STRUCTURAL BEARINGS

SPECIALISED ENGINEERED SOLUTIONS FOR STRUCTURES

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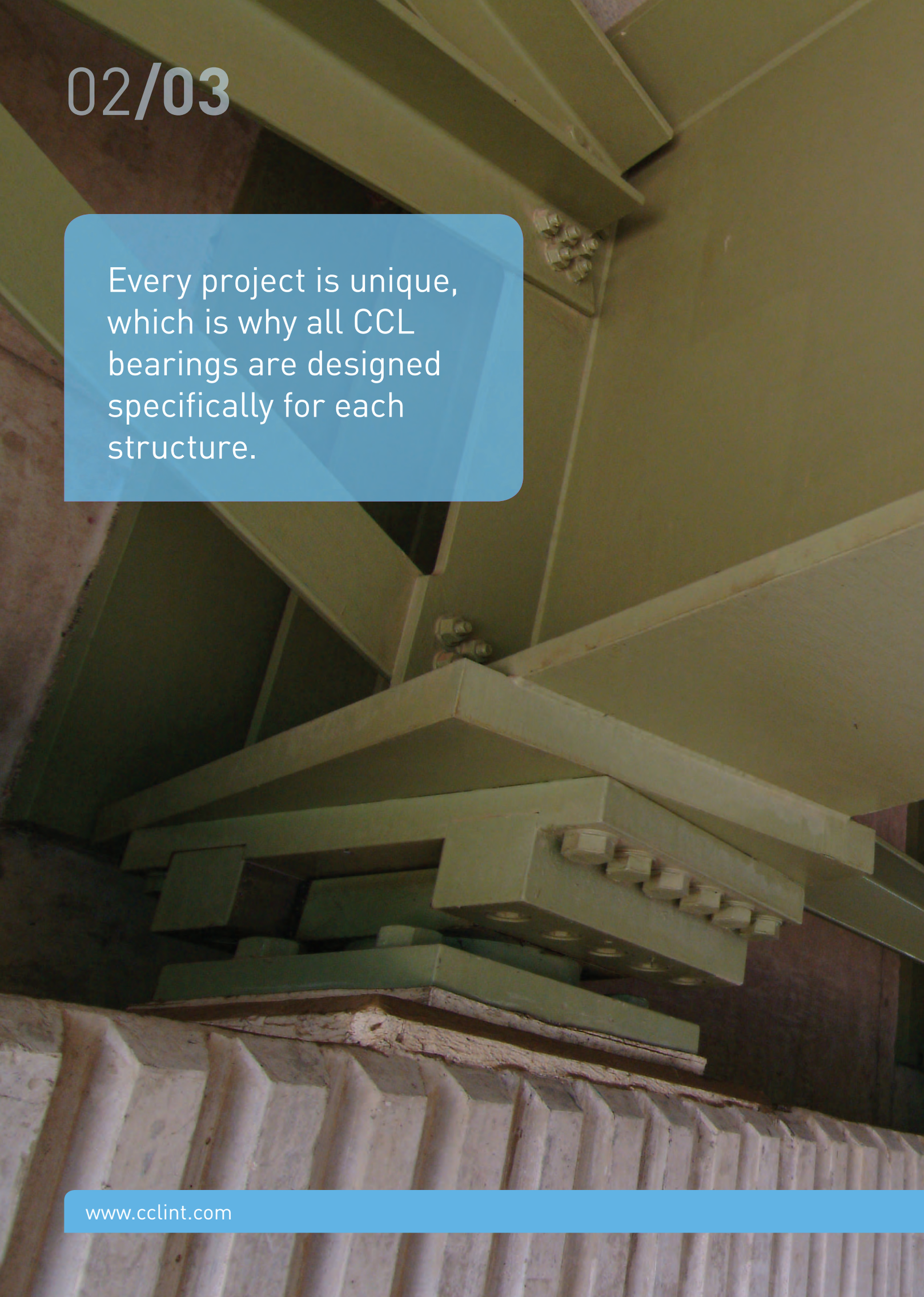


Every project is unique, which is why all CCL bearings are designed specifically for each structure.

BEARING PRINCIPLES

Structural bearings support structures at a constant elevation, carrying forces from the superstructure into the substructure and allowing necessary superstructure motions to take place. The same principles apply to all types of structure where forces are exerted.

Irreversible rotations and translations are caused by the effects of concrete shrinkage, creep, settlement, dead and superimposed dead loads or any similar effects. They will occur only once.

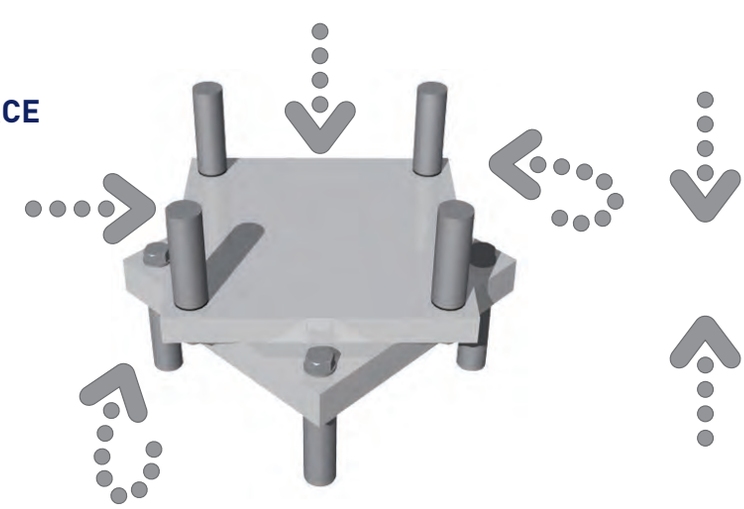
Reversible rotations and translations are due to the effects of temperature, seismic activity, wind and live loads, and will occur repeatedly.

LONGITUDINAL FORCE

Forces, rotations and translations act along the main centre line of the structure.

TRANSVERSE FORCE

Forces, rotations and translations act perpendicular to the main centre line of the structure.



DOWNWARD FORCE

Acts vertically through the centre of the bearing.

UPLIFT FORCE

Acts vertically upwards due to vibration, design of structure, or when the weight of the superstructure does not provide significant compressive load.

BEARING TYPES

CCL designs bespoke bearings to exacting standards. Most structures require a mixture of bearing types and clients are advised to contact CCL at an early stage to ensure bearings are designed in a way that perfectly matches the structure's requirements.

