

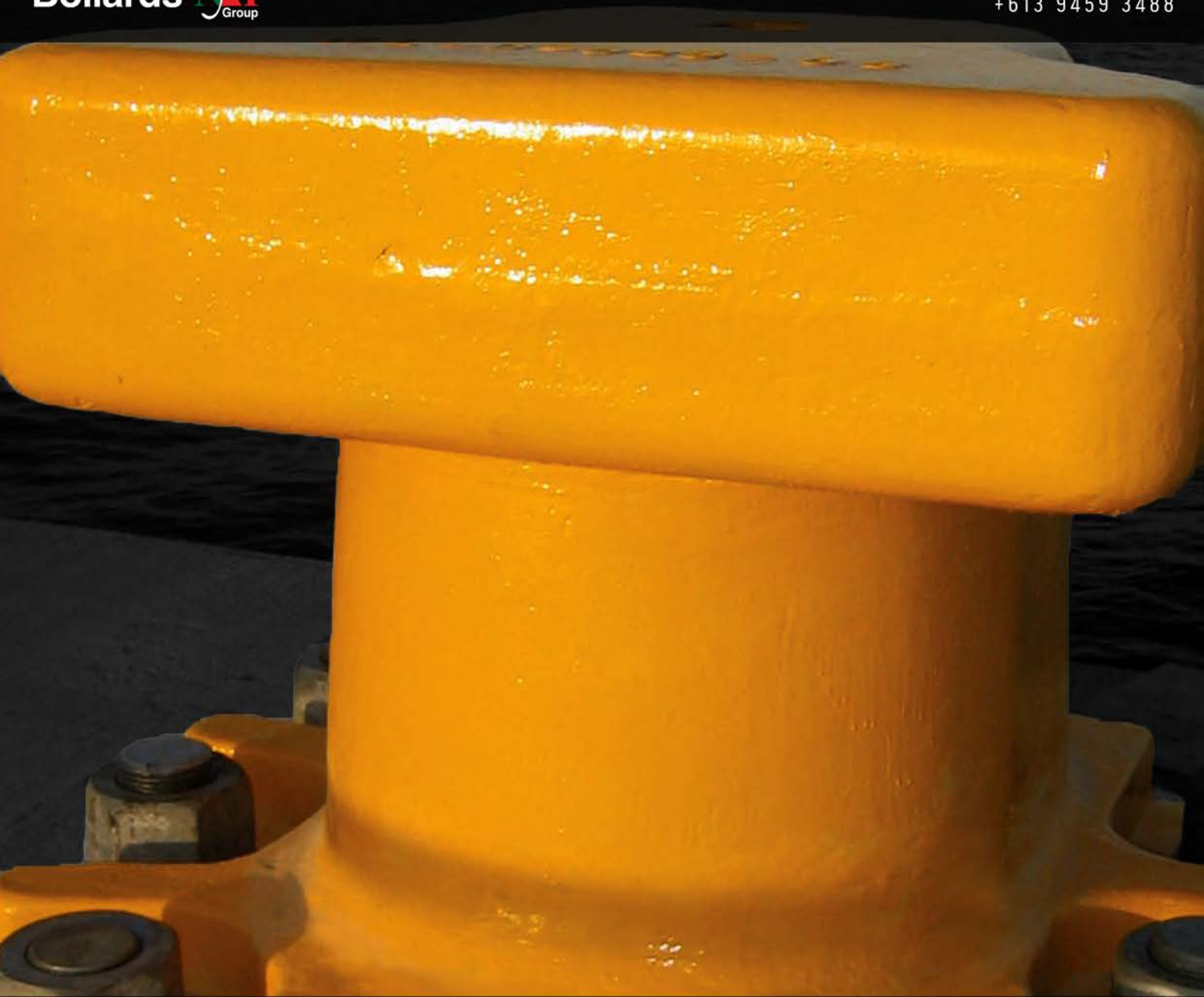


by  **Australian Bollards™**



PROUDLY BY AUSTRALIAN BOLLARDS
MOORING BOLLARDS

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INTRODUCTION

Australian Bollards is a leading Australian manufacturer of marine bollards and cleats. Our range of bollards and cleats is unsurpassed by any other manufacturer or supplier. Australian Bollards can provide many of the most popular style bollards, optimized bollards, or cast any new style to meet your custom requirements. It is Australian Bollards' mission to provide the bollards or cleats our customers require, and not just what we offer.

Australian Bollards began designing and manufacturing bollards with the philosophy to supply the highest quality products backed by reliable engineering and testing. Numerous suppliers of bollards in the market consider only the commercial aspects of the product. Australian Bollards' ability to consider technical and commercial considerations collectively is what has made our company unique. Our customers rely on standard bollards, mooring bollards and cleats to perform as expected, and it is our experience, technical expertise, and integrity which provides this assurance.

Contained within this catalog are the details of our latest mooring bollard and cleat designs and general technical information regarding the selection and installation of bollards and cleats. Should you require additional information, or require support for a unique mooring solution, Australian Bollards' engineers are available around the clock to satisfy your requirements.



BOLLARD TYPES & SELECTION

Mooring bollards are available in a wide range of shapes, load ratings, and materials, of which no single combination can satisfy all customers. Accordingly, Australian Bollards provides a wide range of products. The most commonly used style of bollards are the Single Bitt, Double Bitt, T-head, Staghorn, and Kidney, as well as simple cleats used for smaller vessels.

The particular type of bollard a customer requests, as well as the material used to cast the bollard, is usually a function of what has historically been used at the operator's facility. These differences can also be geographically dependent. For example, T-head bollards are more prominent in some regions while Single Bitt bollards are more commonly used in others. It may also be the preference of the consultant as they may have considered a particular bollard model, along with its particular shape, load rating, and anchorage, during the detailed design of the berth. This choice must be respected to ensure the safe usage of the product.

While customer preference may determine the model supplied by Australian Bollards, there are differences amongst models that should be considered when selecting a bollard. T-head and Staghorn bollards can handle higher line load angles than Single Bitt and Kidney shaped bollards. This feature may be of particular importance where very large changes in water level result in significant differences in line angles. Large differences in line angles may also occur at multipurpose berths where widely varying vessel sizes frequent the same berth.

Double Bitt bollards are useful when high densities of mooring lines are present. The two column design allows two lines to be secured and independently released without having to compromise the mooring of an adjacent vessel. The opposing sloping columns are particularly useful for securing of spring lines as their greatest strength is parallel to the berth.

Kidney shaped bollards offer an economical solution for installations where securing of mooring lines at high angles is not a concern. This style is not recommended when multiple mooring lines will share one bollard as there may be a possibility of an unintentional release due to the shallow lip at the top of the bollard.

LOAD RATINGS

There is some confusion within the marine industry over how mooring bollards are rated and how one goes about selecting a bollard with regards to capacity. It is critical that both the manufacturer of the bollard and the Consultant, or Port Engineer, communicate as to what is expected of the product and how that bollard will perform in service. There are three primary areas of concern when considering the load rating of a bollard:

What is the actual un-factored line load determined to be necessary at the berth?

This load should be determined by a qualified engineer that has performed a detailed mooring analysis. The line loads can be influenced by numerous factors including vessel size, wind conditions, current conditions, passing vessels, elasticity of the mooring lines, vessel deck equipment, tidal levels, bollard spacing, and numerous other factors. It is for this reason that it is not a simple question to ask "What load rating is necessary for a vessel of a particular carrying capacity?" In fact, the carrying capacity of the vessel may be one of the least importance parameters.

What is the necessary anchorage capacity of the bollard to the wharf to ensure safe mooring and to avoid costly structural damage in the event of concrete failure from an overload condition?

This subject, in and of itself, is a very complicated one. The required anchorage can only be determined by considering factors such as anchor bolt size, grade, and embedment depth, whether the bollard is keyed into the concrete or surface mounted, the loads on each anchor bolt, the strength of the concrete itself, as well as the influence of the reinforcing bars located in the vicinity of the bollard anchors. Bollard suppliers are sometimes asked to demonstrate anchor pullout capacity, when in reality it needs to be determined by the structural engineer of the wharf who should be in close communication with the bollard supplier on the size and loads of the anchors being provided. It is not possible for the bollard supplier alone to consider other significant loads being carried by the concrete such as the deck load, crane loads, and fender loads.

What is the working capacity of the bollard, the ultimate failure load, and the failure mode of the bollard and anchorage system?

The bollard itself can be rated based on its yield strength or ultimate strength. All of mooring bollard load ratings are certified using both finite element analysis and hand calculations. The shape of the bollard itself can also be adjusted, if necessary, to satisfy the load requirements of the customer. The load capacity of the bollard and anchorage system may also be intentionally limited, at strategic locations in the system, to avoid damage to the wharf. This is usually accomplished through the use of fuse bolts that can be predicted to fail near a certain load which allows for easy replacement of the failed component without structural damage to the wharf. While this technique is useful for the intended purpose, consideration must be given to the failure mode so that a predictable release of the mooring line is possible without the failed bollard and anchorage system causing harm to port and vessel personnel and equipment.



