

**SLSA SURF BOAT CONSTRUCTION TECHNICAL
SPECIFICATION**

5.1 GENERAL.

5.1.1. Boat builders commencing construction of construction of GRP, or foam or timber sandwich for the first time shall submit a test panel of the proposed layup with full details, to the Hon. National Surf Boat Officer.

5.1.2. Any proposed changes or alternatives to approved layups, stiffening or construction shall be submitted prior to construction, along with supporting professional engineering calculations and advice, for the consideration and approval of the Hon. National Surf Boat Officer. As a minimum requirement, the layups shall be at least as strong (eg, equal or greater cloth weight and improved orientation) as the presently approved layups in the Specification.

5.1.3. All components and items listed in Hull Construction (Clause 5.3.) shall be fitted to the boat unless described as advisory or where an otherwise SLSA approved alternative is allowed.

5.2 DIMENSIONS.

5.2.1. Length Overall -Minimum 6.86 m to a maximum 7.925 m (not including the sweep outrigger).

5.2.2. Beam -Minimum of 1.62 m between projections of outside hull at top of gunwale, measured at widest midship section near to No's 2 or 3 thwarts, see also Clause 5.2.4.

5.2.3. Moulded Depth -Minimum of 558 mm from top of gunwale to lowest part of outside hull at keel, measured at the same section as the beam measurement.

5.2.4. Hull Reverse Curvature -Any reverse curvature in the hull, between the stern and a point 3.00 m from the bow, shall be limited to a maximum of 13 mm, measured between gunwale and keel. Where the gunwale has been moulded, or where the outside hull at top of the gunwale is otherwise hard to measure, the reverse curvature may be measured by placing a straight edge batten over the hull with the top end of the straight edge within 5 mm of the gunwale. A projection of the straight edge to the top of the gunwale must also comply with minimum beam measurement requirements of Clause 5.2.3.

5.2.5. Longitudinal Hull Profile -Minimum hull depths and the minimum profile, relative to the baseline at a maximum of 57 mm from the hull at midships, shall be in accordance with the dimensions given in Figure 1. The gunwale and keel profiles shall each maintain a smooth and continuous curve.

5.3. HULL CONSTRUCTION.

5.3.1. Construction Materials -Wherever the words 'suitable or approved timber' are mentioned they shall refer only to one of the species allowed in the Specification and shall be suitable for the particular purpose. Similarly, for GRP and foam materials the type and minimum densities/weights shall be as specified or otherwise approved by SLSA. Adhesives used shall be either Urea, Resorcinol, Melamine or Epoxy and shall be a gap filling, marine grade suitable for the particular purpose. Resins used in the GRP matrix shall be marine grade, suitable for the particular purpose and the resin to glass ratio shall be kept to a minimum. That is, for maximum strength the percentage glass content shall be kept to a maximum.

The use of resin only, without fibre reinforcement, to build up structure or to add hull weight is not permitted.

5.3.2. Fastenings and Fittings -The fastenings shall be as specified, or of marine grade composition, suitable for the particular application from the following metals: stainless steel, monel metal, silicon bronze, aluminium bronze or copper. The use of brass, steel or plated steel fasteners is not permitted, with the exception of brass in electrical circuit fastenings only. Brass or steel shall not be used for any fittings unless specifically allowed in the Specification. All fittings and fastenings shall be installed ensuring that there are no dangerous protruding, sharp edges or screw threads.

5.3.3. Foam Sandwich Hull.

5.3.3.1. Core Material -Core material shall be an approved PVC foam (presently approved products are 'Kiegecei]', 'Airex', 'Divinyceii', and 'Termanto'). The minimum density shall be 70 kg 1M3 . The minimum thickness shall be 12 mm.

5.3.3.2. Skin Material-The type of reinforcement fibres (eg. glass, aramid or carbon fibre) and resins in the laminate is optional but must be marine grade and suitable for the purpose.

5.3.3.3. Basic Layup -GRP skin laminate shall have a minimum of 600 9M1M2 cloth spread over both sides of foam core (eg, 300 gMIM2 minimum on each side of the laminate or approved variations, but maintaining the minimum 600 gMIM2 weight overall the layup shall include a minimum 225 gM/M2 mat (random strand reinforcement) between the cloth (woven fabric) and the core material. The cloth shall not be laid directly against the core material.

