

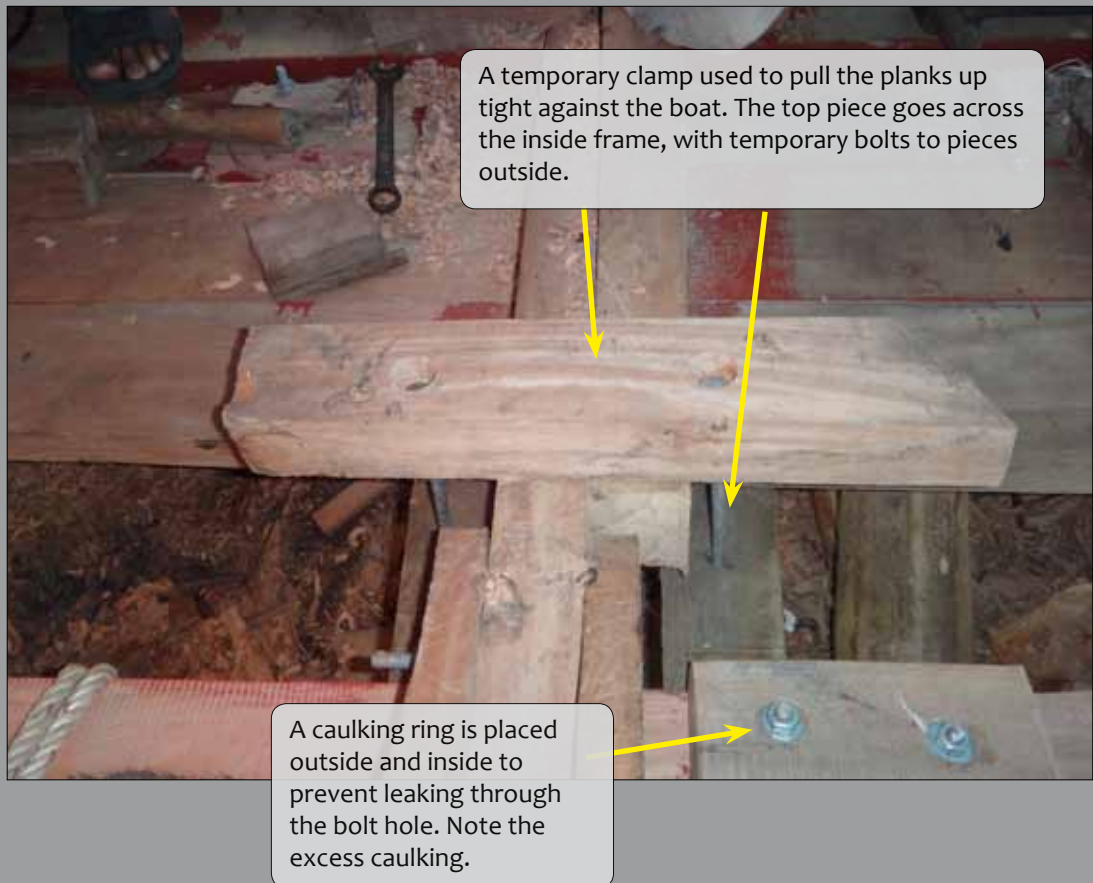
Step 21. The second and third planks are fitted and fastened to the boat.



Step 22. The planks are edge nailed together to maintain good hull shape until the frames are added inside the boat later.



Step 23. The butt joins are bolted in place to support the plank joins.



Step 24. In Cambodia traditional treenails are used for fastening planks to the frames of the boat.

Frames must be of sufficient thickness for the large hole that needs to be drilled for the treenail.

Note: that hot dipped galvanized nails are used at the ends of planks at the stem and stern and also for the first plank at the hog.



The treenails are first correctly shaped at the head.

(Step 24. continued)



(Step 24. continued)



(Step 24. continued)

Important note.

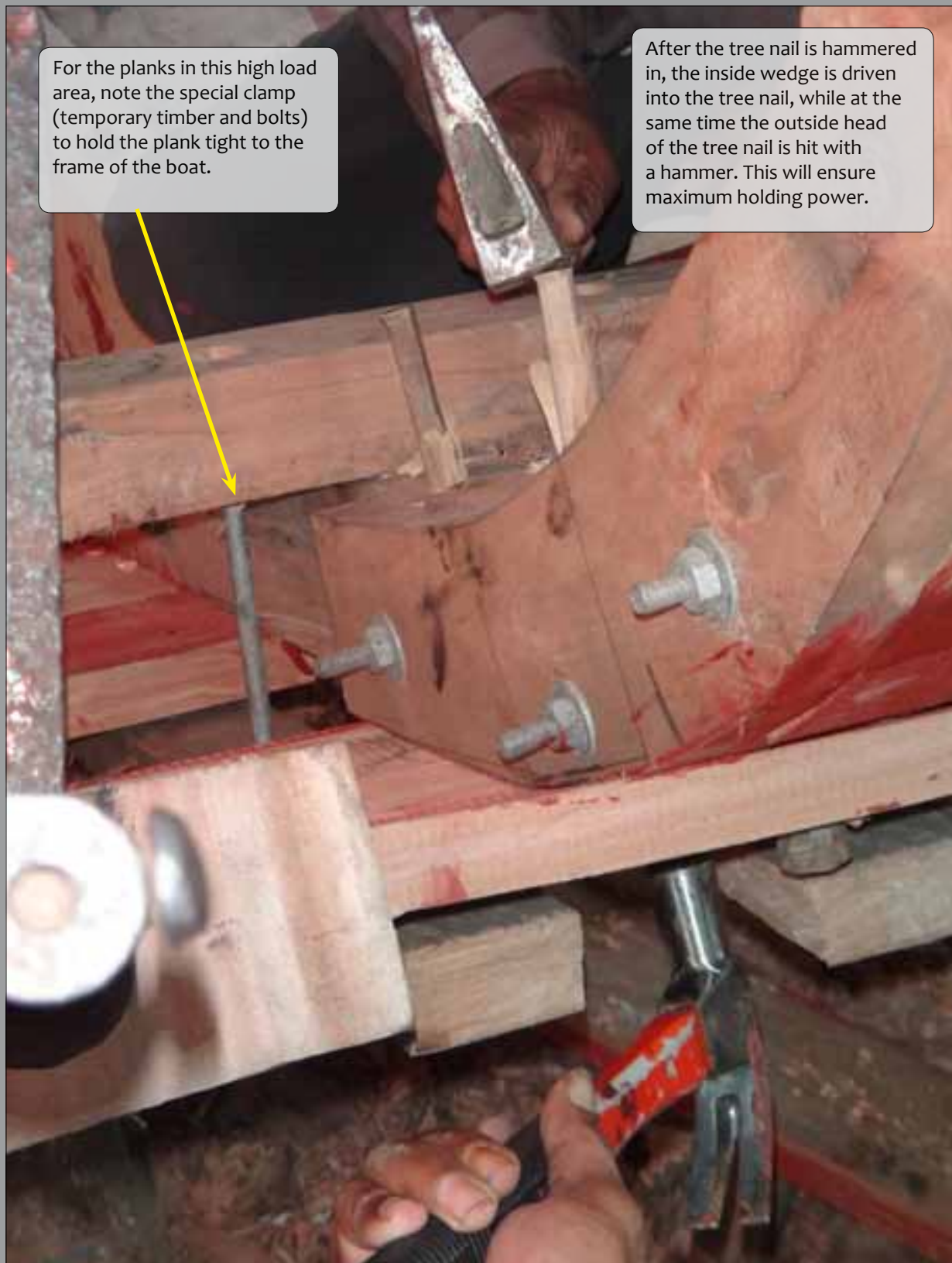
In certain areas the timber planking is under great stress when being bent to the shape of the boat. When using tree nails, there are special techniques to ensure maximum holding power of the tree nail in areas where planking needs maximum holding pressure, because of the extreme bending.



In this photo a special counter sink tool that fits into an electric drill is used to make a tapered fit for the head of the tree nail.

This photo is taken from the outside of the boat bottom.

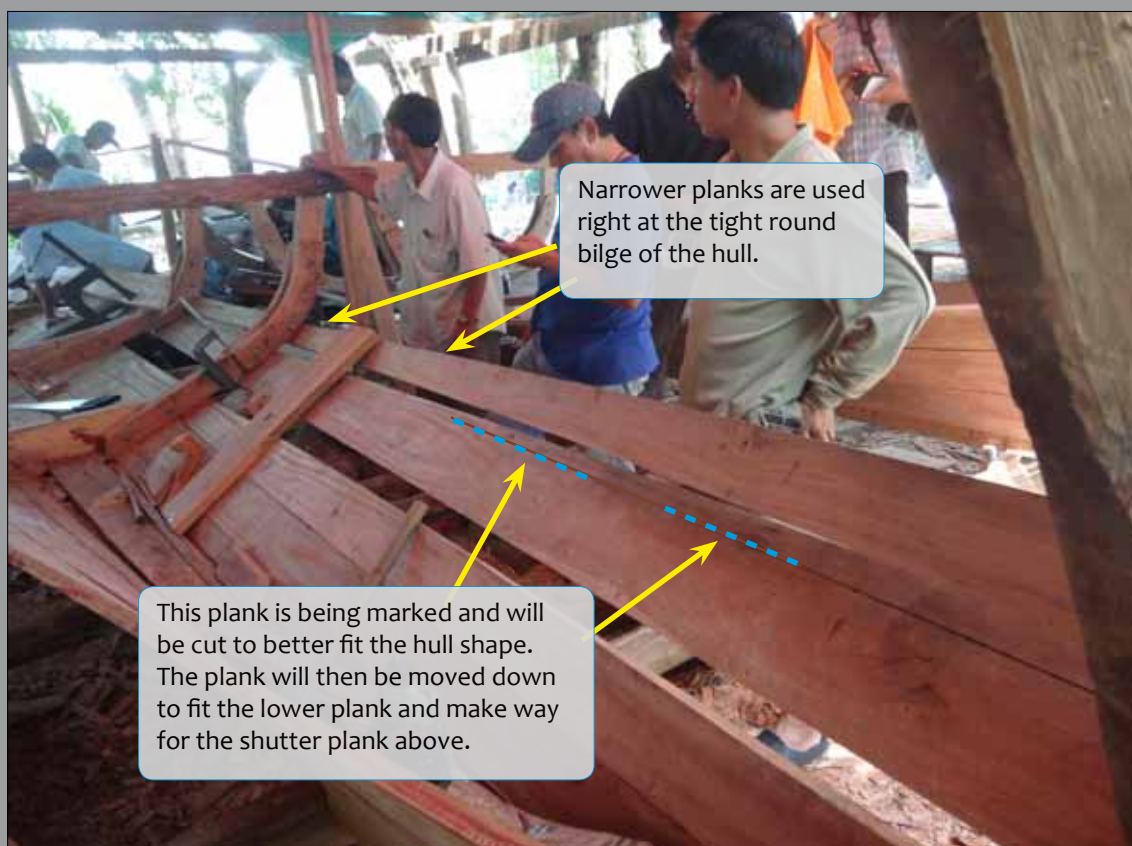
(Step 24. Important note continued)



