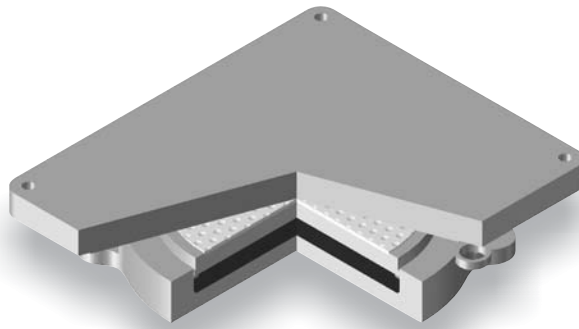


QUALITY STRUCTURAL BEARINGS

Ekspan KA Series

Fixed & Sliding Pot Bearings

In compliance with
AASHTO LRFD SPECIFICATIONS



www.ekspan.com

SUPPORTING the FUTURE



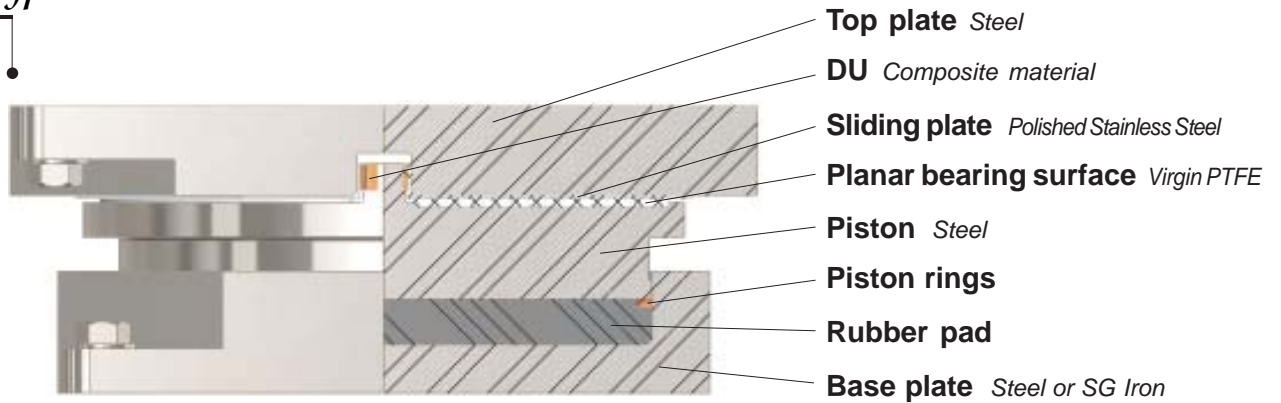
Description

KA series is a range of structural bearings which meets the requirements Sections 14, 2008 Interim Revisions, AASHTO LRFD specifications. They are manufactured to international quality standards. The standard range comprises multi-axis rotation bearings in Fixed, Constrained and Free configurations to support loads up to 30,000 kN. Current design practice has demonstrated the need for a range of bearings with higher horizontal load capacity. To accommodate these requirements and the more usual requirements economically, two ranges of fixed and constrained bearings are now offered. This brochure is detailed in metric please refer to page 15 for US imperial conversion.

Bearing types

KA series bearings are available in three forms -
30 KA Fixed
31 KA Free to move in one horizontal direction
22 KA Free to move in any horizontal direction

Typical 31KA details



Attachment

Fixing holes are provided in the top and base members of the bearings. This enables a variety of fixing methods to be used. Standard fixings are designed to ensure the bearings can be removed as simply as possible.

Support and Installation

Important - See pages 11 - 13 for installation and Maintenance.
 If the bearings are to be installed on a steel spreader plate Ekspan must be notified. The overall height will be reduced by 3mm in these cases.

Concrete stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.
 At the **Maximum Vertical Load** capacity tabulated the mean stress approaches 20N/mm².

Design loads

The designation of loadings varies depending on the design code employed. The tabulated load capacities list Maximum vertical load, at which load the base concrete stress is 20N/mm² maximum. **The working stress / serviceability limit state** maximum loads are determined by the allowable PTFE stresses.

Sub plates

Details of sub plates are shown on each bearing type. These could be optional depending on the need for new build or bearing replacement. Please state when specifying with plates as detailed.

Rotation

All the bearings can rotate at least 0.01 radians about any horizontal axis. Higher rotations may be possible dependent on load combinations. Please send load data to our engineers who will be happy to advise.

Movement

The dimensions for the **31KA** (Constrained) and **22KA** (Free) bearings are shown in the tables for the following movements -

Longitudinal

31KA 100mm total
22KA 100mm total

Transverse

31KA NIL (see pages 6 & 7)
22KA 20mm total

For additional movements above this standard range add the excess movement to the top plate dimensions and the top plate fixing centres.

N.B. 31KA bearings should not be used where movement is required at right angles to the constraints.

The required movements should be specified in the part number as described below.

The clearance between the constraints must not be used to accommodate any structural movement.

Designation of part no.

The part number of a bearing is simply built up as below – eg.

	Type	Maximum Working Load (kN)	Movement Longitudinal (mm)	Movement Transverse (mm)	Fixings Top	Fixings Base
a	30KA	5000			S	S
b	31KA	5000	100		B	S
c	22KA	5000	100	20	N	B
d	22KA	5000	100		BSp	SSp

Full part no for **a** above is **30KA 500/SS**
 (for suffix letters see page 10) **b** above is **31KA 500/100/BS**
c above is **22KA 500/100/20/NB with plate**

c denotes a free KA series Pot Bearing of -

Working load capacity: 5000kN maximum
 Movement: Longitudinal - 100mm total
 Transverse - 20mm total
 Fixing method: No fixings in top plate. Bolts in base plate.

Fixed - Enhanced Horizontal Load Capacity

30KA

Bearing design loads

Bearings should be selected to suit the appropriate design code.
The maximum vertical and horizontal loads shown in the tables may be taken in combination.

