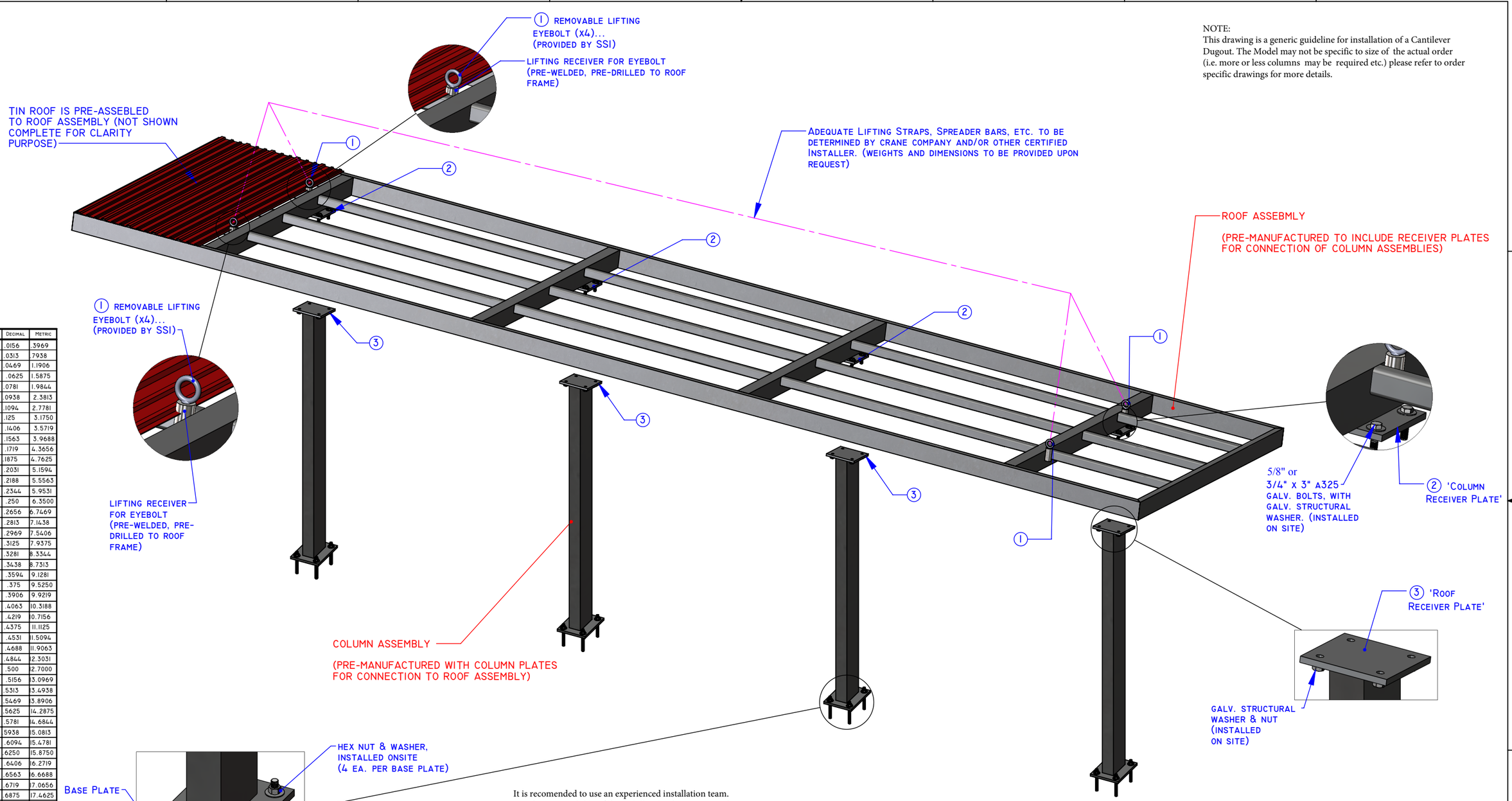
NOTE:
This drawing is a generic guideline for installation of a Cantilever Dugout. The Model may not be specific to size of the actual order (i.e. more or less columns may be required etc.) please refer to order specific drawings for more details.