Bearings are made to order to conform to all relevant local and international regulations and standards. Any of the mechanical bearings can be converted to an uplift type.

In partnership with the client, CCL can design a unique bearing that meets all required specifications.

PF FIXED POT BEARING

Resists vertical load and provides restraint in all horizontal directions. The projecting piston from the top plate is fully retained by the metal pot of the bottom plate to provide full restraint in the horizontal plane. The deformation of the elastomeric disc allows multi-directional rotation to take place.

PS FREE-SLIDING POT BEARING

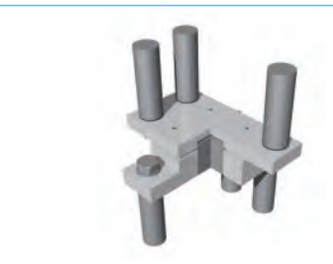
Resists vertical load and allows horizontal movement and rotation in all directions. Within the base plate a rocker is fully retained in the pot. The rocker has a lubricated, dimpled PTFE disc which slides against the stainless steel plate. The stainless steel plate is fitted to the machined top plate allowing free horizontal movement between the two sections of the bearing.

PG GUIDED SLIDING POT BEARING

Resists vertical load and provides perpendicular restraint. In the base plate a rocker is retained in the pot with a lubricated, dimpled PTFE disc to slide against the stainless steel plate. The stainless steel plate is fitted to the machined top plate between two guide rails, which resist the horizontal load in one direction. Horizontal movement occurs along the length of the guide rails. The deformation of the elastomeric disc under the rocker plate allows multi-directional rotation to take place.

FP FIXED PIN BEARING

Does not cater for vertical load but resists horizontal load in any direction. Elastomeric bearings would generally be positioned next to the fixed pin bearing to take up the vertical load.



UG UNIGUIDE BEARING

Does not cater for vertical load but provides unidirectional movement and is resistant to the horizontal load in the perpendicular direction. Elastomeric bearings would generally be positioned next to the uniguide bearing to take up the vertical load.

LR ELASTOMERIC BEARING

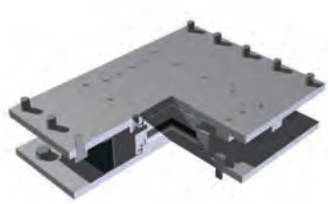
Resists vertical load and provides horizontal movement and rotation. Caters for vertical load where movement is controlled by shear deflection and rotation is by angular deformation. Steel-reinforced plates are vulcanised in alternating rubber layers which are then enclosed by a rubber outer layer, increasing the bearing resistance to ageing caused by external influences, in particular ozone.

PR/SR PLAIN PAD BEARING AND STRIP

Resists low vertical load and allows small movements. Non-reinforced elastomeric pads and strips are used where low loads, small movements and rotations are expected. They are the simplest type of bearing, more readily available and easy to install.

BESPOKE SPECIAL BEARINGS

In addition to the standard range of mechanical bearings, CCL designs bearings to suit customer requirements, often recommending types of materials or corrosion protection for highly corrosive areas such as marine locations, or heavily polluted industrial environments.



	PF FIXED POT BEARING	PS FREE-SLIDING POT BEARING	PG GUIDED SLIDING POT BEARING	FP FIXED PIN BEARING	UG UNIGUIDE BEARING	LR ELASTOMERIC BEARING	PR/SR PLAIN PAD BEARING AND STRIP
Withstands vertical load	✓	✓	✓			✓	✓
Withstands horizontal load – 1 direction			✓		✓		
Withstands horizontal load – 2 directions	✓			✓		✓	
Allows horizontal movement – 1 direction			✓		✓		
Allows horizontal movement – 2 directions		✓				✓	✓
High loadings	✓	✓	✓				
Medium loadings						✓	
Small loadings				✓	✓		✓
Large movements		✓	✓		✓		
Small movements						✓	✓
High rotations	✓	✓	✓				
Small rotations				✓	✓	✓	✓

CCL BEARINGS

Continual investment in design and integrated manufacture means bespoke has become standard.

FROM IDEAS TO INSTALLATION

CCL offers a total end-to-end service from initial concepts through design to manufacture, installation, commissioning and beyond.

Experience gained from projects undertaken around the world enables CCL engineers to adapt their design skills to provide bespoke solutions for special projects and to meet specific national codes.

CCL bearings are manufactured to the highest standards. The company recognises the quality of its design, supply and installation is critical, if a project is to be delivered on time and to specification. CCL carries out installation and on-site inspection to ensure the continued high performance of its bearings.

DESIGN PHILOSOPHY

CCL design teams are from both structural and mechanical engineering backgrounds, to allow the structural design needs of the client to be combined with a bearing that can be optimised in terms of manufacture and cost. Early involvement means that CCL engineers can provide guidance on bearing selection and their interaction with the overall structure.

DESIGN PROCESS

CCL will commence initial designs based on the information received from clients or from site visits on remedial projects if requested. The extent of design depends on information provided. CCL can give general guidance to consultants at initial stages based on a small amount of data. Full involvement at structural design stage can help to minimise cost and reduce the project's critical path.

The bearings listed in this publication are merely a guide. CCL believes in optimising design for each project. Investments in finite element, 3D Modelling, CAD/CAM and parametrics mean CCL can create full bearing drawings in a very short timescale.

MANUFACTURING PROCESS

CCL is a fully approved ISO facility producing CE marked bearings and adheres to strict quality procedures.

All components are fully inspected on receipt at CCL and are fully traceable to source. Parts are then machined or assembled to a unique order number for the specified project. On completion every bearing is fully inspected and labelled before despatch.

TESTING

Depending on the client's requirements and budgets, bearings can be witness tested at test facilities or accredited laboratories. CCL staff will be available to produce test reports and comment on the testing procedure.

INSPECTION, SURVEYING AND MONITORING

Structural monitoring can provide the basis on which to assess a structure's condition and performance to determine whether intervention is required. If action is needed, identifying the underlying cause of the problem is key to finding the right solution. CCL engineers do this by carrying out a condition survey, before submitting carefully considered proposals to the client.

