F1 in Schools Australia

Dark Matter - Australia
Gold Coast Christian College, QLD
2020(21) World Finals - 4th outright

2021/2022 Competition Regulations

Version 1.0

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RE-ENGINEERING AUSTRALIA FOUNDATION

Dark Matter - Gold Coast Christian College, QLD
2020(21) F1 in Schools Virtual World Finals - United Kingdom
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ACKNOWLEDGEMENT

In preparing the F1 in Schools™ Australian Technical Rules, certain wording and images have been adopted from the World Final Technical Regulations.

ALTERATIONS

Re-Engineering Australia Foundation Ltd. reserves the right to alter any specifications and documentation associated with the 'Challenge' without prior notice.

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PREFACE – SUMMARY OF MAIN REVISIONS FROM REVIEW OF 2020/2021 SEASON

This document only contains 'Competition Regulations'. A separate document encompasses the 'Technical Regulations'.

This preface provides an overview of all competition related regulations that have been revised from the 2019/2020 season's regulations.

It is each team's responsibility to thoroughly read this document in order to identify wording changes and to understand any impact this **MAY** have on their project.

All changes between 2020/2021 season and V1.0 of 2021/2022 are identified within the document by using red underlined text.

These regulations will be valid for all 2021 State Finals and the 2022 National Final. Some changes **MAY ONLY** be valid for National Finals.

ARTICLE C1 -	**DEFINITIONS** - Nil changes
C1.24	Adjustment of competition classes into Primary and Secondary divisions
C1.25	New arrangements for virtual events.
ARTICLE C2 -	**GENERAL REGULATIONS**
C2.1	Updated wording to include requirement for minimum 60% achievement
C2.3	Changes to Cadet & Development Class entry requirements and requirement for World Final teams to sign a Participation Agreement
C2.4	Requirement for forms to be uploaded to REA Google Drive and other minor wording changes
C2.7.3	Updated wording for documentation of partnerships in Enterprise Portfolio
C2.9	Updated requirements for submission of project elements to REA Google Drive prior to event.
C2.10	Updated requirements for submission of project elements to REA Google Drive at event check-in
C2.11	New requirements for authenticity checking of team portfolios using Turnitin
C2.12	New penalities for non-compliance of required file formats and submission deadlines
C2.13	New advice for Testing documents and updated wording for portfolios
ARTICLE C3 -	**COMPETITION AND JUDGING FORMAT**
C3.4	Updated wording for 'Who attends judging?'
C3.7	Updated points allocation table
ARTICLE C4 -	**SPECIFICATIONS JUDGING -** Nil changes
ARTICLE C5 -	**ENGINEERING JUDGING**
C5.2.1	Change to total points and new note regarding non provision of Engineering Portfolios to CAD judges
C5.2.2	Change to total points
ARTICLE C6 -	**POSTER JUDGING -** Nil changes
ARTICLE C7 -	**PORTFOLIO JUDGING**
C7.1.3	Changes to portfolio page limits according to referencing method for State & National Finals
C7.1.7	Turnitin process and document requirements
ARTICLE C8 -	**MARKETING JUDGING -** Nil changes
ARTICLE C9 -	**VERBAL PRESENTATION JUDGING -** Nil changes
ARTICLE C10 -	**RACING**
C10.1.5	Inclusion of Denford Deceleration System as a retardation device
C10.1.14	Updated weighting of CO2 cylinders for National Finals
ARTICLE C11 -	**CAR REPAIR**
C11.2	Application of penalty for car repairs violating technical regulations
ARTICLE C12 -	**GRIEVANCES -** Nil changes
ARTICLE C13 -	**JUDGES -** Nil changes
ARTICLE C14 -	**AWARDS -** Nil changes
ARTICLE C15 -	**APPENDICES**
APPENDIX 1:	New Project Elements Checklist for upload of electronic files to REA Google Drive pre-event
APPENDICES 2-6	Nil Changes
CRITERION 1:	Removal of T4.6. T6.2.1 & T6.2.2 updated.T6.9.1 and T6.9.2 updated wording. T7.91 - T7.9.4 updated/ added with T7.9.3 a new requirement.. T7.4 changed requirement. T10.3 changed requirement.
CRITERION 2:	Updated wording for 2.2, updated points for 2.4 and new note regarding non provision of Engineering Portfolios to CAD judges
CRITERION 3:	Updated points for 3.5. Nil change for Cadet Class.
CRITERIA 4-7:	Nil changes
CRITERION 8:	Updated wording for 8.1
CRITERIA 9-10:	Nil changes

ARTICLE C1 - DEFINITIONS

C1.1 Australian Competition Season

The standard sequence of Australian F1 in Schools competitions run across two calendar years. The State Finals held Sept/Oct/Nov in one year will feed to the National Final in February/March/April of the following year. This encompasses a complete season, for which the regulations **SHOULD** remain constant. REA Foundation Ltd reserves the right to update / revise the regulations if deemed appropriate.

C1.2 Australian Competition Calendar

This is a calendar of Regional, State and National Final events which is available via the Events Calendar tab within the F1 in Schools menu on the REA Foundation Ltd. website, www.rea.org.au.

C1.3 Regional Finals

Regional Final events are generally the first level of competition for **ANY** team but usually **ONLY** take place in NSW and QLD where large numbers of teams are registered for the competition. The decision regarding the need for Regional Finals in all other states of Australia is under ongoing review and will depend on the number of Team Registrations received by the advertised deadline. REA Foundation Ltd. will inform teachers of **ANY** changes to requirements as soon as possible once final numbers are known.

Regional Finals are managed by Regional Hub Coordinators identified by REA and usually take place over 1 day.

C1.4 State & National Finals

State and National Final events are managed by Re-Engineering Australia Ltd., are generally held over 2 - 3 days and **MAY** include various programmed social and competition activities. These events aim to provide all participants with an educational and personal development experience. Specifically, the competitions aim to identify and prepare teams to represent Australia at the F1 in Schools World Finals.

C1.5 World Final Competition

The Australian National Final will feed into a World Final which is usually held anywhere from September through November each year depending on the country hosting this competition. For teams aspiring to represent Australia at the World Final, please be aware that the World Final Competition Regulations are different to the Australian Competition Regulations.

C1.6 F1 in Schools National Coordinator / In Country Coordinator

A person employed by Re-Engineering Australia Ltd. (REA) to manage the F1 in Schools™ competition in Australia on behalf of F1 in Schools Ltd. UK and to identify, manage and co-ordinate teams nominated to represent Australia at the F1 in Schools™ World Final.

C1.7 Language Used

The language of the regulations is tiered. Those clauses expressed as "**MUST**" are mandatory and failure to comply will attract objective point and/or racing penalties and in the extreme, disqualification. Those expressed as "**SHOULD**" or "**MAY**" reflect some level of discretion and choice. Some clauses will be satisfied through team registration processes or declarations signed as complied with as part of the Challenge Terms and Conditions, whilst others will be tested through a variety of objective and subjective judging.

C1.8 Parc Fermé

A secure area where Car A & B are held to prevent unauthorised handling, but to allow technical inspections to be conducted by the Judges. (Literal meaning in French of 'closed park').

C1.9 Event Programme

This programme will detail the schedule of all competition activities from Event Registration through to the Awards Presentation.

C1.10 Judging Schedule

A separate Judging Schedule will detail the times and locations of all judging activities for all teams.

C1.11 Terms and Conditions for Entry

There are forms prepared by Re-Engineering Australia Ltd. that teams and teachers are required to complete and submit prior to an event. These forms outline a range of Terms and Conditions that **MUST** be complied with as part of the initial registration process and participation of all teams in the competition. Failure to submit these forms **MAY** result in teams being ineligible to compete at an REA Foundation Ltd. managed State or National Final. Copies of all forms can be found within the Resources tab within the F1 in Schools™ menu of the REA Foundation Ltd. website. For detailed information refer to ARTICLE C2.4.

C1.12 Regulations Documents

C1.12.1 Issuing Authority

REA Foundation Ltd. issues the regulations, their revisions and amendments.

C1.12.2 Competition Regulations

This document is mainly concerned with regulations and procedures directly related to judging and the competition event. Competition Regulation articles have a 'C' prefix. This document **SHOULD** be read in conjunction with the F1 in Schools™ **Australian Technical Regulations** document.

C1.12.3 Technical Regulations

A document separate to this one which is mainly concerned with those regulations that are directly related to F1 in Schools™ car design and manufacture. Technical Regulation articles have a 'T' prefix.

C1.12.4 Interpretation

The final text of these regulations is in English, **SHOULD ANY** dispute arise over their interpretation, the regulation text, diagrams and **ANY** related definitions **SHOULD** be considered together for the purpose of interpretation.

C1.12.5 Text Clarification

ANY frequently asked questions that are deemed by REA Foundation Ltd. to be related to text needing clarification will be answered. The question and the clarification will be published on the REA Foundation Ltd. website.

C1.12.6 Supplementary Competition Regulations

Other documents **MAY** be issued by REA Foundation Ltd. that provide teams with further logistic and other important event information. **ANY** supplementary regulations will be issued to all teachers and team managers of registered teams, where a valid contact email address has been supplied to REA Foundation Ltd and published on the REA Foundation Ltd. website.

C1.13 Key Performance Indicators (KPI's)

These are portions of text that feature on the score cards within a corresponding points range. The KPI's describe the type of evidence the Judges will be looking for in order to score the team appropriately.

C1.14 Net Race Time Value

A 'net race time' value when racing in Automatic Launch (Time Trial) Racing, is the actual time taken for a F1 in Schools™ car to travel the track from start to finish, measured from the instant the launch pod fires to when the car breaks the finish line timing beam. In the case of Manual Launch (Reaction) Racing, the 'net race time' value is calculated as the 'total race time' value displayed on the electronic start gate minus the 'reaction time' value displayed for that race.

C1.15 Gross Race Time Value

The 'gross race time' value is displayed in the total time field on the electronic start gate at the conclusion of every race. This time is the sum of the 'net race time' value and **ANY** 'reaction time' value displayed on the electronic start gate. During time trial races where the automatic launch mode is used there is a zero reaction time value.

C1.16 Reaction Time Value

A 'reaction time' value is the time recorded from the instant the five (5) start lights extinguish to the instant the start trigger is depressed by the driver. This value is displayed in the reaction time field on the electronic start gate.

C1.17 Booth Shell

A Booth Shell is a sytem of walling materials used in different configurations to construct either backboards for Development Class teams at State Finals or a U-Shaped exhibition style arrangement for Professional Class teams at State Finals and ALL teams at National Finals. See APPENDICES 2 & 3.

C1.18 Trade Display

A Trade Display is the final product that teams assemble within a provided Booth Shell configuration over a 2 hour assembly period. This contains all of the structural and visual elements presented for judging.

C1.19 Project Elements

These are **ANY** materials and resources that the team presents as part of its entry for **ANY** judging activity and which are submitted at event registration or as advised.

C1.20 Racing Modes

There are two 'modes' of racing used at Australian State and National Final competitions which are used to determine results for the Grand Prix Race and Knock-out Race events. These are Automatic Launch (Time Trial) Racing and Manual Launch (Reaction) Racing. For more information, refer to ARTICLES C10.2 & C10.3.

C1.21 Launch Energy Recovery System (LERS)

Commencing from the 2017/2018 Season, it will **NOT** be permitted to attach **ANY** device, including a LERS device, to the track or starting mechanism or car, or modify the track or starting mechanism in **ANY** way for **ANY** race event within the Australian F1 in Schools competition including Regional Finals. Car alignment devices are permitted provided they are removed from the track and starting mechanism prior to a run.

C1.22 Engineering Drawings

CAD produced drawings which **SHOULD** be such that, along with relevant CAM programs, could theoretically be used to manufacture the fully assembled car by a third party. Such drawings **SHOULD** include all relevant dimensions, tolerances and material information. F1 in Schools engineering drawings **MUST** include detail to specifically identify compliance intent for the virtual cargo and wing surfaces.

C1.23 Penalties

A range of penalties will be applied for non-compliance with identified competition regulations including:

C1.23.1 Point Penalty

Invoked from non-compliance with some competition regulations governing Portfolio or Trade Display restrictions and Car Servicing/Substitution. These are identified as **[Point Penalty]**.

C1.23.2 Eligibility

Teams need to meet certain eligibility criteria to compete at a State or National Final. Failure to comply with certain eligibility criteria **MAY** lead to disqualification from the competition or a class of competition. These are identified as **[Eligibility]**.

C1.24 Competition Classes

There are three competition classes in the Australian F1 in Schools competition with some having Junior and Senior categories defined by school year levels:

C1.24.1 Cadet Class (1 – 3 team members)

This class is intended as an entry class of competition. Students **MAY** participate multiple times. This is a simplified project with restricted pathway to state level competitions **ONLY** and no pathway to the National or World Final.

- **C1.24.1.1 Primary: Years 5 - 6**
- **C1.24.1.2 Secondary Junior: Years 7 – 9**
- **C1.24.1.3 Secondary Senior: Years 10 – 12**

C1.24.2 Development Class (3 – 5 team members)

Students **MAY ONLY** participate in the Secondary Junior Division once. The Secondary Junior Division only provides either an international or internal collaboration team pathway to the World Final.

- **C1.24.2.1 Primary: Years 5 – 6**
- **C1.24.2.2 Secondary: Years 7 - 9**

C1.24.3 Professional Class (3 – 5 team members)

Open to all students but usually **ONLY** entered by students in Years 7 - 9 who have competed in the Cadet or Development classes previously. The overall National Champion Professional Class team will represent Australia as a 'stand-alone' team at the World Final.

- **C1.24.3.1 Secondary Junior: Years 7 – 9**
- **C1.24.3.2 Secondary Senior: Years 10 – 12**

C1.25 Virtual Events

SHOULD the need arise to run virtual State or National Finals, these regulations still apply. However, separate Supplementary Regulations **WILL** be released that will override the equivalent regulations within this document.

ARTICLE C2 - GENERAL REGULATIONS

C2.1 Representative Team Selection

C2.1.1 State Finals [Eligibility]

In all states other than NSW & Queensland, the first level of competition for teams is usually a State Final. However, REA Foundation Ltd. reserves the right to request Regional Finals in **ANY** state **IF** registrations received by the advertised deadline exceed the maximum 24 teams allowable (excluding Cadet Class teams) at a State Final.

Schools are required to select their best 2 – 3 teams maximum for participation at a State Final where no Regional Final is in place. The participation of additional teams **MUST** be negotiated directly with REA Foundation Ltd.

In NSW and Queensland, all teams **MUST** participate in a **Regional Final** as their first level of competition. The location and timing of these can be found within the 'Events Calendar' tab of the F1 in Schools menu on the REA Foundation Ltd. website.

The best Cadet, Development Class, Professional Junior Class and Professional Senior Class teams from a Regional Final will be eligible to move forward to the State Final so long as they achieve the minimum 60% requirement as per ARTICLE C14.4 (1). Additional teams will be considered on a case by case basis on request to REA Foundation Ltd. by the Regional Hub Manager. **ALL** Regional Final results **MUST** be forwarded to REA Foundation Ltd. within 7 days of the completion of the competition event.

Teams will **NOT** be permitted to move forward to a State Final if they are **NOT** registered **prior** to a Regional Final. This is **NOT** negotiable and Regional Final Coordinators are responsible to ensure **ALL** teams are registered.

At State Finals, the Chair of Judges **MAY** combine the Professional Junior and Professional Senior Class teams into one overall Professional Class if representative numbers in these classes are five or less.

C2.1.2 National Final [Eligibility]

At each State Final, the champion Development, Professional Junior and Professional Senior Class teams and their supervising teachers (2 maximum) will be **invited** to represent their state at a National Final so long as they achieve the minimum 60% requirement as per ARTICLE C14.4 (1).

At National Finals, the Professional Junior and Professional Senior Class teams will be combined into one overall Professional Class.

REA Foundation Ltd. reserves the right to offer 'Wildcard' invitations to selected teams. The number and criteria for selection is at the discretion of REA Foundation Ltd. and is **NOT** necessarily based on final rankings. Teams receiving wildcard invitations will be notified in writing within 7 days of the conclusion of the State Final.

C2.1.3 World Final [Eligibility]

The Development Class and **overall** Professional Class National Champions and their supervising teachers (2 minimum) will be invited to represent Australia at the next World Final which is normally held within 8 months of the Australian National Final.

The **Development Class** National Champions will be required to form either an **international or internal collaboration**. The type of collaboration team formed will be determined by the Australian In-Country Coordinator (ICC). The maximum number of core team members allowable will be three (3) from each team participating in the Collaboration. The Australian In-Country Coordinator (ICC) will be responsible for identifying the overseas or Australian team with whom the Development Class Champions will partner.

The overall **Professional Class** National Champions will represent Australia as a '**stand-alone**' team of up to six (6) team members.

The ICC **MAY** offer up to two (2) 'wildcard' invitations to selected National Final teams. The number of wildcard positions available is determined by the World Final organisers but the criteria for selection is at the discretion of REA Foundation Ltd. and is **NOT** necessarily based on final rankings. Teams receiving wildcard invitations will be notified in writing within 7 days of the conclusion of the National Final. The structure of these teams **MAY** include internal or international collaboration arrangements.

ALL teams accepting selection for World Finals **MUST** sign an Participation Agreement prepared by REA. This is **NOT** negotiable.

C2.1.4 Returning World Final Teams

ANY World Final representative team wishing to return to the Australian Competition will be provided with automatic entry to the National Final immediately following the World Final so long as least 50% of the team membership remains in place. ARTICLE C2.3.11 does **NOT** apply. Team Registrations **MUST** be submitted by the due date and fees still apply.

