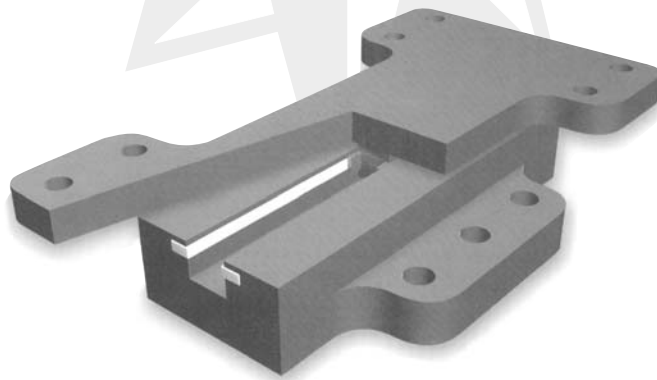




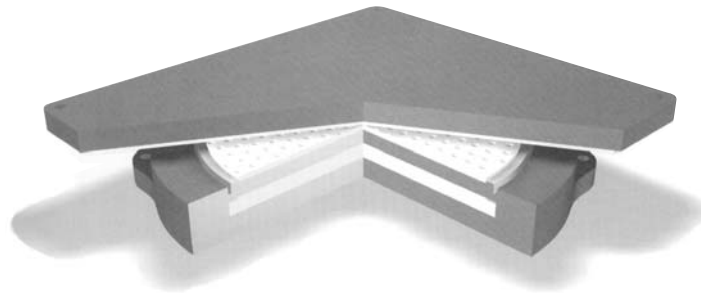
**F Series**

Fixed & Guided Bearings



**K Series**

Fixed & Sliding Pot Bearings



[www.ekspan.com](http://www.ekspan.com)

## Description

F Series is a range of structural bearings for locating structures. They are designed to react only horizontal loads. Fixed and guided bearings are available as standards for loads up to 2352 kN. The bearings fully meet the requirements of BS 5400 Section 9. They are manufactured to meet quality standards applicable throughout the world.

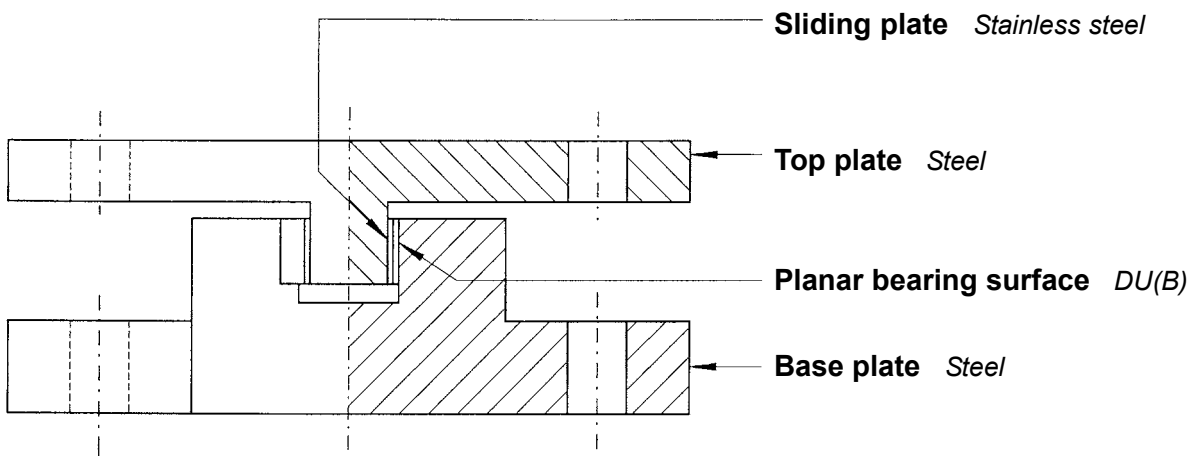
## Bearing types

F series bearings are available in three forms -

- 10F** Fixed
- 11G & 21F** Free to move in one horizontal direction

In addition all bearings can accept compressive movements of up to 3mm which facilitates their use with bearings (such as elastomeric types) which deflect noticeably under load.

## Typical 21F details



The sections through the top plate and base plate are staggered.

## Attachment

All three types, **10F**, **11F** and **21F**, have the facility for bolted attachment of the base to sockets, or an independent attachment plate. **10F and 21F top plates can also be fixed by way of bolts to sockets or an independent attachment plate.**

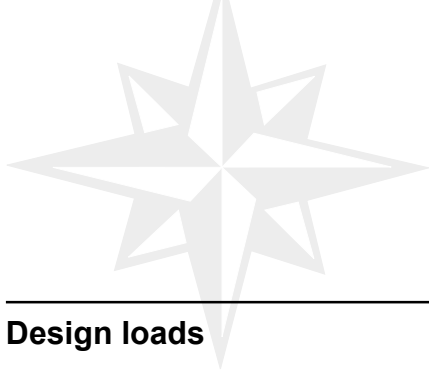
**The 11F bearing has been designed such that the top plate takes the form of a tang permanently embedded in infill concrete between adjacent precast elements.**

## Support and Installation

**Important** - See pages 21 - 23 for Installation and Maintenance.

The bearings are fitted with transport brackets which maintain a clearance for vertical movement. These must be removed after installation.

## Concrete stress



Where suitable reinforcement 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.

With these bearings it is important to ensure that the sockets are embedded in structural concrete not less than the depth indicated on page 6 and in the case of 11F types that the tang is embedded to dimension H on page 5. A material of adequate strength must be used in conjunction with suitable reinforcement to resist bursting and tensile forces.

## Design loads

The designation of loading varies from country to country. These bearings are designed to BS5400 limit state loads. It may be assumed that the Serviceability Limit State load may be substituted for the maximum load in a working stress design.

## Rotation

All the bearings can rotate at least 0.01 radians about the transverse horizontal axis. The **10F** can rotate at least 0.01 radians about all other axes.

## Movement

The The dimensions for the **11F & 21F** bearings allow for a longitudinal movement of  $\pm 50\text{mm}$ . Additional movements in increments of 50mm total can be supplied. **We will be pleased to advise but this will change the top plate dimensions.**

**NB 11F & 21F bearings should not be used where movement at right angles to the guided direction is required.**

## Designation of part no.

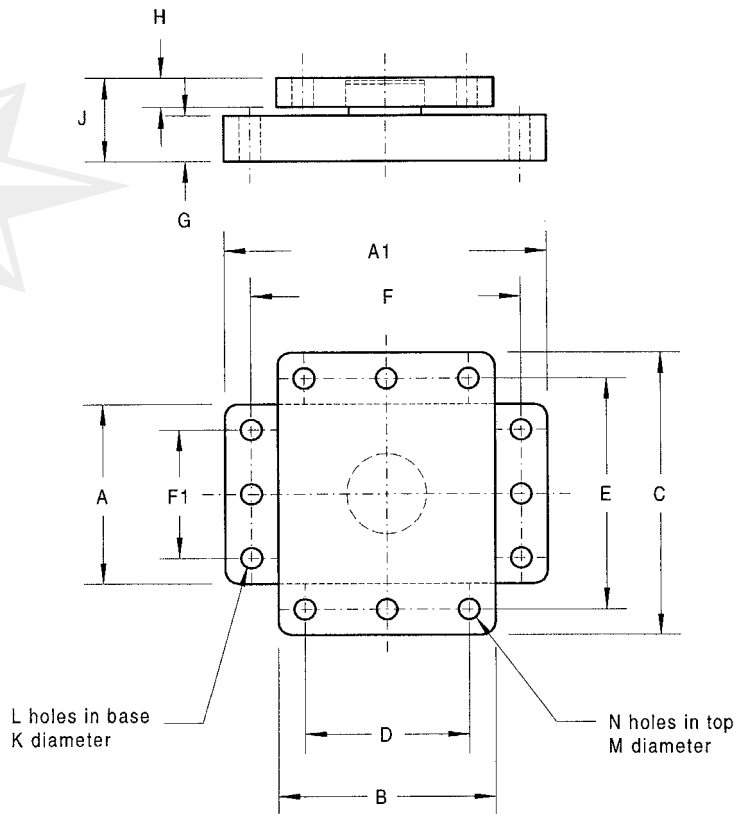
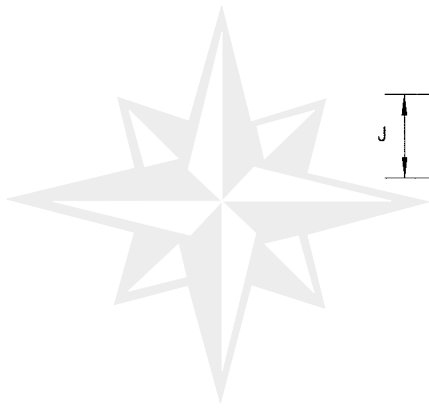
The part number of a bearing is simply built up as below –  
eg.

|   | Type       | Maximum Working Load (kN) | Movement Longitudinal (mm) | Fixings Top | Fixings Base |
|---|------------|---------------------------|----------------------------|-------------|--------------|
| a | <b>10F</b> | 250                       |                            | S           | S            |
| b | <b>11F</b> | 250                       | 100                        | N           | S            |
| c | <b>21F</b> | 250                       | 100                        | B           | S            |

The basic part number is shown in the tables on pages 4 and 5. Select the type of attachment required and the smallest bearing in that range which can accommodate the specified operating conditions.

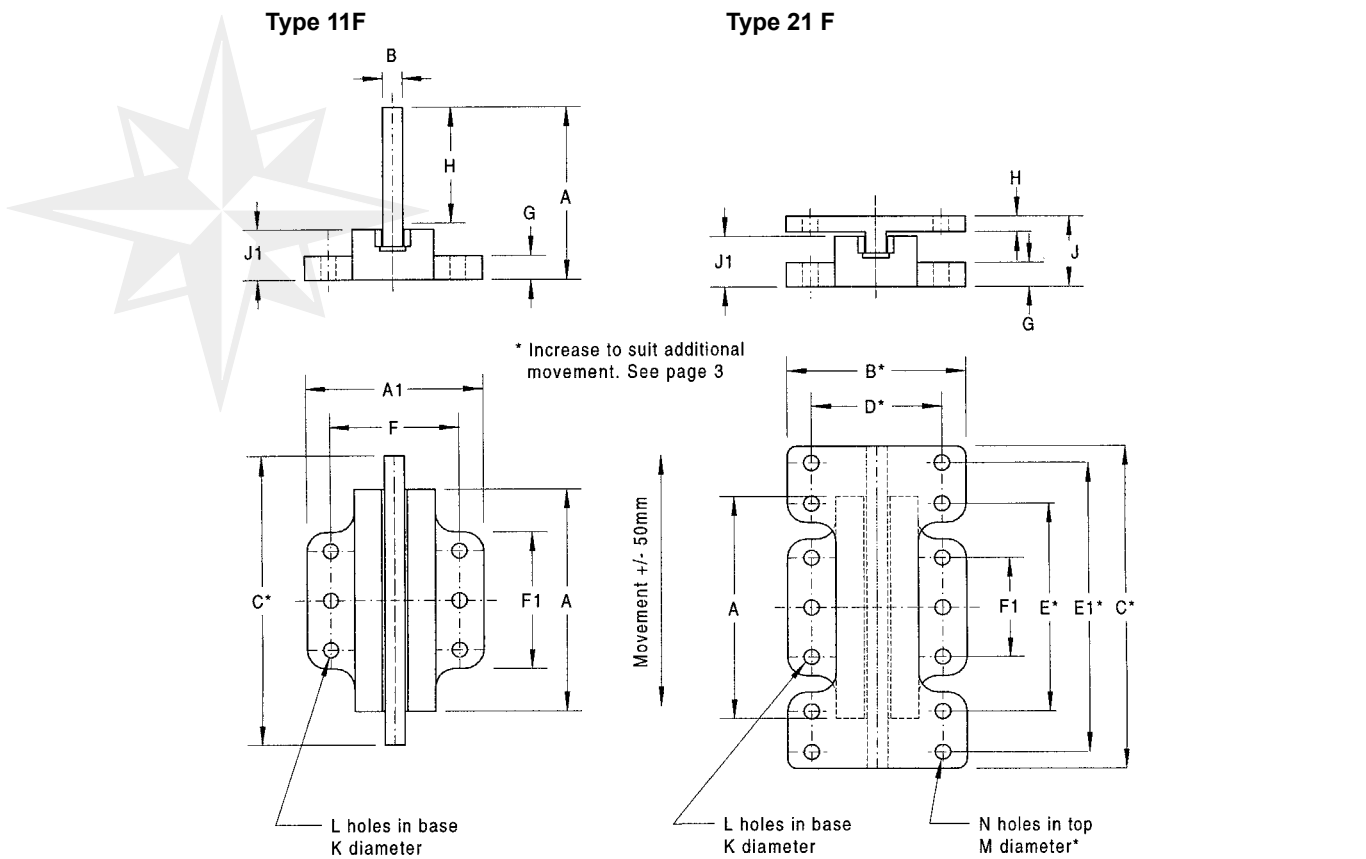
e.g. For **a** above the full part number would be **10F25/SS**  
**b** above the full part number would be **11F25/100/NS**  
**c** above the full part number would be **21F25/100/BS**