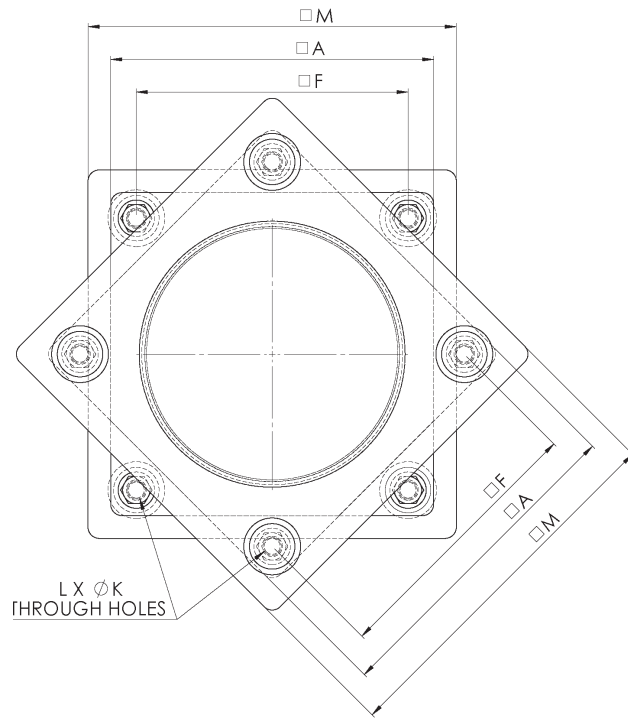
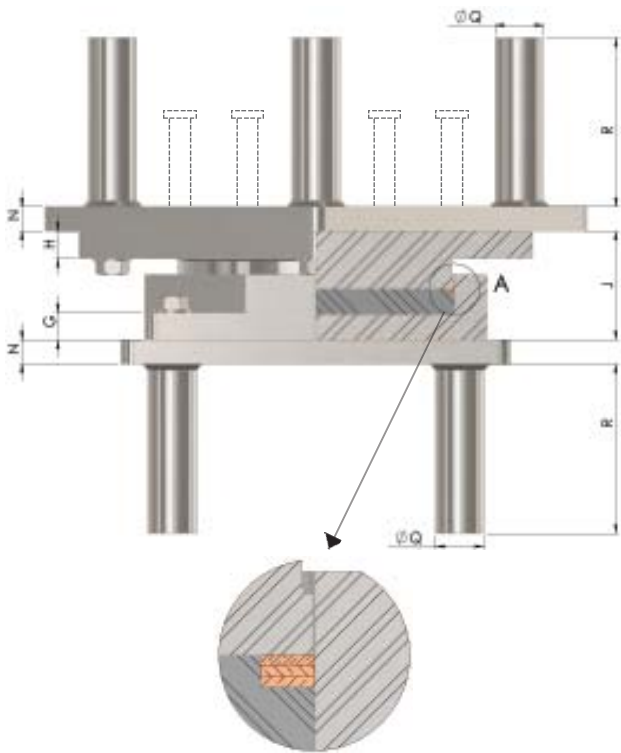
Horizontal loading

The 30KA fixed bearing will resist a horizontal force acting in any direction. In order for the bearing to support the maximum horizontal loads stated in the tables, a minimum concurrent vertical load must be present. At Strength Limit State, the actual load combination may permit the use of a vertical load higher than that shown in the table. Where higher horizontal load capacities are required, Ekspan engineers can assist with a specialist solution to meet customer requirements.

Concrete stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable. At the **Maximum Vertical Load** capacity tabulated the mean stress approaches 20N/mm².

Bearing Part no	Serviceability Limit State Loads			Strength Limit State Loads	
	Maximum Load (kN)	Dead Load (kN)	Horizontal Load (kN)	Maximum Load (kN)	Horizontal Load (kN)
30KA0050	706	358	111	917	184
30KA0075	1017	532	159	1322	265
30KA0100	1380	726	216	1794	359
30KA0130	1710	932	267	2223	445
30KA0160	2039	1122	318	2650	530
30KA0200	2586	1379	404	3361	673
30KA0250	3044	1656	475	3957	792
30KA0300	3705	2019	578	4816	964
30KA0350	4181	2296	653	5435	1087
30KA0400	4685	2593	731	6090	1218
30KA0450	5218	2797	814	6783	1357
30KA0500	5536	2978	864	7196	1440
30KA0550	6114	3310	954	7948	1471
30KA0600	6413	3476	1001	8336	1543
30KA0700	7683	4198	1199	9987	1848
30KA0800	8709	4711	1359	11321	2095
30KA0900	10177	5392	1588	13230	2448
30KA1000	11352	6037	1771	14757	2583
30KA1200	13586	7184	2120	17661	3003
30KA1400	16354	8696	2552	21260	3189
30KA1600	18855	10066	2753	24511	3236
30KA1800	21532	11583	3045	27991	3359
30KA2000	24387	13211	3337	31703	3805
30KA2250	28045	15281	3629	36458	4375
30KA2500	31288	17168	3921	40674	4881
30KA3000	38799	21470	4212	50438	6053



***Weights** Bearing = Bearings without top and base sub plates
 Assembly = Bearings with top and base sub plates

Bearing Part no	Installation Dimensions Bearing (mm)							Installation Dimensions Sub Plate (mm)				*Weights (kg)	
	A	F	G	H	J	K	L	M	N	Q	R	Bearing	Assembly
30KA0050	240	205	18	18	81	14	4	280	20	35	110	29	60
30KA0075	284	239	23	23	89	18	4	324	20	40	140	45	89
30KA0100	330	285	23	23	99	18	4	370	20	40	140	67	121
30KA0130	369	314	28	28	109	22	4	409	20	50	170	93	166
30KA0160	403	348	28	28	119	22	4	443	20	50	170	121	204
30KA0200	453	388	33	33	133	26	4	493	20	55	200	171	276
30KA0250	492	414	33	33	143	26	4	532	20	55	200	214	332
30KA0300	543	447	40	40	159	32	4	587	20	70	240	289	453
30KA0350	582	486	40	40	167	32	4	622	20	70	240	353	530
30KA0400	615	519	40	40	179	32	4	655	20	70	240	422	613
30KA0450	649	553	40	40	187	32	4	689	20	70	240	492	698
30KA0500	668	554	48	48	193	38	4	708	20	80	300	524	773
30KA0550	703	589	48	48	201	38	4	783	40	80	300	606	1084
30KA0600	720	606	48	48	208	38	4	800	40	80	300	659	1154
30KA0700	787	673	48	48	233	38	4	876	40	80	300	888	1463
30KA0800	838	724	48	48	246	38	4	928	40	80	300	1068	1702
30KA0900	908	776	55	55	264	44	4	999	40	105	360	1342	2162
30KA1000	959	827	55	55	278	44	4	1050	40	105	360	1585	2470
30KA1200	1072	940	55	55	308	44	4	1152	40	105	360	2199	3226
30KA1400	1178	1046	55	55	335	44	4	1258	40	105	360	2927	4117
30KA1600	1264	1132	55	55	360	44	4	1364	50	105	360	3647	5306
30KA1800	1351	1219	55	55	381	44	4	1451	50	105	360	4446	6230
30KA2000	1440	1308	55	55	403	44	4	1540	50	105	360	5378	7441
30KA2250	1545	1413	55	55	430	44	4	1645	50	105	360	6650	8977
30KA2500	1633	1501	55	55	450	44	4	1733	50	105	360	7828	10390
30KA3000	1821	1671	63	63	497	50	4	1921	50	120	410	10773	13969