C2.2 Cost of Participation

C2.2.1 State and National Finals [Advice]

In addition to ARTICLE C2.3.10 and the Team Registration fees outlined on the REA Foundation Ltd. website, teams and teachers are responsible for all costs associated with participating in the competition. This includes but is **NOT** limited to project costs, travel and accommodation and meals. Some meals **MAY** be provided to teams and teachers at National Finals.

C2.2.2 World Final [Advice]

World Final teams **WILL** be required to raise all sponsorship / funding required for travelling to and participating in the World Finals. Participation Fees are levied by the organisers of a World Final. Some government funding **MAY** be available to teams but it is the teams' responsibility to source and apply for this funding.

C2.3 Team & Project Entry Conditions

C2.3.1 Varying the Conditions [Advice]

REA Foundation Ltd. reserves the right to vary the Team & Project Entry Conditions where special circumstances exist.

C2.3.2 Team Membership [Eligibility]

Each team registered in the Australian competition **MUST** consist of the following minimum and maximum number of students. Mixed gender teams are encouraged.

C2.3.2.1 Cadet Class: 1 to 3 team members.

C2.3.2.2 Development: 3 to 5 team members.

C2.3.2.3 Professional: 3 to 5 team members.

C2.3.2.4 Collaboration Teams: 4 to 6 team members.

C2.3.3 Collaboration Teams [Eligibility]

These teams will **ONLY** be formed from State Final teams at the invitation of REA Foundation Ltd. for National Final events and will **NOT** include Cadet Class teams. A maximum of 2 schools can participate with balanced representation from each school.

C2.3.4 Supporting or Affiliate Team Members [Eligibility]

Supporting or affiliate team members are **NOT** permitted for **ANY** class or level of the Australian competition.

C2.3.5 Cadet Class Entry Requirements [Eligibility]

A student **MAY** compete in the Cadet Class multiple times so long as they have **NOT** competed in the Development or Professional Classes previously.

C2.3.6 Development Class Entry Requirements [Eligibility]

A student in the Secondary Division, **MAY ONLY** compete in the Development Class once and only if they have have **NOT** competed in the Professional class previously.

C2.3.7 Professional Class Entry Requirements [Eligibility]

C2.3.7.1 A team **MUST** be classified as a Professional Class Team (Senior or Junior) if it has **ANY** member who has participated in F1 in Schools previously in the Development or Professional Classes.

C2.3.7.2 A team **MUST** be classified as a Senior Professional Class Team if it contains **ANY** member who is in Year 10 or above.

C2.3.8 Multiple Class Entry Restrictions [Eligibility]

Individual students can **ONLY** compete in one competition class per event.

C2.3.9 Enrolled Full-time Students [Eligibility]

All team members **MUST** be enrolled as full-time primary/secondary students studying at school or TAFE or home schooled (at the time of the event) to be eligible to participate in National and World Final competitions. Exceptions will be made if World Finals are postponed to the year following the Australian National Final and representative team members have completed their schooling.

C2.3.10 Team Registration Conditions [Eligibility]

Each student team **MUST** be registered by their teacher for their first competition event by the prescribed date advertised on the REA Foundation web site. The REA Foundation Ltd. registration process **MUST** be followed and the entry fee received by REA Foundation Ltd before the competition date. Entry fees are non-refundable once processed. Fees **ONLY** apply to State and National Finals.

C2.3.11 Team Membership Changes [Eligibility]

Each team **MAY ONLY** make one change (i.e. add, subtract or substitute) to its membership when progressing to the next level of competition. REA Foundation Ltd will consider up to two team membership changes between a State and National Final when extenuating circumstances exist and upon written request to the Rules Committee.

C2.3.12 Changes to Team Classification [Eligibility]

When progressing from State to National Finals, teams **MUST** remain in the class in which they qualified. This includes the effects of changes to team membership. Teams **MAY** present a compelling case in writing to REA Foundation Ltd. for transfer to another class which will be considered and adjudicated on by the Rules Committee. Age eligibility criteria applies.

C2.3.13 Entered Cars [Eligibility]

Entered cars **MUST** be designed and produced during the current Challenge Season and the same car design **MUST NOT** be entered in more than one Challenge Season. (Teams developing cars for a World Final event **MUST NOT** enter these cars in Australian competitions.)

C2.4 Competition Procedural Regulations

C2.4.1 Submitting Documentation [Eligibility]

Each team **MUST** complete and submit ALL the relevant competition documentation as required by REA Foundation Ltd. within the stated timeframes. Some forms are signed electronically when teachers register teams. Others **MUST** be signed and uploaded to an REA provided Google Drive link prior to the event. All forms are downloadable from the **Resources/Competition Documents** tab of the F1 in Schools menu on the REA Foundation Ltd website. The following documents apply:

C2.4.1.1 Terms and Conditions Form [Eligibility]

This form constitutes an agreement between REA Foundation Ltd. and supervising teachers regarding participation by teams in State and National finals. The form is **electronically signed** by teachers when registering their teams on-line via the REA Foundation Ltd website. It is very important that teachers read this form before registering their teams.

C2.4.1.2 Media Consent Form (all classes) [Eligibility]

- One per student.
- Valid for the entire Australian Competition Season.
- Parent/Guardian signature required if student under 18 years.
- **MUST** be signed and submitted as per ARTICLES C2.9.2 and C2.9.3. Students failing to submit a signed Media Consent form by the published deadline will **NOT** be permitted to attend or participate at an REA managed final.

C2.4.1.3 Development Class Declaration Form [Eligibility]

This form is **electronically signed** by teachers when they register their Development Class team on-line. Teachers **MUST** be aware of and agree to the special conditions for Development Class teams before enabling the check box in the on-line registration form.

C2.4.1.4 Car Finishing Declaration Form (all classes) [Eligibility]

- One per team.
- New form **MUST** be signed and submitted for **EACH** event as per ARTICLES C2.9.2 & C2.9.3 by the published deadline.
- Team Manager and Teacher signature required.

C2.4.1.5 Grievance Form (all classes) [Advice]

- Submission is via an on-line form, a link to which will be provided on request.
- Completed **ONLY** if teams have a judging grievance.
- **MUST** be submitted by the published deadline.
- **MUST** be completed by the Team Manager **ONLY**.
- The Chair of Judges decision is **FINAL**.

C2.4.1.6 Student Code of Conduct Form (all classes) [Eligibility]

- One per team.
- Valid for the entire competition season.
- ALL student and teacher signatures required.
- Must be read by **ALL** team members at the point of team formation (including any subsequent membership changes) then signed and submitted as per ARTICLE C2.9.2 and C2.9.3.

C2.4.2 Event Check-in

C2.4.2.1 Team Attendance [Eligibility]

All teams **MUST** attend a team Event Check-in process, the timing of which will be published by REA Foundation Ltd. no less than one month prior to the State or National Final. At this check-in, teams will be issued with State or National Final accreditation, event programs and detailed welcome pack.

C2.4.2.2 Submitting Project Elements [Eligibility]

When checking in at State Finals and National Finals, each team **MUST** provide REA Foundation Ltd with minimum mandatory project elements as outlined in ARTICLE C2.10 Failure to provide the listed items **MAY** impact on a team's eligibility to compete and judging outcomes. Some project elements will require pre event electronic uploading on-line to an REA managed google drive by the published deadline as per ARTICLE C2.9, the link for which will be provided by event organisers. Teams **WILL** be required to have a Google account for this purpose.

C2.4.3 Team Uniforms

C2.4.3.1 Development & Professional Class Teams [Eligibility]

At State and National Finals, **ONLY** members of the official competing team are permitted to wear the team's uniform. No teacher, relative or supporter of a team or team member is permitted to wear a Team Uniform at State or National Finals.

C2.4.3.2 Cadet Class Teams [Eligibility]

Cadet Class teams **MUST** wear an official School Uniform.

C2.4.4 Collaboration Team Awards [Advice]

If a **collaboration** team wins an award at a National Final which involves a perpetual trophy, this **MUST** be shared between the team for the 12 months following the event. Award certificates will be duplicated for awards won by collaboration teams.

C2.5 Team responsibilities

C2.5.1 Australian Technical Regulations [Advice]

Teams **MUST** read the Australian Technical Regulations carefully to ensure their cars comply with those regulations.

C2.5.2 Australian Competition Regulations [Advice]

Teams **MUST** read the Australian Competition Regulations (this document) carefully to ensure that all project elements satisfy these regulations and that they understand the requirements and procedures for all aspects of the competition and judging.

C2.5.3 Attendance at Schedule Activities

C2.5.3.1 Team Representation Only [Eligibility]

During the competition, **ONLY** the official team members can represent the team at event check-in, trade display set up, verbal presentation, portfolio, marketing and engineering judging, specifications compliance feedback, critical rule rectification, racing and **ANY** direct communication with the Chair of Judges or Event/Competition Director concerning judging matters.

C2.5.4 All Team Members Required [Eligibility]

During the competition, it is the team's responsibility to ensure that **ALL** team members are present at the correct time and location for **ALL** scheduled activities.

C2.5.5 Trade Display Security [Advice]

Security of a team's Trade Display and its elements is the team's responsibility during competition. Teams are strongly advised to remove and secure any marketing or other items when they are away from their booth attending judging or other activities.

C2.6 Role and Responsibility of Supervising Teacher.

C2.6.1 Terms and Conditions Form [Advice]

All supervising teachers **MUST** carefully read and understand the terms and conditions for entry to the F1 in Schools State & National Finals events, and must have explained all relevant information within this agreement to their team/s.

C2.6.2 Other Documentation [Advice]

All supervising teachers **MUST** ensure **ALL** forms at ARTICLE C2.4.1, are completed and sent to REA Foundation Ltd. by the stated deadline otherwise teams **MAY** be ineligible to participate.

C2.6.3 Duty of Care by Schools & Teachers [Advice]

It is the primary responsibility of **ANY** event accredited supervising teacher to administer their school's duty of care / well-being, relevant to their education system's guidelines, for all their student team members, throughout the entirety of REA Foundation Ltd. managed events. **ANY** concerns arising during the event in relation to this **SHOULD** be brought to the attention of the F1 in Schools Event Director immediately. A school's Duty of Care cannot be transferred to a 3rd party such as REA Foundation Ltd.

C2.6.4 Standard of Care by REA [Advice]

REA Foundation Ltd. will do its utmost to administer a high 'Standard of Care' for teachers, students and members of the public through adherence with requirements of Workplace Health & Safety, Risk Management and Child Protection procedures. It will always strive to ensure the judging process is applied fairly and equally to each and every team attending our managed events.

C2.6.5 Attending Judging Sessions [Advice]

Where space permits and at the discretion of the Chair of Judges, **ONE** approved supervising teacher is permitted to observe (in the background) **ANY** judging activity with their team but **MUST NOT** interact in **ANY** way with the student team, judges or judging process. **ANY** incident considered inappropriate will be brought to the attention of the Chair of Judges. Teachers are to ensure **ALL** team members attend every judging session scheduled for their team.

C2.7 Team Partnerships / Collaborations

C2.7.1 Mentoring [Advice]

F1 in Schools teams are encouraged to develop mentoring partnerships/collaborations with businesses, industry or higher education organisations throughout their project.

C2.7.2 Student Work Only [Advice]

ALL design work, text and scripting for **ALL** project elements presented for assessment **MUST** be wholly undertaken and created by the team members and be their own original work. This includes **ALL** CAD and CAM data, Portfolio, Trade Display and graphical content.

The process of assembling the cars from manufactured components, purchased components and purchased sub-assemblies **MUST** be wholly undertaken by the team. The process of 'finishing' the cars **MUST** be wholly undertaken by the team.

C2.7.3 Documenting Partnerships in Portfolio [Advice]

Aspects of **ANY** partnerships with external individuals or organisations including **ANY** mentoring, sponsorship (financial and in-kind) and provision of services, **MUST** be represented in the team's Enterprise Portfolio. For project elements produced utilising some outside assistance, teams **SHOULD** be able to demonstrate to the judges, a high level of understanding of, and justification for **ANY** of the processes and services used.

C2.7.4 Purchased Project Elements [Advice]

Common sense will prevail for project elements or components that a team has purchased from a supplier, e.g. bearings, screw eye, display hardware. Teams **SHOULD** be able to explain and justify why a specific component was selected / purchased over other similar available components.

C2.8 REA Corporate Partner Logos, Word Marks & National Support

C2.8.1 REA Corporate Partner Logos [Advice]

Teams **MUST** include the REA Foundation Ltd. Corporate Partner logos in their project and failure to use some or all of the logos as required will be reflected in a team's marks in the relevant judging criteria. The logos and branding guidelines (where they exist) are available to download from the Resources tab within the F1 in Schools menu of the REA Foundation Ltd website and teams **MUST** be fully aware of the conditions outlined in these documents. The two levels of Corporate Partners are clearly identified within the downloadable file.

C2.8.1.1 Level 1 Corporate Partner Logos [Advice]

These **MUST** be applied to a team's cars, portfolio, trade display and uniform. Car decals for Level 1 REA Corporate Partners are supplied to teams immediately prior to the Submission process and **MUST** be applied to both Cars A & B[1] and optionally, on identical display cars. Teams are **NOT** permitted to produce their own corporate partner decals. Refer to ARTICLES T1.23 and T3.4 of the Technical Regulations.

C2.8.1.2 Level 2 Corporate Partner Logos [Advice]

These **MUST** be applied to a team's portfolio and trade display as a minimum.

C2.8.2 F1 in Schools™ In Country Logo [Eligibility]

Teams **MUST** use the F1 in Schools Logo with the IN-COUNTRY indicator. No other version of the logo is permitted.

C2.8.3 Formula One® Word Mark Restrictions [Eligibility]

No teams participating in the challenge are permitted to use **Formula One Word Marks** in their team name, logo, email address, domain name, and/or **ANY** social media handle. These Word Marks include: F1, Formula One, Formula 1, Grand Prix and F1 in Schools. Registered team names including **ANY** of these marks will be rejected.

C2.8.4 F1 in Schools™ & Department of Defence Logo Permitted Us [Eligibility]

Use of the F1 in Schools and Department of Defence logos outside of the STEM Challenge is **NOT** permitted and use of these logos within the 'Challenge' is **NOT** permitted on **ANY social media pages.** Use is restricted to project elements such as cars, portfolios, trade displays and team uniform. If using the F1 in Schools logo on Marketing or Sponsorship documents, the following statement **MUST** be included in those documents:

The F1 IN SCHOOLS Logo, F1, FORMULA 1, FIA FORMULA ONE WORLD CHAMPIONSHIP, GRAND PRIX and related marks are trademarks of Formula One Licensing BV, a Formula One group company. All rights reserved

C2.8.5 F1 in Schools™ Word Mark Permitted Use [Advice]

ANY team using the F1 in Schools Word Mark anywhere within their project **MUST** include the **Trade Mark** symbol in superscript form if using as a heading or sub-heading. This symbol is **NOT** required if used as body text.

1 Car B not applicable to Cadet Class

C2.8.6 F1® Word Mark Permitted Use [Advice]

When using the Word Marks F1®, Formula 1® and Formula One® they **MUST** be accompanied by the Registered symbol in superscript form as indicated if using as a heading or sub-heading. This symbol is **NOT** required if used as body text.

C2.8.7 Department of Defence National Support [Advice]

The Australian Government's Department of Defence has provided REA with financial support for F1 in Schools since 2008 and more recently SUBS in Schools since 2014. As the largest financial supporter of REA activities, the Department of Defence is already a supporter of your team, so please **DO NOT** approach them for **ANY** further financial support.

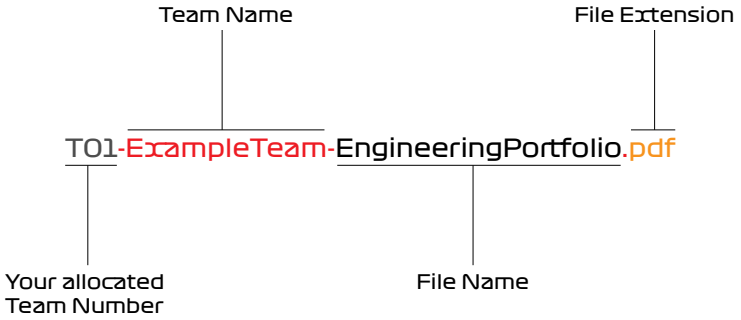
C2.9 Mandatory Project Elements Submission: Prior to Event

C2.9.1 Digital Upload via REA Google Drive [Eligibility]

Around two weeks prior to an event, teams will be emailed a unique link to a google drive folder that they will be required to upload their electronic data to. A deadline will be imposed around one week out from the event. Teams will require a google account for uploading of electronic project elements. Refer to C.2.9.2, C2.9.3 and APPENDIX 1 for a checklist of required elements.