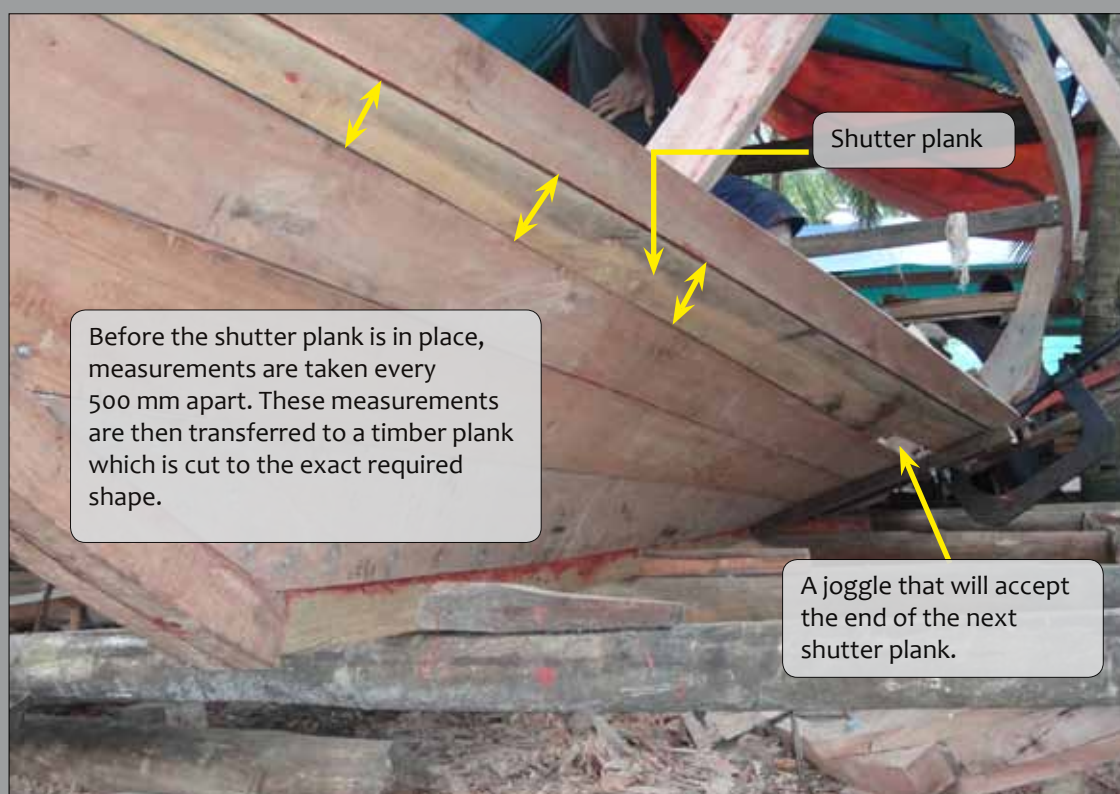
For the planks in this high load area, note the special clamp (temporary timber and bolts) to hold the plank tight to the frame of the boat.

After the tree nail is hammered in, the inside wedge is driven into the tree nail, while at the same time the outside head of the tree nail is hit with a hammer. This will ensure maximum holding power.

Step 25. Developing the planks around the tight round turn of the bilge.

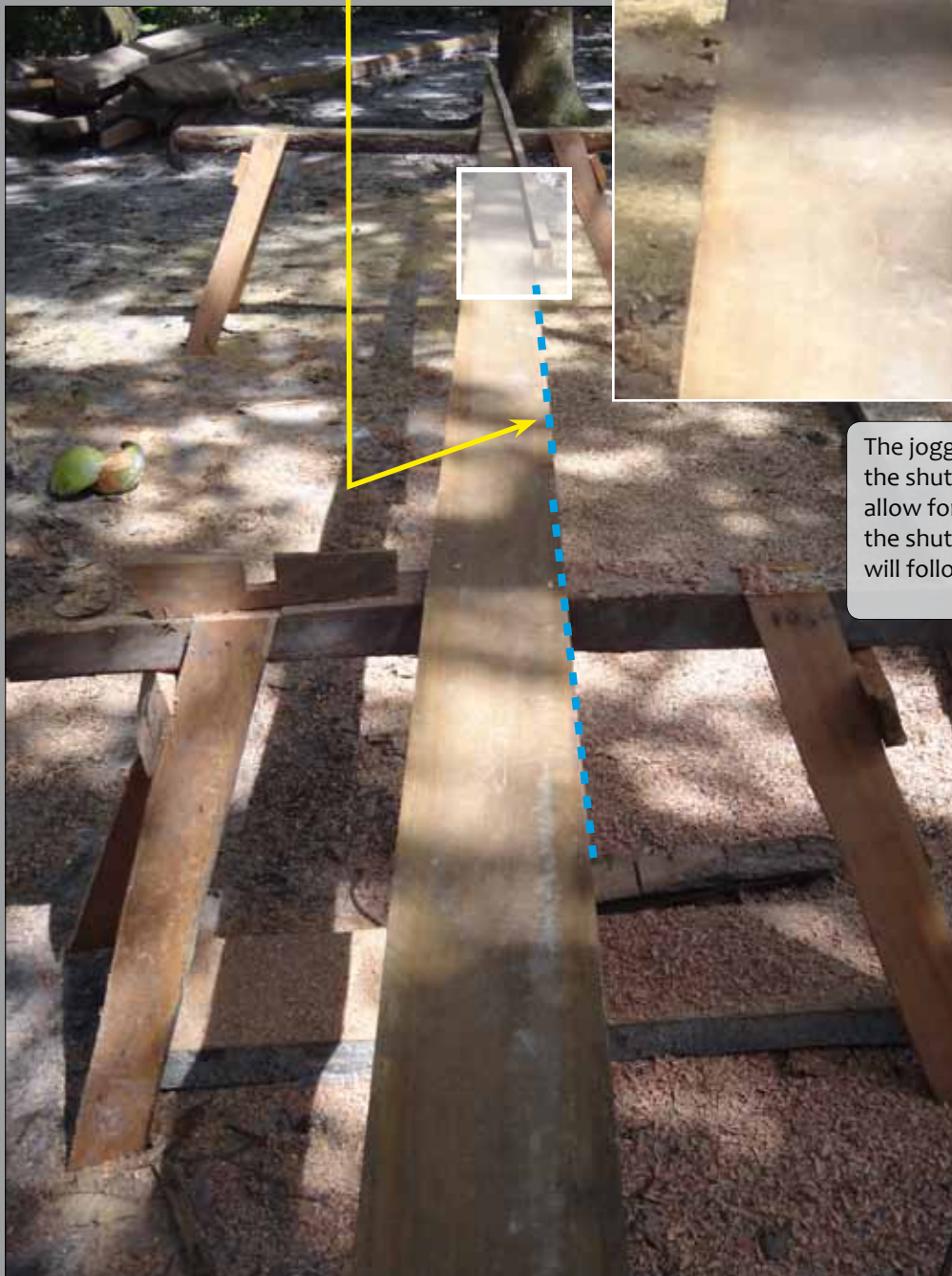
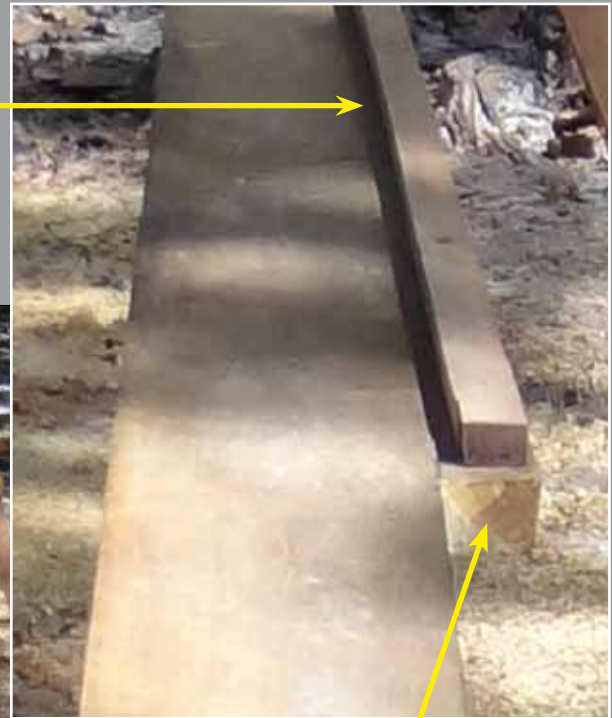


Step 26. A shutter plank is fitted into the space between the planks.



