
|------------------------|-----------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| Internal Diameter | A | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 805 | 900 | 1050 | 1200 | 1350 | 1500 | 1800 | 2100 | 2380 |
| Barrel Diameter | B | 416 | 505 | 590 | 685 | 790 | 901 | 996 | 975 | 1080 | 1266 | 1460 | 1620 | 1800 | 2130 | 2460 | 2750 |
| Socket Diameter | C | 497 | 575 | 665 | 760 | 852 | 960 | 1060 | 1130 | 1235 | 1420 | 1590 | 1800 | 2010 | 2380 | 2650 | 2750 |
| Effective Length | MM | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 |
| Actual Weight | KG | 454 | 616 | 812 | 996 | 1420 | 1856 | 2194 | 1690 | 2060 | 2760 | 3630 | 4290 | 5330 | 7300 | 9160 | 10070 |
| Reinforced | | N | N | N | N | N | N | N | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Approx. Pipes per load | | 61 | 45 | 34 | 28 | 22 | 15 | 12 | 17 | 13 | 10 | 8 | 6 | 5 | 4 | 3 | 2 |
| Chamber Ring to suit † | | 1200 | 1350 | 1350 | 1500 | 1500 | 1500 | 1800 | 1800 | 1800 | 2100 | 2100 | 2400 | 2400 | 2700 | 3000 | 3600 |
| Crushing Strengths | Kn/M | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 | 126 | 144 | 162 | 180 | 216 | 252 | 288 |
| Nominal Joint Gap | MM | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 7 | 7 | 7 | - |
| Maximum Joint Gap | MM | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 36 | 36 | 36 | 41 | 41 | - |
| Maximum Deflection | * Degrees | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0.5 | 0.5 | 0.5 | 0.5 | - |

† Minimum chamber ring size to suit pipe = DN size of pipe + 900

* Lifting anchors available
 ^ Please note internal dimensions

PIPE LUBRICANT

Pipes should only be joined using an FP McCann lubricant

| Nominal size | DN | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 | 1350 | 1500 | 1800 | 2100 |
|-------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| No. of joints per | KG | 27 | 22 | 18 | 15 | 13 | 12 | 10 | 9 | 9 | 8 | 7 | 6 | 5 | 4 | 4 |

Sold in 2.5kg Tubs



ROCKER PIPES

| Nominal Size | DN | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 | *1350 | *1500 | *1800 | *2100 |
|------------------|----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-------|-------|-------|-------|
| Effective Length | MM | 600 | 600 | 600 | 600 | 600 | 1000 | 1000 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 |
| Approx. Weight | KG | 145 | 180 | 220 | 300 | 365 | 800 | 950 | 1020 | 1020 | 1200 | 1605 | 2020 | 2755 | 4440 | 4620 |

* Lifting anchors available



SOCKET BUTT PIPES

| Nominal Size | DN | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 | *1350 | *1500 | *1800 | *2100 |
|------------------|----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-------|-------|-------|-------|
| Effective Length | MM | 600 | 600 | 600 | 600 | 600 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 |
| Approx. Weight | KG | 145 | 174 | 230 | 270 | 370 | 960 | 1175 | 945 | 1105 | 1500 | 1930 | 2435 | 3100 | 4300 | 5400 |

* Lifting anchors available



SPIGOT BUTT PIPES

| Nominal Size | DN | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 | *1350 | *1500 | *1800 | *2100 |
|------------------|----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-------|-------|-------|-------|
| Effective Length | MM | 600 | 600 | 600 | 600 | 600 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 |
| Approx. Weight | KG | 100 | 135 | 155 | 205 | 270 | 870 | 980 | 750 | 910 | 1170 | 1585 | 1850 | 2230 | 3005 | 3800 |

* Lifting anchors available



ONE PIECE BEND

| Degree | 11.25° | | | 22.5° | | | 45° | | | 90° | | |
|-------------------|-------------|-------------|-----|-------------|-------------|-----|-------------|-------------|------|-------------|-------------|------|
| | Length (mm) | Weight (kg) | | Length (mm) | Weight (kg) | | Length (mm) | Weight (kg) | | Length (mm) | Weight (kg) | |
| Nominal size (DN) | a | b | | a | b | | a | b | | a | b | |
| 300 | 115 | 103 | 66 | 160 | 148 | 79 | 257 | 245 | 112 | 618 | 509 | 167 |
| 375 | 239 | 140 | 117 | 294 | 195 | 142 | 413 | 314 | 199 | 735 | 636 | 270 |
| 450 | 127 | 79 | 109 | 196 | 148 | 139 | 344 | 296 | 232 | 745 | 698 | 352 |
| 525 | 97 | 194 | 140 | 179 | 276 | 200 | 335 | 436 | 400 | 828 | 965 | 750 |
| 600 | 149 | 137 | 188 | 240 | 228 | 289 | 437 | 425 | 513 | 973 | 961 | 898 |
| 750 | 384 | 115 | 502 | 499 | 230 | 661 | 744 | 475 | 1087 | 1412 | 1143 | 1810 |



TWO PIECE BENDS - 11.25°, 22.5° & 45°

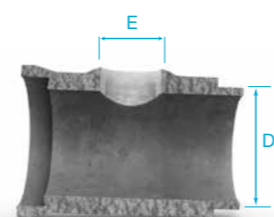
| Nominal Size | DN | 675 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1800 |
|------------------|----|------|------|------|------|------|------|------|------|
| Effective Length | MM | 1000 | 1000 | 1250 | 1250 | 1250 | 1250 | 1250 | 1250 |
| Approx. Weight | KG | 775 | 925 | 1140 | 1515 | 1955 | 2425 | 2965 | 4105 |



THREE PIECE BENDS - 90°

| Nominal Size | DN | 675 | 750 | 825 | 900 | 1050 | 1200 | 1350 | 1500 | 1800 | 2100 |
|------------------|----|------|------|------|------|------|------|------|------|------|------|
| Effective Length | MM | 1750 | 1750 | 2500 | 1750 | 2500 | 2500 | 2500 | 2500 | 2500 | 3000 |
| Approx. Weight | KG | 850 | 1200 | 1900 | 2000 | 2600 | 3500 | 4200 | 5100 | 6800 | 7100 |

Any fabricated/cut bends need to be surrounded in concrete.

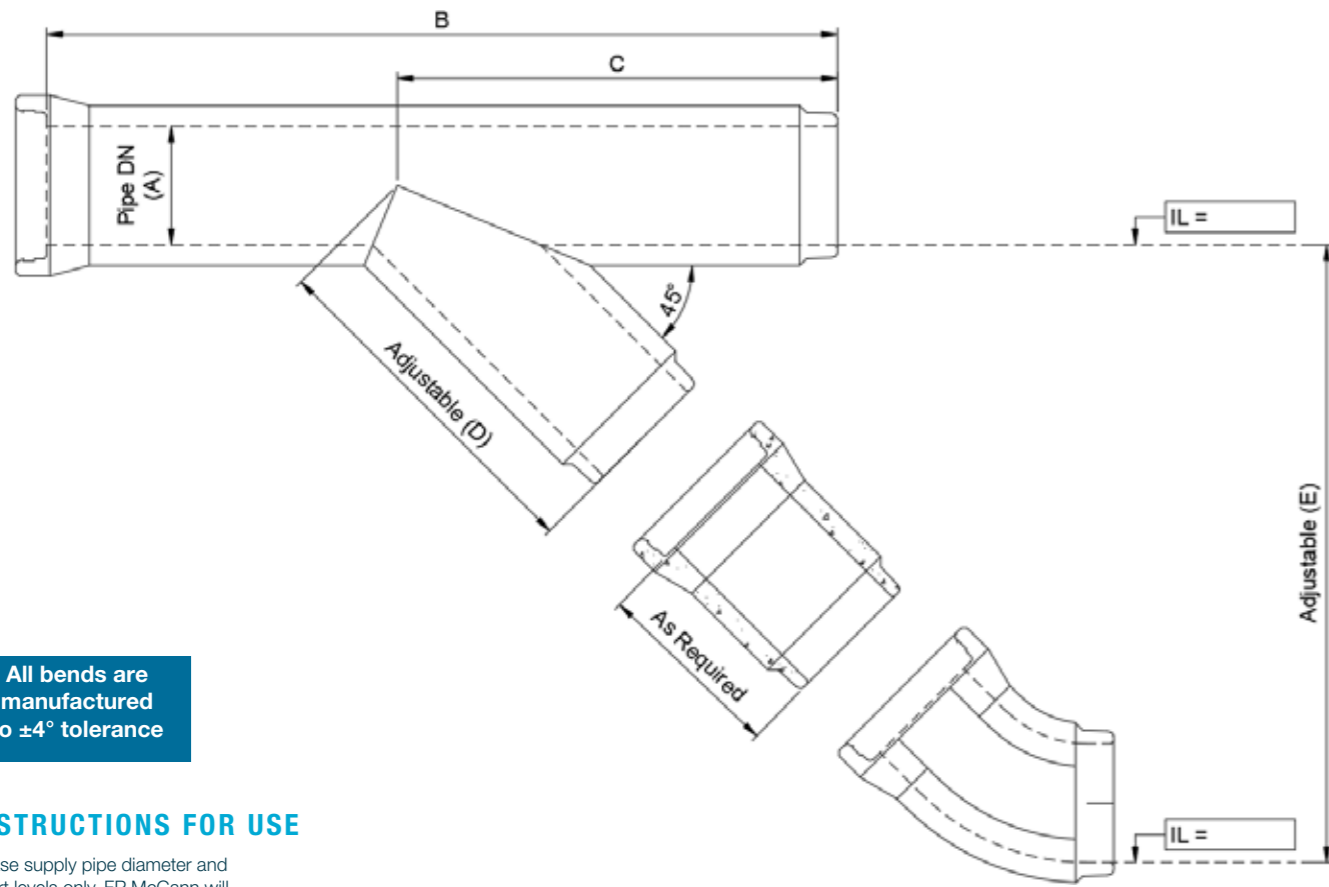
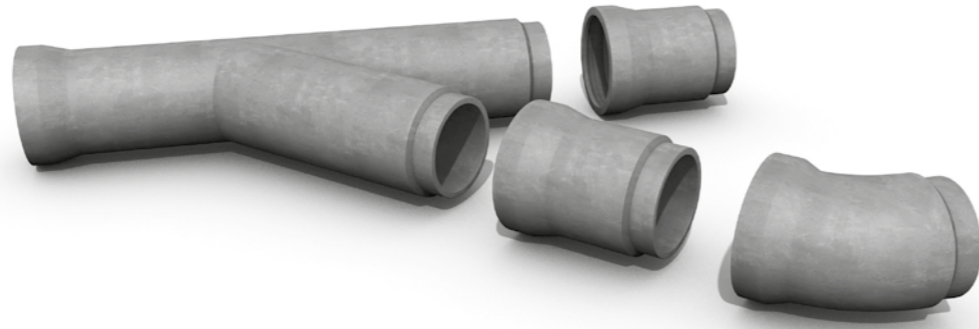


FASTFIT JUNCTIONS

| Nominal Size | DN | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 | 1350 | 1500 | 1800 |
|------------------|----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|
| Branch Size | E | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Effective Length | MM | 600 | 600 | 600 | 600 | 600 | 1000 | 1000 | 1250 | 1250 | 1250 | 1250 | 2500 | 2500 | 2500 |
| Approx. Weight | KG | 132 | 169 | 211 | 277 | 350 | 750 | 905 | 800 | 1140 | 1513 | 2427 | 4416 | 5120 | 7360 |

All junctions are to be fitted on their side. Junctions are not designed for vertical surface compaction and need to be surrounded in concrete.

OBLIQUE (45°) TUMBLING JUNCTION (SPIGOT)



All bends are manufactured to $\pm 4^\circ$ tolerance

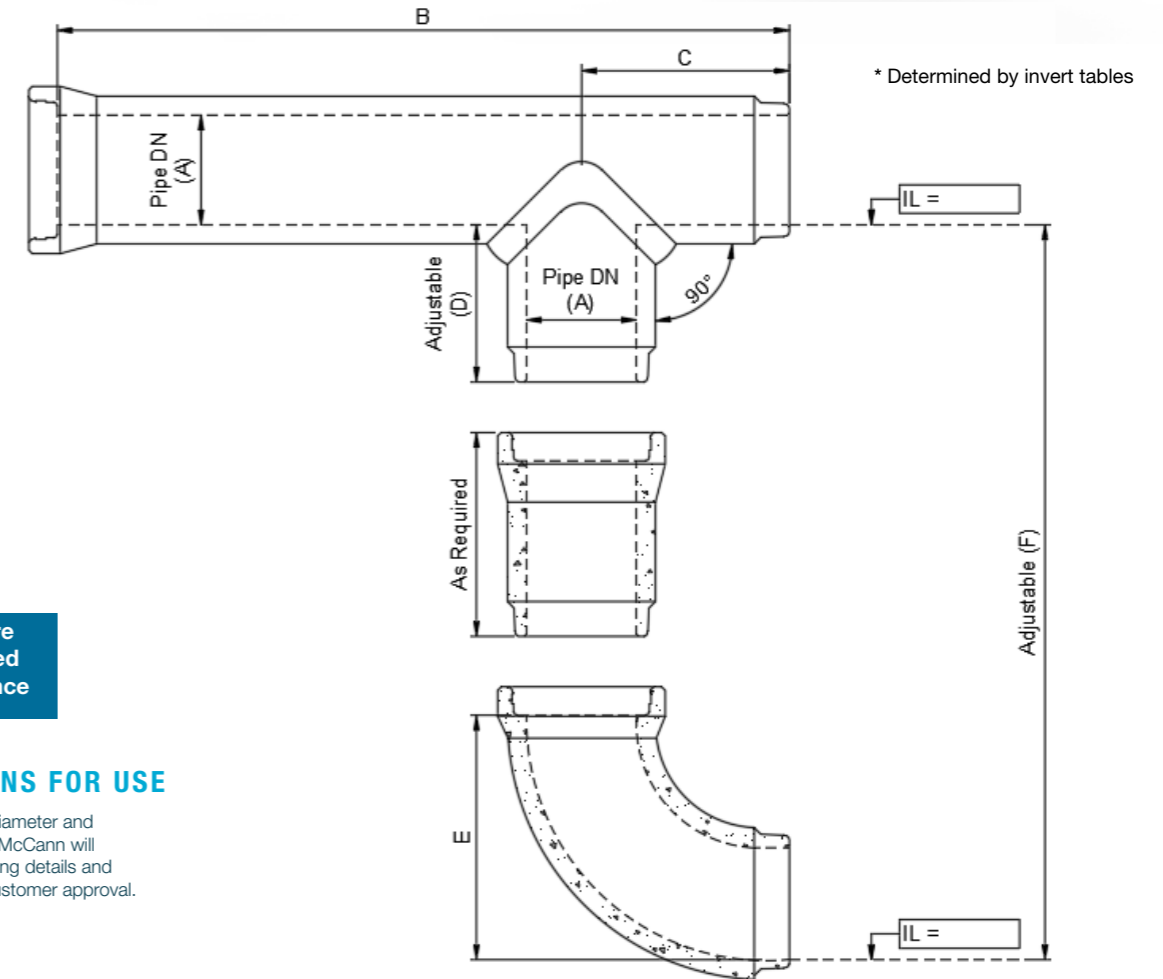
INSTRUCTIONS FOR USE

Please supply pipe diameter and invert levels only. FP McCann will complete the remaining details and return by email for customer approval.