C2.9.1.1 General Requirements [Eligibility]

- This requirement is in addition to the those in C2.10.
- Uploaded files **MUST** be a team's final versions they are submitting for judging.
- **ALL** files **MUST** be clearly labelled in accordance with the specified naming convention as depicted below. **Penalties apply.**



C2.9.1.2 File Formats & Size [Eligibility]

- Documentation **MUST** be submitted as separate **PDF** files no larger than 100mb. **Penalties apply.**
- CAD files **MUST** be submitted as **STEP** or **STP** files. **Penalties apply.**
- All car renders (maximum of 10 in total) **MUST** be submitted as high quality **PNG** files (maximum 10mb each) **Penalties apply.**

C2.9.2 Cadet Class Teams [Eligibility]

1. Poster outlining the Engineering Design process in PDF only
2. Engineering compliance drawing in PDF only
3. Car Finishing Declaration Form in PDF only
4. Media Consent Forms in PDF only
5. Student Code of Conduct Form in PDF only
6. Full Team Logo
    - 2MP minimum (2048x1024)
    - PNG, PSD or AI format (JPG format not accepted)
    - Transparent Background
    - RGB Colour space

7. Team Photo
    - Waist up picture
    - Good lighting
    - Standing at least 3 metres away from any background
    - Wearing team uniform if possible otherwise, school uniform
    - 6MP Resolution minimum (3072 x 2048)
    - PNG format

C2.9.3 Development and Professional Class Teams [Eligibility]

1. Enterprise Portfolio uploaded to Turnitin in PDF only
2. Engineering Portfolio uploaded to Turnitin in PDF only
3. Engineering Compliance Booklet in PDF only
4. High Quality Renders (10 maximum) in PNG format only
5. Testing Document in PDF only
6. ALL 3D CAD Files (including parts and assembly) in STEP or STP format only
7. Car Finishing Declaration Form in PDF only
8. Media Consent Forms in PDF only
9. Student Code of Conduct Form in PDF only
10. Full Team Logo
    - 2MP minimum (2048x1024)
    - PNG, PSD or AI format (JPG format not accepted)
    - Transparent Background
    - RGB Colour space
11. Team Photo
    - Waist up picture (if 4 or 5 members, position in 2 rows)
    - Good lighting
    - Standing at least 3 metres away from any background
    - Wearing team uniform if possible otherwise, school uniform
    - 6MP Resolution minimum (3072 x 2048)
    - PNG format

C2.10 Mandatory Project Elements Submission: At Event Check-in

C2.10.1 Cadet Class Teams

- One (1) complete F1 in Schools car with logo decals as per ARTICLE C2.8.1.1.
- One (1) x A2 poster **OR** two (2) x A3 posters outlining the Engineering Design process printed in hardcopy.
- Separate A3 size printed engineering compliance drawing/s for specification judging printed in hardcopy.

C2.10.2 Development and Professional Class Teams [Eligibility]

- Two (2) complete and identical F1 in Schools cars with logo decals as per ARTICLE C2.8.1.1
- Two (2) identical printed A3 Enterprise Portfolios, bound or in presentation folders, that have been downloaded with the similarity checking report from Turnitin once the deadline has passed.
- Three (3) identical printed A3 Engineering Portfolios bound or in presentation folders that have been downloaded with the similarity checking report from Turnitin once the deadline has passed.
- One (1) bound Engineering Compliance Booklet containing separate A3 size printed engineering compliance drawing/s for specification and CAD judging, and A3 size Photorealistic 3D render/s of car for CAD judging. Booklet **MUST** be bound when submitted.
- Three (3) optional, identical and printed A4 bound Testing Documents that outline the team's testing program.

C2.11 Digital Upload of Portfolios via Turnitin [Eligibility]

ALL State or National Final teams will be required to upload their **FINAL** Engineering and Enterprise Portfolios direct to Turnitin by a published deadline.

It is expected that teams will be uploading draft portfolios well before the deadline to check the document autheticity before uploading their final version.

To facilitate access to Turnitin, REA will contact teachers to request a team email if this has not been supplied as part of the Team Registration process. One **ONLY** valid team (not-teacher or individual student) email **MUST** be provided for each team.

Teams **MUST** use the REA generated Turnitin account for uploading of portfolios, **NOT** their school Turnitin accounts where they exist.

Note: Submitted portfolios are time-stamped by Turnitin. Any team found to have uploaded a portfolio after the published deadline will incur a penalty as per C2.12.1.

C2.12 Penalties

C2.12.1 Late Submission [Advice/Eligibility]

If Project Elements are not received by Re-Engineering Australia Foundation or via Turnitin on or before the required deadline, the following arrangments will be in place:

- Project elements submitted after the deadline will still be assessed/raced.
- Points and feedback will be allocated by judges and appear in the scorecards within team individual reports, however;

1. All points for all late elements will be removed for the purpose of calculating overall rankings and category awards; and
2. Teams submitting **ANY** late elements will **NOT** be eligible to progress to a National or World Final.

C2.12.2 File Size & Document Formats [20 Points]

A penalty of 20 points for each infringement will be applied to **ANY** submitted file for each judging category that:

- Exceeds the maximum files size as per APPENDIX 1.
- Are **NOT** submitted in the correct file format.
- Are submitted in an incorrect format and cannot be automatically read. REA and/or the judges will **NOT** take any steps to translate the files and the penalty still applies.
- Does **NOT** comply with the required file naming convention.

C2.13 Project Judging Elements Detailed Information

C2.13.1 Race Car/s

C2.13.1.1 Cadet Class [Advice]

Each Cadet Class team **MUST** produce one (1) F1 in Schools Car A complete with all corporate partner decals. The race car once submitted will be placed into Parc Ferme and **NOT** released for **ANY** other judging. It will be returned to the team at the conclusion of the event.

C2.13.1.2 Development and Professional Class [Advice]

Each Development and Professional Class team **MUST** produce a minimum three (3) identical F1 in Schools cars - Cars A & B complete with all corporate partner decals as well as a display car for exhibiting within the Trade Display and for other judging.

Cars A & B once submitted will be placed into Parc Ferme and **NOT** released for **ANY** other judging. The cars will be returned to the team at the conclusion of the event unless REA Foundation Ltd exercises the right to retain a car as per ARTICLE C2.14.

C2.13.1.3 Checking the Mass of Cars [Advice]

A Car with a mass that is below the minimum legal mass **WILL NOT** be accepted at submission - refer to Technical Regulations for minimum legal mass. Prior to submission, each team will be given the opportunity to check the mass of their cars on the official State or National Final REA scales. If the mass of either car being submitted is below the minimum legal mass, then the team will withdraw from the submission process to increase the mass of the car/s to at least the minimum legal mass by using **ONLY** the **legal ballasting** procedure – refer ARTICLE C10.1.9 ‘Legal Ballasting of Race Cars, in this document.

C2.13.1.4 Submission of Dry Cars [10pt Penalty]

Cars at submission **MUST** have a surface finish which is dry to touch.

C2.13.2 3D Photorealistic Render/s [Advice]

A hard copy of the 3D photorealistic render/s of the final car design **MUST** be submitted at event check-in. This is to be included in the bound Engineering Compliance Booklet of engineering drawings and clearly identified with the team name. Refer ARTICLE C2.10.2 and APPENDIX 1.

C2.13.3 Testing Document [Advice]

This optional document **SHOULD** provide evidence (virtual and physical) for the design decisions taken, including relevant data and analysis. This document will be provided to Engineering Judges.

C2.13.4 Portfolios [Advice]

Each Development and Professional Class team **MUST** submit A3 sized, well written and presented 'hard copy' Enterprise and Engineering Portfolios which should clearly summarise the team's key activities and key messages for assessment, evaluation, and event promotion. In addition to those submitted at event check-in, teams **SHOULD** produce additional copies for exhibiting within the team's Trade Booth and for Verbal Presentation if desired.

Portfolios can be presented as single or double sided printed sheets. If a Portfolio comprises more than the maximum allowable PRINTED pages, the Judges will only review content up to the prescribed limits as per ARTICLE C7.1.3.

C2.13.5 Trade Display [Advice]

Each team **WILL** be provided with a dedicated exhibition style space for set-up of their Display elements. Refer to ARTICLE C8 for further trade booth specifications, content requirements and information on what is provided for each class of competition.

C2.13.6 Verbal Presentation [Advice]

Teams **WILL** be required to deliver a verbal presentation in relation to their project to the Judges. The presentation **MUST NOT** last longer than ten (10) minutes. Teams **MUST** bring their own laptop with **ANY** slide show or other multimedia files that need to be shown as part of their verbal presentation. Teams **SHOULD** also have available their own VGA and HDMI cables to connect to a data projector/TV monitor. **ANY** team who needs a laptop for verbal presentation judging and is unable to bring one to a State or National Final **MUST** contact REA Foundation Ltd. (contact@rea.org.au) at least one month prior to the event. Refer to ARTICLE C9 of these regulations for details regarding presentation content and other requirements.

C2.13.7 Laptops for Judging [Advice]

Teams **MUST** bring fully charged laptops for identified judging elements as follows. If multiple teams from the same school are participating, more than one laptop **SHOULD** be brought to deal with situations where teams are being judged in the same time block. **ANY** team unable to bring a laptop to a State and National Finals event with CAD software installed **MUST** contact REA Foundation Ltd. (contact@rea.org.au) at least one month prior to the event in an effort to assist in finding a solution.

C2.13.7.1 Engineering Judging

A laptop with the CAD software used by the team and with all CAD part and assembly data **MUST** be brought to State and National Finals events. This will be needed during the engineering judging session so that the team can demonstrate their CAD work and better explain how they engineered their car design.

C2.13.7.2 Verbal Presentation

Teams wishing to run a slideshow or video as part of their Verbal Presentation **MUST** ensure they bring this on a laptop with their own VGA and HDMI cables available for connection to a data projector/TV monitor. Teams **SHOULD** ensure they are familiar with and adept at managing communication between their laptops and data projectors and TV monitors which will be provided by the organisers.

C2.13.8 Access to the Internet [Advice]

At Australian State and National Finals, every effort is made but no guarantee given, for teams to have access to the internet at their Trade Display and rooms where other judging is conducted. Teams are strongly advised to organise their own internet access via a portable wireless device.

C2.14 Project Elements to be Retained by REA Foundation Ltd. [Eligibility]

It is a condition of entry to Australian State and National Finals that each team permits REA Foundation Ltd. to retain 1 x race car, usually a nominated race car and 1 x printed Enterprise and Engineering Portfolio. Teams also permit REA Foundation Ltd. to use these project elements for marketing purposes and / or publication as exemplar projects for reference by others.

ARTICLE C3 - COMPETITION AND JUDGING FORMAT

C3.1 Event Programme [Advice]

An Event Programme outlining the timing and venue for all judging and competition activities will be formulated by REA Foundation Ltd. and provided to all teams at event check-in as well as being uploaded to the REA Foundation Ltd website.

C3.2 Judging Schedule

Each team will be judged as per the Judging Schedule. The Judging Schedule will be formulated by REA Foundation Ltd. to best and fairly accommodate all judging and other competition activities.

C3.2.1 Judging Session Timings [Advice]

Teams will rotate around judging activities as per this judging schedule, with each rotation usually of between 10 – 30 minutes in duration.

C3.2.2 Judging Streams [Advice]

The judging schedule will normally be divided into two or three parallel judging streams (Stream A, Stream B and Stream C), with each judging stream responsible for a class of competition. A number of strategies are implemented within the judging process, including judge briefings and judge reviews for cross-moderation, to ensure there is consistency across the judging streams, particularly where parallel streams exist within a class.

C3.3 Judging Panels [Advice]

REA Foundation Ltd. always makes every effort to select judges from industry and higher education institutions who have knowledge and experience relevant to the panel they will be judging on. All judging panels are fully briefed by the Event Director and/or the Chair of Judges prior to the start of the competition.

C3.4 Who attends Judging? [Eligibility]

ALL team members **MUST** attend every scheduled judging session as per the Judging Schedule except for Specifications Compliance Feedback if provided. At Specifications Compliance Feedback, the Team Manager, Design Engineer and Manufacturing Engineer **MUST** attend as a minimum. One supervising teacher **MAY** observe judging sessions as per the conditions set out in ARTICLE C2.6.5. This teacher **MUST NOT** directly approach or discuss **ANY** judging matters with the judges at **ANY** time unless invited to do so.

C3.5 Students with Special Needs [Eligibility]

In circumstances where a student has special needs and upon written application to REA Foundation Ltd. by the supervising teacher at least one month prior to a State or National Final, every effort will be made to accommodate the needs of the student.

C3.6 Judging Categories [Advice]

There are nine (9) main judging categories, each with its own team of judges – where possible - and specified judging activities as detailed in further articles.

- Specifications
- Engineering - CAD
- Engineering - Manufacturing
- Engineering - Design Process
- Portfolio – Project Management & Future Careers
- Portfolio - Design Clarity & Quality
- Marketing – Branding & Trade Display
- Verbal Presentation - Technique & Content
- Racing

C3.7 Point Allocations [Advice]

At State and National Finals, points will be awarded to teams across six (6) categories with maximum possible scores as detailed in the following table. Cadet Class is **NOT** relevant to the National Final.

Points Allocation Table			
	State Final		National Final
Specification	**Cadet Class**	**Dev. & Pro. Class**	**Dev. & Pro. Class**
Specification	80 points	80 points	80 points
Engineering	**Cadet Class**	**Dev. & Pro. Class**	**Dev. & Pro. Class**
CAD	N/A	70 points	70 points
Manufacturing	20 points	70 points	70 points
Design Process	40 points	70 points	70 points
Portfolio	**Cadet Class**	**Dev. & Pro. Class**	**Dev. & Pro. Class**
Project Management	N/A	100 points	100 points
Design	N/A	50 points	50 points
Marketing	**Cadet Class**	**Dev. & Pro. Class**	**Dev. & Pro. Class**
Branding	N/A	60 points	60 points
Trade Display	N/A	130[2] / 145 points	145 points
Verbal Presentation	**Cadet Class**	**Dev. & Pro. Class**	**Dev. & Pro. Class**
Technique	N/A	70 points	70 points
Content	N/A	95 points	95 points
Racing	**Cadet Class**	**Dev. & Pro. Class**	**Dev. & Pro. Class**
Grand Prix	60 points	150 points	150 points
Reaction Time	N/A	20 points	20 points
Knockout Racing	N/A	30 points	30 points
Total	**200 points**	**995 / 1010 points**	**1010 points**

C3.8 Judging Score Cards [Advice]

The REA Foundation Ltd State and National Finals judging score cards provide detailed information in relation to what the Judges will be looking for. They include key performance indicators which are referred to by the judges in awarding points during judging activities. These can be found in the Appendices at the end of this document. **Reading the score cards carefully is important as they provide critical information for teams as to what needs to be presented for each judging category.**

C3.9 National Champions – Professional Class [Advice]

The **Cummins Golden Turbo** F1 in Schools™ National Champions perpetual trophy will be awarded to the Professional Class team with the highest total score - sum of all judging categories (ARTICLE C3.7). In the case of a tied points score, the team with the highest Grand Prix score will be determined the winner. **The Chair of Judge's decision is final.**

C3.10 Critical Regulations [Advice]

C3.10.1 Non Compliance

Technical Regulations attracting time penalties have been identified as being **critical regulations.** If following specifications compliance **AND** time given to rectify **ANY** infringement (Refer ARTICLE C4.1.4.2), a team's Car A or B[2] is judged as being **NON-COMPLIANT** with **ANY** critical technical regulation, they will be **INELIGIBLE** for the following awards:

- Best Engineered
- Best Engineering CAD
- Best Manufactured Car

C3.10.2 The critical Technical Regulation articles are:

T3.5 / T3.6 / T3.9.1 / T4.1 / T4.2 / T4.4 / T4.6 / T6.2.1 / T6.2.2 / T6.7 / T6.12

T6.13 / T6.14 / T7.1 / T7.2 / T7.3 / T7.4 / T7.7 / T7.8 / T7.9 / T8.3 / T9.6 / T10.4 / T10.7

Note well: Article numbers are from the 2021 Australian Technical Regulations. Please take extra time to check your cars don't break **ANY** of the above critical Technical Regulations.

2 Applicable to Development Class teams at State Finals only.

ARTICLE C4 - SPECIFICATIONS JUDGING (80 points)

C4.1 General Information

C4.1.1 Competition Class Provisions

Specifications judging is conducted for ALL competition classes.

C4.1.2 What will be Assessed?

Specification judging is a detailed inspection process where BOTH Car A & B[3] race cars are assessed for compliance with the F1 in Schools Australian Technical Regulations. Refer to the specification judging score card for scoring details.

C4.1.3 Team Preparation

Teams **MUST** ensure that their Car A & B[3] are complete and ready for specification judging before they are submitted. Notice is also drawn to the critical technical regulations, refer ARTICLE C3.10. Teams **MUST** have also submitted a bound, hard copy of their Engineering Compliance Booklet. Refer ARTICLES C2.9. and C2.10.

C4.1.4 Judging Process / Procedure

Teams begin specifications judging with a full allocation of 80 points. **ANY** infringements of the Technical Regulation articles, on either car, will result in point's being deducted as detailed in the Technical Regulations. There are two parts to the specification judging process.

C4.1.4.1 Specifications Compliance Judging

This is conducted within the confines of parc fermé, where the Scrutineers will check both cars for compliance to the Technical Regulations. A series of specially manufactured gauges will be used to broadly check compliance. Accurate measuring tools, such as Vernier callipers will then be used to closely inspect **ANY** dimensions found to be near to dimensional limits per the initial gauge inspection. Specifications compliance checking **MAY** commence as cars are submitted at event check-in.

C4.1.4.2 Rectifying Critical Regulation Failure

Teams that have been judged during initial specifications compliance to have incurred a critical regulation failure through non-compliance with a Technical Rule attracting a Time Penalty, **WILL** be provided with a special 20-minute car service time, prior to the commencement of racing. If during this service time the car can be modified so as to comply with the failed regulation/s, the Time Penalty/ies **WILL** be removed without being classified as having incurred a critical regulation infringement. However, the points' penalty **WILL** still apply.

Teams are advised to bring their own tools and measuring devices for rectification. REA will **NOT** provide these items.

Specifications Compliance Feedback

Where time permits, each team **WILL** be scheduled a period of time for a review of **ANY** specification infringements ruled. This will generally be conducted at a team's Trade Display or in the case of Cadet Class teams, other area identified in pre-competition event documentation. The Lead Scrutineer will highlight to the team **ANY** technical regulation infringements and provide necessary explanations.

The team is then given an opportunity to explain to the Judges why they feel **ANY** identified infringements **SHOULD** be considered as permissible.

Following the team's explanation, the Lead Scrutineer **MAY** choose to reverse the original decision or uphold it. No further discussion will then be permitted at that point. Teams **MAY** lodge a Grievance as per ARTICLE C2.4.1.6.