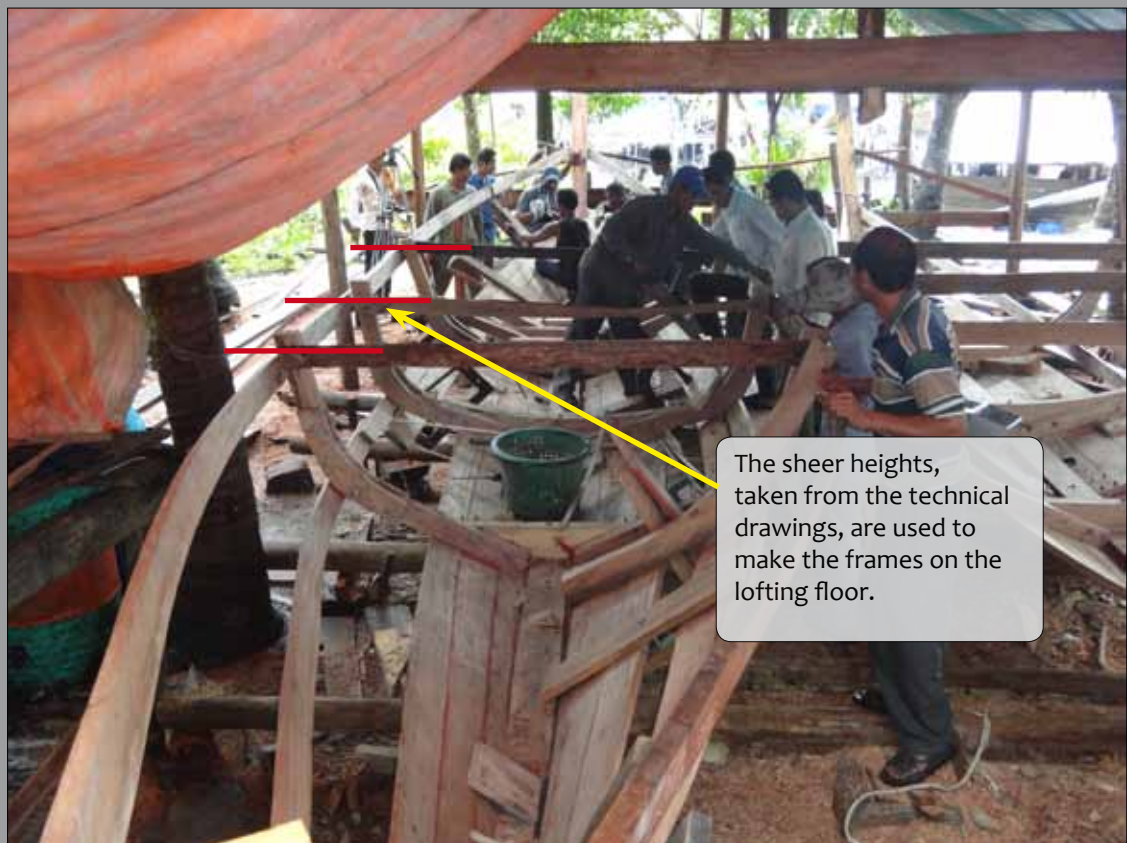
(Step 26. continued)

This shutter plank has been shaped to the correct size to fit in between planks on the boat. Note the timber fairing batten to help develop a fair line on the edge of the plank.

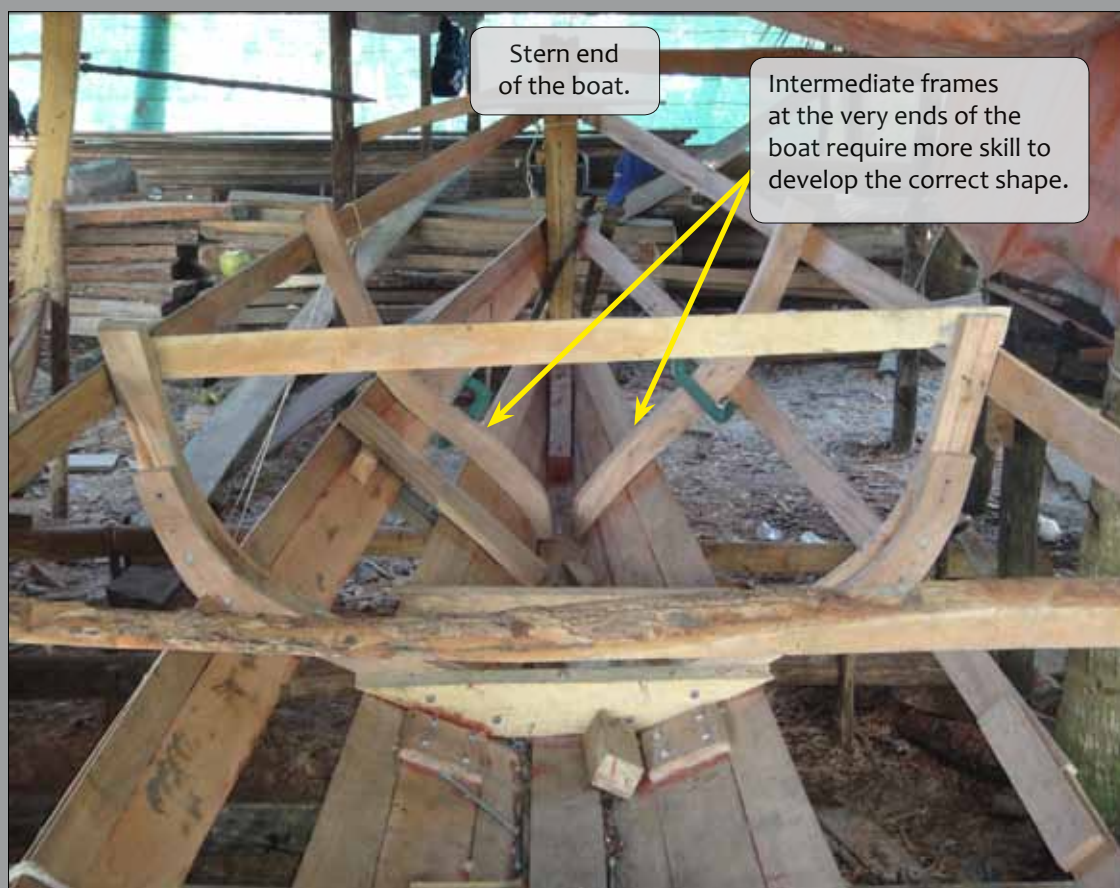
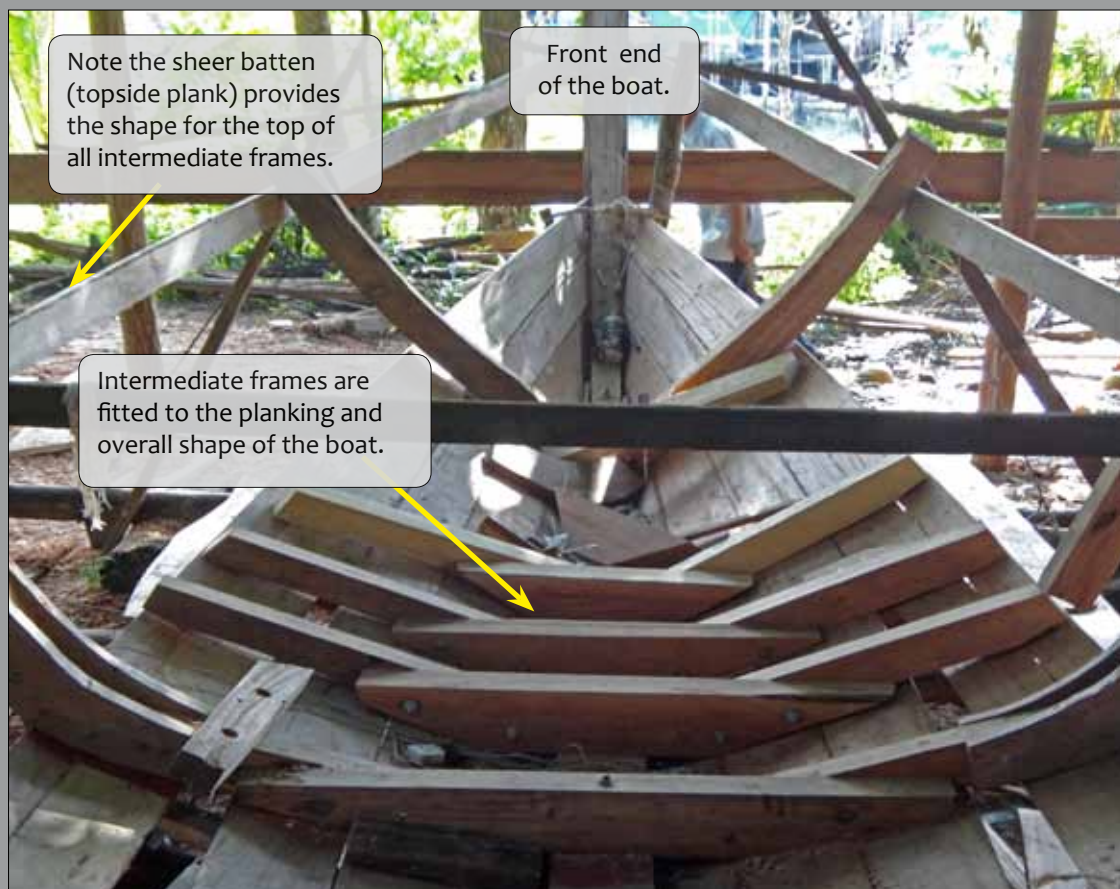


The joggle is cut into the shutter plank to allow for the end of the shutter plank that will follow.

Step 27. Developing the sheer (top side) of the boat.



Step 28. Intermediate frames are fitted into the boat



(Step 28. continued)

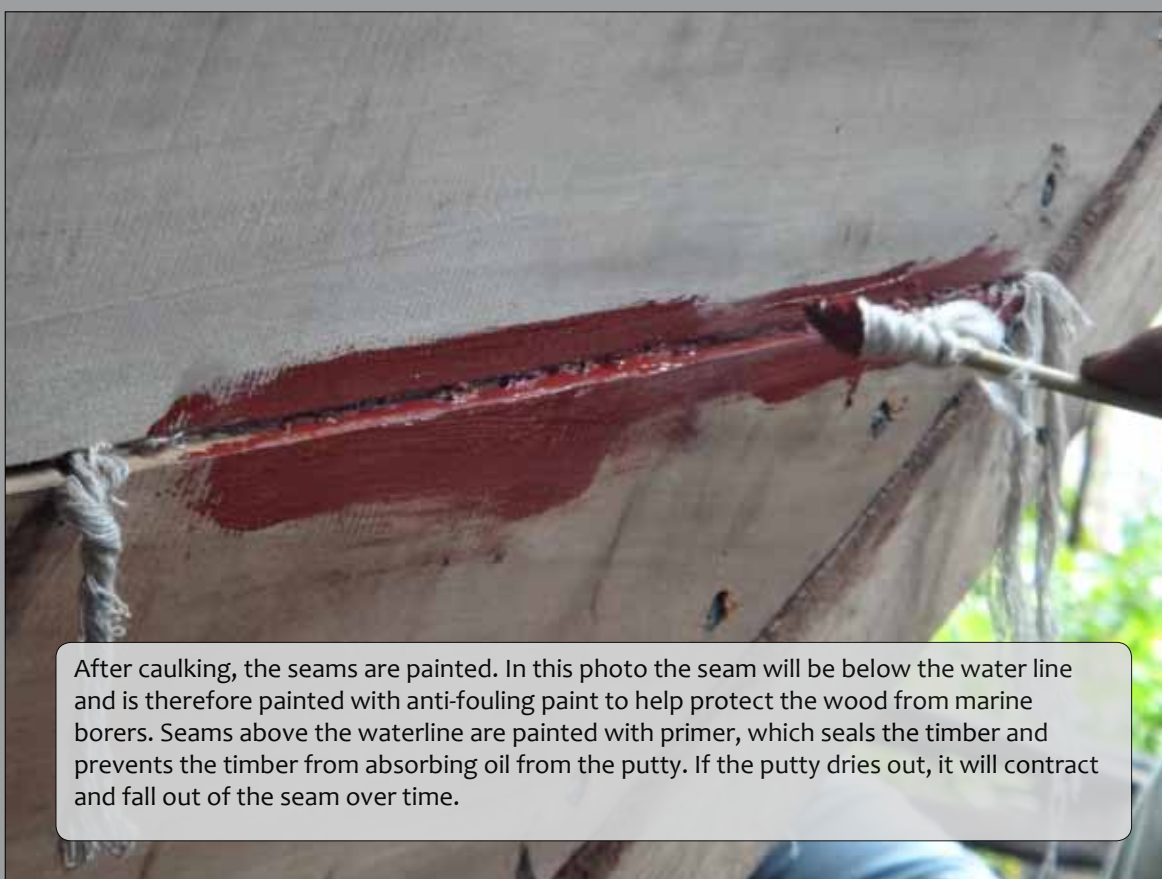


Step 29. After all intermediate frames are manufactured and fitted into the boat, the remaining planking is fitted.