MATERIAL SPECIFICATIONS

Cast Steel ASTM Specifications

ASTM Grade	Tensile Strength Min. ksi [MPa]	Yield Strength Min. ksi [MPa]	Elongation in 2 in. or 50mm, Min %	Reduction of Area, Min. %
A27 Gr. 65-35	65 [450]	35 [240]	24	35
A27 Gr. 70-36	70 [485]	36 [250]	22	30
A27 Gr. 70-40	70 [485]	40 [275]	22	30
A148 Gr. 80-50	80 [550]	50 [345]	22	35

Cast Steel ISO Specifications

ISO Grade	Tensile Strength, Min. ksi [Mpa]	Yield Strength, Min. ksi [Mpa]	Elongation, Min. %	Reduction of Area, Min. %
3755 Gr. 230-450	65 [450]	33 [230]	22	31
3755 Gr. 270-480	70 [480]	39 [270]	18	25
3755 Gr. 340-550	80 [550]	49 [340]	15	21

Ductile Iron ASTM Specifications

ASTM Grade	Tensile Strength Min. ksi [MPa]	Yield Strength Min. ksi [MPa]	Elongation in 2 in. or 50mm, Min %	Reduction of Area, Min %
A536 Gr. 65-45-12	65 [448]	45 [310]	12	N/A
A536 Gr. 80-55-06	80 [552]	55 [379]	6	N/A

Ductile Iron ISO Specifications

ISO Grade	Tensile Strength, Min. ksi [Mpa]	Yield Strength, Min. ksi [Mpa]	Elongation, Min. %	Reduction of Area, Min. %
1083 Gr. 450-310	65 [450]	45 [310]	10	NA
1083 Gr. 550-350	80 [550]	51 [350]	5	NA



INSTALLATION

Various options exist for the installation of mooring bollards and cleats. The most common method is utilizing cast-in-place embedded anchors. Alternate methods include through bolting with cast in pipe sleeves, or epoxy-in anchors for retrofitting existing structures. Cast-in anchors or pipe sleeves should be set in place with the aid of a template or setting frame which will locate the anchors within the proper tolerances. For installations where the bollard is to be set into a recess cast into the concrete, Australian Bollards can supply a unique solution whereby the recess form work and anchor location template can be combined into one tool. Contact Australian Bollards for more information or assistance with this technique.

Always follow installation procedures supplied by Australian Bollards when installing our bollards as each installation may be unique and require special instructions. Particular attention should be paid to the torque values recommended for each installation.

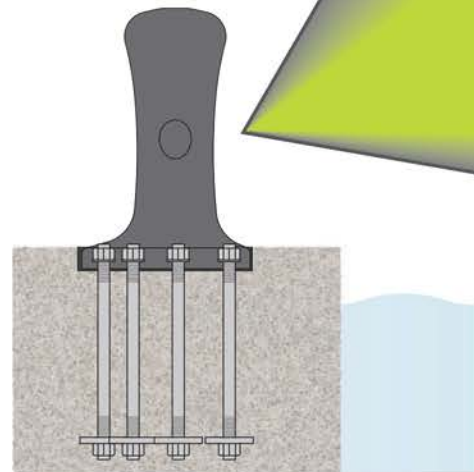
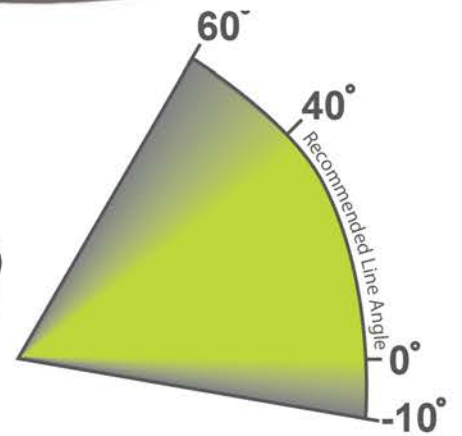
COATINGS

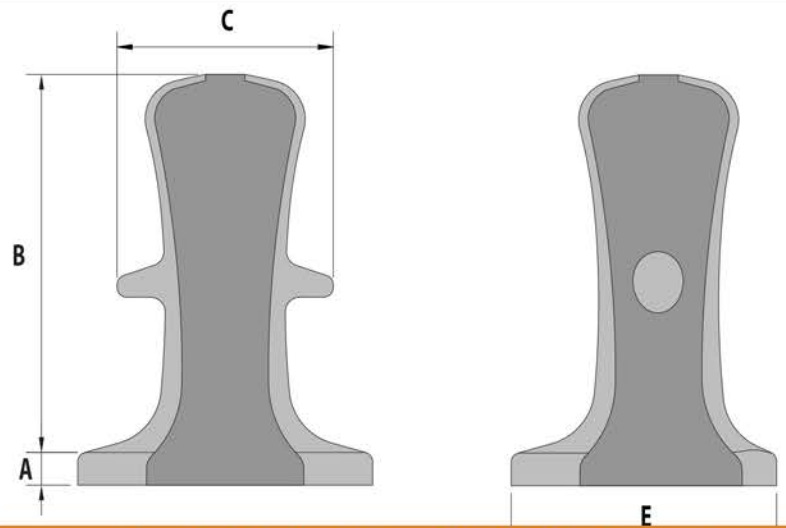
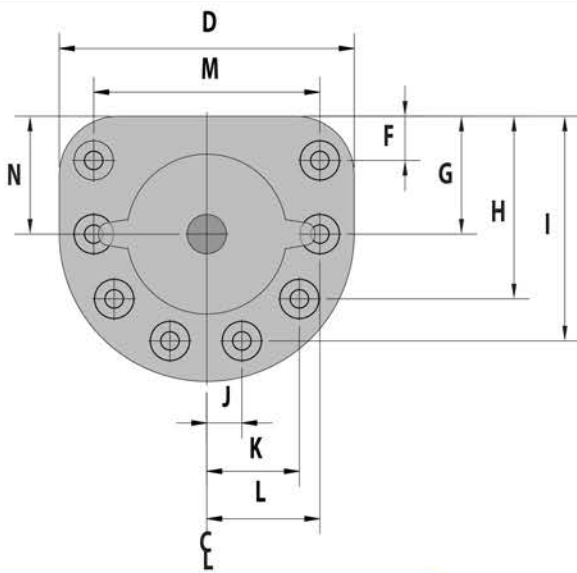
Coatings are an essential part of the system as it prevents excessive corrosion that can weaken a bollard. This is particularly significant for cast steel bollards, which are less corrosion resistant than ductile iron bollards. Virtually any coating requested can be applied, but some attention to the abrasion resistance of the coating should be given as the direct contact and movement of the mooring lines will result in accelerated wear of any coating. Bollards can be supplied fully painted from our factory or with an easily removable rust preventative primer that allows surface preparation and coating on-site after installation. Traditionally, cleats are supplied hot dip galvanized, but can also be supplied painted if requested.



AB-MSB

SINGLE BITT BOLLARD



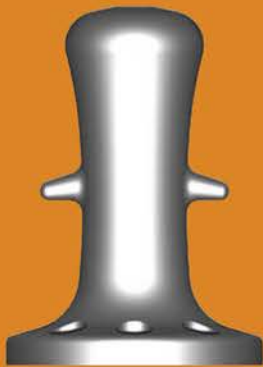


Standard Bollard Capacity (Metric Tonnes)

Imperial Dimensions (inches)	MSB 10	MSB 15	MSB 20	MSB 30	MSB 50	MSB 75	MSB 100	MSB 125	MSB 150	MSB 200
A	1-3/4	1-3/4	2-1/8	2-3/8	2-3/4	3-1/4	3-1/2	3-5/8	3-7/8	4-3/8
B	15-3/8	16-7/8	17-7/8	21-1/4	27	32-5/8	38-3/8	41-5/8	45-3/8	50
C	8-3/4	9-5/8	10-3/8	12-1/8	15-3/8	18-3/4	22	23-3/4	26	28-5/8
D	12-3/4	14-1/8	14-1/8	16-1/2	21	25-1/2	30	32-3/8	35-3/8	39
E	11-1/4	12-3/8	12-3/4	14-7/8	18-7/8	23	27	29-1/8	31-7/8	35-1/8
F	1-3/4	2	2-1/8	2-1/2	3-1/8	3-7/8	4-1/2	4-7/8	5-1/4	5-7/8
G	-	-	-	-	-	-	13	14	15-3/8	15-5/8
H	-	-	7-7/8	9-1/4	10-1/8	12-1/4	20-1/2	22-1/4	24-1/4	24-1/8
I	8	8-7/8	11	12-7/8	15-1/2	18-7/8	23-1/2	25-3/8	27-3/4	29-3/4
J	3-1/4	3-5/8	0	0	3-3/4	4-5/8	0	0	0	4-7/8
K	-	-	4-7/8	5-3/4	7-7/8	9-1/2	7-3/4	8-1/4	9-1/8	12-1/4
L	-	-	-	-	-	-	11-1/2	12-3/8	13-1/2	15
M	9-1/4	10-1/8	10-3/4	12-5/8	16-1/8	19-1/2	23	24-7/8	27-1/8	29-7/8
N	4-3/4	5-1/4	5-5/8	6-5/8	8-3/8	10-1/4	12	13	14-1/8	15-5/8
Bolt Size	1	1	1	1-1/4	1-3/8	1-3/4	1-3/4	2	2	2-1/4
Bolt Length	18	18	18	18	24	30	30	36	36	36
Bolt Qty	4	4	5	5	6	6	7	7	7	8