'c' above denotes a guide bearing with bolted attachment to the top plate and bolts and sockets to the base plate. Maximum load capacity is 254kN SLS/420kN ULS and total movement capacity is 100mm.



| Bearing Part no | SLS Load (kN) | ULS Load (kN) | Installation dimensions (mm) |     |     |     |     |     |     |     |    |    |     |    |   |    |   | Approx Weight *(Kg) |
|-----------------|---------------|---------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|----|----|-----|----|---|----|---|---------------------|
|                 |               |               | A                            | A1  | B   | C   | D   | E   | F   | F1  | G  | H  | J   | K  | L | M  | N |                     |
| 10F15           | 170           | 229           | 140                          | 260 | 140 | 240 | 90  | 190 | 200 | 80  | 35 | 30 | 77  | 22 | 4 | 18 | 4 | 18                  |
| 10F25           | 254           | 420           | 170                          | 330 | 190 | 290 | 130 | 230 | 260 | 100 | 45 | 30 | 87  | 26 | 4 | 22 | 4 | 33                  |
| 10F35           | 450           | 630           | 210                          | 410 | 250 | 350 | 180 | 280 | 330 | 130 | 55 | 35 | 103 | 32 | 4 | 26 | 4 | 61                  |
| 10F50           | 620           | 840           | 280                          | 440 | 280 | 440 | 200 | 360 | 360 | 200 | 65 | 40 | 118 | 32 | 6 | 32 | 4 | 101                 |
| 10F80           | 873           | 1100          | 280                          | 490 | 330 | 440 | 250 | 360 | 410 | 200 | 70 | 45 | 128 | 32 | 6 | 32 | 4 | 126                 |
| 10F120          | 1320          | 1720          | 360                          | 640 | 440 | 520 | 360 | 440 | 540 | 260 | 80 | 50 | 144 | 38 | 6 | 32 | 6 | 234                 |
| 10F170          | 1742          | 2352          | 410                          | 750 | 530 | 610 | 430 | 510 | 640 | 300 | 95 | 55 | 165 | 44 | 6 | 38 | 6 | 368                 |

\* Excluding fixings



| Bearing Part no | SLS Load (kN) | ULS Load (kN) | Installation dimensions (mm) |     |    |     |     |     |    |     |     |     |    |   |     | Approx Weight *(Kg) |
|-----------------|---------------|---------------|------------------------------|-----|----|-----|-----|-----|----|-----|-----|-----|----|---|-----|---------------------|
|                 |               |               | A                            | A1  | B  | C   | F   | F1  | G  | H   | J   | J1  | K  | L |     |                     |
| 11F15           | 170           | 229           | 210                          | 210 | 22 | 350 | 160 | 80  | 25 | 126 | 188 | 52  | 18 | 4 | 19  |                     |
| 11F25           | 254           | 420           | 260                          | 290 | 27 | 400 | 210 | 90  | 35 | 174 | 251 | 67  | 26 | 4 | 39  |                     |
| 11F35           | 450           | 630           | 340                          | 340 | 32 | 480 | 240 | 110 | 40 | 210 | 297 | 77  | 32 | 4 | 66  |                     |
| 11F50           | 620           | 840           | 400                          | 350 | 37 | 540 | 250 | 110 | 45 | 228 | 325 | 87  | 32 | 4 | 90  |                     |
| 11F80           | 873           | 1100          | 470                          | 370 | 42 | 610 | 270 | 210 | 50 | 245 | 360 | 105 | 32 | 6 | 138 |                     |
| 11F120          | 1320          | 1720          | 580                          | 430 | 52 | 720 | 320 | 230 | 60 | 310 | 435 | 115 | 38 | 6 | 235 |                     |
| 11F170          | 1742          | 2352          | 660                          | 490 | 57 | 800 | 360 | 280 | 70 | 366 | 511 | 135 | 44 | 6 | 347 |                     |

| Bearing Part no | SLS Load (kN) | ULS Load (kN) | Installation dimensions (mm) |     |     |     |     |     |     |     |     |    |    |     |     |    |   |    | Approx Weight *(Kg) |     |
|-----------------|---------------|---------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|-----|----|---|----|---------------------|-----|
|                 |               |               | A                            | A1  | B   | C   | D   | E   | E1  | F   | F1  | G  | H  | J   | J1  | K  | L | M  |                     | N   |
| 21F15           | 170           | 229           | 210                          | 210 | 210 | 320 | 160 | 270 | 0   | 160 | 80  | 25 | 20 | 80  | 52  | 18 | 4 | 18 | 4                   | 19  |
| 21F25           | 254           | 420           | 260                          | 290 | 290 | 370 | 210 | 310 | 0   | 210 | 90  | 35 | 23 | 98  | 67  | 26 | 4 | 22 | 4                   | 36  |
| 21F35           | 450           | 630           | 340                          | 340 | 340 | 450 | 240 | 340 | 0   | 240 | 110 | 40 | 29 | 114 | 77  | 32 | 4 | 26 | 4                   | 63  |
| 21F50           | 620           | 840           | 400                          | 350 | 350 | 510 | 250 | 360 | 0   | 250 | 110 | 45 | 31 | 127 | 87  | 32 | 4 | 32 | 4                   | 84  |
| 21F80           | 873           | 1100          | 470                          | 370 | 370 | 680 | 270 | 440 | 620 | 270 | 210 | 50 | 33 | 147 | 105 | 32 | 6 | 26 | 8                   | 135 |
| 21F120          | 1320          | 1720          | 580                          | 430 | 430 | 790 | 320 | 500 | 710 | 320 | 230 | 60 | 43 | 167 | 115 | 38 | 6 | 32 | 8                   | 228 |
| 21F170          | 1742          | 2352          | 660                          | 490 | 490 | 890 | 360 | 570 | 800 | 360 | 280 | 70 | 61 | 206 | 135 | 44 | 6 | 38 | 8                   | 368 |

\* Excluding fixings

The fixings described below are designed to suit the requirements of F Series bearings.

## Standard F Series fixings

By adding a two letter suffix to the bearing part number the type of fixing may be designated -

First letter - Top plate fixing

Second letter - Base plate fixing

**N** - No fixings

**B** - Bolts and washers only

**S** - Bolts, washers & sockets

e.g. /BS signifies -

B (top plate fixing) Bolts & washers

S (base plate fixing) Bolts, washers & sockets

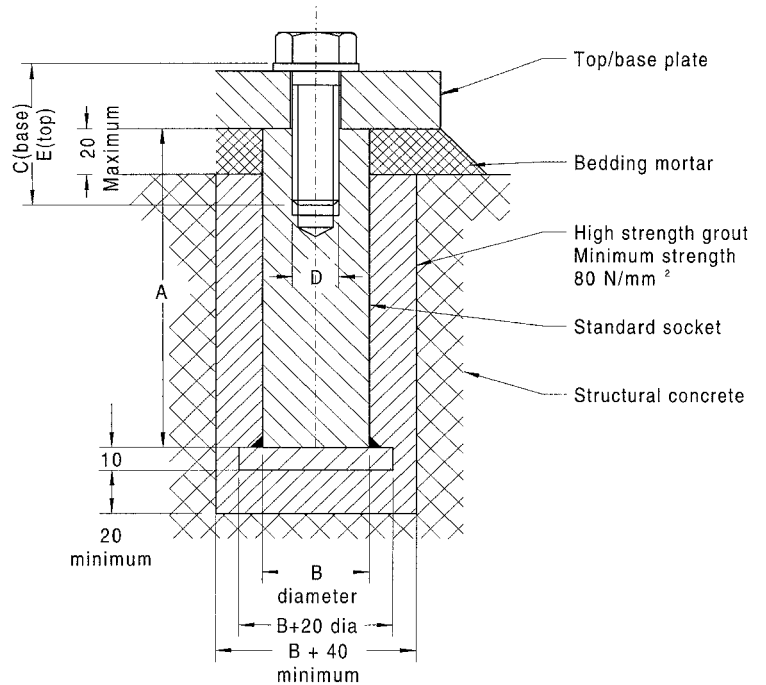
**N.B.** If standard F series fixings are not used, care should be taken to ensure that bolts can be fitted without dismantling the bearing.

Bolts are Hexagon Head to

BS 3692 grade 10.9

Sockets are steel to EN 10025

grade S275.



## Bolts and Sockets 10F

| Bearing Size | Base |     | Bolt |     | Socket |     | Top |     | Bolt |  |
|--------------|------|-----|------|-----|--------|-----|-----|-----|------|--|
|              | B    | A   | D    | C   | B      | A   | D   | E   |      |  |
| 15           | 50   | 170 | 20   | 70  | 40     | 140 | 16  | 60  |      |  |
| 25           | 55   | 200 | 24   | 90  | 50     | 170 | 20  | 70  |      |  |
| 35           | 70   | 240 | 30   | 110 | 55     | 200 | 24  | 80  |      |  |
| 50           | 70   | 240 | 30   | 120 | 70     | 240 | 30  | 90  |      |  |
| 80           | 70   | 240 | 30   | 120 | 70     | 240 | 30  | 100 |      |  |
| 120          | 80   | 300 | 36   | 140 | 70     | 240 | 30  | 100 |      |  |
| 170          | 105  | 360 | 42   | 160 | 80     | 300 | 36  | 110 |      |  |