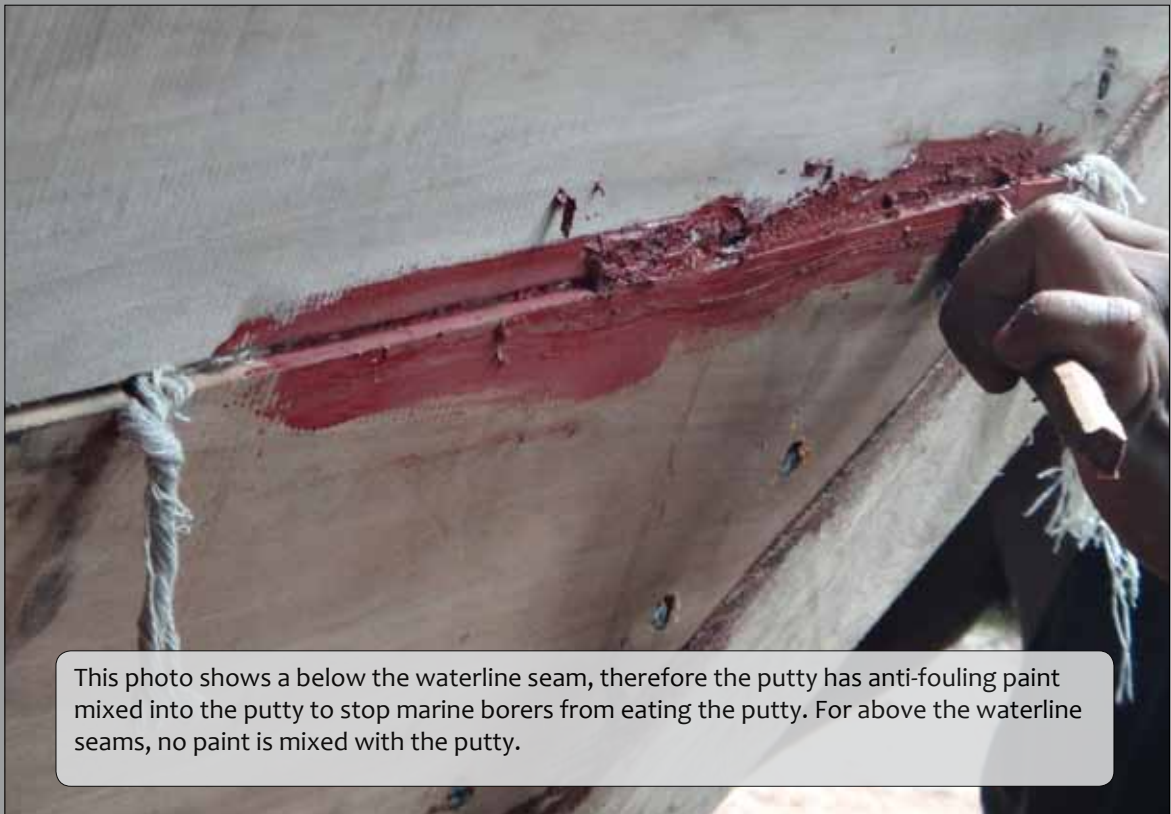
A moulding, (additional timber stringer) is bolted around the outside of the sheer batten to give rigidity to the top of the boat.

Step 30. Every seam (join in every plank) is caulked to make the boat watertight.



After caulking, the seams are painted. In this photo the seam will be below the water line and is therefore painted with anti-fouling paint to help protect the wood from marine borers. Seams above the waterline are painted with primer, which seals the timber and prevents the timber from absorbing oil from the putty. If the putty dries out, it will contract and fall out of the seam over time.

Step 31. After painting of the seams, every seam is filled with putty.



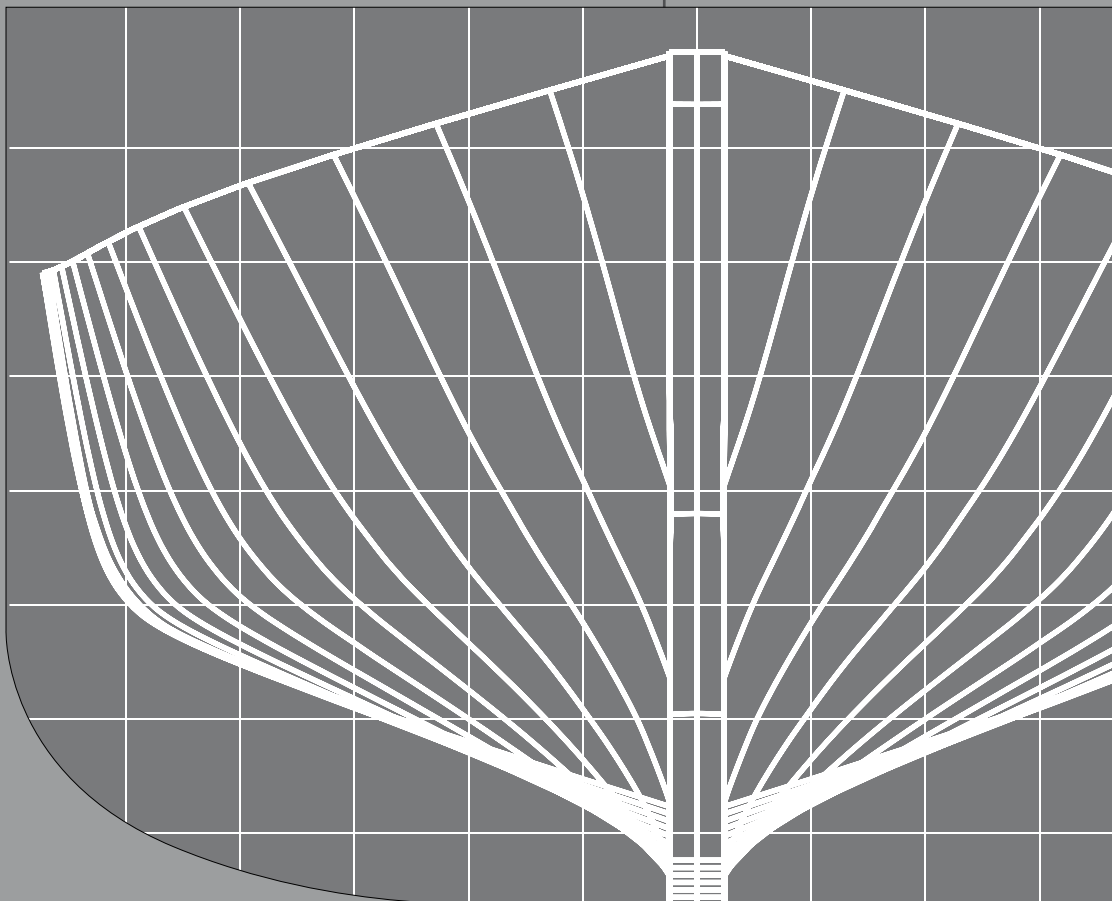
This photo shows a below the waterline seam, therefore the putty has anti-fouling paint mixed into the putty to stop marine borers from eating the putty. For above the waterline seams, no paint is mixed with the putty.

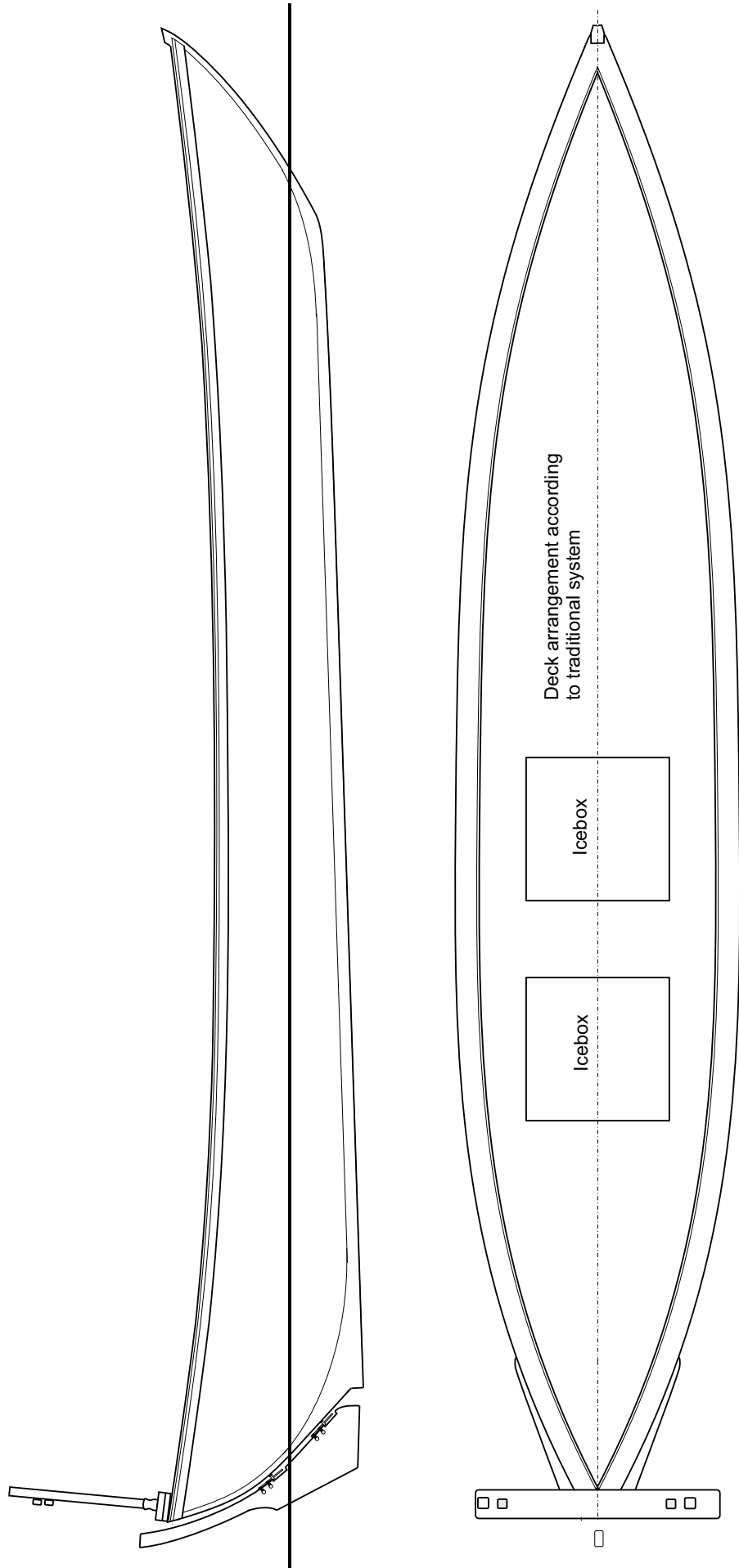
Annexes

nt loaded: $m_{LDC} = 3000 \text{ kg}$ (3.0 tonnes)
nt Designed WL - DWL, $m_{DWL} = 2800 \text{ kg}$
ed designed waterline: $V = 6.5 \text{ knots}$