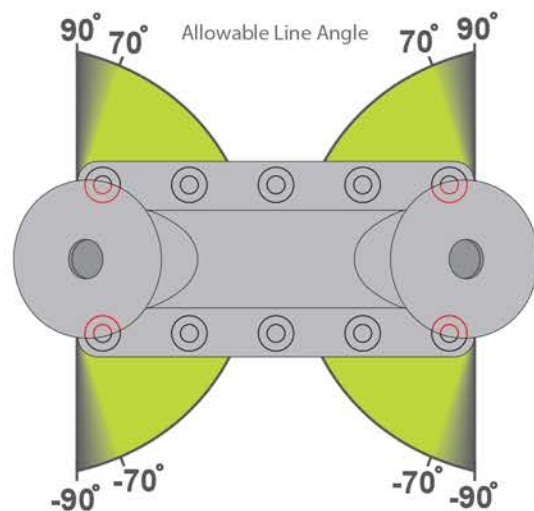
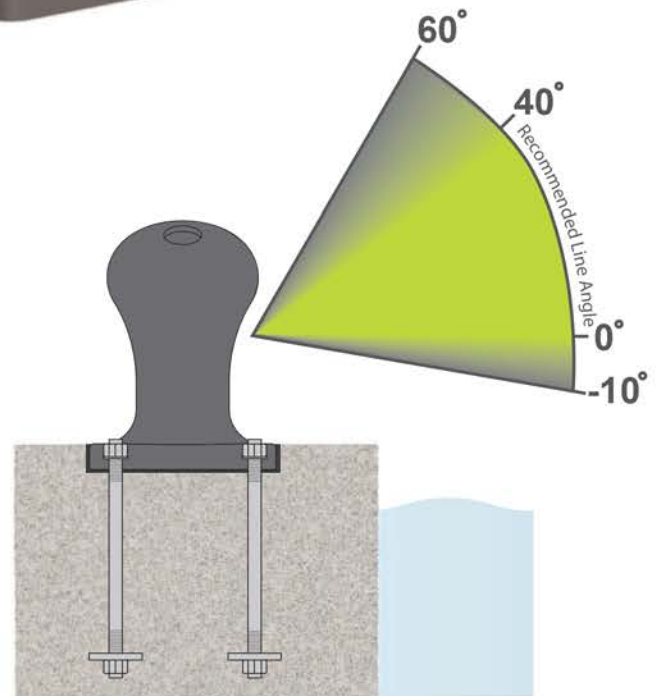
Standard Bollard Capacity (Metric Tonnes)

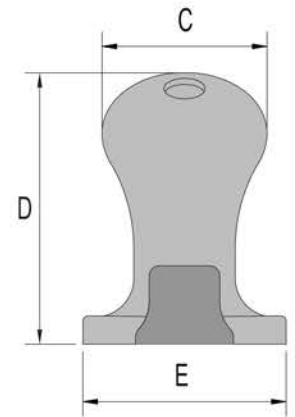
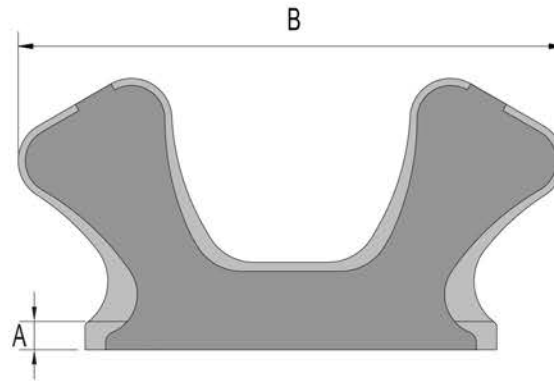
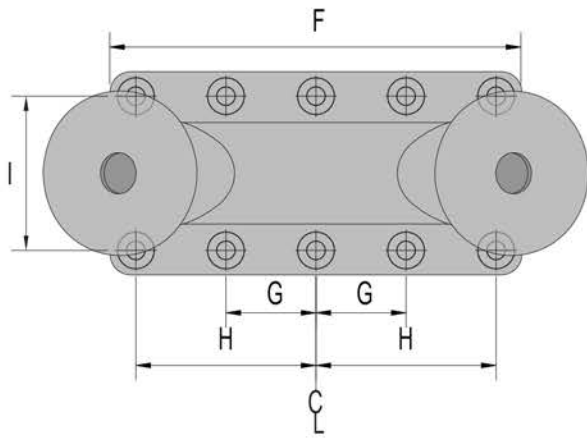
Metric Dimensions (mm)	MSB 10	MSB 15	MSB 20	MSB 30	MSB 50	MSB 75	MSB 100	MSB 125	MSB 150	MSB 200
A	44	44	54	60	70	82	89	92	98	111
B	390	429	454	540	686	829	925	1057	1153	1270
C	224	246	263	307	391	475	559	604	659	726
D	325	358	358	419	533	648	762	823	899	991
E	284	313	322	377	480	583	686	741	809	892
F	46	50	54	63	80	97	114	123	135	149
G	-	-	-	-	-	-	330	357	390	396
H	-	-	201	236	256	311	522	564	616	614
I	205	225	281	328	394	478	597	645	704	755
J	83	91	0	0	96	117	0	0	0	124
K	-	-	124	146	200	243	195	211	231	311
L	-	-	-	-	-	-	291	314	343	380
M	234	257	275	321	409	497	584	631	689	759
N	122	134	143	168	213	259	305	329	360	396
Bolt Size	M24	M24	M24	M30	M36	M42	M48	M48	M56	M56
Bolt Length	450	450	450	450	600	600	750	750	915	915
Bolt Qty	4	4	5	5	6	6	7	7	7	8



AB-MDB

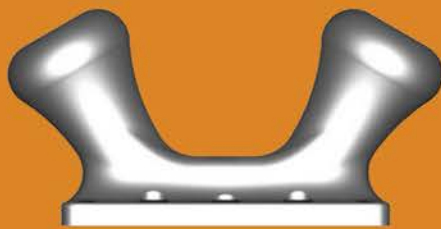
DOUBLE BITT BOLLARD





Standard Bollard Capacity (Metric Tonnes)

Imperial Dimensions (inches)	MDB 20	MDB 30	MDB 50	MDB 75	MDB 100	MDB 125	MDB 150	MDB 200
A	1-1/2	1-3/4	2-1/8	2-1/2	2-7/8	3-1/8	3-5/8	3-7/8
B	26-1/2	30-3/4	37-1/8	45	53	61	66-1/4	74-1/4
C	8	9-1/4	11-1/4	13-5/8	16	18-3/8	20	22-1/2
D	13-1/4	15-1/4	18-1/2	22-3/8	26-3/8	30-3/8	33	36-7/8
E	10-1/2	11-7/8	14	17	20	23	25	27-5/8
F	21	23-3/4	28	34	40	46	50	56
G	2-3/4	3-1/4	3-7/8	7-1/2	8-3/4	10-1/8	11	12-1/4
H	8-3/4	10-1/8	12-1/4	15	17-1/2	20-1/4	22	24-1/2
I	7-1/2	8-3/4	10-1/2	12-3/4	15	17-1/4	18-3/4	21
Bolt Size	3/4	7/8	1-1/8	1-1/4	1-1/2	1-3/4	2	2-1/4
Bolt Length	12	12	18	18	24	30	36	36
Bolt Qty	8	8	8	10	10	10	10	10

