INTERNATIONAL
TEN RATER
CLASS RULES

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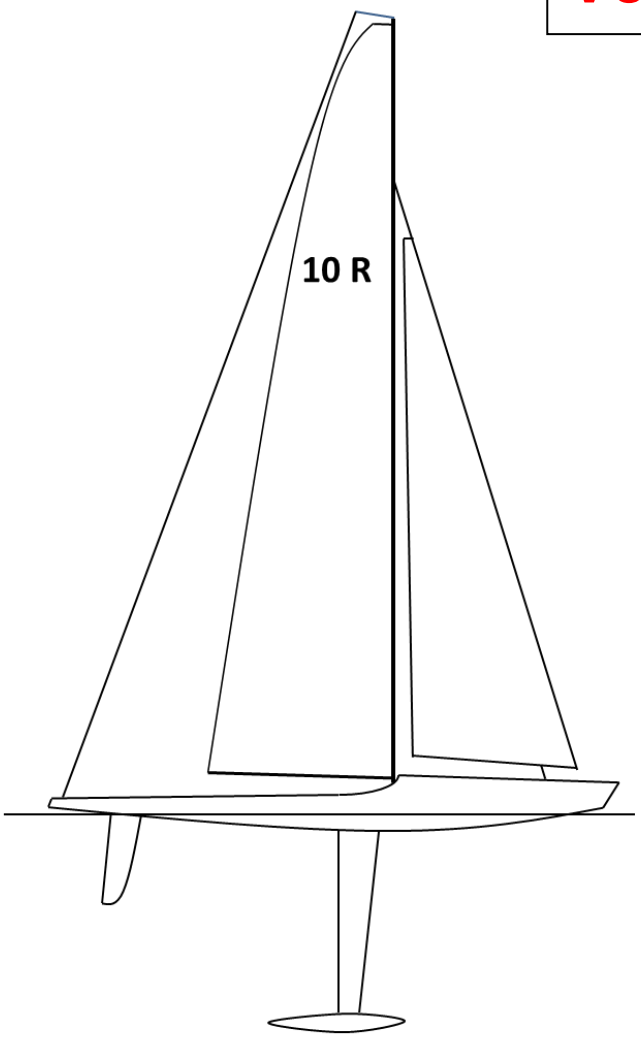


The Ten Rater rule is a direct descendant of the Length and Sail Area rule of 1887.
It has been used for models since the 1890s.

INDEX

Introduction

This introduction only provides an informal background and the International Ten Rater Class Rules proper begin on the next page.

Certification and alterations
*Ten Rater Class **hulls**, **hull appendages**, **rigs** and **sails** are **certified** by **certification measurement**.*

*Ten Rater Class **hulls**, **hull appendages**, **rigs** and **sails** may, after initial **certification measurement**, only be altered to the extent permitted in Section C of the class rules.*

Responsibility
Owners and crews should be aware that compliance with rules in Section C is NOT checked as part of the initial certification measurement process.

*It is the responsibility of the owner and any other person in charge to ensure that a boat is maintained to comply with her class rules and that her **certificate** remains valid (RRS 78.1).*

Deviations outside of tolerances
*When an **equipment inspector** or **official measurer** for an event decides that a **boat** does not comply the class rules RRS 78.3 obliges him to make a report in writing to the Race Committee. When a Race Committee receives such a report they are obliged to protest the boat (RRS 60.2).*

When the protest committee finds that deviations in excess of tolerances specified in the class rules are not caused by normal wear and tear and/or do improve the performance of the boat, it shall penalise her.

When deviations between a boat's measurements and her certificate cannot be corrected as required by RRS 64.3 (a), the protest committee may consider accepting that the boat shall be brought into rating in another configuration before racing again.

If the protest committee decides that a class rule has deliberately or knowingly been breached by an owner, competitor, or crew they may call a hearing under rule 69.

Class rules
Rules regulating the use of equipment during a race are contained in Section C of these class rules, in ERS Part I and in the Racing Rules of Sailing.

*The **class rules** for the International Ten Rater Class are **open class rules** in which anything not specifically prohibited by the **class rules** is permitted, where individual rules require, permit, or prohibit as necessary.*

PART I – ADMINISTRATION

Generic Part 1 rules are being prepared.

Part II – Requirements and Limitations

The **crew** and the **boat** shall comply with the rules in Part II when *racing*. **Certification** to check conformity with rules of Section C is not part of **certification measurement**.

The rules in Part II are **open class rules**. **Certification** shall be carried out in accordance with the ERS except where varied in this Part.

Section C – Conditions for Racing

C.1 GENERAL

C.1.1 RULES

The rules of Section B of the ERS shall not apply.

C.2 CREW

C.2.1 LIMITATIONS

(a) The **crew** shall consist of one person.

(b) The **crew** shall not be substituted during an event.

C.3 ADVERTISING

C.3.1 LIMITATIONS

The **boat** shall display only such advertising as permitted by the ISAF Advertising Code.

C.4 BOAT

C.4.1 FLOTATION

With the **boat** floating in fresh water, with slack rigging, in sailing condition and dry:

(a) the forward waterline ending shall not fall forward of the aft edge of the forward waterline **limit mark**,

(b) the aft waterline ending shall not fall aft of the forward edge of the aft waterline **limit mark**,

(c) submerged parts of the **hull** shall not extend beyond the inboard edges of the waterline **limit marks**.

C.4.2 DRAUGHT

The draught, measured to the datum waterplane as defined in D.2.2(b), shall not exceed 700 mm.

C.4.3 WEIGHT

When carrying out **equipment inspection** the weight of the **boat** in sailing condition, dry and with its heaviest **rig** shall be found using calibrated equipment and rounded to the nearest 0.01 kg. The weight shall be not more than the weight recorded on the **certificate** plus a tolerance of 0.05 kg.

C.5 HULL

C.5.1 LIMITATIONS

The geometry of the **hull** shall not be changed during an event.