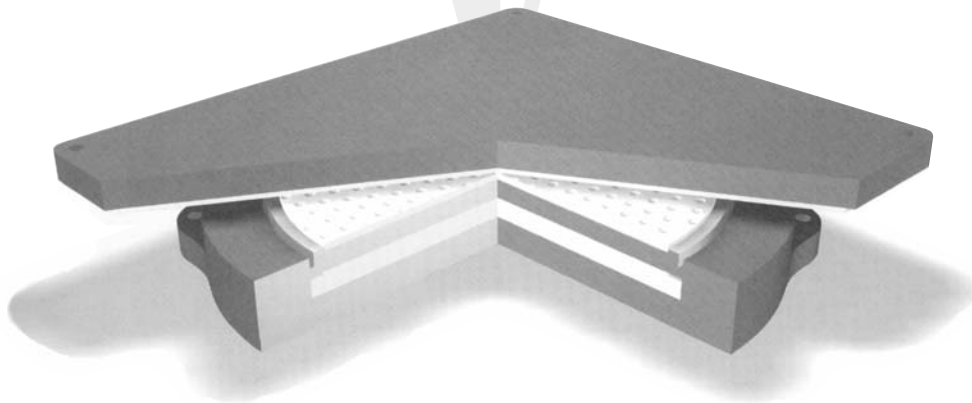
## Bolts and Sockets 11F & 21F

| Bearing Size | Base |     | Bolt |     | Socket |     | Top |     | Bolt |  |
|--------------|------|-----|------|-----|--------|-----|-----|-----|------|--|
|              | B    | A   | D    | C   | B      | A   | D   | E   |      |  |
| 15           | 40   | 140 | 16   | 50  | 40     | 140 | 16  | 50  |      |  |
| 25           | 55   | 200 | 24   | 80  | 50     | 170 | 20  | 60  |      |  |
| 35           | 70   | 240 | 30   | 90  | 55     | 200 | 24  | 70  |      |  |
| 50           | 70   | 240 | 30   | 100 | 70     | 240 | 30  | 80  |      |  |
| 80           | 70   | 240 | 30   | 100 | 55     | 200 | 24  | 70  |      |  |
| 120          | 80   | 300 | 36   | 120 | 70     | 240 | 30  | 90  |      |  |
| 170          | 105  | 360 | 42   | 140 | 80     | 300 | 36  | 120 |      |  |



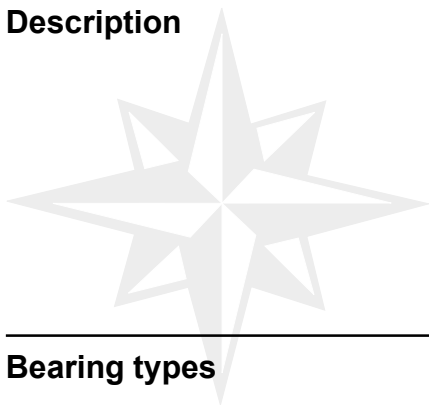
**K Series**

Fixed and Sliding Pot Bearings



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## Description



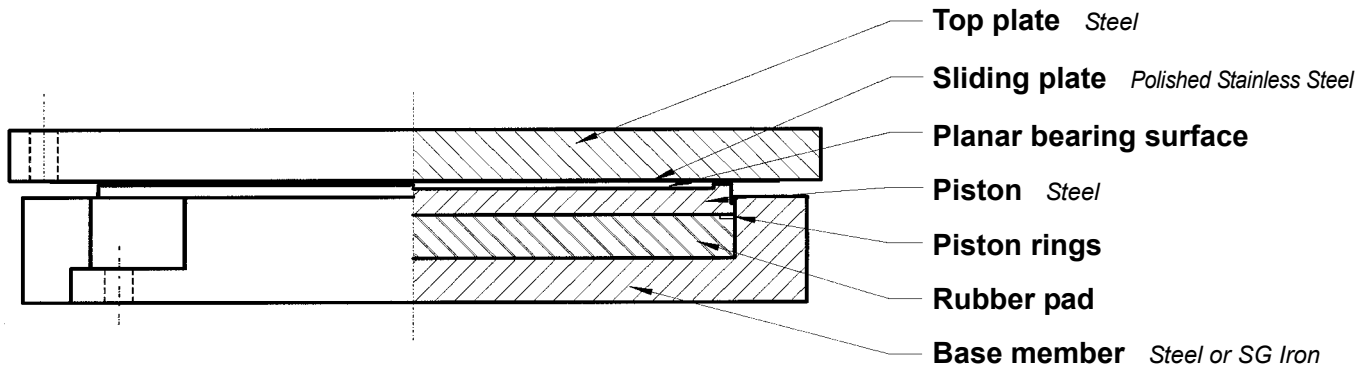
K series 2 & 3 is a range of structural bearings which meets the full requirements of BS5400 Sections 9.1 & 9.2 and those of the British Department of Transport. They are manufactured to international quality standards. The standard range comprises multi-axis rotation bearings in Fixed, Constrained and 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.

## Bearing types

K series bearings are available in five forms -

|                      |  |
|----------------------|--|
| <b>20 &amp; 30 K</b> | Fixed                                    |
| <b>21 &amp; 31 K</b> | Free to move in one horizontal direction |
| <b>22K</b>           | Free to move in any horizontal direction |

## Typical 22K 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. See page 20.

## Support and Installation

**Important** - See pages 21 - 23 for Installation and Maintenance.

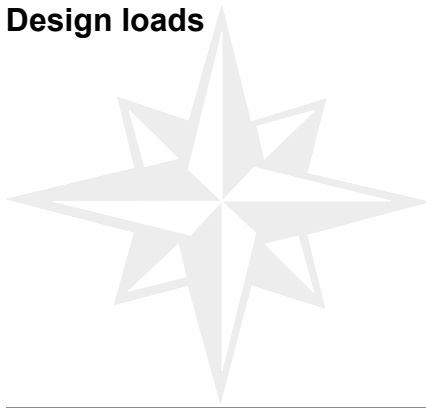
If the bearings are to be installed on a steel spreader plate Ekspan must be notified. The overall height will be reduced by 3mm in these cases.

## 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 **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm<sup>2</sup>.

## Design loads



The designation of loadings varies depending on the design code employed. The tabulated load capacities list Nominal rating, at which load the base concrete stress is 20N/mm<sup>2</sup> maximum. **The working stress / serviceability limit state** maximum loads are determined by the allowable PTFE stresses. The **ultimate limit state** maximum load characteristics are determined by the strength characteristics of the bearing and incorporate the material and partial safety factors  $\gamma_m$  and  $\gamma_3$  as required by BS5400.

**The practice of stating working loads, or nominal loads is inappropriate for limit state designs. The SLS and ULS capacities represent design load effects, i.e. nominal loads to which ALL the appropriate factors have been applied. Factored loads must be provided to ensure correct bearing selection.**

## Rotation

All the bearings can rotate at least 0.01 radians about any horizontal axis. The maximum for each bearing is shown in the tables.

## Movement

The dimensions for the **21K & 31K** (Constrained) and **22K** (Free) bearings are shown in the tables for the following movements -

### Longitudinal

**21 & 31K** 100mm total  
**22K** 100mm total

### Transverse

**21 & 31K** NIL (see pages 14 & 16)  
**22K** 20mm total

Movements in increments of 50mm total can be supplied. The top plate dimensions and the top plate fixing centres should be increased accordingly. **N.B. 21 & 31K 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          |                 | Fixings |      |
|---|------------|---------------------------|-------------------|-----------------|---------|------|
|   |            |                           | Longitudinal (mm) | Transverse (mm) | Top     | Base |
| a | <b>20K</b> | 5000                      |                   |                 | S       | S    |
| b | <b>31K</b> | 5000                      | 100               |                 | B       | S    |
| c | <b>22K</b> | 5000                      | 100               | 20              | N       | B    |

Full part no for  
**a** above is **20K 500/SS**  
**b** above is **31K 500/100/BS**  
**c** above is **22K 500/100/20/NB**

(for suffix letters see page 20)

c denotes a free K series Pot Bearing of -

|                       |                            |  |
|-----------------------|----------------------------|--|
| Working load capacity |                            | 5000kN maximum                                 |
| Movement              | Longitudinal<br>Transverse | 100mm total<br>20mm total                      |
| Fixing method         |                            | No fixings in top plate<br>Bolts in base plate |

### 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 20K 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 of 0.33 x the Nominal Vertical rating must be present.

At ULS, 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, the 30K series or a special bearing may be more appropriate.

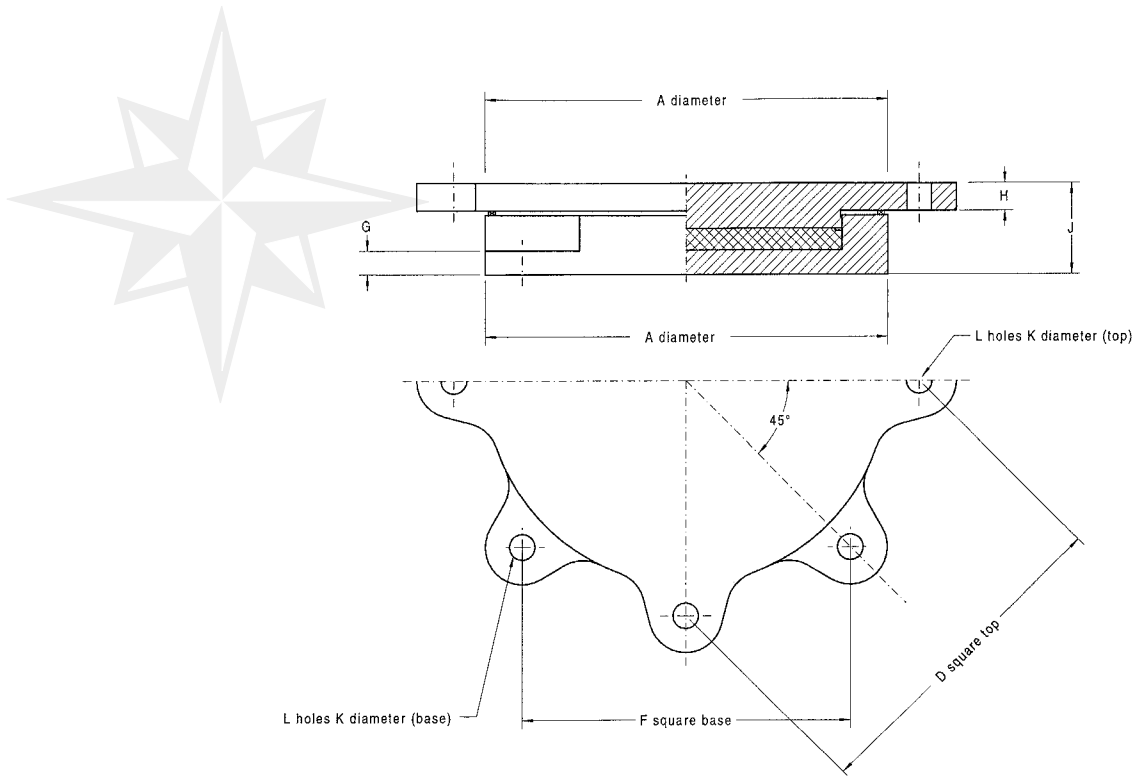
We will be pleased to advise.