REPLACEMENT AND INSTALLATION

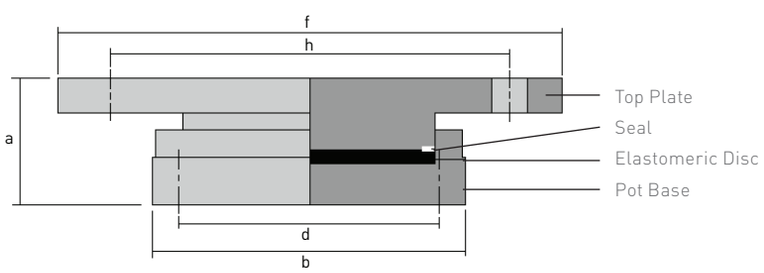
CCL can install bearings or carry out certain remedial works as requested. The company is available to supervise installation by the client or, review any remedial actions due to installation issues. Remedial action if required may include refurbishment or replacement.

TYPICAL STRUCTURAL BEARING SCHEDULE

Structure name or reference							
Bearing identification mark							
Number off							
Seating material	Upper surface						
	Lower surface						
Allowable average contact pressure (N/mm²)	Upper face	Serviceabilty					
		Ultimate					
	Lower face	Serviceabilty					
		Ultimate					
Design load effects (kN)	Serviceability limit state	Vertical	Max				
			Permanent				
			Min				
		Transverse					
		Longitudinal					
	Ultimate limit state	Vertical					
		Transverse					
		Longitudinal					
Translation (mm)	Serviceability limit state	Irreversible	Transverse				
			Longitudinal				
		Reversible	Transverse				
			Longitudinal				
	Ultimate limit state	Irreversible	Transverse				
			Longitudinal				
		Reversible	Transverse				
			Longitudinal				
Rotation (radians)	Serviceability limit state	Irreversible	Transverse				
			Longitudinal				
		Reversible	Transverse				
			Longitudinal				
	Maximum rate (radians/100 kN)		Transverse				
			Longitudinal				
Maximum bearing dimensions (mm)	Upper surface		Transverse				
			Longitudinal				
	Lower surface		Transverse				
			Longitudinal				
	Overall height						
Tolerable movement of bearing under transient loads (mm)			Vertical				
			Transverse				
			Longitudinal				
Allowable resistance to translation under serviceability limit state (kNm)			Transverse				
			Longitudinal				
Allowable resistance to rotation under serviceability limit state (kN)			Transverse				
			Longitudinal				
Type fixing required			Upper face				
			Lower face				

PF FIXED POT BEARINGS

Fixed pot bearings carry vertical load whilst providing restraint in all horizontal directions. There are three types of mechanical pot bearings, all of which are available in a range of capacities and sizes. Each type utilises a piston, rubber disc and pot base, with variations to suit.



Guide dimensions only

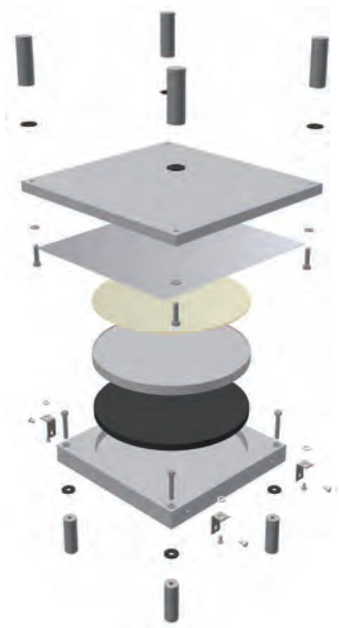
	PF 50	PF 100	PF 150	PF 200	PF 250	PF 300	PF 400	PF 500	PF 750	PF 1000	PF 1500	PF 2000
SLS Permanent vertical load (kN)	330	660	1000	1330	1660	2000	2670	3330	5000	6660	10000	13330
SLS Total vertical load (kN)	500	1000	1500	2000	2500	3000	4000	5000	7500	10000	15000	20000
SLS Horizontal load (kN)	110	210	225	255	350	380	545	810	930	1300	1850	2100
ULS Vertical load (kN)	650	1300	2000	2660	3330	4000	5330	6500	9750	13000	19500	26000
ULS Horizontal load (kN)	140	270	300	330	470	500	710	1050	1200	1690	2400	2700
Overall height a	73	83	83	83	103	103	113	127	136	163	180	190
Base length and width b	170	245	295	340	385	420	490	610	720	760	945	1080
Base bolt ctrs (square) d	130	195	245	290	325	360	425	525	635	660	830	965
Top plate length and width f	170	245	295	340	385	420	490	610	720	760	945	1080
Top bolt ctrs (square) h	130	195	245	290	325	360	425	525	635	660	830	965
Bolt size	M12	M16	M16	M16	M20	M20	M24	M30	M30	M36	M42	M42

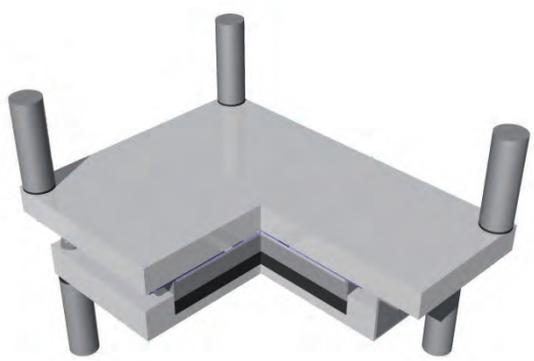
Assumptions:

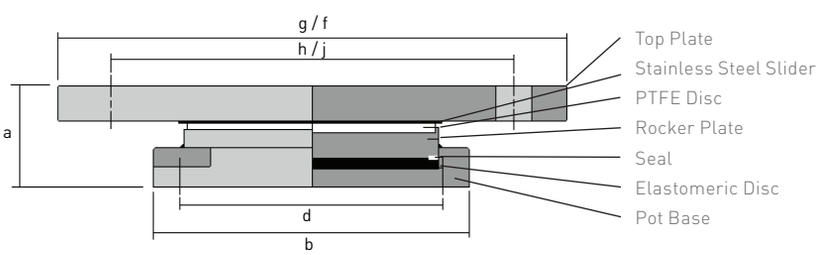
1. Minimum load is at least 25% of total load.
2. Frictional resistance calculated as per BS EN 1337-1:2000 Clause 5.2.
3. For PF50 to PF750 total rotations are up to 0.02 rads. For PF1000 to PF2000 expected rotations are up to 0.006 rads.
4. Lower and upper contact pressures approach 25 N/mm^2 at SLS.
5. 25 mm mortar under base, or according to BS EN1337-11:1998 Clause 6.6.

PS FREE-SLIDING POT BEARINGS

Free-sliding bearings carry vertical load whilst allowing horizontal movement and rotation in all directions.