C4.2 Specification Judging Decision Appeals

Teams **MAY ONLY** appeal the specification judges' decision if they believe their justification for regulation compliance **SHOULD** be accepted. The procedure for submitting technical regulation infringements is outlined in ARTICLE C12.

3 Car B not applicable to Cadet Class

ARTICLE C5 - ENGINEERING JUDGING (210 points)

C5.1 General Information

C5.1.1 Competition Class Provisions

- **Engineering CAD** and the full range of **Manufacturing** judging is conducted for the Development and Professional competition classes **ONLY**.
- **Quality of Finished Product** are the **ONLY** elements of **Manufacturing** judging conducted for the Cadet Class.
- **Engineering Design Process** judging is conducted for ALL competition classes.

C5.1.2 Team Preparation

C5.1.2.1 CAD & Manufacturing Judging

A laptop with the CAD & CAM/CNC software used by the team and with all CAD part and assembly data **MUST** to be taken to engineering judging. (Refer ARTICLE C2.13.7.1). Other items **MAY** also be taken to help the team explain **ANY** engineering or concepts. The engineering judges will **NOT** have access to the team Trade Display for judging purposes. Preparation **SHOULD** include careful reading of the score card. The key performance indicators describe what the judges will be looking for.

C5.1.2.2 Engineering Design Process Judging

- **Cadet Class** teams **SHOULD** succinctly document their Design Process on one (1) A2 poster or two (2) A3 posters.
- **Development and Professional Class** teams **SHOULD** thoroughly document their Design Process in the Engineering Portfolio.

C5.1.3 Judging Process / Procedure

C5.1.3.1 CAD & Manufacturing Judging

CAD & Manufacturing will be judged via scheduled judging interview sessions that will focus on the Key Criteria. These are informal interviews where Judges will ask teams to **demonstrate** their CAD and CAM/CNC work and query them on what they have done. This will be supported by secondary evidence contained within a team's Engineering Portfolio.

C5.1.3.2 Engineering Design Process

Engineering Design Process will be judged from the information documented in the Cadet Class **Poster** or **Engineering Portfolio** of the Development and Professional Class teams'. Teams will be awarded points as per the key performance indicators shown on the Engineering Design Process score card/s.

C5.2 Key Criteria

C5.2.1 CAD (70 points)

Refer to the Engineering CAD judging score card for key performance indicator information. Note: CAD judges are **NOT** provided with a copy of a team's Engineering Portfolio.

C5.2.1.1 What will be assessed?

The engineering judges will assess the team's use of CAD technologies, analysis, rendering, technical merit as well as comparing the CAD model with the finished product. Specific areas to be assessed are:

- Application of CAD
- CAD Organisation
- CAD Based Analysis
- Overall Design Technical Merit
- CAD Model vs Finished Product
- Orthographic (A3 bound Engineering Compliance Booklet)
- Rendering (A3 bound Engineering Compliance Booklet)

C5.2.2 Manufacturing (70 points)

Refer to the Engineering Manufacturing judging score card/s for key performance indicator information.

C5.2.2.1 What will be assessed?

The engineering judges will assess the team's use of CNC and other technologies and the overall technical merit when manufacturing their car body and other components. Specific areas to be assessed are:

- Application of CAM/CNC
- Manufacturing process car body
- Manufacturing process other components
- Tolerancing / Quality Control
- Overall Manufacturing Technical Merit
- Quality of Finished Product - Geometry/Form
- Quality of Finished Product - Surface finish

C5.2.3 Design Process (70 points)

Refer to the Engineering Design Process judging score card/s for key performance indicator information.

C5.2.3.1 What will be assessed?

The engineering judges will assess the team's Design Process which includes all stages from identifying the requirements of the brief through to the final design. Specific areas to be assessed are:

- Requirements Analysis
- Ideas[4]
- Development
- Analysis[4]
- Physical Testing
- Evaluation[4]
- Overall Design Technical Merit[4]

ARTICLE C6 - POSTER JUDGING (40 points) – Cadet Class only

C6.1 General Information

C6.1.1 Competition Class Provisions

Applies to Cadet Class teams **ONLY**

C6.1.2 Who Should Attend?

The presence of Cadet Class team members at State Finals is **optional**. If attending these events, team members **SHOULD** make themselves available for discussion if called upon by the judges.

C6.1.3 Team Preparation

Teams **SHOULD succinctly** document their Engineering Design Process on one (1) A2 poster or two (2) A3 posters. Preparation **SHOULD** include careful reading of the score card. The key performance indicators describe what the judges will be looking for. Lamination of posters is recommended.

C6.1.4 Judging Process / Procedure

The Engineering Design Process will be judged from the information documented in the poster. This **MAY** be supported by a verification interview of team members adjacent to the area where posters are displayed. Teams will be awarded points as per the key performance indicators shown on the Engineering Design Process score card for this class.

This is an informal interview where Judges will ask the team to clarify and/or verify the information presented in the Poster. **Note** that Cadet Class teams do **NOT** have a pathway to the Australian National Final.

4 Cadet Class teams ONLY assessed for these KPI's

C6.2 Key Criteria

C6.2.1 Engineering Design Process (40 points)

Refer to the Engineering Design Process judging score card for key performance indicator information.

C6.2.1.1 What will be assessed?

The engineering judges will assess the **CADET** team's Design Process which includes all stages from identifying the requirements of the brief through to the final design. Specific areas to be assessed are:

- Ideas
- Analysis
- Evaluation
- Overall Design Technical Merit

ARTICLE C7 - PORTFOLIO JUDGING (130 points)

C7.1 General Information

C7.1.1 Competition Class Provisions

Applies to the Development and Professional Class teams **ONLY**.

C7.1.2 Team Preparation

Each team **MUST** prepare an Enterprise and Engineering Portfolio as per ARTICLE 2.13.4. A team's Portfolios tell the story of the team's journey including the knowledge and skills they have acquired along the way. It is considered a professional business document so attention to detail is paramount. Most importantly, teams need to read the Portfolio judging score cards carefully to ensure that all areas to be assessed are included within the context of their Portfolios.

C7.1.3 Portfolio Structure

Due to new arrangements for portfolios at National Final events and the requirement for team portfolios to be self-checked through Turnitin's authenticity software, it is anticipated teams **WILL** need to better address the requirement for referencing content to avoid penalties.

ALL teams using the **'ENDNOTE'** method of referencing **ONLY** will be provided with one extra page in their Engineering and Enterprise Portfolios to facilitate this arrangement. The only content on this extra page is to be the reference list.

Each Portfolio **MUST** be clearly labelled as either Enterprise or Engineering with the team name. To streamline the judging of team Portfolios, teams **MUST** structure this as **TWO** separate documents each containing the following number of pages:

C7.1.3.1 State Finals

1. Development Class
   - 7 Pages (including front cover) using Footnote Method
   - 8 Pages (including front cover) using Endnote Method
2. Professional Class
   - 11 Pages (including front cover) using Footnote Method
   - 12 Pages (including front cover) using the Endnote Method

C7.1.3.2 National Final

1. Development Class
   - 11 Pages using Footnote Method
   - 12 Pages using the Endnote Method
2. Professional Class
   - 11 Pages using Footnote Method
   - 12 Pages using the Endnote Method

Portfolio Design elements will be assessed throughout the teams' **entire** two Portfolios. For more information on the **suggested page content** of the Portfolios, refer to the relevant scorecards and APPENDICES 5 and 6.

C7.1.3.3 Enterprise Portfolio

- Project Management
- Marketing
- Skill Development & Linking Skills with Careers

C7.1.3.4 Engineering Portfolio

- Engineering Design Process

C7.1.4 Judging Process / Procedure

The Portfolios will be assessed behind closed doors which is conducted during the course of the finals event. For some key criterion, this will be supported by a verification interview of team members at the Trade Display or other area identified in pre-competition event documentation. Teams **SHOULD** have a copy of their Portfolios on their Trade Display at all times. Teams are required to submit electronic versions prior to a published deadline, as well as several hard copies of their Portfolios at Event Check-in for assessment by judges. Failure to submit the required number and correct Portfolio size will result in penalties being applied.

C7.1.5 Referencing

"Accurate referencing is important in all academic work. As a student you will need to understand the general principles to apply when citing sources and take steps to avoid plagiarism.

Referencing is the process of acknowledging the sources you have used in writing your essay, assignment or piece of work. It allows the reader to access your source documents as quickly and easily as possible in order to verify, if necessary, the validity of your arguments and the evidence on which they are based.

By referring to the works of established authorities and experts in your subject area, you can add weight to your comments and arguments. This helps to demonstrate that you have read widely, and considered and analysed the writings of others

Good referencing is essential to avoid any possible accusation of plagiarism."[5]

C7.1.6 Plagiarism

"Plagiarism is a term that describes the unacknowledged use of someone's work. This includes material or ideas from any (published or unpublished) sources, whether print, web-based (even if freely available) or audiovisual. Using the words or ideas of others without referencing your source would be construed as plagiarism and is a very serious academic offence. At the end of the day, it is regarded as stealing intellectual property."[5]

From 2020, **'Turnitin',** an integrated originality checking and feedback service, will be used to check for authenticity of content in all teams' state and national final portfolios.

Content in team portfolios found to have been plagiarised, will not be assessed as part of the judging process resulting in **zero marks** for the relevant criteria.

C7.1.7 Turnitin Procedures for Portfolios

Plagiarism detection software 'Turnitin' **WILL** be used to check the authenticity of content in all teams' State and National Final portfolios.

Unreferenced content in team portfolios **WILL** be deemed to have been plagiarised and **WILL NOT** be assessed as part of the judging process resulting in zero marks for the relevant criteria.

State and National Final teams **WILL** be given free access to this software to upload their portfolios and make required changes based on a report of results provided by Turnitin. Multiple uploads can be made to check the authenticity of content in team portfolios.

Judges **WILL** be provided with a report generated by Turnitin based on the content of the **FINAL** version teams upload by the submission deadline.

C7.1.7.1 Turnitin Document Requirements

Teams need to be aware of the following conditions for uploading portfolios to Turnitin.

- File format **MUST** be PDF as required by REA.
- File size must **NOT** exceed 100mb
- PDF files **MUST** be editable and not a 'scanned' PDF.

5 https://www.macmillanihe.com/studentstudyskills/page/Referencing-and-Avoiding-Plagiarism/

Notes

1. PDF documents **MUST** contain text to be submitted. PDF files containing only images of text will be rejected during the upload attempt. To determine if a document contains actual text, copy and paste a section or all of the text into a plain-text editor such as Microsoft Notepad or Apple TextEdit. If no text is copied over, the selection is not actual text.
2. Teams **MUST** include the new Turnitin logo within their project as per the conditions for Level 2 Corporate Partner Logos outlined in the Australian Competition Regulations. This logo is available for download from the REA website at https://rea.org.au/f1-in-schools/resources/

C7.1.8 Portfolio Penalties

The Chair of Judges reserves the right to apply penalties for teams who:

- **DO NOT** submit the correct number of hard copies required for judging **[10pt Penalty]**
- **DO NOT** provide hard copies in the mandated A3 size **[10pt Penalty]**
- **DO NOT** structure their Portfolio as per C7.1.3.3 and C7.1.3.4 **[10pt Penalty]**

C7.2 Key Criteria

C7.2.1 Project Management & Linking Skills With Careers (100 points)

Refer to the Portfolio score card for detailed point scoring and key performance indicator information. There will be **NO** verification interview required for this key criteria.

C7.2.1.1 What will be assessed?

Project Management **MUST** be contained within each team's Enterprise Portfolio in order to assess the following specific areas.

- Team Roles & Tasks
- Scope
- Time Management
- Finance
- Risk Management
- Internal Communication
- Stakeholder Engagement
- Skill Development for Future Careers
- Evaluation

C7.2.2 Portfolio Design (50 points)

Refer to the Portfolio score card for detailed point scoring and key performance indicator information. There will be **NO** verification interview required for this key criterion.

C7.2.2.1 What will be Assessed?

Judges will review each team's **two** Enterprise and Engineering Portfolios in order to assess the following specific areas.

- Production Quality of Materials
- Production Quality of Content
- Content Organisation
- Layout Design
- Typography
- Photos & Images
- Creative Graphics (Visual effects and infographics)
- Editing/Proofreading
- Referencing/Plagiarism
- Writing & Readability

ARTICLE C8 - MARKETING JUDGING (190[6] /205 points)

C8.1 General Information

C8.1.1 Competition Class Provisions

Applies to the Development and Professional Class teams **ONLY**.

C8.1.2 Team Preparation

Each team **MUST** prepare an Enterprise Portfolio as per ARTICLE C2.13.5 and a Trade Display as per ARTICLE C2.3.4. Some **Branding** elements **MUST** be contained within each team's Enterprise Portfolio. Others will be assessed within a team's Trade Booth. Read the **Marketing** Score Cards carefully to ensure that all areas to be assessed are included within the context of their Portfolio and Trade Display.

C8.1.3 Judging Process / Procedure

The Branding and Trade Display criteria from the Marketing Score Card will be assessed primarily within the Trade Display with secondary evidence on logo development assessed from within a team's Enterprise Portfolio. The Judges will introduce themselves then ask questions to help them find certain content and/or seek further explanation. Teams **SHOULD** have a copy of their Enterprise Portfolio on their Trade Display at all times. Teams **MAY** be asked to step away from the Trade Display so judges can gain first impressions and concur before asking them to return to their Display.

C8.2 Key Criteria

C8.2.1 Branding (60 points)

Refer to the Marketing score card for detailed point scoring and key performance indicator information.

C8.2.1.1 What will be assessed?

The Marketing judges will assess a team's **branding** primarily within their **Trade Display.** As a secondary source of evidence, the judges will also access a team's **Portfolio** to assess logo development. Specific areas to be assessed are:

- Team Name
- Logo Development
- Final Logo Design
- Logo Application
- Team Branding
- Media Exposure
- Team Sponsors & REA Corporate Partner ROI
- Team Uniform
- Team Presence
- Team Knowledge

C8.2.2 Trade Display (130 / 145[7] points)

Refer to the Marketing score card for detailed point scoring and key performance indicator information.

C8.2.2.1 Competition Class Restrictions

In addition to the general regulations governing Trade Displays, Development Class teams **MUST** also comply with class restrictions as defined in APPENDIX 2 for State Finals.

C8.2.2.2 What will be assessed?

A Trade Display is to visually 'sell' the team's most important key messages in snapshot form for assessment and event promotion. The Marketing judges will assess a team's trade display content and structure.

6 Development Class Trade Display points for State Finals do not include Criteria 8.6 Structural Design

7 Not applicable to the Development Class at State Finals

Specific areas to be assessed are:

- Trade Display Design Development
- Car Display
- Information Design
- Use of ICTs
- Visual Design & Impact
- Structural Design[8]
- Materials Selection & Use
- Sustainability
- Packaging Restrictions

C8.3 Trade Display Design Requirements

Develop a 'Design Brief' that charts your team's creative approach, design considerations (space, purpose), transport limitations (cost and assembly constraints) and environmental impact to comply with the regulations, inform judges and justify your decisions with the following in mind:

C8.3.1 Costs

Determine a budget and stick to it. Seek sponsorship of cash or donations of display elements. Consider ways of reducing costs through reusing and recycling structural elements.

C8.3.2 Research

Research Innovative ideas and current trends online and/or seek a mentor in this space.

C8.3.3 Scorecard Criteria

Read carefully the Trade Display scorecard, Set Up and conditions within this document.

C8.3.4 Design Considerations

The Trade Display serves two primary functions:

1. Externally showcase the team's key messages
2. Internally store a team's assets such as bags, tools and consumables.

With this in mind, use 3D CAD to create a digital mock-up with consideration for:

C8.3.4.1 Dimensions

Recommended maximum internal build dimensions of provided booth shell/backboard.

C8.3.4.2 Portability

Think flat-pack, modular, lightweight, pop-up, for ease of set-up and transportation.

C8.3.4.3 Sustainability

Reuse and recycle, particularly frameworks that can be reconfigured with new stretch or re-attachable banner materials.

C8.3.4.4 Materials

Consider fabric/textile options which are easier to transport, less prone to damage and more environmentally friendly as opposed to corflute/vinyl equivalents.

C8.3.4.5 Storage

Design options for storage of bags, tools and top-up Marketing materials, as well as hide electrical cables and powerboards

C8.3.4.6 Lighting

Incorporate lighting to accentuate design features and brighten key areas of your exhibit such as product displays and promotional materials.

C8.3.4.7 Shelving

Use shelves to attractively organise products

8 Not applicable to the Development Class at State Finals

C8.4 Set Up

C8.4.1 Stage

From 2020, **ALL** teams are required to comply with new packaging restrictions for **ALL** trade display items brought into State and National Final event venues:

C8.4.1.1 All Team Elements

ALL team elements including structural components, banners, display items (e.g. show car, portfolio), electrical and electronic items, marketing items including give-aways and consumables, and tools and fasteners required to assemble the trade display but excluding ladders and uniforms, **MUST** be 'staged' in the booth shell. Non team members **MAY** assist with lift and carry only.

All staged items **MUST** be brought into the event venue wholly contained within sealed or closed boxes, cartons, containers, cases or tubes.

C8.4.1.2 Maximum Size of Items

To align with standard domestic and international, air and road freight maximum dimensions, no one item can be larger than:

- Boxes/Cartons/Containers/Cases: 1200mm x 600mm x 600mm[9]
- Tubes: 110mm in diameter[9] (containing only posters)

C8.4.1.3 Combined Maximum Volume of Packaged Items

When staged in the booth shell, **ALL** items **MUST** fit within a maximum volume of 1940mm x 1000mm x 1000mm. See APPENDIX 4 for futher information. Non team members **SHALL NOT** assist or direct with the staging/placement of packaged items within the booth shell.

