

Packing Style Criteria

(Summary)

PACKING STYLE	USE	ITEMS
1. Wooden Box and Wooden Framed Box with Skid Base	<ol style="list-style-type: none">1. Items requiring water- proofing2. Items requiring moisture- proofing3. Items requiring protection against vibration, stress, shock, etc.4. Small items.5. Other items as specified.	Rotating equipment, drivers, electrical appliances, instruments, panels, analyzers, laboratory equipment, maintenance machines and tools, valves and pipe fittings (4 inches or less), bolts and nuts, gaskets, etc.
2. Wooden Framed Crate with Skid Base	<ol style="list-style-type: none">1. Items requiring protection against vibration, stress, shock, etc.2. Items requiring partial water-proofing only.	Small vessels less 1m D x 2m L, boiler tubes, prefabricated pipes, PVC pipes and fittings, copper tubes, valves and fittings (6 inches and up), etc.
3. Skids	<ol style="list-style-type: none">1. Items with sturdy construction, but requiring skids for handling. Protection for openings is necessary.	Reactors, towers, vessels, heat exchangers, etc.
4. Bundle	<ol style="list-style-type: none">1. Items with sturdy construction2. Items that require partial protection only.	Iron and steel (angle, H-shape channel, rebar, etc.), steel pipes (4 inches or less), steel structures.
5. Bare		Vehicles, steel pipe (6 inches and up)
6. Shrink	<ol style="list-style-type: none">1. Items requiring water-proofing.	Fire brick, castable, insulating material.
7. Steel Drum		Catalysts, inhibitors
8. Wooden Drum		Cable for instruments and electrical appliances

CATEGORY	ITEMS	Mois- ture proof Box	Water- proof Box	Crate	Skid	Steel Bundle	Wooden Bundle	Bare	Shrink	Steel Drum	Wooden Drum
1. Column, reactor, drum, heat exchanger	Body 1 m dia (D) x 2 m long (L) or less: Body 1 D x 2 L or more:			*							
	Tray, internal, small parts, test ring:		*								
	Stage ladders, 5 tons or less: 5 tons or more: Accessories:		*	*			*	*			
	Template, anchor bolt:			*							
2. Tank	Shell, bottom, deck, roof plates:							* (with dunnage)			
	Annular plate, pontoon, top angle roof structure, girder, stairway, 5 tons or less: 5 tons or more: Accessories:		*	*			*	*			
	Kisseal accessory:		*								
	Main structure, stage, ladder, 5 tons or less 5 tons or more Accessories:		*	*			*	*			
3. Air-cooled heat exchanger	Tube bundle:				* (with frame)						
	Fan assembly:		*	*							
	Driver, small parts:		*								
	Cylindrical body: Box type body, 5 tons or less: 5 tons or more: Accessories:		*	*	*		*	*			
4. Boiler, furnace, flare system	Stack, flare stack:				*						
	Fire brick, castable:		*						*		

CATEGORY	ITEMS	Mois- ture proof Box	Water- proof Box	Crate	Skid	Steel Bundle	Wooden Bundle	Bare	Shrink	Steel Drum	Wooden Drum
4 (cont'd)	Burner, small parts:		*								
5. Pump, compressor, steam, turbine, agitator	Body:		*								
	Accessories:		*								
6. Cooling tower	Wooden parts:		*								
	Steel parts, 5 tons or less: 5 tons or more:						*				
	Accessories:		*	*				*			
7. Laboratory equipment	Instrument:	*									
	Furniture:		*								
	Appliances, such as beaker, spoon:		*								
8. Fire- fighting system	Fire hydrant, air foam system, hose, extinguisher:		*								
	Fire engine:							*			
9. Piping	High alloy and non- ferrous, all sizes:			* (covered by polyethylene film)							
	Carbon steel, low alloy, 4" or less: 6" or more:					*		*			
	Prefabricated high alloy and non-ferrous, all sizes. Carbon steel, low alloy, 12" or less: 14" or more:			*	*			*			
	Fittings, High alloy and non-ferrous, all sizes:		*								

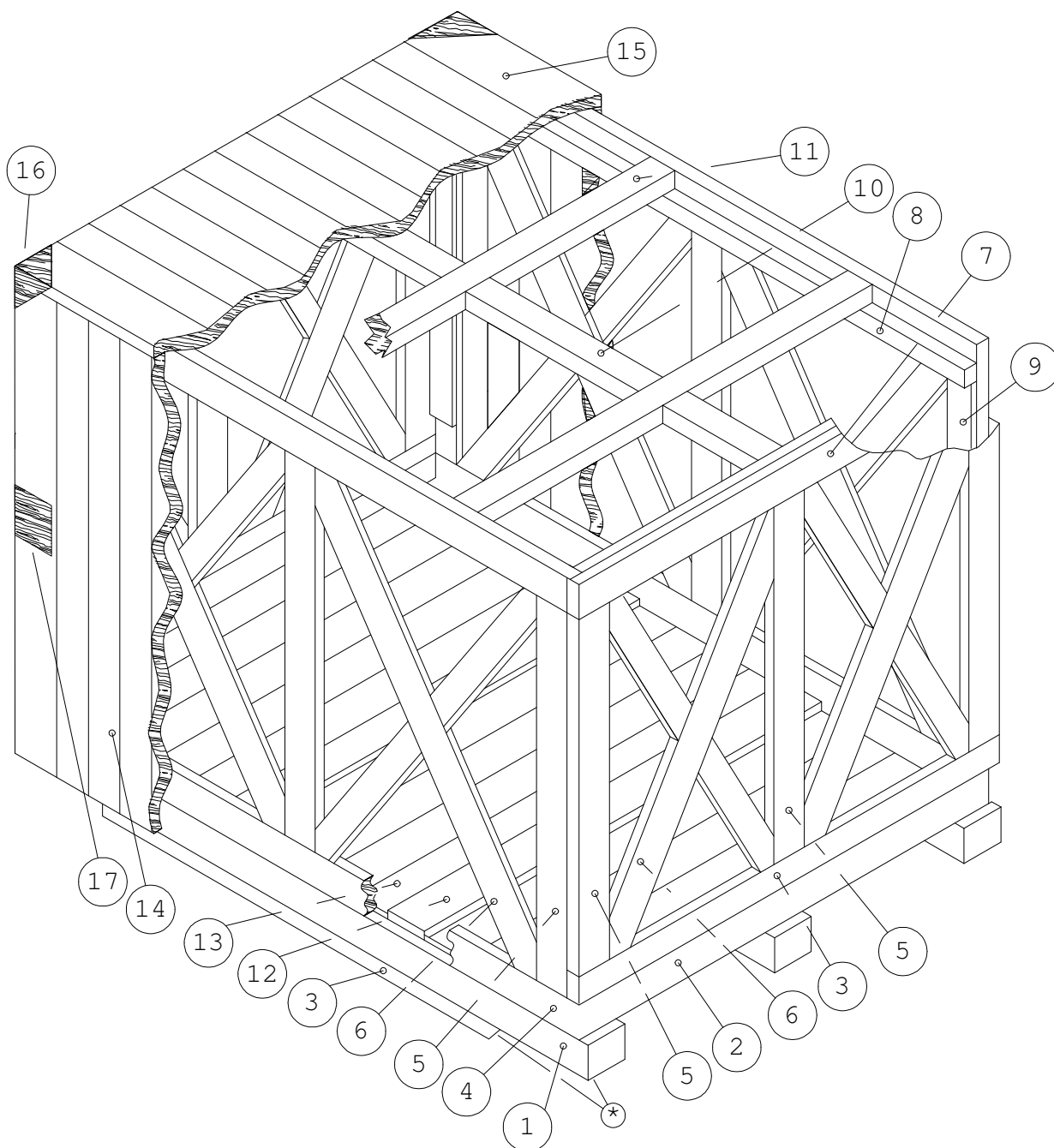
CATEGORY	ITEMS	Mois- ture proof Box	Water- proof Box	Crate	Skid	Steel Bundle	Wooden Bundle	Bare	Shrink	Steel Drum	Wooden Drum
9. (cont'd)	Carbon steel, low alloy, 4" or less: 6" or more:		*	*							
	Valves, 4" or less: 6" or more:		*	*							
	Shop-fabricated supports:		*								
10. Civil	Pile:							*			
	Rebar:					*					
	Cement:		*						*		
	Shaped steel, 1 ton or less: 1 ton or more:					*	*				
	Shop-fabricated structures, 5 tons or less: 5 tons or more:						*	*			
	Accessories:		*	*							
11. Architec- tural	Interior materials, air-conditioning equipment, plumbing fixtures:		*								
	Exterior materials, steel ducts for air- conditioning:			*							
	Shaped steel, 1 ton or less: 1 ton or more:					*	*				
	Shop-fabricated structures, 5 tons or less: 5 tons or more:						*	*			
	Accessories:		*	*							

CATEGORY	ITEMS	Mois- ture proof Box	Water- proof Box	Crate	Skid	Steel Bundle	Wooden Bundle	Bare	Shrink	Steel Drum	Wooden Drum
12. Instrument	Panel sections, electronic instr. racks, panel instruments, computer and VDU's general control room equipment:	*									
	Orifice flanges, venturis, flow tubes, PD meters, vortex meters, orifice plates, ext. displacers, ball float level switches, metering tubes, control and relief valves, sample system racks:		*								
	Transmitters, local contr., D/P manifolds, solenoid valves, junction boxes:		*								
	Cable:										*
	Conduit pipe:			*							
	Steel pipe:					*					
	Fittings:		*								
	Shop-fabricated supports:		*								
	13. Electrical	Switchgear, motor control center, distribution panel, capacity and charger, inverter, telephone and alarm system.	*								
Bus duct, lighting fixtures, push-button station:			*								
Transformer:				*							
Conduit pipe:				*							
Fitting			*								

