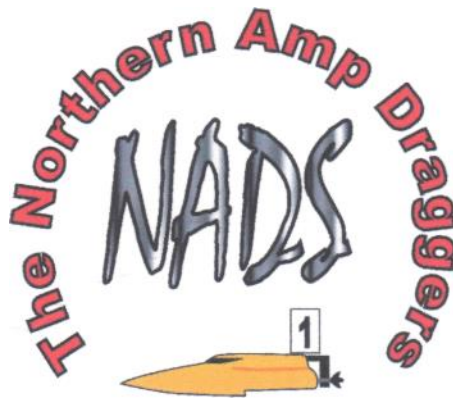


# NORTHERN AMP DRAGGERS FAST ELECTRIC RACING CLUB

Club Constitution and Rules

April 2018



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## Change History

April 2018 – Secretary change.

## 1 COMMITTEE

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Chairman	Name:	Martin Marriott
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Secretary	Name:	Luke Burton
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Treasurer	Name:	George McDonald
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Web Master / Regatta Officer	Name:	Martin Marriott
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## 2 CONSTITUTION OF *THE CLUB*

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### 2.1 DEFINITIONS

**NAME** - The name of *The Club* shall be *Northern Amp Dragers Fast Electric Racing Club* (referred to hereinafter as "*The Club*")

**MEMBER** - A member is defined as an individual who has paid his / her membership subscription fee, or has been awarded free membership of *The Club*.

The Officers of *The Club* shall be:-

**CHAIRPERSON** - The Chairperson will serve for a term of one year, but may stand for re-election at the next AGM. The duties of the chairperson are, to preside over all meetings and sign all accepted minutes. To oversee adherence to *The Club* rules and aims. The Chairperson will have a casting vote.

**SECRETARY** - The Secretary's duties are,

- To keep minutes of all meetings
- To deal with all correspondence other than financial.
- To convene all meetings.

**TREASURER** - The Treasurer's duties are,

- To collect all subscriptions,
- To keep *The Club* accounts.

- To present a balance sheet at the Annual General Meeting, after auditing by a member of **The Club** to be appointed by **The Club** Officers.

These Officers shall be elected at the Annual General Meeting of **The Club**, and shall initially stand for a period of two years in office. They may stand for re-election for further terms of one year if they wish, there being no limit on the number of additional terms an Officer may serve, if elected by a majority of the members.

Other posts may be co-opted as required.

### 3 AIM OF **THE CLUB**

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The aim of **The Club** will be to:-

- Inform and educate members in all aspects of fast electric boat racing, building, tuning and racing.
- Help members to solve problems.
- Help members to fulfil their competitive aspirations at their chosen level.
- To promote fast electric racing in all its forms and increase club membership, especially amongst juniors.

### 4 MEMBERSHIP

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- 1) Membership shall normally be open to all, regardless of age or sex, excepting any limitations at law, and subject to the suitability of the applicant. **The Club** welcomes applications for membership from disabled modellers.
- 2) **The Club** officers shall have the right to terminate the membership of any member whose general demeanour, behaviour or actions are considered to be detrimental to **The Club**.
- 3) **The Club** membership year shall run from the date of the Annual General Meeting to the date of the next year's Annual General Meeting.
- 4) An appeal against termination of membership by **The Club** can be lodged in writing to **The Club** Officers within twenty-eight days of the member being notified of the termination of their membership.

### 5 MEETINGS

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- 1) The Annual General Meeting will be held in October. All members shall be notified at least 28 days in advance of the meeting.
- 2) A Special General Meeting may be called by any member of **The Club** by presenting the Chair Person or Secretary with a written request stating the reason for calling the meeting, and signed by at least eight other members. At least fourteen days' notice shall be given to allow the Secretary time to notify all **The Club** members.
- 3) A quorum for a General Meeting for **The Club**, whether it is an Annual General Meeting or Special General Meeting, shall be no less than ten members, excluding **The Club** Officers, of which at least two must be present.
- 4) Only members of **The Club** are allowed to participate in, or vote at a General Meeting of **The Club**, whether it is an Annual General Meeting, or Special General Meeting.

## 6 FINANCE

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- 1) Annual Subscriptions shall be due the day following the date of the Annual General Meeting and may consist of a Club Fee plus any affiliation fees that are deemed necessary at the Annual General Meeting. Differing rates of club subscriptions may be charged to cater for different categories of membership. Subscriptions from existing members should be paid by the commencement of the following season.
- 2) All orders for payment from any Club bank account or for the withdrawal or realisation of any investment should be signed by two of **The Club** designated counter signatories.
- 3) In the event of **The Club** ceasing to exist, any club property will be disposed of by special auction, or donated to other clubs decided at the time. **The Club** funds and any auction proceeds will be donated to charitable causes to be decided at the time. The decision will be made by members of **The Club** attending an Extraordinary General Meeting called for the purpose.
- 4) The financial year shall run from the First of November to the Thirty- First of October.
- 5) Any member acting on behalf of **The Club** shall be indemnified against any financial claim incurred on behalf of **The Club**.