As an option studs can be supplied instead of sockets in reduced fitting space areas.

For any enquiries or advice, please contact us at enquiry@ekspan.co.uk or call 0114 2611126

Bearing design loads

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.

Horizontal loading

The 31KA guided bearing will resist a horizontal force acting at right angles to the main direction of movement. In order for the bearing to support the maximum horizontal loads stated in the tables, a minimum concurrent vertical load must be present. At Strength Limit State, the actual load combination may permit the use of a vertical load higher than that shown in the table. Where higher horizontal load capacities are required, Ekspan engineers can assist with a specialist solution to meet customer requirements.

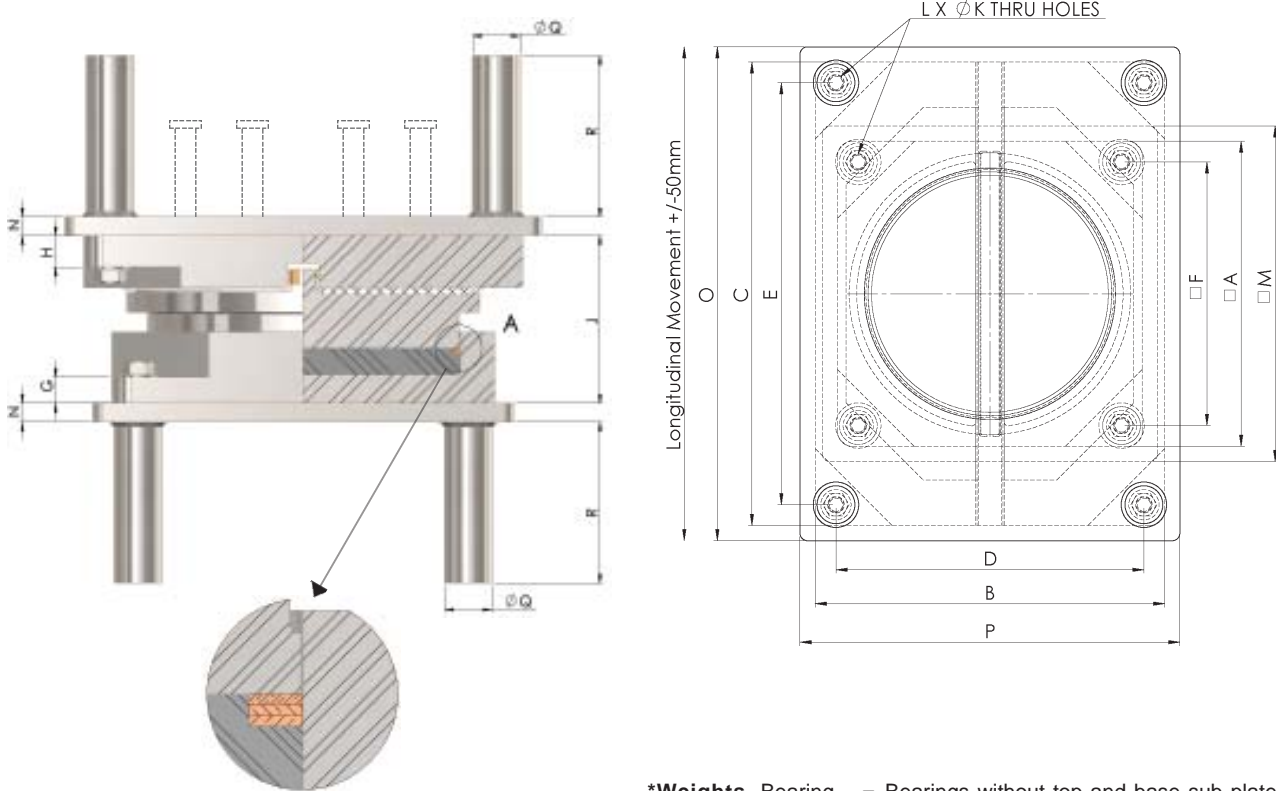
Transverse movement

31KA Bearings are designed to accommodate translation in one direction only. Movement transverse to the constraint is nominally zero. In practice the transverse movement is 1mm maximum. Standard 31KA bearings should not be used where movement is required at right angles to the constraint. Special bearings can be offered for such requirements.

Concrete stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable. At the **Maximum Vertical Load** capacity tabulated the mean stress approaches 20N/mm².