CATEGORY	ITEMS	Mois-ture proof Box	Water-proof Box	Crate	Skid	Steel Bundle	Wooden Bundle	Bare	Shrink	Steel Drum	Wooden Drum
14.	Painting	Paint:	*								
15.	Insulation		*					*			
16.	Catalyst chemicals, inhibitor lubricant	Material contained in bags:	*								
		Material contained in steel drums:								*	
17.	Office equipment	Stationery:	*								
		Books:	*								
		Furniture:	*								
18.	Construction equipment and material	Vehicles:						*			
		Crane, body, counterweight:						*			
		boom:			*			*			
		small parts:		*							
		Gin pole, body:						*			
		pulley, block, hook, shackle, small parts:			*						
		Engine welder:			*						
		Compressor:			*						
		Temporary generator:			*						
		Scaffolding, board, pipe:					*				
clamp:		*									
Forms:					*						
Welding rod:	*										
Gas cylinder:				*							

Packing Style Criteria

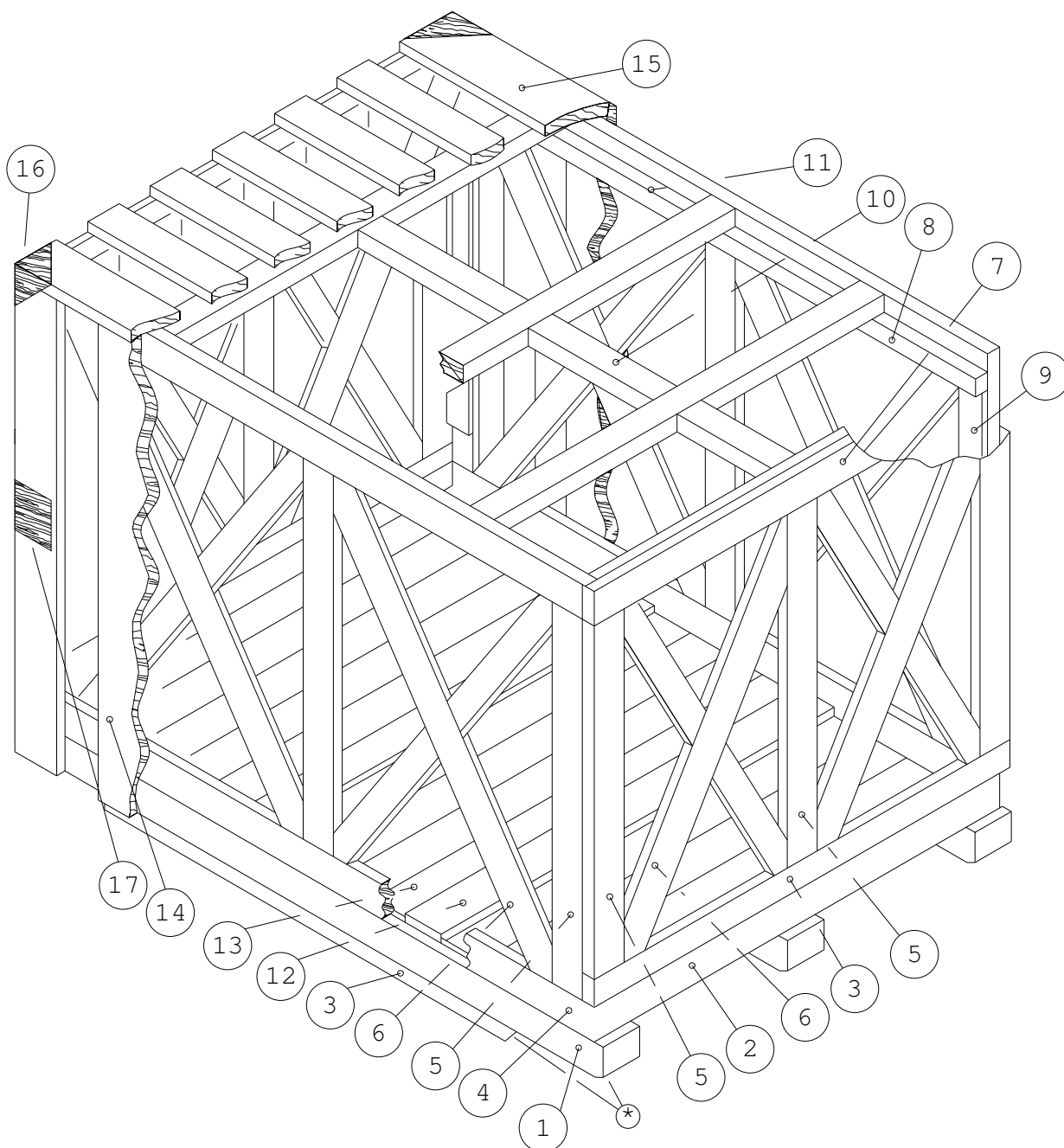
Wooden Framed Box (with Skid Base)



1 Skid *	8 Joist Support	15 Top Sheathing
2 Header	9 Auxiliary Strut	16 Corner Protector
3 Rubbing Strip *	10 Bridging	17 Edge Protector
4 Under Frame Member	11 Top Joist	
5 Strut	12 Load Bearing Floor Member	
6 Diagonal	13 Non-Load Bearing Floor Member	
7 Upper Frame Member	14 Sheathing	

* Corners shall be chamfered as shown in this attachment.

Wooden Framed Crate (with Skid Base)



1 Skid *	8 Joist Support	15 Top Sheathing
2 Header	9 Auxiliary Strut	16 Corner Protector
3 Rubbing Strip *	10 Bridging	17 Edge Protector
4 Under Frame Member	11 Top Joist	
5 Strut	12 Load Bearing Floor Member	
6 Diagonal	13 Non-Load Bearing Floor Member	
7 Upper Frame Member	14 Sheathing	

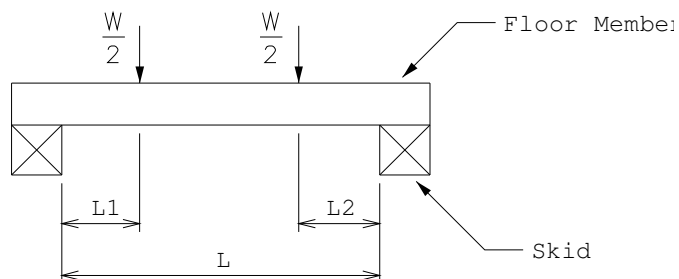
* Corners shall be chamfered as shown in this attachment.

Allowable Load (in Kg) for one Load-Bearing Floor Member (Uniformly Distributed Load)

	Size of Member (width x height) [cm]								
	9 x 4 ¹ / ₂	6 x 6	10 x 5	4 ¹ / ₂ x 9	5 x 10	7 ¹ / ₂ x 7 ¹ / ₂	12x6	6x12	9x9
30	940	1.114	1.289	1.441	1.978	2.175	2.227	3.417	3.758
40	705	835	967	1.081	1.483	1.631	1.670	2.563	2.819
50	564	668	773	865	1.187	1.305	1.336	2.050	2.255
60	470	557	644	720	989	1.088	1.114	1.709	1.880
70	402	476	552	617	847	932	954	1.463	1.611
80	352	417	483	540	742	815	835	1.280	1.409
90	313	371	429	480	659	725	742	1.138	1.252
100	282	334	386	432	593	651	668	1.024	1.127
120	235	278	322	360	494	544	556	853	939
140	202	238	276	308	423	466	476	732	805
160	176	208	241	270	371	408	417	640	705
180	156	185	214	240	330	363	371	569	626
200	141	167	193	216	297	325	334	512	563
220	127	151	176	197	269	296	303	466	512
240	117	139	161	180	247	271	278	427	469
260	107	128	148	166	228	250	257	393	433
280	100	119	138	154	212	233	238	366	402
300	93	111	128	144	198	218	222	342	375
320	88	104	120	135	185	204	208	320	352
340	83	98	113	127	174	191	196	301	331
360	78	92	107	120	165	180	185	285	313
380	74	88	102	114	157	171	176	270	296
400	70	83	96	108	148	163	167	256	281
420		80	94	103	141	155	158	244	267
440			88	98	135	148	151	232	256
460				94	129	141	145	222	244
480					123	135	139	213	235
500						131	133	205	225
	Size of Member (width x height) [cm]								
	10x10	7 ¹ / ₂ x 15	9x15	12x12	15x15	18x18	21x21	24x24	30x30
70	2.209	2.859							
80	1.933	2.501	3.001						
90	1.717	2.223	2.668	2.969					
100	1.546	2.001	2.401	2.672	5.220				
120	1.288	1.667	2.001	2.227	4.350	7.516			
140	1.104	1.429	1.715	1.909	3.728	6.442	10.231		
160	966	1.251	1.501	1.670	3.263	5.637	8.952	13.363	
180	859	1.065	1.334	1.484	2.900	5.011	7.957	11.878	23.200
200	773	1.000	1.201	1.336	2.610	4.510	7.161	10.690	20.880
220	702	910	1.091	1.214	2.372	4.100	6.511	9.718	18.982
240	644	833	1.000	1.113	2.175	3.758	5.968	8.908	17.400
260	595	769	923	1.027	2.007	3.469	5.508	8.223	16.061
280	552	715	857	954	1.864	3.221	5.115	7.636	14.914
300	515	667	800	890	1.740	3.006	4.774	7.127	13.920
320	483	625	750	835	1.630	2.818	4.476	6.681	13.050
340	454	588	706	786	1.535	2.652	4.213	6.288	12.282
360	429	556	667	742	1.450	2.505	3.978	5.939	11.600
380	407	526	632	702	1.373	2.373	3.768	5.627	10.989
400	386	500	600	668	1.305	2.255	3.580	5.345	10.440
420	367	476	571	636	1.242	2.147	3.410	5.091	9.942
440	351	455	545	607	1.186	2.049	3.254	4.859	9.491
460	336	435	521	581	1.134	1.960	3.113	4.648	9.078
480	322	417	500	556	1.088	1.879	2.984	4.454	8.700
500	309	400	480	534	1.044	1.803	2.865	4.275	8.352

NOTES

- 1) When load is concentrated at the center of the length of the floor members, the allowable load shall be half of that in the table (on previous page).
- 2) When load is concentrated at two points of the length of the floor members, the allowable load shall be specified as follows:



- a) Case 1: $L1 = L2$

Value in the table (on previous page) shall be multiplied by the following factors:

L1/L	Factor
1/10 or less	2.5
1/8 or less	2.0
1/6 or less	1.5
1/4 or less	1.0
1/3 or less	0.75
1/2 or less	0.5

- b) Case 2: $L1$ larger than $L2$

Value in the table (on previous page) shall be multiplied by the factors calculated in the following formula:

$$\frac{L}{4 \left(1 - \frac{L1 - L2}{L} \right) L1}$$

Center-to-Center Spacing of Top Joist

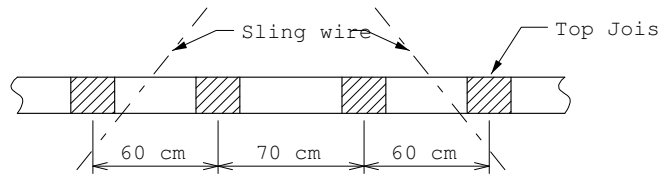
Size of Top Joist (w x thickness) (cm)	Length of Top Joist (cm)																				
	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290
9 x 4 1/2	70	56	46	39	33																
6 x 6		67	55	46	40	34															
10 x 5			64	54	46	39															
4 1/2 x 9				60	51	44	38	34	30												
6 x 9					68	59	51	45	40	36	32										
7 1/2 x 7 1/2						66	58	50	45	40	36	32									
12 x 6						68	59	52	46	41	37	33	30								
7 1/2 x 9							64	56	50	45	40	36	33	30							
6 x 12										63	57	51	46	42	39	36	33	30			
9 x 9										69	62	56	51	46	43	39	36	33	31		
15 x 7 1/2												65	50	54	49	45	42	39	36	33	31
10 x 10													70	64	58	54	49	46	42	39	37
9 x 12													70	64	58	54	49	46	42	39	37
(9+4 1/2) x 9														70	64	59	54	50	46	43	40
(10+5) x 10																		69	64	59	55
9 x 15																			66	61	57
12 x 12																				68	64
(12+3) x 12																					
(12+6) x 12																					
15 x 15																					
Size of Top Joist (w x thickness) (cm)	Length of Top Joist (cm)																				
	300	310	320	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500
10 x 10	34	32	30																		
9 x 12	34	32	30																		
(9+4 1/2) x 9	38	35	33	31																	
(10+5) x 10	52	48	45	43	40	38	36	34	32	30											
9 x 15	53	50	47	44	42	39	37	35	33	32	30										
12 x 12	59	56	52	49	46	44	41	39	37	35	33	32	30								
(12+3) x 12		70	65	61	58	55	52	49	46	44	42	40	38	36	34	33	31	30			
(12+6) x 12					69	65	62	59	56	53	50	48	45	43	41	39	38	36	35	33	32
15 x 15										69	65	62	59	56	54	52	49	47	45	43	42

PLEASE REFER TO NOTE ON NEXT PAGE

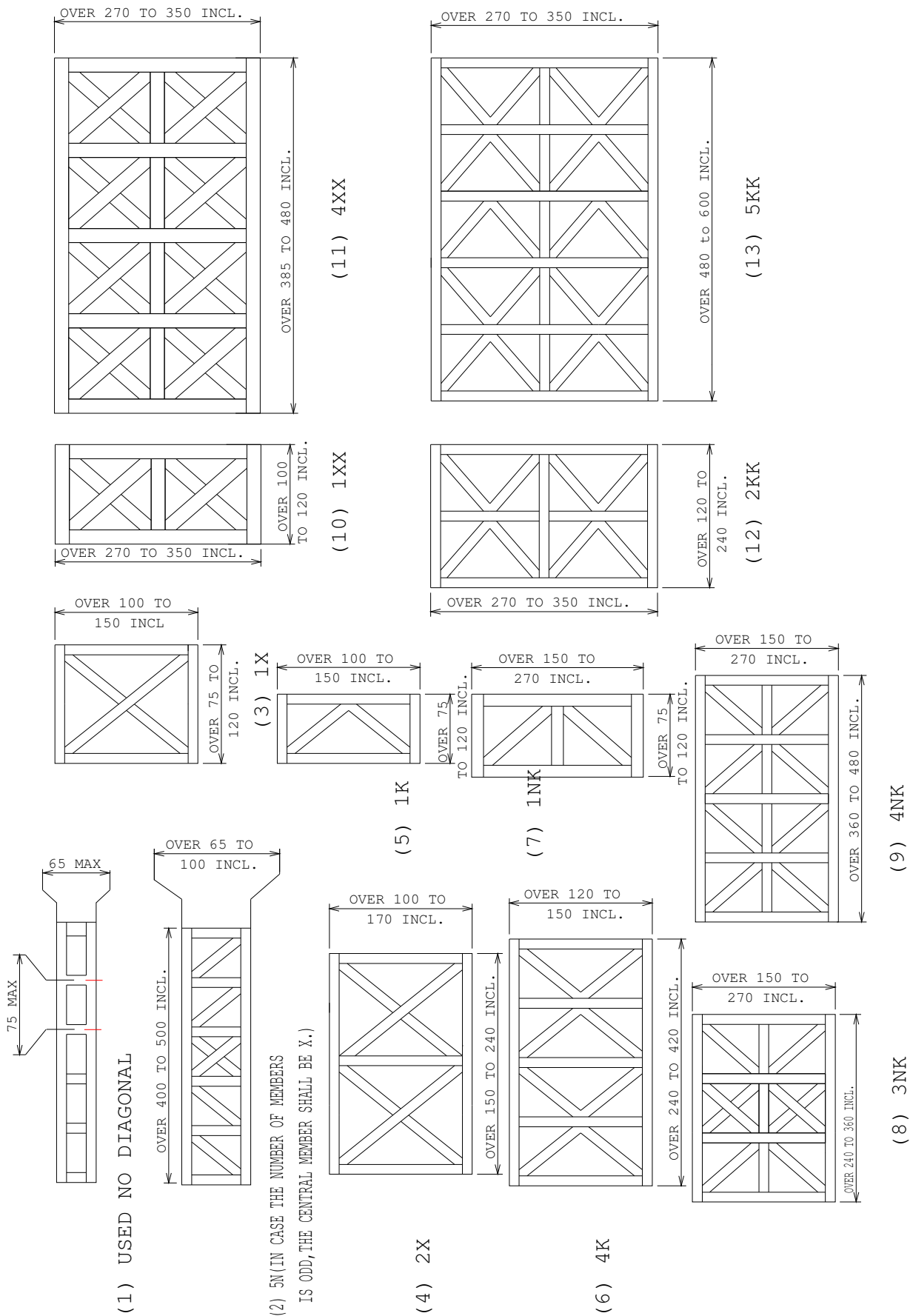
Center-to-Center Spacing of Top Joist

NOTE:

Maximum center-to-center spacing of top joist shall be limited to 70 cm. However, spacing for the places where sling wires touch shall be limited to 60 cm.



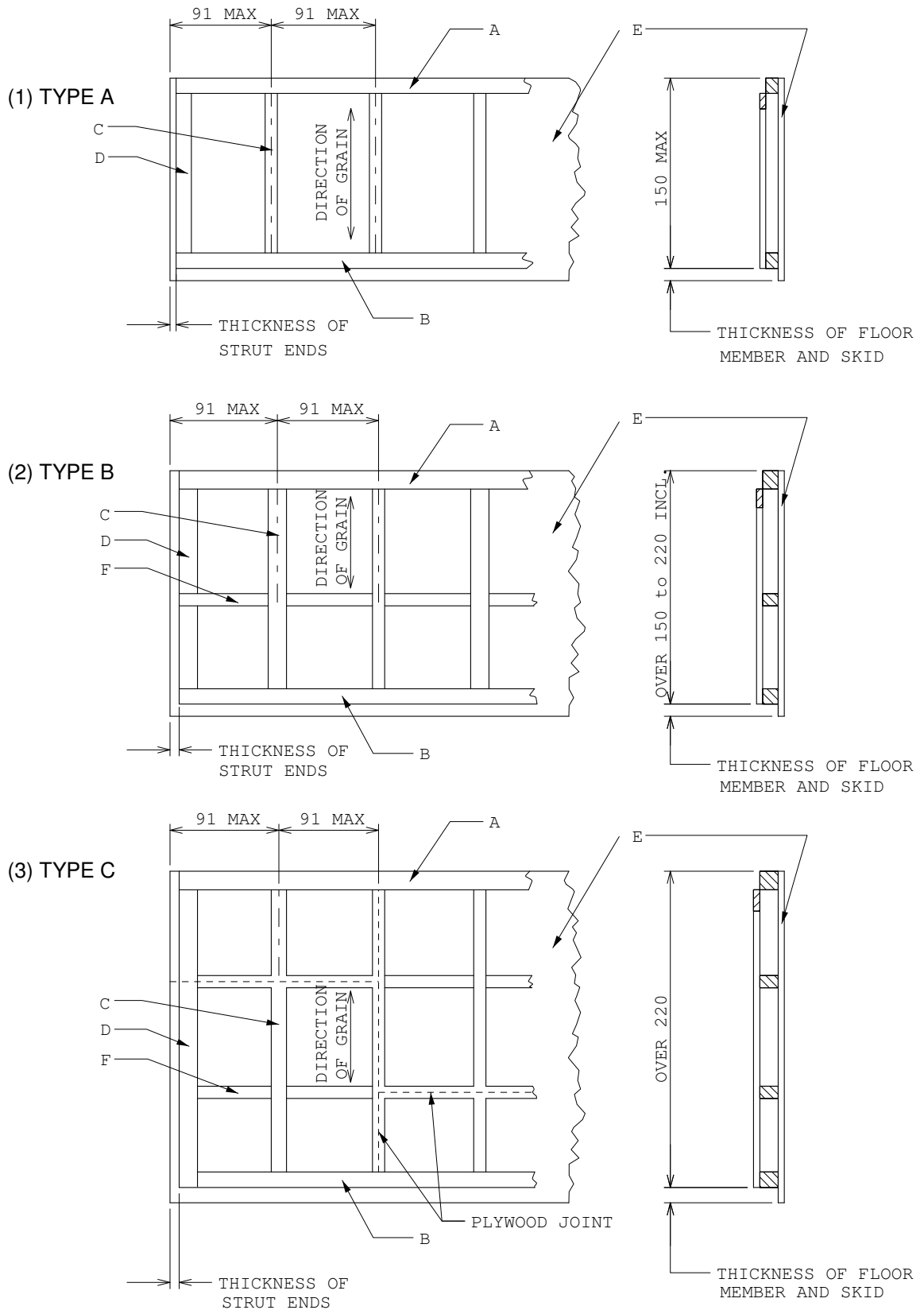
Framing for Lumber Sheathing



Framing for Plywood Sheathing

SIDE

UNIT: cm



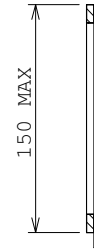
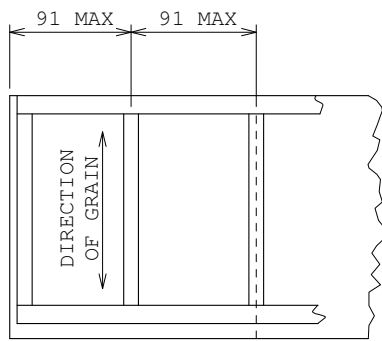
For explanatory notes, please refer to sheet no. 3 of this Attachment.