5.3.3.4. Alternative 1 Layup -An exception to laying mat directly against the core is an approved alternative layup with a minimum 433 gm/m2 woven roving laid directly against the core using epoxy resin. The cloth used for the other skin in this layup is 280 Kevlar cloth, 167 gMIM2 1 and this shall have a minimum 225 gm/m2 mat between the cloth and the core material.

5.3.3.5. Alternative 2 Layup -The 433 gm/m2 woven roving may be replaced by two layers of 280 kevlar or equivalent cloth. In this layup 225 9M/M2 mat shall be laid between each,layer of the 280 kevlar and also the foam core.

5.3.3.6. Multi-Layers of Cloth -Should multi-layers of woven reinforcement (cloth) be used anywhere in the construction of the hull or fittings, a layer of mat (eg.225 gm/m2) shall be placed between each layer of cloth.

5.3.3.7. Connection of Layup Skins -The inner and outer skins shall be solidly connected or joined at the gunwale by excluding the foam core or replacing it with a solid core. Also the core material shall not be continuous from gunwale to gunwale, but shall be divided at the centre line of keel with the skins fixed to, or integral with, the full internal keel in one of the following ways, or otherwise as only approved by SLSA.

- (a) (i). The foam core shall cease 50 mm from each side of centre line;
- (ii). The edge of the foam next to centre line shall be chamfered to a minimum of 12 mm;
- (iii) The inside skin shall join the outside skin at the chamfered

edge and overlap the centre line a minimum of 50 mm; (iv). The internal keel shall be bonded to the lapped skins using epoxy based adhesive or resin; OR,

- (b) (i). A timber spacer, 50 mm x12 mm section, shall be shaped and laid full length to fit outside skin along the keel line , and effectively glued using epoxy based adhesive;
- (ii). The foam core shall be laid hard up to the edge of the timber spacer and the inside skin laid over foam and the timber spacer; (iii). The internal keel shall be glued to the inside skin the space using epoxy based adhesive., OR,
- (c) (i). The internal keel shall be effectively glued to the outside skin using an epoxy based adhesive;
- (ii). The foam core shall be laid hard up to the internal keel on each side;
- (iii). The inside skin shall be laid over the foam core and internal keel in a continuous run.

5.3.4. Single Skin Glass Reinforced Plastic (GRP) Hull.

5.3.4.1. Approved Layups -Single skin GRP hull construction using an SLSA approved layup is permitted. Additional hull stiffening shall be incorporated in this layup by use of longitudinal stiffeners and approved box sections under the thwarts. The following are presently approved layups:

5.3.4.2. Layup No 1 -The reinforcement is:

Celcote Tissue
 Tridirectional Cloth 768 gm/m2 ET6788 (transverse),
 Unidirectional Cloth 768 gm/m2 ET5465 (fore & aft),
 Tridirectional Cloth 768 gm/m 2ET6788 (transverse),with, Vinylester resin used in accordance with the manufacturer's requirements.

5.3.4.3. Layup No 2 -The reinforcement is:

Tissue
 Quadraxial Stitched Roving 1240 gm/m2
 Chop Strand Mat 225 gm/m2
 Woven Roving, 3 x Twill 770 gm/m2.

5.3.4.4. Layup No 2 -The reinforcement is:

Woven Roving 200 gm/m2
 3 Layers of Triaxiai Cloth 668 gm/m2 each:
 1transverse, 2 fore & aft; with vacuum bagged, epoxy resin, heat cure cycle.

5.3.5. Timber Sandwich Hull.

5.3.5.1. Core Material -Core material shall be an SLSA approved timber (presently approved timbers are Australian Red Cedar, Coachwood, etc.) as listed in the Specification of SLSA Surf Boats-Timber Construction. The minimum thickness shall be 10 mm if solid timber is used. The planks used in a solid timber core shall be interlocking. If a combination of ply and solid timber is used the minimum thickness shall be 8 mm. If a 6 ply core is used the minimum thickness shall be 7 mm.