Bearing Part no	Serviceability Limit State Loads			Strength Limit State Loads	
	Maximum Load (kN)	Dead Load (kN)	Horizontal Load (kN)	Maximum Load (kN)	Horizontal Load (kN)
31KA0050	706	358	111	917	184
31KA0075	1017	532	159	1322	265
31KA0100	1380	726	216	1794	359
31KA0130	1710	932	267	2223	445
31KA0160	2039	1122	318	2650	530
31KA0200	2586	1379	404	3361	673
31KA0250	3044	1656	475	3957	792
31KA0300	3705	2019	578	4816	964
31KA0350	4181	2296	653	5435	1087
31KA0400	4685	2593	731	6090	1218
31KA0450	5218	2797	814	6783	1357
31KA0500	5536	2978	864	7196	1440
31KA0550	6114	3310	954	7948	1471
31KA0600	6413	3476	1001	8336	1543
31KA0700	7683	4198	1199	9987	1848
31KA0800	8709	4711	1359	11321	2095
31KA0900	10177	5392	1588	13230	2448
31KA1000	11352	6037	1771	14757	2583
31KA1200	13586	7184	2120	17661	3003
31KA1400	16354	8696	2552	21260	3189
31KA1600	18855	10066	2753	24511	3236
31KA1800	21532	11583	3045	27991	3359
31KA2000	24387	13211	3337	31703	3805
31KA2250	28045	15281	3629	36458	4375
31KA2500	31288	17168	3921	40674	4881
31KA3000	38799	21470	4212	50438	6053



***Weights** Bearing = Bearings without top and base sub plates
 Assembly = Bearings with top and base sub plates

Bearing Part no	Installation Dimensions Bearing (mm)											Installation Dimensions Sub Plate (mm)						*Weights (kg)	
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	Bearing	Assembly
31KA0050	240	327	437	292	402	205	18	21	123	14	4	280	20	477	367	35	110	40	82
31KA0075	284	373	483	328	438	239	23	27	132	18	4	324	20	523	413	40	140	55	107
31KA0100	330	426	536	381	491	285	23	27	152	18	4	370	20	576	466	40	140	74	140
31KA0130	369	467	577	412	522	314	28	33	165	22	4	409	20	617	507	50	170	103	179
31KA0160	403	502	612	447	557	348	28	33	176	22	4	443	20	652	542	50	170	130	216
31KA0200	453	553	663	475	585	388	33	39	198	26	4	493	20	703	593	55	200	181	292
31KA0250	492	592	702	514	624	414	33	39	209	26	4	532	20	742	632	55	200	225	349
31KA0300	547	651	761	555	665	447	40	48	232	32	4	587	20	801	691	70	240	295	438
31KA0350	582	686	796	590	700	486	40	48	244	32	4	622	20	836	726	70	240	365	532
31KA0400	615	726	836	630	740	519	40	48	259	32	4	655	20	876	766	70	240	432	612
31KA0450	649	744	854	648	758	553	40	48	251	32	4	689	20	894	784	70	240	502	696
31KA0500	668	766	876	670	780	554	48	48	258	32	4	708	20	916	806	80	300	540	743
31KA0550	703	800	910	704	814	589	48	48	267	32	4	783	40	990	880	80	300	621	1073
31KA0600	720	820	930	724	834	606	48	48	275	32	4	800	40	1010	900	80	300	675	1144
31KA0700	796	897	1007	783	893	673	48	57	304	38	4	876	40	1087	977	80	300	879	1420
31KA0800	848	954	1064	840	950	724	48	57	321	38	4	928	40	1144	1034	80	300	1047	1673
31KA0900	919	1017	1127	885	995	776	55	66	340	44	4	999	40	1207	1097	105	360	1300	2007
31KA1000	970	1070	1180	938	1048	827	55	66	356	44	4	1050	40	1260	1150	105	360	1548	2328
31KA1200	1072	1168	1278	1036	1146	940	55	66	389	44	4	1152	40	1358	1248	105	360	2143	3065
31KA1400	1178	1275	1385	1125	1235	1046	55	75	420	50	4	1258	40	1465	1355	105	360	2794	3908
31KA1600	1264	1374	1473	1212	1311	1132	55	81	448	54	4	1364	50	1573	1474	105	360	3459	5043
31KA1800	1351	1461	1562	1299	1400	1219	55	81	474	54	4	1451	50	1662	1561	105	360	4199	5973
31KA2000	1440	1550	1651	1388	1489	1308	55	81	499	54	4	1540	50	1751	1650	105	360	4982	7054
31KA2250	1545	1655	1758	1493	1596	1413	55	81	531	54	4	1645	50	1858	1755	105	360	6120	8441
31KA2500	1633	1743	1845	1581	1683	1501	55	81	555	54	4	1733	50	1945	1846	105	360	7189	9738
31KA3000	1821	1931	2035	1745	1849	1671	63	93	611	62	4	1921	50	2135	2031	120	410	9837	12896

As an option studs can be supplied instead of sockets in reduced fitting space areas.

Bearing design loads

Bearings should be selected to suit the appropriate design code. If in doubt seek our advice.

Bearing movement

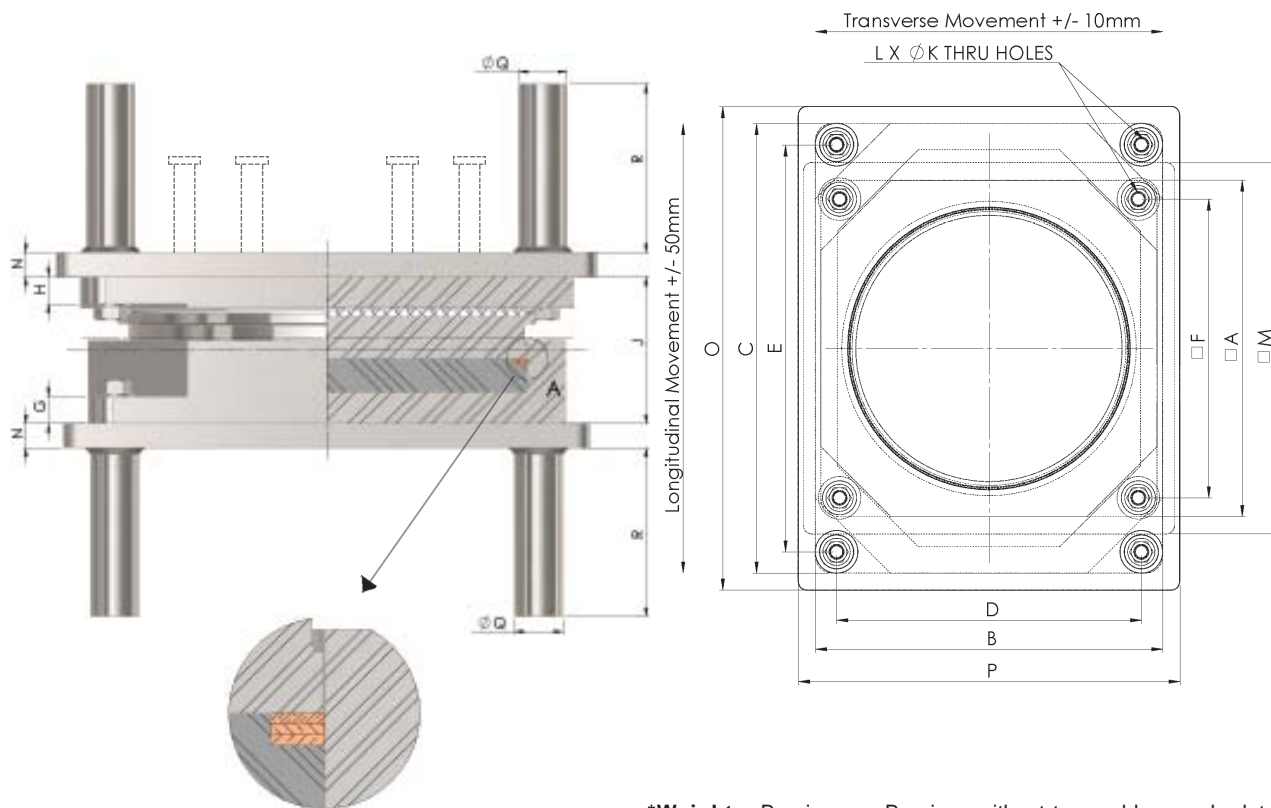
22KA Bearings are designed to accommodate movement in both longitudinal and transverse directions.