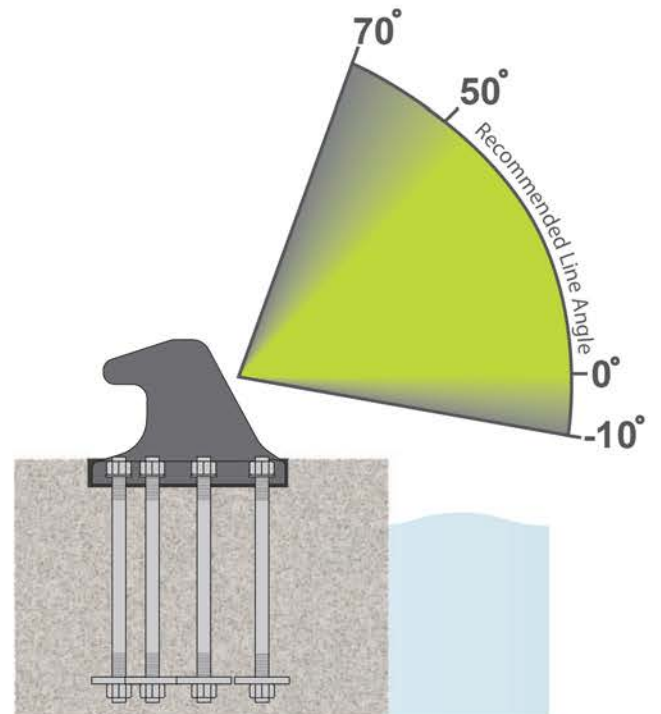


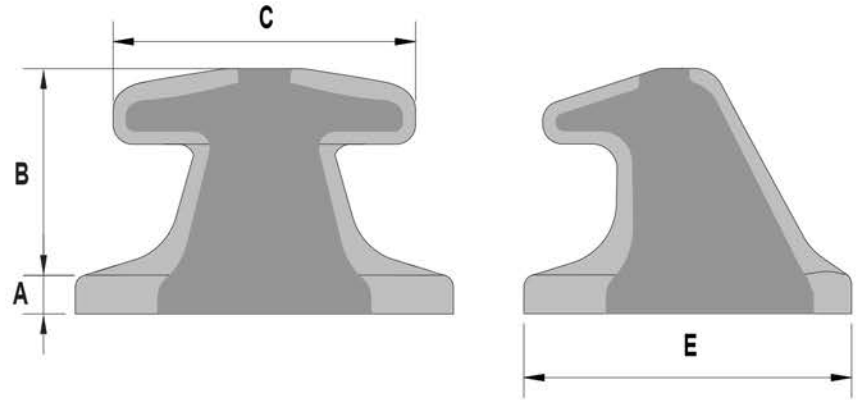
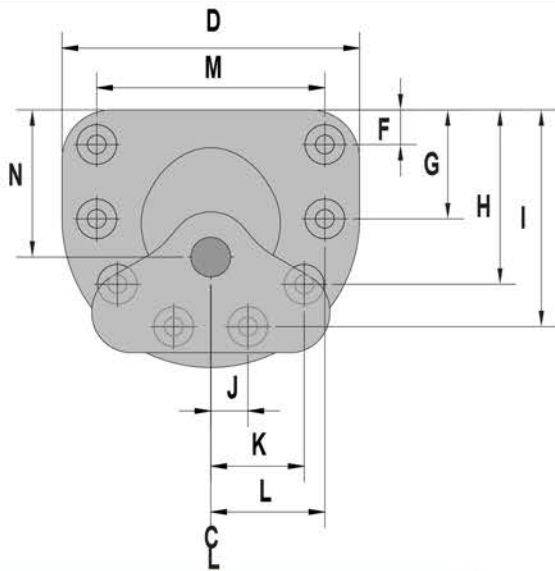
Standard Bollard Capacity (Metric Tonnes)

Metric Dimensions (mm)	MDB 20	MDB 30	MDB 50	MDB 75	MDB 100	MDB 125	MDB 150	MDB 200
A	38	46	56	62	73	80	91	98
B	673	781	942	1144	1346	1548	1683	1885
C	204	236	285	346	407	468	509	570
D	335	389	469	570	670	771	838	938
E	267	302	356	432	508	584	635	702
F	533	604	711	864	1016	1168	1270	1422
G	70	81	98	189	222	256	278	311
H	222	258	311	378	444	512	556	622
I	191	221	267	324	381	438	476	533
Bolt Size	M20	M22	M30	M36	M42	M42	M48	M56
Bolt Length	300	300	450	450	600	600	750	915
Bolt Qty	8	8	8	10	10	10	10	10

AB-MTH

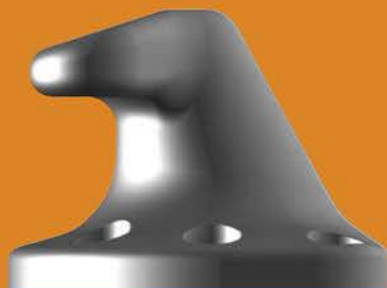
T-HEAD BOLLARD





Standard Bollard Capacity (Metric Tonnes)

Imperial Dimensions (inches)	MT 10	MT 15	MT 20	MT 30	MT 50	MT 75	MT 100	MT 125	MT 150	MT 200
A	1-7/8	2	2-1/8	2-1/4	2-3/4	3-1/4	3-1/4	3-3/8	3-5/8	3-7/8
B	7-7/8	8-5/8	9-1/2	9-7/8	12-1/8	13-7/8	16-1/8	18	19-3/8	20-1/2
C	12	13-1/4	13-3/4	14-3/8	17-3/4	20-3/8	24	26-3/8	28-3/8	30
D	15	16-1/2	17-1/4	18	22-1/4	25-1/2	30	33	35-3/8	37-1/2
E	13	14-1/4	15	15-5/8	19-1/4	22-1/8	26	28-5/8	30-5/8	32-1/2
F	1-3/4	1-7/8	2	2-1/8	2-5/8	3	3-1/2	3-7/8	4-1/8	4-3/8
G	-	-	-	-	-	-	12	13-1/4	14-1/8	13-3/4
H	-	-	9-1/8	9-1/2	11-3/4	11-3/4	19-1/2	21-1/2	23-1/8	22
I	9-5/8	10-1/2	13	13-1/2	16-5/8	18-1/4	22-1/2	24-3/4	26-1/2	27-3/8
J	4-1/8	4-1/2	0	0	0	4-1/8	0	0	0	4-5/8
K	-	-	6	6-1/4	7-3/4	9-1/2	7-3/4	8-1/2	9-1/8	11-3/4
L	-	-	-	-	-	-	11-1/2	12-5/8	13-1/2	14-3/8
M	11-1/2	12-5/8	13-1/4	13-3/4	17	19-1/2	23	25-1/4	27-1/8	28-3/4
N	7-3/8	8-1/8	8-1/2	8-7/8	11	12-5/8	14-7/8	16-3/8	17-1/2	18-5/8
Bolt Size	1	1	1	1-1/8	1-3/8	1-1/2	1-3/4	1-3/4	2	2
Bolt Length	18	18	18	18	24	24	30	30	36	36
Bolt Qty	4	4	5	5	5	6	7	7	7	8

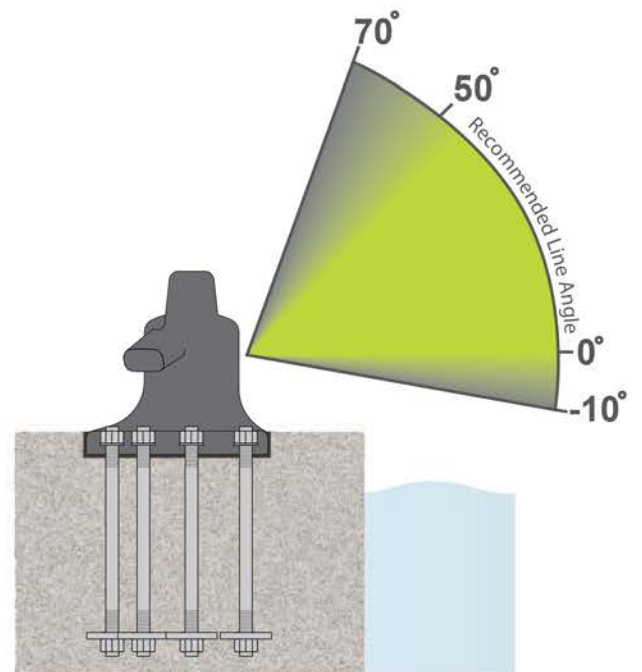


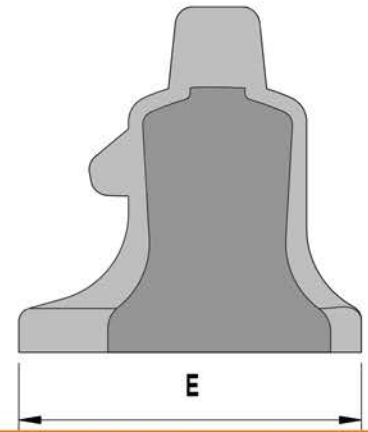
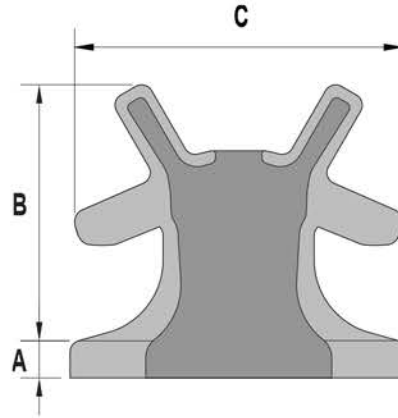
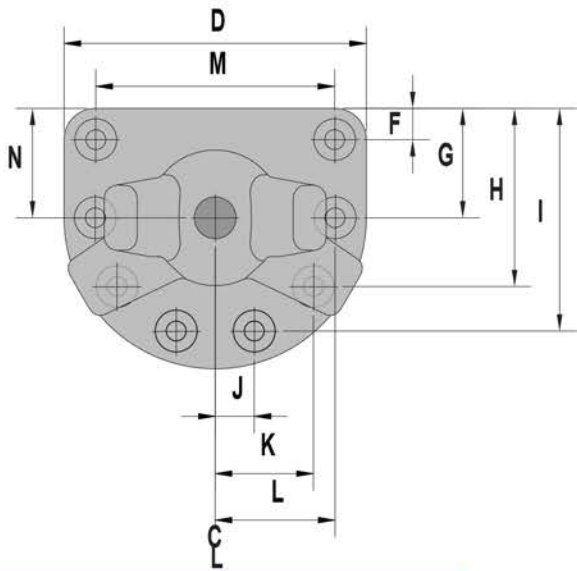
Standard Bollard Capacity (Metric Tonnes)