Guide dimensions only

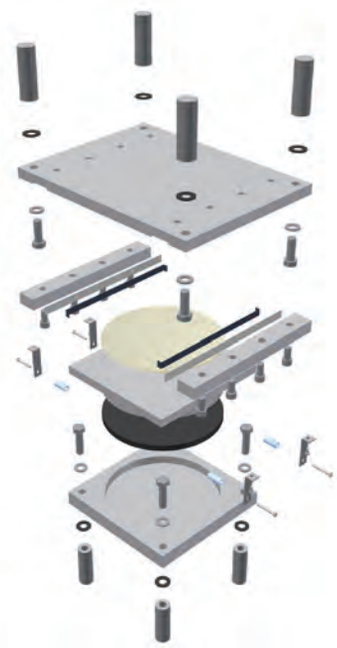
	PS 50	PS 100	PS 150	PS 200	PS 250	PS 300	PS 400	PS 500	PS 750	PS 1000	PS 1500	PS 2000
SLS Permanent vertical load (kN)	330	660	1000	1330	1660	2000	2670	3330	5000	6660	10000	13330
SLS Total vertical load (kN)	500	1000	1500	2000	2500	3000	4000	5000	7500	10000	15000	20000
ULS Vertical load (kN)	650	1300	2000	2600	3330	4000	5330	6500	9750	13000	19500	26000
Overall height a	80	91	98	103	108	118	123	133	148	173	198	213
Base length and width b	190	250	275	350	350	385	440	485	595	730	845	990
Base bolt ctrs (square) d	150	200	225	300	290	325	380	425	530	645	745	890
Top plate length f	300	360	380	455	450	480	530	570	670	750	885	1020
Top plate width g	300	380	405	480	500	535	590	635	760	930	1070	1215
Top plate bolt ctrs longitudinally h	260	310	330	405	390	420	470	510	605	665	785	920
Top plate bolt ctrs transversely j	260	330	355	430	440	475	530	575	695	845	970	1115
Bolt size	M12	M16	M16	M16	M16	M16	M16	M20	M24	M30	M36	M36

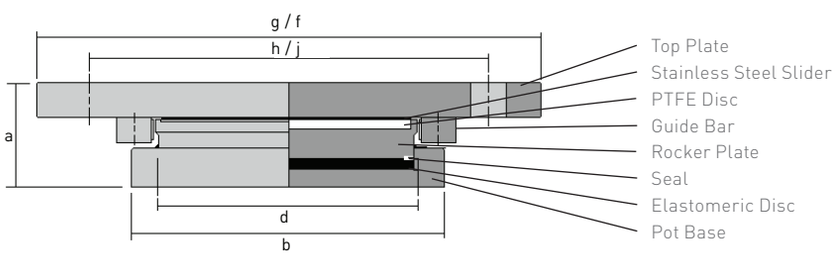
Assumptions:

1. Minimum load is at least 25% of total load.
2. For PS50 to PS750 total rotations are up to 0.02 rads. For PS1000 to PS2000 expected rotations are up to 0.006 rads.
3. Lower and upper contact pressures approach 25 N/mm^2 at SLS.
4. 25 mm mortar under base, or according to BS EN1337-11:1998 Clause 6.6.
5. Movements assumed to be +/- 50 mm longitudinally and +/- 20 mm transversely as per BS EN 1337-1:2000 Clause 5.4.

PG GUIDED SLIDING POT BEARINGS

Guided sliding bearings carry vertical load whilst allowing movement in one direction and providing restraint perpendicular to this movement. They also allow rotation in all directions.





Guide dimensions only

	PG 50	PG 100	PG 150	PG 200	PG 250	PG 300	PG 400	PG 500	PG 750	PG 1000	PG 1500	PG 2000
SLS Permanent vertical load (kN)	330	660	1000	1330	1660	2000	2670	2670	5000	6660	10000	13330
SLS Total vertical load (kN)	500	1000	1500	2000	2500	3000	4000	4000	7500	10000	15000	20000
SLS Horizontal load (kN)	100	200	220	255	350	380	510	510	890	1350	1700	2100
ULS Vertical load (kN)	650	1300	2000	2660	3330	4000	5330	5330	9750	13000	19500	26000
ULS Horizontal load (kN)	130	250	280	310	440	475	670	670	1120	1580	2200	2550
Overall height a	105	128	128	133	143	148	163	163	188	218	233	253
Base length and width b	200	270	330	375	425	455	530	530	730	845	1050	1090
Base bolt ctrs (square) d	160	220	280	325	365	395	465	465	645	745	935	975
Top plate length f	305	365	415	460	495	525	585	585	750	840	935	1015
Top plate width g	355	435	510	555	610	635	725	725	965	1110	1265	1340
Top plate ctrs longitudinally h	265	315	365	410	435	465	520	520	665	740	820	900
Top plate ctrs transversely j	315	385	460	505	550	575	660	660	880	1010	1150	1225
Bolt size	M12	M16	M16	M16	M20	M20	M24	M24	M30	M36	M42	M42

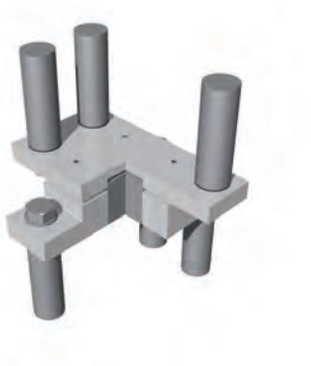
Assumptions:

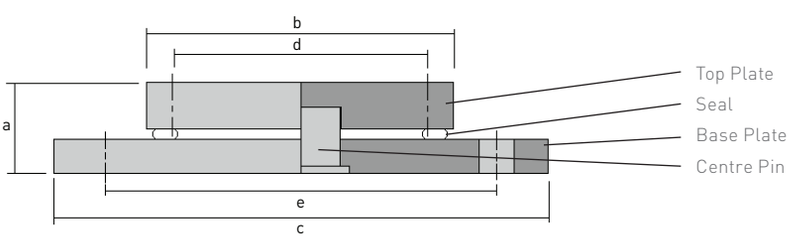
1. Minimum load is at least 25% of total load.
2. Frictional resistance calculated as per BS EN 1337-1:2000 Clause 5.2.
3. For PG50 to PG750 total rotations are up to 0.02 rads. For PG1000 to PG2000 expected rotations are up to 0.006 rads.
4. Lower and upper contact pressures approach 25 N/mm^2 at SLS.
5. 25 mm mortar under base, or according to BS EN1337-11:1998 Clause 6.6.
6. Movements assumed to be +/- 50 mm as per BS EN 1337-1:2000 Clause 5.4.