### 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 **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm<sup>2</sup>.

| Bearing Part no | Nominal Vertical Rating Maximum (kN) | Working/Serviceability Limit State Loads |            | Ultimate Limit State Loads |            | Rotation (Radians) |
|-----------------|--------------------------------------|--|------------|----------------------------|------------|--------------------|
|                 |                                      | Vertical                                 | Horizontal | Vertical                   | Horizontal |                    |
| 20K0050         | 500                                  | 706                                      | 50         | 917                        | 65         | 0.025              |
| 20K0075         | 750                                  | 1017                                     | 75         | 1322                       | 97         | 0.021              |
| 20K0100         | 1000                                 | 1385                                     | 100        | 1800                       | 130        | 0.022              |
| 20K0130         | 1300                                 | 1734                                     | 130        | 2254                       | 169        | 0.017              |
| 20K0160         | 1600                                 | 2206                                     | 160        | 2867                       | 208        | 0.014              |
| 20K0200         | 2000                                 | 2733                                     | 195        | 3250                       | 253        | 0.011              |
| 20K0250         | 2500                                 | 3421                                     | 245        | 4290                       | 318        | 0.016              |
| 20K0300         | 3000                                 | 4017                                     | 290        | 5292                       | 377        | 0.013              |
| 20K0350         | 3500                                 | 4778                                     | 335        | 6211                       | 435        | 0.012              |
| 20K0400         | 4000                                 | 5410                                     | 380        | 7033                       | 494        | 0.011              |
| 20K0450         | 4500                                 | 6082                                     | 420        | 7906                       | 546        | 0.014              |
| 20K0500         | 5000                                 | 6792                                     | 465        | 8829                       | 604        | 0.013              |
| 20K0550         | 5500                                 | 7389                                     | 505        | 9605                       | 656        | 0.012              |
| 20K0600         | 6000                                 | 8011                                     | 545        | 10414                      | 708        | 0.011              |
| 20K0700         | 7000                                 | 9503                                     | 625        | 12353                      | 812        | 0.010              |
| 20K0800         | 8000                                 | 10751                                    | 700        | 13976                      | 910        | 0.012              |
| 20K0900         | 9000                                 | 12076                                    | 775        | 15698                      | 1007       | 0.011              |
| 20K1000         | 10000                                | 13478                                    | 840        | 17521                      | 1092       | 0.010              |
| 20K1200         | 12000                                | 16060                                    | 970        | 20878                      | 1261       | 0.011              |
| 20K1400         | 14000                                | 18869                                    | 1080       | 24529                      | 1404       | 0.010              |
| 20K1600         | 16000                                | 21382                                    | 1180       | 27796                      | 1534       | 0.011              |
| 20K1800         | 18000                                | 24052                                    | 1270       | 31267                      | 1651       | 0.010              |
| 20K2000         | 20000                                | 26880                                    | 1340       | 34944                      | 1742       | 0.011              |
| 20K2250         | 22500                                | 30171                                    | 1415       | 39222                      | 1839       | 0.010              |
| 20K2500         | 25000                                | 33653                                    | 1465       | 43748                      | 1904       | 0.011              |
| 20K3000         | 30000                                | 40115                                    | 1500       | 52149                      | 1950       | 0.010              |



| Bearing Part no | Installation Dimensions (mm) |      |     |    |    |     |    |   | Approx Weight *(kg) |
|-----------------|------------------------------|------|-----|----|----|-----|----|---|---------------------|
|                 | A                            | D    | F   | G  | H  | J   | K  | L |                     |
| 20K0050         | 190                          | 160  | 160 | 20 | 17 | 59  | 14 | 4 | 12                  |
| 20K0075         | 230                          | 190  | 180 | 20 | 17 | 59  | 14 | 4 | 17                  |
| 20K0100         | 260                          | 210  | 210 | 15 | 15 | 62  | 14 | 4 | 22                  |
| 20K0130         | 290                          | 230  | 230 | 15 | 18 | 64  | 14 | 4 | 29                  |
| 20K0160         | 330                          | 260  | 260 | 15 | 18 | 70  | 14 | 4 | 39                  |
| 20K0200         | 360                          | 280  | 280 | 20 | 17 | 74  | 14 | 4 | 49                  |
| 20K0250         | 400                          | 310  | 310 | 20 | 18 | 81  | 14 | 4 | 67                  |
| 20K0300         | 440                          | 340  | 330 | 20 | 15 | 82  | 14 | 4 | 80                  |
| 20K0350         | 480                          | 360  | 360 | 25 | 20 | 92  | 14 | 4 | 107                 |
| 20K0400         | 510                          | 390  | 390 | 25 | 19 | 91  | 14 | 4 | 119                 |
| 20K0450         | 540                          | 410  | 410 | 30 | 23 | 105 | 14 | 4 | 156                 |
| 20K0500         | 570                          | 430  | 430 | 25 | 22 | 105 | 18 | 4 | 173                 |
| 20K0550         | 600                          | 450  | 450 | 30 | 22 | 115 | 18 | 4 | 210                 |
| 20K0600         | 620                          | 470  | 470 | 30 | 26 | 117 | 18 | 4 | 227                 |
| 20K0700         | 670                          | 500  | 500 | 35 | 24 | 125 | 18 | 4 | 282                 |
| 20K0800         | 720                          | 540  | 530 | 40 | 28 | 139 | 18 | 4 | 366                 |
| 20K0900         | 760                          | 570  | 560 | 35 | 27 | 138 | 22 | 4 | 398                 |
| 20K1000         | 800                          | 600  | 600 | 35 | 27 | 138 | 22 | 4 | 440                 |
| 20K1200         | 880                          | 660  | 640 | 45 | 30 | 161 | 22 | 4 | 628                 |
| 20K1400         | 950                          | 710  | 700 | 45 | 34 | 166 | 26 | 4 | 746                 |
| 20K1600         | 1010                         | 760  | 740 | 45 | 38 | 180 | 26 | 4 | 919                 |
| 20K1800         | 1080                         | 810  | 790 | 50 | 37 | 189 | 26 | 4 | 1107                |
| 20K2000         | 1130                         | 850  | 830 | 50 | 41 | 204 | 32 | 4 | 1310                |
| 20K2250         | 1200                         | 900  | 870 | 55 | 41 | 204 | 32 | 4 | 1463                |
| 20K2500         | 1270                         | 950  | 910 | 55 | 49 | 222 | 32 | 4 | 1800                |
| 20K3000         | 1390                         | 1030 | 990 | 65 | 49 | 233 | 32 | 4 | 2238                |

\*Excluding fixings

### 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 30K 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 of 0.33 x the Nominal Vertical rating must be present.

At ULS, the actual load combination may permit the use of a vertical load higher than that shown in the table.

Where lower horizontal load capacities are required, the 20K series bearing may be more economical.

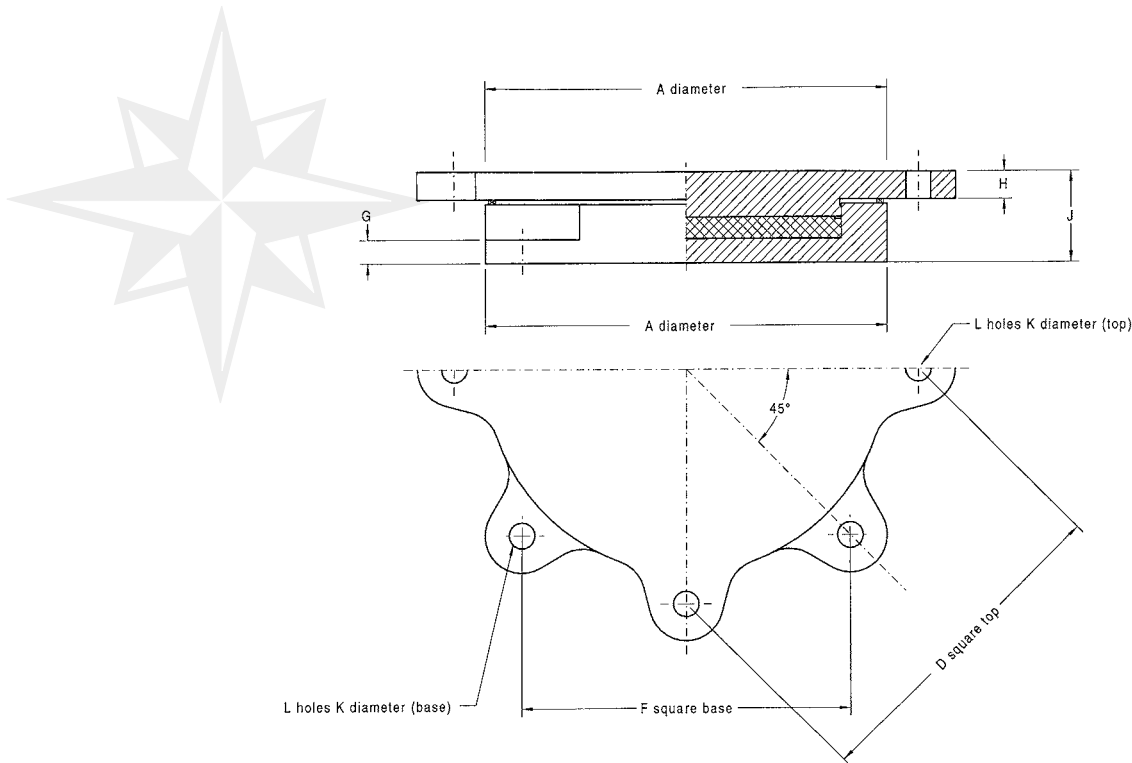
We will be pleased to advise.

### 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 **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm<sup>2</sup>.

| Bearing Part no | Nominal Vertical Rating Maximum (kN) | Working/Serviceability Limit State Loads |            | Ultimate Limit State Loads |            | Rotation (Radians) |
|-----------------|--------------------------------------|--|------------|----------------------------|------------|--------------------|
|                 |                                      | Vertical                                 | Horizontal | Vertical                   | Horizontal |                    |
| 30K0050         | 500                                  | 706                                      | 105        | 917                        | 136        | 0.025              |
| 30K0075         | 750                                  | 1017                                     | 150        | 1322                       | 195        | 0.021              |
| 30K0100         | 1000                                 | 1385                                     | 200        | 1800                       | 260        | 0.022              |
| 30K0130         | 1300                                 | 1734                                     | 260        | 2254                       | 338        | 0.020              |
| 30K0160         | 1600                                 | 2206                                     | 315        | 2867                       | 409        | 0.021              |
| 30K0200         | 2000                                 | 2733                                     | 390        | 3552                       | 507        | 0.022              |
| 30K0250         | 2500                                 | 3421                                     | 485        | 4447                       | 630        | 0.020              |
| 30K0300         | 3000                                 | 4071                                     | 575        | 5292                       | 747        | 0.021              |
| 30K0350         | 3500                                 | 4778                                     | 665        | 6211                       | 864        | 0.022              |
| 30K0400         | 4000                                 | 5410                                     | 755        | 7033                       | 981        | 0.020              |
| 30K0450         | 4500                                 | 6082                                     | 840        | 7906                       | 1092       | 0.021              |
| 30K0500         | 5000                                 | 6792                                     | 925        | 8829                       | 1202       | 0.013              |
| 30K0550         | 5500                                 | 7389                                     | 1010       | 9605                       | 1313       | 0.012              |
| 30K0600         | 6000                                 | 8011                                     | 1090       | 10414                      | 1417       | 0.011              |
| 30K0700         | 7000                                 | 9503                                     | 1250       | 12353                      | 1625       | 0.010              |
| 30K0800         | 8000                                 | 10751                                    | 1400       | 13976                      | 1820       | 0.012              |
| 30K0900         | 9000                                 | 12076                                    | 1545       | 15698                      | 2008       | 0.011              |
| 30K1000         | 10000                                | 13478                                    | 1680       | 17521                      | 2184       | 0.010              |
| 30K1200         | 12000                                | 16060                                    | 1935       | 20878                      | 2515       | 0.011              |
| 30K1400         | 14000                                | 18869                                    | 2160       | 24529                      | 2808       | 0.010              |
| 30K1600         | 16000                                | 21382                                    | 2360       | 27796                      | 3068       | 0.011              |
| 30K1800         | 18000                                | 24052                                    | 2535       | 31267                      | 3295       | 0.010              |
| 30K2000         | 20000                                | 26880                                    | 2680       | 34944                      | 3484       | 0.011              |
| 30K2250         | 22500                                | 30171                                    | 2825       | 39222                      | 3672       | 0.010              |
| 30K2500         | 25000                                | 33653                                    | 2925       | 43748                      | 3802       | 0.011              |
| 30K3000         | 30000                                | 40115                                    | 3000       | 52149                      | 3900       | 0.010              |