* Determined by invert tables

| Oblique (45°) Spigot Tumbling Bay Junction | | | | | | | | | | | |
|--|---------|------|------|------|------|------|------|------|------|------|------|
| Nominal Size | A | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 |
| Effective Length | B | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 |
| Distance from Spigot End (standard) | C | 1042 | 1392 | 1307 | 1576 | 1674 | 1867 | 2103 | 1881 | 1703 | 1795 |
| Branch Pipe Length (minimum) | D (min) | 655 | 778 | 890 | 979 | 1142 | 1271 | 1390 | 1388 | 1549 | 1896 |
| Branch Pipe Length (standard) | D (std) | 870 | 1112 | 1087 | 1177 | 1329 | 1433 | 1558 | 1453 | 1679 | 1896 |
| Invert to Invert height (minimum) | E (min) | 645 | 842 | 872 | 1040 | 1117 | 1252 | 1509 | 1335 | 1537 | 1783 |
| Approx Weight | Kg | 520 | 696 | 873 | 1350 | 1458 | 2311 | 2828 | 2210 | 3654 | 3875 |

SQUARE (90°) TUMBLING JUNCTION (SPIGOT)



* Determined by invert tables

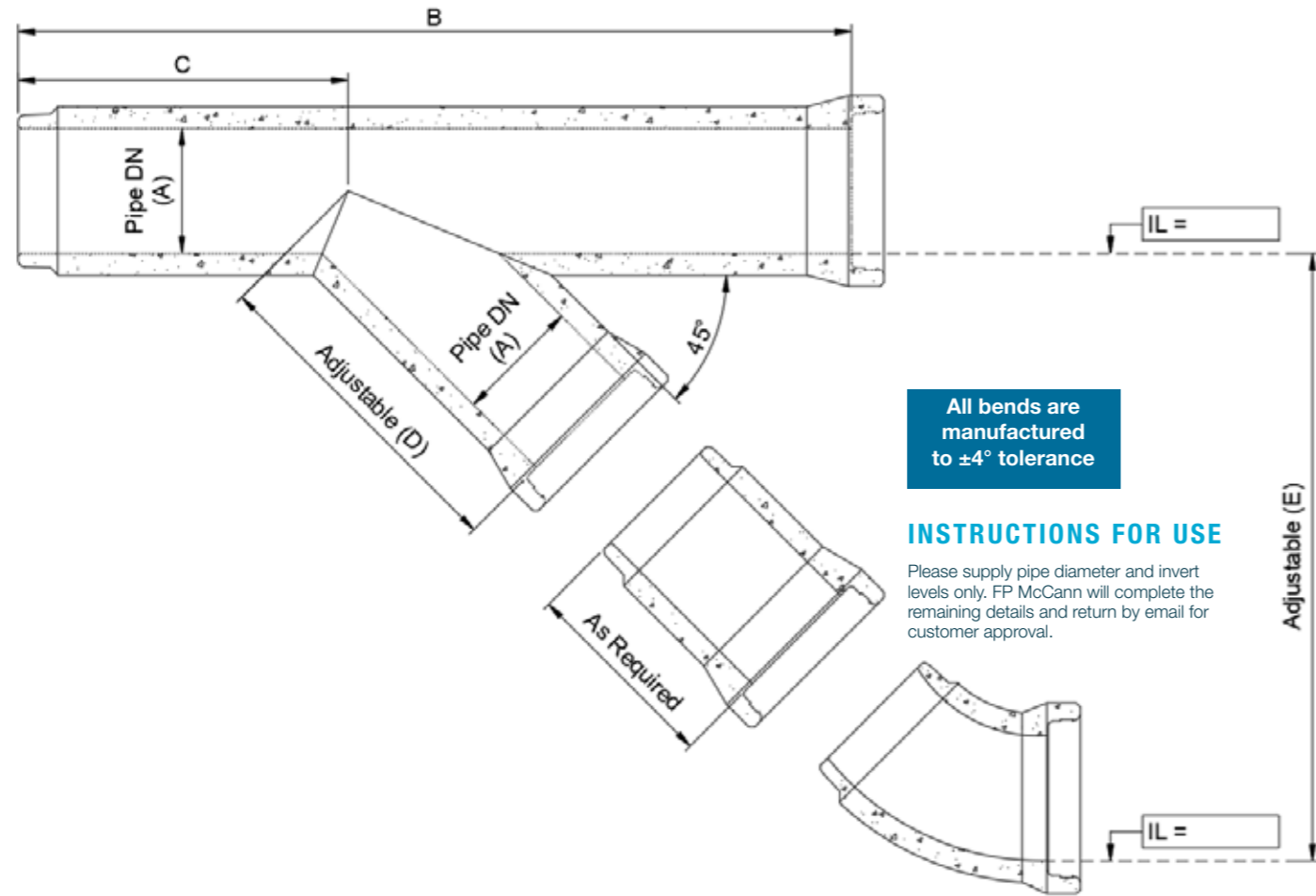
All bends are manufactured to $\pm 4^\circ$ tolerance

INSTRUCTIONS FOR USE

Please supply pipe diameter and invert levels only. FP McCann will complete the remaining details and return by email for customer approval.

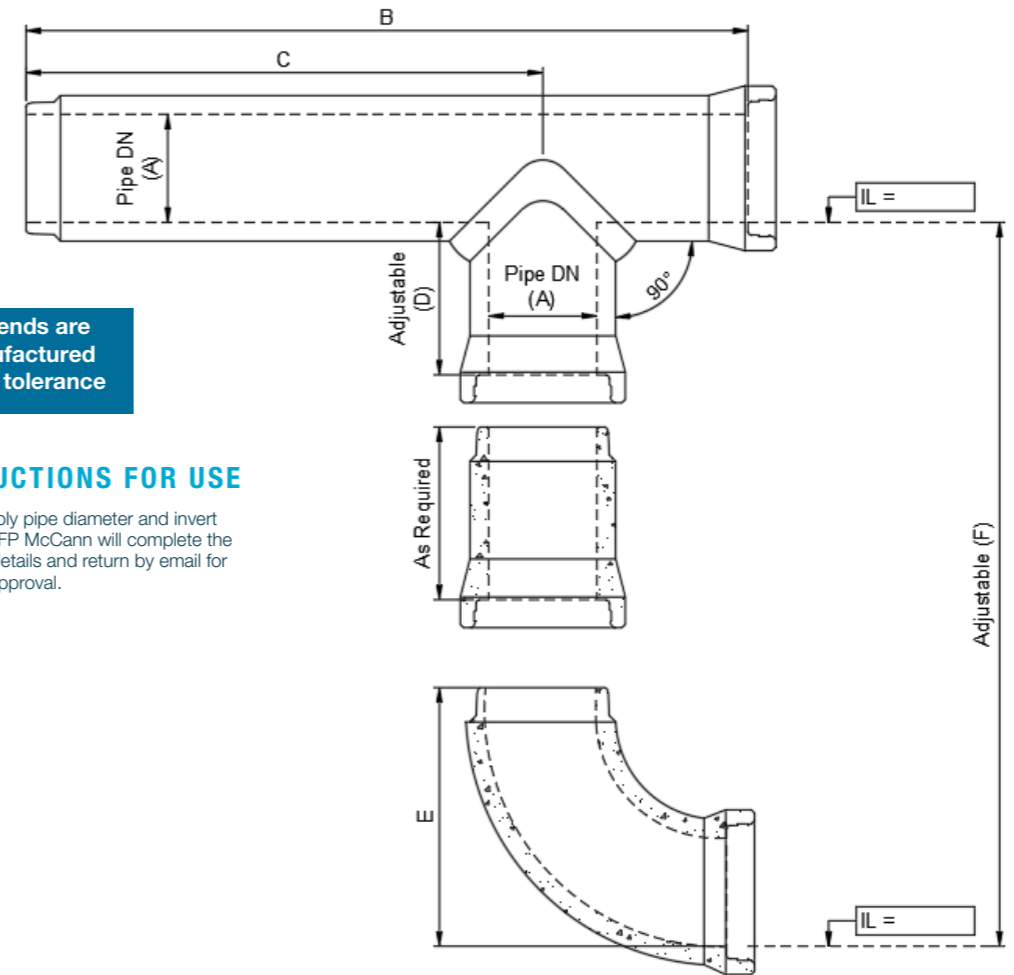
| Square (90°) Spigot Tumbling Bay Junction | | | | | | | | | | | | |
|---|---------|------|------|------|------|------|------|------|------|------|------|------|
| Nominal Size | A | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 |
| Effective Length | B | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 |
| Distance from Spigot End (standard) | C | 509 | 636 | 698 | 934 | 961 | 999 | 1143 | 1509 | 999 | 1425 | 1425 |
| Branch Pipe Length (minimum) | D (min) | 170 | 190 | 205 | 205 | 240 | 260 | 280 | 215 | 252 | 250 | 300 |
| Branch Pipe Length (standard) | D (std) | 430 | 440 | 445 | 445 | 470 | 480 | 490 | 433 | 465 | 480 | 500 |
| Bend Length | E | 671 | 923 | 970 | 1258 | 1273 | 1336 | 1787 | 1374 | 1449 | 1950 | 2100 |
| Invert to Invert height (minimum) | F (min) | 841 | 1113 | 1175 | 1463 | 1513 | 1596 | 2067 | 2126 | 1701 | 2200 | 2400 |
| Approx Weight | Kg | 484 | 640 | 827 | 1098 | 1396 | 1453 | 2457 | 1990 | 2964 | 3370 | 4374 |

OBLIQUE (45°) TUMBLING JUNCTION (SOCKET)



| Oblique (45°) Socket Tumbling Bay Junction | | | | | | | | | | | |
|--|---------|------|------|------|------|------|------|------|------|------|------|
| Nominal Size | A | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 |
| Effective Length | B | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 |
| Distance from Spigot End (standard) | C | 1455 | 1251 | 962 | 822 | 696 | 399 | 759 | 497 | 623 | 535 |
| Branch Pipe Length (minimum) | D (min) | 720 | 810 | 912 | 1029 | 1129 | 1268 | 1383 | 1476 | 1679 | 1896 |
| Branch Pipe Length (standard) | D (std) | 870 | 985 | 1087 | 1329 | 1329 | 1443 | 1558 | 1626 | 1679 | 1896 |
| Invert to Invert height (minimum) | E (min) | 682 | 818 | 965 | 1064 | 1189 | 1270 | 1314 | 1397 | 1629 | 1783 |
| Approx Weight | Kg | 572 | 748 | 940 | 1450 | 1550 | 2400 | 3090 | 2390 | 3885 | 4199 |

SQUARE (90°) TUMBLING JUNCTION (SOCKET)



| Square (90°) Socket Tumbling Bay Junction | | | | | | | | | | | | |
|---|---------|------|------|------|------|------|------|------|------|------|------|------|
| Nominal Size | A | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 825 | 900 | 1050 | 1200 |
| Effective Length | B | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 | 2500 |
| Distance from Spigot End (standard) | C | 1980 | 1765 | 1755 | 1515 | 1527 | 1501 | 1088 | 991 | 1501 | 1075 | 1075 |
| Branch Pipe Length (minimum) | D (min) | 230 | 210 | 225 | 245 | 230 | 260 | 280 | 317 | 395 | 420 | 400 |
| Branch Pipe Length (standard) | D (std) | 430 | 440 | 445 | 445 | 470 | 480 | 490 | 477 | 465 | 480 | 500 |
| Bend Length | E | 659 | 824 | 923 | 1196 | 1261 | 1336 | 1518 | 1912 | 1449 | 1950 | 2025 |
| Invert to Invert height (minimum) | F (min) | 889 | 1034 | 1148 | 1441 | 1491 | 1596 | 1798 | 2229 | 1844 | 2370 | 2425 |
| Approx Weight | Kg | 540 | 685 | 854 | 1098 | 1453 | 1550 | 2542 | 2050 | 3144 | 3398 | 4582 |

STORM-HOLD™

LARGE DIAMETER PIPE STORMWATER MANAGEMENT SYSTEM

The production of water-impermeable surfaces in construction is inevitable. This includes roof areas on buildings, car parks, loading bays and road pavements. The provision of these surfaces interrupts the natural drainage process, creating increased stormwater run-off in respect of both volume and flow rate.

In many cases, this increase in stormwater flow and volume is a problem as the local sewer or watercourse does not have the sufficient capacity to cope. This problem could be alleviated by an increase in the size of the stormwater sewer or watercourse, thus providing the capacity within the drainage system to cope with the increased surface water. This, however, may be expensive, cause major infrastructure disruption, and can often be completely unfeasible.

Legislation under Planning Policy Statement 25 and Building Regulations approved Document H3 for flood risk assessment (SuDS), has created the need for planners and developers to design and install effective stormwater management systems.

The types of systems that can be employed to overcome these issues are well documented and varied. Quite often they can be very technically demanding in their operation, maintenance and construction. The selection of a system will depend on site constraints, position, expected loading, geographical limitations and inevitably cost.

The Storm-Hold system offers a complete solution to the stormwater attenuation problem and utilises a tried, tested and approved method of stormwater storage. FP McCann can provide the complete package of design, product specification and supply of products and installation advice.

PRODUCT FEATURES

- Available in a range of sizes
- Can use and combine a number of techniques and products such as pipes, culverts, tanks, manifold systems and soakaways
- A complete solution with all connections
- Established and familiar products
- Can be laid in short lengths
- The system can be adapted to load-bearing and non-load bearing applications
- 120 year design life
- Adoptable by water companies
- Manufactured in accordance with a BSI accredited quality management system conforming to ISO 9001
- Available straight from stock



STRUCTURAL

The inherent structural strength of concrete is well documented and can be designed to meet the severest of loading criteria.

Storm-Hold systems can be tailored to suit low load situations, for example, when the tank is to be situated below verges or gardens.

BENEFITS

- System can be designed specifically to suit the application
- Quick construction using a standard joint
- No need for fabrication on-site or external specialist contractors
- Straightforward installation using known techniques, no need to retrain
- Can be installed under roads and car parks
- Can cope with construction plant loading
- Flotation is not a concern – no need for geotechnical anchors when located below the water table
- Long term solution

DESIGN

The design of the system can be tailored to suit most structural and hydraulic criteria.

RELEVANT LEGISLATION/ INFORMATION

- Planning Policy Statement 25 (PPS25) December 2009
- Department of Communities and Local Government (DCLG)
- Future Water February 2008, Department for Environment, Food and Rural Affairs (DEFRA)
- The Pitt Review, Learning Lessons from the 2007 floods by Sir Michael Pitt
- The Code for Sustainable Homes February 2008, Department for Communities and Local Government (DCLG)
- The SuDS Manual 2007, CIRIA C697
- Sustainable drainage systems - Hydraulic, structural and water quality advice 2004, CIRIA C609
- Flood and Water Management Act 2010

FP McCann's Storm-Hold systems can be designed to suit a wide range of construction projects and drainage schemes. Precast concrete attenuation components include products such as side entry manholes, stop end bends and spigot and socket end wall pipes. These products

can either be engineered into an on-line sewer pipe system or utilised off-line as single or multiple stormwater holding tanks. All FP McCann storm attenuation products comply with the requirements set out within 'Sewers for Adoption 7th Edition' and are made from Kite marked precast concrete components, which comply with the relevant Standards: BS EN 1916 / BS 5911-1 and Manholes BS EN 1917.

MODULAR TANK SYSTEM

FP McCann's Stormstore™ range of precast tank and chamber systems is the most extensive in the UK. Products manufactured include StormTank™ bespoke precast concrete panel system, StormChamber™ bespoke precast concrete chamber system, a precast concrete storm and waste water management system called Modular Tank System and StormHold™ stormwater management system. Complementary products include StormCleanser™ hydrodynamic separator, StormBrake™ vortex flow control system and StormChannel™ heavy-duty precast concrete slotted drainage channel.

STORMSTORE™ RANGE OF TANKS & CHAMBER SYSTEMS

KEY ADVANTAGES OF OUR RANGE

- From receiving the specification, designs can be returned within 2 days
- Complete design package provided, including calculations and drawings
- Manufactured off-site, including factory-fitted pipework and flow control connections, ensures consistent quality, lower construction costs, faster installation and lower health and safety issues
- Design service life of 100 years
- Overall cost of the project can be estimated no matter how complicated the design
- Bespoke designs can be used for reproductions and for future alterations
- No vertical shuttering required, unless an in-situ floor is installed
- Complies with all relevant British Standards and Eurocodes

STORMCHAMBER™

MULTIPURPOSE CHAMBER SYSTEM

FP McCann's StormChamber™ multipurpose chamber system is a single piece chamber system made up of a base unit, risers and cover slab to suit chamber depth and the specific application. A 3D dimensional drawing is available on request. This flexible modular system is suitable for most tank and chamber applications.