Metric Dimensions (mm)	MT 10	MT 15	MT 20	MT 30	MT 50	MT 75	MT 100	MT 125	MT 150	MT 200
A	47	52	54	57	70	80	80	87	93	97
B	199	219	240	250	308	354	413	458	492	521
C	305	335	351	366	451	518	610	671	719	762
D	381	419	438	457	564	648	762	838	899	952
E	330	363	380	396	489	561	660	726	779	826
F	44	49	51	53	66	76	89	98	105	111
G	-	-	-	-	-	-	305	335	360	349
H	-	-	232	242	298	298	496	546	586	559
I	243	267	329	343	423	463	572	629	674	694
J	103	114	0	0	0	105	0	0	0	119
K	-	-	152	159	196	241	195	215	231	299
L	-	-	-	-	-	-	291	320	343	365
M	292	321	336	351	432	497	584	643	689	730
N	189	208	217	226	279	321	377	415	445	472
Bolt Size	M24	M24	M24	M30	M36	M42	M42	M48	M48	M56
Bolt Length	450	450	450	450	600	600	600	750	750	915
Bolt Qty	4	4	5	5	5	6	7	7	7	8

AB-MSH

STAGHORN BOLLARD





Standard Bollard Capacity (Metric Tonnes)

Imperial Dimensions (inches)	MSH 10	MSH 15	MSH 20	MSH 30	MSH 50	MSH 75	MSH 100	MSH 125	MSH 150	MSH 200
A	1-5/8	1-3/4	2	2-1/8	2-3/8	2-7/8	3-1/4	3-1/2	3-3/4	4
B	11-3/8	12-5/8	13-5/8	15-1/2	16-3/8	19-1/4	22	24-1/4	26-1/2	27-1/2
C	13-3/4	15-1/2	16-7/8	19	20-1/4	24-5/8	28-1/4	31	33-7/8	35-1/4
D	15	16-1/2	17-3/8	19-5/8	20-7/8	25-3/8	29	31-7/8	34-3/4	36-1/4
E	13	14-1/4	15	16-7/8	18	21-7/8	25	27-1/2	30	31-1/4
F	1-3/4	1-7/8	1-3/4	2	2-1/8	2-5/8	3	3-1/4	3-5/8	3-3/4
G	-	-	-	-	-	-	11-1/2	12-5/8	13-3/4	13-1/8
H	-	-	9-1/4	10-3/8	11	11-1/4	19	21	22-7/8	21-3/8
I	9-5/8	10-1/2	13-1/4	14-7/8	15-7/8	18-1/8	22	24-1/4	26-3/8	26-3/4
J	4-1/8	4-1/2	0	0	0	4-3/4	0	0	0	4-5/8
K	-	-	6-1/4	7	7-1/2	9-7/8	7-3/4	8-1/2	9-1/4	11-3/4
L	-	-	-	-	-	-	11-1/2	12-5/8	13-3/4	14-3/8
M	11-1/2	12-5/8	13-3/4	15-1/2	16-1/2	20	22-7/8	25-1/4	27-1/2	28-5/8
N	5-1/2	6	6-1/4	7-1/8	7-1/2	9-1/8	10-1/2	11-1/2	12-5/8	13-1/8
Bolt Size	1	1	1	1-1/8	1-3/8	1-1/2	1-3/4	1-3/4	2	2
Bolt Length	18	18	18	18	24	24	30	30	36	36
Bolt Qty	4	4	5	5	5	6	7	7	7	8

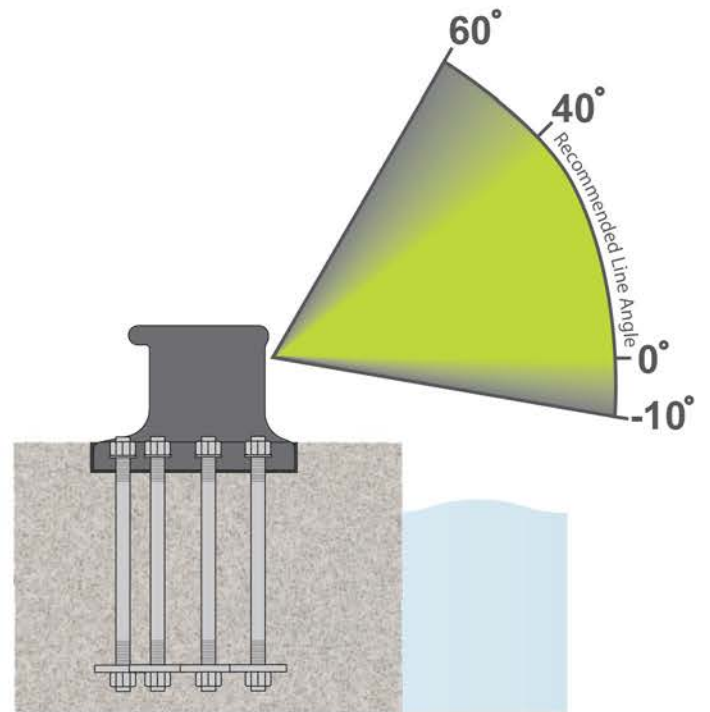
Standard Bollard Capacity (Metric Tonnes)

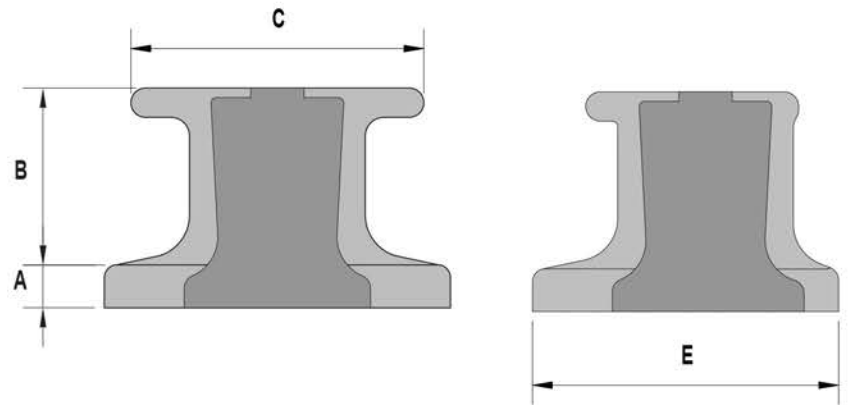
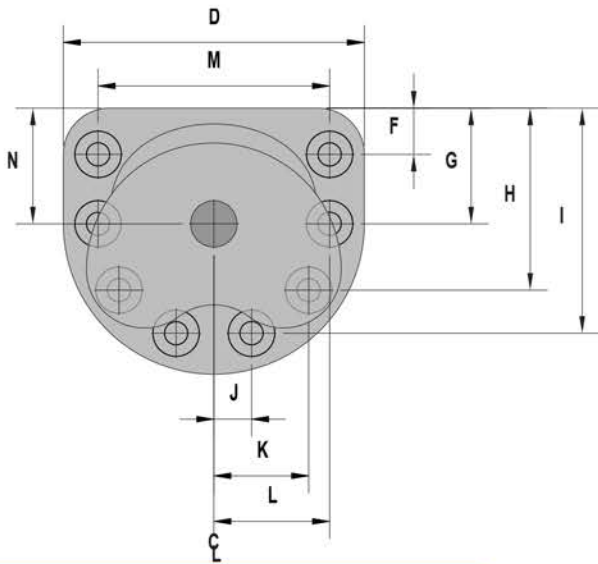
Metric Dimensions (mm)	MSH 10	MSH 15	MSH 20	MSH 30	MSH 50	MSH 75	MSH 100	MSH 125	MSH 150	MSH 200
A	41	45	49	55	59	71	81	90	98	102
B	291	320	349	392	419	489	559	615	671	699
C	348	394	430	483	516	627	717	788	860	896
D	381	419	442	497	530	645	737	810	884	921
E	330	363	381	429	457	556	635	699	762	794
F	44	49	46	51	55	67	76	84	91	95
G	-	-	-	-	-	-	292	321	351	333
H	-	-	234	263	281	287	484	532	581	543
I	243	267	335	377	402	459	559	615	671	679
J	103	114	0	0	0	120	0	0	0	119
K	-	-	159	179	191	250	195	215	235	299
L	-	-	-	-	-	-	291	320	349	365
M	291	320	349	393	419	509	582	640	698	727
N	140	154	160	180	192	233	267	293	320	333
Bolt Size	M24	M24	M24	M30	M36	M42	M42	M48	M48	M56
Bolt Length	450	450	450	450	600	600	600	750	750	915
Bolt Qty	4	4	5	5	5	6	7	7	7	8