FP FIXED PIN BEARINGS

Fixed pin bearings will not transfer any vertical load. The vertical load would generally be taken by laminated elastomeric bearings positioned each side of the fixed pin bearing.

In situations where space is restricted, the bolting of the top plate can prove difficult. Uniguide and fixed pin bearings can be supplied with an optional tang plate to overcome this problem. This provides a permanent anchor for the bearing within the concrete.





Guide dimensions only

	FP 25	FP 50	FP 75	FP 100	FP 125	FP 150	FP 200
SLS Horizontal load (kN)	250	500	750	1000	1250	1500	2000
ULS Horizontal load (kN)	350	700	1050	1300	1565	1900	2800
Overall height a	90	120	130	140	150	160	170
Top plate and base plate width b	175	245	310	390	450	530	670
Top plate and base plate length c	285	425	530	610	650	730	890
Top and base plate bolt ctrs transversely d	110	150	200	280	340	420	560
Top and base plate bolt ctrs longitudinally e	220	330	420	480	540	620	770
Bolt size	M24	M36	M42	M42	M42	M42	M42
No. of bolts (top and base)	4	4	4	4	6	6	10

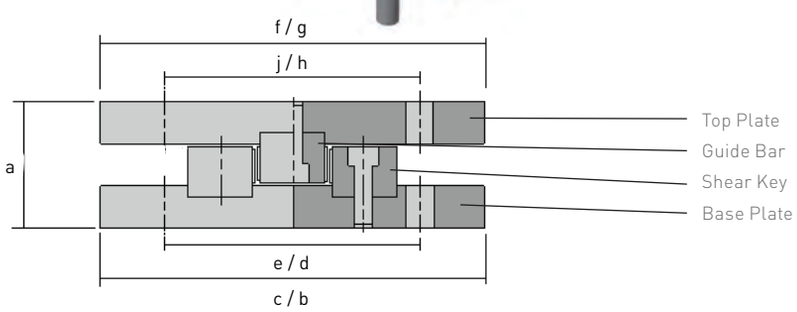
Assumptions:
1. 25 mm mortar under base, or according to BS EN1337-11:1998 Clause 6.6.

UG UNIGUIDE BEARINGS

Uniguide bearings allow movement in one direction to allow expansion from the fixed end, but provide restraint in the perpendicular direction.

Uniguide bearings will not transfer any vertical load. Elastomeric bearings would usually be positioned next to the uniguide to take the vertical load.

Guide dimensions only



	UG 200	UG 300	UG 400	UG 500	UG 750	UG 1000	UG 1500	UG 2000
SLS Horizontal load (kN)	200	300	400	500	750	1000	1500	2000
ULS Horizontal load (kN)	280	415	560	700	1030	1400	2100	2800
Overall height a	110	125	136	136	194	216	237	249
Base plate length b	225	315	330	395	435	480	560	670
Base plate width c	275	290	350	405	495	525	560	630
Base plate bolt ctrs longitudinally d	80	100	110	120	130	140	150	200
Base plate bolt ctrs transversely e	230	230	250	340	415	430	445	505
Top plate length f	325	425	470	515	650	660	700	800
Top plate width g	275	290	350	405	495	525	560	630
Top plate bolt ctrs longitudinally h	270	370	370	450	550	565	580	670
Top plate bolt ctrs transversely j	230	240	270	280	415	430	445	505
Top bolt size	M16	M20	M24	M24	M30	M36	M42	M48
Base bolt size	M16	M20	M24	M24	M30	M36	M42	M48

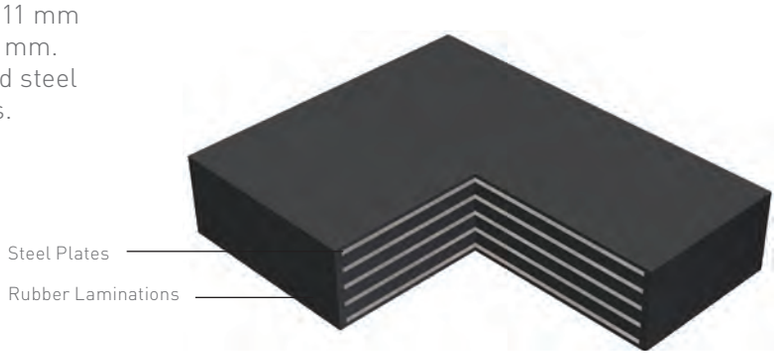
Assumptions:

1. Movements assumed to be +/- 50 mm as per BS EN 1337-1:2000 Clause 5.4.
2. 25 mm mortar under base, or according to BS EN1337-11:1998 Clause 6.6.

LR ELASTOMERIC BEARINGS

Elastomeric bearings are usually designed and manufactured to the requirements of EN1337-3:2005 or British Standard BS 5400: Part 9.

CCL standard bearings have chloroprene or natural rubber laminates in thicknesses of 5, 8 and 11 mm and steel plates in thicknesses of 2, 3 and 4 mm. Other thicknesses of rubber laminations and steel plates can be produced for bespoke designs.



PR/SR PLAIN PAD AND STRIP BEARINGS

This bearing type is the cheapest and quickest to produce but allows small vertical rotation and shear displacements by elastic deformation. To prolong its lifespan it should not be used under heavy and constant shear forces.

ELASTOMERIC TECHNICAL INFORMATION

2520-04-08-ENR3

A	Overall length in cm
B	Overall breadth in cm
C	Number of rubber laminations
D	Thickness of individual rubber laminations in mm
E	Grade and type of rubber
F	Thickness of steel plate in mm (standard size 2, 3 and 4 mm)

Note:

The number of plates = the number of laminates + 1
Top and bottom cover thickness = 2.5 mm
Side cover thickness = 4.5 mm

To calculate the total thickness of the bearing:

T = Top and bottom cover thickness + total thickness of rubber laminations + total thickness of plates.