STORMCHAMBER™ – INTERNAL DIMENSIONS

| | |
|----------------------|----------------------|
| 1250 x 1250mm | 2500 x 2000mm |
| 1500 x 1500mm | 2500 x 2500mm |
| 2000 x 1500mm | 3000 x 2500mm |
| 2000 x 2000mm | 3000 x 3000mm |

The above size range do not generally have toe units.

Sizes above 3000x3000mm up to a maximum size of 5000x3500mm. The length and width of these chambers can be adjusted up/down in 250mm increments to suit requirements. The height of the chamber is flexible up to 6 metres, with 8 metres possible, subject to calculations.

If chamber dimensions are critical and don't fit with the above range, we can usually offer a solution.

TYPICAL CONSTRUCTION/ INSTALLATION

(Subject to specific application)

- Base unit is placed on level concrete blinding or type 1 sub base
- Riser unit/s are placed onto the base unit, if required
- Hydrophilic swell, butyl sealant and bearing strips are placed in the joint between the base unit and riser unit/s
- Internal wall is fitted at factory or at site and is connected with threaded rod, nuts and washers
- Pipework is connected and backfilling takes place
- Cover slab is bedded on with high strength mortar, contained to the inside by butyl sealant strip

You should consider the overall installed cost of the chamber when taking into account all the benefits and cost savings detailed below, not the upfront material cost.



BENEFITS

- Concrete surround is not required, saving time and money on site installation. Up to 85% reduction in on-site construction programme
- Pipe penetrations are done at the factory, avoiding the need for cutting or core drilling on site
- Weir walls, flow controls etc can be factory fitted, if required. Up to 95% reduction in site man-hours for pit construction
- Virtual elimination of on-site waste
- 55% reduction in lorry movements for deliveries
- Traffic calming/ management reduction
- Elimination of need for confined space working
- Significant reduction in site noise
- Clear openings to suit requirements
- Reduces enclosed spaces work and working at depth
- Reduction in Health and Safety and Dynamic Risk Assessment issues
- Enhanced functionality - product can be designed for future alterations
- A flexible modular system with a high quality factory finish
- Greatly reduces long term maintenance costs
- Smaller units may be adjusted using alternative increments, if required



STORMTANK™

MULTIPURPOSE PANEL SYSTEM

The StormTank™ multipurpose panel system is an underground structure consisting of wall panels, an in-situ or precast concrete base and cover slab, which are assembled on-site by the contractor or an approved installer using a range of standard jointing types. The panels can be made with cast-in pipe connections, recesses and openings and have penstocks or flap valves pre-installed. Internal weir-walls, overflows, underpasses and baffle walls can also be incorporated into the structure.

This system can be used for a variety of uses such as CSO chambers, storage tanks, large size manholes, pumping stations, valve chambers etc. The main advantage of using this system is that there is no size limitation, except for the height, which cannot exceed six metres, with a two metre overburden. A detailed installation guide is available. Please contact FP McCann for further details.

PRODUCT APPLICATIONS

- Air-infiltration chambers
- Hydro-brake chambers
- Large CSO chambers
- Water storage tanks
- Pumping stations
- Attenuation tanks
- Large manholes
- ASP structures
- Sludge tanks
- Basements
- Headwalls



MODULAR TANK SYSTEM



StormStore (storm and waste water management system) provides a multifunctional, durable solution for the detention, retention, infiltration, harvesting and treatment of water, comprising of a combination of standardised precast concrete elements, which are designed to solve your storm and waste water management needs.



DETENTION

StormStore™ provides a cost-effective solution for site applications where stormwater needs to be detained and allowed to discharge at a controlled rate.

RETENTION

StormStore™ retention systems are ideal for applications where the goal is to retain rainwater or stormwater for some type of harvest and reuse applications.

INFILTRATION

Eliminate the issues created with discharging stormwater off-site by using a StormStore™ to infiltrate stormwater into the soil for natural treatment and to replenish local aquifers.

HARVESTING

Water harvesting is the collection, storage, cleaning and recycling of stormwater to replace or reduce the consumption of municipal potable water.

TREATMENT

Stormwater treatment options such as pre-treatment, post-treatment and oil water separators are available as stand-alone systems, as well as integration with StormStore.

FP MCCANN PRECAST CONCRETE ATTENUATION TANK SOLUTION AT GUILFORD BUS DEPOT

Project: Guildford Bus Depot - Attenuation Tank

Client: McClaren Construction

Consulting Engineer: Burrows Graham

Design, Manufacture & Installation: FP McCann

Products Supplied: Precast Concrete Attenuation Tank System

FP McCann has successfully delivered a bespoke precast concrete attenuation tank for the Guildford Bus Depot project on behalf of McLaren Construction. The project required a system capable of attenuating 1,500m³ of water volume, delivered within a constrained programme and under challenging site conditions.

From the earliest stages, FP McCann worked closely with McLaren Construction's design team and consulting engineers Burrows Graham to develop the most appropriate solution. The site presented a number of technical constraints, including contaminated ground conditions, flotation risk, and demanding loadbearing requirements. Early contractor involvement enabled these challenges to be addressed efficiently through collaborative design development and technical workshops.

All precast elements were manufactured in the UK, supporting the project's sustainability objectives. Units were produced using a tightly controlled process, with reinforcement cages installed and concrete poured and finished within the same day, before demoulding the following morning. Once demoulded, units were stood upright to allow full finishing and inspection of both faces. Prior to delivery, all panels were inspected by FP McCann's quality assurance team to ensure compliance with specification.

From placement of order, FP McCann completed the full design, detailing, manufacture, and delivery process within approximately eight weeks. The project involved over 600 tonnes of precast concrete units, demonstrating the efficiency and programme certainty achievable through off-site manufacturing.

The completed attenuation tank delivers a design life in excess of 100 years and achieves Class 1 watertightness. The precast concrete solution performs exceptionally well in contaminated ground and high-flotation environments, providing a robust, durable, and low-maintenance asset. By delivering the right solution first time, FP McCann has ensured long-term performance, sustainability, and reliability for the Guildford Bus Depot project.



FP MCCANN PRECAST CONCRETE STORM OVERFLOW TANK INSTALLED AT NORTH YORKSHIRE SEWAGE TREATMENT WORKS

Project: Stormwater Attenuation Tank Extension, Tadcaster STW, North Yorkshire.

Client: Yorkshire Water

Main Contractor: Seymour Civil Engineering

Products Supplied: Precast Concrete StormTank

FP McCann has designed and installed a 315m³ precast concrete StormTank extension on behalf of client Yorkshire Water and project contractor Seymour Civil Engineering at Tadcaster Sewage Treatment Works (STW). The FP McCann StormTank extension is part of Yorkshire Water's £180 million drive to reduce the frequency of stormwater overflows from its drainage network.

Sited alongside and configured to the existing online attenuation tank, the extended tank's capacity is designed to further alleviate flood risks in line with climate change conditions and stormwater surge events within the treatment works. FP McCann's StormTank is amongst a number of attenuation systems that are now accepted by Yorkshire Water and adoptable under the S104 approval process within Water UK's Sewer Sector Design and Construction Guidance.

StormTank is part of the FP McCann multi-purpose precast concrete tank range and can be designed and installed up to 6 metres high with overall dimensions to suit the client brief.

Measuring 23.4 metres long by 12.6 metres at the widest point, the Tadcaster STW StormTank extension manages a storm event by capturing excess combined wastewater. The wastewater can then be released into sewage treatment works for processing at a controlled rate, thereby relieving the pressure on the wastewater management system and reducing the risk of overflows from the network.

The StormTank extension designed as water class tightness 1 has been constructed using 15 individual 2.28 metres high steel reinforced precast concrete wall panels sections each 350mm thick with a heel and toe foundation base. Wall panel lengths range from 3.275 metres to 4.542 metres. To meet Yorkshire Water's benching profile the open tank has been designed with a stepped floor. One side of the tank is out of the ground with the other three sides backfilled and fitted with a surrounding safety handrail.

The precast concrete wall sections were positioned on the base foundation and a 350mm thick C40 concrete insitu tank floor slab was cast. The stepped floor was formed with a further 150mm thick concrete layer. The panel sections manufactured at McCann's state-of-the-art precast facility in Byley, Cheshire were delivered to site over a period of 3 weeks for installation by the approved FP McCann specialist fixing team, Beresford Flooring Ltd.



STORMBRAKE™

VORTEX FLOW CONTROL SYSTEM

DESIGN

FP McCann's StormBrake™ is manufactured using grade 304L / 316L stainless steel for increased durability, strength and resistance to corrosion and chemical damage. It consists of 3 main parts: an inlet section, a vortex chamber and an outlet. Each part can be configured to provide the most efficient solution to specific site requirements.

Each StormBrake™ is fitted with a pivoting bypass door on the front face in line with the outlet pipe. A stainless steel wire cable is attached to the bypass door and extends to the top of the manhole chamber. Upon pulling the cable the bypass door rotates and moves upwards, revealing a clear straight-through channel between the manhole and the outflow pipe. In the event of the StormBrake™ becoming blocked by debris, the bypass door allows fast discharge of water out of the chamber for maintenance.



FLOW STAGES

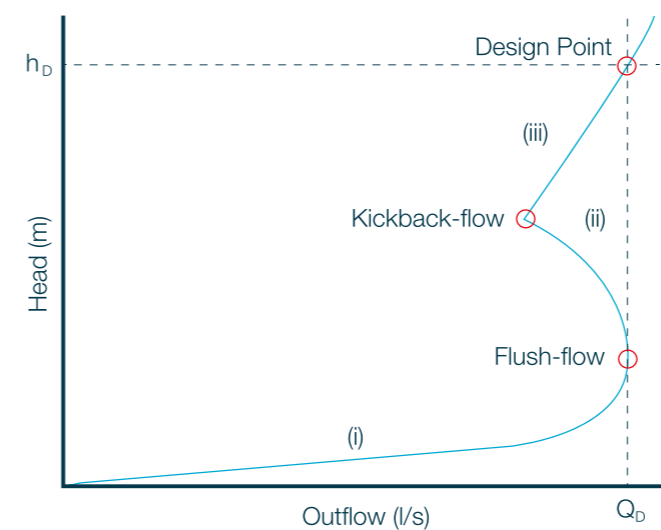
The performance of FP McCann's StormBrake™ is determined by relating the upstream head to the outflow leaving the device. Its performance is characterised by a head-flow curve, which produces a unique 'S'-shape, corresponding to the following three phases of flow:

- (i) **Pre-vortex phase** – hydrodynamics governed by orifice flow. The flow generated by the upstream head is not large enough to induce a vortex in the StormBrake™. This phase occurs until the flush-flow point is reached.
- (ii) **Transition phase** – flow throttling initiated. Vortex continually forms and collapses, resulting in significant energy loss and lower flow rates despite increasing upstream head. This phase is bounded by the flush-flow and kickback points.
- (iii) **Vortex phase** – vortex fully formed with central air core. The air core imposes a quasi-physical flow restriction, reducing the available area in the pipe for outflow.



By changing the geometry of the StormBrake™, the positions of the flush-flow and kickback points can be tailored to suit the clients' needs. For example, the curve below is ideal for situations where upstream storage capacity is limited. The flush-flow point occurs at the design flow, allowing for maximum discharge of water during the early stages of a storm, therefore minimising upstream storage requirements.

VFC HEAD-FLOW CURVE



TESTING

FP McCann's in-house development team test the StormBrake™ using a full scale test facility. The test-rig is constructed of the same components that would be used on site, increasing the accuracy and realism of the tests. The team works closely with university researchers to apply state-of-the-art experimental methods and computational fluid dynamics to the development process. To date, over 2.5 million litres of water has been used to characterise the performance of the StormBrake™. This volume is constantly increasing, due to continual development and rigorous hydrodynamic characterisation, ensuring maximum product performance to meet the requirements of each specific site.

INSTALLATION

- 1) Position the StormBrake™ so that the inlet is at the bottom and the outlet surround is resting on the inside of the outlet pipe. Mark the locations of the mounting points on the chamber wall;
- 2) Using the marked locations, drill holes to the required diameter and depth for the supplied masonry anchors. Fix the anchors to the drilled holes.
- 3) Attach the StormBrake™ to the anchor points, ensuring the neoprene gasket is flush with the chamber wall, and fasten the device by tightening the bolts. This will compress the neoprene gasket to provide a watertight seal between the device and the wall.
- 4) Fix the stainless steel wire cable from the bypass door to the underside of the manhole cover, vertically above the device. A secondary bracket is supplied and should be fitted halfway up the chamber to guide the bypass door cable in deeper chambers.
- 5) Adjust the length of the bypass cable accordingly, so that it reaches ground level whilst ensuring the bypass door can open if required.



STORMCLEANSER™

HYDRODYNAMIC SEPERATOR

FP McCann has designed and developed the enhanced StormCleanser™ for the treatment of urban catchment stormwater run-off.

The StormCleanser™ provides a cost-effective solution for designers, engineers and contractors involved in the provision of Sustainable Drainage Systems (SuDS). This unit has no moving parts, requires no power, and is constructed within standard precast concrete chambers.

The standard units come factory fitted in precast chambers and could also be installed on-site as required. The modular stainless steel built assembly is designed to provide installation simplicity. The separator internal assembly is fabricated out of stainless steel (304L/316L), per BSI BS EN 10088-2-2014. Stainless Steel material grade and composition, provides exceptional longevity due to high corrosion resistance. The lifespan of the internal assembly outlasts the lifespan of a typical precast concrete structure (100+ years).

The enhanced StormCleanser™ design allows for an inlet at varying angles with respect to the outlet. Moreover, the design also enables configuration with multiple inlets, at different orientations and of various sizes. The symmetric inlet design provides the freedom of clockwise or counter-wise flow direction, and allows the vortex formation with minimal hydrodynamic losses and turbulence.



Fixed flow direction separators tend to lose efficiency especially when a higher flow inlet is placed ahead of a lower flow inlet. The changeable flow direction provides drainage engineers the freedom to set the desired orientation of multiple inlets. StormCleanser™ allows for preferential flow direction of the main inlet, providing optimum performance for a wide range of configurations. StormCleanser™ is developed with state-of-the-art hydraulics technology, using Computational Fluid Dynamics (CFD) modelling and full-scale experimentation.



OPERATION

The StormCleanser™ is specifically designed to remove suspended solids, hydrocarbons, and floatable debris from the stormwater run-off. Water and pollutants enter the system via the inlet pipe, where the internal geometry enables low energy forced vortex flow patterns. This allows the floatables to gather and solids to settle to the bottom of the treatment chamber for subsequent removal.

Settled sediment is retained within the sump storage of the unit, allowing easy access for suction cleaning. Re-suspension of the solids is minimised by the provision of a baffle plate (Catch Skirt), positioned above the sediment storage sump. A central core allows for convenient suction hose entry down to the sump for cleaning and maintenance. If there is a stormwater surge in excess of maximum treatment flow rate, it overflows a weir, bypasses the treatment zone and directly discharges through the outlet pipe. This helps to minimize the effects of scour within the treatment region and prevents wash out of retained sediment downstream.