C.5.2 IDENTIFICATION

The **hull** registration number shall be displayed on the external surface of the **hull** clearly and legibly with a minimum height of 20 mm.

C.6 HULL APPENDAGES

C.6.1 LIMITATIONS

The same **hull appendages** shall be used during an event when a **hull appendage** has been lost or damaged beyond repair. Such replacement may be made only with the approval of the race committee who shall then remove or cancel any **event limitation mark** attached to the replaced **hull appendage**.

C.6.2 USE

(a) The **hull appendages** shall not be attached to the **hull** more than 15 mm from the centreplane.

(b) No part of any **hull appendage** shall cut the datum waterplane as defined in D.2.2(b).

(c) The **hull appendages** shall not be extendable or retractable.

C.7 RIG

C.7.1 LIMITATIONS

(a) Where the measured rig area recorded on the **certificate** is less than or equal to 10% of the maximum permitted sail area, the measured area of **spars** found as in I shall be less than or equal to that area recorded on the **certificate**.

(b) Where the measured rig area recorded on the **certificate** is greater than 10% of the maximum permitted sail area, the cross widths of other **spars** found as in I shall comply with the **certificate**.

C.7.2 USE

The **rig** shall not project fore or aft of the **hull** in relation to the datum waterplane as defined in D.2.2(b).

C.8 SAILS

C.8.1 LIMITATIONS

(a) The dimensions of **sails** shall not exceed the dimensions of the **sails** recorded on the **certificate**.

(b) When carrying out **equipment inspection sails** shall be measured as in J except that the **sail** may be moved vertically on the grid to achieve compliance.

(c) The minimum **luff** length of the largest **sail** of the certified rig shall not exceed 2400 mm and shall not be less than 1990 mm.

(d) The minimum **luff** length of the largest **sail** of alternative rigs used when *racing* shall not be less than 990 mm.

(e) For **sails** other than **soft sails**, the dimensions given by C.8.1. (c) and (d) apply to the distance from deck level to top point.

(f) **Sails** shall not be reefed.

(g) When a **sail** has been lost or damaged beyond repair it may be replaced only with the approval of the race committee who shall then remove or cancel any **event limitation mark** attached to a replaced **sail**.

C.8.2 IDENTIFICATION

(a) **Sail** identification shall comply with the RRS.

(b) The class insignia shall be “10R” of dimensions: height 24–30 mm; width, except “1”, 24–30 mm; thickness 5–8 mm and shall be displayed on the mainsail above a straight line between the **three-quarter leech point** and the nearest point on the **luff**.

C.8.3 USE

When a **sail** has a bolt rope or **spar** sliders they shall be set in a **spar** track.

C.9 EQUIPMENT

C.9.1 PROHIBITED

(a) Automated control of rig and sails.

(b) Automated steering.

(c) On board cameras.

(d) The use of pictures from any source while racing.

C.9.2 USE

(a) Except for the establishment and maintenance of a radio control link, control unit positioning information, signal strength, and battery status information, no radio transmissions from the **boat** shall be used.

(b) Remote control and related equipment, if temporarily removed and/or replaced:

(1) shall be refitted in the same position.

(2) shall be replaced by equipment of similar weight.

Section D – Hull

D.1 GENERAL

D.1.1 RULES

The **hull** shall either comply with the **class rules** in force at the time of its initial **certification measurement** or comply with the current **class rules**.

D.1.2 CERTIFICATION

See rule A.11.

D.1.3 IDENTIFICATION

The **hull** registration number shall be marked in an easily visible location on a non-removable part of the **hull** by any of the following means: painting on, engraving in, bonding in, moulding in.

D.2 HULL

D.2.1 LIMIT MARKS

(a) A forward and an aft waterline **limit mark** shall be placed on the outer surface of the **hull** across the centreplane, minimum size 30 mm long by 2 mm wide, and long enough to be easily visible with the boat afloat.

D.2.2 DEFINITIONS

(a) **Measured Waterline Length**

The measured waterline length shall be taken as the distance between points formed by the intersection of the centreplane and the inboard edges of the waterline **limit marks.**

(b) **Datum Waterplane**

The datum waterplane shall be taken as the horizontal plane through points formed by the intersection of the centreplane and the inboard edges of the waterline **limit marks.**

D.2.3 MATERIALS

(a) Except in remote control equipment, the density of material shall not exceed that of lead (11,340 kg/m3).

(b) The forward 15 mm shall be of elastomeric material. From the foremost point of the **hull** to the point where the bow profile is 20 degrees to the datum waterplane, the vertical thickness of elastomeric material shall not be less than 5 mm.

D.2.4 CONSTRUCTION

(a) The **hull** shall be a **monohul**l.

(b) With the following exceptions, hollows in the external surface of the **hull** are prohibited:

(1) 40 mm or more above the datum waterplane.

(2) 15 mm or less from the centreplane.

(3) Trunking for **hull appendages**.

(4) Inset transom and upper surface of deck.

(5) Hollows which do not exceed 1 mm in depth when checked with a straight edge of length 300 mm.

Section E – Hull Appendages

E.1 GENERAL

E.1.1 RULES

Hull appendages shall comply with the current **class rules**.

E.2 HULL APPENDAGES

E.2.1 MATERIALS

Materials shall not be of density higher than lead (11,340 kg/m^3).

Section F – Rig

F.1 GENERAL

F.1.1 RULES

Rigs shall comply with the current **class rules**.

F.2 MEASURED RIG AREA

See Section I.

Section G – Sails

G.1 GENERAL

G.1.1 RULES

Sails shall comply with the **class rules** in force at the time of their initial **certification measurement**.

G.1.2 CERTIFICATION

The **official measurer** shall

(a) **certify sails** at the **tack**,

(b) mark **sails** with the date of **certification measurement**,

(c) mark the **tacks** of the largest sails used together with their measured area,

(d) mark the **tacks** of alternative **sails** with the area of their parent **sail**.