C8.4.1.4 Forklifts

No forklifts or other material handling equirpment will be provided at State and National Finals by REA or the venue.

C8.4.2 Assemble

C8.4.2.1 Timing

A time period will be scheduled for teams to assemble their Trade Displays within the provided booth shell scheme arrangement, usually after event check-in and prior to the commencement of judging. Assembly will be conducted by all teams in accordance with the published schedule. A time limit of two (2) hours maximum for each team will be enforced to avoid penalties.

C8.4.2.2 Team Members Only

Non team members are **NOT** permitted to assist teams with the staging or assembly of Trade Displays. All displays **MUST** be designed so that adult assistance is **NOT** required for assembling. This includes power, lighting and height issues. Step or full size ladders will **NOT** be provided, therefore teams need to factor this in to their assembly requirements if they cannot supply their own. All adults (excluding officials and judges) **WILL** be required to remain out of the venue where Trade Displays are located until the setup is complete.

C8.4.3 Booth Shell Scheme Information

All team booth shell systems will include 1 x 240-volt power supply but teams will need to provide their own power boards, if required, which **MUST** have a valid electrical safety test tag. At National Finals **ONLY**, each provided booth shell will also contain integrated lighting and fascia's.

C8.4.3.1 Development Class

At State Finals, Development Class teams will be provided with back boards **ONLY**, along with a trestle style table. Use of the trestle table by Development Class teams is compulsory and teams are required to provide their own table coverings.

For all dimensions, refer APPENDIX 3.

At **National Finals,** Development Class team trade displays arrangements will be as per Professional Class teams.

9 Tolerance of 50mm applies

C8.4.3.2 Professional Class

At State and National Finals, REA Foundation Ltd. will provide each **Professional Class** team with a self-contained booth shell scheme, exhibition style display space. Dimensions vary depending on the type of shell scheme provided and the quality of build supplied. In addition, the dimensions can vary between end booths sharing one side wall and internal booths sharing two side walls.

For all dimensions, refer APPENDIX 4.

C8.4.4 Conditions

Teams **MUST** comply with the following conditions:

- Development Class Teams **MUST** adhere to restrictions regarding Trade Displays for State Finals. Refer APPENDIX 3.
- Each teams' booth shell **SHOULD** be fully fitted out for judging at the end of the 2hr setup whereupon photos will be taken. **NO** other items can be added to the trade display (excluding top-up marketing items) from this point forward and penalties will be applied for teams breaching this rule.
- REA Foundation Ltd. will instruct teams to remove or alter **ANY** display inclusions considered to be a safety hazard or inappropriate, including rubbish, bags etc. which are **NOT** part of the display. **NO** part of the team's completed trade display is allowed to protrude beyond the physical dimensions of their allocated space. This includes anything that might protrude above the display space highest point e.g. flags, banner, balloons. Teams **WILL** be required to remove items infringing this rule and penalties will apply.
- Teams **MAY** provide their own display internal walls and tables/cabinets so long as they strictly fit within the booth shell system provided. **NO** part of a team's substitute internal walling system can encroach beyond or above the walls of the booth shell system provided by the competition organisers and systems **MUST** be designed so that **NO** part of the provided booth shell system (including the fascia framework) requires dismantling.
- Teams **MUST NOT** play sounds or music at their Trade Display at a loud volume. **ANY** sound or music played **MUST** be strictly relevant to the project such as commentary on a video produced by the team and **NOT** just for 'entertainment' value.
- Chairs are **NOT** permitted in or near the displays unless it is a chair/stool specially designed for the display, and this **MUST** sit within the volume of the booth shell's external dimensions.
- Booth shells will be pre-allocated to teams by the event organisers. Teams **MUST** use the booth shell allocated and booth shell walling cannot be repositioned by **ANY** team unless there is an obstruction or issue of WHS and this **MUST** first be approved by the Competition Director or Chair of Judges.
- At National Finals teams **MUST** design their trade displays to fit within the supplied booth shell without requiring the removal of the booth fascia. Removal of the fascia will incur a penalty. See ARTICLE C8.4.5.
- From arrival at the competition venue until the official Trade Display Assembly Period, teams are **NOT** permitted to pre-construct nor assemble **ANY** part of their Trade Display anywhere within the premises of the competition venue including **ANY** venue car park.
- Trade Displays **MUST** be manned by at least one team member at all times excluding judging sessions. When a team is undertaking a judging session, the teacher or a supporting adult **SHOULD** supervise the trade display to ensure security. Note that competitions are generally open to the public.
- Trestle tables are **NOT** to be sat upon as they are **NOT** built for this. **ANY** damage to booth shell systems or provided trestle tables **MUST** be paid for by the team or their school.
- Workplace health and safety measures **MUST** be considered when teams are working at heights on their Trade Display.
- **ANY** electrical appliance (including power boards and extension cords) connected to the power supply **MUST** have a valid electrical safety test tag.

C8.4.5 Trade Display Penalties

The Chair of Judges reserves the right to apply penalties for teams who:

- **DO NOT** comply with Development Class restrictions at State Finals **[10pt Penalty]**
- **DO NOT** complete their set-up within the 2hr time limit **[10pt Penalty]**
- **DO NOT** leave their stand in a safe state **[10pt Penalty]**
- **DO NOT** clear their pit and surrounding area of all rubbish **[10pt Penalty]**
- **DO NOT** contain their display within the display volume **[10pt Penalty]**
- **DO NOT** comply with added content restrictions **[10pt Penalty]**
- **DO NOT** design their display to enable fit-out without removal of fascia **[10pt Penalty]**
- Construct **ANY** part of their display at the venue prior to scheduled build **[10pt Penalty]**
- **DO NOT** comply with **ALL** packaging restrictions **[50pt Penalty]**

ARTICLE C9 - VERBAL PRESENTATION JUDGING (165 points)

C9.1 General Information

C9.1.1 Competition Class Provisions

Applies to Development and Professional Class teams **ONLY.**

C9.1.2 Who needs to attend?

All team members **MUST** be present at and contribute to the Verbal Presentation.

C9.1.3 Judging Process / Procedure

Verbal presentation judging is scheduled for the same duration as other judging sessions, usually 20 – 30 minutes. Teams will be given 5 minutes at the start of their time to set-up and test their laptop and **ANY** other presentation technologies and resources. The team will inform the judges when they are ready to begin. The judges start timing the 10-minute duration and will provide a discreet time warning signal when one minute of presentation time remains. The team will be asked to cease presenting when the time limit has been reached. At the conclusion of the team's presentation time, the judges **MAY** choose to provide some feedback and / or ask **ANY** clarifying questions they feel necessary. However, assessment can **ONLY** be based on the team's 10-minute presentation. Verbal presentations **MAY** be filmed for judge's review or promotional and future resource purposes.

C9.1.4 Team Preparation

Each team is required to prepare a verbal presentation as per the requirements at ARTICLE C2.13.6. **ANY** multimedia content, slides etc. **MUST** be saved on and shown using the team's own laptop along with VGA and HDMI cables. Teams need to have all presentation resources tested and ready for verbal presentation judging. Most importantly, teams **SHOULD** read the verbal presentation judging score card carefully to ensure their presentation features all elements and content that the verbal presentation judges will be looking for.

C9.1.5 Verbal Presentation Judging Provisions.

REA Foundation Ltd. will provide a dedicated private space, such as a small meeting room, where each team will deliver their presentation to the judges. This space will include a data projector and screen or large TV monitor. Multimedia sound systems **MAY NOT** always be available and teams **MAY** have to bring their own portable speakers. If available these will be in fixed positions but usually with sufficient cable length to allow teams some freedom for choosing where they wish to locate their laptop. A single table will also be made available with its use and location in the presentation space being optional.

C9.1.6 Verbal Presentation Video Recordings

The verbal presentations of all teams **MAY** be video recorded by the REA Foundation Ltd. for the purpose of judging review and / or post event publicity and promotional purposes for F1 in Schools.

C9.2 Key Criteria

C9.2.1 Technique (70 points)

Refer to the Verbal Presentation score card for detailed point scoring and key performance indicator information.

C9.2.1.1 What will be assessed?

- Presentation Energy
- Team Contribution
- Visual Aids
- Audience Engagement
- Articulation
- Structure
- Use of Time

C9.2.2 Content (95 points)

Refer to the Verbal Presentation score card for detailed point scoring and key performance indicator information.

C9.2.2.1 What will be assessed?

- Team Objectives
- Description of Car Product
- Innovation
- Refinement
- Collaboration
- Learning Outcomes
- Future Career Aspirations and Research
- Overall Clarity

ARTICLE C10 - RACING (200 points)

C10.1 General Information

C10.1.1 Competition Class Provisions

Racing applies to ALL competition classes.

C10.1.2 Launch / Timing System

At State and National Finals, the official Denford or Pitsco F1 in Schools Race System (whichever is available), will be used for launching cars, timing races and driver reaction times to 1/1000th of a second. Where possible, teams **SHOULD** be familiar with the operation of these Race Systems.

C10.1.3 Official REA Foundation Ltd Race Track

At State and National Finals, REA Foundation Ltd. Will use the official REA Foundation Ltd or Denford Elevated Race Track (whichever is available), the length of which is approximately 24 -25 metres. A ‘thermally fused braid’ tether line of diameter 0.2 mm and fixed at the track end, passes down the centre of each lane. At the start of the track, the line passes through 90 degrees over a single pulley and is then attached to a 2.0kg mass suspended above the floor.

The official **distance** that cars are raced from start to finish is 20 metres.

C10.1.4 Car Design Considerations

The design of the car **SHOULD** be undertaken with an understanding of the car’s journey on the track. The most damaging loads are imparted to the car during the retardation phase after the car crosses the finish line. Cars are typically retarded by running into a buffer comprised of towels. This can be as much as a -20g collision. To avoid engineering deficiency penalties, cars are to be robust enough to withstand this loading as part of the defined use and operational cycle.

C10.1.5 Retardation Devices

Standard track environments provide a buffer of towels positioned behind the finish line or the Denford Deceleration System consisting of tapered brushes which gradually slow cars down after they have crossed the finishing line. However teams are permitted to provide their own retardation environment and the team will be responsible for its management. Such an environment **MUST** be approved by a Race Marshall. It shall **NOT** be attached to the track and it shall be restricted to be fully within their lane. Retardation systems **MUST** be located a minimum of 100mm after the finish line and be in place when the track marshall is ready to launch the cars. No further time delays will be allowed.

C10.1.6 Who needs to attend?

All Development and Professional Class team members **MUST** be present during their scheduled racing sessions and **SHOULD** assemble at the track start for briefing by the race track judges 5 minutes prior to their scheduled time. Cadet Class teams who cannot attend State Finals will have their car raced in Automatic Launch mode by the track marshalls and the results recorded.

C10.1.7 Time Penalties

If following specifications compliance AND time given to rectify **ANY** infringement (Refer C4.1.4.2), a team's Car A or B[10] is judged as being NON-COMPLIANT with **ANY** critical technical regulation, a Time Penalty of 0.05 seconds per infringement will be applied to every run/lap (up to a maximum of 0.5 second) for ALL forms of racing.

C10.1.8 DNS Penalties

If a car incurs a breakage during racing and is unable to be repaired during a 10 minute Car Repair session immediately following a team's scheduled racing, it will DNS **ANY** following races until it can be repaired in a subsequent Car Repair session.

C10.1.9 Legal Ballasting of Race Cars

Once a team arrives at the event venue, the team **MAY** increase the mass of a car (ballasting) using **ONLY** the methods stated in ARTICLE C10.1.9.1. A car that has had its mass increased by **ANY** method other than those stated in ARTICLE C10.1.9.1 **WILL NOT** be accepted at Submission.

At the Event venue, REA **WILL** provide a set of scales by which teams **MAY** check the mass of the cars prior to Submission. If the team sees that a car is below the minimum mass, then the team **MUST** increase the car mass to at least the minimum mass prior to Submission using **ONLY** the method stated in ARTICLE C10.1.9.1. During Submission all cars will be weighed. If during Submission a car is below the minimum mass, then the team **WILL** withdraw from Submission and increase the car mass to at least the minimum mass using **ONLY** the method stated in ARTICLE C10.1.9.1, whereupon the team will resume the Submission process.

Teams **MUST** consider carefully the method by which the mass of a car is increased, as a car **MUST** comply with the Technical Regulations after its mass is increased. When adding mass, teams are advised to pay particular attention to issues such as effect on ground clearance.

C10.1.9.1 Methods of increasing mass that MAY NOT infringe Technical Regulations

1. Addition of screws that are supplied by REA at submission and such that:
   - Screws **MUST** be screwed in fully up to the screw head
   - Screws **MUST NOT** be screwed into that part of the Body that surrounds the canister
   - Screws **MUST NOT** obstruct the tether line.

C10.1.9.2 Methods of increasing mass that WILL infringe Technical Regulations

1. Addition of BluTack, putty or other pressure-sensitive adhesive material to the Body
2. Attaching pieces of solid material to the Body except those in ARTICLE C10.9.1.

10 Car B not applicable to Cadet Class teams

C10.1.10 Safety Checks

Race Officials will routinely inspect cars for safety during scheduled races - in particular, to ensure that the tether line guides are secure. If the Officials rule a car to be unsafe, **ANY** remaining races leading up to a Car Repair session **WILL** be deemed DNS. Unresolved safety concerns **WILL** prohibit cars from racing on the track and **WILL** result in zero points being awarded for racing.

C10.1.11 Did Not Start (DNS)

Cars deemed unsafe or ineligible to race by Scrutineers **WILL** be classified as Did Not Start (DNS) in racing events.

C10.1.12 Did Not Finish (DNF)

Damage incurred during a run, before the car crosses the finish line, (e.g. wheel, wing, tether line guide or **ANY** other part of the car product separating) **WILL** result in a Did Not Finish (DNF) race result. The Judges **MAY** refer to video evidence where available to verify a DNF result.

C10.1.13 False Start (FS)

A false start (jump start) occurs during Manual Launch (Reaction) Racing when the driver depresses the trigger button before the 5 start gate lights have extinguished. This will be signalled with the outer red light above a lane illuminating.

In the event of a reaction False Start (FS) in Manual Launch (Reaction) Racing, the car will subsequently be run using automatic launch mode to record a net “lap time” but a reaction FS will also be recorded.

Teams **NOT** recording a Reaction run time (i.e. four False Starts) will be excluded from Knock-out Racing as well as the marks associated with this and Fastest Reaction Time.

During knock-out racing – If one team false starts (jump starts), the other team **SHOULD** continue to race as normal. The team who false started forfeits that race, scoring an FS, and the other team’s time is recorded.

If both teams false start the first race, the race will be forfeited. If both teams subsequently false start the second race, the race will be re-run until a winner is determined.

If both teams false start the second race **ONLY**, the race will be forfeited and the winner determined from the first race results.

C10.1.14 C02 Cylinders

CO2 cylinders **MUST** be inserted so that they are situated firmly against the base of the cartridge chamber. Refer to ARTICLE T10.3.

All cylinders for State and National Finals contain 8 grams of CO2. They are provided by REA Foundation Ltd. and are weighed as follows:

- State Finals: Within 0.50 grams, with random allocation
- National Finals: Within 0.30 grams, with random allocation

C10.1.15 Car Mass Checks

Cars will have their mass checked at the race track prior to commencing each race event. This is done to ensure each car remains at or above the legal minimum mass. If the mass of a car is judged to have gone below the legal minimum mass whilst stored in parc fermé, then the judges in consultation with the team will add ballast in the form of one or more REA supplied screws until the mass of the car is at least the required minimum mass.

C10.1.16 Judges Handling Cars

The race Judges will **NOT** be required to comply with **ANY** special car handling requests made of them by teams. This includes use of **ANY** special gloves or tools.

C10.2 Types of Racing

The F1 in Schools State and National Final racing points will be awarded through the staging of three types of racing modes.

C10.2.1 Automatic Launch (Time Trial) Racing

Automatic launch mode, consisting of two races in each lane which will be conducted first as per the judging schedule and results contribute towards the overall Grand Prix Race event.

C10.2.2 Manual Launch (Reaction) Racing

Manual / driver launch mode, commonly referred to as 'reaction racing' consisting of two races in each lane and follows Automatic Launch (Time Trial) Racing as per the judging schedule. These races make up the final contribution towards the overall Grand Prix Race event results.

'Drivers' will **NOT** be permitted to practise during the official race time.

C10.2.3 Manual Launch (Reaction) Knock-out Racing

Manual / driver launch mode, one race in each lane per round of competition. The knock-out competition is the last of the scheduled racing and is **NOT** conducted for Cadet Class teams.

C10.3 Racing Procedures

C10.3.1 Manual / Driver Launch

A maximum of two (2) team members (driver/s) can be appointed for launching the team's car using the manual launch method. **ONLY** one driver per scheduled session of Reaction Racing is permitted. **ONLY** the driver can stand within the dedicated starting area.

C10.3.2 Start Line Car Adjustments

A Race Marshall will initially stage the car on the track but teams are permitted to make **ANY** adjustments approved by the Race Marshall after the car has been staged so long as this does **NOT** take more than 30 seconds. The use of 'positioning blocks' to align the car in the centre of the lane is permitted however these **MUST** be removed prior to launch. Teams **MUST NOT** use devices which interface with the starting mechanism and teams are **NOT** permitted to attach signage or other materials to the track or timing system.

C10.3.3 Finish Line Management

At least one member of the team **MUST** be appointed as responsible for managing the finish line retardation device. I.e., standard deceleration towels or teams' own system (refer ARTICLE C10.1.5). Once the race session is complete, a race marshall shall remove and inspect each car before it is returned to Parc Ferme or released to the team member for Car Repairs.