Concrete stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

At the **Maximum Vertical Load** capacity tabulated the mean stress approaches 20N/mm².

Bearing Part no	<u>Serviceability Limit State Loads</u>			<u>Strength Limit State Loads</u>
	Maximum Load (kN)	Dead Load (kN)	Minimum Load (kN)	Maximum Load (kN)
22KA0050	706	519	184	917
22KA0075	1017	743	265	1322
22KA0100	1380	1007	359	1794
22KA0130	1710	1243	445	2223
22KA0160	2039	1491	530	2650
22KA0200	2586	1888	673	3361
22KA0250	3044	2206	990	3957
22KA0300	3705	2695	1204	4816
22KA0350	4181	3033	1359	5435
22KA0400	4685	3391	1523	6090
22KA0450	5218	3776	1696	6783
22KA0500	5536	4015	2519	7196
22KA0550	6114	4412	2782	7948
22KA0600	6413	4637	2918	8336
22KA0700	7683	5563	3496	9987
22KA0800	8709	6287	3963	11321
22KA0900	10177	7359	4631	13230
22KA1000	11352	8188	5165	14757
22KA1200	13586	9761	7065	17661
22KA1400	16354	11771	8504	21260
22KA1600	18855	13535	9805	24511
22KA1800	21532	15467	11197	27991
22KA2000	24387	17475	12682	31703
22KA2250	28045	20016	14584	36458
22KA2500	31288	22345	16270	40674
22KA3000	38799	27724	22092	50438



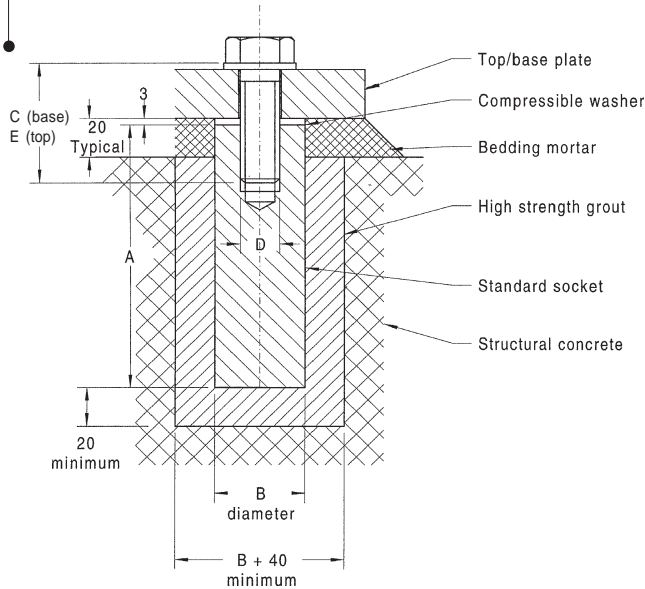
*Weights Bearing = Bearings without top and base sub plates
 Assembly = Bearings with top and base sub plates

Bearing Part no	Installation Dimensions Bearing (mm)												Installation Dimensions Sub Plate (mm)						*Weights (kg)	
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	Bearing	Assembly	
22KA0050	240	320	372	281	333	205	18	18	91	14	4	280	20	412	360	35	110	69	116	
22KA0075	280	360	410	321	371	245	18	18	96	14	4	320	20	450	400	35	110	97	158	
22KA0100	324	404	450	354	400	279	23	23	104	18	4	364	20	490	444	40	140	145	219	
22KA0130	361	441	486	391	436	316	23	23	114	18	4	401	20	526	481	40	140	189	285	
22KA0160	395	475	518	425	468	351	23	23	122	18	4	435	20	558	515	40	140	236	343	
22KA0200	445	525	565	464	504	391	28	28	136	22	4	485	20	605	565	50	170	322	454	
22KA0250	482	562	599	501	538	426	28	28	146	22	4	522	20	639	602	50	170	391	538	
22KA0300	533	613	647	552	586	478	28	28	157	22	4	573	20	687	653	50	170	519	716	
22KA0350	572	652	682	580	610	507	33	33	169	26	4	612	20	722	692	55	200	616	827	
22KA0400	604	684	713	612	641	539	33	33	180	26	4	644	20	753	724	55	200	732	961	
22KA0450	638	718	744	646	672	573	33	33	188	26	4	678	20	784	758	55	200	784	1025	
22KA0500	656	736	762	664	690	578	33	33	193	26	4	696	20	802	776	55	200	843	1129	
22KA0550	692	772	793	700	721	614	33	33	200	26	4	772	40	873	852	55	200	961	1520	
22KA0600	708	788	811	716	739	630	33	33	207	26	4	788	40	891	868	55	200	1041	1620	
22KA0700	774	854	874	782	802	696	33	33	228	26	4	854	40	954	934	55	200	1362	2030	
22KA0800	825	905	920	816	831	729	40	40	240	32	4	905	40	1000	985	70	240	1639	2375	
22KA0900	892	972	983	883	894	796	40	40	256	32	4	972	40	1063	1052	70	240	1993	2916	
22KA1000	943	1043	1031	954	942	847	40	40	271	32	4	1023	40	1111	1123	70	240	2329	3326	
22KA1200	1047	1147	1121	1058	1032	952	40	40	303	32	4	1127	40	1201	1227	70	240	3130	4273	
22KA1400	1151	1251	1217	1145	1111	1037	48	48	329	38	4	1231	40	1297	1331	80	300	4081	5398	
22KA1600	1234	1334	1296	1228	1190	1120	48	48	354	38	4	1334	50	1396	1434	80	300	5033	6874	
22KA1800	1321	1421	1376	1315	1270	1207	48	48	374	38	4	1421	50	1476	1521	80	300	6088	8134	
22KA2000	1407	1507	1454	1384	1331	1275	55	55	393	44	4	1507	50	1554	1607	105	360	7296	9564	
22KA2250	1508	1608	1549	1485	1426	1376	55	55	419	44	4	1608	50	1649	1708	105	360	8947	11494	
22KA2500	1595	1695	1629	1572	1506	1463	55	55	439	44	4	1695	50	1729	1795	105	360	10448	13239	
22KA3000	1776	1876	1798	1753	1675	1644	55	55	482	44	4	1876	50	1898	1976	105	360	14214	17665	