FEATURES

- Developed at inhouse high-flow Hydraulic Rig, and rigorously tested against actual rainfall inlet conditions
- High retention at most frequent rainfall events per annum
- High treatment flow rate to size ratio preventing oversized separators in the drainage design i.e. minimise footprint
- Wide range of chamber sizes (Ø1200 – Ø4000mm) and pipe sizes (Ø150 – Ø900mm)

APPLICATIONS

- SuDS based drainage networks
- Housing Developments
- Retail Parks
- Commercial Centres
- Leisure Facilities

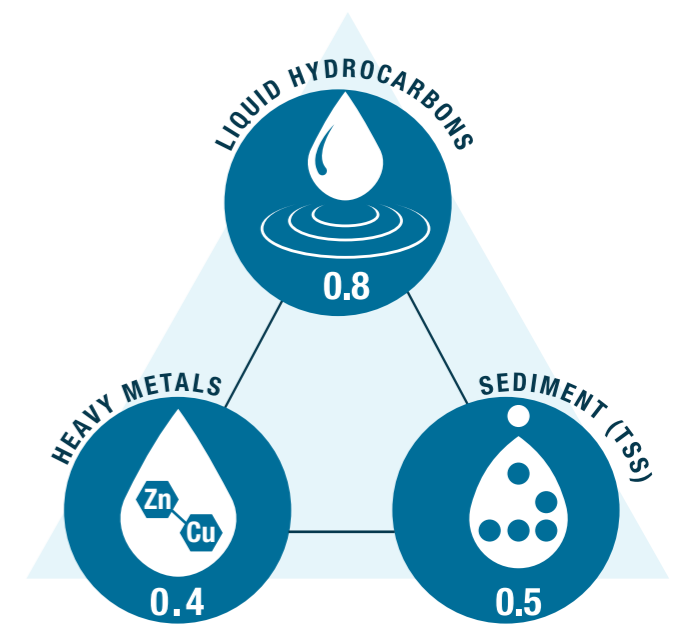
SPECIFICATIONS

| MODEL | TANK DIAMETER | MAX TREATMENT FLOW RATE | PIPE SIZE | MIN. SEDIMENT STORAGE CAPACITY | MIN. OIL STORAGE CAPACITY | MAX. HEAD LOSS AT TREATMENT FLOW RATE |
|------------|---------------|-------------------------|-----------|--------------------------------|---------------------------|---------------------------------------|
| | (mm) | (L/s) | (mm) | (m³) | (L) | (mm) |
| PRE-SC1200 | 1200 | 43 | 300 | 0.50 | 320 | 240 |
| PRE-SC1500 | 1500 | 67 | 375 | 0.82 | 630 | 300 |
| PRE-SC1800 | 1800 | 96 | 450 | 1.23 | 1085 | 360 |
| PRE-SC2100 | 2100 | 131 | 525 | 1.75 | 1725 | 420 |
| PRE-SC2400 | 2400 | 172 | 600 | 2.38 | 2575 | 480 |
| PRE-SC2700 | 2700 | 217 | 675 | 3.13 | 3670 | 540 |
| PRE-SC3000 | 3000 | 268 | 750 | 4.01 | 5035 | 600 |
| PRE-SC3600 | 3600 | 387 | 900 | 6.20 | 8703 | 720 |
| PRE-SC4000 | 4000 | 477 | 900 | 8.00 | 11938 | 800 |

Notes:

- MTRF is per WRc specified Weighted Annualised Removal Efficiency of at least 50%, for a particle size distribution (PSD) with a D_{50} : 63µm and density of 2650 kg/m³
- Customized solutions such as: oriented inlet, multiple inlets, and different pipe sizes available as required
- Sediment storage capacity could be extended as required, per the desired maintenance frequency

SuDS POLLUTION MITIGATION INDEX (PMI)



- Tested using extremely fine sand particles starting from 2µm
- Modular and innovative design for multiple inlet orientation
- Choice of flow direction providing optimal configuration performance
- Complies with SuDS legislation
- Industrial Developments
- Highway Drainage Products
- Car Parks, Roads, Motorways and Trafficked Areas
- Existing surface water sewer discharges

CATCHPIT

The catchpit effectively provides a sealed sump manhole, a monolithic precast concrete unit fitted with connector seals, which can be used to connect to the following types of pipe: uPVC, twin wall, clay, ductile iron and concrete. The catchpit is designed to accommodate pipe sizes DN150 to DN1800 and is in line with highway specification.

PRODUCT BENEFITS

- Creates an immediate watertight structure
- Prefabricated off-site (minimising on-site labour and costs)
- Quick and efficient to install
- Accommodates connection to all types of pipe used in road and manhole construction
- Safety benefits gained in the construction of manholes as the pre-formed sump and connect seals eliminate on-site construction, thus greatly reducing labour activity within the manhole
- Quality is greatly increased as construction is within the factory environment and complies with BS EN 1917 and BS 5911
- Eliminates material wastage associated with current in-situ method
- Yields environmental benefits such as lower carbon footprint, less concrete used on-site and less excavated material removed from site
- Bespoke designs available



| Chamber Size (DN) | External Diameter (mm) | Internal Diameter (mm) | External Height (mm) | Internal Height (mm) | + Max. Pipe ID (mm) | | Capacity (l) | **Approx. Weight (t) | Lifters |
|-------------------|------------------------|------------------------|----------------------|----------------------|---------------------|----------|--------------|----------------------|------------------------|
| | | | | | Concrete | Twinwall | | | |
| DN1050 | 1240 | 1050 | 1000 | 850 | 375 | 450 | 736 | 1.4 | 3x Ø45mm lifting holes |
| DN1200 | 1380 | 1200 | 1000 | 850 | 375 | 450 | 961 | 1.7 | 3x Ø45mm lifting holes |
| DN1500 | 1800 | 1500 | 1416 (T1) | 1095 | 600 | 675 | 1935 | 4.5 | 3x Utility Anchors |
| | 1800 | 1450 | 1671 (T2) | 1350 | 825 | 900 | 2386 | 5.5 | 3x Utility Anchors |
| | 1800 | 1467 | 1921 (T2) | 1600 | 1050 | 1050 | 2827 | 6.1 | 3x Utility Anchors |
| | 1800 | 1483 | 2171 (T2) | 1850 | 1050 | 1200 | 3269 | 6.6 | 3x Utility Anchors |
| | 1800 | 1500 | 2421 (T2) | 2100 | 1050 | 1200 | 3711 | 7.2 | 3x Utility Anchors |
| DN1800 | 2100 | 1800 | 1421 (T1) | 1119 | 600 | 675 | 2847 | 6.3 | 3x Utility Anchors |
| | 2100 | 1777 | 1671 (T2) | 1369 | 900 | 900 | 3483 | 6.8 | 3x Utility Anchors |
| | 2100 | 1785 | 1921 (T2) | 1619 | 1050 | 1200 | 4120 | 7.5 | 3x Utility Anchors |
| | 2100 | 1792 | 2171 (T2) | 1869 | 1200 | 1350 | 4756 | 8.1 | 3x Utility Anchors |
| | 2100 | 1800 | 2421 (T2) | 2119 | 1200 | 1350 | 5392 | 8.8 | 3x Utility Anchors |
| DN2100 | 2400 | 2062 | 1435 | 1085 | 600 | 675 | 3758 | 7.5 | 3x Utility Anchors |
| | 2400 | 2071 | 1685 | 1335 | 825 | 900 | 4624 | 8.4 | 3x Utility Anchors |
| | 2400 | 2096 | 1935 | 1585 | 1050 | 1050 | 5490 | 9.3 | 3x Utility Anchors |
| | 2400 | 2087 | 2185 | 1835 | 1200 | 1350 | 6355 | 10.1 | 3x Utility Anchors |
| | 2400 | 2100 | 2435 | 2085 | 1500 | 1500 | 7221 | 10.9 | 3x Utility Anchors |
| DN2400 | 2700 | 2362 | 1730 | 1380 | 900 | 900 | 6243 | 10.3 | 3x Utility Anchors |
| | 2700 | 2371 | 1980 | 1630 | 1050 | 1200 | 7374 | 11.2 | 3x Utility Anchors |
| | 2700 | 2379 | 2230 | 1880 | 1350 | 1350 | 8505 | 12.1 | 3x Utility Anchors |
| | 2700 | 2387 | 2480 | 2130 | 1500 | 1500 | 9636 | 13.0 | 3x Utility Anchors |
| | 2700 | 2395 | 2730 | 2380 | 1500 | 1800 | 10767 | 13.9 | 3x Utility Anchors |

RAIN WATER HARVESTING CHAMBERS

FP McCann's rain harvesting chamber is a bespoke precast water storage chamber that is compatible with water harvesting systems for residential, industrial/commercial and agricultural installations. Capturing rainwater for re-use offers significant cost savings for the user and benefits the environment by increasing water resources and further enhancing water amenity. The chamber complies with Environment Agency SuDS (Sustainable Urban Drainage System) directives.

The basic concept of harvesting rainwater is simple - rainwater is mostly collected from the roofs of buildings - it flows through gutters and downspouts and is then filtered and collected by a storage tank. From the tank, it can be recirculated or treated to produce a better quality of recycled water.



VOLUME CAPACITY OF STORAGE CHAMBERS

| Internal Diameter (x1000mm) | Capacity (Litres) | Weight (kg) |
|-----------------------------|-------------------|-------------|
| DN1800 | 1200 | 1800 |
| DN1800 | 1500 | 1900 |
| DN2400 | 3000 | 5900 |
| DN2400 | 5000 | 7250 |
| DN2400 | 7000 | 8700 |



SMOOTHBORE TUNNEL AND SHAFT LININGS



FP McCann has developed a comprehensive range of smoothbore shaft and tunnel linings. Each size is specifically designed to meet the tunnelling industry's exacting and varied needs, recognising the key criteria as being strength, stability and the capability of performing in all types of ground conditions.

DESIGN FEATURES

All rings, with the exception of the cutter choker, comprise of ordinary segments and two top segments. The top segments have one tapered cross joint so that they can be installed with an EPDM gasket. The cutter choker comprises all ordinary segments.

SEALING

FP McCann is the only precast concrete manufacturer to supply pre-fitted, tailor-made EPDM rubber gaskets on the full range of smoothbore shaft and tunnel linings. The gaskets provide an immediate water-tight seal on construction and are fully compliant with the requirements of the British Tunnelling Society specification. Speed of build, safety and increase on-site productivity are key benefits.

CONNECTION

Cross joint connections are made using a spear bolt passing through a pocket in one segment and a plastic socket in the adjacent segment. Circle joint connections are made using a T bolt passing through a hole in one segment and into a T box in the adjacent segment. Bolts are designed to fully compress the gasket. All connections are sherardised. (Other finishes to fittings, including galvanised, are available on request). FP McCann manufactures front bolted and back bolted linings on all diameters. For diameter 10.5m and above, universal linings are available to allow for changes in construction method. (Build manual available upon request).

RING TYPES

Segmental rings are front or back bolted and include:

1. Standard rings
2. Corbel rings
3. Recessed rings (standard, choker or cutter choker)
4. Choker rings
5. Combined cutter choker rings

MIX AND REINFORCEMENT

Each segment is wet cast to achieve a smooth internal finish. The concrete mix provides a Design Chemical Class 4 (DC4) with a minimum 28 day characteristic cube strength of 55 N/mm². Alternative mixes are available. The segments are reinforced with either a reinforcing cage or structural synthetic and steel fibres to suit both design and customer requirements.

BUILD METHODS

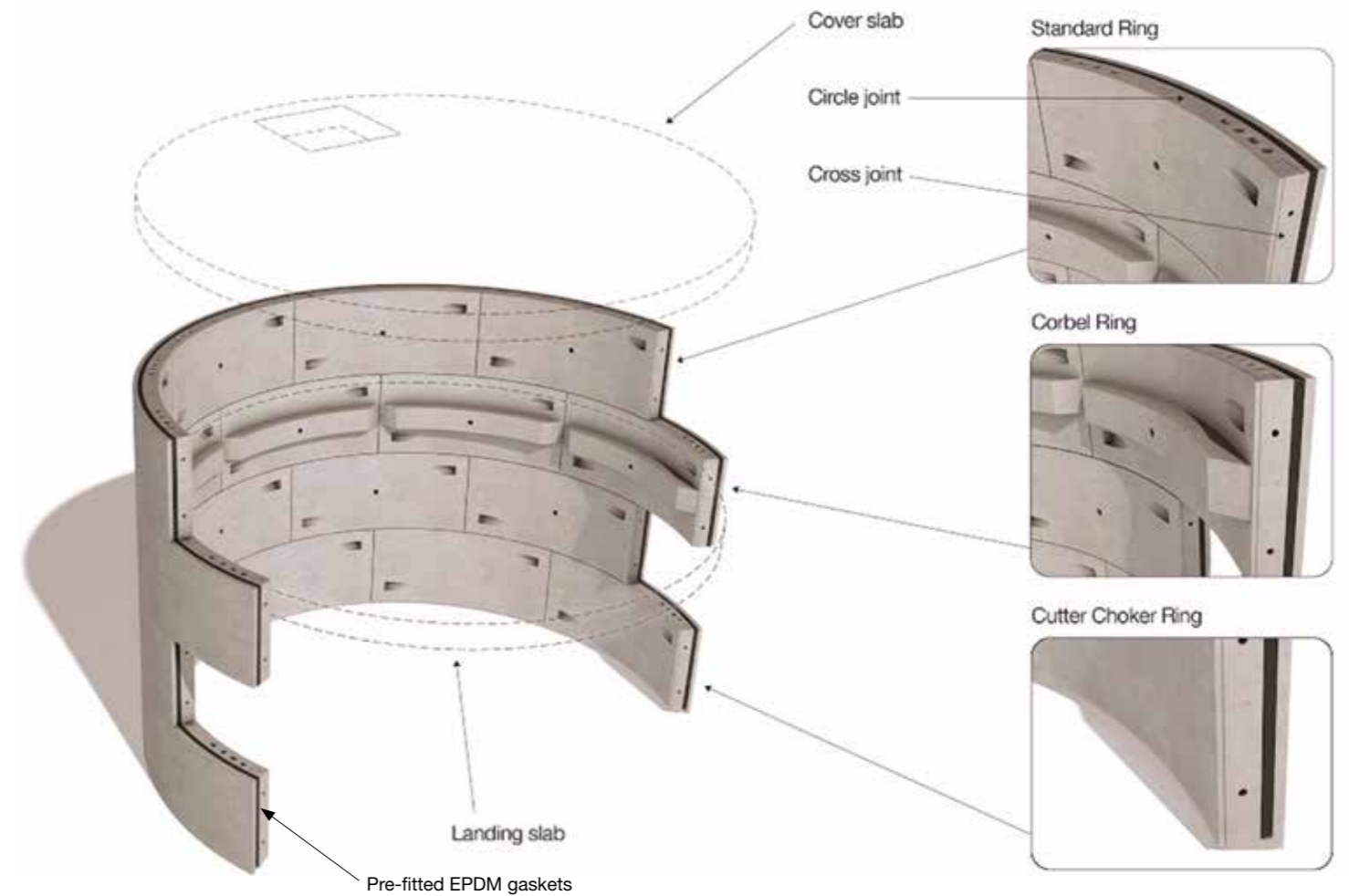
The segmental rings are suitable for underpinning, caisson and chimney construction methods.

QUALITY

FP McCann conducts all operations using an Integrated Management System accredited to ISO 9001.