## 7 GENERAL

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- 1) Any proposed amendment to the constitution or Rules of **The Club** can be made at a General Meeting if thirty days' notice is given of the amendment.
- 2) All members shall have a single vote, and full voting rights at all General Meetings. Decisions at these meetings shall be based on simple majority voting of all members present. Juniors under 16 may vote, but only if accompanied by a responsible adult, who must ensure that the junior member fully understands the situation. (A member becomes a senior at the age of 18).
- 3) The Chair Person shall have the casting vote at all meetings in the event of a tied vote.
- 4) Rules formulated by **The Club** officers shall be presented to a General Meeting for approval.
- 5) A copy of **The Club** Constitution and rules will be given to all members on payment of subscriptions.
- 6) Members shall agree, by joining **The Club** to abide by the Rules.
- 7) Any matter not provided for within this constitution or any question as to interpretation, shall be dealt with by **The Club** Officers whose decision is final.

## 8 SAFETY

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### 8.1 GENERAL SAFETY REGULATION VALID FOR ALL CLASSES

- 1) All boats must be equipped with a so-called emergency circuit breaker (aka Safety Loop). The Safety Loop must:
  - a) Break the circuit between the drive batteries and the motor.
  - b) Be completely removable.
  - c) Be sufficiently strong to avoid breakage while pulling out.
  - d) Be easily removable without risk of fingers passing near the propeller.
  - e) Consist of two sockets with twin or double plug
  - f) Have a loop which has a minimum internal diameter of 20mm

- g) Be coloured red  
(See Appendix 3 for drawing)
- 2) All boats must be equipped with a kill switch for the Radio control equipment, that is operated from the outside of The boat If the receiver is supplied with a so-called BEC system, then the competitor has to prove this to the starting judge. Switches under sliding lids are not permitted.
  - 3) The hulls of boats must have a well recognizable colour. (This well recognizable colour must amount to at least 1/3 of the bottom of the hull). This should contribute to the clear recognition of a capsized model. Dark, for example black, deep-blue, white or similar colours are not permitted
  - 4) Should the recovery boat have to drive onto the course during a heat, the recovery boat always has priority of way.  
The recovery boat is to be passed at slow speed. Any danger for the recovery boat and its occupants is absolutely to be avoided. If the recovery boat is touched by a boat during a heat this counts to an automatic disqualification of the competitor. With an accidental touch a 1 lap penalty can occur (this lies in the judgement of the starting judge).
  - 5) Juniors up to the age of 12 may compete in any class providing the club feels they are competent and are also under adult supervision
  - 6) Juniors up to the age of 12 may not be used as start assistants for safety reasons.
  - 7) On all racing platforms as well as in the pit area, adequate fire protection equipment has to be present, fire extinguisher, fire blankets and buckets of dry sand. Each competitor is responsible for the safe transport and handling of their batteries.
  - 8) Lipos can be heated to 40 degrees Celsius in a suitable heating container but not while being charged.
  - 9) The starting judge is entitled, if the regulations are not abided by, to exclude the competitors from the competition or heat. The correct function of the emergency circuit breakers can be checked at the registration and before every heat by the starting judge. The colour of the Hull is checked at the registration, if no registration occurs, the starting judge inspects the Hull before every heat.
  - 10) A protest against the General safety regulation is not possible.
  - 11) The recovery of dead in the water boats takes place only after a heat has finished, except if a boat looks like it is going to sink.

## 9 RULES

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### 9.1 GENERAL RULES

- 1) Club members shall operate no device deemed unsafe by a Club Officer
- 2) All "fit and able" members shall share the workload at organised events.
- 3) Members shall adopt a "reasonable" attitude at all times.
- 4) Any Club Officers, their co-opted assistant, or Race Controller may enforce these Rules, Appeals against decisions may be lodged at the next formal meeting.
- 5) During a race meeting, in the event of any protest against a judge's decision, the matter shall be referred to the Officer of the Day, or Race Controller whose decision in the matter is final.
- 6) A person can participate in Club events as a guest at up to three meetings, after which he/she must become a member of **The Club**, and of the MPBA.

- 7) The consumption of alcohol or recreational drugs will not be permitted during the racing or competition day, any competitor or helper found to be under the influence of either will not be allowed to race or compete or enter the start area and will not be allowed to use the rescue boat or any equipment.