5.3.5.2. Skin Layup-Inside and outside skins shall both have a minimum of 280 gm/m2 cloth except that in solid timber construction a 280 gm/m2

unidirectional cloth shall be used, running from gunwale to gunwale, inside and outside of hull. The cloth shall lap and extend a minimum of 125 mm over each side of keel.

5.3.5.3. Internal Keel-An internal foam keel shall be sealed and bonded to the inside skin by a minimum of 2 layers of cloth and 2 layers of mat of similar material to skin layup. If a timber internal keel is used it shall be bonded to the timber core and/or skin using epoxy base adhesive.

5.3.6. Scantlings, Stiffening and Strengthening-All "timbers", including stringers, risers and gunwales, where used, shall be full length, straight grained, approved timber varieties. If stringers, risers and gunwales cannot be fitted in one length, the use of scarf joints shall be acceptable with a full taper of minimum ratio 12: 1. Where specifically allowed in the Specification an SLSA approved foam cored GRP construction may be used in lieu of timber.

5.3.7. Structural and Scantling Sizes -All sizes quoted for timber, other material scantlings and structural components shall be the minimum finished sizes. Extreme or unnecessary dressing, scalloping, bevelling or shaping of timbers shall not be permitted. Similar restrictions shall apply to specified sandwich construction alternatives.

5.3.8. Inner Gunwale -The inner gunwale shall be 44 mm x 22 mm Silver Ash, Mountain Ash, Yellow Wood or White Ash efficiently glued to the hull. The dimensions shall be maintained continuously for the length of the boat and shall not be bevelled or scalloped to attach fittings.

5.3.9. Outer Gunwale-The outer gunwale (gunwale mould) shall be 44 mm x 22 mm Silver Ash, Mountain Ash, Yellow Wood or White Ash screwed and glued to the hull and inner gunwale. The depth shall be maintained continuously for the total length of the boat and shall not be bevelled to attach fittings. Some shaping of the thickness is permitted forward of the splashboard. As appropriate, any end grain hull veneers or soft core material shall be sealed off, for example with a 3 mm cover board or a solid core material (see Clause 5.3.3.7.). The gunwale unit shall not be weakened in the fitting of rowlock bosses, etc.

5.3.10. Gunwale Strengthening-inner gunwales shall be strengthened, underneath or adjacent to rowlock fittings, with 44 mm x 19 mm timber of the same species as inner gunwale and shall extend full length between adjacent thwart knees; they may be tapered from the rowlock fitting to the knees or to a minimum of 300 mm if the knees are not fitted. Alternatively, equivalent strengthening at the bow and stroke rowlocks may be fitted only on the outside of outer gunwale and may be incorporated in outrigger construction. ~

5.3.11. Foam Sandwich Gunwales-Alternatively, the gunwales may be of an approved foam sandwich construction but maintaining the dimensions and profile, and excluding any bevelling or shaping, as per timber gunwales. The following are presently approved layups:

5.3.11.1. Construction No 1-The inner and outer gunwale shall each be a minimum of 44 mm x 20 mm approved foam with a minimum density of 130 kg /m³ . The GRP skin layup shall be a minimum of:

3 layers of 338 kg/m² glass cloth or unidirectional rovings, carbon fibre or Kevlar, with FGI 22353 epoxy resin.

5.3.11.2. Construction No 2-The total gunwale is 44 mm depth x 50 mm width approved foam with a minimum density of 130 kgIM³ . The GRP skin layup is:

2 layers of 668 k g1M2 Triaxial cloth, with epoxy resin.

5.3.11.3. Construction No 3- The inner and outer gunwales are each 55 mm depth x 25 mm width approved foam with a minimum density of 130 kg/m³. The GRP skin layup is:

Unidirectional Roving 500gm/m² (fore & aft)

2 layers Woven Roving 330gm/m² each

5.3.12. Stringers and Seat Risers-Stringers and seat risers, when used shall be 32 mm x 19 mm approved timber (extending from stem to stern) glued to contacting surfaces. Timbers approved are: Silver Ash, Yellowwood, Spruce, Oregon, Alpine Ash, Coachwood, Celery-Top Pine, Hoop Pine, Huon Pine, Myrtle Beech, Queensland Maple, select Spotted Gum A foam core with GRP skin of the same layup as the hull may be used in lieu of timber in stringers and seat risers.