Framing for Plywood Sheathing

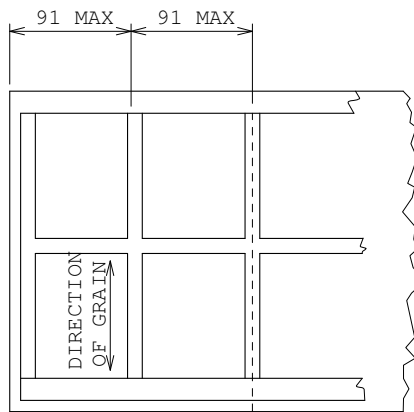
ENDS

UNIT: cm

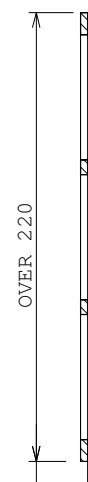
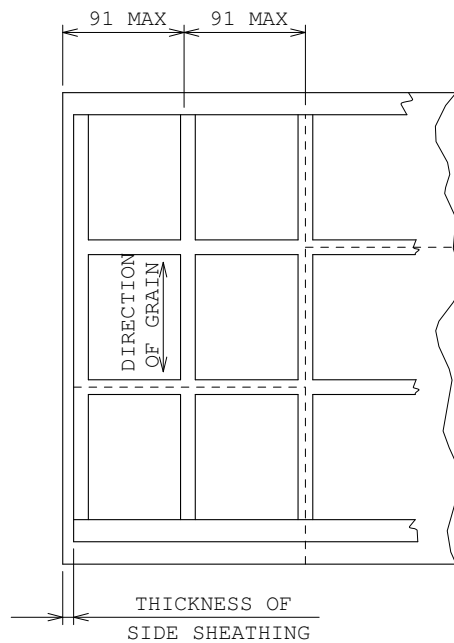
(1) TYPE A



(2) TYPE B



(3) TYPE C



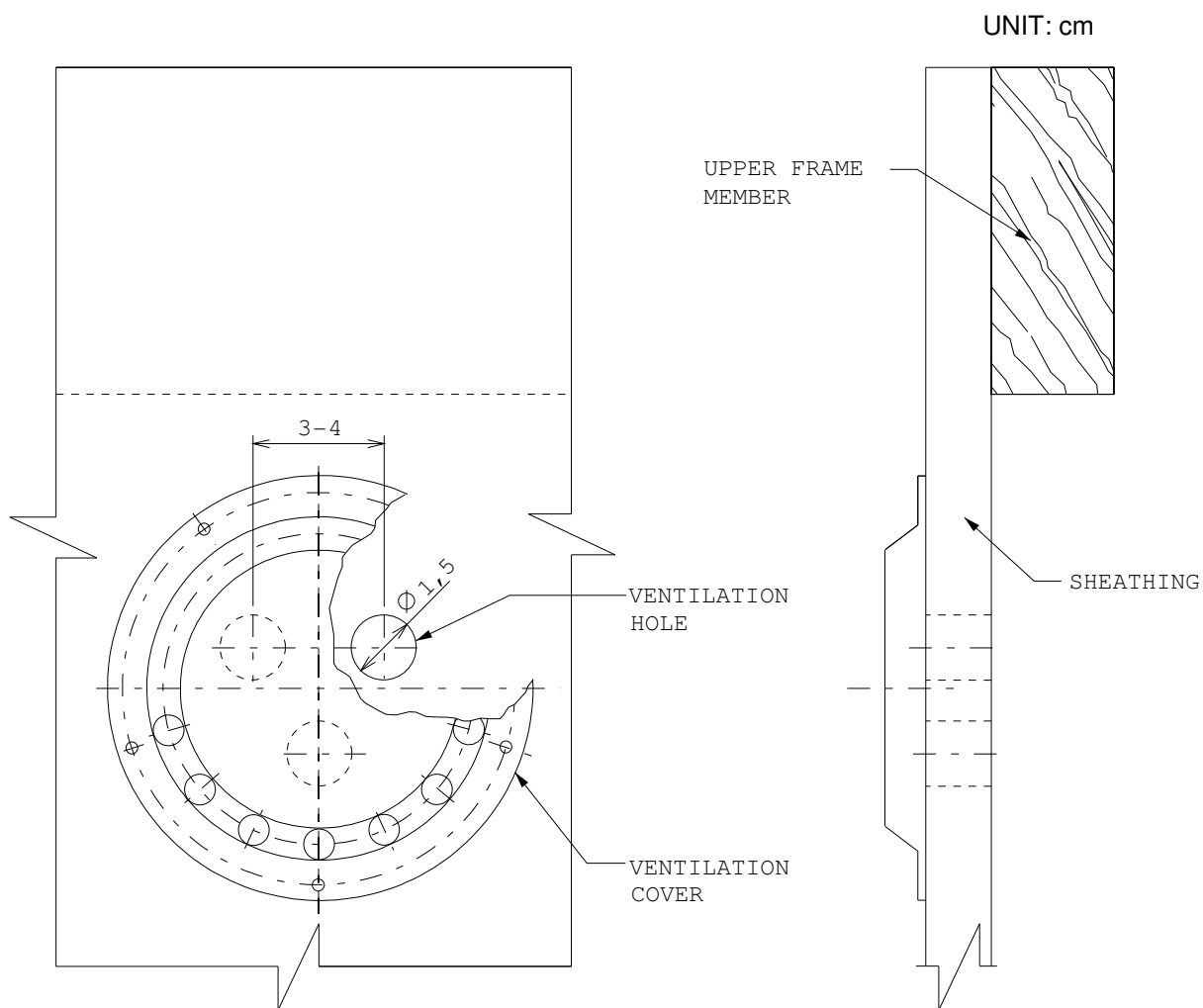
THICKNESS OF
HEADER

Framing for Plywood Sheathing

Notes:

- A = Upper frame member
- B = Under frame member
- C = Strut
- D = Edge strut
- E = Sheathing
- F = Horizontal member

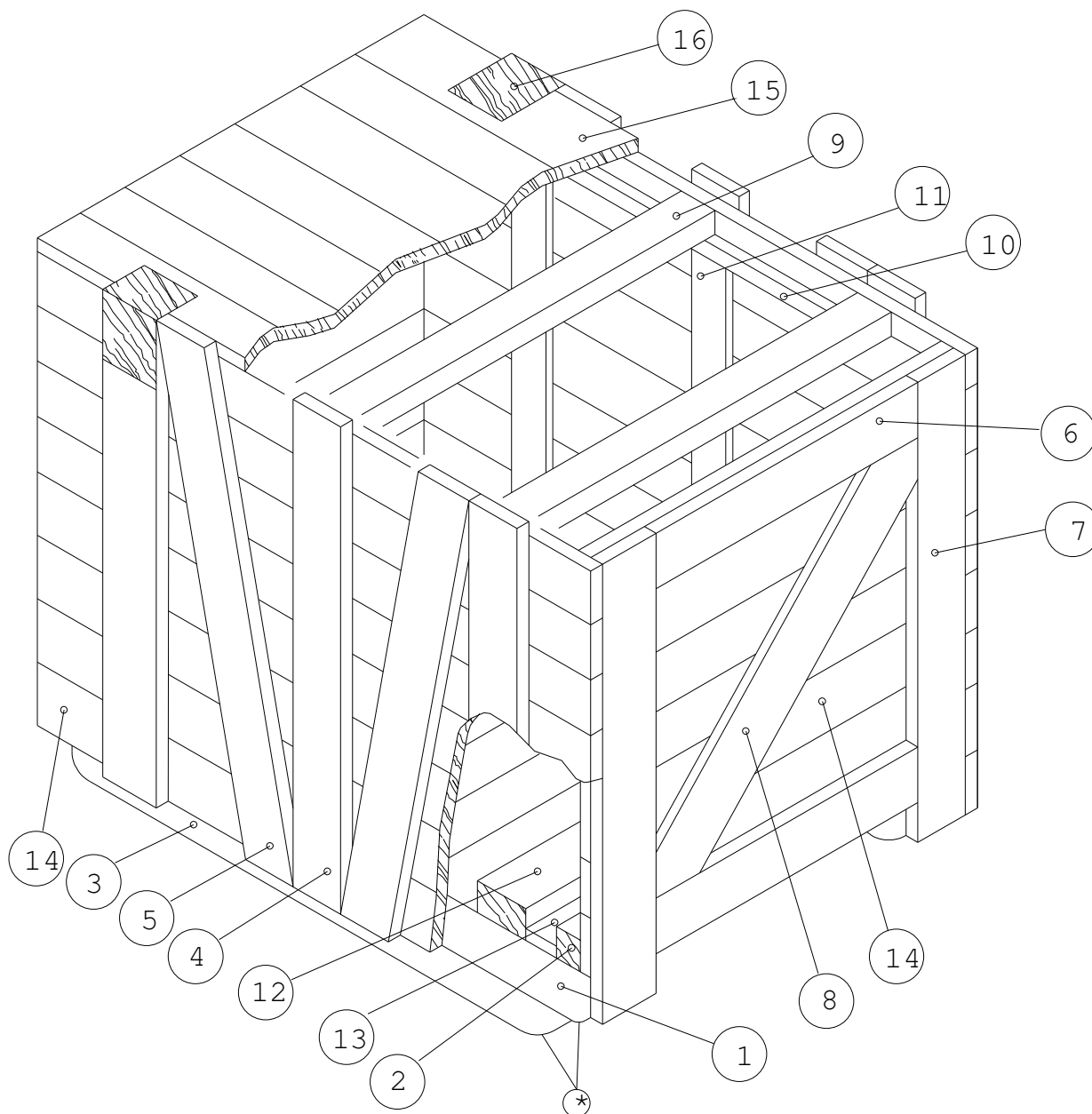
Ventilation System



Numbers of Ventilation Systems

Volume (m ³)	Number of Ventilation Systems
12 and under	2
13 to 26	4
27 to 35	6
over 35	8