Fraction	Decimal	Metric
1/64	.0156	.3969
1/32	.0313	.7938
3/64	.0469	1.1906
1/16	.0625	1.5875
5/64	.0781	1.9844
3/32	.0938	2.3813
7/64	.1094	2.7781
1/8	.125	3.1750
9/64	.1406	3.5719
5/32	.1563	3.9688
11/64	.1719	4.3656
3/16	.1875	4.7625
13/64	.2031	5.1594
7/32	.2188	5.5563
15/64	.2344	5.9531
1/4	.250	6.3500
17/64	.2656	6.7469
9/32	.2813	7.1438
19/64	.2969	7.5406
5/16	.3125	7.9375
21/64	.3281	8.3344
11/32	.3438	8.7313
23/64	.3594	9.1281
3/8	.375	9.5250
25/64	.3906	9.9219
13/32	.4063	10.3188
27/64	.4219	10.7156
7/16	.4375	11.1125
29/64	.4531	11.5094
15/32	.4688	11.9063
31/64	.4844	12.3031
1/2	.500	12.7000
33/64	.5156	13.0969
17/32	.5313	13.4938
35/64	.5469	13.8906
9/16	.5625	14.2875
37/64	.5781	14.6844
19/32	.5938	15.0813
39/64	.6094	15.4781
5/8	.6250	15.8750
41/64	.6406	16.2719
21/32	.6563	16.6688
43/64	.6719	17.0656
11/16	.6875	17.4625
45/64	.7031	17.8594
23/32	.7188	18.2563
47/64	.7344	18.6531
3/4	.7500	19.0500
49/64	.7656	19.4469
25/32	.7813	19.8438
51/64	.7969	20.2406
13/16	.8125	20.6375
53/64	.8281	21.0344
27/32	.8438	21.4313
55/64	.8594	21.8281
7/8	.8750	22.2250
57/64	.8906	22.6219
29/32	.9063	23.0188
59/64	.9219	23.4156
15/16	.9375	23.8125
61/64	.9531	24.2094
31/32	.9688	24.6063
63/64	.9844	25.0031

It is recomended to use an experienced installation team. It is the responsibility of the installers to observe any and all safety measures/regulations required for installation in your area. Modification to installation method suggested in this document may be needed to conform to local requirements and/or general onsite safety.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ± .01
THREE PLACE DECIMAL ±.005

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

FINISH

DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	CS	10-13-14
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

COMMENTS:

SPORTSFIELD SPECIALTIES
DESIGNED TO MEET THE DEMANDS OF MODERN SPORTS CONSTRUCTION
WWW.SPORTSFIELDSPECIALTIES.COM

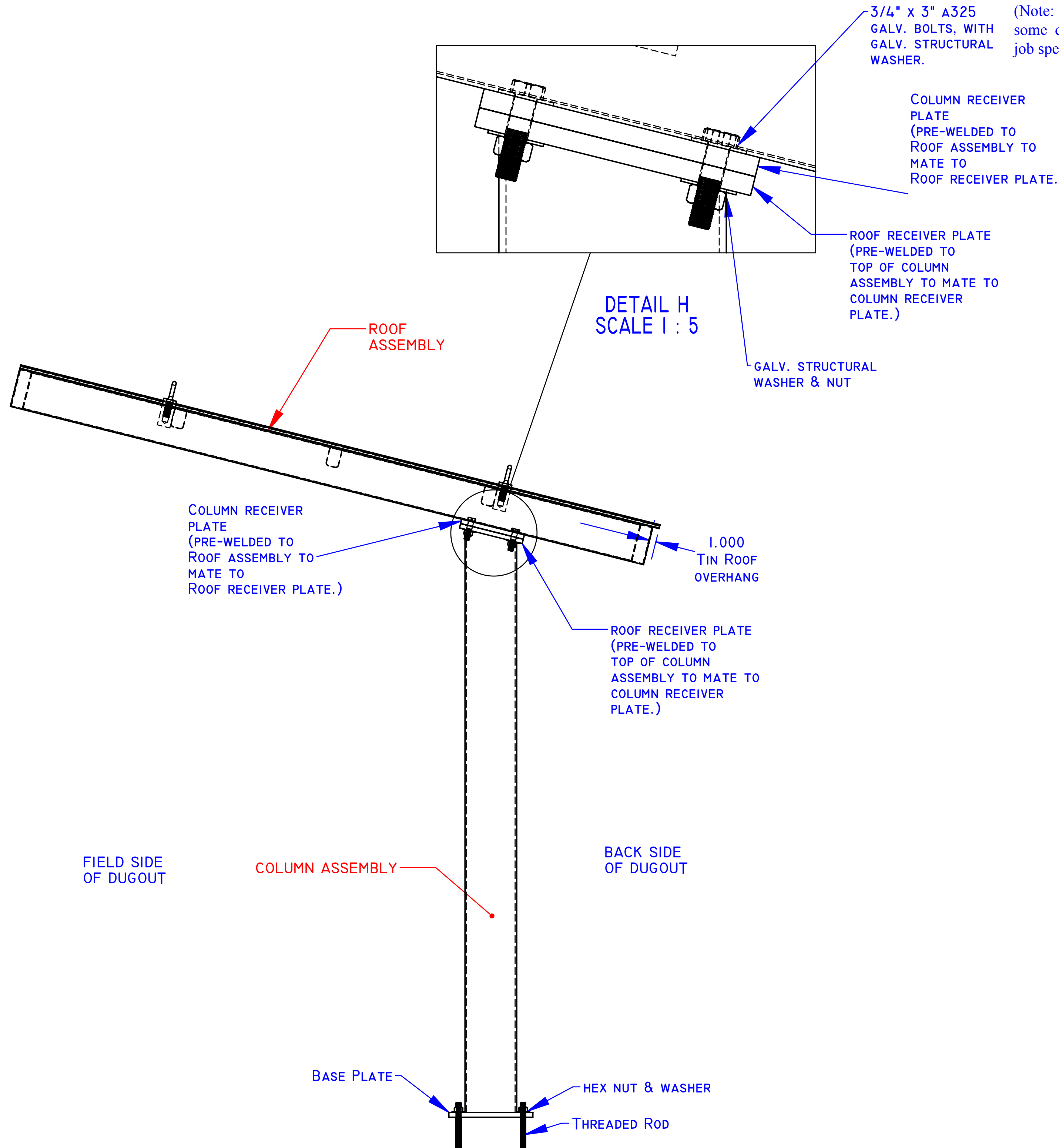
TITLE:

CDO Assembly Guideline

SIZE	DWG. NO.	REV
B		

SCALE: 1:64 WEIGHT: SHEET 1 OF 2

T:\Engineering\Drawings\Modular Products\Dugouts\Common Parts\Cantilever Dugouts\



-ROOF ASSEMBLIES WILL COME ON A FLAT BED STACKED BASED ON QTY OF ORDER.
-LIFTING EYEBOLTS WILL ALREADY BE BOLTED IN THE TOP ROOF ASSEMBLY FOR REMOVING FROM TRUCK AND SETTING (RE-USE FOR OTHER ROOF ASSEMBLIES)
-COLUMN ASSEMBLIES WILL BE PALLETIZED
-ASSOCIATED HARDWARES TO BE IN BOXES

SUGGESTED INSTALL:
-HOIST ROOF ASSEMBLY (ALWAYS BRACING AS NEEDED FOR SAFE INSTALL)...
NOTE: TIN ROOF OVERHANGS ~1" TOWARD THE BACKSIDE OF DUGOUT FOR WATER RUNOFF.

-BOLT EACH 'COLUMN ASSEMBLY' TO THE 'ROOF ASSEMBLY' SO THAT THE 'ROOF RECEIVER PLATE' IS PITCHED DOWN TOWARD BACK SIDE OF DUGOUT.
NOTE: DO NOT FULLY TIGHTEN BOLTS AS YOU WILL NEED TO ADJUST COLUMNS FOR PLUMB DURING SET. BOLTING HARDWARE INCLUDED.

-ONCE ALL COLUMN ASSEMBLIES ARE ON, LIFT AND SIT THE DUGOUT INTO PLACE (BRACE AS NEEDED)

-ADJUST EACH COLUMN FOR PLUMB

-ONCE PLUMB, DRILL HOLES FOR ANCHOR RODS AND INSTALL ANCHORING PER 'HILTI INSTALLATION INSTRUCTIONS,' PROVIDED ALONG WITH HARDWARE AND ADHESIVE.
NOTE: VERIFY THE EMBEDMENT DEPTH NEEDED AS WELL AS EDGE DISTANCE. DRILLS AND BITS NOT INCLUDED

-AFTER WAITING APPROPRIATE AMOUNT OF CURE TIME (REFER TO 'HILTI INSTALLATION INSTRUCTION') TIGHTEN DOWN ALL WASHERS AND NUTS. (4 EACH PER BASE PLATE)