os designed waterline:

$$L_{WL} = 5.80, \quad B_{DWL}/T_C = 4.53, \quad L_{WL}/m_{DWL}^{0.33} = 2.0$$

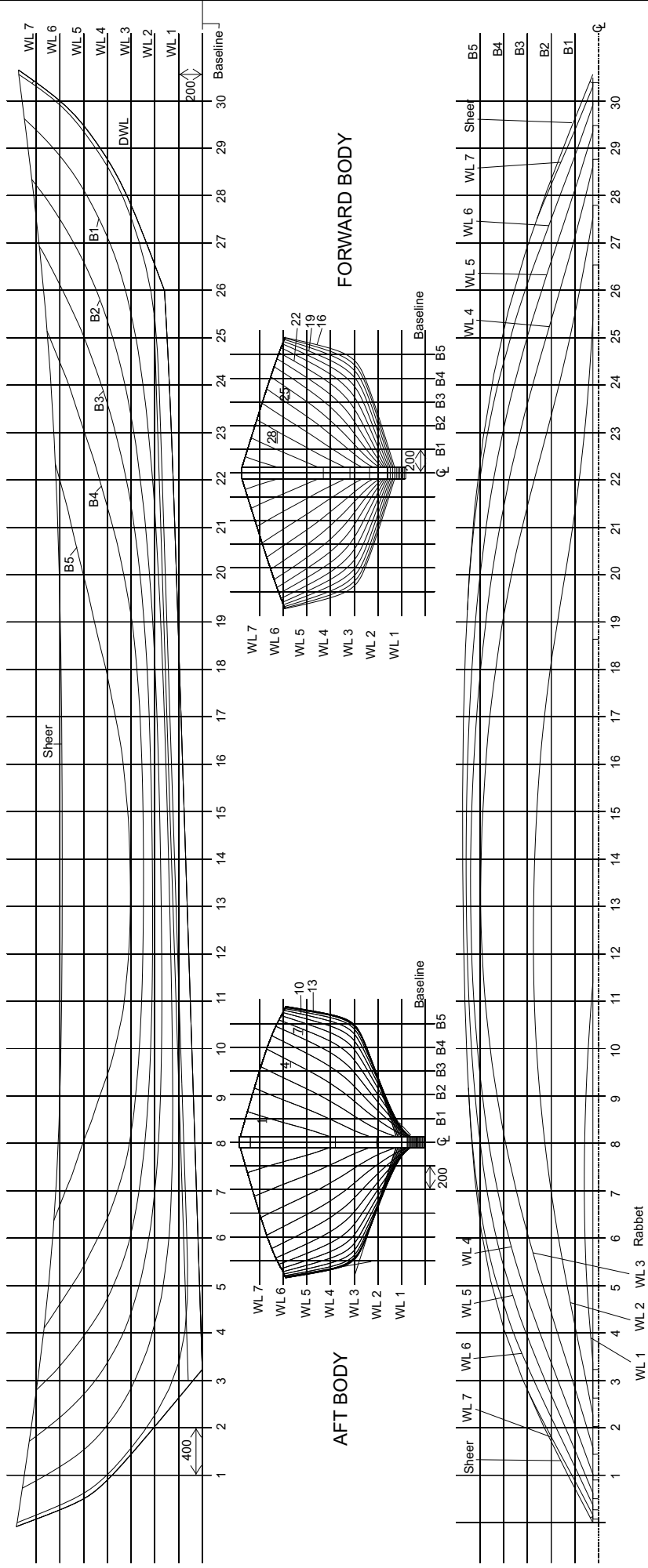




MAIN DATA

Length over all: $L_{tt} = 12.3 \text{ m}$ (40 ft)
Beam moulded: $B_H = 2.30 \text{ m}$ (7.5 ft)
Depth moulded: $D_H = 0.95 \text{ m}$ (3.1 ft)
Cubic number: $CUNO = L_{tt} \times B_H \times D_H = 27 \text{ m}^3$
Length in waterline, Loaded: $L_{wl} = 10.6 \text{ m}$ (33.4 ft)
Beam in waterline, Loaded: $B_{wl} = 1.83 \text{ m}$ (6.0 ft)
Maximum draft: $T_{max} = 0.60 \text{ m}$ (2.0 ft)
Displacement light: $m_{LCC} = 1700 \text{ kg}$ (1.7 tonnes)
Deadweight: 1300 kg (1.3 tonnes)
Displacement loaded: $m_{LDC} = 3000 \text{ kg}$ (3 tonnes)
Engine: 9.7 kw (13 hp) Honda petrol engine with longtail.
Service speed at 80% power with waves and some fouling= 6.5 knots.

Cambodia 12.3 m Fishing boat			
GENERAL ARRANGEMENT			
Scale = 1 : 50		Design no.	Drawing no.
Design: Gulbrandsen		CAM - 2	1
2011.01.12			



MAIN DATA

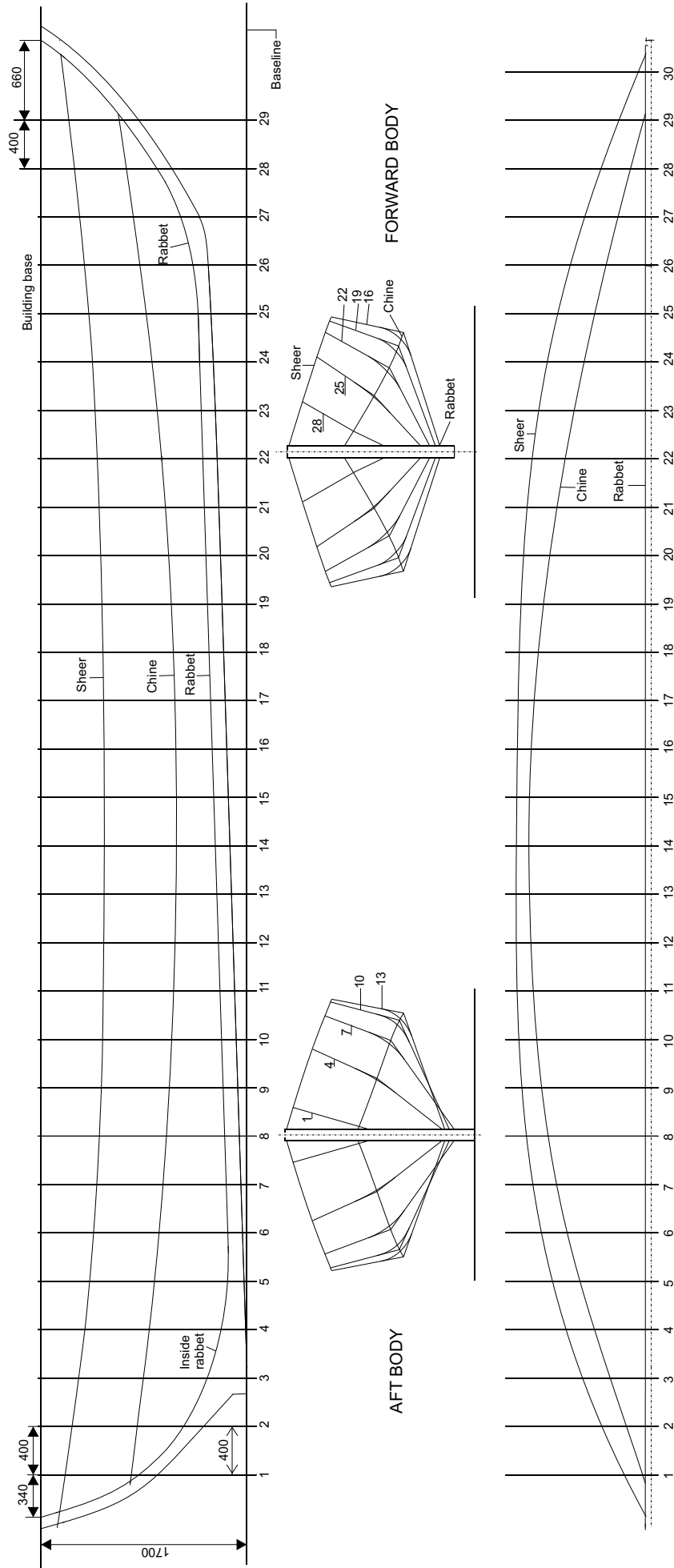
Length over all: $L_H = 12.3$ m
Beam moulded $B_H = 2.4$ m
Depth moulded: $D_H = 0.95$ m
Length designed waterline : $L_{DWL} = 10.6$ m
Beam designed waterline : $B_{DWL} = 1.83$ m
Body draft midship: $T_c = 0.40$ m

Displacement loaded: $m_{Loc} = 3000$ kg (3.0 tonnes)
Displacement Designed WL - DWL, $m_{DWL} = 2800$ kg (2.8 m³ = 2.8 tonnes)
Service speed designed waterline: $V = 6.5$ knots

Ratio designed waterline:
 $L_{DWL}/B_{DWL} = 5.80$, $B_{DWL}/T_c = 4.53$, $L_{WL}/m_{DWL}^{0.33} = 7.5$
 $V/\sqrt{L_{DWL}} = 2.0$