Wooden Box (with Skid Base)



1 Skid *	8 End Diagonal Cleat	15 Top Sheathing
2 Header	9 Top Joist	16 Edge Protector
3 Rubbing Strip *	10 Joist Support	
4 Side Batten	11 Auxiliary Strut	
5 Side Diagonal Cleat	12 Load Bearing Floor Member	
6 End Horizontal Batten	13 Non-Load Bearing Floor Member	
7 End Vertical Batten	14 Sheathing	

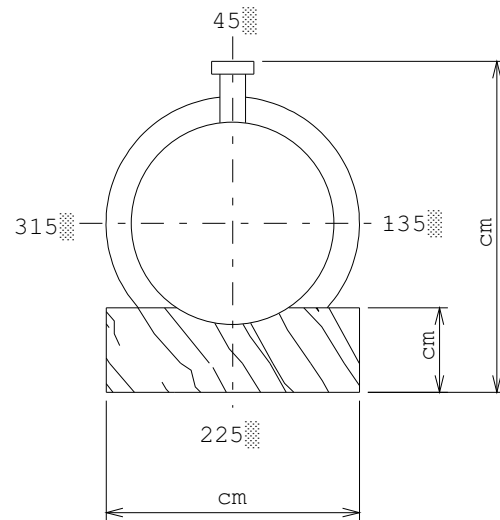
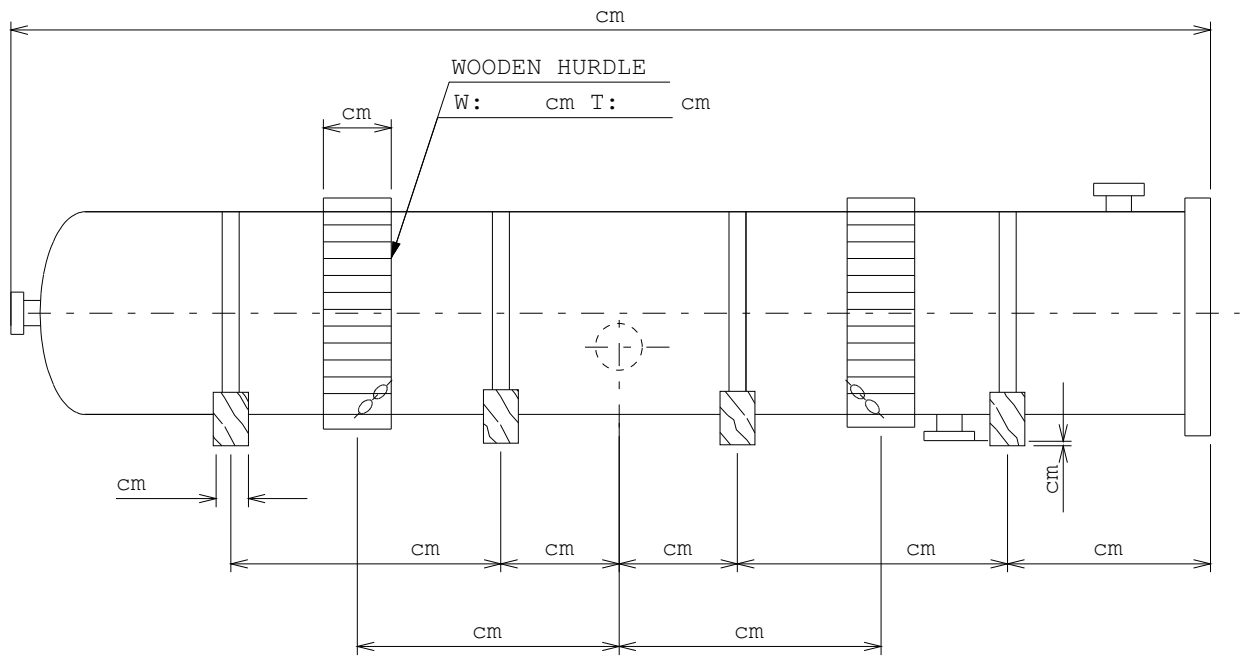
* Corners shall be chamfered, if required by the project specification, as shown in this attachment.

Main Member Size for Wooden Box

(Units: cm; net weight in kg)

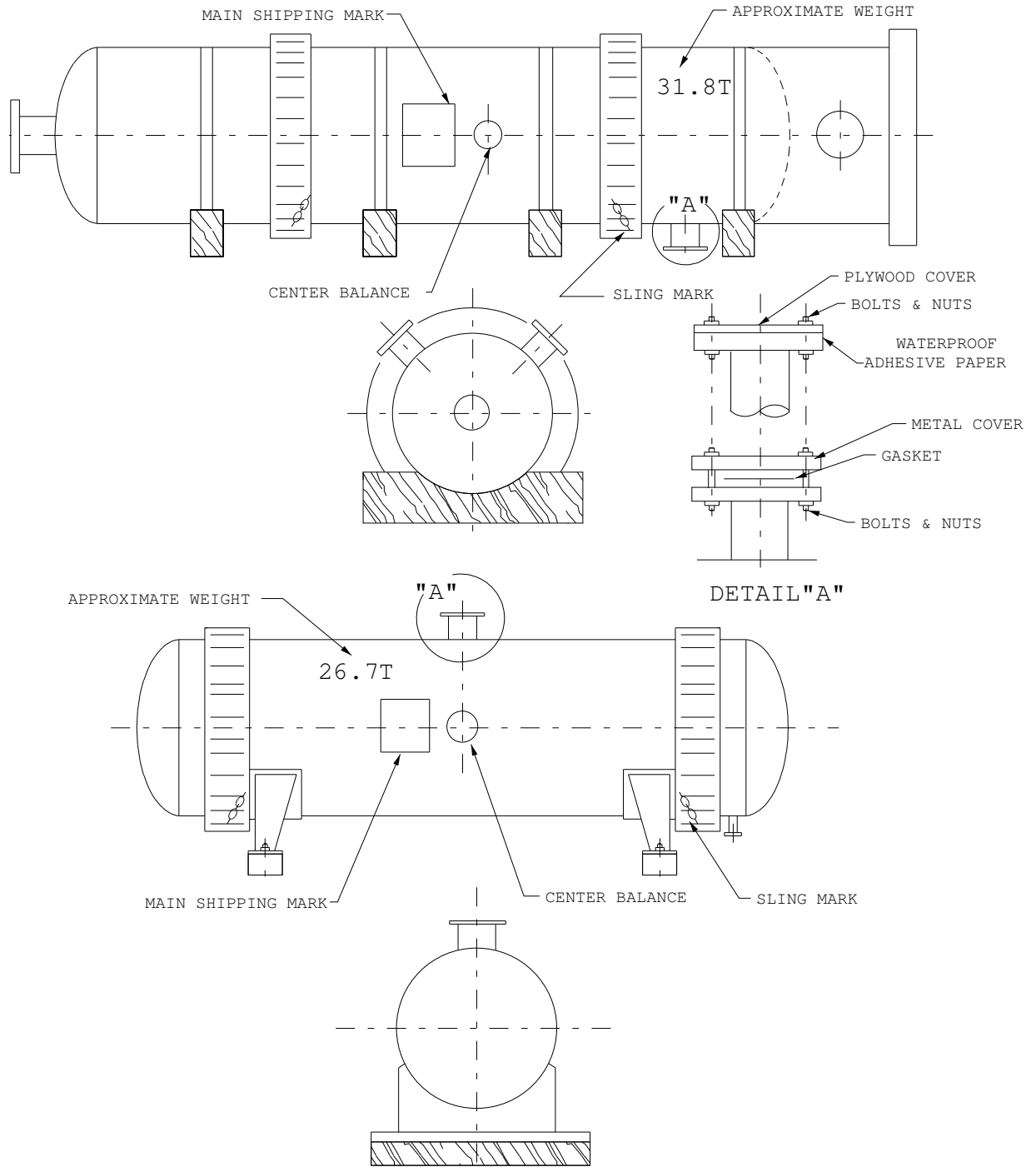
Name of Member	Net weight >	200 kg or less	400 kg or less	600 kg or less	800 kg or less	1000 kg or less
Skid	Length of Box	100	150	200	200	200
	Size (W x T)	9.0x3.0	9.0x4.5	6.0x6.0	10.0x5.0	9.0x6.0
Header		9.0x3.0 or 4.5x4.5	9.0x4.5 or 6.0x6.0	9.0x4.5 or 6.0x6.0	6.0x6.0	9.0x6.0
Rubbing Strip		2.4 or more				
Non-Load Bearing Floor Member		1.5 or more				
Sheathing		1.8 or more				
Load Bearing Floor Member		to conform to Appendix 5				
Top Sheathing	Wooden Box	1.8 or more				
	Crate	1.8 or more				