5.3.13. Stringers in Single Skin GRP Hulls-Hulls of solid GRP construction shall have a minimum of two full length stringers (stiffeners). If a buoyancy insert or tanking is used, its construction may be incorporated with the hull stringers which shall maintain continuity end to end.

5.3.14. Internal Keel-A full length internal keel shall be fitted using Oregon, Spruce, Celery-Top Pine or Huon Pine and the unshaped size shall be 98 mm x 31 mm; if Silver Ash, Mountain Ash, Alpine Ash or White Ash the unshaped size shall be 76 mm x 31 mm; or if a foam box section is used the unshaped core size shall be 98 mm x 36 mm. An alternate approved construction is, when using full length buoyancy tank inserts, the longitudinal bulkhead verticals are considered to replace the role of the box section internal keel, providing: (a), the verticals are fully glassed and within 180 mm of the centre line; (b), a minimum of 75 mm of each side of each vertical is additionally glassed with of 300 gMIM2 cloth each side and adequately glassed to the hull; (c), the cloth component in the normal hull skin layup between the verticals is increased by a minimum of 40%; and (d), the lapped hull layup must be adequate to support the external false keel and connections,

5.3.15. External False Keel-A full length external keel shall be glued and/or screwed to the internal keel over the lapped hull layup using 38 mm x 19 mm Silver Ash, Yellowwood or Alpine Ash. The false keel may be shaped from 38 mm down to 19 mm at the keel rubbing band and the depth may be evenly tapered from 19 mm to 6 mm over the rear 1.8 m.

5.3.16. Deep False Keel-Variations to the above configuration may be permitted if they comply with the following guidelines. The false keel shall be:

- (a) of minimum length 2 m;
 - (b) placed, as a minimum, between No 2 thwart and the quarter bar;
 - (c) of maximum depth 75 mm;
 - (d) of minimum total side area 0.10 m² (100,000 mm²), ie, over a basic 75 mm x 2.67 m triangular shape;
 - (e) suitably tapered at each end; and,
 - (f) fitted with an approved rubbing band extending as a minimum from the bow to the stern end of the false keel. The rubbing band is optional from the stern end of the false keel to the stern.
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5.3.17. Stem-The stem shall be reinforced internally with either:

- (a) a suitable timber insert shaped from 25 mm x 36 mm section effectively glued to inside of hull;
- OR,

- (b) a minimum of two layers of 15 mm foam interleaved with two layers of cloth similar to hull layup and extending a minimum of 200 mm either side; OR,
- (c) the GRP hull layup overlapping at least 200 mm either side.

5.3.18. Thwarts-Thwarts shall be fitted using 178 mm x 22 mm approved timber, suitably glued and/or screwed or fibreglassed at the seat risers or support blocks. Alternatively, they shall be 178 mm x 20 mm approved foam and sheathed with same layup as the hull.

5.3.19. Thwart Stanchions-The thwarts shall have stanchions which shall be:

- (a) of approved timber insert of 125 mm x 22 mm section effectively glued, and or screwed and fastened with shoulder moulds to thwarts and keel to function as both a tie down and support to the thwart. The stanchions may be shaped, provided a minimum of 75% of its original cross-sectional shape is retained; OR,
- (b) of approved foam material with the same layup as hull and effectively glassed to thwarts and keel. The foam stanchion may be constructed as part of a sealed box designed to support the thwart; OR,
- (c) alternatively, if the stanchions above are not used the thwarts shall be constructed as an inverted U and be of same thickness and construction as the thwart, with the depth of the downward flanges to be a minimum of 200 mm where the flange contacts the inner hull (see Figure 2).