| Bearing Part no | Installation Dimensions (mm) |      |      |    |    |     |    |   | Approx Weight *(kg) |
|-----------------|------------------------------|------|------|----|----|-----|----|---|---------------------|
|                 | A                            | D    | F    | G  | H  | J   | K  | L |                     |
| 30K0050         | 210                          | 170  | 170  | 15 | 16 | 58  | 14 | 4 | 14                  |
| 30K0075         | 240                          | 200  | 200  | 25 | 20 | 62  | 18 | 4 | 21                  |
| 30K0100         | 280                          | 230  | 230  | 15 | 18 | 65  | 18 | 4 | 28                  |
| 30K0130         | 310                          | 260  | 250  | 20 | 26 | 79  | 22 | 4 | 43                  |
| 30K0160         | 350                          | 280  | 280  | 20 | 24 | 83  | 22 | 4 | 55                  |
| 30K0200         | 390                          | 320  | 320  | 25 | 27 | 96  | 26 | 4 | 81                  |
| 30K0250         | 430                          | 350  | 340  | 30 | 26 | 95  | 26 | 4 | 97                  |
| 30K0300         | 470                          | 380  | 380  | 25 | 33 | 113 | 32 | 4 | 138                 |
| 30K0350         | 510                          | 410  | 410  | 35 | 36 | 121 | 32 | 4 | 175                 |
| 30K0400         | 540                          | 430  | 430  | 25 | 35 | 130 | 32 | 4 | 209                 |
| 30K0450         | 580                          | 470  | 470  | 35 | 38 | 133 | 38 | 4 | 248                 |
| 30K0500         | 600                          | 490  | 490  | 35 | 41 | 134 | 38 | 4 | 268                 |
| 30K0550         | 630                          | 510  | 510  | 40 | 41 | 142 | 38 | 4 | 312                 |
| 30K0600         | 650                          | 520  | 520  | 40 | 41 | 142 | 38 | 4 | 330                 |
| 30K0700         | 710                          | 570  | 570  | 30 | 45 | 156 | 44 | 4 | 430                 |
| 30K0800         | 750                          | 600  | 600  | 35 | 44 | 155 | 44 | 4 | 471                 |
| 30K0900         | 800                          | 630  | 630  | 45 | 53 | 174 | 44 | 4 | 608                 |
| 30K1000         | 840                          | 660  | 660  | 40 | 53 | 174 | 44 | 4 | 664                 |
| 30K1200         | 910                          | 730  | 720  | 45 | 51 | 182 | 50 | 4 | 809                 |
| 30K1400         | 980                          | 780  | 770  | 55 | 59 | 201 | 50 | 4 | 1036                |
| 30K1600         | 1040                         | 820  | 810  | 60 | 57 | 209 | 50 | 4 | 1206                |
| 30K1800         | 1100                         | 860  | 860  | 35 | 55 | 218 | 50 | 4 | 1379                |
| 30K2000         | 1160                         | 900  | 900  | 35 | 54 | 217 | 50 | 4 | 1509                |
| 30K2250         | 1220                         | 950  | 940  | 45 | 53 | 226 | 50 | 4 | 1736                |
| 30K2500         | 1280                         | 970  | 970  | 55 | 52 | 235 | 44 | 4 | 1976                |
| 30K3000         | 1390                         | 1040 | 1040 | 60 | 53 | 247 | 38 | 4 | 2407                |

\*Excluding fixings

### 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 21K guided bearing will resist a horizontal force acting at right angles to the main direction of sliding.

In order for the bearing to support the maximum horizontal loads stated in the tables, a minimum concurrent vertical load of 0.33 x the Nominal Vertical rating must be present.

At ULS, 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, the 31K series or a special bearing may be more appropriate.

We will be pleased to advise.

### Transverse movement

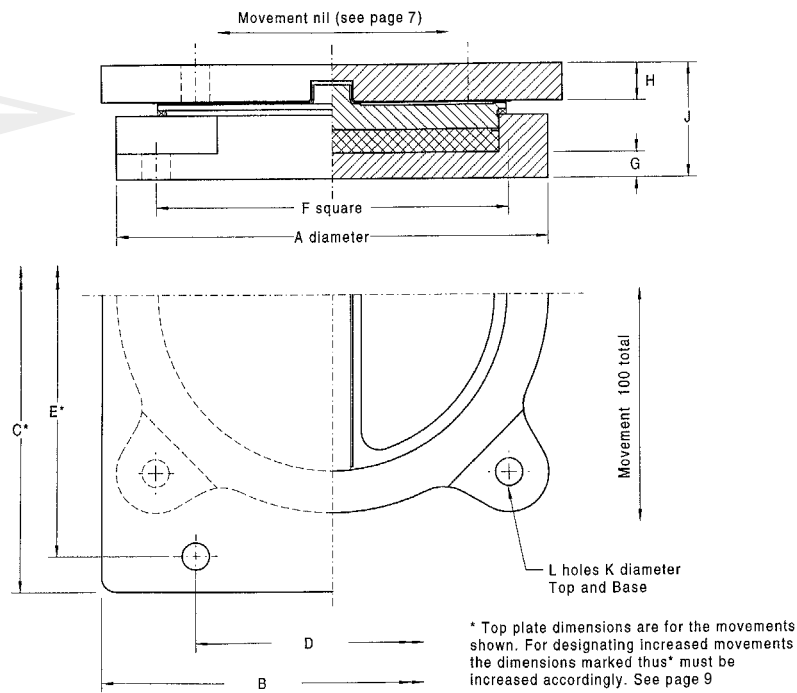
21K Bearings are designed to accommodate in one direction only. Movement transverse to the constraint is nominally zero. In practice the transverse movement is 1mm maximum. Standard 21K bearings should not be used where movement is required at right angles to the constraint. Special bearings can be offered 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 **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm<sup>2</sup>.

| Bearing Part no | Nominal Vertical Rating Maximum (kN) | Working/Serviceability Limit State Loads Vertical |          | Limit State Loads Horizontal (kN) | Ultimate Limit State Loads Vertical |                 | Rotation (Radians) |
|-----------------|--------------------------------------|---|----------|-----------------------------------|-------------------------------------|-----------------|--------------------|
|                 |                                      | Permanent (kN)                                    | All (kN) |                                   | Vertical (kN)                       | Horizontal (kN) |                    |
| 21K0050         | 500                                  | 363   | 544      | 50                                | 707                                 | 65              | 0.025              |
| 21K0075         | 750                                  | 565   | 848      | 75                                | 1102                                | 97              | 0.021              |
| 21K0100         | 1000                                 | 723   | 1085     | 100                               | 1410                                | 130             | 0.022              |
| 21K0130         | 1300                                 | 901   | 1351     | 130                               | 1756                                | 169             | 0.017              |
| 21K0160         | 1600                                 | 1097  | 1646     | 160                               | 2139                                | 208             | 0.014              |
| 21K0200         | 2000                                 | 1359  | 2039     | 195                               | 2650                                | 253             | 0.011              |
| 21K0250         | 2500                                 | 1724  | 2586     | 245                               | 3361                                | 318             | 0.016              |
| 21K0300         | 3000                                 | 2070  | 3105     | 290                               | 4036                                | 377             | 0.013              |
| 21K0350         | 3500                                 | 2426  | 3640     | 335                               | 4732                                | 435             | 0.012              |
| 21K0400         | 4000                                 | 2740  | 4111     | 380                               | 5344                                | 494             | 0.011              |
| 21K0450         | 4500                                 | 3123  | 4685     | 420                               | 6090                                | 546             | 0.014              |
| 21K0500         | 5000                                 | 3478  | 5218     | 465                               | 6783                                | 604             | 0.013              |
| 21K0550         | 5500                                 | 3690  | 5536     | 505                               | 7196                                | 656             | 0.012              |
| 21K0600         | 6000                                 | 4076  | 6114     | 545                               | 7948                                | 708             | 0.011              |
| 21K0700         | 7000                                 | 5122  | 7683     | 625                               | 9987                                | 812             | 0.010              |
| 21K0800         | 8000                                 | 5806  | 8709     | 700                               | 11321                               | 910             | 0.012              |
| 21K0900         | 9000                                 | 6784  | 10177    | 775                               | 13230                               | 1007            | 0.011              |
| 21K1000         | 10000                                | 7568  | 11352    | 840                               | 14757                               | 1092            | 0.010              |
| 21K1200         | 12000                                | 9075  | 13586    | 970                               | 17661                               | 1261            | 0.011              |
| 21K1400         | 14000                                | 10902   | 16354    | 1080                              | 21260                               | 1404            | 0.010              |
| 21K1600         | 16000                                | 12570   | 18855    | 1180                              | 24511                               | 1534            | 0.011              |
| 21K1800         | 18000                                | 14355   | 21532    | 1270                              | 27991                               | 1651            | 0.010              |
| 21K2000         | 20000                                | 16258   | 24387    | 1340                              | 31703                               | 1742            | 0.011              |
| 21K2250         | 22500                                | 18696   | 28045    | 1415                              | 36458                               | 1839            | 0.010              |
| 21K2500         | 25000                                | 20859   | 31288    | 1465                              | 40674                               | 1904            | 0.011              |
| 21K3000         | 30000                                | 25866   | 38799    | 1500                              | 50438                               | 1950            | 0.010              |



| Bearing Part no | Installation Dimensions (mm) |      |      |     |      |     |    |    |     |    |   | Approx Weight *(kg) |
|-----------------|------------------------------|------|------|-----|------|-----|----|----|-----|----|---|---------------------|
|                 | A                            | B    | C    | D   | E    | F   | G  | H  | J   | K  | L |                     |
| 21K0050         | 190                          | 240  | 370  | 110 | 330  | 160 | 20 | 32 | 87  | 14 | 4 | 32                  |
| 21K0075         | 230                          | 270  | 400  | 130 | 360  | 180 | 20 | 32 | 87  | 14 | 4 | 41                  |
| 21K0100         | 260                          | 300  | 420  | 160 | 380  | 210 | 15 | 32 | 94  | 14 | 4 | 51                  |
| 21K0130         | 290                          | 330  | 450  | 180 | 410  | 230 | 15 | 32 | 91  | 14 | 4 | 60                  |
| 21K0160         | 330                          | 370  | 470  | 210 | 430  | 260 | 15 | 32 | 96  | 14 | 4 | 75                  |
| 21K0200         | 360                          | 400  | 500  | 230 | 460  | 280 | 20 | 32 | 101 | 14 | 4 | 90                  |
| 21K0250         | 400                          | 440  | 520  | 260 | 480  | 310 | 20 | 32 | 108 | 14 | 4 | 113                 |
| 21K0300         | 440                          | 480  | 560  | 280 | 520  | 330 | 20 | 32 | 108 | 14 | 4 | 133                 |
| 21K0350         | 480                          | 520  | 590  | 310 | 550  | 360 | 25 | 37 | 117 | 14 | 4 | 172                 |
| 21K0400         | 510                          | 550  | 610  | 340 | 570  | 390 | 25 | 37 | 116 | 14 | 4 | 189                 |
| 21K0450         | 540                          | 580  | 640  | 360 | 600  | 410 | 30 | 37 | 129 | 14 | 4 | 229                 |
| 21K0500         | 570                          | 610  | 680  | 370 | 630  | 430 | 25 | 37 | 129 | 18 | 4 | 256                 |
| 21K0550         | 600                          | 640  | 700  | 390 | 650  | 450 | 30 | 37 | 138 | 18 | 4 | 298                 |
| 21K0600         | 620                          | 660  | 720  | 410 | 670  | 470 | 30 | 37 | 134 | 18 | 4 | 308                 |
| 21K0700         | 670                          | 710  | 770  | 440 | 720  | 500 | 35 | 42 | 148 | 18 | 4 | 397                 |
| 21K0800         | 720                          | 760  | 820  | 470 | 770  | 530 | 40 | 42 | 161 | 18 | 4 | 490                 |
| 21K0900         | 760                          | 800  | 860  | 490 | 800  | 560 | 35 | 42 | 160 | 22 | 4 | 535                 |
| 21K1000         | 800                          | 840  | 900  | 530 | 840  | 600 | 35 | 42 | 159 | 22 | 4 | 588                 |
| 21K1200         | 880                          | 920  | 980  | 570 | 920  | 640 | 45 | 47 | 182 | 22 | 4 | 814                 |
| 21K1400         | 950                          | 990  | 1050 | 620 | 980  | 700 | 45 | 47 | 186 | 26 | 4 | 951                 |
| 21K1600         | 1010                         | 1050 | 1110 | 660 | 1040 | 740 | 45 | 47 | 195 | 26 | 4 | 1118                |
| 21K1800         | 1080                         | 1120 | 1180 | 710 | 1110 | 790 | 50 | 52 | 209 | 26 | 4 | 1384                |
| 21K2000         | 1130                         | 1170 | 1230 | 730 | 1150 | 830 | 50 | 52 | 217 | 32 | 4 | 1564                |
| 21K2250         | 1200                         | 1240 | 1300 | 770 | 1220 | 870 | 55 | 52 | 222 | 32 | 4 | 1774                |
| 21K2500         | 1270                         | 1310 | 1370 | 810 | 1290 | 910 | 55 | 57 | 236 | 32 | 4 | 2121                |
| 21K3000         | 1390                         | 1430 | 1490 | 890 | 1410 | 990 | 65 | 57 | 247 | 32 | 4 | 2623                |

\*Excluding fixings

### 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 31K 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 of 0.33 x the Nominal Vertical rating must be present.