Typical Drawing of Skid-Mounted Equipment

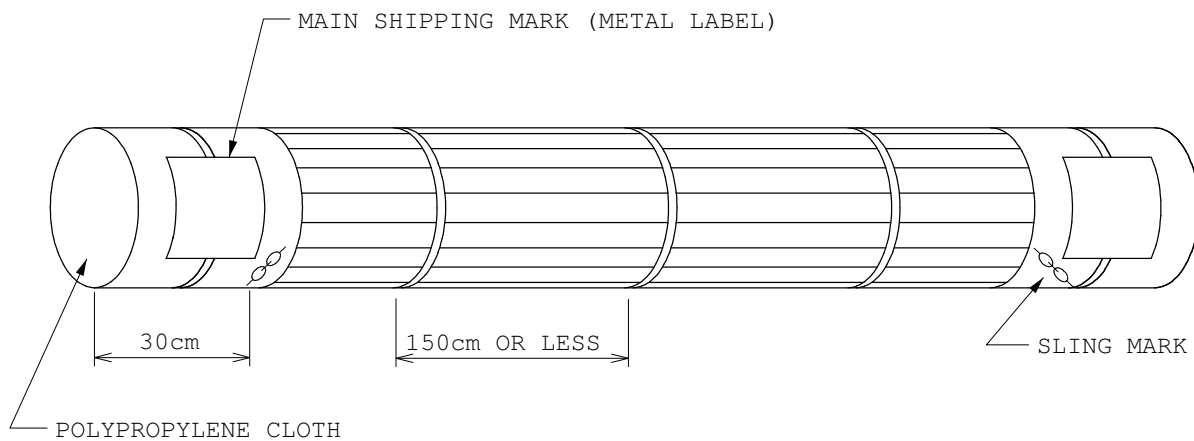


Item No.	:	
Net WT	:	T
Gross WT	:	T
LxWxH	:	x x cm
Volume	:	M^3

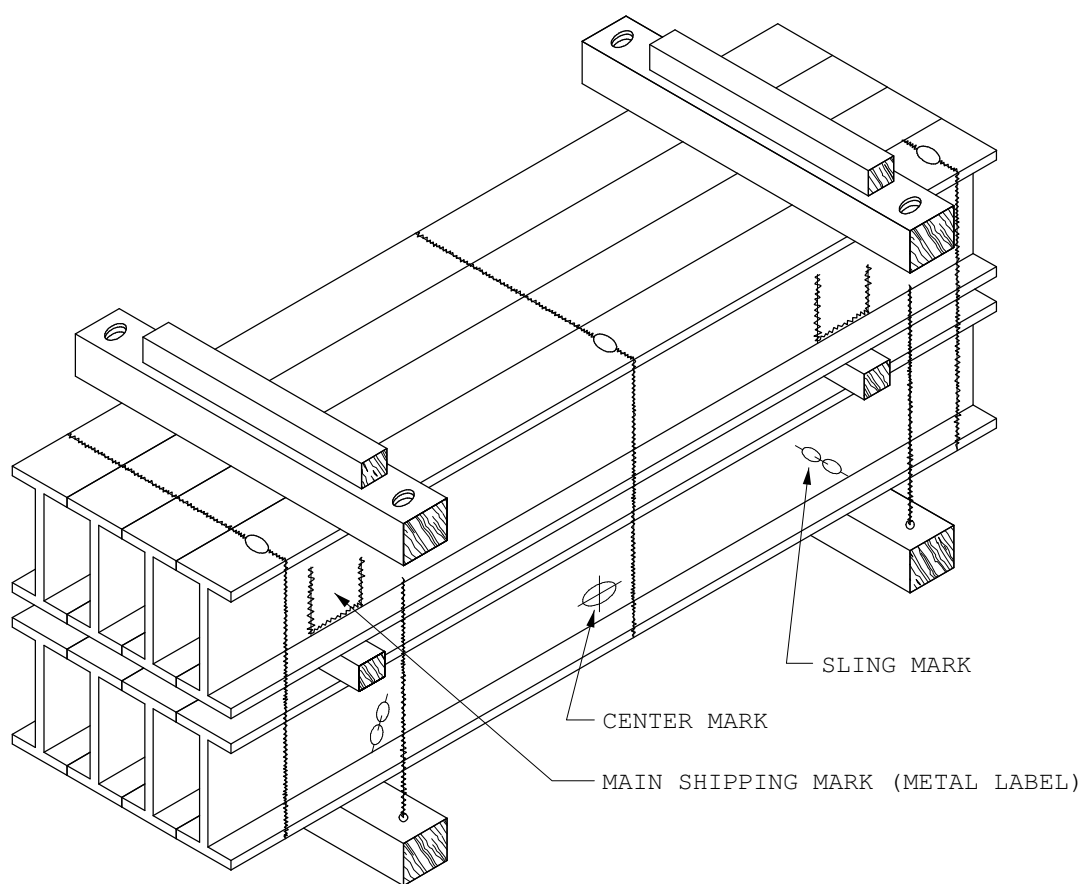
Marking Method of Skid-Mounted Equipment