G.2 MEASURED SAIL AREA

See Section J.

PART III – APPENDICES

The rules in Part III are **open class rules**. Measurement shall be carried out in accordance with the ERS except where varied in this part.

Section H – Rating and Weight

H.1 RATING FORMULA

Rating = L x S x 8

where L is the measured waterline length as defined in D.2.2(a).
S is the sum of the measured rig area given in I.2 and the measured sail area given in J.2.

H.2 RATING

The **boat** shall have a rating no greater than 10.00 calculated as in H.1.

H.3 WEIGHT

The weight of the **boat** in sailing condition, dry and with its heaviest **rig** shall be found using calibrated equipment, rounded to the nearest 0.01 kg and recorded on the **certification measurement** forms.

Section I – Rig Area

I.1 GENERAL

(a) One **boom** with a maximum **boom spar cross section** not exceeding 22 mm may be used to extend the **tack** and/or **clew** of each **sail** without being included in the measured rig area.

(b) Fittings not faired into a **spar** and no bigger than is reasonably required for their purpose shall not be included in the measured rig area.

(c) Fittings faired into a **spar** or bigger than reasonably required for their purpose shall be considered to be part of the **spar**.

I.2 MEASURED RIG AREA

The measured rig area is the sum of the area of the components of the largest **rig** excluding

(a) **spars** as in I.1 (a),

(b) fittings as in I.1 (b) and (c),

(c) **rigging** with a maximum cross section of less than 2 mm,

where

(d) the area of each component shall be found as in I.3 or I.4,

unless the measured rig area exceeds 10% of the maximum permitted sail area when

(e) the area of each component shall be found as in J.4

I.3 CONSTANT AND EVENLY TAPERED PROFILES

I.3.1 CALCULATION

The area of the **spar**, Am, is calculated as:

$Am = h \times (m_0 + m_n) / 2$

where: h is the length of the **spar** above deck,

m_0 is the **fore-and-aft mast spar cross section** or **vertical boom spar cross section** at one end,

m_n is the **fore-and-aft mast spar cross section** or **vertical boom spar cross section** at the other end.

I.4 OTHER PROFILES

I.4.1 MEASUREMENT

(a) **Mast spars** shall be placed over the measurement grid perpendicular to the grid lines and with a grid line at deck level. See figure K.1.1.

(b) Other **spars** shall be placed over the measurement grid perpendicular to the grid lines and with a grid line at one end. See figure K.1.2.

(c) The **fore-and-aft mast spar cross sections** or **vertical boom spar cross sections**, m_0 to m_n, shall be measured at and along all the grid lines that the **spar** cuts.

I.4.2 CALCULATION

(a) The area of **spar** above the uppermost gridline cutting the **spar**, At, is calculated as:

$At = 0.7 \times m_n \times E$

where E is the height of the **spar** above the uppermost grid line.

(b) The area of the **spar**, Am, is calculated as:

$Am = 100 (m_0 + m_n) + 200 (m_1 + m_2 + \ldots m_{n-1}) + At$

Section J – Sail Area

J.1 GENERAL

(a) During measurement:

(1) battens need not be removed,

(2) **sails** may be attached to **spars**,

(3) stays not exceeding 2 mm in diameter and inside luff **tabling** need not be removed.

(4) tell tales shall be ignored for measurement purposes

(b) Parts of **stiffening** which are less than 2 mm in diameter and not covered by sail material shall not be taken as parts of the **sail**.

(c) Where a **sail** has a bolt rope the cross widths shall be taken to the aft edge of the **spar**.

(d) Discontinuous attachments on the **luff** shall be disregarded for the purpose of measurement provided that their total length, measured along the **luff**, does not exceed 10% of the **luff** length and that the longest attachment is no more than twice the shortest.

J.2 MEASURED SAIL AREA

The measured sail area is the sum of the area of the largest **sails** used together.

J.3 SOFT SAILS

J.3.1 GENERAL

This method shall be used for **soft sails** with the exception of **double luff** sails.

J.3.2 MEASUREMENT

(a) Where the **sail** has no clearly defined **head point**, **tack point** and/or **clew point**, permanently marked point(s) on the sail shall be used instead.

(b) The **sail** shall be placed over the measurement grid with the **clew point** on a grid line and with the **head point** and **tack point** on a line perpendicular to the grid lines. See figure K.2.1.

(c) If the **tack point** falls above the grid line on which the **clew point** is placed, the **sail** shall be moved vertically until the **tack point** is on a grid line. See Figure K.2.2.

(d) The upper limit of area A1 shall be marked at the **luff** and **leech** where they pass over the grid line. See figure K.2.3.

(e) Cross widths, c_m to c_n, shall be measured from the **leech** to the **luff** and from the **foot** to the **luff**, or the **leech** to the **foot**, at and along all the grid lines which the sail cuts. See Figure K.2.3.

(f) Hollows in the **sail edges** shall be bridged by a straight line and cross widths shall be taken to the bridging line. See Figure K.2.4.

J.3.3 CALCULATION

(a) The major area, A1, is calculated as:

$A1 = 100 (c_0 + c_n) + 200 (c_1 + c_2 + \ldots c_{n-1})$

(b) The head area, A2, is found from c_n, c_{n-1} and E using a calculation contained in the measurement form where E is the height of the sail above the uppermost grid line. See Figure K.5

(c) The area below the **luff perpendicular** and above the lowest grid line, A3, is calculated as:

$A3 = 10 (c_0 + c_m) + 20 (c_{-0.2} + c_{-0.4} + \ldots c_m)$

(d) The area below the lowest grid line, A4, is calculated as:

$A4 = c_m \times F$

(e) The sum of the areas, As, is calculated as:

$As = A1 + A2 + A3 + A4$

J.4 OTHER SAILS

J.4.1 GENERAL

(a) This method shall be used for :

(1) **sails** other than **soft sails**,

(2) **double luff** sail / **spar** combinations,

(3) **rig** components where their combined area found using I.2 exceeds 10% of the maximum permitted sail area.