## 9.2 PENALTIES

- 1) All penalties are to be declared to the competitor immediately. If there is a protest at a penalty then the Officer of the day or race controller has the final decision.
- 2) If race number shields become unreadable or missing during a race, the boat should be taken out of the water. If this is not done, the Platform Judge may disqualify the competitor after warning him first.
- 3) If a boat gets stuck in a buoy and the driver tries to escape from the buoy by using his motor, hereby removing the buoy from its fixed position, he is not allowed to take the restart.
- 4) If any competitor runs over a non-moving boat, a yellow card with a 1 lap deduction penalty is given to the driver of that boat who hit the non-moving boat, when avoiding it was possible. If the same driver hits this non-moving boat a second time, a red card is given. This means disqualification for that heat. If the non-moving boat is declared a "dead " boat by the Platform Judge any running into it automatically leads to a red card.
- 5) Should a boat pop out of the water or suddenly spin out so a collision is unavoidable, no penalty will be called.
- 6) If a competitor leaves the race platform during a race, his radio control must stay in place. If the radio is also off the platform, this leads to disqualification for that heat.
- 7) A slower boat can be passed on either side. The slower boat should then hold its course and in no way hinder the overtaking boat. Any obstruction will lead to a 1 lap penalty. If a slower boat repeats this, he will be disqualified for that heat. Any form of "Team" racing, hindering other competitors' boats or even damaging them will be sanctioned with a Red card. A faster boat overtaking a slower boat must not cause any obstruction to the slower boat, if a collision occurs caused by the faster boat, a Yellow card will be given. Should this lead to the early retirement of the slower boat, a Red card will be given.
- 8) Unsportsmanlike conduct, hindering another competitor, causing danger to spectators or hitting the race platform can be sanctioned by the Platform Judge at his own judgement,
  - a) First offence, official warning ( yellow card)
  - b) At a second time or in case of reckless behaviour, a red card will be given (disqualification). The competitor is to take his boat out of the water immediately.
- 9) Fair play is to be respected at all times. Should a competitor behave in an un-sportsmanlike manner towards other competitors or Judges, he will be disqualified immediately for the event by the Main Judge; (on advice from the Platform Judge). Any physical violence towards other people leads to an immediate expelling from the grounds. This also counts for start helpers. Further penalty will be decided afterwards by the Section Committee.
- 10) At the discretion of the race controller, any racer must make their boat available for scrutineering immediately after a race. Any infringement of race rules for that class may result in disqualification.

Yellow card:            1 lap deduction  
 Red card                Disqualification from the heat

### 9.3 SPECIFIC CLASS RULES

Please note that the following is a list of classes that COULD be run. It does not indicate that all these classes WILL be run. The classes to be run in any year will generally be decided at the AGM of the year before.

**.....** = Deviation from Naviga rules

#### 9.3.1 Class - Physical Features

Class Name	Style	Length Max(mm)	Length Min(mm)	Weight Max(gm)	Weight Min(gm)	Motor
<b>Cat</b>	Catamaran Surface piercing prop	None	None	None	None	Any
<b>Hydro 1</b> <b>Hydro 2</b>	Hydroplane, Surface piercing prop	None	None	None	None	Any
<b>Mini Hydro</b>	Hydroplane, Surface piercing prop	450	None	None	450	Any
<b>Mini Hydro Sprint</b>	Hydroplane, Surface piercing prop	450	None	None	Any	Any
<b>Mini Mono</b>	Mono Hull, Surface piercing prop	450	None	None	450	Any
<b>Mono 1</b> <b>Mono 2</b>	Mono Hull, Surface piercing prop	None	None	None	None	Any
<b>Mini Eco Expert</b>	Mono Hull, Sub Surface prop	430	None	None	450	Any
<b>ECO Expert</b>	Mono Hull, Sub Surface prop	None	None	None	1000	Any

#### 9.3.2 Class - Race format

Class Name	Course (See Apdx' 1)	Penalties			Race Time	Overrun Time	Format (See below)
		Missed Buoy	Jump Start	Mill Time			
<b>Cat</b> <b>Hydro 1</b> <b>Hydro 2</b> <b>Mini Mono</b> <b>Mono 1</b> <b>Mono 2</b>	Naviga oval CW	1st = 5secs, others = 1 lap each	1 lap	10 secs	6 mins	60 secs	1
<b>Mini Hydro</b>	Naviga oval CW	1st = 5secs, others = 1 lap each	1 lap	10 secs	<b>5 mins</b>	60 secs	1
<b>Mini Hydro Sprint</b>	Naviga oval CW	DSQ	DSQ	10 secs	N/A	N/A	3
<b>ECO Expert Mini</b> <b>ECO Expert</b>	Naviga triangle CCW	1st = 5secs, others = 1 lap each	1 lap	None	6 mins	60 secs	2

Formats:

1. After a mill start, race continues for 'Race Time'. Entrant continues after 'Race Over' signal to complete that lap. The time taken to finish that lap is recorded. The winner of a race is the one with the greatest number of laps and if drawn, the lowest 'Seconds Over'. The first line crossing is the race start and does not count towards the number of laps. Turning around trying to avoid missing a buoy is not allowed.