Example:

- Bearing reference 2520-04-08-ENR3
- Number of rubber laminations = 4
- Thickness of laminations = 8 mm
- Number of plates = 4 + 1 = 5
- Thickness of plate = 3 mm

T = (2.5 + 2.5) + (4 x 8) + (5 x 3) = 52

						Zero Shear No Rotation	Max. Shear With Zero Rotation			Zero Shear With Rotation			Max Shear With Rotation		
Bearing Reference	Plan Dimension (mm)	Height (mm)	Weight (kg)	Kc (kN/mm)	Ks (kN/mm)	SLS Vertical Load (kN)	Max.Shear Movement Located (mm)	Max.Shear Movement Unlocated (mm)	SLS Vertical Load (kN)	SLS Vertical Load (kN)	Rotational Capacity (rads)	Max.Shear Movement Located (mm)	Max.Shear Movement Unlocated (mm)	SLS Vertical Load (kN)	Rotational Capacity (rads)
1010-01-05ENR2	100 x 100	14	0.38	115	0.90	90	3.5	7.0	68	39	0.0113	3.5	7.0	31	0.0090
1010-02-05ENR2	100 x 100	21	0.57	65	0.60	90	7.0	10.5	65	42	0.0215	7.0	10.5	32	0.0167
1010-03-05ENR2	100 x 100	28	0.76	45	0.45	90	10.5	14.0	63	43	0.0316	10.5	14.0	32	0.0240
1010-04-05ENR2	100 x 100	35	0.95	34	0.36	82	14.0	17.5	60	43	0.0417	14.0	17.5	32	0.0309
1510-01-05ENR2	150 x 100	14	0.58	255	1.35	170	3.5	7.0	129	81	0.0105	3.5	7.0	64	0.0083
1510-02-05ENR2	150 x 100	21	0.87	144	0.90	170	7.0	10.5	124	86	0.0198	7.0	10.5	66	0.0153
1510-03-05ENR2	150 x 100	28	1.16	100	0.68	170	10.5	14.0	118	88	0.0290	10.5	14.0	66	0.0219
1510-04-05ENR2	150 x 100	35	1.45	77	0.54	154	14.0	17.5	113	89	0.0383	14.0	17.5	65	0.0281
1510-05-05ENR2	150 x 100	42	1.73	62	0.45	129	17.5	21.0	99	89	0.0475	17.5	21.0	64	0.0338
2010-01-05ENR2	200 x 100	14	0.78	418	1.80	257	3.5	7.0	195	128	0.0101	3.5	7.0	101	0.0080
2010-02-05ENR2	200 x 100	21	1.17	237	1.20	257	7.0	10.5	187	136	0.0189	7.0	10.5	105	0.0146
2010-03-05ENR2	200 x 100	28	1.56	165	0.90	257	10.5	14.0	179	139	0.0277	10.5	14.0	104	0.0208
2010-04-05ENR2	200 x 100	35	1.95	127	0.72	233	14.0	17.5	171	140	0.0365	14.0	17.5	102	0.0266
2015-01-05ENR2	200 x 150	14	1.19	1032	2.70	524	3.5	7.0	411	229	0.0047	3.5	7.0	185	0.0038
2015-02-05ENR2	200 x 150	21	1.78	592	1.80	524	7.0	10.5	400	247	0.0089	7.0	10.5	196	0.0070
2015-03-05ENR2	200 x 150	28	2.38	415	1.35	524	10.5	14.0	389	253	0.0130	10.5	14.0	198	0.0102
2015-04-05ENR2	200 x 150	35	2.97	320	1.08	524	14.0	17.5	378	257	0.0171	14.0	17.5	198	0.0132
2015-05-05ENR2	200 x 150	42	3.57	260	0.90	524	17.5	21.0	368	259	0.0212	17.5	21.0	196	0.0161
2015-06-05ENR2	200 x 150	49	4.16	219	0.77	524	21.0	24.5	357	260	0.0253	21.0	24.5	194	0.0189
2515-01-08ENR3	250 x 150	19	2.16	503	2.60	453	5.6	9.1	349	239	0.0101	5.6	9.1	190	0.0080
2515-02-08ENR3	250 x 150	30	3.30	263	1.61	453	11.2	14.7	335	244	0.0198	11.2	14.7	190	0.0153
2515-03-08ENR3	250 x 150	41	4.45	178	1.16	453	16.8	20.3	320	246	0.0294	16.8	20.3	186	0.0222
2515-04-08ENR3	250 x 150	52	5.59	135	0.91	431	22.4	25.9	305	247	0.0390	22.4	25.9	181	0.0287
2515-05-08ENR3	250 x 150	63	6.73	108	0.75	355	28.0	31.5	275	247	0.0486	28.0	31.5	176	0.0347
2520-01-08ENR3	250 x 200	19	2.91	939	3.46	735	5.6	9.1	578	358	0.0060	5.6	9.1	289	0.0048
2520-02-08ENR3	250 x 200	30	4.45	494	2.14	735	11.2	14.7	560	368	0.0117	11.2	14.7	291	0.0093
2520-03-08ENR3	250 x 200	41	5.99	335	1.55	735	16.8	20.3	542	371	0.0174	16.8	20.3	289	0.0135
2520-04-08ENR3	250 x 200	52	7.52	254	1.22	735	22.4	25.9	524	373	0.0231	22.4	25.9	285	0.0176
2520-05-08ENR3	250 x 200	63	9.06	204	1.00	735	28.0	31.5	506	374	0.0287	28.0	31.5	280	0.0216
3020-01-08ENR3	300 x 200	19	3.50	1298	4.15	961	5.6	9.1	755	482	0.0058	5.6	9.1	388	0.0047
3020-02-08ENR3	300 x 200	30	5.36	686	2.57	961	11.2	14.7	732	495	0.0113	11.2	14.7	392	0.0090
3020-03-08ENR3	300 x 200	41	7.21	466	1.86	961	16.8	20.3	708	500	0.0168	16.8	20.3	388	0.0131
3020-04-08ENR3	300 x 200	52	9.06	353	1.46	961	22.4	25.9	685	502	0.0223	22.4	25.9	383	0.0170
3020-05-08ENR3	300 x 200	63	10.92	284	1.20	961	28.0	31.5	662	503	0.0278	28.0	31.5	376	0.0208
3025-01-08ENR3	300 x 250	19	4.41	2045	5.19	1386	5.6	9.1	1100	646	0.0039	5.6	9.1	523	0.0032
3025-02-08ENR3	300 x 250	30	6.74	1088	3.21	1386	11.2	14.7	1074	667	0.0076	11.2	14.7	533	0.0061
3025-03-08ENR3	300 x 250	41	9.07	741	2.33	1386	16.8	20.3	1047	674	0.0113	16.8	20.3	532	0.0089
3025-04-08ENR3	300 x 250	52	11.40	562	1.82	1386	22.4	25.9	1021	678	0.0150	22.4	25.9	528	0.0117