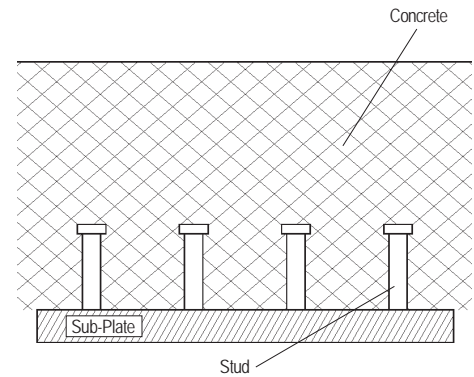
As an option studs can be supplied instead of sockets in reduced fitting space areas.

Standard Fixings for KA Series Bearings

KA Series fixings - with socket



KA Series fixings - with studs



With steel to steel connections bolting or welding of Ekspan sub-plates is possible.

Notations to dimensional references for bearing diagrams

- | | |
|---|---|
| <ul style="list-style-type: none"> A - Base plate square dimension - length or breadth of base plate (square dimension - mm) B - Width of top plate (mm) C - Length of top plate (mm) D - Transverse width between the fixings on top plate (mm) E - Longitudinal length between the fixings on top plate (mm) F - Longitudinal / transverse distance between the fixings on base plate (square dimension - mm) G - Lug thickness of base plate (mm) H - Lug thickness of top plate (mm) | <ul style="list-style-type: none"> J - Overall height of the nominal bearing (mm) K - Hole diameter of the fixings on top and base plate L - No. of fixings on top and base plate M - Length and breadth of base sub plate (square dimension - mm) N - Thickness of base or top sub plate (mm) O - Length of top sub plate (mm) P - Width of top sub plate (mm) Q - Diameter of top/base socket (mm) R - Length of top/base socket (mm) |
|---|---|



GOOD INSTALLATION

Mechanical guide bearing and upper adaptor plate correctly installed.
All bearing interfacing surfaces are horizontal.
All surfaces are free from contaminants.



BAD INSTALLATION

Bearing incorrectly installed.
Over rotation due to poor grout bed. Fasteners not tightened. Additional washers used as packers. Void between top plate and super structure. Stainless steel sliding surface painted on site.

Installation

CONSIDER THE EFFECTS IF BEARINGS ARE NOT CORRECTLY INSTALLED

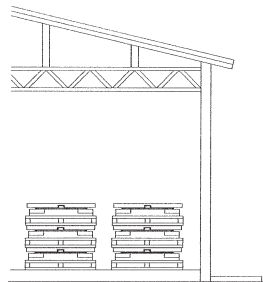
Our structural bearings are manufactured to close tolerances by skilled technicians working in clean conditions. To obtain the requisite performance from bearings it is imperative that they are properly handled at the work site and installed with the same care as when they were assembled in the factory. The following notes will assist those responsible for specifying and supervising the installation of structural bearings.

Please note that Ekspan are able to provide installation, supervision or training of personnel. A test paper can also be supplied to verify the understanding of installers.

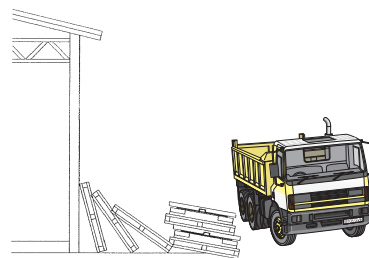
Bearings must be installed with precision to meet the bridge and bearing design criteria.

Storage

Our structural bearings are protected from contamination under normal working conditions by an efficient sealing system. Care should be taken in storage to prevent contamination and damage to the working surfaces.



Correct

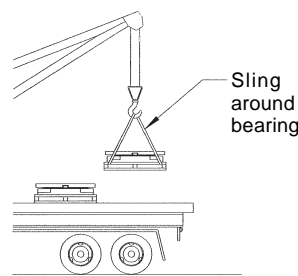


Incorrect

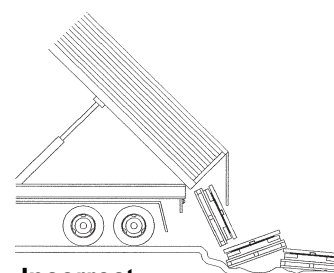
Handling

Robust transportation devices are fitted to all bearings to ensure that the components are maintained in their correct relative positions before and during installation. The devices are normally finished in red paint. Unless special devices have been specified, they should not be used for slinging or suspending the bearings beneath beams.

Due to unpredictable conditions, which may occur during transportation or handling on site, the alignment and presetting (if applicable) of the assembled bearing should be checked against the drawing. Do not endeavour to rectify any discrepancies on site. The bearing should either be returned to Ekspan or, where practical, an Ekspan engineer should be called in to inspect and reassemble. Bearings too heavy to be lifted by hand should be properly slung using lifting equipment.