KEY FEATURES AND BENEFITS

- Smooth internal faces
- Simple locking process
- Speedy installation
- Immediate watertight seal
- Cost-effective
- Added safety features
- Technical advice and support



FP MCCANN SMOOTHBORE SHAFT LININGS

| Size (Standard ring) | | | Segments per ring (Std ring) | | Vol per ring (Std ring) (m ³) | Wt per Standard ring* (tonnes) | Standard segment weight* (Kg) | Corbel segment weight* (Kg) | Choker segment weight* (Kg) | Cutter / choker seg wt* (Kg) | Excavations m ³ per standard ring mm over extrados | | | Grout per ring (m ²) | Caulking | |
|-----------------------|-----------------------|-----------|------------------------------|-----|---|--------------------------------|-------------------------------|-----------------------------|-----------------------------|------------------------------|---|--------|--------|----------------------------------|----------------|---------------|
| Internal diameter (m) | External diameter (m) | Width (m) | Ord | Top | | | | | | | 0 | 25 | 50 | | Circle (lin m) | Cross (lin m) |
| 2.440 | 2.740 | 0.75 | 3 | 2 | 0.92 | 2.29 | 458 | | | 924 | 4.42 | 4.59 | 4.75 | 6.46 | 7.74 | 4.50 |
| 3.050 | 3.450 | 1.00 | 3 | 2 | 2.04 | 5.11 | 1021 | 1149 | 1296 | 1364 | 9.35 | 9.62 | 9.90 | 10.84 | 9.66 | 5.00 |
| 3.660 | 4.060 | 1.00 | 4 | 2 | 2.43 | 6.06 | 1011 | 1140 | 1280 | 1345 | 12.95 | 13.27 | 13.59 | 12.75 | 11.58 | 6.00 |
| 4.000 | 4.400 | 1.00 | 4 | 2 | 2.64 | 6.60 | 1100 | 1244 | 1391 | 1463 | 15.21 | 15.55 | 15.90 | 13.82 | 12.64 | 6.00 |
| 4.500 | 4.900 | 1.00 | 5 | 2 | 2.95 | 7.38 | 1055 | 1194 | 1332 | 1400 | 18.86 | 19.24 | 19.63 | 15.39 | 14.22 | 7.00 |
| 5.000 | 5.400 | 1.00 | 6 | 2 | 3.27 | 8.17 | 1021 | 1156 | 1289 | 1354 | 22.90 | 23.33 | 23.76 | 16.96 | 15.79 | 8.00 |
| 5.500 | 5.900 | 1.00 | 6 | 2 | 3.58 | 8.95 | 1119 | 1270 | 1411 | 1484 | 27.34 | 27.81 | 28.27 | 18.54 | 17.36 | 8.00 |
| 6.000 | 6.450 | 1.00 | 7 | 2 | 4.40 | 11.00 | 1222 | 1369 | 1506 | 1585 | 32.67 | 33.18 | 33.70 | 20.26 | 18.93 | 9.00 |
| 6.500 | 6.950 | 1.00 | 8 | 2 | 4.75 | 11.88 | 1188 | 1331 | 1463 | 1540 | 37.94 | 38.48 | 39.04 | 21.83 | 20.50 | 10.00 |
| 7.000 | 7.450 | 1.00 | 8 | 2 | 5.11 | 12.77 | 1277 | 1456 | 1571 | 1653 | 43.59 | 44.18 | 44.77 | 23.40 | 22.07 | 10.00 |
| 7.500 | 7.950 | 1.00 | 9 | 2 | 5.46 | 13.65 | 1241 | 1416 | 1527 | 1605 | 49.64 | 50.27 | 50.90 | 24.98 | 23.64 | 11.00 |
| 8.200 | 8.700 | 1.00 | 10 | 2 | 6.64 | 16.59 | 1383 | 1559 | 1669 | 1757 | 59.45 | 60.13 | 60.82 | 27.33 | 25.84 | 12.00 |
| 9.000 | 9.500 | 1.00 | 10 | 2 | 7.26 | 18.16 | 1514 | 1708 | 1826 | 1922 | 70.88 | 71.63 | 72.38 | 29.85 | 28.35 | 12.00 |
| 10.500 | 11.100 | 1.00 | 12 | 2 | 10.18 | 25.45 | 1818 | 2015 | 2130 | 2284 | 96.77 | 97.64 | 98.52 | 34.87 | 33.07 | 14.00 |
| 11.400 | 12.000 | 1.00 | 12 | 2 | | 28.98 | 2.07 | | 2.42 | | | | | | | |
| 12.500 | 13.200 | 1.00 | 12 | 2 | 14.13 | 35.32 | 2523 | 2941 | 2895 | | 136.85 | 137.89 | 138.93 | 41.47 | 39.35 | 14.00 |
| 15.000 | 15.700 | 1.00 | 14 | 2 | 16.88 | 42.20 | 2637 | 2890 | 3024 | | 193.59 | 194.83 | 196.07 | 49.32 | 47.20 | 16.00 |
| 17.500 | 18.300 | 1.00 | 16 | 2 | 22.49 | 56.23 | 3124 | | 3524 | | 263.02 | 264.46 | 265.90 | 57.49 | 55.06 | 18.00 |
| 20.000 | 20.900 | 1.00 | 18 | 2 | 28.91 | 72.28 | 3614 | | 4025 | | 343.07 | 344.71 | 346.36 | 65.66 | 62.91 | 20.00 |
| 25.000 | 25.900 | 1.00 | 22 | 2 | 35.98 | 89.95 | 3748 | | 4172 | | 526.85 | 528.89 | 530.93 | 81.37 | 78.62 | 24.00 |
| 27.000 | 28.000 | 1.00 | 28 | 2 | 43.140 | 112.160 | 3739 | | 3924 | | | | | | | |

*Nominal weights. Increase by 5% for sizing of lifting equipment and reduce by 5% for floatation design.

FP MCCANN PRECAST CONCRETE SEGMENTAL SHAFT FORMS COMBINED STORMWATER ATTENUATION TANK FOR YORKSHIRE WATER

Project: Combined StormWater Holding Tank - Dick Lane, Bradford, West Yorkshire

Client: Yorkshire Water

Main Contractor: Peter Duffy Ltd

Products Supplied: 20.0m id Back-Bolted Precast Concrete Segmental Shaft; 20.0m diameter Precast Concrete Cover Slab

FP McCann's back-bolted segmental shaft rings have been used to build a 20.0m id storm overflow holding tank as part of Yorkshire Water's project to improve the water quality in Pudsey Beck. Once complete, the works at Dick Lane Bradford are forecast to reduce storm overflow discharge by up to 65%. Yorkshire Water is making planned improvements to a number of its wastewater treatment works and overflow network to tackle the number of discharges from storm surge events across its operating region.

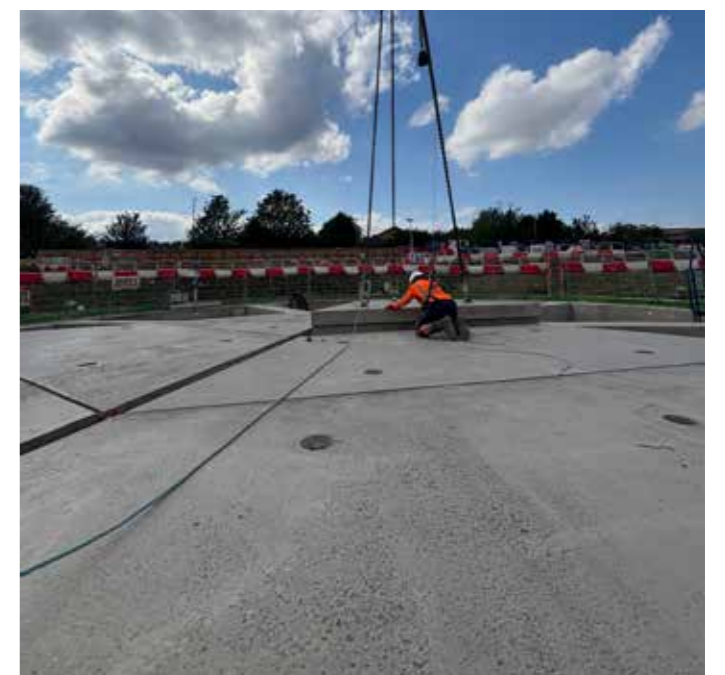
The 3,000m³ segmental shaft attenuation tank has been installed by HB Tunnelling Ltd on behalf of Yorkshire Water term contract partner Peter Duffy Ltd. The CSO holding tank will capture excessive volumes of stormwater and then release volumes at a system-controlled level into the nearby sewage treatment works for processing. The extra storage will slow the flow of wastewater to storm overflows, reducing the number and duration of discharges during prolonged or heavy rainfall, before returning the stored water to the sewer network for treatment.

The 20.0m id shaft has been sunk 14.0 metres deep using the jacked caisson method of construction with the individual back-bolted precast concrete rings forming the shaft wall as each was jacked down into position. The design of the structure includes the use of a universal transition recessed choker ring manufactured by FP McCann which sits on top of an FP McCann concrete cutting edge; the choker incorporating recesses cast into the intrados that provide shear interaction with the concrete base to resist floatation.

Each load of precast concrete segments was delivered on specialist vehicles on a just-in-time schedule to ensure ease of access to the tight, traffic managed site. The individual 20.0m id rings were then formed on site by the skilled HB Tunnelling team. To complete the shaft build, a central column consisting of FP McCann 3600mm diameter caisson rings has been constructed to span precast beams across the shaft onto which a 20m diameter multi-section precast concrete cover slab has been laid.

The FP McCann precast concrete cover slab has been installed in 25 individual sections spanning 8 FP McCann precast radial beams.

Both the segmental rings, beams and cover slab sections were manufactured and transported from FP McCann's Cadeby factory near Nuneaton, Warwickshire. Central column caisson rings were also delivered from the Company's Cadeby factory.



FP MCCANN PRECAST CONCRETE SEGMENTAL SHAFTS INSTALLED AT THAMES TIDEWAY WATER TREATMENT WORKS

Project: Heathwall Pumping Station. Capacity Extension Works, Tideway Central

Client: Thames Water (Tideaway)

Construction Delivery Partners: Ferrovial Agroman UK Ltd & Laing O'Rourke Construction (FLO) joint venture.

Shaft Sinking Contractor: Active Tunnelling Ltd

Products Supplied: Precast Segmental Shafts (11.4m ID/17.5m ID)

FP McCann has supplied two precast concrete segmental shafts that have been installed as part of one of the UK's largest ongoing civil engineering projects. The Thames Tideway Tunnel is a major new 'super sewer' urgently needed to protect the tidal River Thames from pollution and to modernise London's Victorian sewage network for the 21st century.

The 25km tunnel once complete in 2023 along with associated infrastructure will be able to capture around 39 million tonnes of sewage a year. Divided into three construction packages East, Central and West, the construction in the central region is being delivered by a joint venture of Ferrovial Agroman UK Ltd and Laing O'Rourke Construction (FLO). This contract is known as Tideway Central, with work taking place from Fulham to Blackfriars.

In line with the main Tideway Tunnel project, significant capacity expansion is being undertaken on a number of existing sewage treatment works owned by Thames Water. Located in the heart of central London, work is currently ongoing at Heathwall Pumping Station where the two FP McCann precast segmental shaft structures have been sunk on the very tight site. The smaller of the shafts at 11.4m ID is the interception shaft and will transport intercepted sewage from the pumping station to a depth 28 metres below ground. The second shaft at 54m deep, is a new Combined Sewer Overflow (CSO) and is linked to the base of the small shaft by a 2.4m ID 42 metres long culvert tunnel.

The larger shaft is 17.5m ID and was sunk using the jacked caisson method to a depth 16m followed by the underpinning method of construction to a depth of 33m and Spray Concrete Lined (SCL) to a finished level 54m BGL. The smaller shaft was constructed using the same methodology.

Coventry based micro tunnelling and auger boring specialist Active Tunnelling were awarded the £5 million shaft sinking package at Heathwall Pumping Station by FLO in 2019. Over a period of 18 months the company has had to work not only within the constraints of the close proximity to the River Thames and local residents, but also to a carefully managed delivery programme. The FP McCann shaft segments were transported on a 'just-in-time' basis from the Company's Cadeby manufacturing plant in Nuneaton, Leicestershire.

When fully operational, the interception shaft will capture the raw sewage before it discharges into the Thames and transfer it via the culvert tunnel into the new CSO prior to then discharging through a 4.0m ID, 43 metres long connection tunnel that will empty directly into the main 'super sewer' below the River. It is anticipated that the upgrade of Heathwall Pumping Station will reduce the outfall of untreated sewage by up to 90%.

Commenting on the shaft sinking processes, Richard Wilson, Project Manager for Active Tunnelling says, "The use of such universal precast concrete segmental shafts allows for an extremely efficient and structurally sound build process enabling two options, caisson and underpinning. Construction is simple and allows for ease of ground excavation. The smaller site footprint taken compared to other shaft construction options, helps to reduce the volume of material to be removed thereby minimising the environmental impact. From the installation of the first rings, both shaft builds continued uninterrupted".

FP McCann's smoothbore tunnel and shaft segments are all factory fitted with EPDM gaskets. Cross segment connections are made by passing a spear bolt through a pocket in one segment and screwing it into a threaded plastic socket in the adjacent segment. Circle joint connections are made using a 'T' bolt passing through a hole in one segment into a 'T' box in the adjacent segment. Bolts are designed to fully compress the gaskets.



TUNNEL SEGMENTS



FP McCann designs and manufactures a bespoke range of both Trapezoidal and Expanded Segmental Smoothbore tunnel linings, designed to provide durability, speed and ease of installation in tunnel construction. Trapezoidal tunnel linings are developed to work alongside technologically advanced tunnel boring machines, with linings designed and manufactured to suit exacting project requirements.

Tunnel segments can be modified to suit a variety of joint fixings, segment thickness and tunnel diameters. The latest manufacturing techniques incorporate steel fibre dosing to guarantee a high quality, reliable product. The wedge-shaped design of individual segments eliminates the requirement for a special closure segment.

FP McCann has the in-house expertise to manufacture concrete moulds to meet the latest BTS specification. Alternatively, projects can be supplied utilising specialist manufactured steel moulds, if required.



TRAPEZOIDAL TUNNEL LININGS

| Size | | | | No of segments per ring | Vol per ring (m ³) | Weight per ring* (tonnes) | Average weight/segment (kg) |
|-----------------------|-----------------------|--------------------|--------------------|-------------------------|--------------------------------|---------------------------|-----------------------------|
| Internal diameter (m) | External diameter (m) | Min Ring Width (m) | Max Ring Width (m) | | | | |
| 2.440 | 2.800 | 0.990 | 1.010 | 6 | 1.48 | 3.70 | 617 |
| 2.850 | 3.210 | 0.988 | 1.012 | 6 | 1.71 | 4.28 | 714 |
| 3.050 | 3.400 | 1.187 | 1.209 | 6 | 2.12 | 5.31 | 885 |
| 4.000 | 4.450 | 0.975 | 1.025 | 8 | 2.99 | 7.47 | 933 |

*Nominal weights. Increase by 5% for sizing of lifting equipment and reduce by 5% for floatation design.

EXPANDED TUNNEL LININGS

| Size | | | Segments per ring | | | Vol per ring (m ³) | Weight per ring* (tonnes) |
|-----------------------|-----------------------|----------------|-------------------|-----|-----|--------------------------------|---------------------------|
| Internal diameter (m) | External diameter (m) | Ring Width (m) | Ord | Top | Key | | |
| 2.590 | 2.950 | 1.000 | 5 | 2 | 1 | 1.57 | 3.92 |
| 3.050 | 3.400 | 1.200 | 5 | 2 | 1 | 2.13 | 5.32 |

*Nominal weights. Increase by 5% for sizing of lifting equipment and reduce by 5% for floatation design.

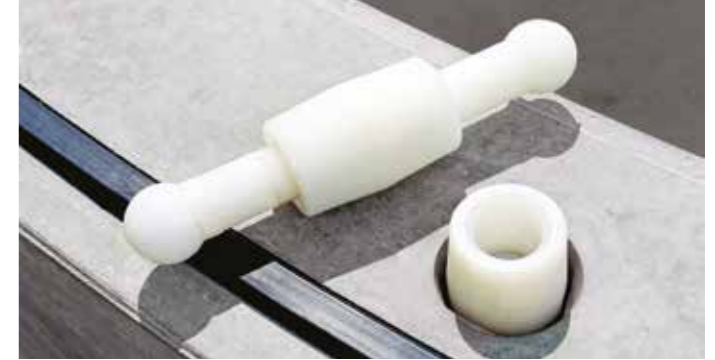
TUNNELOCK

PLASTIC TUNNEL LINING CONNECTION

Combining the advantages of a solid dowel and a secure threaded connection, this self-locking plastic connector provides a superb circle joint fixing for tunnel linings. Suitable for use with packings, hydrophilic seals and EPDM compression gaskets, it is fast and easy to build and has no pockets/recesses to fill.