C10.3.4 Automatic Launch Race Procedure

Cars are launched in automatic mode with four (4) races total per team, two (2) races in each lane. These races **MAY** be run over two separate sessions. Teams are advised to check the Judging Schedule. The total time displayed on the start gate for each race is recorded for scoring purposes. The automatic launch race events will be conducted using the following procedure:

i Teams race in order as shown in the competition program.

ii One team member to track finish for deceleration system control – maximum of 30 seconds.

iii Both Car A and Car B[11] **WILL** be used for Automatic Racing.

iv All cars are weighed and ballast applied as per C10.1.15.

v Teams will decide which lanes Car A & B[11] will race on.

vi Race 1 – Race Marshalls will load both Car A & B[11] onto the track at the same time, in opposite lanes along with a competitor's cars in accordance with the team's requirements.

vii Race Marshalls set cars at track start line, inserts CO2 cylinder and engages car with launch pod.

viii A team member is then allowed 30 seconds to 'fine tune' the staging of their first car.

ix Judge presses the start system reset button – car is launched.

x Judge records TOTAL RACE TIME displayed on start gate.

xi Race Marshall at finish line removes and disposes of used CO2 cylinder.

xii Team member at finish line lifts the retardation device and rolls car to the end of the tether line, then swaps lanes and adjusts the retardation device for the second race. All care **MUST** be taken to ensure no damage is occasioned to the competitor's car sitting at the end of the tether line.

xiii Race 2 conducted in opposing lane using same process as per vi - x.

xiv Race Marshall at finish line removes cars from tether line and returns them to Parc Ferme, or places them at the designated Car Repair location if damage has occurred. At the conclusion of Car Repair, cars are returned to Parc Ferme.

xv This process is repeated for Race 3 and Race 4 at the next race session as per the Judging Schedule with cars placed in lanes opposite to the configuration used in Races 1 and 2.

11 Car B not applicable to Cadet Class teams

C10.3.5 Manual Launch Race Procedure

Cars are launched in manual / driver reaction mode with four (4) races total per team, two (2) races in each lane. These races **MAY** be run over two separate sessions. Teams are advised to check the Judging Schedule. The TOTAL RACE TIME displayed and the REACTION TIME displayed for each race is recorded. The manual launch reaction races will be conducted as follows:

i Teams race in order as shown in the competition program.
ii One team member to track finish for deceleration system control – maximum of 30 seconds.
iii Both Car A and Car B[11] **WILL** be used for Reaction Racing.
iv All cars are weighed and ballast applied as per C10.1.15.
v Teams will decide which lanes Car A & B[11] will race on.
vi Race 1 – Race Marshalls will load both Car A & B[11] onto the track at the same time, in opposite lanes along with a competitor's cars in accordance with the team's requirements.
vii Race Marshalls set cars at track start line, inserts CO2 cylinder and engages car with launch pod.
viii A team member is then allowed 30 seconds to 'fine tune' the staging of their first car.
ix Driver stands trackside with corresponding lane start trigger. Remaining team members stand behind driver.
x Race Marshall presses the start system reset button – lights come on
xi When lights extinguish, driver pressers trigger and car is launched.
xii Judge records TOTAL RACE TIME and REACTION TIME displayed on start gate.
xiii Race Marshall at finish line removes and disposes of used CO2 cylinder.
xiv Team member at finish line lifts the retardation device and rolls car to the end of the tether line, then swaps lanes and adjusts the retardation device for the second race. All care **MUST** be taken to ensure no damage is occasioned to the competitor's car sitting at the end of the tether line.
xv Race 2 conducted in opposing lane using same process as per vii – xi.
xvi Race Marshall at finish line removes cars from tether line and returns them to Parc Ferme, or places them at the designated Car Repair location if damage has occurred. At the conclusion of Car Repair, cars are returned to Parc Ferme.
xvii This process is repeated for Race 3 and Race 4 at the next race session as per the Judging Schedule with cars placed in lanes opposite to the configuration used in Races 1 and 2
xviii Race 3 & 4 driver can be inter-changed at this point.

C10.3.6 Knock-out Competition Procedure[12]

Development and Professional Class teams will be issued the race seeding prior to knock-out racing commencing. The seeding order for the first knock-out round is determined through seeding all teams using the fastest 'gross race time' they achieved from the manual racing for the Grand Prix Race event including **ANY** relevant Time Penalties. In the event that two or more teams achieve the same Best Gross Lap, rankings will be based on a team's second fastest Gross Lap. Some teams **MAY** draw a 'bye' in round 1. Cars are launched in manual / driver reaction mode, with two (2) races total, one (1) race in each lane, for each round of the knock-out. The team with the fastest 'total race time', as displayed on the start gate, from the two races conducted, is the winner of that knock- out round. The knock-out competition will be conducted as follows:

Teams race in order of the competition seeded draw.

i One team member to track finish for deceleration system control – maximum of 30 seconds.
ii Both Car A and Car B **WILL** be used for Knockout Racing.
iii All cars are weighed and ballast applied as per C10.1.15.
iv Teams will decide which lanes Car A & B will race on.
v Race 1 – Race Marshalls will load both Car A & B onto the track at the same time, in opposite lanes along with a competitor's cars in accordance with the team's requirements.
vi Race Marshalls set cars at track start line, inserts CO2 cylinder and engages car with launch pod.
vii A team member is then allowed 30 seconds to 'fine tune' the staging of their first car.
viii Driver stands trackside with corresponding lane start trigger. Remaining team members stand behind driver.
ix Race Marshall presses the start system reset button – lights come on
x When lights extinguish, driver pressers trigger and car is launched.

12 Excludes the Cadet Class teams

xi Judge records TOTAL RACE TIME displayed on start gate.

xii Race Marshall at finish line removes and disposes of used CO2 cylinder.

xiii Team member at finish line lifts the retardation device and rolls car to the end of the tether line, then swaps lanes and adjusts the retardation device for the second race. All care **MUST** be taken to ensure no damage is occasioned to the competitor's car sitting at the end of the tether line.

xiv Race 2, driver can be inter-changed at this point.

xv Race 2 conducted in opposing lane using same process as per vi – xi.

xvi Race Marshall at finish line removes cars from tether line and returns them to Parc Ferme, or places them at the designated Car Repair location if damage has occurred. At the conclusion of Car Repair, cars are returned to Parc Ferme.

xvii In case of a tied result, a further 'sudden death' race will be conducted and teams will toss a coin for lane allocation.

C10.4 Race Scoring for Awards

C10.4.1 Grand Prix Race

Due to variability in track conditions, the 'Grand Prix Race' award marks will be awarded based on multiple runs, similar to a multiple lap race. The 'Race Time' will be the sum of the recorded net lap times from Automatic (Time Trial) Racing and Manual Launch (Reaction) Racing where the single fastest and slowest laps recorded are excluded. One lap DNF can be considered the "slowest lap" and excluded. A second lap DNF will lead to the car being deemed as failing to complete the race.

Teams will be awarded points that match the performance of their car when compared to the fastest car in the competition. The scaling system uses the following formula to calculate points:

C10.4.1.1 Professional & Development Classes (150 points)

- **Regional Final Race Points =** 50 + (100 / (Fastest Car Race Time x 0.30)) x (Fastest Car Race Time x 1.30 – Team's Race Time)
- **State Final Race Points =** 50 + (100 / (Fastest Car Race Time x 0.20)) x (Fastest Car Race Time x 1.20 – Team's Race Time)
- **National Final Race Points** = 50 + (100 / (Fastest Car Race Time x 0.15)) x (Fastest Car Race Time x 1.15 – Team's Race Time)

The **minimum score** awarded for a team completing the race is 50 marks and requires **7 legal runs.**

The **minimum score** awarded for a team starting but failing to complete the race is 30 marks plus 2 marks for each lap completed up to a maximum of 6 laps.

Teams **NOT** starting the race **(DNS)** will receive 0 points.

C10.4.1.2 Cadet Class (60 points)

- **Regional Final Race Points =** 20 + (40 / (Fastest Car Race Time x 0.30)) x (Fastest Car Race Time x 1.30 – Team's Race Time)
- **State Final Race Points =** 20 + (40 / (Fastest Car Race Time x 0.20)) x (Fastest Car Race Time x 1.20 – Team's Race Time)

The **minimum score** awarded for a team completing the race is 20 marks and requires **3 legal runs.**

The **minimum score** awarded for a team starting but failing to complete the race is 10 marks plus 2 marks for each lap completed up to a maximum of 2 laps.

Teams **NOT** starting the race **(DNS)** will receive 0 points.

C10.4.2 Fastest Reaction Time[13] (20 points)

At State and National Finals, Development and Professional Class teams **ONLY** will be awarded points based on their fastest driver Reaction Time as per the following table:

Fastest Reaction Time	Points/Marks Awarded
< 0.141	20 points
0.140 ≤ time < 0.150	17 points
0.151 ≤ time < 0.160	15 points
0.161 ≤ time < 0.170	13 points
0.171 ≤ time < 0.180	11 points
0.181 ≤ time < 0.190	9 points
0.190 ≤ time < 0.200	7 points
>0.200	5 points

C10.4.3 Knockout Racing[13] (30 points)

State and National Final events **WILL** include knock-out Manual Launch (Reaction) Racing for Professional and Development Class teams where time permits. The knockout draw is seeded based on team rankings from the Manual Launch (Reaction) Racing of the Grand Prix racing event (qualifying).

C10.4.3.1 State Final Arrangements

- Where time permits, all teams will participate in Knockout Racing. This decision will be at the discretion of the Chair of Judges.
- If either the Junior or Senior Professional Classes have 5 or less competing teams, both will be combined into an overall Professional Class for the purpose of Knockout Racing
- Where time does **NOT** permit, **ONLY** the top 8 seeded teams in each of the Development and overall Professional Classes will participate in the knock-out competition.

C10.4.3.2 National Final Arrangements

- **ONLY** the top 8 seeded teams in each of the Development and overall Professional Classes will participate in the knock-out competition.

An example draw for a field of 8 and 16 teams is shown on the following page.

C10.4.3.3 Sample Knockout Draws

Field of 16 – State Finals

Round of 16	Quarter Final	Semi Final	Final	Winner
Rank 1	..	..	..	..
16				
8	..			
12				
4	..	..		
13				
9	..			
5				
6	..	..	..	
10				
14	..			
3				
7	..	..		
11				
15	..			
2				

13 Excludes Cadet Class teams

Field of 8 – State or National Final

Round of 8	Semi Final	Final	Winner
Rank 1			
8			
5			
4			
6			
3			
7			
2			

C10.4.3.4 Marks Awarded for Final Positions

The marks to be awarded from actual Knock-out racing outcomes or direct rankings from the reaction launch racing are shown in the following table.

Final Position in Knock-out Racing	Marks Awarded
Winner – Knock-out Champion (1st)	30 marks
Knocked out in Final (2nd)	27 marks
Knocked out in Semi-Final (3rd or 4th)	24 marks
Knocked-out in Quarter Final (5th to 8th place)	18 marks
Knocked out in a preliminary round (9th to last place)	12 marks
Teams excluded from Knock-out racing	0 marks

C10.4.3.5 Knock-out Racing Not Conducted

Where knock-out races are **NOT** specifically conducted due to time constraints or unforeseen circumstances, then the knock-out marks will be awarded based directly upon the manual reaction launch run time rankings.

ARTICLE C11 - CAR REPAIRS

C11.1 Car Servicing

- There will be **NO** car 'servicing' sessions.
- Once a car is submitted at event check in, **NO** servicing including lubrication of **ANY** component **SHALL** be permitted at **ANY** time including car repair sessions.

C11.2 Car Repairs

- At State and National Final events, teams will be allocated **10 minutes** to perform penalty free repairs on cars in the dedicated Car Repair area if the team can satisfy a Track Marshall or Race Director that the car has suffered damage during racing or handling.
- This will be permitted to occur immediately after a team's racing session for automatic launch (time trial) racing, manual launch (reaction) racing and knockout racing as per the judging schedule.
- Evidence of damage **MUST** be either a cracked component, a component separated from the car, or some other change of condition of the car so as to be considered a safety issue by a Track Marshall.
- The repair **MAY ONLY** return the car to its state prior to receiving the damage for which it is being repaired.
- Design or assembly issues such as wheels **NOT** rotating satisfactorily **SHALL NOT** be accepted as damage.
- Repair **SHALL NOT** be permitted for the purpose of improving the performance of the car.
- All damage issues and related repair work during racing is at the Judge's discretion and **MAY** be referred to the Lead Scrutineer and/or Chair of Judges for a final decision.
- Should repairs undertaken by teams result in a violation of any technical regulations, a penalty **MAY** be imposed by the Lead Scrutineer and/or Chair of Judges.
- All repairs **WILL** be managed and monitored by a designated Track Marshall.
- The allocated 10 minutes for car repairs commences as soon as the Track Marshall places the damaged car within the Car Repair area. Timing will **NOT** be stopped for **ANY** reason, including the retrieval of tools to effect repairs.
- Teams are **NOT** required to complete **ANY** Car Repair forms.

C11.3 Car Repair Penalties

- A car **NOT** returned within the 10 minutes **SHALL** be deemed DNS for the following races until it can be repaired in subsequent Car Repair sessions.
- A repaired car **WILL** be weighed and **MUST** meet the minimum mass, otherwise, ballast in the form of screws will be applied by Track Marshalls where required.
- **ANY** repaired car deemed unsafe to race by the Lead Track Judge, will result in a DNS for the following scheduled race/s until it can be repaired in a subsequent Car Repair session.

C11.4 Dedicated Area

Car Repair **MUST ONLY** take place at the dedicated Car Repair area. A maximum of two (2) team members and Judges are allowed to enter the car repair area. Repairs will be managed and monitored by a designated Track Marshall. Teams **MUST** keep the area clean of glue and rubbish.

C11.5 Team Tool Kits

Tool kits are allowed to be taken into car repair. Teams **MUST** supply all of their own tools and other necessary resources. Judges will **NOT** be able to assist teams with **ANY** additional resource requirements.

ARTICLE C12 - GRIEVANCES

C12.1 Procedure

C12.1.1 Specifications Compliance Related

1. **SHOULD** a team be dissatisfied with the decision of the Lead Scrutineer, following rectification outlined in ARTICLE C4.1.4,2, an appeal **MAY** be submitted in writing by the advertised deadline using the official on-line Grievance Form. Refer ARTICLE C2.4.1.6.
2. The Chair of Judges **WILL** discuss the appeal with the scrutineers and **MAY** seek additional advice from REA Foundation Ltd. regulation authorities. The Chair of Judges will then meet with the team, to discuss the appeal and explain the final decision.

C12.1.2 Non Specifications Related

Submitted by the advertised deadline using the official on-line Grievance Form.

C12.2 Judge's Decision

The Chair of Judges decision related to **ANY** grievance is final and no further discussion will be entered into.

ARTICLE C13 - JUDGES

C13.1 Overview

There will be several teams of judges that form the entire judging panel.

Judges are generally higher education and industry experts invited by REA Foundation Ltd. They are selected and appointed to teams based on their qualifications and experience.

All judges undertake a comprehensive briefing prior to the competition and are required to declare **ANY** conflicts of interest with respect to the teams they are judging. Where a conflict of interest **MAY** occur, the judge is required to step back from judging the relevant team/s.

Some judges **MAY** perform a dual role. For example, undertake the specifications compliance of cars AND Engineering judging.

Each judging category will have one judge appointed as the Lead Judge.

C13.2 Chair of Judges

An independent authority appointed by REA Foundation Ltd. to oversee all judging procedures. The Chair of Judges will determine the final judging decision where a grievance has been submitted or other judging issue needs resolution. The Chair of Judges will also preside over a meeting of all Lead Judges to ratify the final results and work with the Competition Director to ensure all scores are entered correctly into a spread sheet to identify awards winners.

C13.3 The Judging Teams

C13.3.1 Specifications Judges

Will scrutinise each Car A & B[14] with respect to the Australian Technical Regulations.

C13.3.2 Engineering Judges

Will assess each team's use of CAD/CAM, CNC technologies, quality of manufacture and the engineering design process.

C13.3.3 Portfolio Judges

Portfolio Judges will assess each team's portfolio design and project management as per the Portfolio score card.

C13.3.4 Marketing Judges

Marketing Judges will assess each team's branding and trade display as per the Marketing score card.

C13.3.5 Verbal Presentation Judges

Verbal presentation Judges will assess each team's presentation technique and content as per the verbal presentation score card.

C13.3.6 Race Judges

Will oversee and rule on all race events and **ANY** incidents.

C13.3.7 Car Repair Judges

Car Repair Judges will oversee all car service activities and rule on **ANY** infringements that **MAY** occur.

C13.4 Judging Decisions

THE DECISION OF THE JUDGES IS FINAL.

ARTICLE C14 - AWARDS

C14.1 Awards Celebration

At each State and National Final, an Awards Presentation is conducted, the timing of which is included in the Event Programme which is released closer to the event.

At some National Finals, the Awards Presentation is combined with a Gala Celebration which **MAY** include the provision of cocktail style food or sit down dinner.

C14.2 Participation Recognition

At State and National Finals, all students, supervising teachers and judges will receive official participation/ recognition certificates. These will be provided in the team and judge information packs.

Students participating at a National Final will also receive participation medallions presented at the Awards Presentation ceremony.

C14.3 Prizes and Trophies

C14.3.1 State Finals

At State Finals, teams winning an award will be presented with an A4 certificate **ONLY**.

C14.3.2 National Finals

At National Finals, winning teams will be presented with an A3 framed certificate and for most but **NOT** all awards, individual award medallions. Post event, all team members will be sent individual A4 certificates.