Correct



Incorrect

Presetting

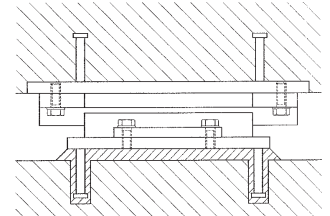
If bearings are required to be preset eg where once only large movements may occur during stressing operations, this should be specified as a requirement and should only be carried out in our works prior to despatch. Do not attempt this operation on site.

Bedding

Bearings must be supported on a flat rigid bed. Steel spreader plates must be machined flat and smooth to mate exactly with the bearings' upper and lower faces. Bearings may also be bedded on epoxy or cement mortar or by dry packing. Whichever system is preferred for the particular structure it is of extreme importance that the final bedding is free from high or hard spots, shrinkage, voids, etc.

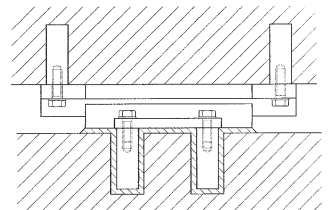
Unless there is a specific design requirement, the planar surfaces must be installed in a horizontal plane. The correct installation of bearings is vital for the bearing performance. Costly repairs become necessary all too often due to inadequate specification or poor site supervision. The bearings should not be loaded until the bedding mortar has cured.

Fixing bearings to concrete using permanent anchor plates

***Cast-in-situ structures***

Care must be taken to ensure that the bearings are not damaged by the formwork or contaminated by concrete seepage. The interface between the top plate and the formwork should be protected and sealed. Owing to the loading effects of a wet concrete mass, the top plates should be propped to prevent rotation and plate distortion. Bearing top plates of PTFE sliding bearings are especially vulnerable in this respect.

Fixing cast-in-situ structures ensure that the bearing working surfaces are protected and supported to prevent distortion and rotation

***Bearing removability***

Where possible, bearings should be fixed in such a manner as to facilitate removal. Our bearings have generally been designed with this in mind. However, when selecting the bearing type preferred, the removability feature should be highlighted in your enquiry.

Removal of transport brackets

These brackets, normally painted red should only be removed when the bearing is properly installed and ready for operation.

Check list for the installation of bearings

DO-

1. Handle carefully and where necessary with adequate craneage.
2. Store in a clean dry place.
3. Ensure that the bearings are installed in the correct location and orientation.
4. Ensure that the bearings are installed on a flat rigid bed before the design loads are applied.
5. Ensure that the fixings are uniformly tightened.
6. Complete any site coatings and make good paint damaged during handling and installation.
7. Protect working surfaces during the placing of in-situ concrete.
8. Keep the bearings and surrounding areas clean.
9. Remove any temporary transit clamps etc. before the bearings are required to operate.
10. Take special care to support top plates when casting in-situ concrete.

DO NOT-

1. Dismantle the bearing on site.
2. Leave bearings uncovered.
3. Attempt to modify without our approval.
4. Install without qualified supervision.

Site Coating

Care should be taken to ensure that working surfaces are not damaged in any site coating operation. After installation damaged coatings must be repaired irrespective of any call for site coatings. Exposed fixing bolts should be protected after final tightening. Any tapped holes exposed after removal of transportation brackets etc. (coloured red) should be sealed with self-vulcanizing silicone sealant.

Routine maintenance of bearings

1. Immediately following installation bearings shall be inspected to ensure that all aspects of 'Installation of bearings' have been adhered to and bearings shall subsequently be re-inspected not less frequently than every two years after their installation.
2. Paint and /or other specified protective coatings must be maintained in good and efficient condition and free from scratches or chips. Any areas of the protective coating showing damage or distress must be rectified.
3. Areas surrounding the bearings must be kept clean and dry and free from the adverse effects of external influences such as airborne debris or water/salt (for example emanating from leaking joints).
4. The wearing surfaces of the bearing must be checked to ensure that they are continuing to operate efficiently.
5. Fixing bolts must be checked for tightness.
6. Any bedding material showing signs of distress or ineffectiveness must be replaced and the reason for its failure investigated and corrected.
7. Routine inspections shall include a check that translational and rotational capacities of the bearing have not been exceeded and show no sign of being likely to exceed the requirements specified at the design stage.

Sample Quality Bearing Specification Clauses - KA Series Pot Bearings

- 1.01 The bearings should be designed and manufactured by Ekspan in accordance with Sections 14, 2008 Interim Revisions, AASHTO LRFD specifications and be constructed from steel grade EN100025 S355 J2G3.
(HIGH QUALITY STEEL GOOD LOADING CAPACITIES)
- 1.02 Bearings should be designed to allow for combination load effects.
- 1.03 The sliding surface of the bearing must be fully welded to the top plate of the bearing. This prevents crevice corrosion de-lamination of the stainless steel ensuring bearing longevity. The stainless steel sliding surface should be mirror polished provided with a surface finish of 8.0 μ -in. RMS or better in accordance with Sections 14.7.2.2.
Paint will be applied to overlap the welded area of the sliding surface so as to protect the area from the risk of corrosion.
(REDUCES CORROSION IN UNLOADED AREAS WHICH IS THE CAUSE OF MOST BEARING FAILURES)
- 1.04 PTFE bearing surfaces shall be Virgin material with a dimpled surface and lubricated with silicon grease in accordance with Sections 14.7.2. The PTFE shall be retained in the bearing by a machined recess.
(FRICTION IS AT A MINIMUM, LIFE IS EXTENSIVE AND THE PTFE CANNOT "CREEP")
- 1.05 Guide sliding surfaces should also be fully welded and mirror polished. The wear surface of the guide shall be a mechanically restrained high load resistant material DU(B) in accordance with Sections 14.7.7.
(THE LIFE OF BEARINGS IS EXTENDED WITH USE OF GOOD WEAR MATERIALS)
- 1.06 Pot bearing pistons are machined with a tightly controlled tolerance between the pot and the piston.
(REDUCE EDGE PRESSURE EFFECTS ON RUBBER)
- 1.07 The rubber pad in a pot bearing is to have a minimum of 3 brass rings, which should be sized to meet and fit tight to the pot wall. 14.7.4.5
(THIS IS KEY TO ENSURE THAT THE RUBBER IS RETAINED IN THE POT - IF NOT THEN THE RUBBER MAY EXTRUDE UNDER LOAD)
- 1.08 The rubber pad shall meet Section 14.7.4, and shall be made from a compound based on virgin natural rubber or virgin neoprene conforming to the requirements of Section 18.3 of the AASHTO LRFD Bridge Construction Specifications. The nominal hardness shall lie between 50 and 60 on the Shore A scale.
(THIS MEANS THAT WHEN THE BEARING IS LOADED THERE ARE NO AIR GAPS TO CLOSE ENSURING THAT DATUMS ARE MAINTAINED)
- 1.09 The rubber pad shall fit in the pot without need for deflection. Corners should be moulded in such a way as to ensure that the pad fits to the machined pot base.
(THIS ALSO REDUCES AIR ENTRAPMENT)
- 1.10 The outer surfaces of the bearing will be blasted to SA 3 and have the contract specified paint system applied.
- 1.11 Bearings to be supplied with Ekspan plates. Bearings will be supplied with base and top sockets.