3025-05-08ENR3	300 x 250	63	13.72	452	1.50	1386	28.0	31.5	994	680	0.0187	28.0	31.5	522	0.0144
3025-06-08ENR3	300 x 250	74	16.05	379	1.27	1386	33.6	37.1	967	681	0.0224	33.6	37.1	516	0.0170
3025-07-08ENR3	300 x 250	85	18.38	326	1.11	1369	39.2	42.7	941	682	0.0261	39.2	42.7	509	0.0195
4025-01-08ENR3	400 x 250	19	5.90	3339	6.92	2107	5.6	9.1	1673	1020	0.0038	5.6	9.1	826	0.0031
4025-02-08ENR3	400 x 250	30	9.03	1788	4.29	2107	11.2	14.7	1632	1055	0.0073	11.2	14.7	843	0.0059
4025-03-08ENR3	400 x 250	41	12.15	1221	3.10	2107	16.8	20.3	1592	1067	0.0109	16.8	20.3	841	0.0086
4025-04-08ENR3	400 x 250	52	15.27	927	2.43	2107	22.4	25.9	1551	1074	0.0144	22.4	25.9	834	0.0112
4025-05-08ENR3	400 x 250	63	18.39	747	2.00	2107	28.0	31.5	1511	1077	0.0179	28.0	31.5	825	0.0137
4025-06-08ENR3	400 x 250	74	21.51	626	1.70	2107	33.6	37.1	1471	1080	0.0215	33.6	37.1	815	0.0162
4025-07-08ENR3	400 x 250	85	24.63	538	1.48	2081	39.2	42.7	1430	1082	0.0250	39.2	42.7	804	0.0186
4030-01-08ENR3	400 x 300	19	7.11	4771	8.31	2847	5.6	9.1	2275	1284	0.0028	5.6	9.1	1045	0.0022
4030-02-08ENR3	400 x 300	30	10.87	2574	5.14	2847	11.2	14.7	2230	1337	0.0053	11.2	14.7	1076	0.0043
4030-03-08ENR3	400 x 300	41	14.63	1763	3.72	2847	16.8	20.3	2185	1355	0.0079	16.8	20.3	1080	0.0063
4030-04-08ENR3	400 x 300	52	18.39	1340	2.92	2847	22.4	25.9	2140	1365	0.0105	22.4	25.9	1075	0.0083
4030-05-08ENR3	400 x 300	63	22.15	1081	2.40	2847	28.0	31.5	2094	1370	0.0131	28.0	31.5	1068	0.0102
4030-06-08ENR3	400 x 300	74	25.91	906	2.04	2847	33.6	37.1	2049	1374	0.0156	33.6	37.1	1059	0.0120
4030-07-08ENR3	400 x 300	85	29.67	780	1.77	2847	39.2	42.7	2004	1377	0.0182	39.2	42.7	1049	0.0139
4030-08-08ENR3	400 x 300	96	33.42	684	1.57	2847	44.8	48.3	1959	1379	0.0208	44.8	48.3	1038	0.0156
4535-01-11ENR4	450 x 350	24	12.27	3691	8.86	3155	7.7	11.2	2517	1515	0.0036	7.7	11.2	1230	0.0029
4535-02-11ENR4	450 x 350	39	18.93	1922	5.25	3155	15.4	18.9	2458	1546	0.0071	15.4	18.9	1240	0.0057
4535-03-11ENR4	450 x 350	54	25.60	1299	3.73	3155	23.1	26.6	2399	1557	0.0105	23.1	26.6	1233	0.0083
4535-04-11ENR4	450 x 350	69	32.26	981	2.89	3155	30.8	34.3	2340	1562	0.0140	30.8	34.3	1221	0.0109
4535-05-11ENR4	450 x 350	84	38.93	789	2.36	3155	38.5	42.0	2282	1566	0.0175	38.5	42.0	1207	0.0135
4535-06-11ENR4	450 x 350	99	45.59	659	2.00	3155	46.2	49.7	2223	1568	0.0209	46.2	49.7	1192	0.0159
4535-07-11ENR4	450 x 350	114	52.26	566	1.73	3155	53.9	57.4	2164	156	0.0244	53.9	57.4	1176	0.0183
5040-01-11ENR4	500 x 400	24	15.64	5721	11.25	4559	7.7	11.2	3653	2114	0.0028	7.7	11.2	1721	0.0023
5040-02-11ENR4	500 x 400	39	24.13	2998	6.67	4559	15.4	18.9	3579	2166	0.0055	15.4	18.9	1745	0.0045
5040-03-11ENR4	500 x 400	54	32.61	2032	4.74	4559	23.1	26.6	3505	2184	0.0082	23.1	26.6	1741	0.0066
5040-04-11ENR4	500 x 400	69	41.10	1536	3.67	4559	30.8	34.3	3430	2193	0.0109	30.8	34.3	1729	0.0086
5040-05-11ENR4	500 x 400	84	49.59	1235	3.00	4559	38.5	42.0	3356	2199	0.0137	38.5	42.0	1714	0.0106
5040-06-11ENR4	500 x 400	99	58.08	1033	2.54	4559	46.2	49.7	3282	2202	0.0164	46.2	49.7	1698	0.0126
5040-07-11ENR4	500 x 400	114	66.57	887	2.20	4559	53.9	57.4	3208	2205	0.0191	53.9	57.4	1679	0.0145
5040-08-11ENR4	500 x 400	129	75.06	778	1.94	4559	61.6	65.1	3134	2207	0.0218	61.6	65.1	1660	0.0164
6045-01-11ENR4	600 x 450	24	21.19	9658	15.19	7181	7.7	11.2	5773	3240	0.0023	7.7	11.2	2643	0.0019
6045-02-11ENR4	600 x 450	39	32.69	5107	9.00	7181	15.4	18.9	5670	3337	0.0044	15.4	18.9	2698	0.0036
6045-03-11ENR4	600 x 450	54	44.19	3471	6.39	7181	23.1	26.6	5566	3371	0.0066	23.1	26.6	2700	0.0053
6045-04-11ENR4	600 x 450	69	55.69	2629	4.96	7181	30.8	34.3	5463	3388	0.0088	30.8	34.3	2688	0.0070
6045-05-11ENR4	600 x 450	84	67.19	2116	4.05	7181	38.5	42.0	5359	3399	0.0109	38.5	42.0	2671	0.0086
6045-06-11ENR4	600 x 450	99	78.69	1770	3.42	7181	46.2	49.7	5256	3405	0.0131	46.2	49.7	2650	0.0102
6045-07-11ENR4	600 x 450	114	90.19	1522	2.96	7181	53.9	57.4	5152	3410	0.0152	53.9	57.4	2627	0.0117
6045-08-11ENR4	600 x 450	129	101.69	1334	2.61	7181	61.6	65.1	5049	3414	0.0174	61.6	65.1	2602	0.0133
6045-09-11ENR4	600 x 450	144	113.19	1188	2.34	7181	69.3	72.8	4946	3417	0.0196	69.3	72.8	2577	0.0148

Table is for guidance only. Please submit a bearing schedule for a bespoke proposal.