At ULS, the actual load combination may permit the use of a vertical load higher than that shown in the table.

Where lower horizontal load capacities are required, the 21K series may be more economical.

We will be pleased to advise.

### Transverse movement

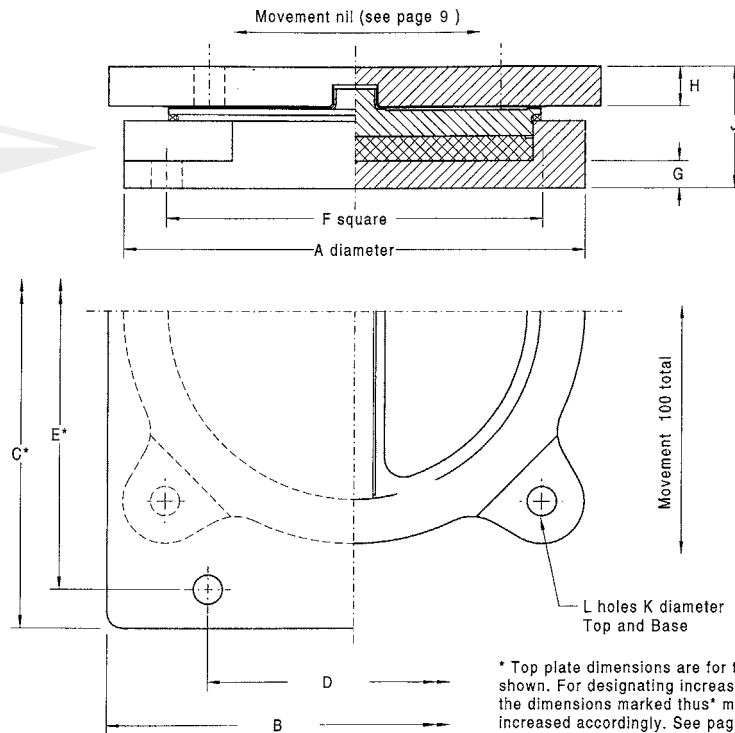
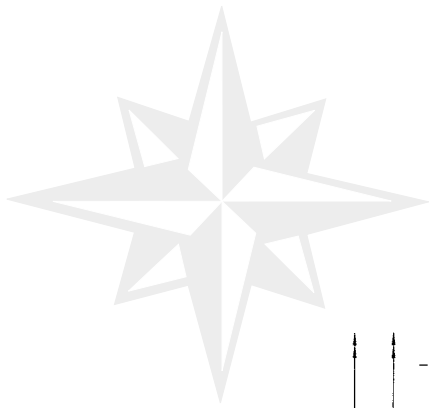
31K Bearings are designed to accommodate in one direction only. Movement transverse to the constraint is nominally zero. In practice the transverse movement is 1mm maximum. Standard 31K bearings should not be used where movement is required at right angles to the constraint. Special bearings can be offered 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 **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm<sup>2</sup>.

| Bearing Part no | Nominal Vertical Rating Maximum (kN) | Working/Serviceability Limit State Loads Vertical |          | Limit State Loads Horizontal (kN) | Ultimate Limit State Loads Vertical |                 | Rotation (Radians) |
|-----------------|--------------------------------------|---|----------|-----------------------------------|-------------------------------------|-----------------|--------------------|
|                 |                                      | Permanent (kN)                                    | All (kN) |                                   | Vertical (kN)                       | Horizontal (kN) |                    |
| 31K0050         | 500                                  | 493   | 706      | 105                               | 917                                 | 136             | 0.025              |
| 31K0075         | 750                                  | 723   | 1017     | 150                               | 1322                                | 195             | 0.021              |
| 31K0100         | 1000                                 | 920   | 1380     | 200                               | 1794                                | 260             | 0.022              |
| 31K0130         | 1300                                 | 1140  | 1710     | 260                               | 2223                                | 338             | 0.020              |
| 31K0160         | 1600                                 | 1359  | 2039     | 315                               | 2650                                | 409             | 0.021              |
| 31K0200         | 2000                                 | 1724  | 2586     | 390                               | 3361                                | 507             | 0.022              |
| 31K0250         | 2500                                 | 2029  | 3044     | 485                               | 3957                                | 630             | 0.020              |
| 31K0300         | 3000                                 | 2470  | 3705     | 575                               | 4816                                | 747             | 0.021              |
| 31K0350         | 3500                                 | 2787  | 4181     | 665                               | 5435                                | 864             | 0.022              |
| 31K0400         | 4000                                 | 3123  | 4685     | 755                               | 6090                                | 981             | 0.020              |
| 31K0450         | 4500                                 | 3478  | 5218     | 840                               | 6783                                | 1092            | 0.021              |
| 31K0500         | 5000                                 | 3690  | 5536     | 925                               | 7196                                | 1202            | 0.013              |
| 31K0550         | 5500                                 | 4076  | 6114     | 1010                              | 7948                                | 1313            | 0.012              |
| 31K0600         | 6000                                 | 4275  | 6413     | 1090                              | 8336                                | 1417            | 0.011              |
| 31K0700         | 7000                                 | 5122  | 7683     | 1250                              | 9987                                | 1625            | 0.010              |
| 31K0800         | 8000                                 | 5806  | 8709     | 1400                              | 11321                               | 1820            | 0.012              |
| 31K0900         | 9000                                 | 6784  | 10177    | 1545                              | 13230                               | 2008            | 0.011              |
| 31K1000         | 10000                                | 7568  | 11352    | 1680                              | 14757                               | 2184            | 0.010              |
| 31K1200         | 12000                                | 9057  | 13586    | 1935                              | 17661                               | 2515            | 0.011              |
| 31K1400         | 14000                                | 10902   | 16354    | 2160                              | 21260                               | 2808            | 0.010              |
| 31K1600         | 16000                                | 12570   | 18855    | 2360                              | 24511                               | 3068            | 0.011              |
| 31K1800         | 18000                                | 14355   | 21532    | 2535                              | 27991                               | 3295            | 0.010              |
| 31K2000         | 20000                                | 16258   | 24387    | 2680                              | 31703                               | 3484            | 0.011              |
| 31K2250         | 22500                                | 18696   | 28045    | 2825                              | 36458                               | 3672            | 0.010              |
| 31K2500         | 25000                                | 20859   | 31288    | 2925                              | 40674                               | 3802            | 0.011              |
| 31K3000         | 30000                                | 25866   | 38799    | 3000                              | 50438                               | 3900            | 0.010              |



| Bearing Part no | Installation Dimensions (mm) |      |      |     |      |      |    |    |     |    |   | Approx Weight *(kg) |
|-----------------|------------------------------|------|------|-----|------|------|----|----|-----|----|---|---------------------|
|                 | A                            | B    | C    | D   | E    | F    | G  | H  | J   | K  | L |                     |
| 31K0050         | 210                          | 260  | 390  | 120 | 350  | 170  | 15 | 32 | 91  | 14 | 4 | 38                  |
| 31K0075         | 240                          | 290  | 440  | 140 | 390  | 200  | 25 | 32 | 94  | 18 | 4 | 51                  |
| 31K0100         | 280                          | 320  | 460  | 170 | 410  | 230  | 15 | 37 | 101 | 18 | 4 | 67                  |
| 31K0130         | 310                          | 350  | 510  | 180 | 450  | 250  | 20 | 37 | 104 | 22 | 4 | 84                  |
| 31K0160         | 350                          | 390  | 540  | 210 | 480  | 280  | 20 | 37 | 106 | 22 | 4 | 102                 |
| 31K0200         | 390                          | 430  | 590  | 240 | 520  | 320  | 25 | 37 | 118 | 26 | 4 | 135                 |
| 31K0250         | 430                          | 470  | 630  | 260 | 560  | 340  | 30 | 42 | 126 | 26 | 4 | 173                 |
| 31K0300         | 470                          | 510  | 690  | 280 | 610  | 380  | 25 | 47 | 137 | 32 | 4 | 229                 |
| 31K0350         | 510                          | 550  | 720  | 310 | 640  | 410  | 35 | 47 | 144 | 32 | 4 | 272                 |
| 31K0400         | 540                          | 580  | 740  | 330 | 660  | 430  | 25 | 47 | 157 | 32 | 4 | 317                 |
| 31K0450         | 580                          | 620  | 810  | 360 | 710  | 470  | 35 | 47 | 153 | 38 | 4 | 363                 |
| 31K0500         | 600                          | 640  | 820  | 380 | 720  | 490  | 35 | 52 | 158 | 38 | 4 | 404                 |
| 31K0550         | 630                          | 670  | 840  | 400 | 740  | 510  | 40 | 57 | 169 | 38 | 4 | 475                 |
| 31K0600         | 650                          | 690  | 860  | 410 | 760  | 520  | 40 | 57 | 168 | 38 | 4 | 500                 |
| 31K0700         | 710                          | 750  | 920  | 450 | 810  | 570  | 30 | 57 | 175 | 44 | 4 | 604                 |
| 31K0800         | 750                          | 790  | 950  | 480 | 840  | 600  | 35 | 57 | 177 | 44 | 4 | 664                 |
| 31K0900         | 800                          | 840  | 990  | 510 | 880  | 630  | 45 | 57 | 186 | 44 | 4 | 780                 |
| 31K1000         | 840                          | 880  | 1020 | 540 | 910  | 660  | 40 | 62 | 190 | 44 | 4 | 877                 |
| 31K1200         | 910                          | 950  | 1110 | 580 | 990  | 720  | 45 | 62 | 204 | 50 | 4 | 1080                |
| 31K1400         | 980                          | 1020 | 1160 | 630 | 1040 | 770  | 55 | 62 | 212 | 50 | 4 | 1276                |
| 31K1600         | 1040                         | 1080 | 1210 | 670 | 1090 | 810  | 60 | 67 | 224 | 50 | 4 | 1517                |
| 31K1800         | 1100                         | 1140 | 1250 | 720 | 1130 | 860  | 35 | 67 | 233 | 50 | 4 | 1713                |
| 31K2000         | 1160                         | 1200 | 1290 | 760 | 1170 | 900  | 35 | 67 | 232 | 50 | 4 | 1863                |
| 31K2250         | 1220                         | 1260 | 1340 | 800 | 1220 | 940  | 45 | 67 | 251 | 50 | 4 | 2178                |
| 31K2500         | 1280                         | 1320 | 1380 | 850 | 1270 | 970  | 55 | 62 | 257 | 44 | 4 | 2382                |
| 31K3000         | 1390                         | 1430 | 1490 | 930 | 1390 | 1040 | 60 | 62 | 259 | 38 | 4 | 2804                |