AB-MK

KIDNEY BOLLARD





Standard Bollard Capacity (Metric Tonnes)

Imperial Dimensions (inches)	MK 15	MK 20	MK 30	MK 50	MK 75	MK 100	MK 125	MK 150	MK 200
A	1-5/8	2	2-1/8	2-3/8	2-3/4	3-1/8	3-1/2	3-3/4	4-3/8
B	7-5/8	8-1/2	10-1/8	10-3/8	11-3/4	13-3/8	14-3/4	16-1/8	18
C	10-7/8	13	15-1/8	16-1/4	19	21-5/8	23-7/8	26	29-7/8
D	12-3/4	15-3/8	17-7/8	19-1/4	22-3/8	25-5/8	28-1/8	30-3/4	35-3/8
E	11-3/8	13-5/8	15-7/8	17	19-3/4	22-5/8	24-7/8	27-1/8	31-1/4
F	2	2-3/8	2-3/4	3	3-1/2	3-7/8	4-3/8	4-3/4	5-3/8
G	-	-	-	-	9-3/8	10-3/4	11-3/4	12-7/8	13-5/8
H	-	8-3/8	10-1/8	8-7/8	15	17-1/8	18-7/8	20-5/8	21-3/8
I	8-3/8	11-3/4	13-3/4	13-7/8	17-1/4	19-5/8	21-5/8	23-5/8	26-3/8
J	3-1/2	0	0	3-1/2	0	0	0	0	4-3/8
K	-	5-3/8	6	7-1/4	5-3/4	6-5/8	7-1/4	7-7/8	11-1/8
L	-	-	-	-	8-5/8	9-3/4	10-3/4	11-3/4	13-5/8
M	9-7/8	11-3/4	13-3/4	14-3/4	17-1/4	19-5/8	21-5/8	23-5/8	27-1/8
N	4-7/8	5-7/8	6-7/8	7-3/8	8-5/8	9-7/8	10-7/8	11-3/4	13-5/8
Bolt Size	1	1	1-1/8	1-3/8	1-1/2	1-3/4	2	2	2-1/4
Bolt Length	18	18	18	24	24	30	36	36	36
Bolt Qty	4	5	5	6	7	7	7	7	8

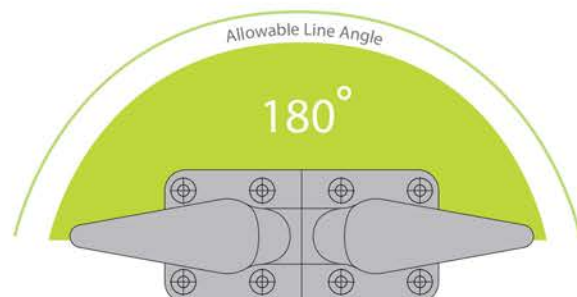
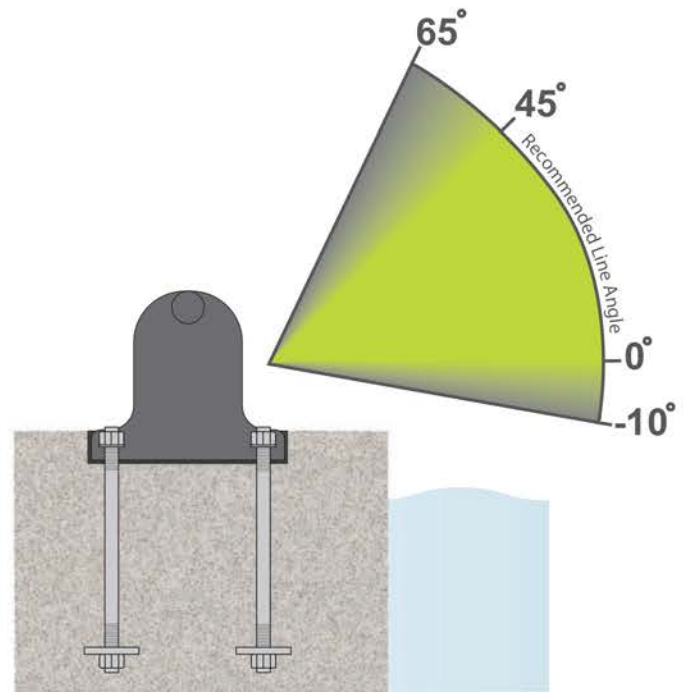
Standard Bollard Capacity (Metric Tonnes)

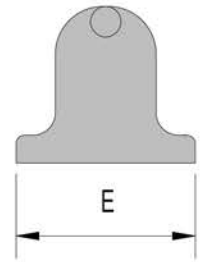
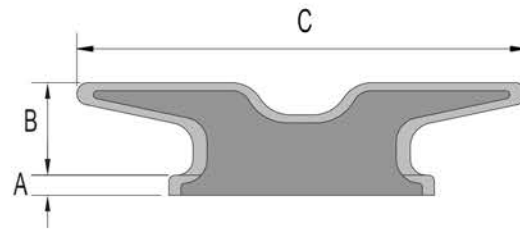
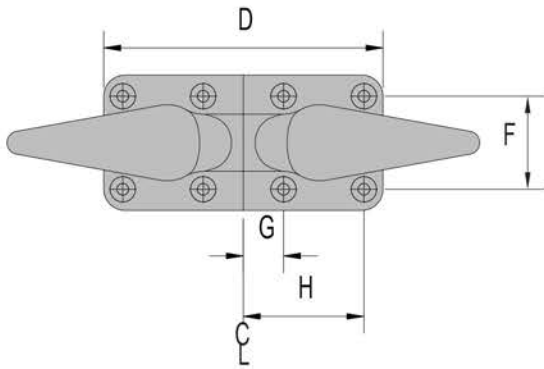
Metric Dimensions (mm)	MK 15	MK 20	MK 30	MK 50	MK 75	MK 100	MK 125	MK 150	MK 200
A	41	51	54	60	70	79	89	95	111
B	194	216	257	264	298	340	375	410	457
C	275	330	385	413	481	550	605	660	759
D	325	390	455	488	569	650	715	780	897
E	288	345	402	431	503	575	632	690	793
F	50	60	70	75	88	100	110	120	138
G	-	-	-	-	238	272	299	326	345
H	-	213	258	226	381	436	479	523	543
I	213	300	350	353	438	500	550	600	671
J	88	0	0	88	0	0	0	0	112
K	-	136	154	183	146	167	184	201	283
L	-	-	-	-	218	249	274	299	345
M	250	300	350	375	438	500	550	600	690
N	125	150	175	188	219	250	275	300	345
Bolt Size	M24	M24	M30	M36	M36	M42	M48	M56	M56
Bolt Length	450	450	450	600	600	600	750	915	915
Bolt Qty	4	5	5	6	7	7	7	7	8



AB-MC

CLEATS
BOLLARD





Cleats ¹					
Imperial Dimensions (inches)	MC 24	MC 30	MC 36	MC 42	MC 54
A	1-3/4	2	2	2	2-1/2
B	6-1/4	7	8	9	11-1/2
C	24	30	36	42	54
D	16	20	24	26	33
E	8-1/2	10-1/2	12	12	16
F	5-1/2	7	8-1/4	8-1/2	11
G	-	-	-	3-3/4	4-3/4
H	6-1/2	8	10	11-1/4	14-1/4
Bolt Size	3/4	1	1	1	1-1/8
Bolt Length	12	18	18	18	18
Qty	6	6	6	8	8

Cleats ¹					
Metric Dimensions (mm)	MC 24	MC 30	MC 36	MC 42	MC 54
A	44	51	51	51	64
B	159	178	203	229	292
C	610	762	914	1067	1371
D	406	508	610	660	838
E	216	267	305	305	406
F	140	178	209	216	279
G	-	-	-	95	121
H	165	203	254	285	362
Bolt Size	M20	M24	M24	M24	M30
Bolt Length	300	460	460	460	460
Qty	6	6	6	8	8

¹Cleat nomenclature is not based on load rating. Model numbers are based on length in inches.

