segmental shafts

fpmccann tunnels &shafts

Technical helpline 01455 290780
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Tunnels & Shaft Solutions

FP McCann manufactures a comprehensive range of smooth shaft segmental rings suitable for underpinning, caisson and chimney construction methods. Factory pre-fitted EPDM rubber gaskets are standard on all segments providing an immediate water-tight seal on construction. Additional to cross joint and circle joint bolting systems, FP McCann offers a safer and more efficient back bolting system for the caisson build method.

Ring Types

The following segmental ring types are available:
Standard rings
Corbel rings
Recessed rings (Standard, choker or cutter choker)
Choker rings
Combined Cutter Choker rings
Segmental rings in stock are front or back bolted.

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 to enable installation with EPDM gasket. The cutter choker comprises entirely of ordinary segments.

Sealing

All segmental rings are supplied with a factory fitted EPDM gasket as the primary sealing system that is immediate upon build.

Connection

Cross joint 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 gasket. All connections and fittings have a sheradised finish, a galvanised finish is available upon request.

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 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 BS EN ISO 9001.

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Key Features and Benefits

- Smooth internal faces
- Simple locking process
- Speedy installation
- Cost reducing
- Added safety features
- Technical advice and support

Size (Standard ring)			Segments per ring (Standard ring)		Vol per ring (Std ring) (mΔ)	Weight per Standard ring* (tonnes)	Standard segment weight* (kg)	Corbel segment weight* (kg)	Cutter / segment weight* (kg)	Cutter / choker seg wt* (kg)	Excavations mΔ per standard ring			Grout per ring (m≈)	Caulking	
											mm over extrados					
Internal diameter (m)	External diameter (m)	Width (m)	Ord	Top							0	25	50		Circle (lin m)	Cross (lin m)
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
4.500	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		1411		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		32.67	33.18	33.70	20.26	18.93	9.00
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		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		2130	2284	96.77	97.64	98.52	34.87	33.07	14.00
12.500	13.200	1.00	12	2	14.13	35.32	2523		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		3024		193.59	194.83	196.07	49.32	47.20	16.00
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

*Nominal weights. Increase by 5% for sizing of lifting equipment and reduce by 5% for floatation design. Sizes in italic are future development