ELASTOMERIC BEARING INSTALLATION

BASE FIXITY

Cast into recess in concrete with bedding mortar fill

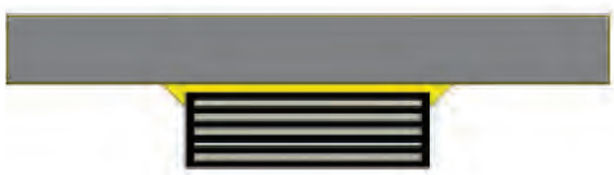
Cast onto bedding mortar and built around the edges

Glued onto smooth mortar plinth (standard method)

TOP FIXITY

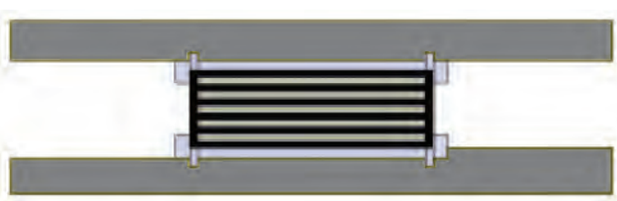
Cast into in-situ concrete deck

Glued to beam soffit (standard method)



TOP AND BASE FIXITY

Fixed using auxiliary steel plates (extreme cases only)

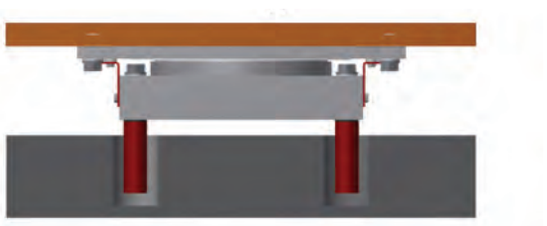


Bearing must be fixed on the top and bottom faces if positive fixity is required.

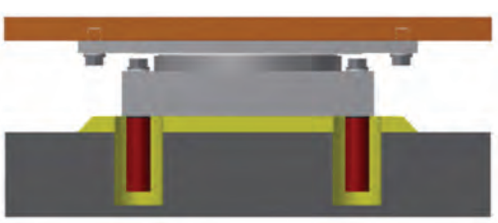
POT BEARING INSTALLATION

STEEL DECK FIXITY

A. Fix bearing to underside of steel deck with bolted connection. Ensure base plate is adequately secured with transit fixings or additional support. Bearing sockets fit within preformed holes in the bearing plinth.



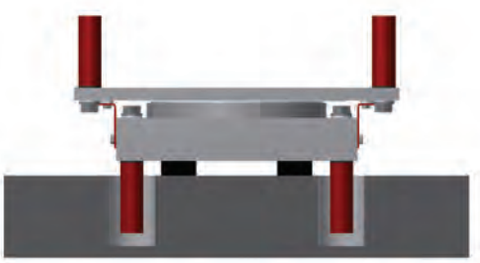
B1. Pour grout under bearing and within socket holes. Allow to cure, achieving the desired strength. Release transit brackets and allow load into bearing.



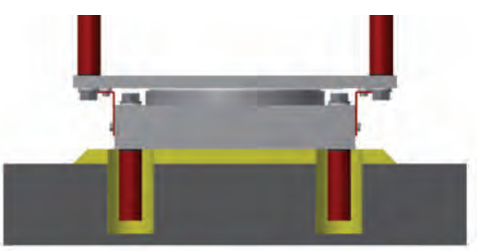
B2. For a steel connection beneath the bearing, a bolted connection can also be accommodated.

CONCRETE DECK FIXITY

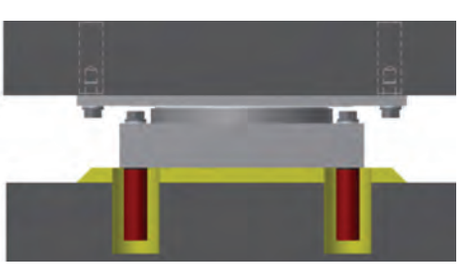
A. Place bearing upon nylon packers at a set height upon the bearing plinth, ensuring top plate is level. Bearing sockets fit within preformed holes in the bearing plinth.



B. Pour grout under bearing and within socket holes. Allow to cure, achieving the desired strength.



C. Cast concrete beam above bearing. Once complete, release transit brackets and allow load into bearing.



QUALITY STANDARDS

CCL is an ISO 18001 and 14001 registered company operating a quality management system compliant with ISO 9001: 2008. High performance bearings are individually designed and manufactured in accordance with European Standard EN 1337 and BS 5400 Sections 9.1 and 9.2: 1983 and are CE marked. If required bearings can be manufactured to any other global standard.

Established in 1935, CCL has a long history of providing specialised engineered solutions for structures. Every day, CCL products and services are used in building and civil engineering structures across the world.

CCL's advanced solutions help engineers, planners and construction companies create and maintain these structures.

9105 – DESIGNED AND PRODUCED BY
Grey Matter – www.usegreymatter.com

Regional Headquarters:

Americas
8296 Sherwick Court,
Jessup, MD 20794,
United States

T: +1 (301) 490 8427
E: cclus@cclint.com

Europe
Unit 8, Millennium Drive,
Leeds, LS11 5BP,
United Kingdom

T: +44 (0) 113 270 1221
E: cclgb@cclint.com

Gulf
Detroit House Building, Flat No. 201,
Motorcity, Dubai,
United Arab Emirates

T: +971 (4) 454 23 42
E: cclgulf@cclint.com
F: +971 (4) 454 23 43

MENA/Africa
Derviche Haddad Building,
Zouk Mosbeh, Beirut,
Lebanon

T: +961 (09) 22 60 44
E: cclme@cclint.com
F: +961 (09) 22 60 77

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www.cclint.com