\*Excluding fixings

### Bearing design loads

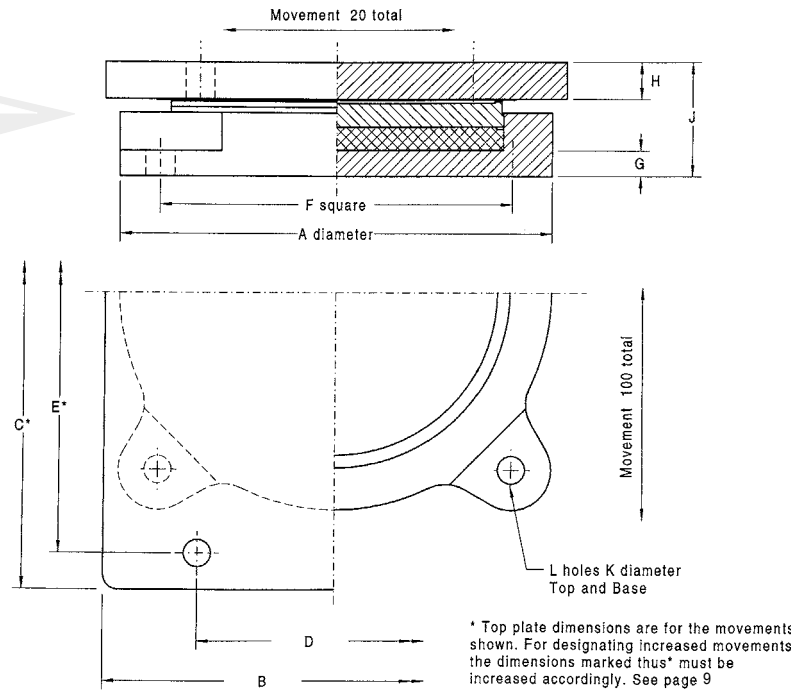
Bearings should be selected to suit the appropriate design code. If in doubt seek our advice.

### 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 **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm<sup>2</sup>.

| Bearing Part no | Nominal Vertical Rating Maximum (kN) | Working/Serviceability Limit State Loads |          | Ultimate Limit State Loads Vertical (kN) | Rotation (Radians) |
|-----------------|--------------------------------------|--|----------|--|--------------------|
|                 |                                      | Vertical Permanent (kN)                  | All (kN) |  |                    |
| 22K0050         | 500                                  | 339                                      | 508      | 660                                      | 0.025              |
| 22K0075         | 750                                  | 530                                      | 795      | 1033                                     | 0.021              |
| 22K0100         | 1000                                 | 763                                      | 1144     | 1487                                     | 0.022              |
| 22K0130         | 1300                                 | 990                                      | 1485     | 1930                                     | 0.020              |
| 22K0160         | 1600                                 | 1301                                     | 1951     | 2536                                     | 0.021              |
| 22K0200         | 2000                                 | 1654                                     | 2481     | 3225                                     | 0.022              |
| 22K0250         | 2500                                 | 2120                                     | 3180     | 4134                                     | 0.020              |
| 22K0300         | 3000                                 | 2565                                     | 3848     | 5002                                     | 0.021              |
| 22K0350         | 3500                                 | 3053                                     | 4579     | 5952                                     | 0.022              |
| 22K0400         | 4000                                 | 3492                                     | 5238     | 6809                                     | 0.020              |
| 22K0450         | 4500                                 | 3960                                     | 5940     | 7722                                     | 0.021              |
| 22K0500         | 5000                                 | 4458                                     | 6686     | 8891                                     | 0.020              |
| 22K0550         | 5500                                 | 4877                                     | 7315     | 9509                                     | 0.020              |
| 22K0600         | 6000                                 | 5316                                     | 7973     | 10364                                    | 0.020              |
| 22K0700         | 7000                                 | 6371                                     | 9503     | 12353                                    | 0.020              |
| 22K0800         | 8000                                 | 7257                                     | 10751    | 13976                                    | 0.021              |
| 22K0900         | 9000                                 | 8201                                     | 12076    | 15698                                    | 0.020              |
| 22K1000         | 10000                                | 9203                                     | 13478    | 17521                                    | 0.020              |
| 22K1200         | 12000                                | 11055                                    | 16060    | 20878                                    | 0.021              |
| 22K1400         | 14000                                | 13077                                    | 18869    | 24529                                    | 0.020              |
| 22K1600         | 16000                                | 14891                                    | 21382    | 27796                                    | 0.020              |
| 22K1800         | 18000                                | 16823                                    | 24052    | 31267                                    | 0.020              |
| 22K2000         | 20000                                | 18873                                    | 26880    | 34944                                    | 0.020              |
| 22K2250         | 22500                                | 21264                                    | 30171    | 39222                                    | 0.020              |
| 22K2500         | 25000                                | 23798                                    | 33653    | 43748                                    | 0.020              |
| 22K3000         | 30000                                | 28510                                    | 40115    | 52149                                    | 0.020              |



| Bearing Part no | Installation Dimensions (mm) |      |      |      |      |     |    |    |     |    |   | Approx Weight *(kg) |
|-----------------|------------------------------|------|------|------|------|-----|----|----|-----|----|---|---------------------|
|                 | A                            | B    | C    | D    | E    | F   | G  | H  | J   | K  | L |                     |
| 22K0050         | 190                          | 240  | 300  | 200  | 260  | 160 | 15 | 22 | 71  | 14 | 4 | 21                  |
| 22K0075         | 230                          | 270  | 330  | 230  | 290  | 180 | 20 | 22 | 76  | 14 | 4 | 29                  |
| 22K0100         | 260                          | 300  | 360  | 260  | 320  | 210 | 15 | 27 | 85  | 14 | 4 | 41                  |
| 22K0130         | 290                          | 330  | 390  | 290  | 350  | 230 | 15 | 27 | 85  | 14 | 4 | 50                  |
| 22K0160         | 330                          | 370  | 430  | 330  | 390  | 260 | 15 | 27 | 90  | 14 | 4 | 65                  |
| 22K0200         | 360                          | 390  | 460  | 350  | 420  | 280 | 20 | 32 | 99  | 14 | 4 | 84                  |
| 22K0250         | 400                          | 430  | 500  | 390  | 460  | 310 | 20 | 32 | 103 | 14 | 4 | 106                 |
| 22K0300         | 440                          | 470  | 540  | 430  | 500  | 330 | 20 | 32 | 107 | 14 | 4 | 130                 |
| 22K0350         | 480                          | 500  | 580  | 460  | 540  | 360 | 25 | 32 | 112 | 14 | 4 | 156                 |
| 22K0400         | 510                          | 530  | 610  | 490  | 570  | 390 | 25 | 37 | 117 | 14 | 4 | 188                 |
| 22K0450         | 540                          | 560  | 640  | 520  | 600  | 410 | 30 | 37 | 127 | 14 | 4 | 223                 |
| 22K0500         | 570                          | 590  | 670  | 540  | 620  | 430 | 25 | 37 | 126 | 18 | 4 | 246                 |
| 22K0550         | 600                          | 620  | 700  | 570  | 650  | 450 | 35 | 37 | 141 | 18 | 4 | 299                 |
| 22K0600         | 620                          | 640  | 720  | 590  | 670  | 470 | 30 | 37 | 137 | 18 | 4 | 309                 |
| 22K0700         | 670                          | 690  | 770  | 640  | 720  | 500 | 35 | 42 | 152 | 18 | 4 | 401                 |
| 22K0800         | 720                          | 740  | 820  | 690  | 770  | 530 | 40 | 42 | 161 | 18 | 4 | 487                 |
| 22K0900         | 760                          | 780  | 860  | 720  | 800  | 560 | 35 | 42 | 160 | 22 | 4 | 532                 |
| 22K1000         | 800                          | 820  | 900  | 760  | 840  | 600 | 35 | 42 | 160 | 22 | 4 | 585                 |
| 22K1200         | 880                          | 900  | 980  | 840  | 920  | 640 | 45 | 47 | 184 | 22 | 4 | 816                 |
| 22K1400         | 950                          | 970  | 1050 | 900  | 980  | 700 | 45 | 47 | 188 | 26 | 4 | 955                 |
| 22K1600         | 1010                         | 1030 | 1110 | 960  | 1040 | 740 | 50 | 52 | 202 | 26 | 4 | 1168                |
| 22K1800         | 1080                         | 1100 | 1180 | 1030 | 1110 | 790 | 55 | 52 | 212 | 26 | 4 | 1390                |
| 22K2000         | 1130                         | 1150 | 1230 | 1070 | 1150 | 830 | 55 | 52 | 226 | 32 | 4 | 1603                |
| 22K2250         | 1200                         | 1220 | 1300 | 1140 | 1220 | 870 | 55 | 52 | 225 | 32 | 4 | 1782                |
| 22K2500         | 1270                         | 1290 | 1370 | 1210 | 1290 | 910 | 60 | 57 | 239 | 32 | 4 | 2137                |
| 22K3000         | 1390                         | 1410 | 1490 | 1330 | 1410 | 990 | 65 | 57 | 253 | 32 | 4 | 2656                |

\*Excluding fixings

## Standard K Series fixings

By adding a two letter suffix to the bearing part number the type of fixing may be designated -

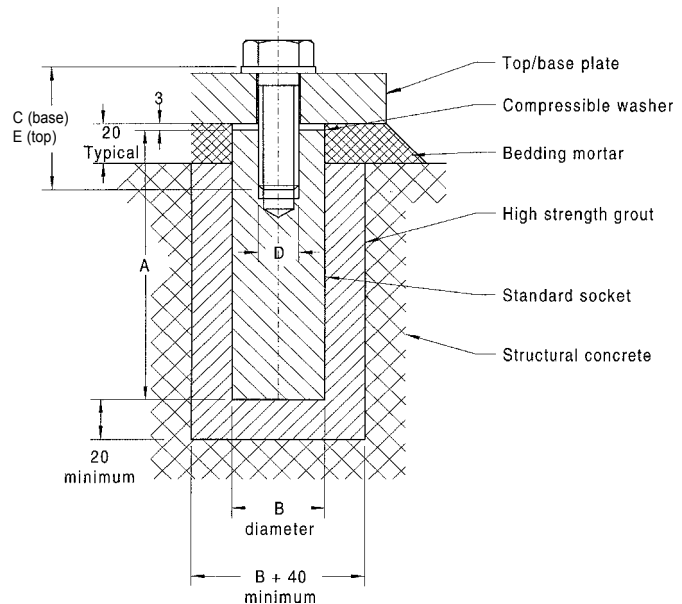
First letter - Top plate fixing  
 Second letter - Base plate fixing

- N** - No fixings
- B** - Bolts and washers only
- S** - Bolts, washers & sockets

e.g. /BS signifies -  
 B (top plate fixing) Bolts & washers  
 S (base plate fixing) Bolts, washers & sockets

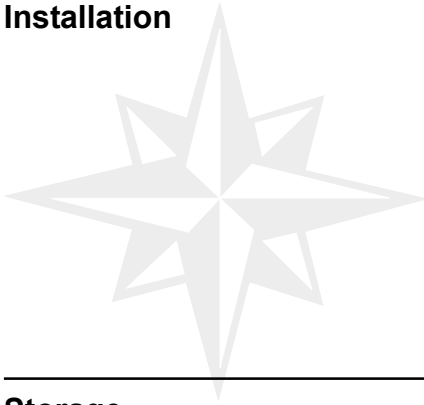
**N.B.** If standard K series fixings are not used, care should be taken to ensure that bolts can be fitted without dismantling the bearing.