FRACTION	DECIMAL	METRIC
1/64	.0156	.3969
1/32	.0313	.7938
3/64	.0469	1.1906
1/16	.0625	1.5875
5/64	.0781	1.9844
3/32	.0938	2.3813
7/64	.1094	2.7781
1/8	.125	3.1750
9/64	.1406	3.5719
5/32	.1563	3.9688
11/64	.1719	4.3656
3/16	.1875	4.7625
13/64	.2031	5.1594
7/32	.2188	5.5563
15/64	.2344	5.9531
1/4	.250	6.3500
17/64	.2656	6.7469
9/32	.2813	7.1438
19/64	.2969	7.5406
5/16	.3125	7.9375
21/64	.3281	8.3344
11/32	.3438	8.7313
23/64	.3594	9.1281
3/8	.375	9.5250
25/64	.3906	9.9219
13/32	.4063	10.3188
27/64	.4219	10.7156
7/16	.4375	11.1125
29/64	.4531	11.5094
15/32	.4688	11.9063
31/64	.4844	12.3031
1/2	.500	12.7000
33/64	.5156	13.0969
17/32	.5313	13.4938
35/64	.5469	13.8906
9/16	.5625	14.2875
37/64	.5781	14.6844
19/32	.5938	15.0813
39/64	.6094	15.4781
5/8	.6250	15.8750
41/64	.6406	16.2719
21/32	.6563	16.6688
43/64	.6719	17.0656
11/16	.6875	17.4625
45/64	.7031	17.8594
23/32	.7188	18.2563
47/64	.7344	18.6531
3/4	.7500	19.0500
49/64	.7656	19.4469
25/32	.7813	19.8438
51/64	.7969	20.2406
13/16	.8125	20.6375
53/64	.8281	21.0344
27/32	.8438	21.4313
55/64	.8594	21.8281
7/8	.8750	22.2250
57/64	.8906	22.6219
29/32	.9063	23.0188
59/64	.9219	23.4156
15/16	.9375	23.8125
61/64	.9531	24.2094
31/32	.9688	24.6063
63/64	.9844	25.0031

It is recomended to use an experienced installation team. It is the responsibility of the installers to observe any and all safety measures/regulations required for installation in your area. Modification to installation method suggested in this document may be needed to conform to local requirements and/or general onsite safety.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ± .01
THREE PLACE DECIMAL ± .005
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL
FINISH
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN		
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

COMMENTS:

SPORTSFIELD SPECIALTIES

TITLE:

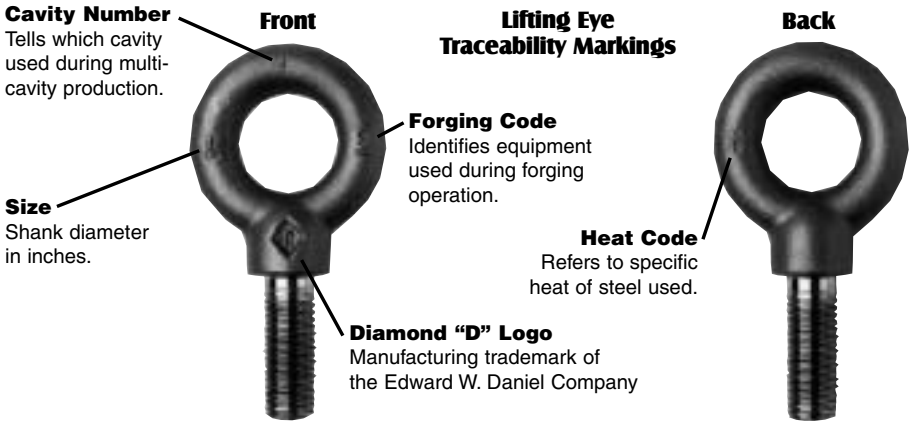
CDO Assembly Guideline

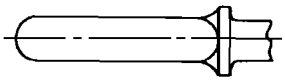
SIZE	DWG. NO.	REV
B		

SCALE: 1:64 WEIGHT: SHEET 1 OF 1

T:\ENGINEERING\DRAWINGS\MODULAR PRODUCTS\DUGOUTS\COMMON PARTS\CANTILEVER DUGOUTS\

General Information





Application:

(a) Loads should always be applied to lifting eyes in the plane of the eye, not at some angle to this plane.

(b) Shoulder lifting eyes must be properly seated (should bear firmly against the mating part) otherwise the working loads must be reduced substantially. A steel washer or spacer may be required for proper seating.

(c) No greater load should be allowed than that given under rated capacity in each of the tables of dimensional data.

(d) To obtain greatest strength from a lifting eye, it must fit reasonably tight in the hole into which it is screwed to prevent unscrewing due to twist of cable. Tightness and seating must be checked after initial load.