5.3.20. Thwart Knees-Thwarts shall be fitted with knees by one of the following methods:

- (a) each thwart shall have four timber knees, blocked and glued to the hull, with three fastenings to the thwart and one through the gunwale. The knees shall be of grown Tea-tree, plywood or steamed laminates and of 22 mm minimum thickness. Copper fastenings (boat nail and roovelburr) through the gunwale may be replaced with 10 gauge screws of approved material, which shall penetrate the outer gunwale a minimum of 10 mm; OR,
- (b) each thwart shall have central single knees at each end of all thwarts of the above timber or similar sandwich construction as the hull and shall extend from the thwart to a minimum of the mid height of the inner gunwale. The knees shall be adequately glassed to the inner gunwale, inside hull and the thwart with additional reinforcement extending the full width of the thwarts; OR,
- (c) each thwart shall have a sandwich foam stiffener of the same width as the thwart at each end. The stiffener shall be of the same thickness as the hull and extend from the thwart to a minimum of the mid height of the inner gunwale, and shall be adequately glassed to the inner gunwale, inside hull and the thwart (see Figure 3).

5.3.21. Extra Thwart-An extra thwarts shall be fitted between the quarter bar and the stroke thwart by one of the following methods:

- (a) of 75 mm x 19 mm approved timber, strengthened on underside by 38 mm x 19 mm timber on edge and tapering to the hull or by a 62 mm x 19 mm stanchion, and shall be fastened to hull with 2 knees similar to thwart knees; OR,
- (b) of 62 mm x 20 mm approved foam and strengthened on underside with 62 mm x 20 mm approved foam on edge, both with same layup as the outer hull; OR,

- (c) an approved sealed chamber shaped to the hull may be used with approved knees fastened to the hull as in 5.3.20.

5.3.22. Buoyancy Tank Insert-A suitable buoyancy tank insert may be moulded and/or fitted inside the hull, also contributing to hull strength, and may incorporate part of the function of the thwarts and stanchions. The following modifications may then be incorporated: ~

5.3.22.1. Buoyancy Tank Insert Knees-in sandwich construction only, the "thwart" knees/stiffeners may be deleted if complying with all of the following conditions:

- (a) a suitable buoyancy tank insert is fitted to the inside hull;
- (b) the insert runs continuously the length of the hull and contributes to boat strength;
- (c) the full thickness sandwich construction hull runs through and between the inner and outer gunwales; and,
- (d) there is suitable reinforcement doubling at the insert/ hull interface at the normal thwart riser height and running the full length.
- (e) Note that knees/stiffeners are still required in all other types of construction.

5.3.22.2. Insert Tank Thwarts-In boats fitted with full length buoyancy tank inserts, a minimum of three thwarts including the bow shall be fitted. The thwarts shall be of the above specified size and shall be incorporated into insert so that full strength is maintained across the boat, gunwale to gunwale.

5.3.23. Hull Decking-The decking shall be moulded and securely screwed/glued to, and supported by, the gunwales and at least two deck beams of 75 mm x 22 mm timber or equivalent GRP/ foam sandwich which shall be securely connected to the gunwales. The decking shall be constructed by one of the following methods:

- (a) 6 mm minimum core GRP foam sandwich; OR,
- (b) 5 mm ply covered with 3 mm timber veneer; OR,
- (c) 2 x 3 mm moulded timber veneers to finish not less than 6 mm thickness; OR,
- (d) solid GRP of same layup and thickness as the hull.

5.3.24. Bulkheads-Bulkheads shall 6 mm ply or foam sandwich panels, or solid GRP of same layup and thickness as the hull, and shall be efficiently back framed to withstand surge of water in the boat. Approved sealed bulkheads may be incorporated into the design of the buoyancy tank insert and form part of the buoyancy provisions.

5.3.25. Buoyancy-As a safety provision the boat shall remain buoyant in the damaged condition and or with inspection hatches missing or open. Buoyancy shall be provided as follows:

5.3.25.1. Buoyancy-Sandwich Hull Construction-Two units, each of minimum 0.085 M3 of polystyrene foam, or similar material, securely fastened as low as possible behind fore and aft bulkheads. Alternatively, the bulkheads shall be sealed in an approved manner, which if not fully sealed and maintained shall be considered unseaworthy.

5.3.25.2. Buoyancy-Solid GRP Hull Construction-Two units to a total minimum of 0.4 m³ of polystyrene foam, or similar material, evenly distributed fore and aft to ensure the boat will float when damaged and full of water. The additional foam shall be used unless demonstrated that sufficient buoyancy exists.