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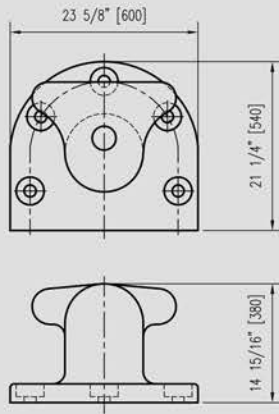
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SOME LISTED VARIATIONS

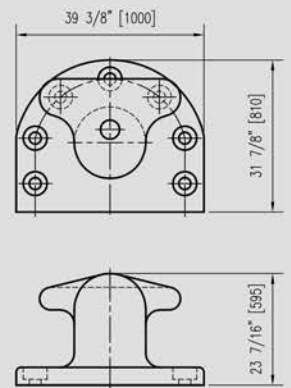
AUSTRALIANBOLLARDS.COM.AU / SALES@NJMGROUP.COM.AU / + 613 9459 3488



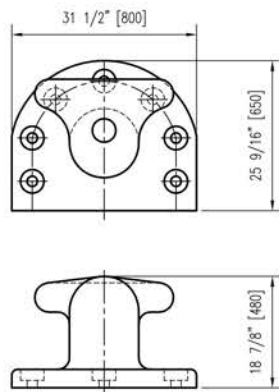
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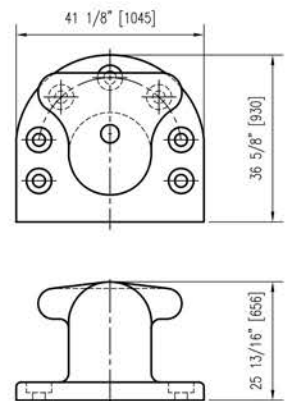
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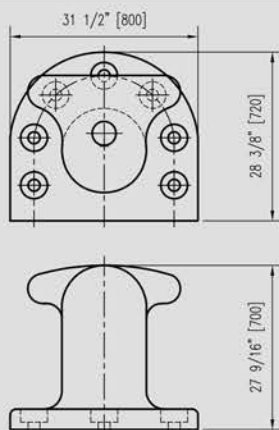
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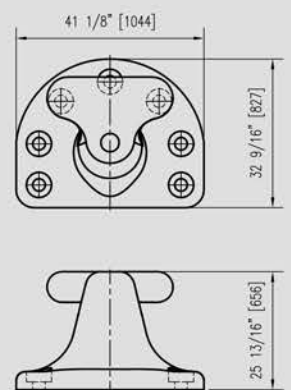
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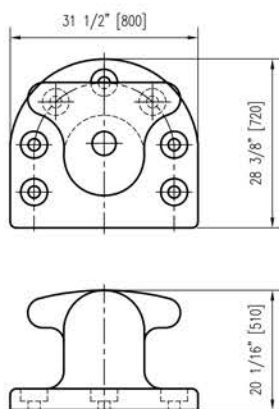
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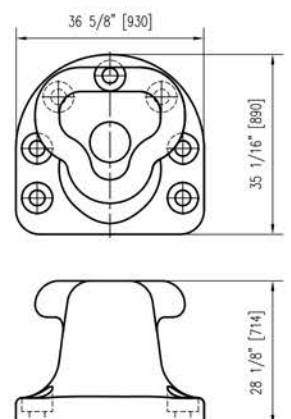
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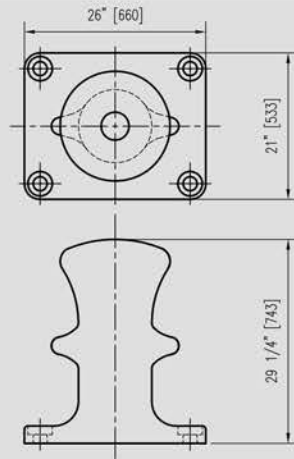
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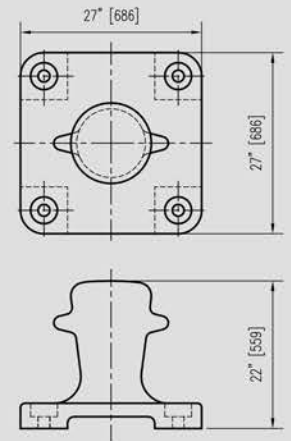
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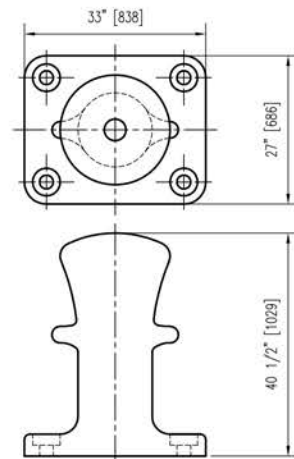
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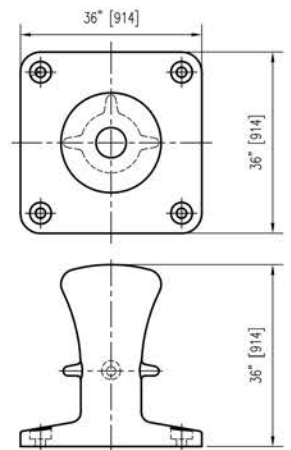
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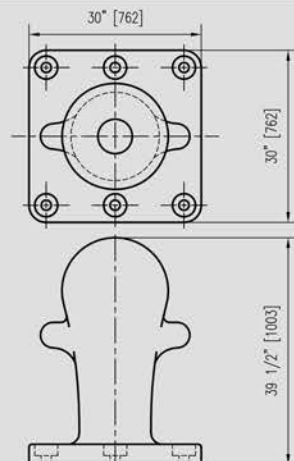
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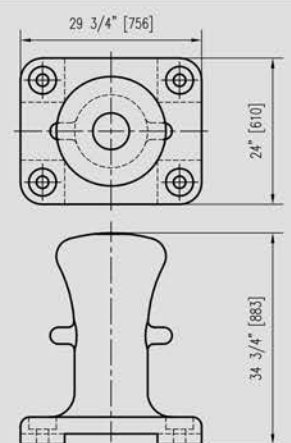
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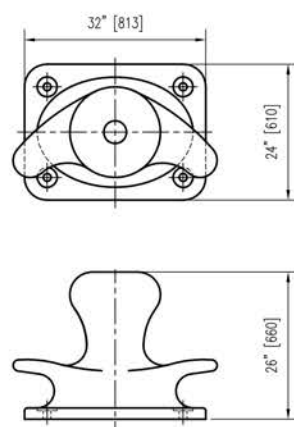
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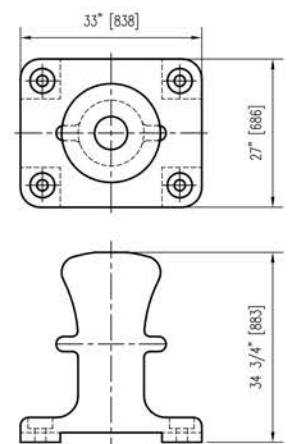
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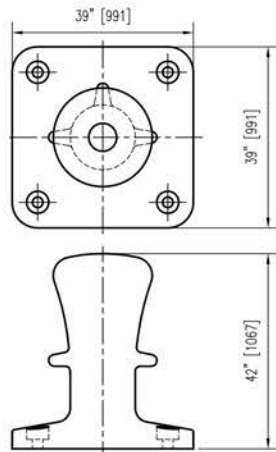
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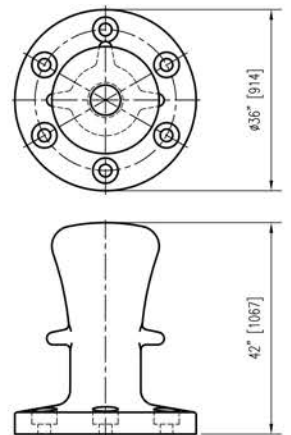
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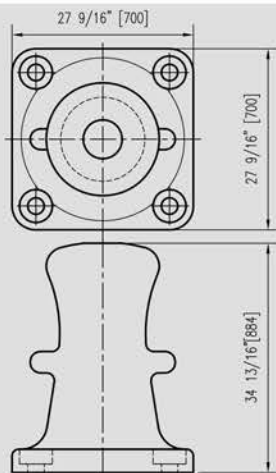
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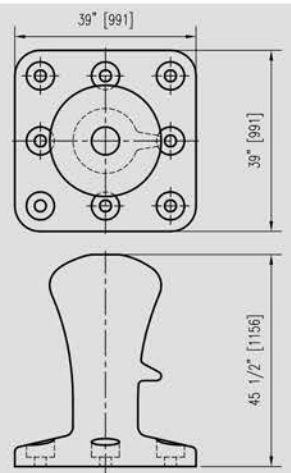