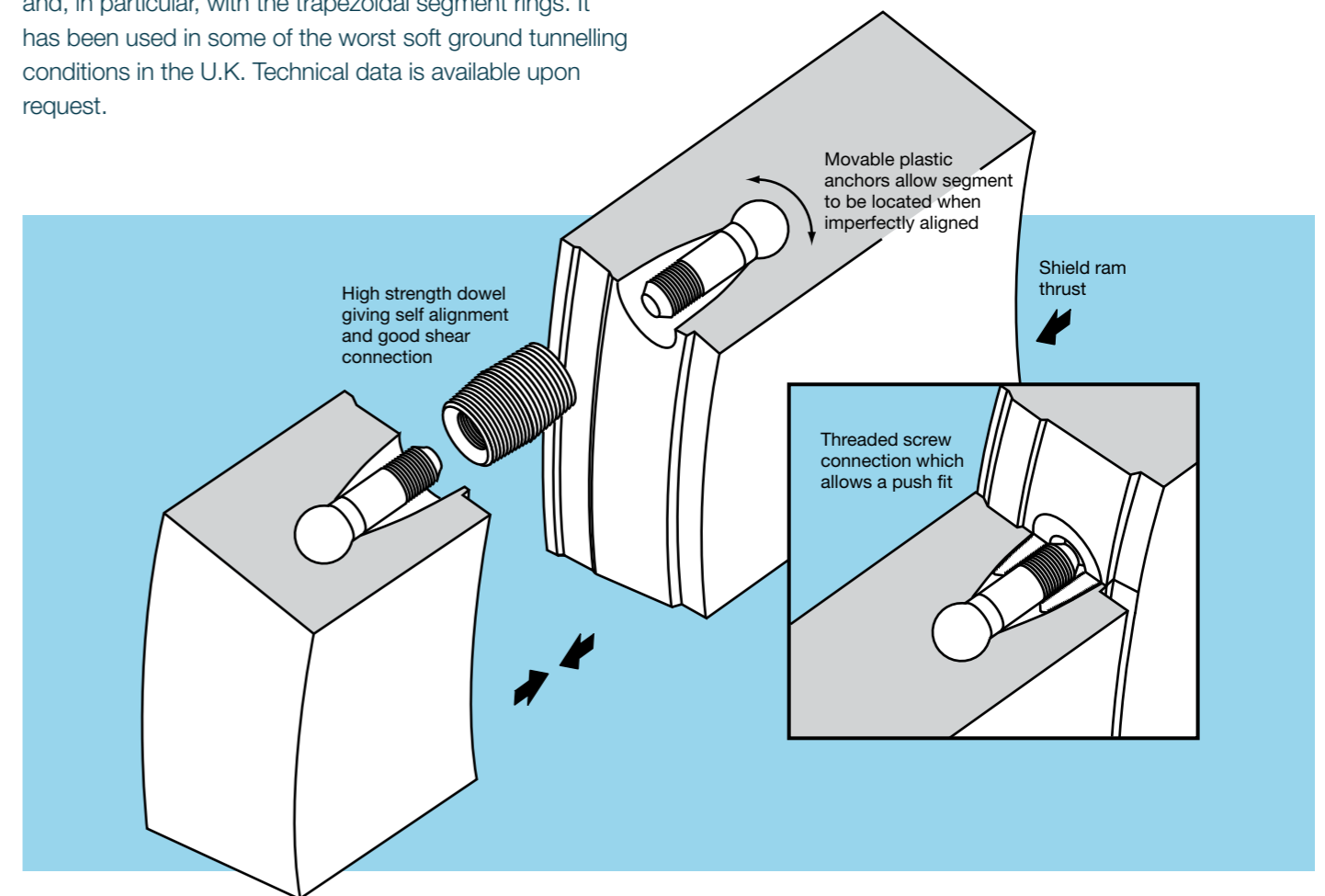
DESIGN

The Tunnelock circle joint connection has been developed over many years to provide the ideal connection between tunnel rings. Manufactured from a high strength durable plastic, it combines the advantages of a bolted connection with the speed, economy and alignment characteristics of a dowel. The system has been developed in conjunction with major tunnelling contractors and is suitable for use in traditional open face shields or with the latest full face tunnel boring machines. The dowels allow a very fast ring erection sequence and are designed to reduce lipping between segments. The secure interlocking system is tolerant of a dirty environment and allows for the initial misalignment of segments to compensate for tapered joints and gaskets. Therefore, it is suitable for use with all types of tunnel rings and, in particular, with the trapezoidal segment rings. It has been used in some of the worst soft ground tunnelling conditions in the U.K. Technical data is available upon request.



BENEFITS

- Highly durable connection with no corrodible parts
- Fast ring construction
- Minimum building clearance (50mm standard, 75mm heavy duty) allows the use with most types of tunnelling machine and ram length
- The rigid dowel action of the coupler re-aligns the segment and minimises the stepping of joints
- No extra reinforcement required
- Suitable for trapezoidal segment rings
- Simple and easy to use
- Does not induce bursting forces in the concrete
- No circle joint pockets to fill
- Suitable for use with all types of sealing system, including EPDM compression gaskets and hydrophilic seals
- Self-locking
- Self-aligning



COVER & LANDING SLABS



COVER AND LANDING SLABS

Reinforced cover and landing slabs are an integral part of FP McCann's tunnels and shafts product range, manufactured at the company's specialist precast concrete facility. Both cover and landing slabs are cast to design specifications and made to order for just-in-time delivery. On site, the slabs can be quickly installed and provide an integral secure shaft cover or internal landing.

SIZES

Cover and landing slabs are generally circular to match the FP McCann range of smoothbore shaft segments and other segmental linings. They are available in 1, 2, 3 and 4+ sections. The standard range of sizes are highlighted opposite. A bespoke design facility is available for non-standard shapes and sizes.



| One piece Cover Slabs | | | |
|------------------------------|------------------------------|---------------------|-----------------------|
| Shaft internal diameter (mm) | Shaft external diameter (mm) | Slab thickness (mm) | Total slab weight (T) |
| 2100 | 2350 | 250 | 2.82 |
| 2400 | 2680 | 275 | 4.03 |
| 2700 | 3000 | 275 | 5.05 |
| 3000 | 3360 | 300 | 6.92 |
| Two piece Cover Slabs | | | |
| Shaft internal diameter (mm) | Shaft external diameter (mm) | Slab thickness (mm) | Total slab weight (T) |
| 3000 | 3360 | 300 | 6.92 |
| 3660 | 4060 | 300/325 | 9.84/11.27 |
| 4000 | 4400 | 350 | 13.84 |
| 4500 | 4900 | 375 | 18.39 |
| 5000 | 5400 | 400 | 23.82 |
| Three piece Cover Slabs | | | |
| Shaft internal diameter (mm) | Shaft external diameter (mm) | Slab thickness (mm) | Total slab weight (T) |
| 5000 | 5400 | 400 | 23.82 |
| 5500 | 5900 | 425 | 30.21 |
| Four + piece Cover Slabs | | | |
| Shaft internal diameter (mm) | Shaft external diameter (mm) | Slab thickness (mm) | Total slab weight (T) |
| 5500 | 5900 | 425 | 30.21 |
| 6000 | 6450 | 450 | 38.23 |
| 6500 | 6950 | 475 | 46.85 |
| 7500 | 7950 | 525 | 67.76 |
| 8000 | 8500 | 550 | 81.15 |
| 9000 | 9500 | 600 | 110.58 |
| 10500 | 11100 | 675 | 169.83 |
| 12500 | 13200 | 775 | 275.75 |

COVER & LANDING SLABS



| Cover Slabs with RC Beams | | | |
|--|------------------------------|---------------------|-----------------------|
| Shaft internal diameter (mm) | Shaft external diameter (mm) | Slab thickness (mm) | Number of RC beams |
| 8000 | 8500 | 250 | 2 |
| 9000 | 9500 | 250 | 2 |
| 10500 | 11100 | 275 | 2 |
| 12500 | 13200 | 350 to 250 | 2, 3 or 4 |
| 15000 | 15700 | 400 to 300 | 2, 3 or 4 |
| Cover Slabs with RC Beam or Pre-stressed Beams | | | |
| Shaft internal diameter (mm) | Shaft external diameter (mm) | Slab thickness (mm) | Number of RC beams |
| 20000 | 20900 | Special | Special |
| 25000 | 25900 | Special | Special |
| One piece Landing Slabs | | | |
| Shaft internal diameter (mm) | Slab diameter (mm) | Slab thickness (mm) | Total slab weight (T) |
| 2100 | 2050 | 175 | 1.50 |
| 2400 | 2350 | 175 | 1.97 |
| 2700 | 2650 | 200 | 2.87 |
| 3000 | 2950 | 200 | 3.55 |
| Two piece Landing Slabs | | | |
| Shaft internal diameter (mm) | Slab diameter (mm) | Slab thickness (mm) | Total slab weight (T) |
| 3000 | 2950 | 200 | 3.55 |
| 3660 | 3610 | 225 | 5.99 |
| 4000 | 3950 | 250 | 7.97 |
| 4500 | 4450 | 275 | 11.12 |
| 5000 | 4950 | 300 | 15.01 |
| 5500 | 5450 | 325 | 19.71 |
| 6000 | 5950 | 350 | 25.30 |
| Three + piece Landing Slabs | | | |
| Shaft internal diameter (mm) | Slab diameter (mm) | Slab thickness (mm) | Total slab weight (T) |
| 6000 | 5950 | 350 | 25.30 |
| 6500 | 6450 | 375 | 31.86 |
| 7500 | 7450 | 425 | 48.17 |
| 8000 | 7950 | 450 | 58.08 |
| 9000 | 8950 | 500 | 81.79 |

MIX AND REINFORCEMENT

Slab sections are wet cast in fabricated steel moulds and are steel cage reinforced. The concrete mix design is to a standard characteristic strength of 55N/mm² at 28 days. Alternative mixes are available.

DESIGN FEATURES

Design and detailing can be undertaken by FP McCann to our customers' design specification. Reinforced cover slabs are generally designed to withstand loads in accordance with the recommendations of relevant British Standards (e.g. BS EN 1990 and BD37/01, usually adopting 30HB loading or Eurocodes with appropriate load models, in conjunction with relevant overburden). Landing slabs are designed for an imposed loading of 5kN/m².

LIFTING AND HANDLING

Depending on lifting requirements on site, FP McCann is able to supply fitted lifting loops or cast-in sockets and spherical head lifting anchors.

QUALITY STANDARDS

Shaft cover slabs and landing slabs are manufactured in accordance with FP McCann's quality management system, BSI accredited to ISO 9001.

KEY FEATURES AND BENEFITS

- No formwork or ready mixed concrete required
- Simple jointing system
- Speedy installation
- Bespoke design and casting service
- Technical advice and support

CAISSON UNITS



FP MCCANN CAISSON RANGE

| Caissons Shafts DN | Available Depths (mm) | | | Barrel DN | Wall Thickness | Lifting (Cast in Socket) |
|--------------------|-----------------------|------|-----|-----------|----------------|------------------------------|
| | mm | 1000 | 750 | | | |
| 2100 | ✓ | ✓ | ✓ | 2350 | 125 | 3 No. RD24 Wavy Tail Inserts |
| 2400 | ✓ | ✓ | ✓ | 2680 | 140 | 3 No. RD24 Wavy Tail Inserts |
| 2700 | ✓ | ✓ | ✓ | 3000 | 150 | 3 No. RD30 Wavy Tail Inserts |
| 3000 | ✓ | ✓ | ✓ | 3360 | 180 | 3 No. RD30 Wavy Tail Inserts |
| 3600 | ✓ | ✓ | ✓ | 3970 | 185 | 3 No. RD30 Wavy Tail Inserts |
| *4000 | ✓ | ✓ | ✗ | 4400 | 200 | 6 No. RD36 Wavy Tail Inserts |

*DN4000 supplied as a two piece unit.

CAISSON RINGS - TABLE OF WEIGHTS (DN 2100-4000)

| Caissons Shafts DN | Cutting Shoe Weight (Kg) | | Approx. Weight p/metre Caisson (with cutting shoe) (Kg)** | | Approx. Weight p/metre Caisson (without cutting shoe)** |
|--------------------|--------------------------|------|---|------|---|
| | 10mm | 20mm | 10mm | 20mm | |
| 2100 | 320 | 581 | 2590 | 2851 | 2270 |
| 2400 | 378 | 635 | 3278 | 3535 | 2900 |
| 2700 | 441 | 794 | 3931 | 4284 | 3490 |
| 3000 | 529 | 953 | 5209 | 5633 | 4680 |
| 3600 | 641 | 1148 | 6361 | 6868 | 5720 |
| *4000 | 725 | 1298 | 7585 | 8158 | 6860 |

* DN4000 supplied as a two piece unit.

** Nominal weights increase by 5% for sizing lifting equipment and reduce by 5% for floatation design. Base units may be fitted with a light duty (10mm) or a medium duty (20mm) cutting shoe.

FP McCann manufactures a range of reinforcing units suitable for sinking by the caisson method. Caisson shaft units can be supplied with diameters of 2100mm up to 4000mm. Caissons are manufactured within the scope of the ISO9001 accredited Quality Management System and in accordance with BS EN 1917 and BS5911-3, where appropriate[^].

Open caisson-sinking techniques permit a shaft structure to be progressively sunk, either under its own weight or with the aid of caisson jacks, in a controlled manner from the surface to a predetermined depth. Caisson shafts are constructed using a metal cutter ring and base section with rings being added on top as excavation proceeds. The technique is suited to shaft construction through weak soils, high-plasticity clays, silts, sands and gravel, particularly below the water table.

[^] Caisson manholes cannot be CE marked as their diameters are not covered by the scope of the harmonised European Standard BS EN 1917. However: 2100mm - 3000mm manholes are kite-marked against the scope of the complementary British Standard BS5911-3. 3600mm and 4000mm diameters remain operative within the scope of the ISO 9001 accredited Quality Management System.

JACKING PIPES

FP McCann provides an extensive range of concrete pipes and fittings. All products are manufactured from high quality raw materials and are sulphate resistant.

FP McCann's jacking pipes enable pipe installation where the opening of trenches is neither practical nor cost-effective.

FP McCann's jacking pipes are made from dense, durable reinforced concrete. The mix provides a design chemical class 4 (DC4), with a minimum 28 day characteristic cube strength of 50N/mm²

They are manufactured in accordance with BS EN 1916 and BS 5911-1 and certified by Quality Assessment under the kitemark scheme and ISO 9001.

FEATURES

- Self-lubricating joint gasket
- Built-in handling system with an extensive range to suit most machines and shields



Q&A ON JACKING PIPES

Q. What is pipe jacking?

A. Pipe jacking is a technique for the installation of underground pipes, ducts and culverts with minimal environmental disruption. Jacking pipes can also act as conduits for other utilities like gas, electricity and telecommunications.

Q. How does it work?

A. Tunnelling excavation, by machine or by hand, takes place between two shafts or caissons, whilst specially designed pipes are pushed through the ground by powerful jacks.

Q. Why is pipe jacking used?

A. Primarily to install water and sewerage systems where the opening of trenches is impractical; for example, in environmentally sensitive areas, under railways, motorways, rivers, canals, buildings and in crowded urban sites.

Q. What are the cost advantages?

A. Jacking is cost-effective when compared with deep open cut methods and other forms of tunnelling. It offers low maintenance costs, speed and safety of installation with fewer joints, smooth internal finishes and improved flow characteristics without the need for secondary linings required by some segmental systems.

Q. What are the environmental advantages?

A. Minimum excavation means less disturbance, less pollution, less noise, fewer lorry movements and a reduction in the need for costly traffic diversions and delays. There is a reduced risk of settlement, damage or movement to other structures and services.