Steel Bundle and Wooden Bundle

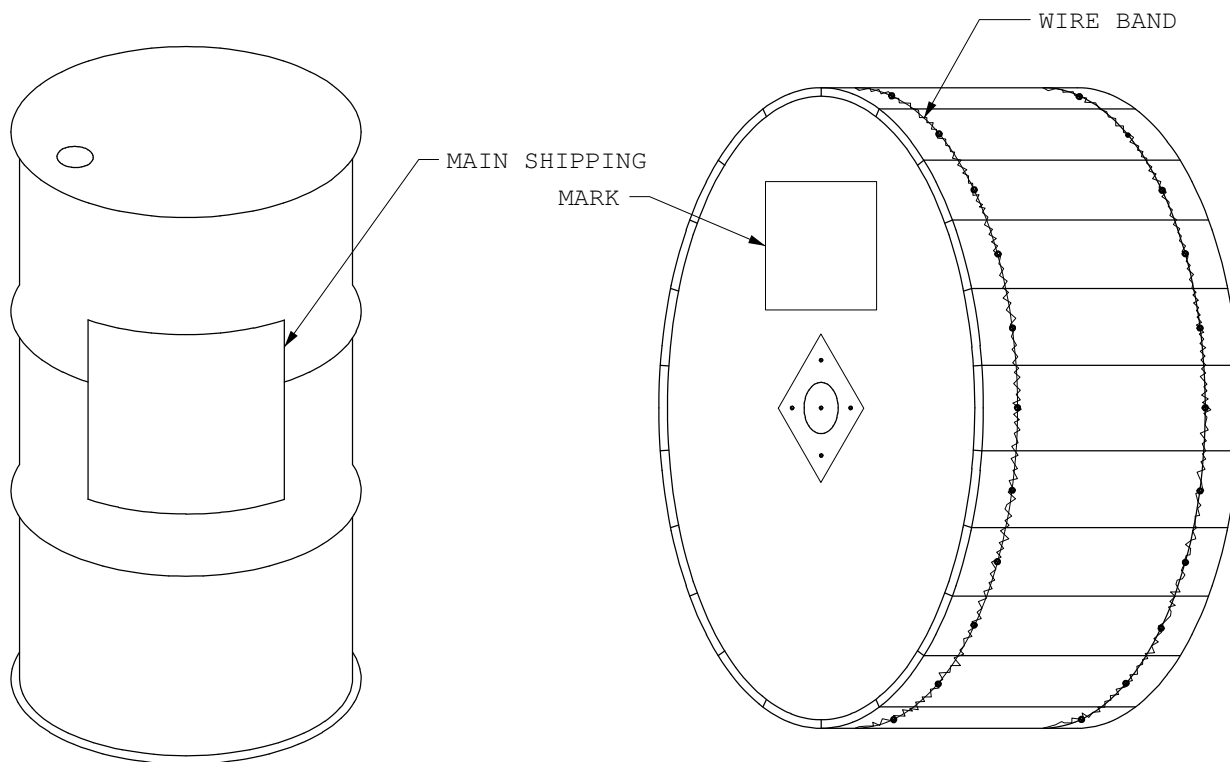


STEEL BUNDLE



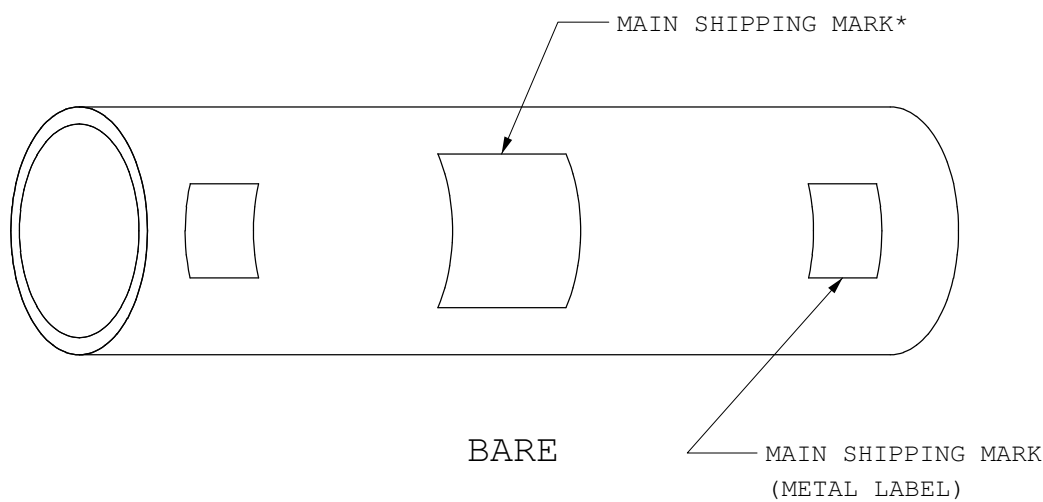
WOODEN BUNDLE

Bare, Metal Drum, and Wooden Drum



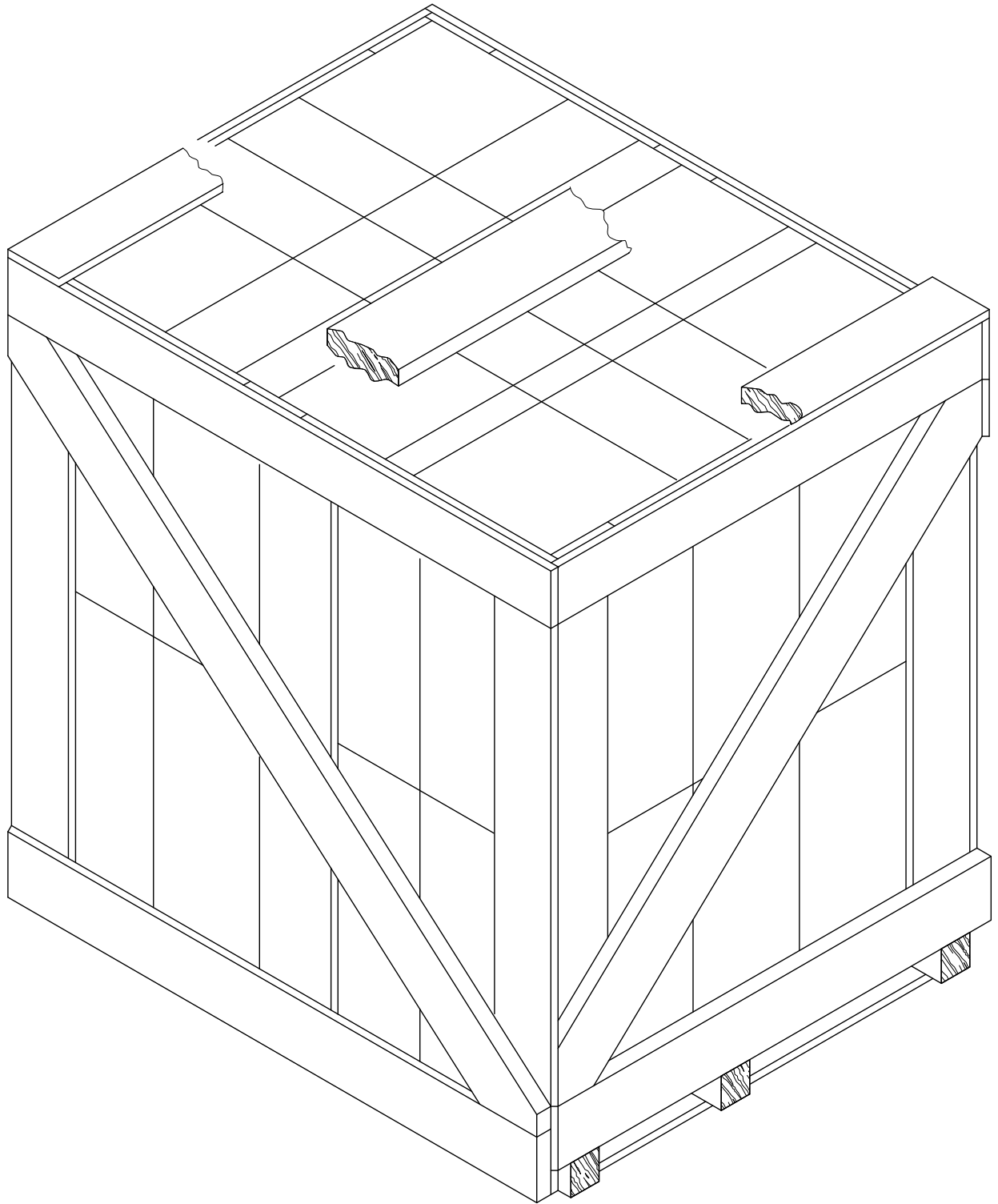
METAL DRUM

WOODEN DRUM



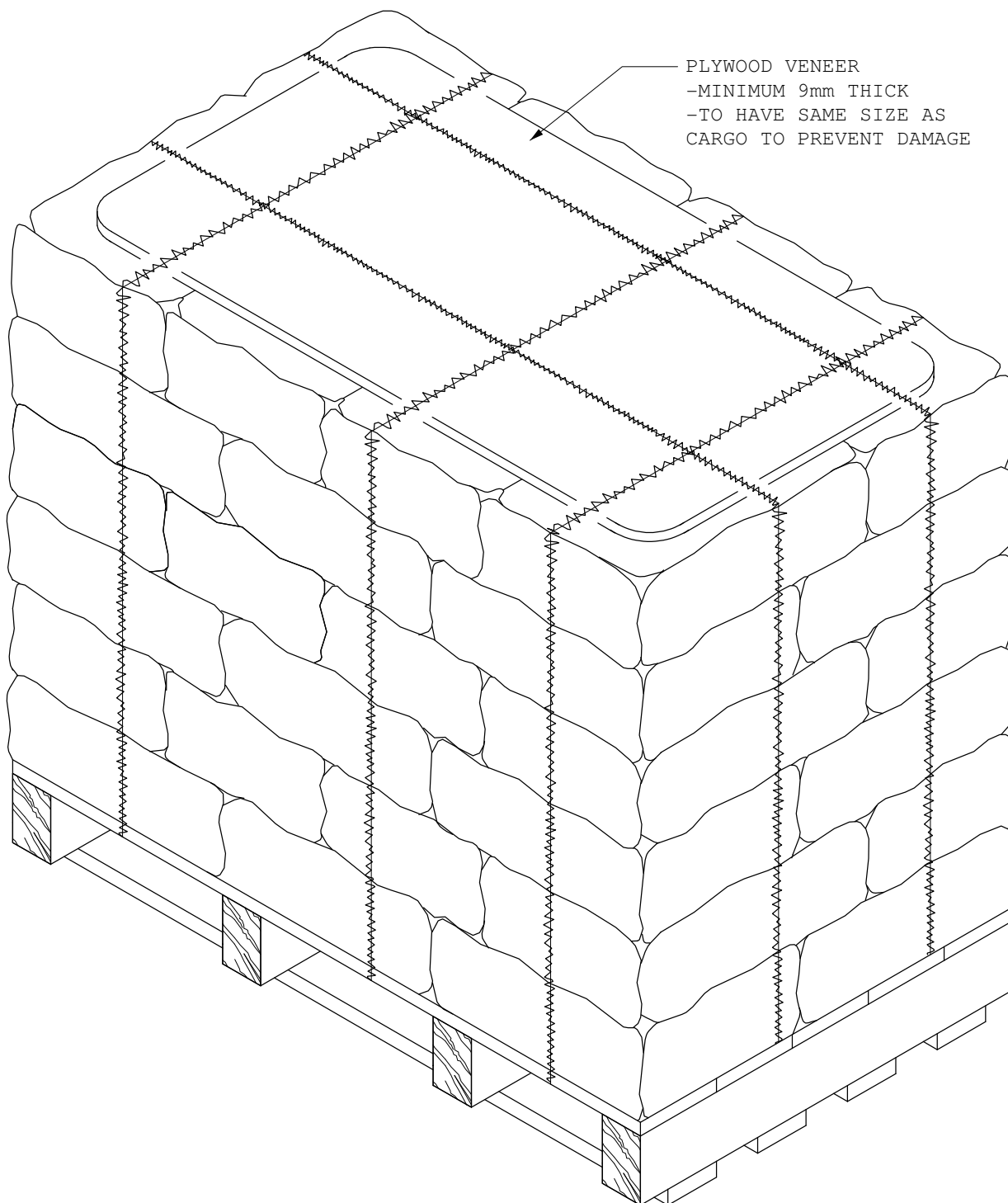
* Shipping mark shall be stenciled directly to the surface of the material. If the package does not have enough space for the shipping mark, a metal label shall be firmly affixed to the material.

Framed Shrink Wrapping



All marks shall be printed on sheets of cardboard and fixed to the inside of the film wrapping. The number of marks shall be the same as for boxes and crates.

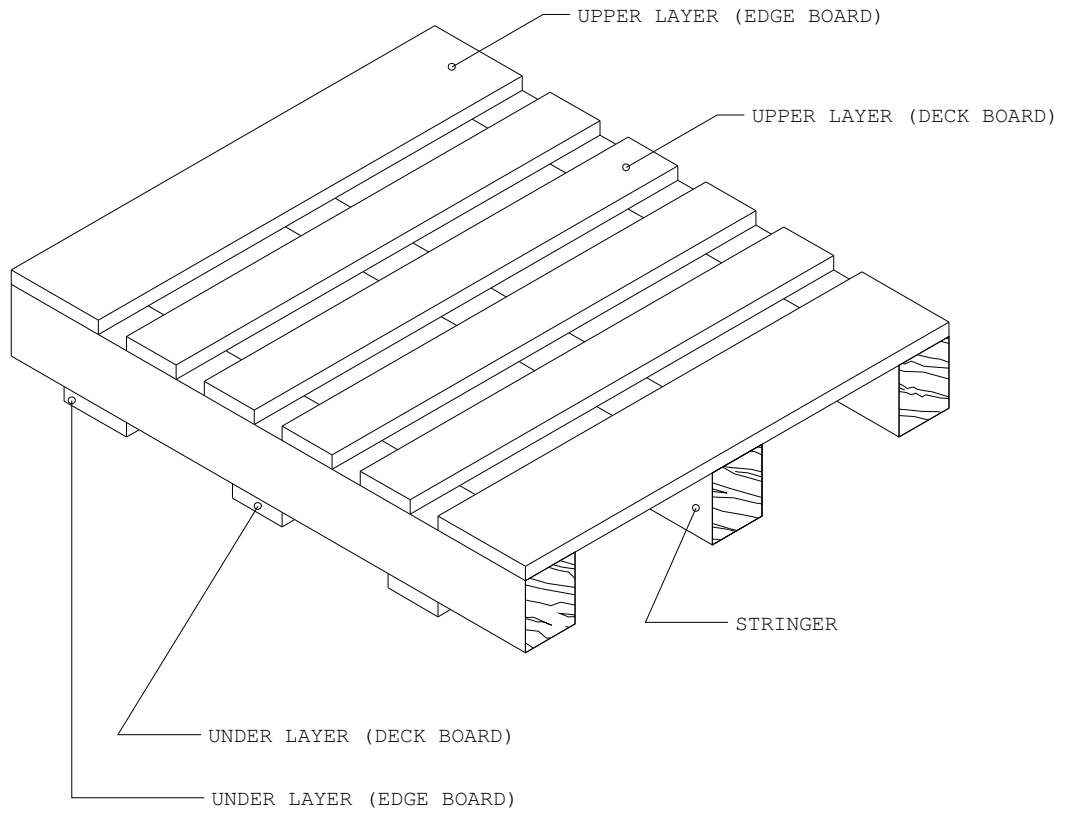
Non-Framed Shrink Wrapping



Notes:

- a) All marks shall be printed on sheets of cardboard and fixed to the inside of the film wrapping. The number of marks shall be the same as for boxes and crates.
- b) Additional plywood veneer must be placed between cargo and the pallet to prevent damage to material containing bags.