(b) Small areas of supporting **spar** not enclosed by a **sail**, and end plates, shall be measured using Sections I and J if appropriate. Where the methods in Sections I and J are not appropriate, any suitable method may be used and the measurements and calculations shall be reported on the measurement form.

(c) Each element of a group of elements, including those which retract into a parent, shall be measured as a separate item as in J.4.2. See figure K.3.1.

J.4.2 MEASUREMENT

(a) Where the element has no clearly defined **head point**, **tack point** and/or **clew point**, permanently marked point(s) on the element shall be used instead. See figure K.3.2.

(b) The element shall be placed over the measurement grid with the **clew point** on a grid line and with the **head point** and **tack point** on a line perpendicular to the grid lines. See figure K.3.2.

(c) If the **tack point** falls above the grid line on which the **clew point** is placed the element shall be moved vertically until the **tack point** is on a grid line. See Figure K.2.2.

(d) The **luff** and the **leech** shall be marked where they pass over the grid line. See figure K.3.3.

(e) Skin girths, g_0 to g_n , shall be measured from the **leech** to the **luff** and from the **foot** to the **luff**, or the **leech** to the **foot**, at and along all the gridlines which the sail cuts. See figure K.3.3.

(f) The skin girth at each grid line shall be taken as the distance from the **leech** or **foot**, round the surface of the element through the corresponding point on the **luff** or **foot**, back to the same point. Any flaps shall be placed to give the greatest girth. See figure K.3.4.

(g) The half girth, c_n, at a grid line is one half of the skin girth, g_n, at that grid line.

(h) Hollows in the element edges shall be bridged by a straight line and skin girths shall be taken to the bridging line. See Figure K.2.4.

J.4.3 CALCULATION

The area of the element, As, is calculated as in Section J.3.3.

Section H – Figures

K.1 SPAR MEASUREMENT

K.1.1 , K.1.2 , K.1.3

K.2 SOFT SAIL MEASUREMENTS

K.2.1. , K.2.2

K.2 SOFT SAIL MEASUREMENTS

K.2.3. , K.2.4

K.3 OTHER SAILS

K.3.1.