Ekspan advise that the specification clauses above demonstrate good practice to ensure good quality bearings.

Notes

CONVERSION TABLE

METRIC

Length	1 mm	= 0.03937 in
	1 m	= 3.281 ft
	1 m	= 1.094 yd
Area	1 mm ²	= 0.00153 in ²
	1 m ²	= 10.764 ft ²
	1 m ²	= 1.196 yd ²
Force	1 N	= 0.2248 lbf
	1 kN	= 0.1004 tonf
Stress and pressure	1 N/mm ²	= 145 lbf/in ²
	1 N/mm ²	= 0.0647 tonf/in ²
	1 N/m ²	= 0.0208 lbf/ft ²
	1 kN/m ²	= 0.0093 tonf/ft ²

IMPERIAL

Length	1 in	= 25.4 mm
	1 ft	= 0.3048 m
	1 yd	= 0.9144 m
Area	1 in ²	= 645.2 mm ²
	1 ft ²	= 0.0929 m ²
	1 yd ²	= 0.8361 m ²
Force	1 lbf	= 4.448 N
	1 tonf	= 9.964 kN
Stress and pressure	1 lbf/in ²	= 0.0068 N/mm ²
	1 tonf/in ²	= 15.44 N/mm ²
	1 lbf/in ²	= 47.88 N/m ²
	1 tonf/ft ²	= 107.3 kN/m ²

CIVIL ENGINEERING - PRODUCTS

- **BRIDGE AND STRUCTURAL SUPPORT BEARINGS** (BS5400, EN1337, AASHTO)
- POT BEARINGS
- ELASTOMERIC BEARINGS
- SPHERICAL BEARINGS
- ROCKER BEARINGS
- GUIDED BEARINGS
- ROLLER BEARINGS
- RUBBER PAD BEARINGS
- RUBBER STRIP BEARINGS
- HIGHWAY APPROVED EXPANSION JOINTS
- SUB-SURFACE DRAINAGE
- DAMPERS & SHOCK TRANSMISSION UNITS
- BUILDING SEALS/JOINTS
- GROUTS & ADHESIVES

FOR APPLICATION IN:

Bridges; Steel Structures; Tall Buildings; Shopping Centres; Stadiums; Towers; Swing Bridges, Piers and Jetties; RORO Ferry Terminals; Building Vibration Isolation; Carparks; Walkways.



INDUSTRIAL PRODUCTS

- OFFSHORE BRIDGE AND TOPSIDE BEARINGS
- MACHINE SUPPORT BEARINGS
- PLATFORM SUPPORT BEARINGS
- ACOUSTIC BEARINGS
- ANTI-VIBRATION BEARINGS
- PETRO/CHEMICAL PIPE SUPPORT BEARINGS
- BUILDING SEALS/JOINTS
- WALL/FLOOR EXPANSION JOINTS
- SPECIALIST MOVEMENT SOLUTIONS
- LARGE TANK SUPPORTS
- STEEL SUPPORT BEARINGS
- LARGE MOVING STRUCTURES

FOR APPLICATION IN:

Ships; Ramps and Topsides; Oil Platforms; Submarines; Generator Supports; Conveyor Supports; Machine Mounts; Large Tank and Vessel Supports; Vibration Isolation; Pipeline Supports; Radio Telescopes.



RENEWABLE SERVICES

- OVERLAND PIPE SUPPORT BEARINGS
- ROTARY BEARINGS TECHNOLOGY
- TURBINE BEARING TECHNOLOGY
- TURBINE BLADE TESTING
- TURBINE FOUNDATIONS & SUPPORTS
- WAVE TECHNOLOGY
- SPECIALIST FABRICATION SERVICES
- VESSEL SUPPORT SYSTEMS
- FLOOD DEFENCE SYSTEMS
- SPECIALIST TEST EQUIPMENT - DESIGN TO INSTALLATION

FOR APPLICATION IN:

Hydro-Electric Plants; Wind Turbine Construction; Testing of Turbine Blades; Wave Power Devices; Reaction Vessels for Wave Power; Foundations for Offshore Turbines.



SERVICE - OPERATION & MAINTENANCE

- PRINCIPLE CONTRACTOR SERVICES
- SPECIALIST SUB-CONTRACT SERVICES
- BEARING & EXPANSION JOINT INSTALLATION
- BRIDGE INSPECTION/MAINTENANCE
- SPECIALIST SWING BRIDGE SYSTEMS
- EXPANSION JOINT INSPECTION/MAINTENANCE
- BRIDGE/STRUCTURAL JACKING, AND TEMPORARY WORKS
- BRITISH WATERWAYS – LOCK GATES
- OFFSHORE STRUCTURAL INSPECTION/MAINTENANCE
- CABLE STAY INSPECTION/ MAINTENANCE
- POST TENSION SYSTEM MAINTENANCE
- LUBRICATION SYSTEMS
- SPECIALIST STRUCTURAL MONITORING

FOR APPLICATION IN:

Bridges; Steel Structures; Tall Buildings; Shopping Centres; Stadiums; Towers; Swing Bridges, Piers and Jetties; RORO Ferry Terminals; Building Vibration Isolation; Carparks; Walkways.



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