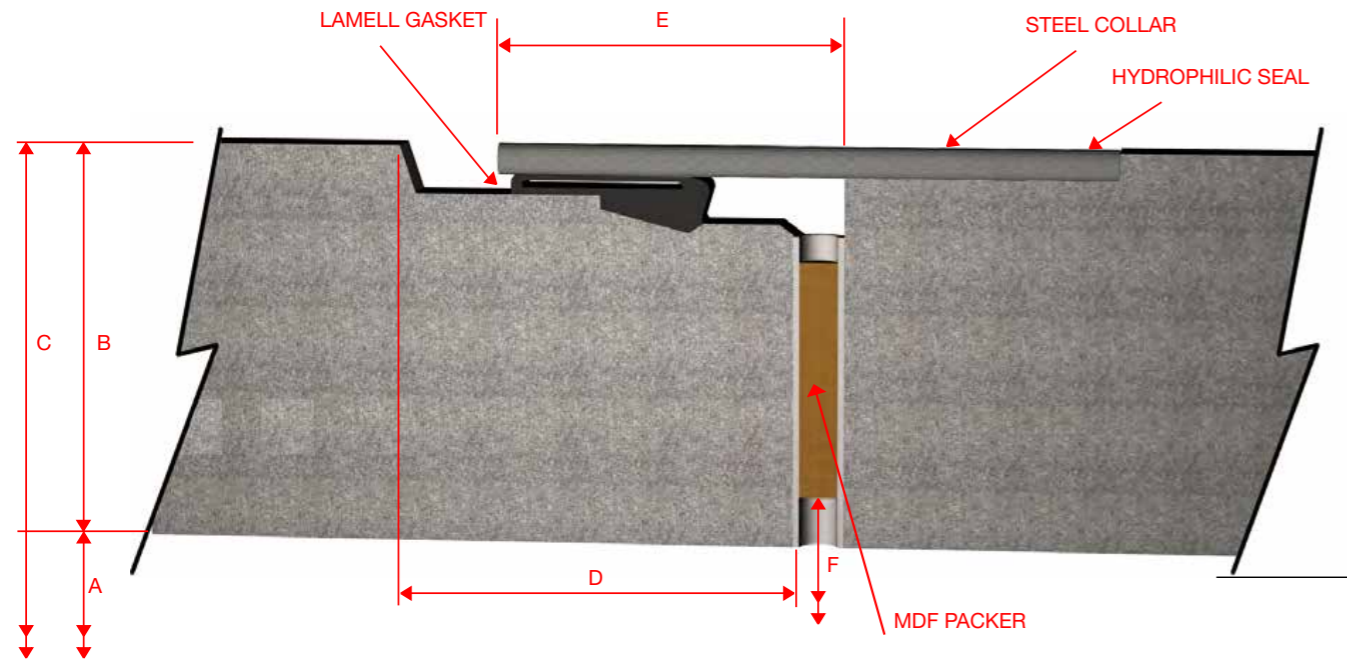
Q. What types of concrete jacking pipe are there?

A. Pipes with steel collars are manufactured to BS EN 1916 and BS 5911-1. Steel collar pipes incorporate an accurately rolled collar manufactured from BS EN 10025-2:2004 S275 mild steel. They can be used on both machine dug and hand dug drives.

Q. What is meant by microtunnelling?

A. Refers to non-man entry sizes installed by machine, though some consider it to include larger pipes installed by remote control methods.

STEEL COLLAR JOINT



FP MCCANN'S JACKING PIPE RANGE

| DN* (mm) | Bore Diameter A (mm) | Wall Thickness B (mm) | Outside Diameter C (mm) | Length Metres | Weight Kg Approx | Spigot Length D (mm) | Socket Length E (mm) | Packer Size Width (mm) | Packer Size Thickness (mm) | Int.Dia to Packer F (mm) | Proof Load kN/m | Maximum Load KN/m |
|----------|----------------------|-----------------------|-------------------------|---------------|------------------|----------------------|----------------------|------------------------|----------------------------|--------------------------|-----------------|-------------------|
| # 450 | 450 | 77 | 604 | 1.20 | 430 | 115 | 110 | 33 | 12 | 480 | 36 | # 54 |
| # 600 | 585 | 90 | 764 | 1.20 | 640 | 125 | 110 | 46 | 15 | 611 | 48 | # 72 |
| # 600 | 585 | 90 | 764 | 2.00 | 1050 | 125 | 110 | 46 | 15 | 611 | 48 | # 72 |
| 900 | 904 | 98 | 1100 | 2.50 | 2120 | 130 | 125 | 56 | 15 | 934 | 72 | 108 |
| 1000 | 980 | 110 | 1200 | 2.50 | 2580 | 130 | 125 | 66 | 15 | 1010 | 72 | 120 |
| 1200 | 1200 | 115 | 1430 | 1.20 | 1590 | 130 | 125 | 68 | 18 | 1230 | 96 | 144 |
| 1200 | 1200 | 115 | 1430 | 2.50 | 3250 | 130 | 125 | 68 | 18 | 1230 | 96 | 144 |
| 1400 | 1350 | 125 | 1600 | 2.50 | 3950 | 130 | 125 | 78 | 18 | 1380 | 112 | 168 |
| 1500 | 1500 | 140 | 1780 | 2.50 | 4910 | 130 | 125 | 93 | 18 | 1530 | 120 | 180 |
| 1800 | 1830 | 155 | 2140 | 2.47 | 6490 | 134 | 125 | 110 | 18 | 1860 | 145 | 216 |
| 2000 | 1950 | 190 | 2330 | 2.35 | 8150 | 134 | 125 | 145 | 18 | 1980 | 160 | 240 |
| 2000 | 1950 | 190 | 2330 | 2.50 | 8600 | 134 | 125 | 145 | 18 | 1980 | 160 | 240 |
| 2000 | 1980 | 175 | 2330 | 2.50 | 8040 | 134 | 125 | 130 | 18 | 2010 | 160 | 240 |
| 2000 | 2076 | 167 | 2410 | 2.47 | 7900 | 134 | 125 | 122 | 18 | 2106 | 160 | 240 |
| 2400 | 2425 | 200 | 2825 | 2.50 | 11190 | 145 | 140 | 150 | 18 | 2455 | 200 | 300 |

Alternative Length of Pipes (Maximum length 2.5m)

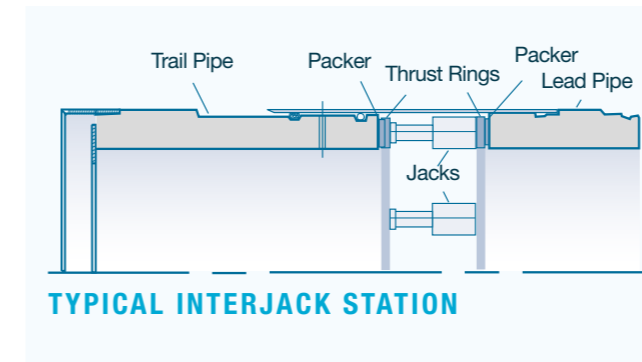
Alternative length of pipes in some of the sizes shown above can be manufactured to order.

FP McCann is always interested in adding to the above range, and would be pleased to discuss the supply of any sizes not shown.

* Nominal size as given by Table 6 BS 5911-1.

These items are not covered by BS EN 1916 and BS 5911-1 but have been designed and tested using the same criteria.

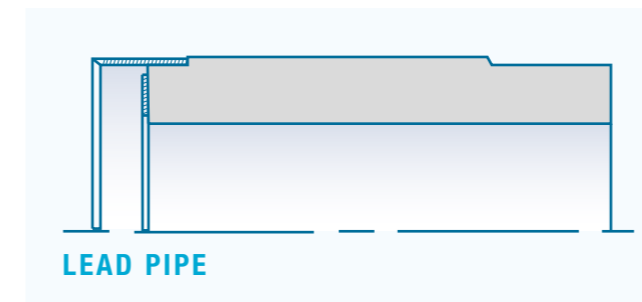
Weights given are the nominal weights increased by 5% to allow for variations in material unit tolerance



LEAD PIPES

Lead pipes are located at the front of the drive. It is standard practice to fit a steel shield over the lead pipe in every hand dug drive, providing protection to miners and facilitating steering.

Machine dug drives do not usually require a lead pipe as the



contractor can adapt the machine to fit over a standard pipe spigot.

SPECIAL CHARACTERISTICS

- A flat end instead of a spigot - 600mm long by 20mm deep rebate
- Joint gaskets are not supplied as standard with lead Grout Sockets or Lubrication Holes

Designed to reduce friction during jacking, lubricating or grout sockets can be cast into standard pipes to suit customer requirements. They are normally 1 1/4" BSP steel sockets fitted with plugs. Conical non-return valves are supplied as standard. The ratio of pipes with grout sockets to standard pipes varies, depending on ground conditions. As a guide, it can be one pipe in every three or one in every five.

| Pipe Diameter mm | Number | Location |
|------------------|------------------|----------|
| 900-1800 | 2 holes per pipe | |
| 1950 - 2400 | 3 holes per pipe | |

TABLE SHOWING STANDARD CONFIGURATIONS OF GROUT SOCKETS.

PACKERS

It is important that suitable packing material is used between adjacent pipes to ensure even stress distribution and load transfer. We recommend medium density fibre board (MDF). FP McCann can supply and fix packers at works, although the contractor usually supplies and fixes them on site prior to pipe installation. It is important that packers are fitted in the correct position.

INTERMEDIATE JACKING STATIONS (INTERJACKS)

Interjacks are frequently installed on drives where the jacking forces required exceed the capability of the pipe or the jacks. Installing interjacks relieves pressure on the whole drive length by first pushing the section of pipes in front of the interjack using jacks installed within the interjack itself; the rear section of pipes is then pushed by the main jacks. Each interjack station comprises two pipes, a lead and a trail, with a steel can or shield which is either cast integrally with the lead pipe - a fixed can, or fitted round the pipe separately - a loose can. The interjack trail pipe is common to both fixed and loose can types. The choice of interjack type is usually left to the contractor's preference.

FIXED CAN INTERJACKS

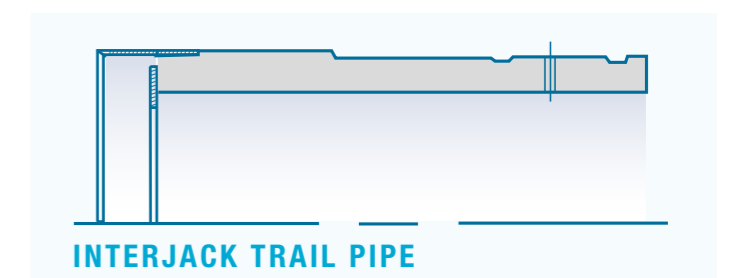
These are used with steel collar pipes. FP McCann provides the lead pipe with the can already fitted. It then becomes the contractor's responsibility to fit suitable steel thrust rings, packers and jacks inside the can.

LOOSE CAN INTERJACKS

Generally used with in-wall jointed pipes and have a lead pipe with a short 300mm by 20mm recess in place of the socket. The contractor provides the can as well as the thrust rings, packers and jacks.

INTERJACK TRAIL PIPES

Recognisable by their long 1400mm by 20mm rebate instead of the normal spigot. Two recesses are located towards the end of the rebate to take special sealing rings provided by FP McCann. Lubrication points are positioned between the recesses.



JACKING PIPES



Easi-lift Handling System

To assist the contractor in adopting a safe working method for lowering heavy pipes into deep, confined spaces, the FP McCann Easi-lift handling system is available for pipes from DN 900 to DN 2400. Galvanized lifting anchors are cast into the pipe wall and are used in conjunction with certified lifting shackles and chains to provide a safe, speedy and accurate system of off-loading, stacking and placing. Anchors are positioned below the outside diameter of the pipe to avoid any potential to snag or plough.

BENEFITS OF JACKING PIPES

Safe - Easi-lift ensures a positive horizontal lift every time, no weight balancing is required.

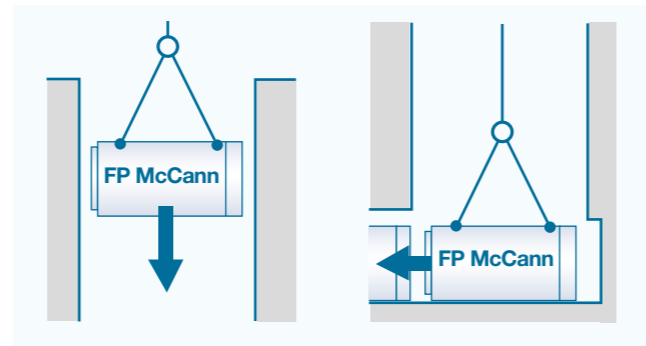
Accurate - pipes can be lowered down deep shafts and onto the jacking cradle in one smooth, easy operation.

Time saving - lifting eyes are engaged and disengaged by rotation in a few seconds.

Cost saving - eliminates the purchase of cumbersome slings and reduces the risk of damage to pipes.

No leaks - through lifting holes which need sealing.

Lamell is a fast, efficient, easy-to-fit pipe joint seal.

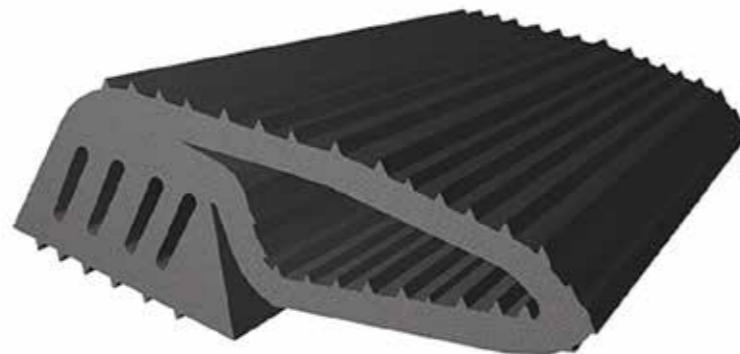


Incorporating an innovative, self-lubricating SBR gasket, the Lamell seal is ideal for use in wet conditions. Lamell provides a reliable, flexible, water-resistant seal requiring no additional lubrication.

PIPES FOR SPECIAL REQUIREMENTS

FP McCann's jacking pipes are designed to meet all normal in-service conditions. However, there are situations which demand special consideration. FP McCann can offer a number of options to help combat more extreme conditions, such as:

- Stainless steel collars to suit ground or effluent conditions
- Alternative mix designs to suit ground or effluent conditions
- Protective coatings or linings to suit ground or effluent conditions
- Special strength pipes with increased reinforcement
- Secondary seals can be provided, if requested
- Note: special requirements or non-standard products should be ordered in advance of their anticipated delivery dates.



JACKING PIPE INSTALLATION

HANDLING AND JOINTING - GENERAL

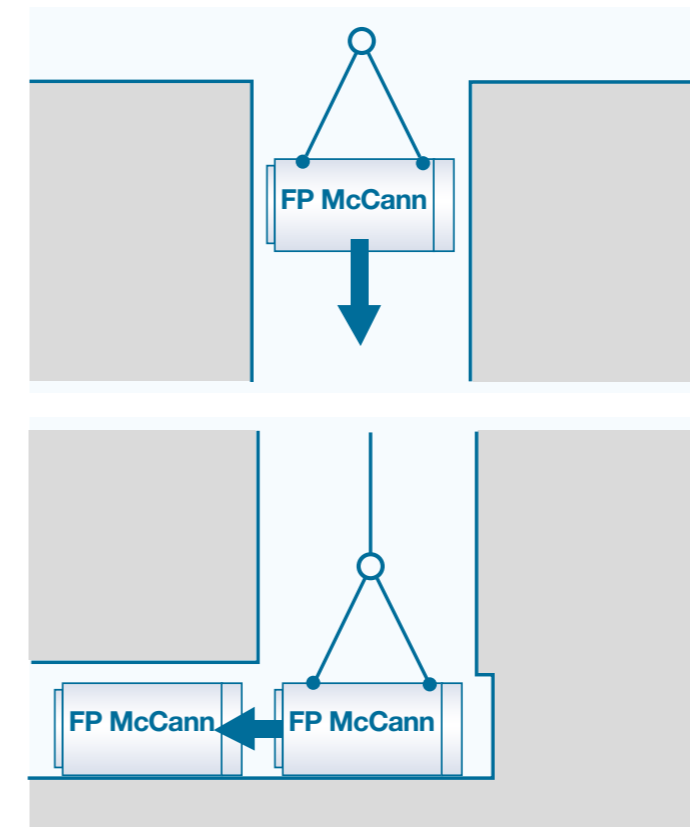
FP McCann's jacking pipes are robust and should arrive on site in good condition. Care in handling is simply a matter of common sense.