2. There is no mill start. The race continues for 'Race Time'. Entrant continues after 'Race Over' signal to complete that lap. The time taken to finish that lap is recorded. The winner of a race is the one with the greatest number of laps and if drawn, the lowest 'Seconds Over'. The first line crossing counts towards the number of laps. If a buoy is passed on the wrong side, the competitor has the right to turn his model and drive around the buoy on the right side, provided that he thereby does not hinder the other competitors
3. After a mill start, race continues for six laps. The winner of a race is the first to complete the six laps. The first line crossing is the race start and does not count towards the number of laps.

### 9.3.3 Class - Batteries

Only Nickel Metal Hydride, LiPo or LiFePo batteries are permitted as a propulsion pack. Dimensions and weight restrictions are fixed in each class rules and regulations.

Turning down cells on a lathe to achieve weight relief is not permitted.

If an energy limiter is used:

1. It must be connected between the battery and the safety loop so that it remains powered when the safety loop is removed.
2. The correct energy limit for the class being raced must be selected.
3. The receiver throttle signal must connect to the limiter and the limiter to the ESC.

The maximum voltage of a single cell before the race may not exceed:-

NiMh (max. height of the cell with expansions 45 mm)	1.4v
LiPo	4.23v
LiFePo	3.65v

Battery Rules				
Class Name	Option 1		Option 2 <sup>(b)</sup>	Option 3 <sup>(b)</sup>
	Numbers / Configuration	gm	mAh	WattHrs
Mini Mono, Mini Hydro, Mini Eco Expert	LiPo - 2S1P / 2S2P / 3S1P / 3S2P hardcase allowed	115 <sup>(a)</sup>	2500(2S) 1700(3S)	20(1200) See below
	NiMh - 7 x 2/3 af	any		
	LiFePo - 3 cells 18650 or 2 cells 26650	any		
Mono1, Hydro1, Eco Expert	LiPo - 2S1P / 2S2P / 3S1P / 3S2P hardcase allowed	280	6600(2S) 4500(3S)	54(3240) See below
	NiMh - 7 SubC	any		
	LiFePo - max 6 cells 3S2P Type 26650	any		
Mono2, Hydro2	LiPo - 4-6S1P / 4-6S2P hardcase allowed	560	6600(4S) 4500(6S)	108(6480) See below
	NiMh - 8-14 SubC	any		
	LiFePo - max 12 cells 4-6S2P Type 26650	any		
Cat	N/A	N/A	6600(4S) 4500(6S)	108(6480) See below
Mini Hydro Sprint	LiPo – 3S max	any	any	N/A
	NiMh – 7S max	any		
	LiFePo – 3S Max	any		

Note

a) this is the NAD's value.

b) the same cell options apply as in Option 1.

Where Option:

1. Naviga legal (can remove outer packaging. No capacity restrictions.)
2. Unlimited weight (No alteration to pack. No weight restrictions)

3. Energy Limiters. With Naviga rules as defined from 1 Jan 2018 with the following exceptions.  
 a) For M1/H1/Eco Expert classes, the energy limit (WattHrs) will be set by the following formula.  

$$\text{ROUND}(\text{CELLS} * 3.7 * (\text{AH} - 0.2))$$

where

*CELLS = The number of cells in the "best" pack.*

*AH = The capacity (in Amp Hours) of the "best" pack*

(Note: "best" means the 2S or 3S Naviga legal pack that is commercially available that contains the most energy)

- b) For M2/H2/Cat classes the energy limit will be double that defined in (a)

- c) Unmodified manufacturers packs to be used

(No weight or capacity restrictions)

## 9.4 TIMING & SCORING

Definition of terms:-

<b>Competitor</b>	An individual who is entered to race in one or more CLASSES
<b>Class</b>	A specification of a type of boat with defined characteristics and racing to defined rules.
<b>Entrant</b>	A unique combination of a COMPETITOR racing in a specific CLASS which has an associated boat number.
<b>Round</b>	The coming together of COMPETITORS at a specific location to race one or more CLASSES over one or more consecutive days.
<b>Heat</b>	The label given to a RACE if two or more RACES contribute towards the ranking of an ENTRANT in a specific ROUND.
<b>Race</b>	An individually timed/counted race between two or more ENTRANTS in a specific CLASS. More than one race may be run for each HEAT in each CLASS if there are too many ENTRANTS to run in one race.
<b>League</b>	The cumulative results of four or more ROUNDS which are conducted over a racing season (year) which will define the ranking of ENTRANTS.