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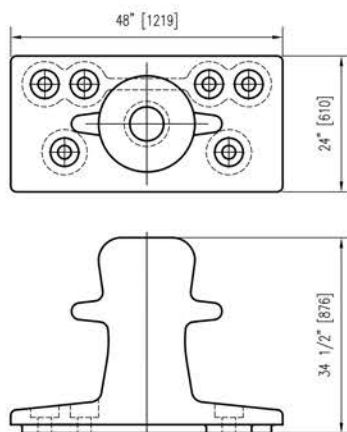
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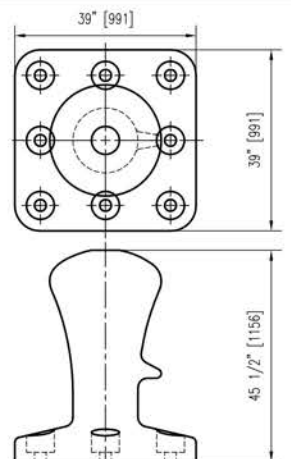
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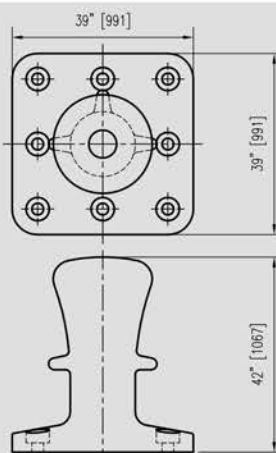
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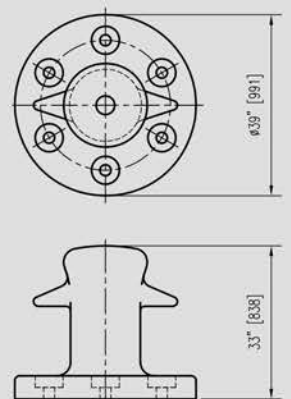
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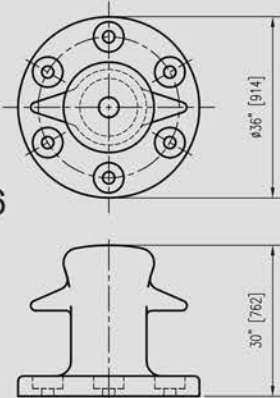
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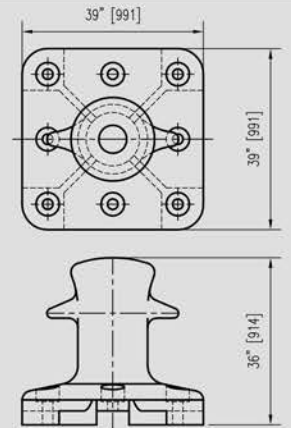
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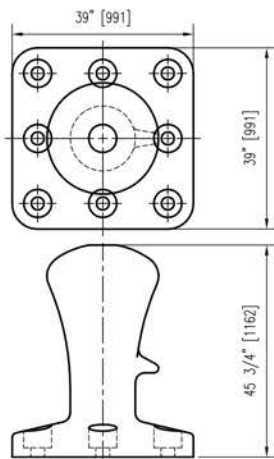
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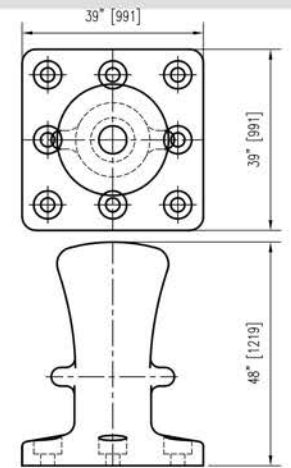
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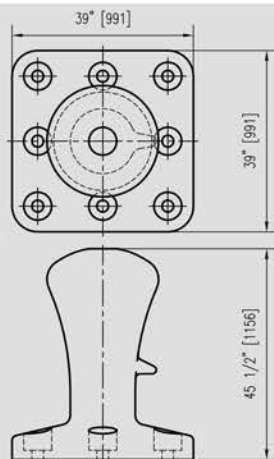
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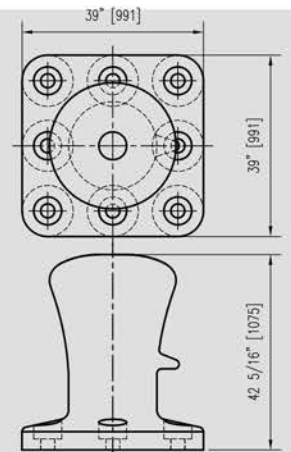
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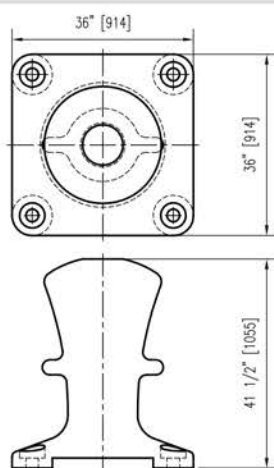
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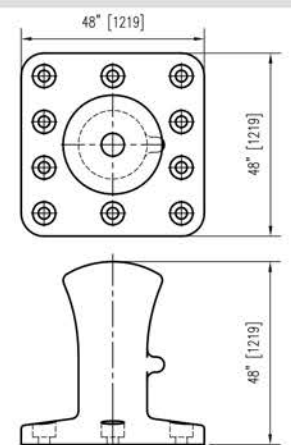
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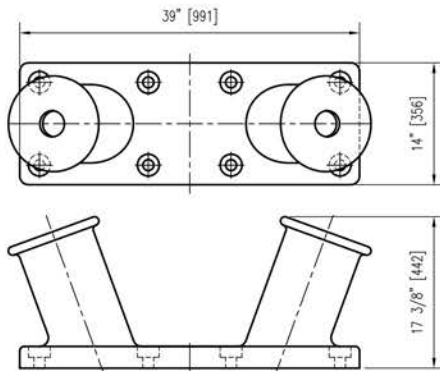
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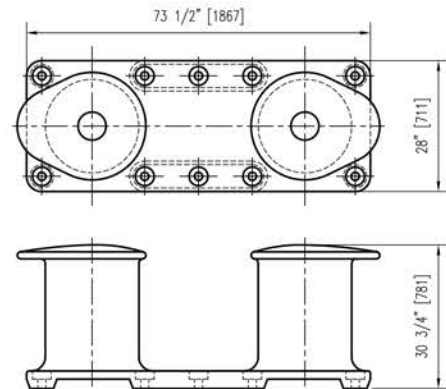
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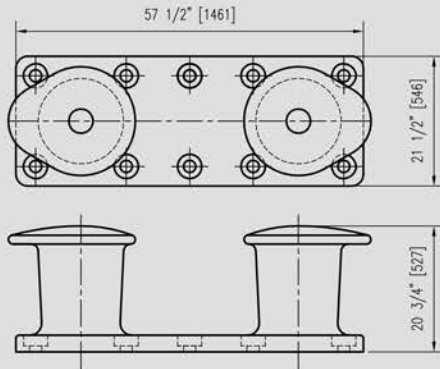
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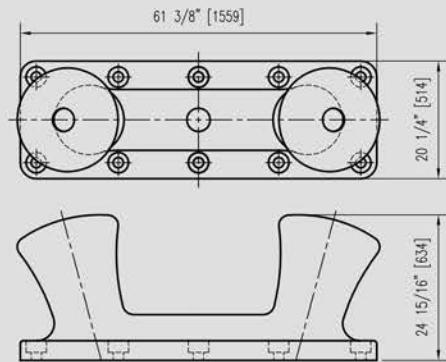
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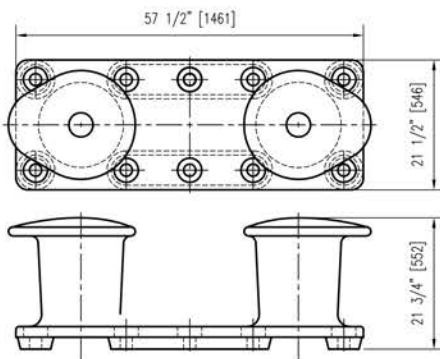
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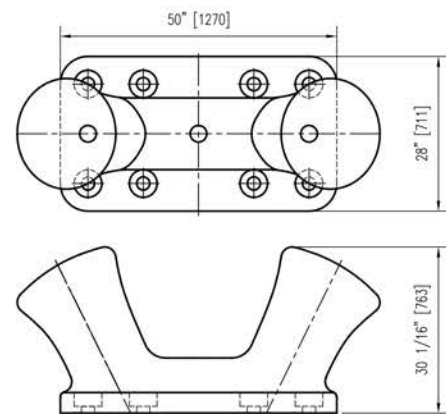
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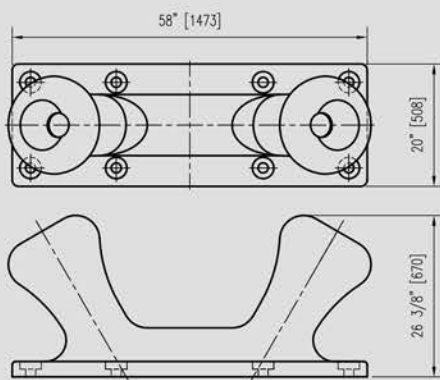
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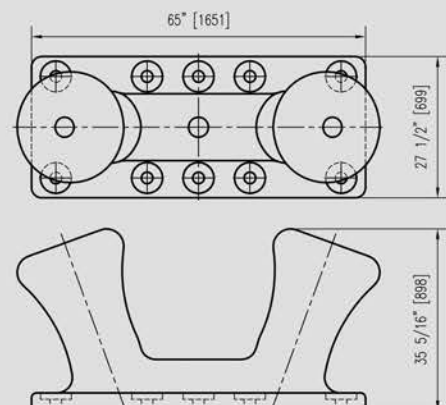
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ABLDB1751



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