C14.3.3 Perpetual Trophies

Perpetual Trophies are presented for some but **NOT** all awards at National Finals **ONLY**. Teams receiving these trophies are responsible for having their team details engraved upon the trophy using identical material/engraving plates to maintain consistency of appearance. The teacher/ school is responsible for returning the trophy to REA Foundation Ltd. prior to the following National Final.

14 Car B is not applicable to Cadet Class teams

C14.4 List of Awards to be Presented

Notes:

1. Eligibility for winning awards, requires teams to achieve at least 60% of the overall mark used to calculate overall 1st, 2nd and 3rd placings and Category Awards.
2. Teams incurring Time Penalties will **NOT** be eligible to win Engineering related awards Refer ARTICLE C3.10.1.
3. In situations where there are five or less teams representing a competition class, overall 2nd and 3rd place, along with some category awards **MAY NOT** be presented. This will be at the discretion of the Chair of Judges.

C14.4.1 Development and Professional Class Teams

GRAND PRIX RACE AWARD

The team with fastest race time and scoring 150pts in:

Criteria 11.1: Racing/Grand Prix Racing.

AGPC: FASTEST LAP AWARD

The team with fastest individual net run time from:

Criteria 11.1: Racing/Grand Prix Racing.

BEST REACTION TIME AWARD[15]

The team with the quickest reaction launch time from:

Criteria 11.2: Racing/Grand Prix Racing

KNOCKOUT CHAMPIONS AWARD[14]

The team with the fastest gross time in the last round of:

Criteria 11.3: Racing/Knockout Racing

BEST ENGINEERED AWARD[16]

Team with highest combined score for:

Criteria 1: Engineering/Specifications

Criteria 2: Engineering/Computer Aided Design (CAD)

Criteria 3: Engineering/Manufacturing

Criteria 4: Engineering/ Design Process

BEST ENGINEERING CAD AWARD[14,15]

Team with highest score for:

Criteria 2: Engineering/Computer Aided Design (CAD)

BEST MANUFACTURED CAR AWARD[14,15]

Team with highest score for:

Criteria 3: Engineering/Manufacturing

BEST TEAM PORTFOLIO AWARD

Team with highest combined score for:

Criteria 4: Engineering Design Process

Criteria 5: Portfolio/Project Management

Criteria 6: Portfolio/Portfolio Design

Criteria 7.1, 7.2 & 7.3: Marketing/Branding

AIPM: BEST MANAGED ENTERPRISE AWARD

Team with highest score for:

Criteria 5: Portfolio/Project Management

VISUAL CONNECTIONS: BEST GRAPHIC DESIGN AWARD

Team with highest combined score for:

Criteria 6: Portfolio/Portfolio Design

Criteria 7: Marketing/Branding

Criteria 8.1, 8.2, 8.3 & 8.4: Marketing/Trade Display

15 No Perpetual Trophy exists for these awards at a National Final

16 Not awarded to teams with time penalties

BEST TEAM TRADE DISPLAY AWARD[17]

Criteria 8: Marketing/Trade Display

BEST TEAM MARKETING AWARD

Team with highest combined score for:

Criteria 7: Marketing/Branding

Criteria 8: Marketing/Trade Display

Criteria 5.5: Portfolio/Project Management

BEST TEAM VERBAL PRESENTATION AWARD

Team with highest combined score for:

Criteria 9: Verbal Presentation/Presentation Technique

Criterial 10: Verbal Presentation/Content

OUTSTANDING INDUSTRY COLLABORATION AWARD

Team with highest score for:

Criteria 10.5: Verbal Presentation/Content

INNOVATION AWARD

Team with highest score for:

Criteria 10.3 & 10.4: Verbal Presentation/Content

CHAIR OF JUDGES RECOGNITION OF ACHIEVEMENT AWARD[17]

Discretion of the Chair of Judges

ENGINEERS AUSTRALIA: WOMEN IN STEM AWARD[18]

Interview by Engineers Australia representative/s

MOTORSPORT AUSTRALIA: AUSTRALIAN MOTOR SPORT AWARD[17]

Student Nomination Form & Interview of Shortlisted Candidates by MA representative/s

BEST NEWCOMER AWARD[16, 17,]

Highest scoring team from school attending the National Final for the first time

3RD PLACE[16,]

Team with the third highest scoring sum of all marking criteria

2ND PLACE[16,]

Team with the second highest scoring sum of all marking criteria

CHAMPIONS

Team with the highest scoring sum of all marking criteria

C14.4.2 Cadet Class Teams (State Finals only)

FASTEST LAP AWARD

The team with fastest individual net run time from:

Criteria 11.1: Racing/Grand Prix Racing.

BEST TEAM POSTER AWARD

Team with highest score for Poster Criteria

Criteria 4: Engineering/Design Process

BEST ENGINEERED CAR AWARD

Team with highest score for:

Criteria 1: Engineering/Specifications

Criteria 3.6 & 3.7: Engineering/Manufacturing

CHAMPIONS

Team with the highest scoring sum of all marking criteria.

Note: For Cadet Class teams there is no pathway to the World Finals

17 No Perpetual Trophy exists for these awards at a National Final

18 Awarded at a National Final ONLY

ARTICLE C15 - APPENDICES

1. PROJECT ELEMENTS CHECKLIST FOR DIGITAL UPLOAD

The following team Project Elements **MUST** be received on or before the published time and date, as per ARTICLE C2.10

LEGEND: CAD = Cadet DEV = Development PRO = Professional G-Drive - Google Drive

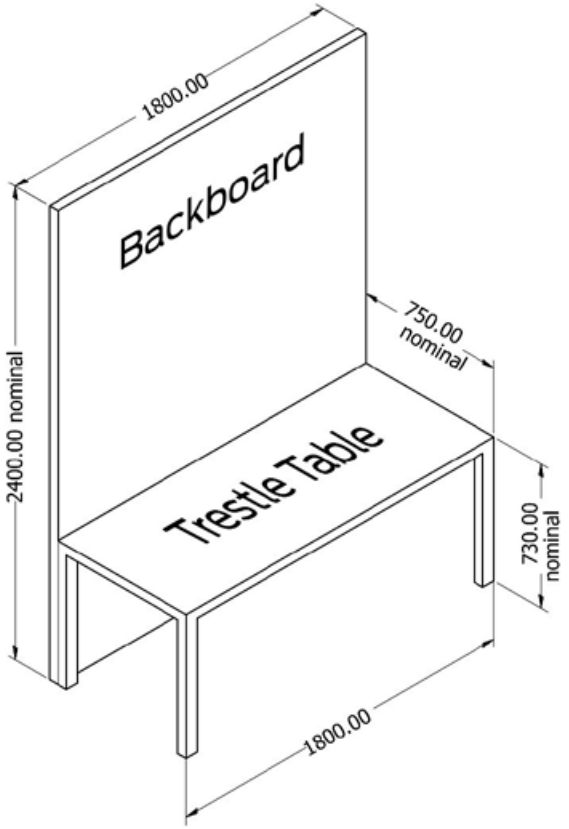
	Project Element	Class	Submission Details	Judging Criteria
ENGINEERING				
☐	1 x A2 Poster or 2 x A3 Posters	CAD	Electronic: PDF format Maximum 100mb file size Submitted to REA G-Drive	• Engineering: Design Process
☐	1 x A3 Engineering Drawing	CAD	Electronic: PDF format Maximum 100mb file size Submitted to REA G-Drive	• Engineering: Specifications
☐	1 x Engineering Portfolio	DEV PRO	Electronic: PDF format Maximum 100mb file size Submitted to Turnitin	• Engineering: Manufacturing • Engineering: Design Process • Portfolio: Design
☐	1 x Engineering Compliance Booklet	DEV PRO	Electronic: PDF format Maximum 100mb file size Submitted to REA	• Engineering: Specifications • Engineering: CAD
☐	Optional Testing Document	DEV PRO	Electronic: PDF format Submitted to REA G-Drive	• Engineering CAD • Engineering Manufacturing
☐	Separate High Quality Renders (maximum 10)	DEV PRO	Electronic: PNG Submitted to REA G-Drive	• For use by REA
☐	ALL Engineering CAD Files (parts & assembly)	CAD DEV PRO	Electronic: STEP or STP Files Submitted to REA G-Drive	• For use by REA
ENTERPRISE				
	Project Element	**Class**	**Submission Details**	**Judging Criteria**
☐	1 x Enterprise Portfolio	DEV PRO	Electronic: PDF format Maximum 100mb file size Submitted to Turnitin	• Portfolio: Project Management • Portfolio: Design • Marketing: Branding
☐	1 x Design Development Brief	DEV PRO	Electronic: PDF Submitted to REA G-Drive	• Marketing: Trade Display
FORMS				
	Project Element	**Class**	**Submission Details**	**Judging Criteria**
☐	1 xCar Finishing Form	CAD DEV PRO	Electronic: PDF Submitted to REA G-Drive	• For use by REA
☐	Media Consent Form (for each team member)	CAD DEV PRO	Electronic: PDF Submitted to REA G-Drive	• For use by REA
☐	1 x Student Code of Conduct Form	CAD DEV PRO	Electronic: PDF Submitted to REA G-Drive	• For use by REA
TEAM IDENTITY				
	Project Element	**Class**	**Submission Details**	**Judging Criteria**
☐	Full Team Logo (including tag line if relevant)	CAD DEV PRO	Electronic: PNG, PSD or AI Submitted to REA G-Drive	• For use by REA
☐	Team Picture	CAD DEV PRO	Electronic: PNG Submitted to REA G-Drive	• For use by REA

2. AWARDS MATRIX

				Professional & Development Class Awards																			Cadet Class Awards				
Judging Category	**Judging Category**	**Criteria**		Champions	2nd Place	3rd Place	Best Newcomer	Best Engineered	Best Engineering CAD	Best Manufactured Car	Fastest Lap	Grand Prix Race	Best Reaction Time	Knockout Champions	Best Managed Enterprise	Best Team Portfolio	Best Graphic Design	Best Team Trade Display	Best Team Marketing	Best Team Verbal Pres.	Outstanding Ind. Collab.	Innovation	Champions	Best Engineered Car	Best Team Poster	Fastest Lap
Engineering	Specifications	1	Specifications	■	■	■	■	■															■	■			
Engineering	Computer Aided Design	2.1	Application of CAD	■	■	■	■	■	■																		
		2.2	CAD Organisation	■	■	■	■	■	■																		
		2.3	CAD Based Analysis	■	■	■	■	■	■																		
		2.4	Overall CAD Technical Merit	■	■	■	■	■	■																		
		2.5	CAD Model v's Finished Product	■	■	■	■	■	■																		
		2.6	Orthographic	■	■	■	■	■	■																		
		2.7	Rendering	■	■	■	■	■	■																		
Engineering	Manufacturing	3.1	Application of CAD/CAM	■	■	■	■	■		■																	
		3.2	Manufacturing Process Car Body	■	■	■	■	■		■																	
		3.3	Manufacturing Process Other Components	■	■	■	■	■		■																	
		3.4	Tolerancing/Quality Control	■	■	■	■	■		■																	
		3.5	Manufacturing Technical Merit	■	■	■	■	■		■																	
		3.6	Quality of Finished Product - Geometry/Form	■	■	■	■	■		■													■	■			
		3.7	Quality of Finished Product - Surface Finish	■	■	■	■	■		■													■	■			
Engineering	Design Process	4.1	Requirements Analysis	■	■	■	■	■								■											
		4.2	Ideas	■	■	■	■	■								■							■		■		
		4.3	Development	■	■	■	■	■								■											
		4.4	Analysis	■	■	■	■	■								■							■		■		
		4.5	Physical Testing	■	■	■	■	■								■											
		4.6	Evaluation	■	■	■	■	■								■							■		■		
		4.7	Overall Design Technical Merit	■	■	■	■	■								■							■		■		
Portfolio	Team & Project Management	5.1	Team Roles & Tasks	■	■	■	■								■	■											
		5.2	Scope	■	■	■	■								■	■											
		5.3	Time Management	■	■	■	■								■	■											
		5.4	Finance	■	■	■	■								■	■											
		5.5	Risk Management	■	■	■	■								■	■											
		5.6	Internal Communications	■	■	■	■								■	■											
		5.7	Stakeholder Engagement	■	■	■	■								■	■			■								
		5.8	Skill Development for Future Careers[19]	■	■	■	■									■											
		5.9	Evaluation	■	■	■	■								■	■											
Portfolio	Portfolio Design	6.1	Production Quality of Materials	■	■	■	■									■	■										
		6.2	Production Quality of Content	■	■	■	■									■	■										
		6.3	Content Organisation	■	■	■	■									■	■										
		6.4	Layout Design	■	■	■	■									■	■										
		6.5	Typography	■	■	■	■									■	■										
		6.6	Photos & Images	■	■	■	■									■	■										
		6.7	Creative Graphics	■	■	■	■									■	■										
		6.8	Editing/Proofreading	■	■	■	■									■	■										
		6.9	Referencing/Plagiarism	■	■	■	■									■	■										
		6.10	Writing & Readability	■	■	■	■									■	■										
Marketing	Branding	7.1	Team Name	■	■	■	■									■	■		■								
		7.2	Logo Development	■	■	■	■									■	■		■								
		7.3	Final Logo Design	■	■	■	■									■	■		■								
		7.4	Logo Application	■	■	■	■										■		■								
		7.5	Team Branding	■	■	■	■										■		■								
		7.6	Media Exposure	■	■	■	■										■		■								
		7.7	Sponsorship ROI	■	■	■	■										■		■								
		7.8	Team Uniform	■	■	■	■										■		■								
		7.9	Team Presence	■	■	■	■										■		■								
		7.10	Team Knowledge	■	■	■	■										■		■								
Marketing	Trade Display	8.1	Trade Display Design Development	■	■	■	■										■	■	■								
		8.2	Car Design	■	■	■	■										■	■	■								
		8.3	Information Design	■	■	■	■										■	■	■								
		8.4	Use of ICT's	■	■	■	■										■	■	■								
		8.5	Visual Design & Impact	■	■	■	■										■	■	■								
		8.6	Structural Design[20]	■	■	■	■										■	■	■								
		8.7	Structural Materials Design	■	■	■	■										■	■	■								
		8.8	Sustainability	■	■	■	■										■	■	■								
		8.9	Packaging Restrictions	■	■	■	■										■	■	■								
Verbal Presentation	Technique	9.1	Presentation Energy	■	■	■	■													■							
		9.2	Team Contribution	■	■	■	■													■							
		9.3	Visual Aids	■	■	■	■													■							
		9.4	Audience Engagement	■	■	■	■													■							
		9.5	Articulation	■	■	■	■													■							
		9.6	Structure	■	■	■	■													■							
		9.7	Timing	■	■	■	■													■							
Verbal Presentation	Content	10.1	Team Objectives	■	■	■	■													■							
		10.2	Description of Car Product	■	■	■	■													■							
		10.3	Innovation	■	■	■	■													■		■					
		10.4	Refinement	■	■	■	■													■		■					
		10.5	Collaboration	■	■	■	■													■	■						
		10.6	Learning Outcomes	■	■	■	■													■							
		10.7	Future Career Aspirations & Research	■	■	■	■													■							
		10.8	Overall Clarity	■	■	■	■													■							
Racing	Racing	11.1	Automatic Launch	■	■	■	■				■	■											■			■	
		11.2	Manual Launch	■	■	■	■				■	■											■			■	
		11.3	Reaction Time	■	■	■	■						■														
		11.4	Knockout Race	■	■	■	■							■													

19 Not included for calculation of Best Managed Enterprise Award
20 Not applicable to Development Class at State Finals

3. DEVELOPMENT CLASS TRADE DISPLAYS



The intent of these amended regulations is to reduce the cost and complexity for **Development Class** teams participating in the competition. These restrictions **ONLY** apply to **State Final** competitions.

State Final Arrangements

At State Final events, REA Foundation Ltd will supply Development Class teams with fabric covered backboards with nominal dimensions of 2000mm (L) x 2400mm (H). Development Class teams **MAY ONLY** use 1800mm of the provided length situated immediately behind a supplied Trestle Table of the same length.

Development Class teams **MUST** use a REA supplied trestle table at **State Final** events with nominal dimensions of 1800mm (L) x 750m (W) x 730mm (H). REA do **NOT** supply table cloths

Within the provided display, Development Class teams will **ONLY** be permitted to:

1. Display upon the backboard of the display within the identified 1800mm length, using **ANY** material no thicker than 10mm
2. Display upon the trestle table within the identified area with no separate or combined display item/s being higher than 500mm.
3. Display at the front of the trestle table within the identified 1800mm length using **ANY** material no thicker than 10mm affixed or resting against the Trestle Table at 90° to the floor.

No other areas/surfaces within the display space provided can be used. The volume underneath the table can be used for storage **ONLY** but stored contents **MUST NOT** be visible from front or side view at **ANY** time throughout the event.