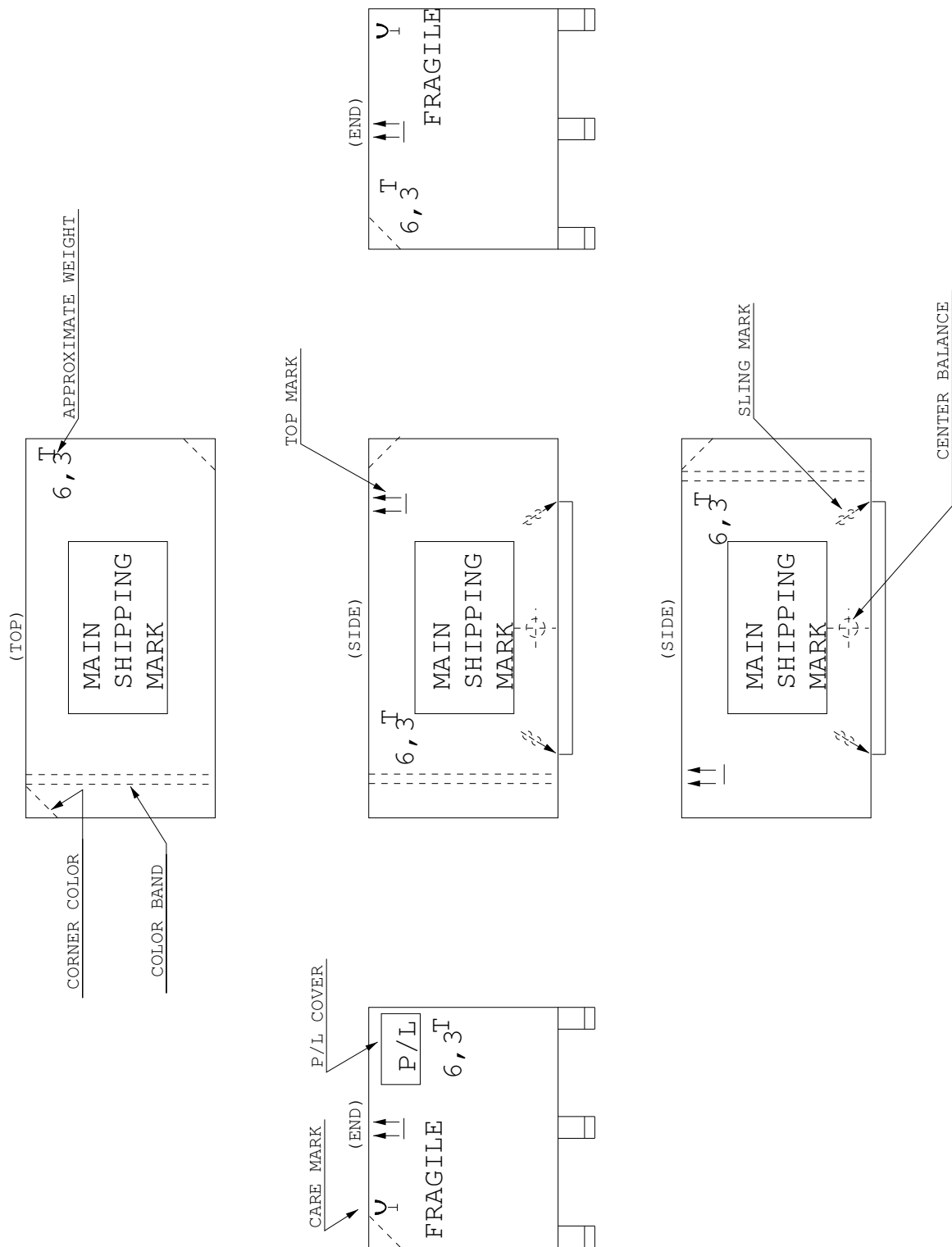
Pallet for Shrink Wrapping



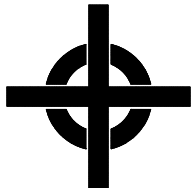
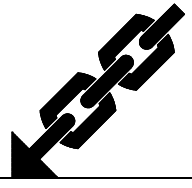
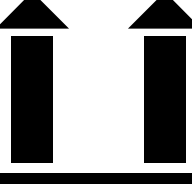
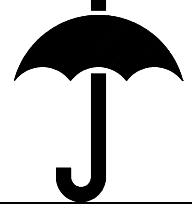
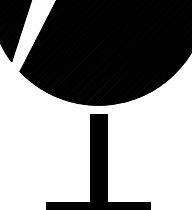
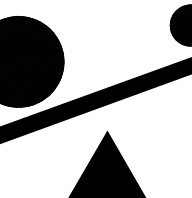
Marking Specification for Boxes, Crates, and Shrink-Wrapped Packages

Mark	Ink		Mark Location	Size	Remarks
	Color	Material			
Main Shipping Mark	Black	Fine Waterproof Ink or Oil Paint	Both Sides and Top	Optimum Size for each Package.	
Care Mark: Siling Mark Center Mark	Red	Fine Waterproof Ink or Oil Paint	Both Sides	Optimum Size for each Package.	
Other Mark			Top Mark: both sides and ends; Others: both ends.		
Approx. Weight	Black	Fine Waterproof Ink or Oil Paint	Both Sides, Ends, and Top	15 cm and over	Only for packages exceeding 5 tons; handwriting is permissible; unit shall be tons
Badger Logo	Green	Fine Waterproof Ink or Oil Paint	Both Sides, Ends, and Top	Minimum diameter: 20 cm.	
Packing List Cover	Yellow on Black Ground	Enamel	Upper Part of the One End	L: 14 cm W: 18 cm	Do not overlap with care mark; use tin plate.

Positioning of Shipping Mark, Care Mark and Center Balance

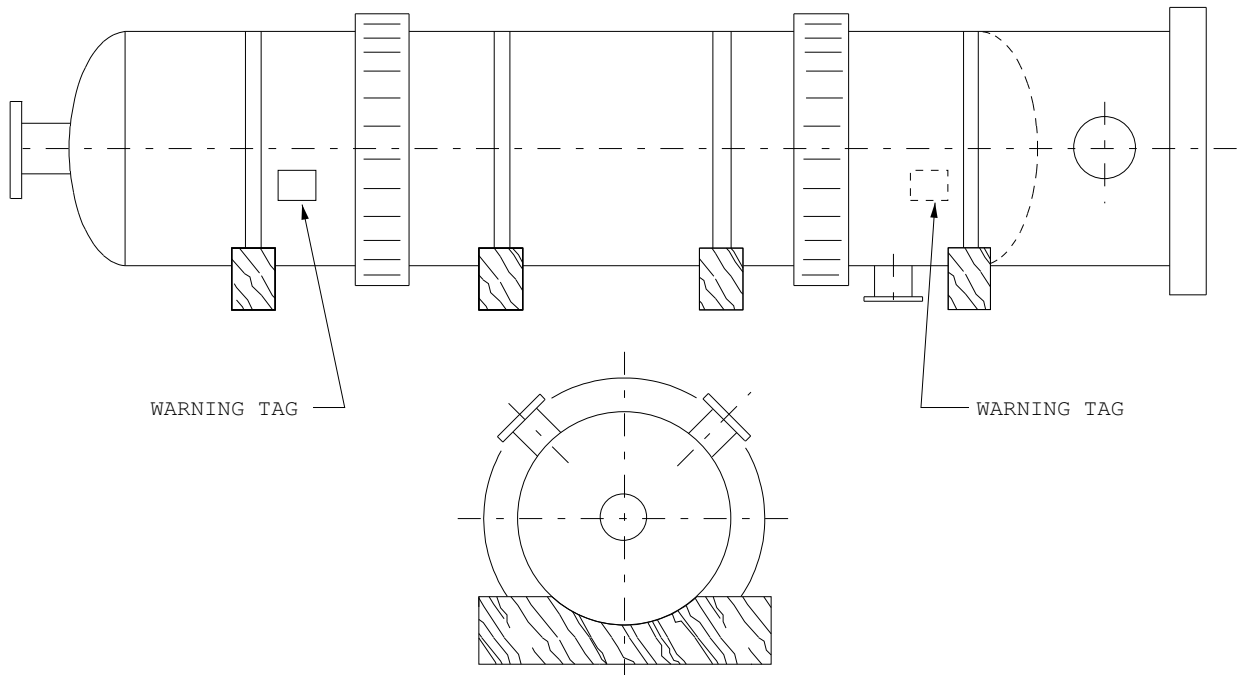


Care Mark, Center Mark, and Sling Mark

No	Marks	Letters Stenciled	Marks Stenciled	Remarks
1	Center	None		At the center of gravity
2	Sling	None		Where wire is applied
3	Top	None		This side up
4	Keep Dry	Keep Dry		For waterproof and moistureproof boxes
5	Handle with Care	Fragile		For fragile cargo
6	Heavy Weight this end	Heavy Weight this end		Inclination One side of Load

The letters shall be stenciled beneath the marks.

Position of Warning Tags



WARNING TAG

WARNING TAG

WARNING TAG

WARNING TAG