Lines used to calculate hydrodynamic and stability data by computer

Cambodia 12.3 m Fishing boat		
LINES - ROUND BOTTOM		
Scale = 1 : 50	Design no.	Drawing no.
Design: Gulbrandsen	CAM - 2	
2011.01.12	2	



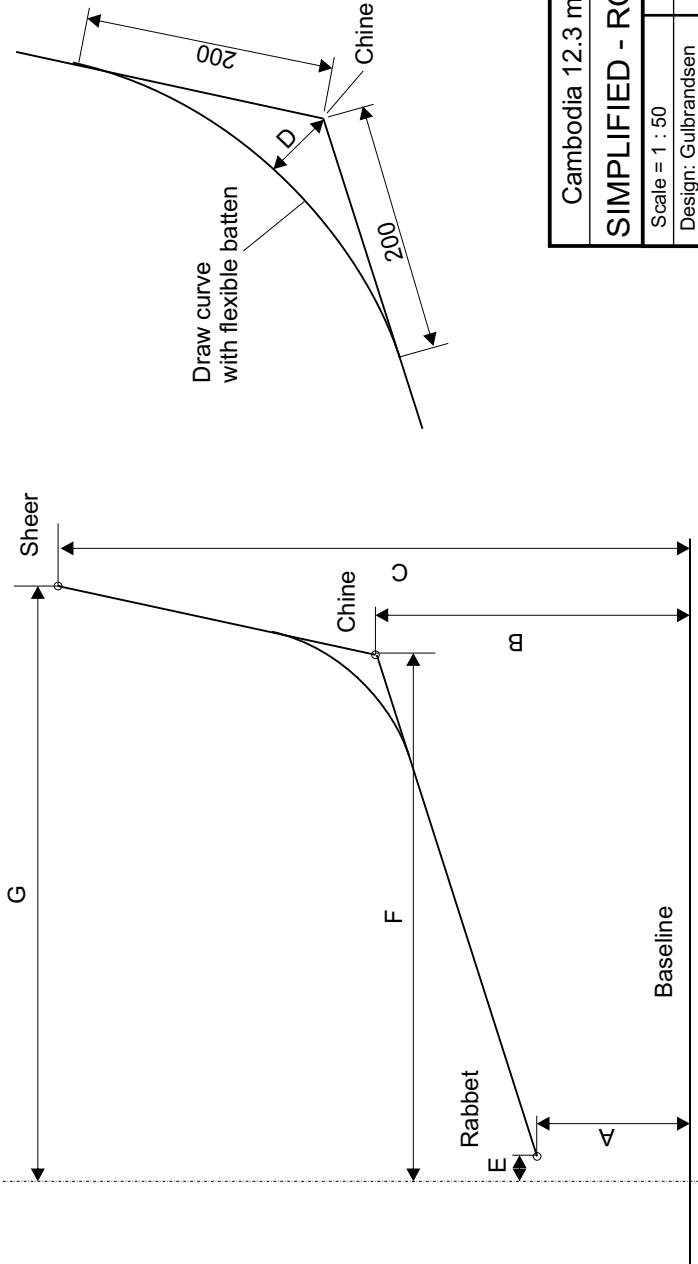
NOTE: THE LINES ARE TO THE INSIDE OF THE PLANKING (OUTSIDE OF FRAMES)

Cambodia 12.3 m Fishing boat			
SIMPLIFIED - ROUND BOTTOM			
Scale = 1 : 50		Design no.	Drawing no
Design: Gulbrandsen		CAM - 2	3
2011.01.12			

DIMENSIONS IN mm TO INSIDE OF PLANKING

HEIGHT FROM BASELINE

Frame	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
A Rabbet	878	512	327	212	158	156	169	182	195	208	220	233	246	258	273	286	298	311	322	337	349	362	375	388	401	444	546	742	1024
B Chine	954	905	854	805	762	724	692	664	641	621	606	594	585	583	582	586	596	608	628	646	672	703	741	781	830	880	939	1000	1054
C Sheer	1500	1441	1386	1337	1295	1261	1234	1214	1200	1190	1185	1182	1180	1180	1180	1181	1184	1189	1196	1203	1217	1232	1250	1274	1303	1336	1376	1421	1518
D Round	0	0	0	10	18	24	30	35	40	43	46	49	51	52	53	52	51	49	46	43	38	26	19	11	0	0	0	0	0



Cambodia 12.3 m Fishing boat

SIMPLIFIED - ROUND BOTTOM

Scale = 1 : 50

Design: Gulbrandsen

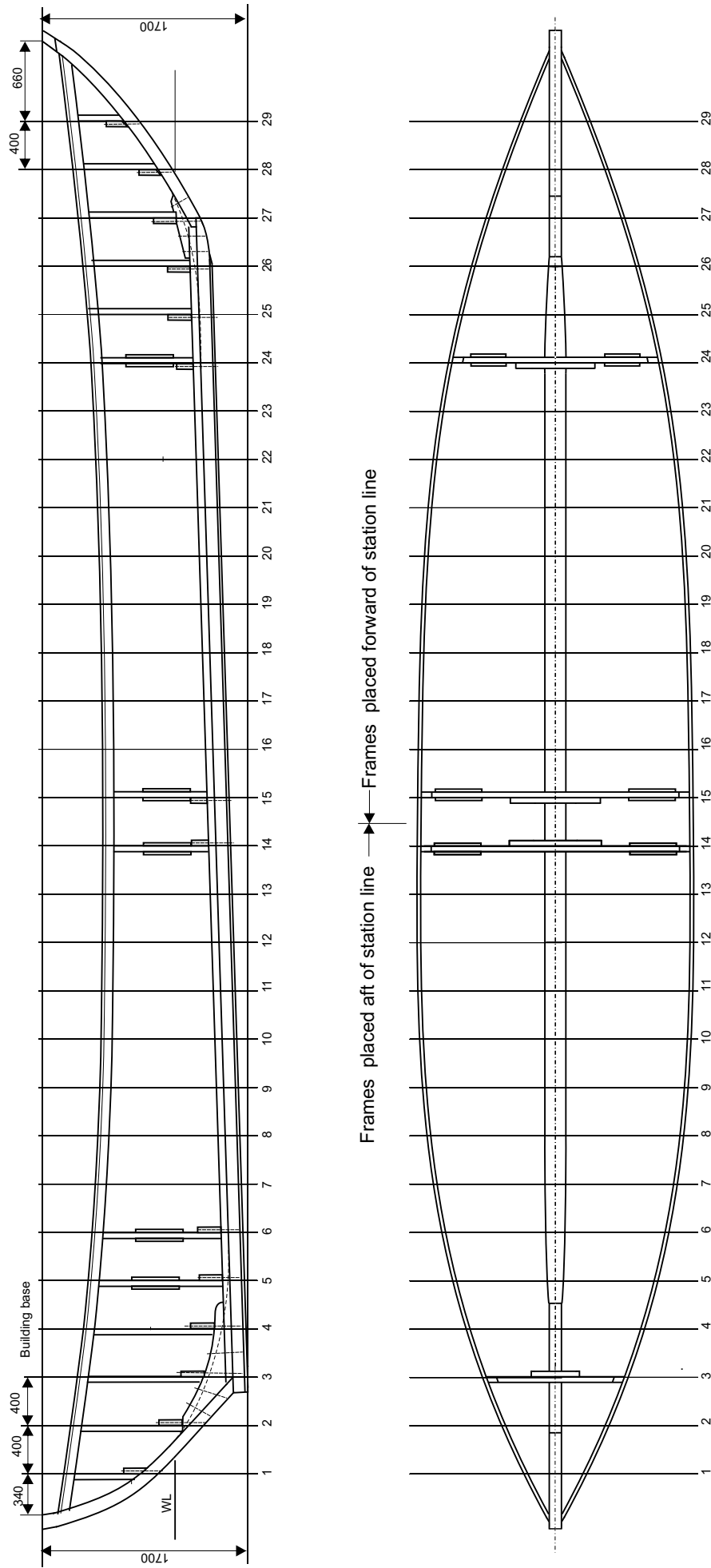
2011.01.12

Design no.