(e) Lifting eyes should never be painted or otherwise coated when used for lifting, as such coatings will very likely cover up flaws.

(f) To attain the rated capacity listed for regular lifting eyes, full thread engagement allowing 1/2 turn for alignment to the plane of the eye is necessary.

Physical Testing:
Each lot of standard lifting eyes is manufactured and tested according to ASTM A489-93 and ANSI B18. 15.

BREAKING STRENGTH: The threaded shank is screwed into one jaw of a testing machine and a pin secured to the other jaw passed through the eye.

BEND TEST: Unthreaded parts must be capable of being bent to pressure or blows through 45˚ without showing cracks or indications of failure.

TENSILE TEST: Per ASTM A489.

PLAIN & SHOULDER LIFTING EYES

Material Data:
Grade C1030
Heat Treat . . . . . Quench & Draw

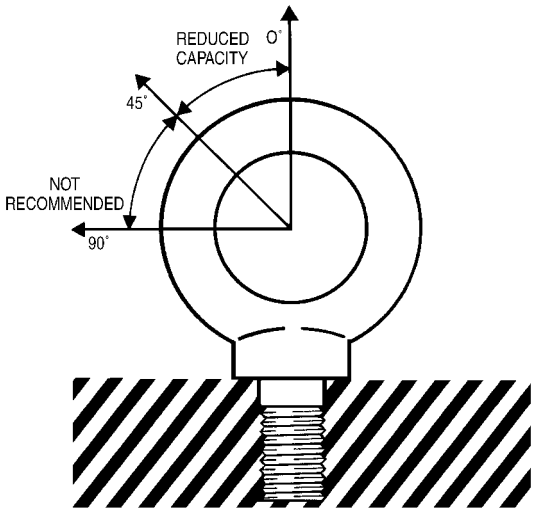
Mechanical Properties:
Grain Size . . . . . 5 or Finer
Tensile . . . . . 65,000 psi min.
Yield . . . . . 30,000 psi min.
Elongation . . . . . 30% min.
Reduction of Area . . . . . 60% min.

Diamond "D" Lifting Eyes are processed and tested to the above requirements. Tests are performed on randomly selected lifting eyes from a given heat lot.

LIMITED WARRANTY: See page 36 .

CERTIFICATIONS: Request for certification(s) must be made at time of order entry and there will be a charge associated with the certification.

FORGING TOLERANCES: Tolerances on all forged products is 1/32".



Lifting Eye Capacities

DIAMETER		RATED CAPACITY 0˚		RATED CAPACITY 45˚		over 45˚
IN.	MM	LBS.	KGS	LBS.	KGS	
1/4	(M6)	500	(210)	125	(52)	N
5/16	(M7)	900	(370)	225	(92)	O
3/8	(M8)	1,300	(500)	325	(125)	T
7/16	(M10)	1,800	(740)	450	(185)	
1/2	(M12)	2,400	(1,030)	600	(257)	
9/16	(M14)	3,200	(1,600)	800	(400)	R
5/8	(M16)	4,000	(1,810)	1,000	(452)	E
3/4	(M18)	5,000	(2,140)	1,250	(535)	C
7/8	(M20)	7,000	(2,860)	1,750	(715)	O
1	(M24)	9,000	(3,850)	2,250	(962)	M
1-1/8	(M27)	12,000	(5,200)	3,000	(1,300)	M
1-1/4	(M30)	15,000	(6,400)	3,750	(1,600)	E
1-1/2	(M36)	21,000	(8,970)	5,250	(2,242)	N
1-3/4	(M45)	28,000	(11,960)	7,000	(2,990)	D
2	(M52)	38,000	(16,230)	9,500	(4,057)	E
2-1/2	(M65)	56,000	(24,200)	14,000	(6,000)	D

(Metric in Parenthesis)

NOTE ON LIFTING EYE & NUT EYE BOLT RATED CAPACITIES
All rated lifting capacities included in the product charts are based on full sized shank and eye unaltered, and unaltered threading.

Lifting Eye Capacities & Safety information

Rated Capacity: The maximum recommended load that should be exerted on the item at zero degree vertical pull. All rated load values are for pulls exerted in the plane of the eye.

Ultimate Strength: As defined in the machinist's handbook is: the stress at which a material in tension, compression, or shear will rupture or fracture.

Yield Strength: The maximum stress that can be applied to a material without permanent deformation of the material.

Safety Factor: An industry term denoting **theoretical capability**. Lifting eye rated capacity is figured with a 5 to 1 safety factor for a zero degree straight vertical pull