There can be up to 7 Rounds in the year.

The format of the races on each day is as follows:-

- Depending upon how many 'Entrants' are available (2 minimum), a decision will be made by the Race Controller as to which classes are to be run that day and in what order.
- Each Class will have 3 heats during the day (time permitting).
- A maximum number of boats (decided by the Race Controller) are allowed to partake in a race. If there are more Entrants than this then the heat will be 'Split' into 2 or more.
- A maximum of four classes can be entered by any competitor per race day.
- To qualify for league points a competitor must race in a minimum of four rounds.

The rules for calculating the results are as follows:-

- Missed buoys are penalised by deducting 5 seconds for the first buoy missed. Any subsequent missed buoys are penalised by deducting 1 lap.

- A Yellow Card can be given at the discretion of the Race Controller. This is penalised by the deduction of 1 lap.
- A Red Card can be given at the discretion of the Race Controller. This is penalised by disqualification from that heat. It will result in 0 laps being given.
- A Jump Start is allocated if in a Class which has a Mill Time, the Class Entrant crosses the start line before the start of the race. If the MyLaps transponder system is used, this will be done automatically.
- At the end of a race a Class Entrant is allowed to complete the lap they are on. The time from the end of the race to the final line crossing is called 'Seconds Over' and will contribute to the final result.
- The race order is in descending order of the number of laps completed in the race time. If there are Entrants with the same number of laps, the Seconds Over will be used to prioritise them (smaller the better). Any laps or time penalties are taken into account before calculating the race order. If there happens to be a draw (same laps and Seconds Over) the Entrant who had the better result in heat 1 is to be preferred.
- Points are allocated to the Entrants according to their placing. The points are allocated as follows (placing>points) – 1>9, 2>6, 3>4, 4>3, 5>2, others 1.
- Only the best two of the three heats are used to calculate the winner.
- The League position for the year is calculated by summing the points of the best 5 rounds.
- If there is a draw for points at the end of the year, the winner will be chosen by looking at the next best rounds that wasn't included in the main calculation.
- If an Entrant is disqualified in a heat. They will receive 0 laps for that heat. If they are disqualified in all 3 heats, they will receive 0 POINTS irrespective of their race position.
- If an Entrant completes 0 laps in total over the 3 heats, 0 points will be awarded.

Whenever possible, the race timing will be done by using a transponder based system. This is currently done by using a MyLaps RC4 decoder connected to the RaceMaster Timing & Management software.

All racers must equip their boats with a transponder which is compatible with the RC4 decoder. This transponder must be mounted horizontally, as high as possible and not beneath carbon fibre or any other material that will absorb the transponder signal. The placement of the transponder in the boat is not specified, but has to be in such a fashion it cannot move from its fixed placement.

See Appendix 4 for drawing.

If the transponder system is not functional due to it not being able to be deployed or to a fault, the RaceMaster system is to be used with the manual push button unit connected.

If the RaceMaster system is not functional, then manual stopwatches are to be used.

## 9.5 RACING NUMBERS

All models must have a race number.

The dimensions for the back plate is to be 80mm by 80mm minimum. The back plate should be made out of white none transparent material. The number on this shield must be in black with a height of 70mm and a width of at least 10mm.

For the mini classes a smaller size is permitted of 70x70mm with 65mm high numbers.

The race number has to be mounted on or at the back of the boat, vertically and visible from both sides.

If the number is not clearly visible or is transparent to the lap counters, the competitor has to return to the race platform in the next lap. After replacement of the race number the competitor can carry on with the race.

See Appendix 2 for drawing.

## 10 RISK ASSESSMENT

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### 10.1 HAZARD

- Falling
- Tripping
- Slipping
- Drowning
- Being struck by an out of control boat
- Injury to hands from propellers
- Fire
- Explosion
- Falling from rescue boat
- Eye injury from transmitter aerial's.

### 10.2 EVALUATIONS

- 1) Slipping, tripping, falling, the people most at risk are the officials and drivers at the waterside whilst racing, spectators are also at risk.
- 2) Drowning, everyone at the waterside is at risk, especially non-swimmers and young children.
- 3) Being struck by an out of control boat, at risk will be spectators, drivers, officials within five meters of the water's edge, and wildlife such as waterfowl.
- 4) Risk of injury to hands from moving propellers, at risk will be assistants who start the boats in the water, drivers and assistants working on the boats in the pits and spectators after a boat has left the water.
- 5) Falling from the rescue boat, at risk are the officials who operate the rescue boat.
- 6) Eye injuries from telescopic transmitter aerials, at risk are the officials, drivers and assistants in the start or rostrum area.
- 7) Injury from re-chargeable batteries disintegrating or catching fire within a model boat or while the battery is being charged or handled within the pits area. At risk are the officials, drivers and assistants in the start area also drivers and assistants in the pits.