DO TAKE EXTRA CARE WITH THE JOINTS.

Lifting appliances should be capable of smooth hoisting, lowering and travelling with the heaviest pipe and must satisfy the required safety regulations.

EASI-LIFT HANDLING SYSTEM

This is the simplest, safest and most efficient way of handling FP McCann's jacking pipes, DN 900 and above. Place the lifting eyes over the cast-in anchors and rotate ensuring the lugs on each eye are pointing towards the centre of the pipe before commencing the lift.



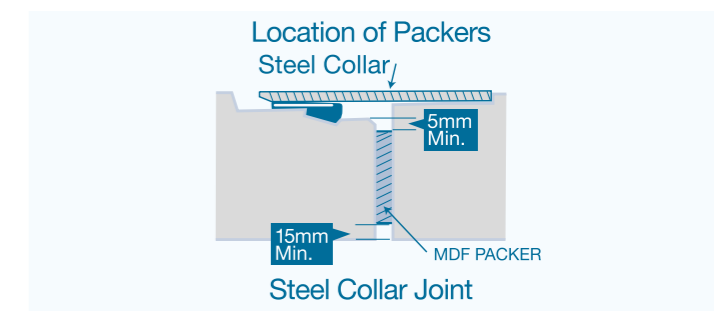
If easi-lift is not used then:

- Webbed slings should be used to handle pipes round the barrel rather than through the bore. Should slings be used through the bore, pipe ends must be protected from chafing. Wire ropes and chain slings are not recommended.
- Pipes should be stacked on firm, level ground. The bottom layer must be securely chocked and the height of the stack should not exceed two metres.
- Store rubber rings and gaskets away from strong sunlight and frost.

Note: the mantle is tough but can be damaged by sharp implements. Care should be taken to handle and store gaskets correctly.

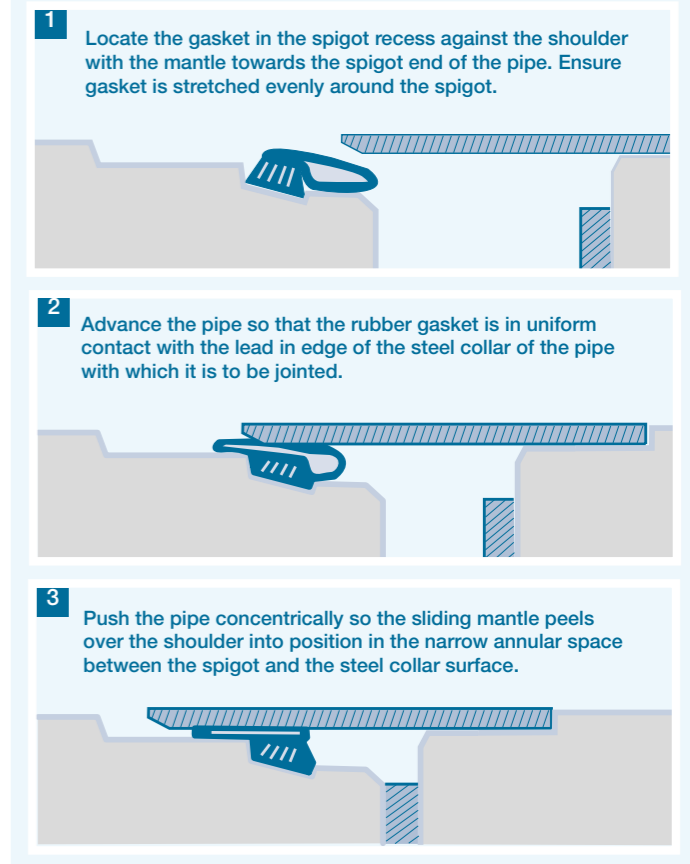
PACKERS

It is preferable to fit packers just prior to jointing as they remain clean and dry and are less likely to work loose. It is important they are fitted concentrically and should be offset from the pipe faces as per the minimum dimensions shown below, especially the inside bore.



JOINTING USING THE LAMELL SEAL

Prior to placing ensure the gasket and the joint surfaces are clean. Lubrication is not required and **MUST NOT** be applied.

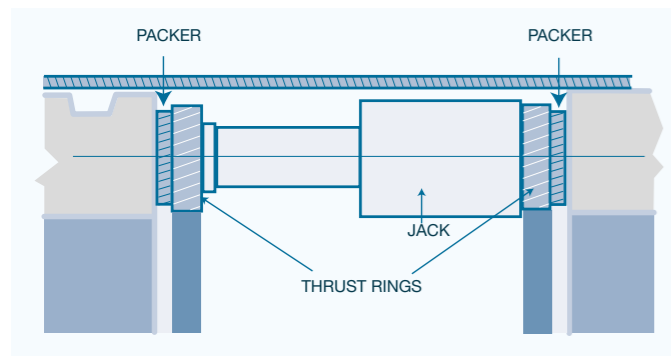


STANDARD INTERJACK INSTALLATION



It is assumed that:
All preparatory work will have been completed before the installation of the interjack, i.e. drilling and fixing of brackets, fixing of segmented thrust rings and hydraulics
The jacks are securely restrained so they will not become misaligned during use

IMPORTANT
The hydraulic jacks must be positioned so that their centre line is the same as that of the pipe wall. All thrust rings should be of adequate stiffness to prevent joint loading.



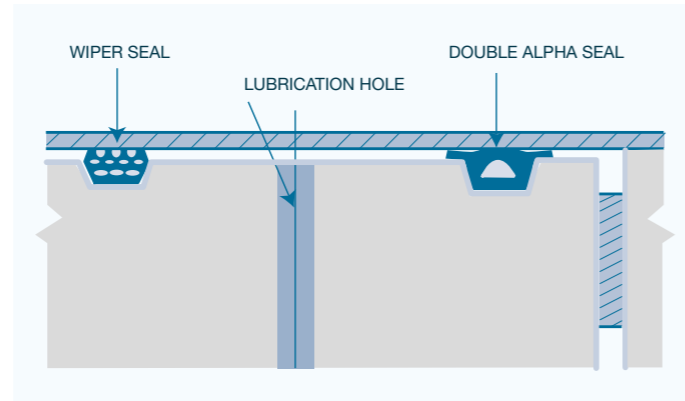
Typical position of jacks relative to pipe wall

ASSEMBLING A FIXED CAN INTERJACK

1. When installing the lead pipe into the drive a suitable spacer must be inserted into the can to provide adequate clearance between it and the pit thrust ring

IMPORTANT
No Load should be applied to the end of the steel can.

2. Fit the seals to the interjack trail pipe ensuring that they are fitted in the correct position to maintain a watertight seal. Lubrication points (usually 3/4" BSP) are provided between the two seals to allow effective lubrication



Typical sealing arrangement of fixed and loose can interjack

3. Lubricate the two parts of the interjack station. Both the inside of the steel can and seals must be liberally coated. Use FP McCann lubricant. Petroleum lubricants must not be used as this will cause degradation of seals
4. While jointing ensures the trail pipe is offered up squarely and neither of the two gaskets are displaced during assembly. During use the interjack station must be continuously lubricated by maintaining a minimum pressure of 5psi (0.4 bar) between the seals, preferably by automatic systems
5. If the final location of the seals is in doubt, the trail pipe must be withdrawn and the procedure repeated

ASSEMBLING A LOOSE CAN INTERJACK

Follow the previous 5 steps, remembering the steel can is added separately and is usually supplied by the contractor.

Note: Standard interjack stations are designed to withstand an internal pressure of 0.07N/mm². We cannot guarantee performance at pressures above this figure. It is not normally possible to fit Interjack pipes with the Easi-Lift handling system.

JACKING LOADS

FP McCann's jacking pipes are designed to meet the requirements of British Standard 5911 Part 1 and European Standard BS EN 1916. The Maximum Jacking Force (F_{jmax}) which can be applied to a pipe is determined by the pipe strength, the configuration of the thrust ring and the tunnel alignment, i.e. the angular deflection between pipes. The maximum load decreases as angular deflections occur during jacking. Should deflection exceed that which can be accommodated by the packer, the maximum load decreases significantly. The figures below are for guidance only. For further assistance, contact FP McCann's technical department.

* It is important to note that the table indicates the loads for which each pipe was designed and does not include any safety factor used by the contractor (Refer to clause 5.3.4 BS EN 1916)

MAXIMUM DESIGN LOADS - (TONNES)

| Pipe Nominal Size mm | Pipe I/D mm | Pipe O/D mm | Packer Depth mm | Packer Thickness (mm) | Angular Deflection | | | | |
|----------------------|-------------|-------------|-----------------|-----------------------|--------------------|-----------------|---------|---------|---------|
| | | | | | 0** | Angle Varies*** | 0.25 | 0.5 | 1.0 |
| | | | | | degrees | | degrees | degrees | degrees |
| 450 | 450 | 604 | 33 | 12 | 111 | 56 | 56 | 56 | 35 |
| 600 | 585 | 764 | 46 | 15 | 200 | 100 | 100 | 86 | 52 |
| 900 | 904 | 1100 | 56 | 15 | 365 | 183 | 183 | 117 | 73 |
| 1000 | 980 | 1200 | 66 | 15 | 468 | 234 | 234 | 141 | 86 |
| 1200 | 1200 | 1430 | 68 | 18 | 581 | 291 | 252 | 156 | 95 |
| 1350 | 1350 | 1600 | 78 | 18 | 749 | 375 | 298 | 186 | 112 |
| 1500 | 1500 | 1780 | 93 | 18 | 994 | 497 | 365 | 227 | 134 |
| 1800 | 1830 | 2140 | 110 | 18 | 1427 | 714 | 461 | 287 | 166 |
| 1950 | 1950 | 2330 | 145 | 18 | 2029 | 1015 | 612 | 373 | 203 |
| 1980 | 1980 | 2330 | 130 | 18 | 1832 | 916 | 556 | 343 | 192 |
| 2100 | 2076 | 2410 | 122 | 18 | 1790 | 895 | 534 | 332 | 188 |
| 2400 | 2425 | 2825 | 150 | 18 | 2573 | 1287 | 687 | 419 | 225 |

** The load must be perpendicular to the joint face (no deflection and all jacking forces perfectly square)
*** There is angular deflection but there is no joint gap i.e. any deflection being taken up within the packer

HAULAGE LOAD QUANTITIES

Table showing quantities per 24.5 tonne load

| Nominal Dia. mm | In-wall joint 2.5m long | | | Steel Collar joint 2.5m long | | | | | |
|-----------------|-------------------------|--------|--|------------------------------|--------|-----------------|---------------------------------|--------|------|
| | Approx. number of pipes | metres | | Approx. number of pipes | metres | Nominal Dia. mm | Approx. number of pipes | metres | |
| 900 | 8 | 20.0 | | 900 | 11 | 27.5 | 1950 | 3 | 7.50 |
| 1050 | 6 | 15.0 | | 1000 | 9 | 22.5 | 2100 | 3 | 7.50 |
| 1200 | 5 | 12.5 | | 1200 | 7 | 17.5 | 2400 | 2 | 5.00 |
| 1500 | 4 | 10.0 | | 1350 | 6 | 15.0 | Microtunnelling pipes 2m long | | |
| 1800 | 3 | 7.50 | | 1500 | 5 | 12.5 | 600 | 24 | 48.0 |
| 2000 | 2 | 5.00 | | 1650 | 4 | 10.0 | 675 | 21 | 42.0 |
| 2400 | 2 | 5.00 | | 1800 | 3 | 7.50 | Microtunnelling pipes 1.2m long | | |
| 1.2m long | | | | 1.2m long | | | 450 | 60 | 72.0 |
| 900 | 17 | 20.4 | | 1200 | 15 | 18.0 | 600 | 40 | 48.0 |



PIPE JACKING TECHNOLOGY ADOPTED ON MAINLINE RAIL 'UNDER TRACK CROSSING' PROJECT

Project: Drainage Improvement Scheme; Transpennine Route Upgrade, Ulleskelf Mire, North Yorkshire

Client: Network Rail

Main Contractor: Transpennine Route Upgrade East Alliance

Products Supplied: 1800mm id Precast Concrete Jacking Pipes

A no-dig drainage improvement scheme has been successfully completed beneath a mainline railway in North Yorkshire. The 70 mile Transpennine Route between Manchester and York is undergoing a multi-billion pound upgrade to allow for more frequent, faster and heavier trains.

At Ulleskelf Mire near Tadcaster, the Transpennine Route Upgrade (TRU) East Alliance working in conjunction Coventry based microtunnelling and pipe jacking specialist Active Tunnelling, has installed three new drainage tunnels beneath the four-track line replacing two 179 years old brick arches. The work was undertaken on the flood plain during late summer 2023 to allow for a speedy and successful completion.

In the first type of operation of its kind in the UK, the infrastructure work involved three tunnel boring machines (TBM's) working simultaneously side by side. The three tunnels each measuring 17.8 metres long and 1.8 metres in diameter have been lined with FP McCann's 1800mm id reinforced precast concrete jacking pipes supplied from the Company's manufacturing facility in Alnwick, Northumberland.

The trenchless tunnelling and pipe jacking process is far less intrusive than the traditional open-cut method of drainage pipe laying and is particularly suited to projects where transport infrastructure must be crossed. In this case, the three TBM's named Katherine, Nicola and Emma after the three project managers, bored below the rail lines to keep the operational railway open to trains and passengers for the maximum amount of time, thereby keeping disruption to a minimum. The drainage pipes were installed by Active Tunnelling in just 54 hours. The total volume of earth removed was 615 tonnes, significantly less than that of a similar length open-cut trench.





AGRICULTURE

Lydney 01594 847500 Grantham 01476 562277 Toomebridge 028 7965 0471

BOX CULVERTS

Byley 01606 843500 Toomebridge 028 7965 0471

BRIDGES

Toomebridge 028 7965 0471

BUILDING PRODUCTS

Cadeby 01455 290780

DOCK LEVELLER PITS

Weston Underwood 01335 361269

DRAINAGE

Ellistown 01530 240000 (England/Wales) Magherafelt 028 7954 9026 (Scotland) Toomebridge 028 7965 0471

FENCING

Cadeby 01455 290780

FILTER BED SYSTEMS

Littleport 01353 861416

FLOORING

Weston Underwood 01335 361269 Uddingston 01698 803300

POWER & INFRASTRUCTURE

Littleport 01353 861416 Toomebridge 028 7965 0471

PRECAST OFF-SITE BUILDING SOLUTIONS

Byley 01606 843500 Grantham 01476 562277 Littleport 01353 861416 Toomebridge 028 7965 0471

RAIL

Littleport 01353 861416 Toomebridge 028 7965 0471

SPECIALIST PRECAST

Littleport 01353 861416 Toomebridge 028 7965 0471

TANKS & CHAMBERS

Byley 01606 843500 Weston Underwood 01335 361269

TUNNELS & SHAFTS

Cadeby 01455 290780 Toomebridge 028 7965 0471

WALLING

Grantham 01476 562277 Lydney 01594 847500
Uddingston 01698 803 300 (Scotland) Toomebridge 028 7965 0471