Drawing no

CAM - 2

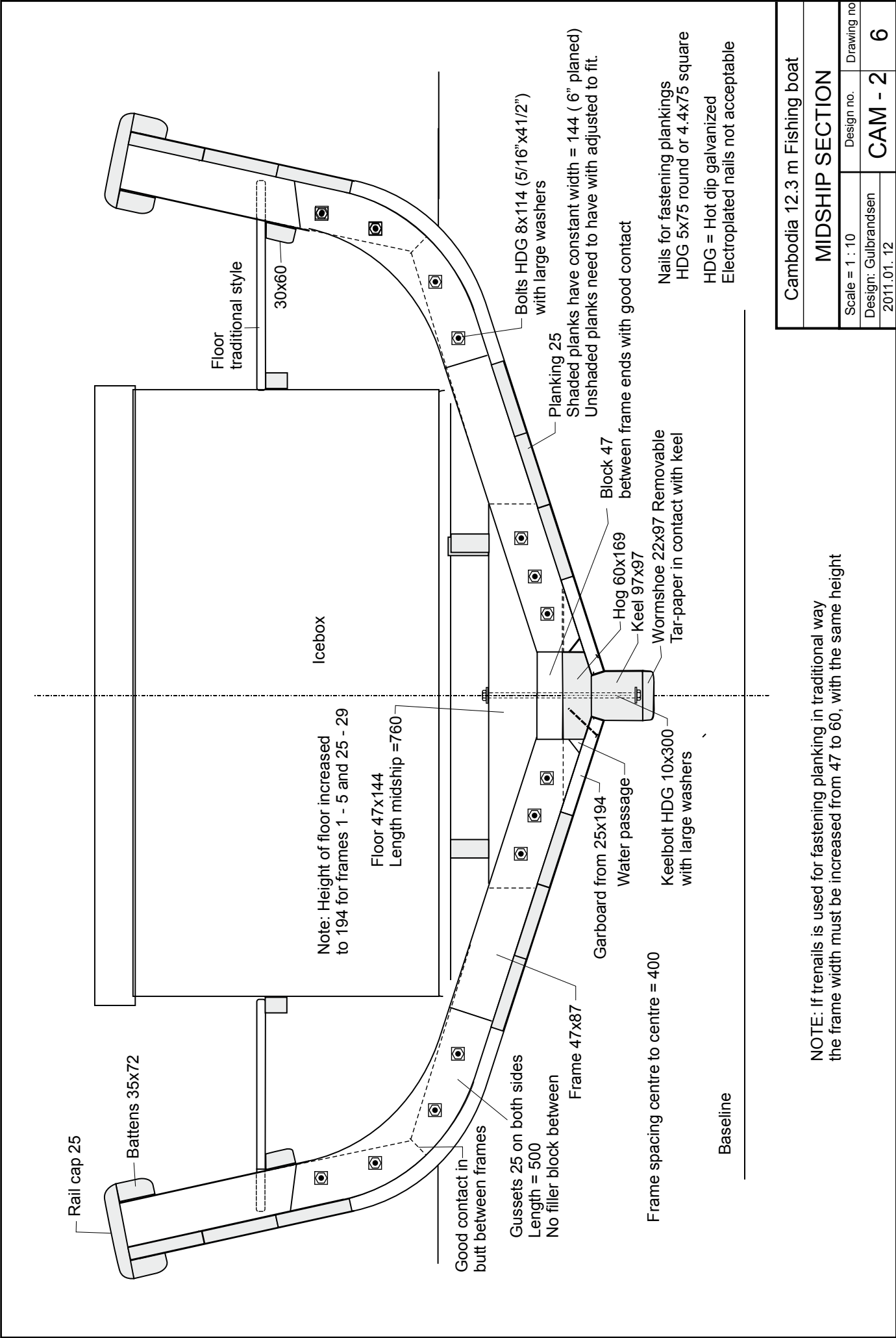
4

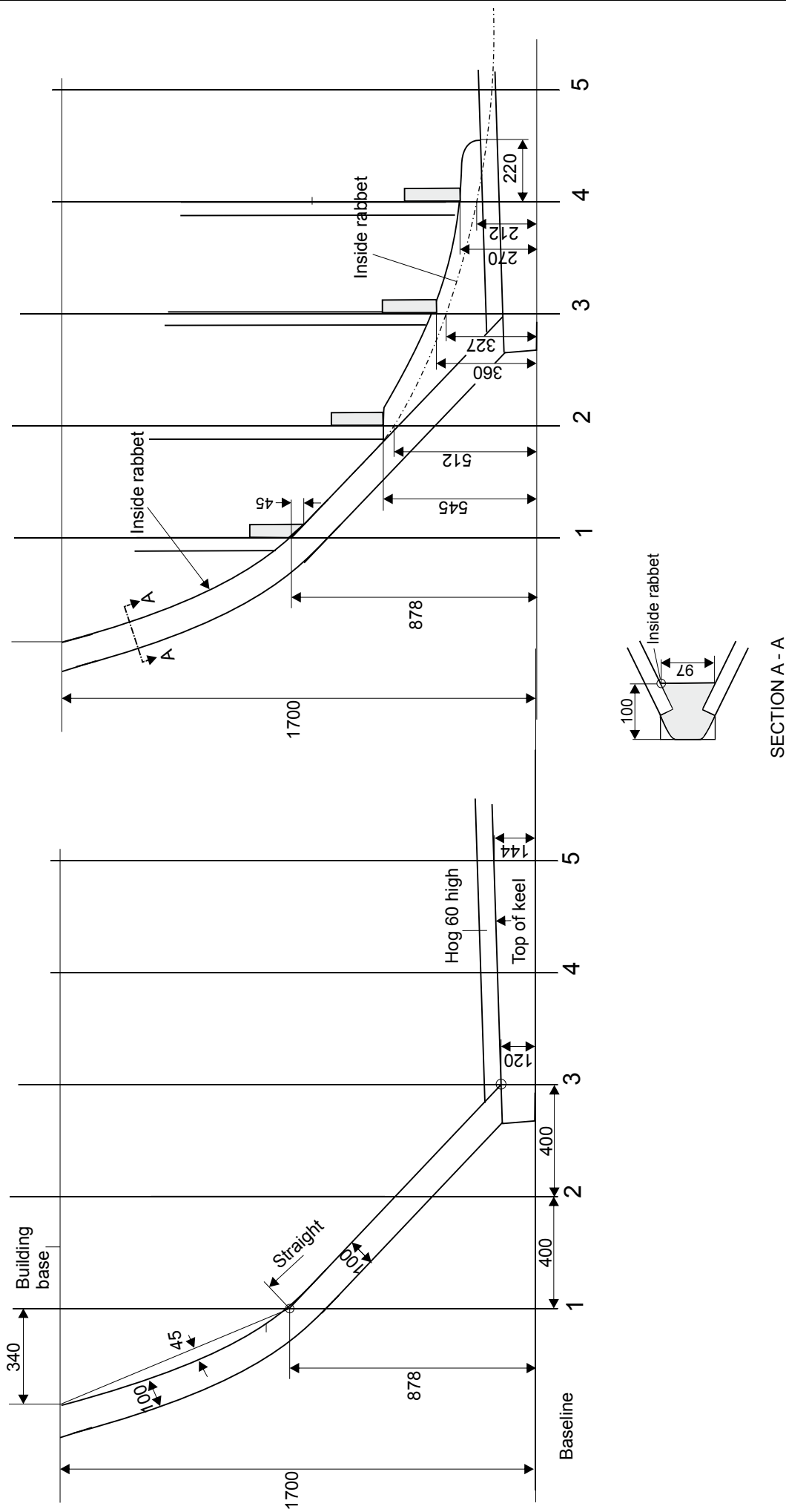


Frames placed aft of station line Frames placed forward of station line

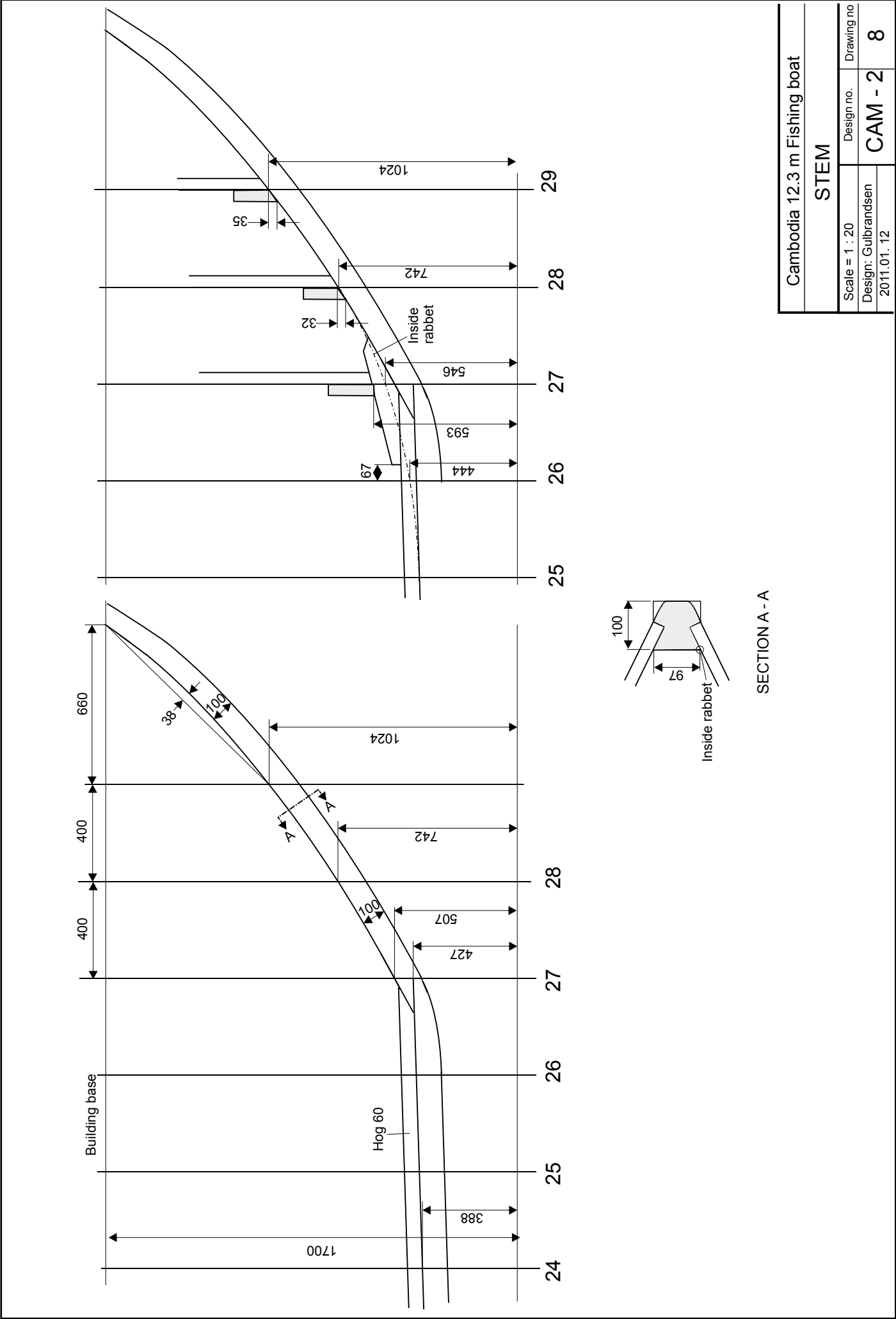
Take care to place frames on the correct side of the station marks.