## 10.3 EVALUATING THE RISK

### 10.3.1 General approach

- Always assess the risks.
- Base that assessment on now and how it has been in the past
- Is the risk more or less than usual?
- Are more precautions needed or can they be reduced.
- Do you need to seek a second opinion?

### 10.3.2 The Safety Officer of The Day

The Officer of the Day must ensure that the event has a Safety Officer of the Day. The Safety Officer of the Day must look at the slipping, tripping, falling risk, and advise the Officer of the Day that they need to erect a tape exclusion zone or safe spectators area where this risk manifests itself due to uneven surfaces, steep or wet banks, debris and rocks, where a fall would lead to the person going into the water, especially spectators. Evaluate the risk as HIGH, MEDIUM, LOW, and put the appropriate precautions in place, including highlighting the risk at the drivers meeting at the start, using the officials on the day to steward and advise spectators of this risk.

### 10.3.3 Drowning

The officer of the day must satisfy himself that he has assessed the conditions at the lakeside, i.e. depth of water at jetty or side, can you stand up if you fell in at edge of water. Is it suddenly shelving, is there a lifebelt and rope at hand, is it in good condition, is everyone at the event aware of the dangers. Evaluate the risks as HIGH, MEDIUM, and LOW and put in place measures to inform and to protect competitors and spectators.

### 10.3.4 Being Struck By an Out of Control Boat

The officer must evaluate the risk and put in place a catch netted area if spectators are nearby.

Evaluate the risk as HIGH, MEDIUM, and LOW and if needed put in place the necessary precautions and inform those at risk.

### 10.3.5 The Risk of Injury by Rotating Propeller

The Officer of the Day must check that all boats have an acceptable safety isolation loop fitted to avoid the risk of injury from rotating propellers. Drivers and officials must be made aware of the need to remove safety isolation loops whenever the boat is removed from the water. Evaluate the risk as HIGH, MEDIUM, and LOW this can be assessed by previous cases, as low risk, but the risk should be brought to everyone's attention.

### 10.3.6 Falling Out of the Rescue Boat

The officer of the day should ensure that the correct procedures are in place, for the use of the rescue boat, buoyancy jackets must be worn at all times in the boat. Evaluate the risk as HIGH, MEDIUM, LOW, this should include whether the officials in the boat are competent and trained. Juniors are not allowed to use the rescue boat.

### 10.3.7 Injuries to Eyes by Transmitter Aerials

The officer of the day should ensure that all transmitters, fitted with telescopic aerials, have a device to reduce the risk of eye injury, i.e. a practice golf ball, or foam ball, or some such device. Drivers wearing glasses reduce this risk.

### 10.3.8 Risk of Disease in the Water

The officer of the day should evaluate the risk as HIGH, MEDIUM, LOW, They should regularly remind officials, drivers, assistants, and spectators of the dangers of still, or stagnant water and point out the need for latex gloves and personal hygiene at all times. Based on experience, the risk to all the above has only been assessed as LOW or less, but this does not mean that the assessment does not need to be made at every event.

### 10.3.9 Risk of Injury from Re-Chargeable Batteries Disintegrating or Catching Fire

The officer of the day should evaluate the risk as HIGH, MEDIUM, LOW. A separate evaluation should be made for each cell technology. The following technologies are currently in use, Nickel Metal Hydride (Ni-MH) Lithium Polymer (LiPO or LiPoly) and Lithium iron (LiFePO4). New technologies must be subject to a full risk assessment before their use is permitted. Separate assessments must be made for operational use within a boat and charging in the pit area. The risk of injury while the battery is within a running boat is usually LOW while the boat is in the lake but the risk when a boat comes ashore must be evaluated. The officer of the day should ensure that batteries are charged in a suitable area with precautions appropriate to the cell technology. The correct type of charger must be used. The risk associated with charging conditions at each event must be evaluated. If LIPOS catch fire during a race then that boat is left for the fire to burn itself out before it is recovered.

## 10.4 METHOD STATEMENT

Because of the nature of the environment and the location of the events, careful consideration and assessment is required.