Bolts are Hexagon Head to BS 3692 grade 8.8



| Bearing Size | Bearing Type |      |        |      |        |      |        |      |        |      |        |      |        |      |     |     |     |    |     |     |
|--------------|--------------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|-----|-----|-----|----|-----|-----|
|              | 20K          |      | 30K    |      |        |      | 21K    |      |        |      | 31K    |      |        |      | 22K |     |     |    |     |     |
|              | Socket       | Bolt | Socket | Bolt | Socket | Bolt | Socket | Bolt | Socket | Bolt | Socket | Bolt | Socket | Bolt |     |     |     |    |     |     |
|              | B            | A    | D      | C    | E      | B    | A      | D    | C      | E    | B      | A    | D      | C    | E   | B   | A   | D  | C   | E   |
| 0050         | 35           | 110  | 12     | 40   | 35     | 35   | 110    | 12   | 35     | 35   | 35     | 110  | 12     | 40   | 50  | 35  | 110 | 12 | 35  | 40  |
| 0075         | 35           | 110  | 12     | 40   | 35     | 40   | 140    | 16   | 50     | 45   | 35     | 110  | 12     | 40   | 50  | 40  | 140 | 16 | 50  | 55  |
| 0100         | 35           | 110  | 12     | 35   | 35     | 40   | 140    | 16   | 40     | 40   | 35     | 110  | 12     | 35   | 50  | 40  | 140 | 16 | 40  | 60  |
| 0130         | 35           | 110  | 12     | 35   | 40     | 50   | 170    | 20   | 50     | 55   | 35     | 110  | 12     | 35   | 50  | 50  | 170 | 20 | 50  | 65  |
| 0160         | 35           | 110  | 12     | 35   | 40     | 50   | 170    | 20   | 50     | 50   | 35     | 110  | 12     | 35   | 50  | 50  | 170 | 20 | 50  | 65  |
| 0200         | 35           | 110  | 12     | 40   | 35     | 55   | 200    | 24   | 60     | 60   | 35     | 110  | 12     | 40   | 50  | 55  | 200 | 24 | 60  | 70  |
| 0250         | 35           | 110  | 12     | 40   | 40     | 55   | 200    | 24   | 65     | 60   | 35     | 110  | 12     | 40   | 50  | 55  | 200 | 24 | 65  | 75  |
| 0300         | 35           | 110  | 12     | 40   | 35     | 70   | 240    | 30   | 65     | 70   | 35     | 110  | 12     | 40   | 50  | 70  | 240 | 30 | 65  | 85  |
| 0350         | 35           | 110  | 12     | 45   | 40     | 70   | 240    | 30   | 75     | 75   | 35     | 110  | 12     | 45   | 55  | 70  | 240 | 30 | 75  | 85  |
| 0400         | 35           | 110  | 12     | 45   | 40     | 70   | 240    | 30   | 65     | 75   | 35     | 110  | 12     | 45   | 55  | 70  | 240 | 30 | 65  | 85  |
| 0450         | 35           | 110  | 12     | 50   | 45     | 80   | 300    | 36   | 80     | 85   | 35     | 110  | 12     | 50   | 55  | 80  | 300 | 36 | 80  | 95  |
| 0500         | 40           | 140  | 16     | 50   | 45     | 80   | 300    | 36   | 80     | 85   | 40     | 140  | 16     | 50   | 60  | 80  | 300 | 36 | 80  | 100 |
| 0550         | 40           | 140  | 16     | 55   | 45     | 80   | 300    | 36   | 85     | 85   | 40     | 140  | 16     | 55   | 60  | 80  | 300 | 36 | 85  | 105 |
| 0600         | 40           | 140  | 16     | 55   | 50     | 80   | 300    | 36   | 85     | 85   | 40     | 140  | 16     | 55   | 60  | 80  | 300 | 36 | 85  | 105 |
| 0700         | 40           | 140  | 16     | 60   | 50     | 105  | 360    | 42   | 85     | 100  | 40     | 140  | 16     | 60   | 65  | 105 | 360 | 42 | 85  | 110 |
| 0800         | 40           | 140  | 16     | 65   | 50     | 105  | 360    | 42   | 90     | 100  | 40     | 140  | 16     | 65   | 65  | 105 | 360 | 42 | 90  | 110 |
| 0900         | 50           | 170  | 20     | 65   | 55     | 105  | 360    | 42   | 100    | 105  | 50     | 170  | 20     | 65   | 70  | 105 | 360 | 42 | 100 | 110 |
| 1000         | 50           | 170  | 20     | 65   | 55     | 105  | 360    | 42   | 95     | 105  | 50     | 170  | 20     | 65   | 70  | 105 | 360 | 42 | 95  | 115 |
| 1200         | 50           | 170  | 20     | 75   | 60     | 120  | 410    | 48   | 105    | 110  | 50     | 170  | 20     | 75   | 75  | 120 | 410 | 48 | 105 | 125 |
| 1400         | 55           | 200  | 24     | 80   | 65     | 120  | 410    | 48   | 115    | 120  | 55     | 200  | 24     | 80   | 80  | 120 | 410 | 48 | 115 | 125 |
| 1600         | 55           | 200  | 24     | 80   | 70     | 120  | 410    | 48   | 120    | 120  | 55     | 200  | 24     | 80   | 80  | 120 | 410 | 48 | 120 | 130 |
| 1800         | 55           | 200  | 24     | 85   | 70     | 120  | 410    | 48   | 95     | 115  | 55     | 200  | 24     | 85   | 85  | 120 | 410 | 48 | 95  | 130 |
| 2000         | 70           | 240  | 30     | 90   | 80     | 120  | 410    | 48   | 95     | 115  | 70     | 240  | 30     | 90   | 90  | 120 | 410 | 48 | 95  | 130 |
| 2250         | 70           | 240  | 30     | 95   | 80     | 120  | 410    | 48   | 105    | 115  | 70     | 240  | 30     | 95   | 90  | 120 | 410 | 48 | 105 | 130 |
| 2500         | 70           | 240  | 30     | 95   | 90     | 105  | 360    | 42   | 110    | 105  | 70     | 240  | 30     | 95   | 95  | 105 | 360 | 42 | 110 | 115 |
| 3000         | 70           | 240  | 30     | 105  | 90     | 80   | 300    | 36   | 105    | 100  | 70     | 240  | 30     | 105  | 95  | 80  | 300 | 36 | 105 | 110 |

### Installation



#### CONSIDER THE EFFECTS IF BEARINGS ARE NOT CORRECTLY INSTALLED

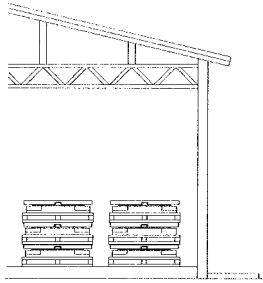
Our structural bearings are manufactured to close tolerances by skilled technicians working in clean conditions. To obtain the requisite performance from bearings it is imperative that they are properly handled at the work site and installed with the same care as when they were assembled in the factory. 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.

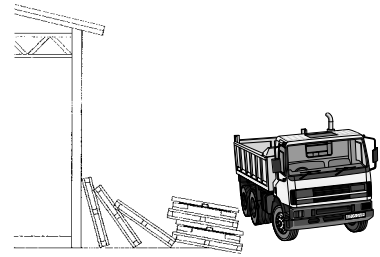
**Bearings must be installed with precision to meet the bridge and bearing design criteria.**

### 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**

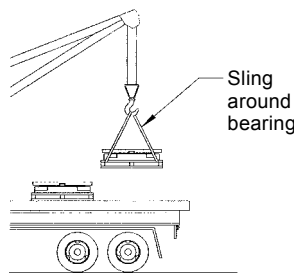


**Incorrect**

### Handling

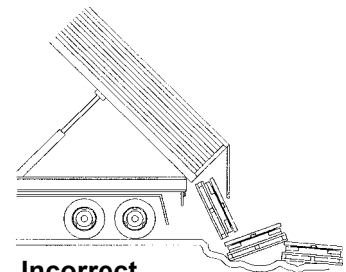
Robust transportation devices are fitted to all bearings to ensure that the components are maintained in their correct relative positions before and during installation. The devices are normally finished in red paint. Unless special devices have been specified, they should not be used for slinging or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



Sling  
around  
bearing

**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.

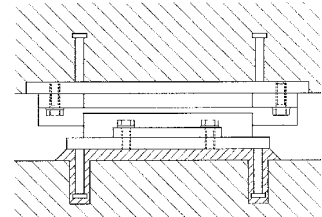
### Bedding



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*

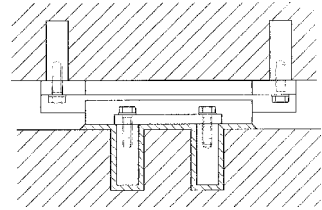


### Cast-in-situ structures

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

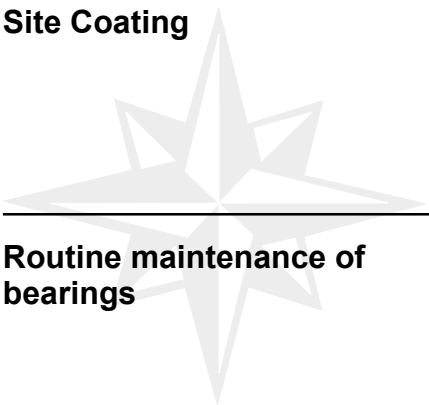
#### DO-

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.

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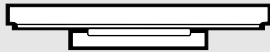
### Routine maintenance of bearings

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 - K Series Pot Bearings**

- 1.01 The bearings should be designed in accordance with BS 5400 part 9 & EN1337 and be constructed from steel grade EN100025 S355 J2G3. *(HIGH QUALITY STEEL GOOD LOADING CAPACITIES)*
- 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 to a minimum of 8/1 P BS1449/ EN10088-2 or with a reflectivity of 48/55. 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 EN1337-2. 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 EN1337-2. *(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 2 brass rings, which should be sized to meet and fit tight to the pot wall. EN1337-5 *(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 BS5400 part 9, EN 1337 and be Natural rubber with a hardness of 55 to 65 IRHD. It will be preformed with a recess on the to surface which allows the retaining rings to finish flush with the rubber. *(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.

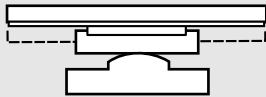
## BRIDGE & INDUSTRIAL BEARINGS & JOINTS



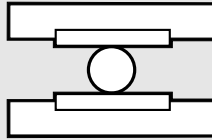
**A Series** Sliding bearings



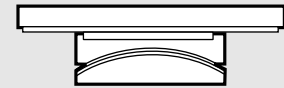
**B Series** Sliding bearings with elastomer base



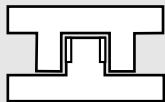
**D Series** Line rocker bearings



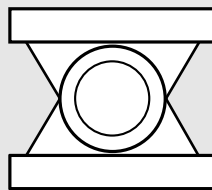
**J Series** roller bearings



**E Series** ANTICLASTIC BEARINGS



**F Series** Pin and Guide bearings



Link bearings



**G Series** Spherical bearings



**K Series** pot bearings



Expansion joints

***A world wide service offering effective solutions in:-***  
**Inspection • Design • Manufacture • Supply**  
**Installation • Commissioning • Planned Maintenance**

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**Tel: +44 (0)114 2611126 · Fax: + 44 (0)114 2611165**

**Website: [www.ekspan.com](http://www.ekspan.com)**

**E-mail: [enquiry@ekspan.co.uk](mailto:enquiry@ekspan.co.uk)**



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