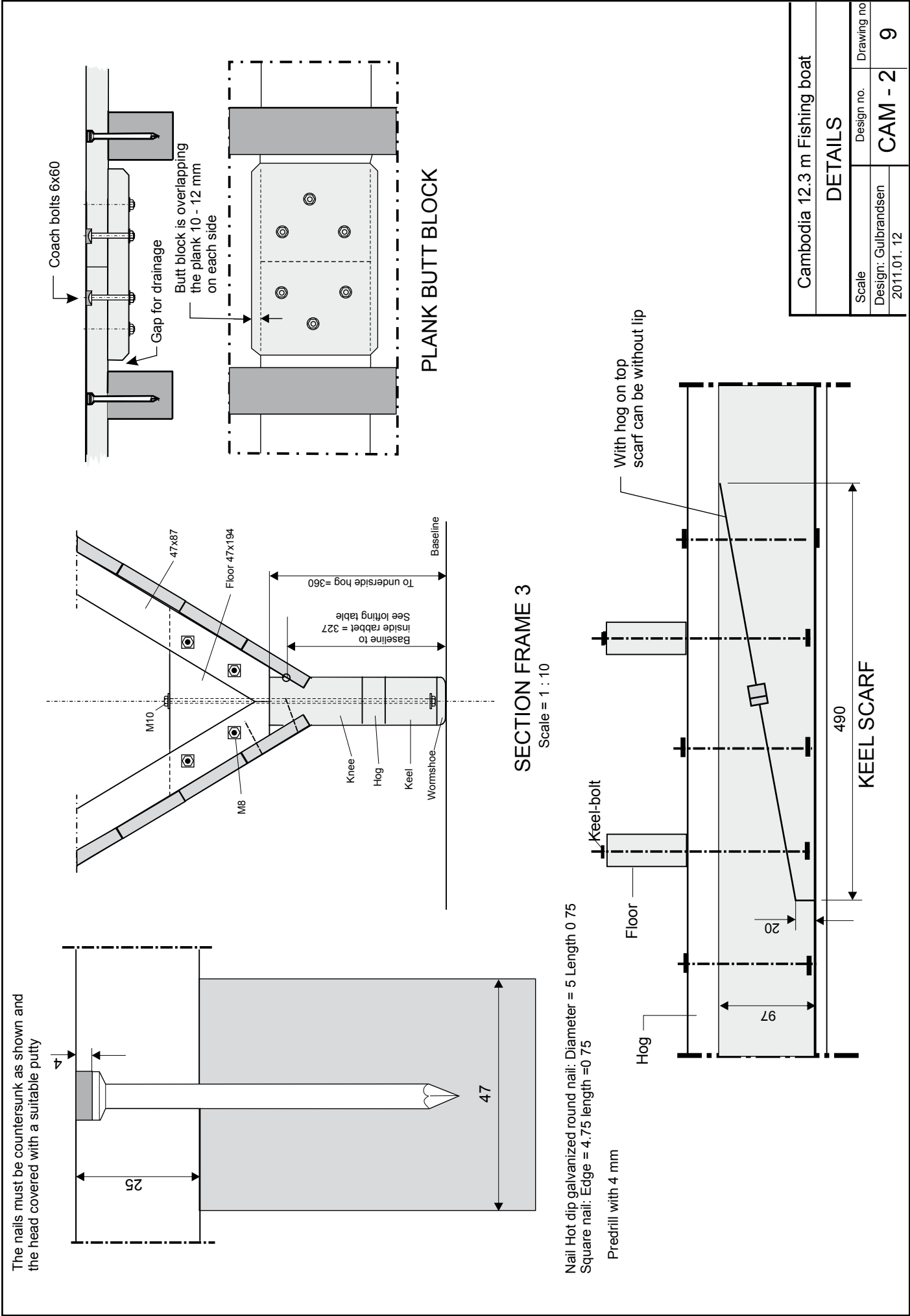
Cambodia 12.3 m Fishing boat			
CONSTRUCTION			
Scale = 1 : 50		Design no. CAM - 2	Drawing no. 5
Design: Gulbrandsen			
2011.01. 12			

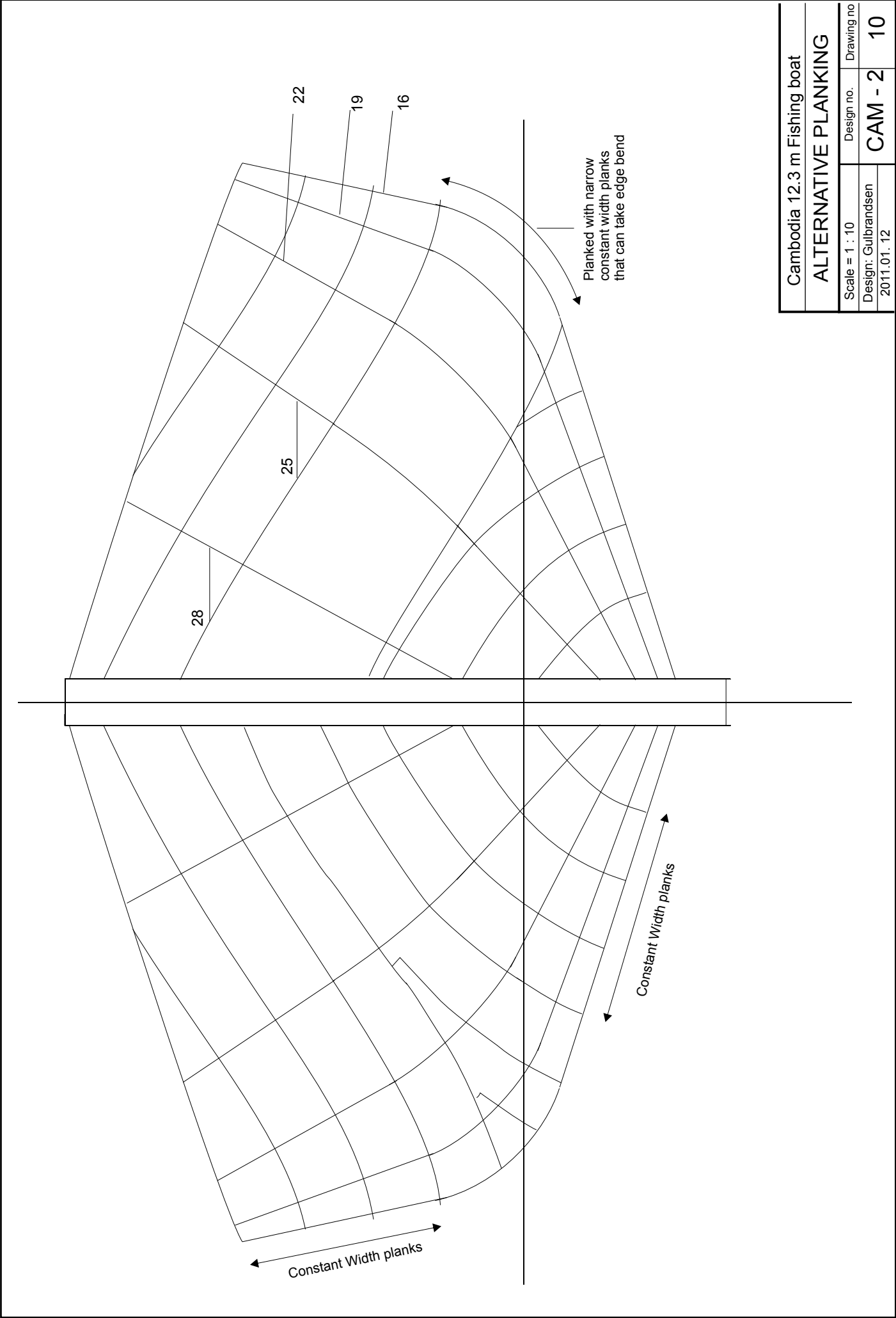




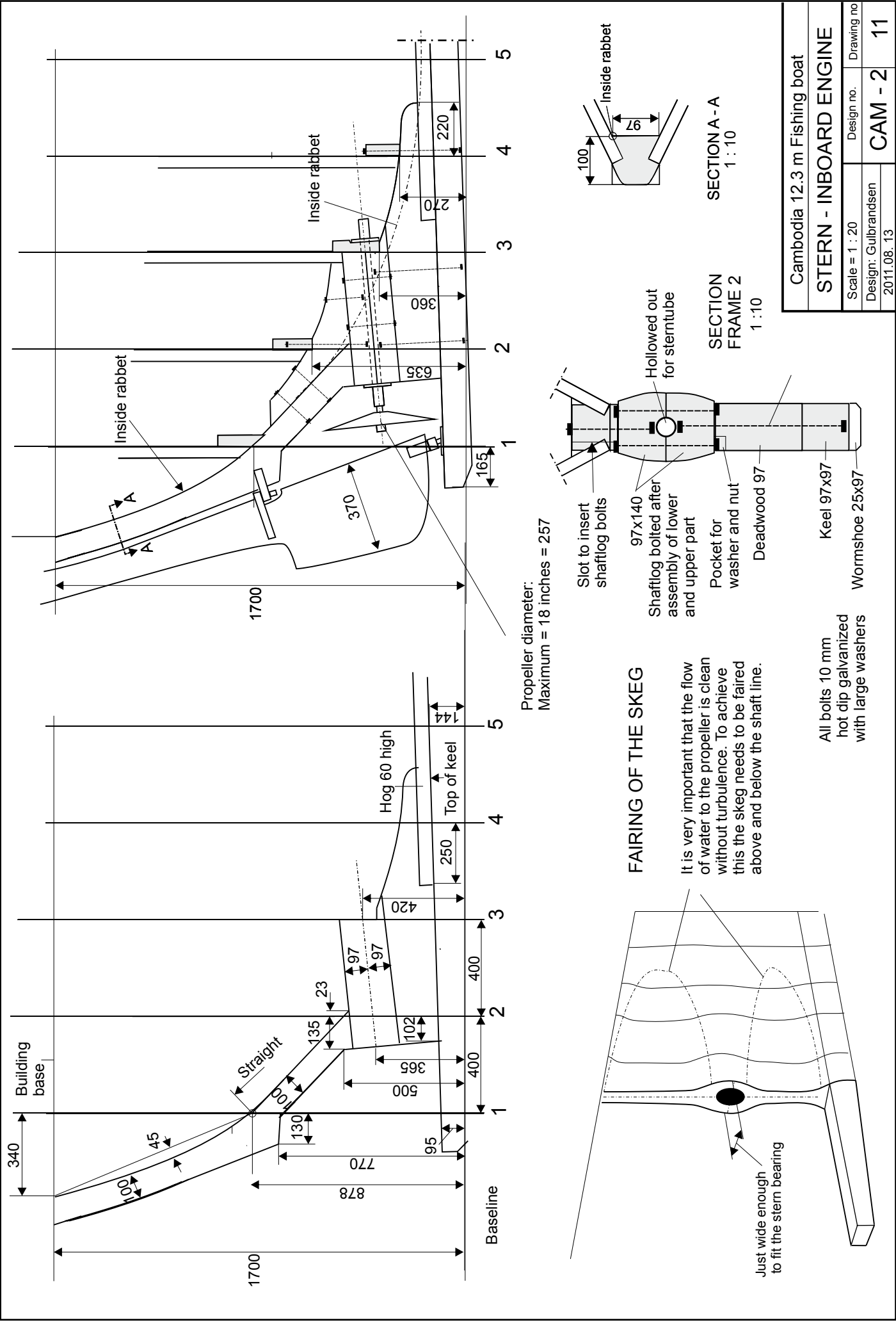
Cambodia 12.3 m Fishing boat			
STERN			
Scale = 1 : 20	Design no.		Drawing no.
Design: Gulbrandsen	CAM - 2		7
2011.01.12			







Cambodia 12.3 m Fishing boat			
ALTERNATIVE PLANKING			
Scale = 1 : 10	Design no.	Drawing no	
Design: Gulbrandsen	CAM - 2		10
2011.01. 12			





The Regional Fisheries Livelihood Programme for South and Southeast Asia (RFLP)
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