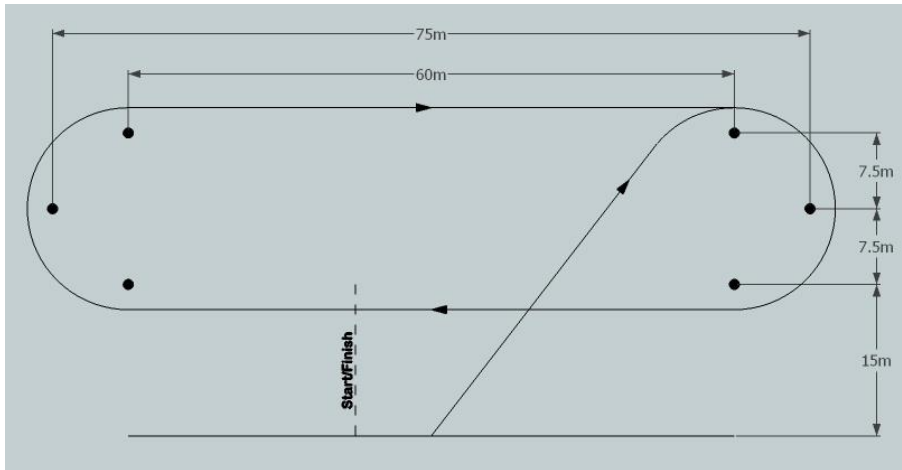
- 1) The course should be set out to give the largest safety margin to spectators, and competitors with the distance between the water's edge and the spectators to provide a safety zone.
- 2) An exclusion zone may be needed around the pits and drivers area, also the officials and timekeepers.
- 3) All racing classes will start as "dead boats" in the water.
- 4) At all meetings a first aid kit, suitable fire extinguisher and a bucket of soft sand should be available.
- 5) At booking in competitors will put down on the job sheet the tasks they will take on for the day. One task for each class they have entered is preferred.
- 6) Lipos can be heated to 40 degrees Celsius in a suitable heating container but not while being charged.
- 7) If you are altering the connectors soldered directly onto the cell pack please ensure that all terminals apart from the one you are working on are 100% insulated with either insulation tape, fibreglass tape or polyimide tape. On completion of alterations please make sure that all connectors are insulated to avoid short circuits.
- 8) Lipo cells should be kept under observation whilst being charged.

**Never Alter the Grey/ Silver Plastic Cell Sacks In Any Way.**

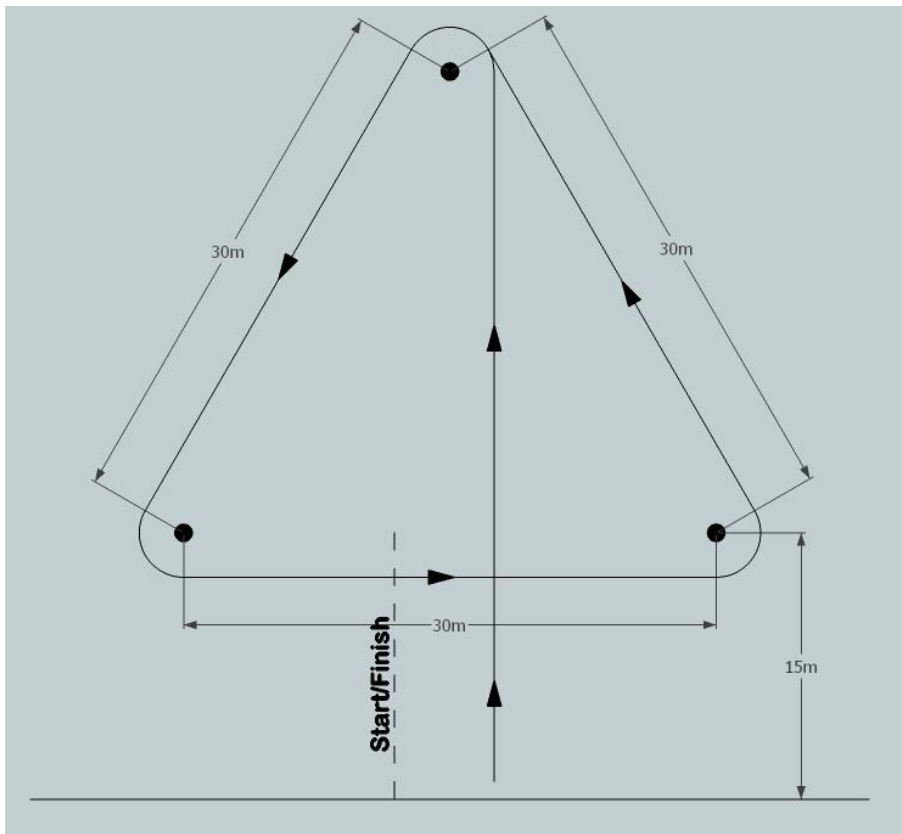
## 11 APPENDIX 1 – CIRCUITS

Note that the dimensions shown below are a maximum size and can be reduced at the discretion of the race controller.