5.3.26. Coaming-A coaming shall be provided aft of the forward decking using 10 mm timber, moulded or laminated in one piece, to stand 75 mm above decking at the centre, or in two pieces fixed to three knees. Alternatively, the coaming may be made of GRP or foam sandwich of same layup and thickness as the hull. ~

5.3.27. Tuck-The tuck stern shall be of same materials used in hull skin and shall be additionally reinforced with a minimum 12 mm timber or foam backing or core. Timber may be used as the core material for a sandwich tuck, or as backing for an effectively reinforced solid GRP tuck

5.3.28. Quarter Knees to Tuck-Two quarter knees shall be fitted using 22 mm sided Tea-tree or laminated or moulded plywood. Alternatively, an approved GRP lamination, may be used.

5.3.29. Breast Hooks-Breast hooks knees shall be fitted using 22 mm sided Teatree, laminated or moulded plywood, suitable timber or approved GRP or foam sandwich construction moulded to shape of hull.

5.3.30. Sweep Outrigger-The sweep outrigger shall be a minimum 150 mm x 50 mm Silver Ash, Mountain Ash, Yellowwood, or Blue Gum securely fixed and glued to deck beams and fastened to the tuck with a 38 mm sided knee or metal bracket. Alternatively, the sweep outrigger may be constructed with 150 mm x 60 mm approved foam, with a minimum density of 130 kg m³, sheathed with a minimum of three layers of 300 gm/m² cloth using epoxy resin and glued or glassed to the tuck and deck structure. The outrigger may be tapered down from the tuck to the aft bulkhead.

5.3.31. Quarter Bar-The quarter bar shall be shaped from a suitable timber minimum 63 mm x 25 mm and bolted to the gunwale with maximum 6 mm stainless steel bolts; or, glued using epoxy based adhesive and fastened each end with two 75 mm x 10 gauge stainless, monel metal or silicon bronze screws. . Alternatively, the quarter bar may be constructed with 60 mm x 60 mm approved foam, sheathed with a minimum of three layers of 300 gMIM² using epoxy resin and or glassed to gunwales

5.3.32. Foot-stretchers-Foot-stretchers shall be a minimum of 10 mm marine ply laminate; or, 20 mm approved foam, sheathed with a minimum of three layers of 300 gm/m² using epoxy resin; or, approved equivalent GRP construction. These alternatives may be incorporated into the buoyancy tank insert.

5.3.33. Keel Band-The keel band shall be 19 mm x 3 mm brass, marine grade stainless steel or approved non-ferrous or synthetic material. Note, this item needs regular inspection to ensure there are no damaged or sharp edges.

5.3.34. Rowlock Fittings.

5.3.34.1. Metal Rowlock Fittings-The four rowlock fittings shall be fabricated from marine grade stainless steel or monel metal; or cast from marine grade phosphor bronze or similar. The fittings shall fit over the top of the gunwale or approved outrigger gunwale construction and designed so that rowlocks and oars are in the correct position for rowing. All sharp edges shall be eliminated and corners to top and bottom plates shall have a minimum 10 mm radius. Fastening shall be kept to a minimum to avoid weakening of the gunwale. Fabricated fittings shall include a full tubular section for housing the rowlock shaft and the inside of this shank tube shall not extend more than 10 mm from a longitudinal line parallel to the widest line of the outer gunwale. Any rowlock fitting may be outriggered to a maximum of this widest line and is called an "outrigger rowlock fitting".

5.3.34.2. Moulded GRP Rowlock Fittings-The rowlock fittings may be incorporated into GRP gunwale construction. The dimensions and restrictions shall be as for the metal fittings. The cloth layup of the approved GRP gunwale shall be increased a minimum of 200% at the fitting, and a suitable synthetic or metal shank tube incorporated into the construction. Note: this fitting may not be as strong as the metal type.

5.3.35. Outrigger Rowlock Fittings-An outrigger rowlock fitting is defined as one where the inside of the shank tube is more than 10 mm from the normal outside line of the top edge of the outer gunwale. Outrigged fittings must be additionally protected for safety by a method approved by the Hon. National Surf Boat Officer. Approved methods are as follows.