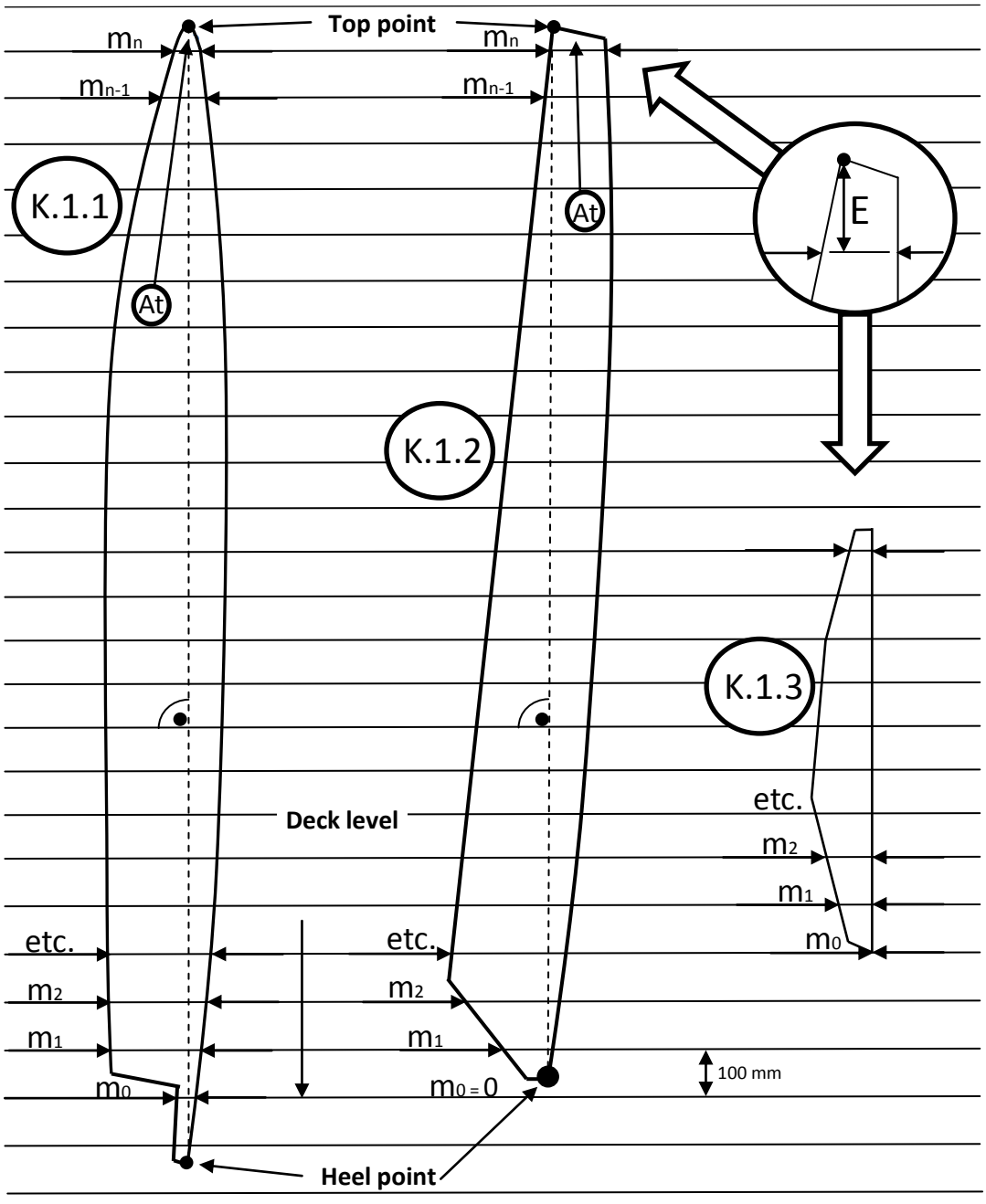
K.3 OTHER SAILS

K.3.2. , K.3.3

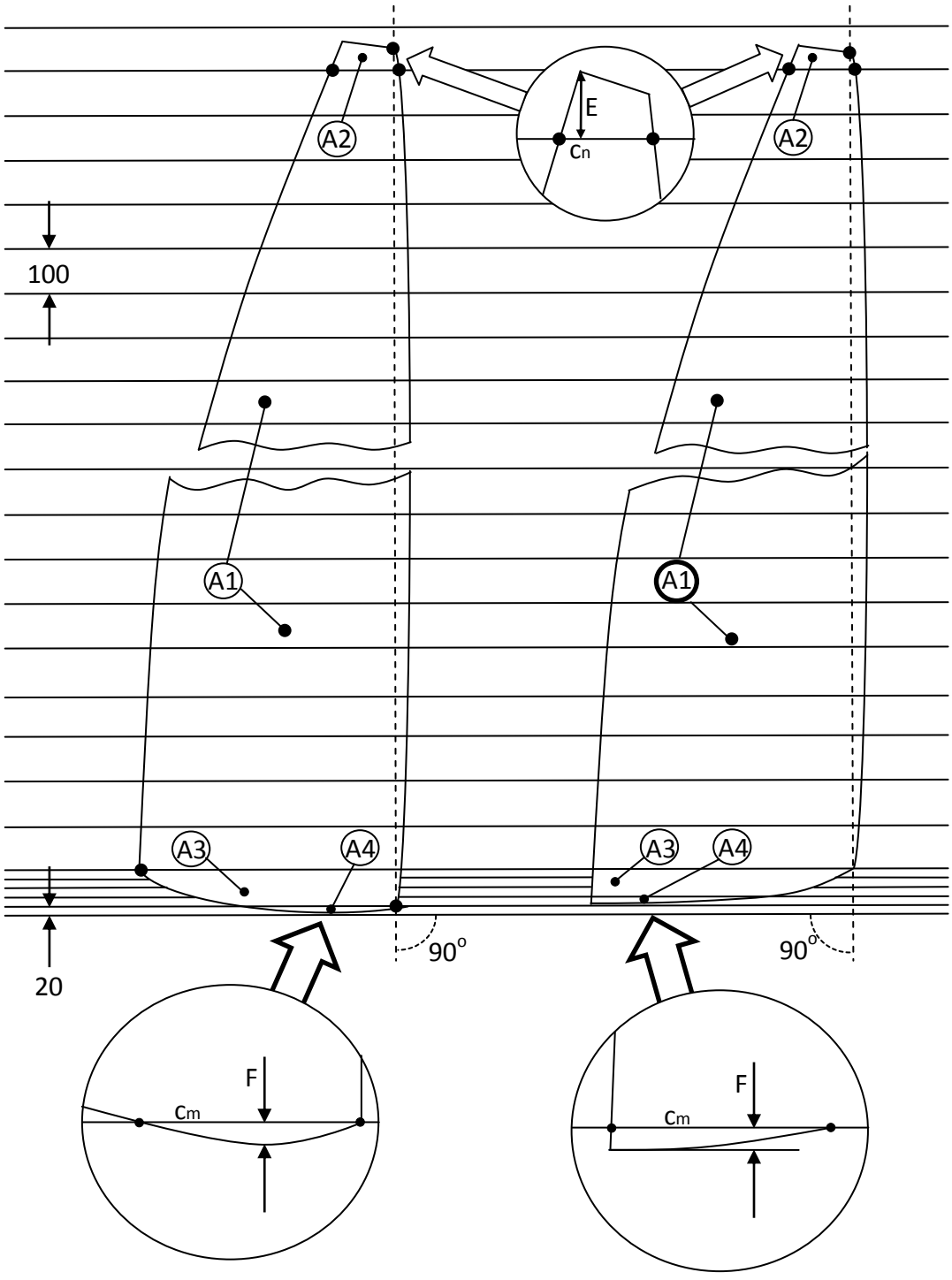
K.4 WATERLINE LENGTH MEASUREMENT OF PLUMB ENDED YACHTS