### 11.1 MONO/HYDRO OVAL

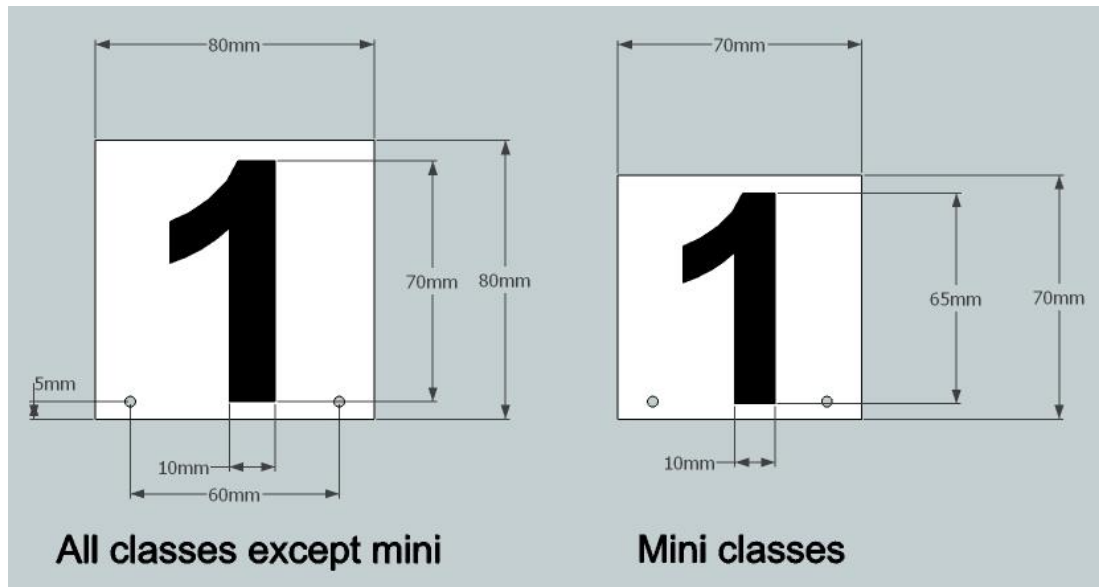


### 11.2 ECO TRIANGLE



## 12 APPENDIX 2 – RACING NUMBERS

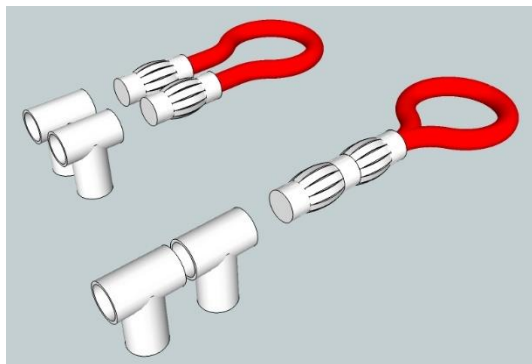
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## 13 APPENDIX 3 – SAFETY LOOP

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Here are two examples of designs which meet the required specifications as outlined in the "General Safety Regulations" section.

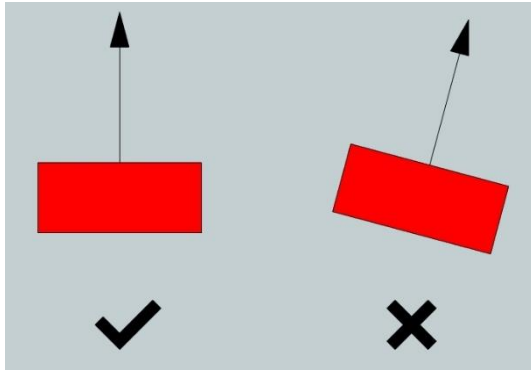




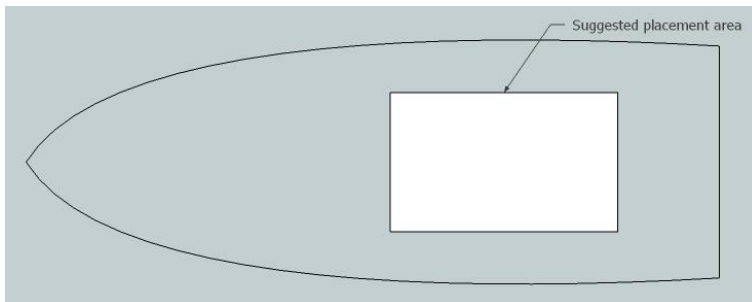
## 14 APPENDIX 4 – TRANSPONDER PLACEMENT

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See the “Timing & Scoring” section for details.



Orientation – Mount horizontally.



Placement – The location is not prescribed but it is suggested to mount in the central area away from other electronics. Do not mount beneath carbon fibre or any other material that will absorb the transponder signal.