(a) Cover Plates. The top and bottom plates of the rowlock fittings shall be fully enclosed with an approved metal cover ensuring that there are no protruding or sharp edges and the fitting shall have a minimum taper of 1:1, fore and aft (see Figure 4). This enclosed fitting only, may also be used in combination with the outer gunwale outrigged with the approved timber or GRP foam sandwich and which shall extend fore and aft with a minimum taper of 1: 1.

(b) Protective Wedges. Other types outrigger fittings, if not fully enclosed and/or not tapered correctly, shall be protected, fore and aft, by timber wedges of species approved for gunwales. The wedges shall have a minimum taper of 3: 1, and shall extend from the outer gunwale to the inside edge of the shank tube as a minimum, or to the outside edge of the fitting as a maximum. The depth of the wedges shall taper from the full fitting depth, at the fitting, down to the full depth of the gunwale, at the gunwale. The wedges shall be suitably rounded, adequately glued and screwed to the gunwale gaps minimised in the fitting and not exceeding 10 mm (see Figure 5).

5.3.36. Rowlocks-The rowlocks shall have sufficient spring to allow the oars to be released should they become fouled under the boat. The rowlocks shall also be designed so the oars will slip out when pulled inboard past the leather or synthetic sleeve. The rowlock shank shall not be greater than 16 mm diameter, shall not protrude more than 50 mm below the rowlock fitting and shall have a hole at the heel for a rowlock retaining pin. The retaining pin shall be manufactured from stainless steel or monel metal and be ring shaped without sharp or protruding ends to prevent injury.

5.3.37. Sweep Rowlock-The rowlock shall be manufactured from stainless steel, monel metal or galvanised steel, may be rounded or goose-necked and bolted through the sweep outrigger rowlock fitting of similar material for rowlock fitting. Nyloc type nuts or a nut with a ring shaped pin shall be used to prevent release and injury.

5.3.38. Bungs-Drain holes in the hull and/or stern shall have the bungs attached to the boat by nylon cord or non-ferrous chain and screw fittings.

5.3.39. Oars-There is no specific Specification for surf boat oars. However, for safety the blade shall have a minimum 6 mm thickness with no sharp corners at the edges.

5.3.40. Rescue Tube-An SLSA approved rescue tube shall be fixed to topside of the bow thwart decking or tank top by velcro straps (for quick release).

5.3.41. Optional Equipment-Additional equipment may be fitted or carried on the boat and includes pumps, additional GRP seats, SLSA approved sliding seats,

approved signal plate, signal flags, stainless steel boat or raft knife, and buckets. Specific requirements are as follows.

5.3.41.1. Pumps-A maximum of two manual or battery operated pumps of unrestricted capacity may be fitted ensuring that associated piping and fixtures can not cause injury.

5.3.41.2. Batteries-The batteries used shall be restricted to the fully sealed type and shall be securely attached to the boat in a battery housing of suitable shape and material. The battery housing does not need to be fully enclosed or waterproof; but if the battery is contained in a box breathing holes shall be provided to dissipate any dangerous gases. Care should be taken when charging the sealed batteries which should be done out of the boat and only using chargers suitable for this type of battery. **NOTE: ORDINARY CAR BATTERIES SHALL NOT BE USED.** Associated switching and wiring fitted for pumps and batteries shall have no sharp or protruding parts, edges, screws, etc, by design and location which could cause injury.

5.3.41.3. GRP Seats-Additional GRP seats may be used, suitably fastened to thwarts or buoyancy tank inserts, and ensuring that there are no gaps or sharp corners, etc, that can cause injury.

5.3.41.4. Sliding seats-Only sliding seats approved by SLSA may be used in normal SLSA competition. Special events, etc, may specifically allow other types. Currently the only SLSA approved sliding seat is the Ferrett (South Australia) design and manufacture.

This is a copy of the Technical Specifications and that can change with out notice so use it as a guide only and contact National Council Surf Craft officer for an up to date specifications before handing to a builder or changing any thing on a SLSA boat.