K.5 CALCULATION OF AREA A2

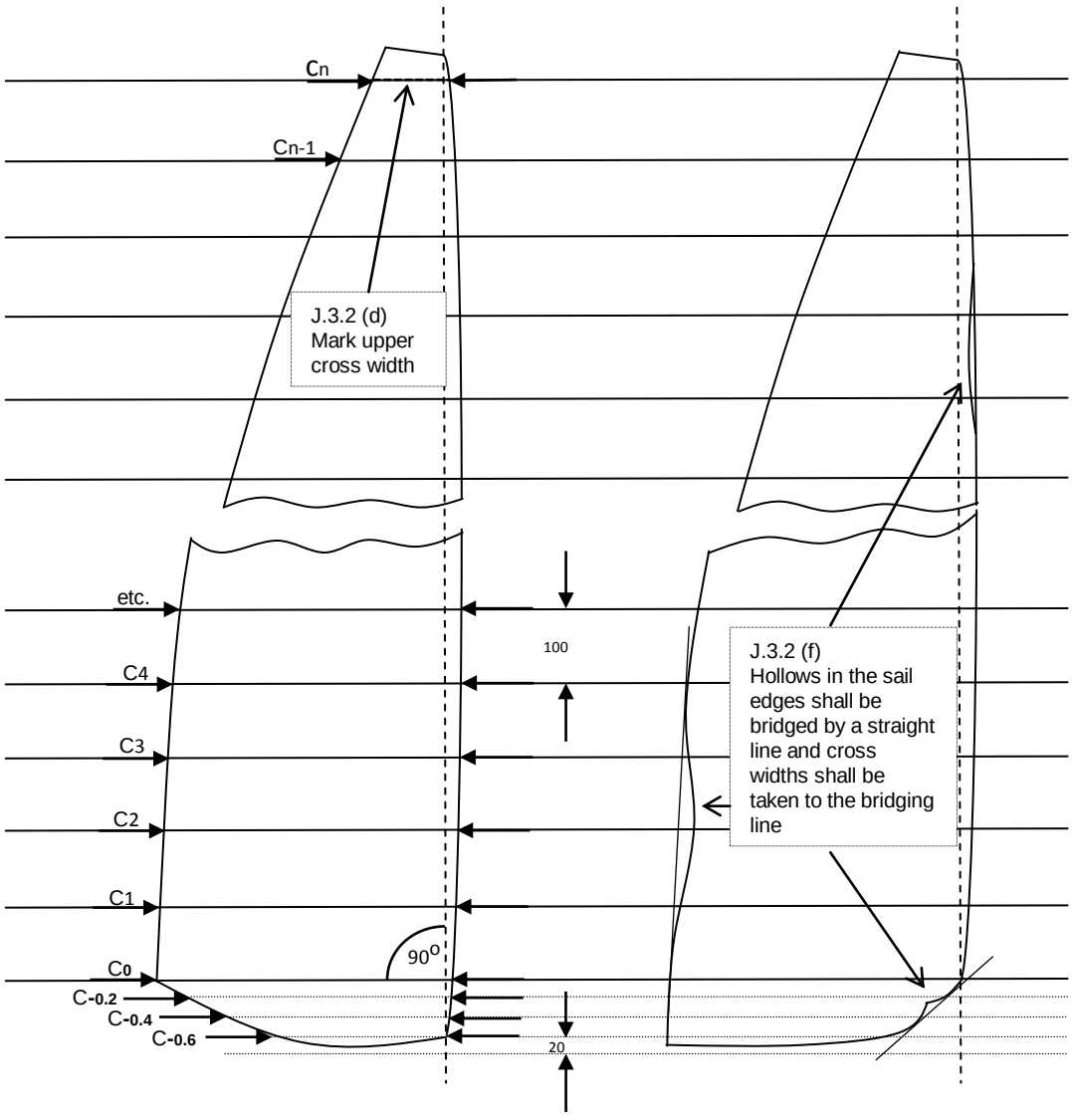
K.1 SPAR MEASUREMENT
K.1.1, K.1.2, K.1.3



K.2 SOFT SAIL MEASUREMENTS
K.2.1, K.2.2



K.2 SOFT SAIL MEASUREMENTS
K.2.3, K.2.4



K.3 OTHER SAILS

K.3.1

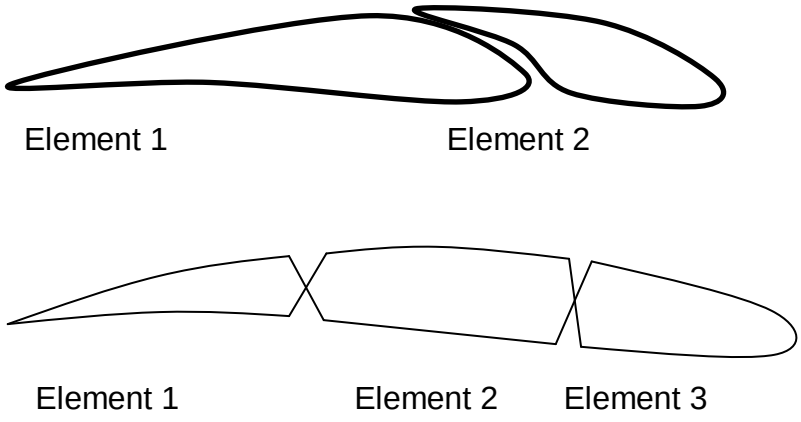
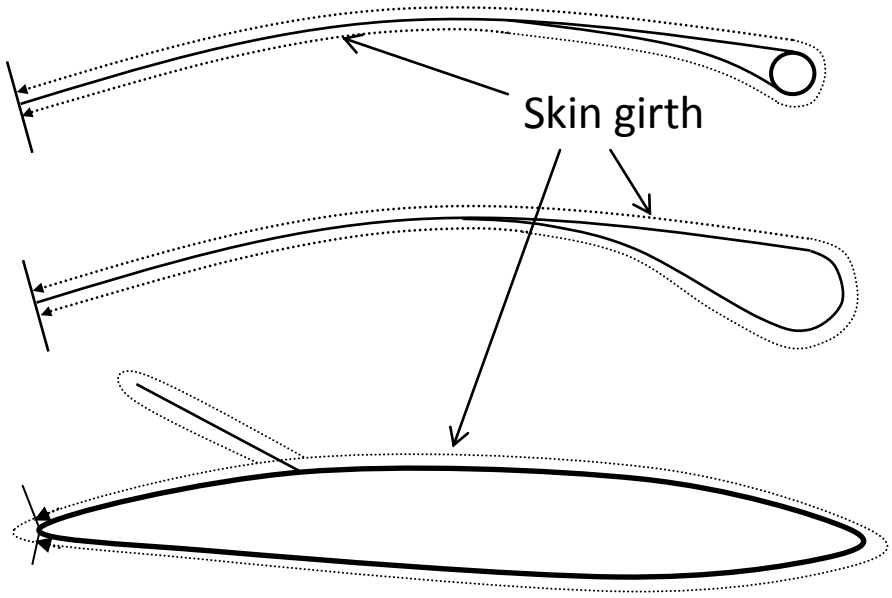
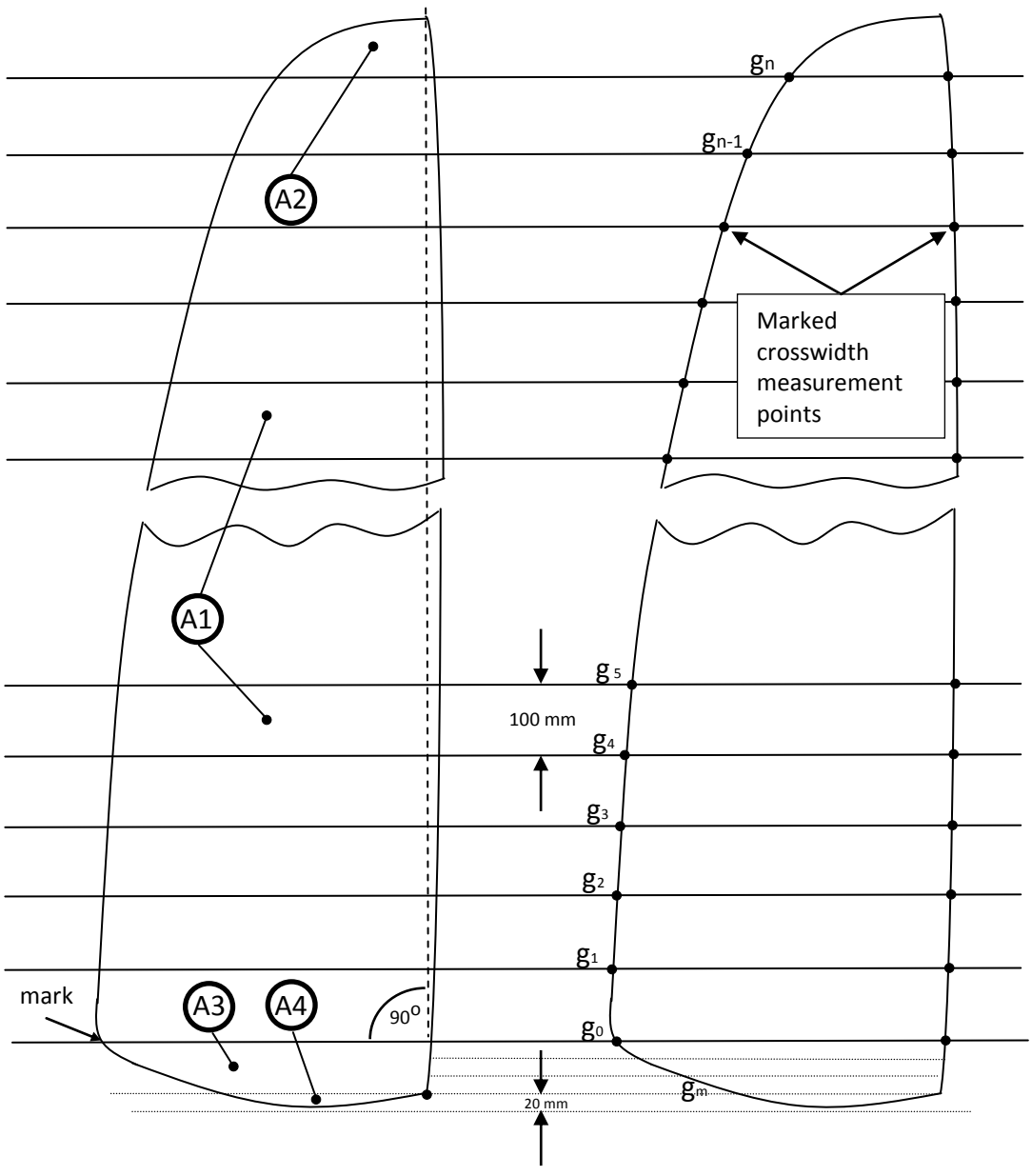


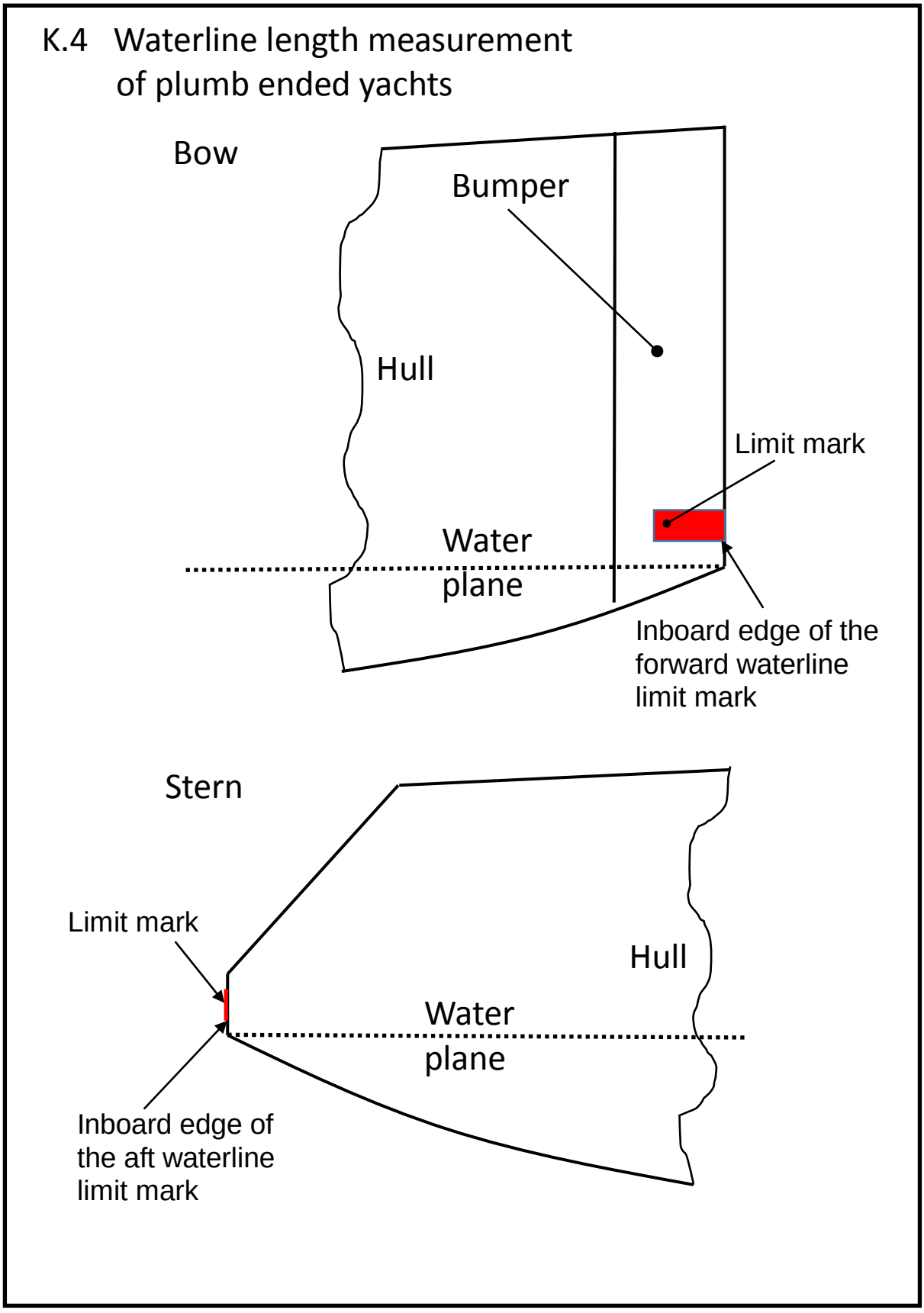
Figure K.3.4



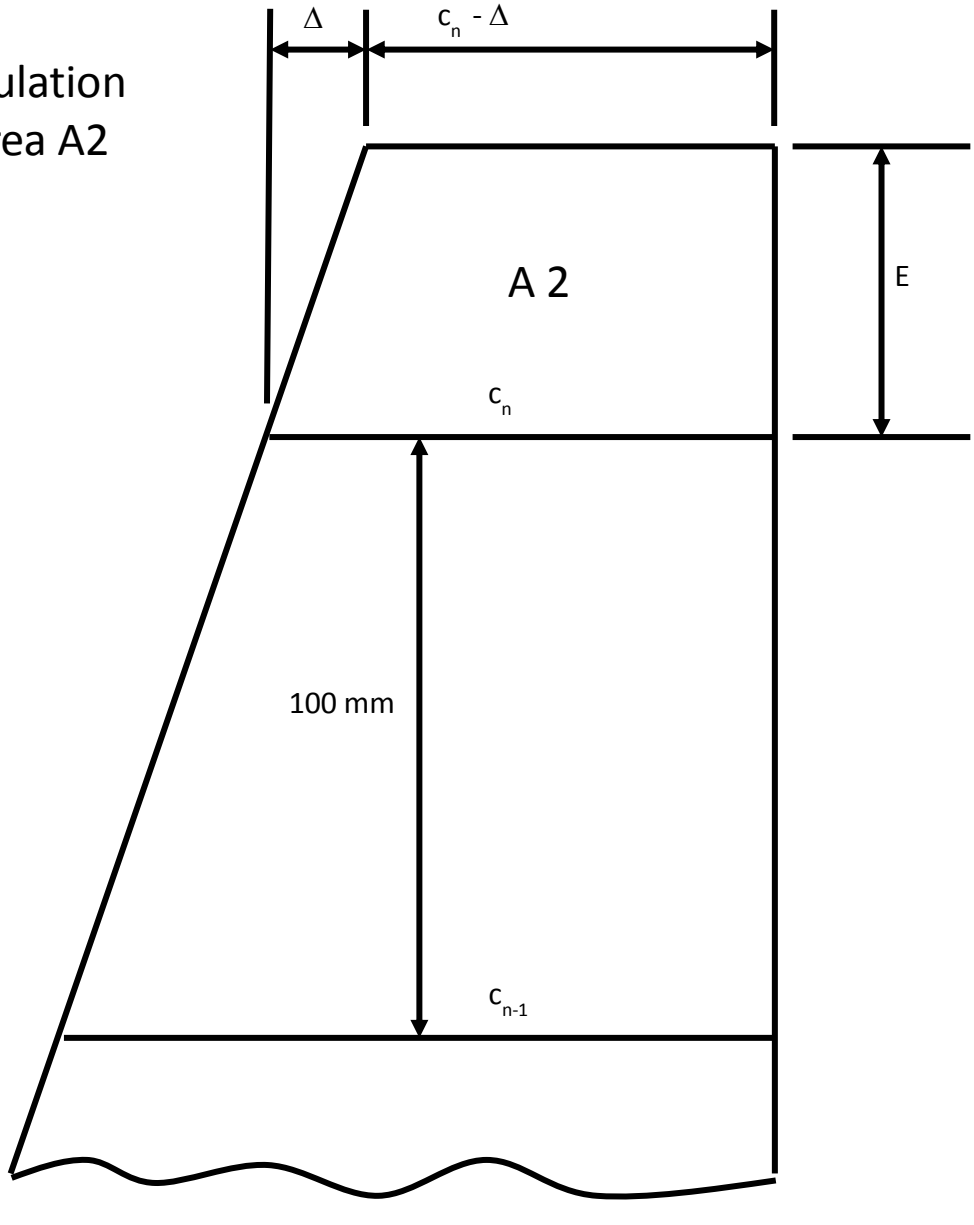
K.3 OTHER SAILS
K.3.2, K.3.3



K.4 Waterline length measurement of plumb ended yachts



K.5. Calculation of area A2



$\Delta = (E/100)\ (c_{n-1} - c_n)$ → *Δ derived from the gradient of the leech*

$A2 = 0{,}5\ E\ (c_n + (c_n - \Delta))$ → *trapezoidal rule*

$A2 = 0{,}5\ E\ (c_n (2 + E/100) - E\ c_{n-1}/100)$

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