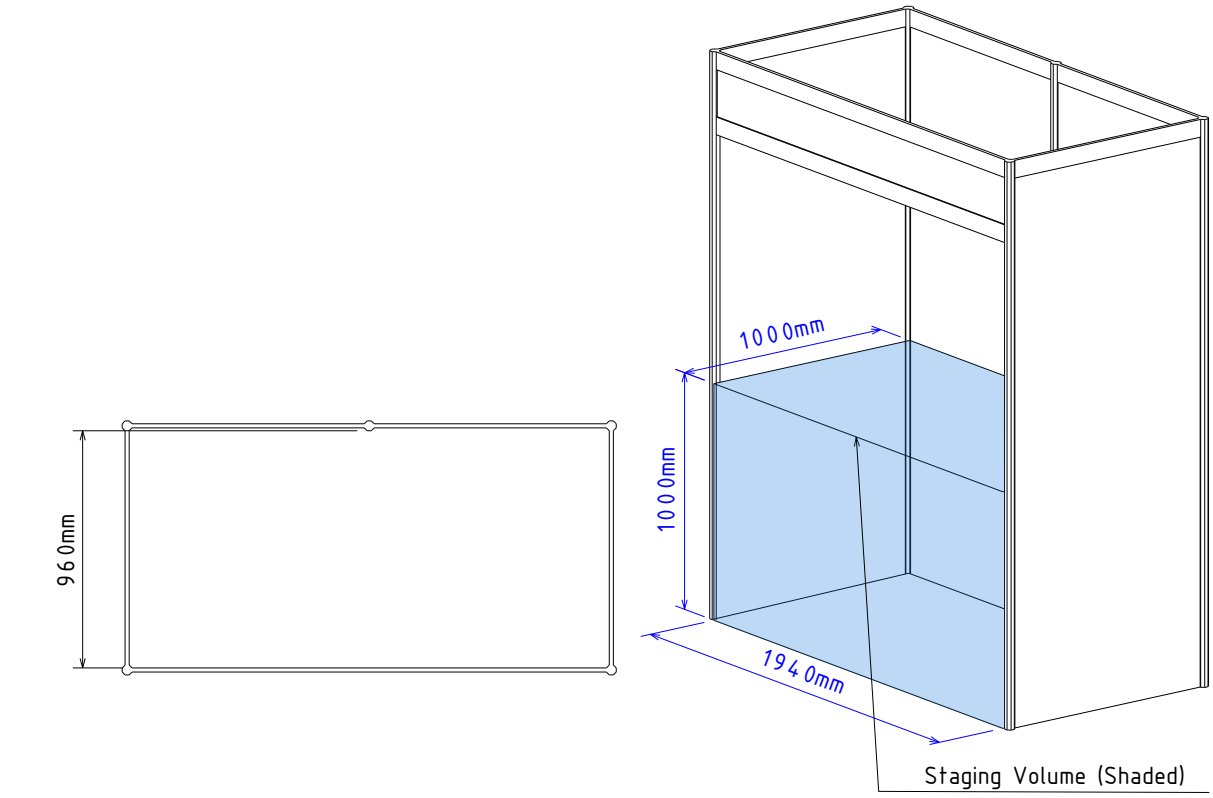
National Final Arrangements

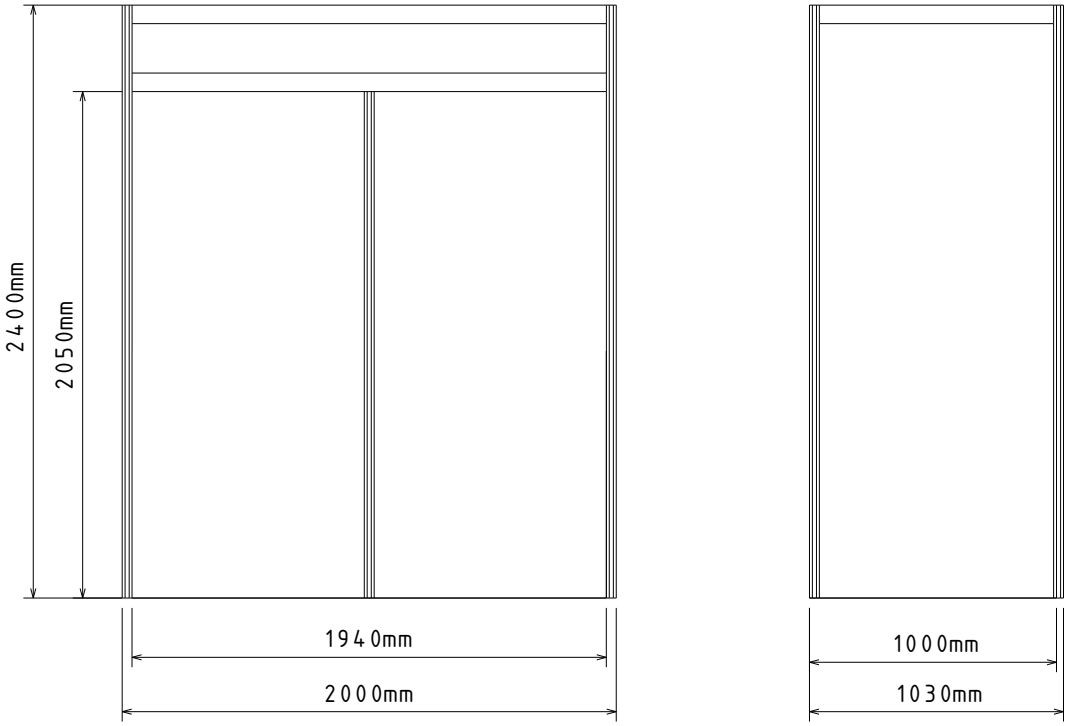
At National Finals, Development Class teams will be provided with a full shell scheme Trade Display with fascia. No restrictions other than those general conditions listed at ARTICLE C.8.4 will apply. Development Class teams are eligible to use the entire volume of the booth as per Professional Class provisions.

NO Trestle Tables will be supplied to Development Class teams at a National Final. Teams **MUST** construct their own display furniture to meet the maximum internal dimensions and fit within the volume of the display space provided.

4. BOOTH SHELL SCHEME

The diagrams below shows the nominal external dimensions and maximum internal build dimensions of the booth shell scheme used for Professional Class teams at state finals and all teams at the National Final.





5. DEVELOPMENT CLASS PORTFOLIO CONTENT PAGE PLAN

Development Portfolio Page Content Plan: *Suggested content organisation for assessment*

Enterprise Portfolio: Project Management & Career Development

Cover:* Name & Logo ***	Team Mgt: Roles, Responsibilities & Interaction ***	Time, Finance, Risk Comms, Mgt Tools & Methods. Evaluation *
		Linking Skills with Future Careers *

Marketing & Partnerships

Stakeholder ROI Plan & Community Activity / PR **	Team Name, Logo, Branding, Uniform & Trade Booth ***	Partnerships with External Individuals & Collaborations *

Engineering Portfolio: Engineering Design Process

Cover:* Rendering Name & Logo ***	Car Design Requirements & Research ***	Car Design Development & Analysis ***
		Car Design Development & Analysis ***
		Car Manufacturing ***
Car Design Physical Testing. Evaluation ***	Free for teams to decide content	

To streamline the judging process, teams are encouraged to arrange the content of their Enterprise and Engineering Portfolios in accordance with this Content Plan. However they should also refer to the relevant scorecdrd criteria. The number of pages allocated to the suggested criteria above is at the discretion of each team.

** Components of the Cover are critical to both the Enterprise & Engineering Portfolios*

Pink – Portfolio content assessed in Portfolio criteria
Blue – Portfolio content assessed in Booth criteria
Red – Portfolio content assessed in Engineering criteria
Green – Assessed in Marketing criteria

6. PROFESSIONAL CLASS PORTFOLIO CONTENT PAGE PLAN

Professional Portfolio Page Content Plan: *Suggested content organisation for assessment*

Enterprise Portfolio: Project Management & Career Development

Cover:* Name & Logo ***	Team Mgt: Roles, Responsibilities & Interaction ***	Project Scope & Time Management Tools / Methods *	Team Finances, Risk Management Tools & Methods *	Communication Tools & Methods Evaluation *	Linking Skills with Future Careers *

Marketing & Partnerships

Team Stakeholder ROI Plan & Activity **	Team Community Activity/ PR & Social Media *	Team Name, Logo & Branding ***	Uniform & Booth Design *	Partnerships with External Individuals & Collaborations *

Engineering Portfolio: Engineering Design Process

Cover:* Rendering Name & Logo ***	Car Design Requirements & Research ***	Car Design Ideas ***	Innovation *	Car Design Development ***	Car Design Analysis ***
Car Manufacturing ***	Car Manufacturing ***	Car Design Physical Testing ***	Car Process Evaluation ***	Free for teams to decide content	

To streamline the judging process, teams are encouraged to arrange the content of their Enterprise and Engineering Portfolios in accordance with this Content Plan. However they should also refer to the relevant scorecard criteria. The number of pages allocated to the suggested criteria above is at the discretion of each team.

** Components of the Cover are critical to both the Enterprise & Engineering Portfolios*

Pink – Portfolio content assessed in Portfolio criteria
Blue – Portfolio content assessed in Booth criteria
Red – Portfolio content assessed in Engineering criteria
Green – Assessed in Marketing criteria

CRITERIA 1 - SPECIFICATION SCORE CARD (1 OF 4)

For clarification on individual regulations, refer to the 2021/2022Australian Technical Regulations.

Regulation	Regulation Overview	Min/Max Quick Guide	Penalty	Car A	Car B	Judge 1	Judge 2	Deduction	Remarks	Rectification	
ARTICLE T2 – GENERAL PRINCIPLES										Pass/Fail	Pass/Fail
T2.4	Safe Construction	Visual Check	-10								
ARTICLE T3 – GENERAL CAR REGULATIONS										Pass/Fail	Pass/Fail
T3.1.1	Designed and engineered using CAD / CAM	Check Portfolio	-10								
T3.1.2	Body manufactured using CNC only.	Check Portfolio	-10								
T3.1.3	Car A & B - Identical Components	Visual Check	-10						DC & PC Only		
T3.1.4	Mirrored Side or Top/Bottom Machining with 6mm cutter	Visual Check	-10						DC Only		
T3.1.5	Mirrored Side Machining with 6mm cutter	Visual Check	-10						CC Only		
T3.1.7	No separately formed balsa parts	Check Drawings	-10						CC Only		
T3.1.8	Balsa default material for all non-rotating parts	Visual Check	-10						CC Only		
T3.2.1	Leading Features Min Width – Foremost Extremity (FE)	3mm or R1.5mm	-10								
T3.2.2	Leading Features Min Width – 6mm back from FE	6mm	-10								
T3.3.2	Signed & uploaded Car Declaration form as per C2.4.14	Check with Admin	-10								
T3.3.3	Hand Finishing permitted. Max variation to CAD Model.	3mm	-10								
T3.3.4	Hand Created Features – not permitted	Visual Check	-10								
T3.4.2	REA Corporate Partner Logo Decals (REA, F1, DoD, Vis Conn)	Visual Check	-2 ea								
T3.4.3.1	REA Corporate Partner Logo Decals Minimum Dimensions	30mm x 15mm	-2 ea								
T3.4.3.2	Positioning of F1iS A & B Decals on Side Pods	Visual Check	-2 ea								
T3.4.3.3	Positioning of other Corp Partner. Decals visible in top or side view	Visual Check	-2 ea								
T3.5	Undefined features	Check T1.6	-4								
T3.6	Overall length	Min:170mm Max:210mm	-4								
T3.8	Track clearance	Min: 2mm	-4								
T3.9.1	Balsa default material for all non-rotating components	Visual & Drawing Check	-4								
T3.9.2	BalsaThickness	Min 3mm	-1								
T3.10	Status during racing – no parts removed/added for racing	Visual check	-2								

LEGEND **Eligibility Regulations/Possible Disqualification** **Critical Regulations/Time Penalty** **CC = Cadet Class** **DC = Development Class** **PC = Professional Class**

CRITERIA 1 - SPECIFICATION SCORE CARD (2 OF 4)

For clarification on individual regulations, refer to the 2021/2022Australian Technical Regulations.

Regulation	Regulation Overview	Min/Max Quick Guide	Penalty	Car A	Car B	Judge 1	Judge 2	Deduction	Remarks	Rectification	
ARTICLE T4 – BODY & SIDE POD RULES										Pass/Fail	Pass/Fail
T4.1	Body construction – single continuous balsa between axles	Visual & Drawing Check	-4								
T4.2	Implants, foreign objects & voids not permitted	Visual & Drawing Check	-4								
T4.3	Side pod projected surface	Min 30mm x 15mm	-1								
T4.4	Virtual cargo – between centre line of front & rear axles	T4.5	-4								
T4.5	Virtual cargo identification on Engineering Drawings[1]	Drawing Check	-1								
ARTICLE T5 – NOSECONE RULES										Pass/Fail	Pass/Fail
T5.1	Nosecone/parts metallic material prohibited	Visual & Drawing Check	-4						PC & DC Only		
T5.2	Nose cone non-metallic material not behind front axle centre line	Visual & Drawing Check	-1								
ARTICLE T6 – WING RULES										Pass/Fail	Pass/Fail
T6.1	Wing surfaces clearly identified in Engineering Drawings[1]	Drawing Check	-1								
T6.2.1	Front wing clear airspace - see Tech Regs for wording changes	Min 3mm	-4								
T6.2.2	Rear wing clear airspace - see Tech Regs for wording changes	Min 3mm	-4								
T6.3	Front wing/support structure in front of centre line of axle	Visual Check	-1								
T6.4	Wing construction must remain rigid during racing	Visual Check	-2						PC & DC Only		
T6.5	Front wing/support structure-no-metallic material	Visual & Drawing Check	-10						PC & DC Only		
T6.6	Front wing/support structure-connect with nosecone only	Visual & Drawing Check	-1								
T6.7.1	Front wing span	Balsa: Min 34mm Other: Min 40mm	-4								
T6.7.2	Rear wing span	Balsa: Min 34mm Other: Min 40mm	-4								

LEGEND **Eligibility Regulations/Possible Disqualification** **Critical Regulations/Time Penalty** **CC = Cadet Class** **DC = Development Class** **PC = Professional Class**

1 Assessed by Engineering CAD judges

CRITERIA 1 - SPECIFICATION SCORE CARD (3 OF 4)

For clarification on individual regulations, refer to the 2021/2022Australian Technical Regulations.

Regulation	Regulation Overview	Min/Max Quick Guide	Penalty	Car A	Car B	Judge 1	Judge 2	Deduction	Remarks	Rectification	
ARTICLE T6 – WING RULES continued										Pass/Fail	Pass/Fail
T6.9.1	Front wing chord - check Tech Regs for wording changes	Min 15mm	-2								
T6.9.2	Rear wing chord - check Tech Regs for wording changes	Min 15mm	-2								
T6.10.1	Front wing thickness	Balsa: Min 3.5mm Max: 9mm Other: Min 1.5mm Max 9mm	-2								
T6.10.2	Rear wing thickness	Balsa: Min 3.5mm Max: 9mm Other: Min 1.5mm Max 9mm	-2								
T6.11	Rear wing positioning behind centre line of rear axle	Visual Check	-1								
T6.12	Rear wing height measured normal to bottom surface	> 34mm	-4								
T6.13	Rear wing must be made of balsa	Visual & Drawing Check	-4						DC Only		
T6.14	Rear wing non-metallic support structure behind rear axle centre line	Check Drawings	-4						PC Only		
ARTICLE T7 – WHEEL RULES										Pass/Fail	Pass/Fail
T7.1	Number and location, common shared centreline	4, 2 x 2	-4								
T7.2.1	Combination of four unmodified REA standard wheels	Visual Check	-4						CC & DC Only		
T7.3	Team manufactured wheels – front & rear wheel diameter	Min 26mm	-4						PC Only		
T7.4	Track contact width – front & rear wheels	Front: Min 12mm Rear: Min 15mm	-4						PC Only		
T7.5	Full contact width with race track – no camber	80gsm paper	-2								
T7.6	No tyre tread – consistent diameter & circumference	Visual Check	-2								
T7.7	Freely rotating wheels – forward rolling motion	Reasonably minimal effort	-4								
T7.8	Visibility in front view – permitted height of obstruction	Max 15mm	-4								
T7.9.1	Visibility in front of front wheels	Min 1mm exclusion zone	-4								
T7.9.2	Visibility behind front wheels	Min 15mm exclusion zone	-4								
T7.9.3	Visibility in front of rear wheels - new requirements	Check Tech Regs	-4								
T7.9.4	Visibility behind rear wheels	Min 1mm exclusion zone	-4								

LEGEND **Eligibility Regulations/Possible Disqualification** **Critical Regulations/Time Penalty** **CC = Cadet Class** **DC = Development Class** **PC = Professional Class**

CRITERIA 1 - SPECIFICATION SCORE CARD (4 OF 4)

For clarification on individual regulations, refer to the 2021/2022 Australian Technical Regulations.

Regulation	Regulation Overview	Min/Max Quick Guide	Penalty	Car A	Car B	Judge 1	Judge 2	Deduction	Remarks	Rectification	
ARTICLE T8 – WHEEL SUPPORT RULES										Pass/Fail	Pass/Fail
T8.1	Contained with projected cylinder volume	Visual Check	-2								
T8.2	Not integrated with wing support systems	Visual Check	-2								
T8.3	Four unmodified REA axle grommets	Visual Check	-4						CC & DC Only		
T8.4.1	2 standard REA axles or modified axles of same diameter	Visual Check/Min 3mm	-2						DC Only		
T8.4.2	2 standard REA axles. No other material to be used.	Visual Check	-2						CC Only		
T8.5.1	No added parts or modifications to wheel systems	Visual Check	-2						CC & DC Only		
ARTICLE T9 – TETHER LINE GUIDE RULES										Pass/Fail	Pass/Fail
T9.1	2 guides firmly secured, front and rear underside of car	Visual Check	-1								
T9.2	Longitudinal separation measured inside edges of guides	Min 120mm	-1								
T9.3	Inside diameter of guide (hole size)	Min 3mm	-2								
T9.4.1	Guides must be closed for racing	Visual Check	-4								
T9.4.2	No sharp edges	Visual Check	-4								
T9.4.3	Adequate strength & fixing	200g mass	-4								
T9.5.1	2 Standard REA Tether Line Guides	Visual Check	-1						CC Only		
T9.5.2	Placement must be within the 6mm x 6mm tether slot feature	Visual Check	-1						CC Only		
T9.6	Separate tether guide support system (T9.6.1 - T9.6.6)	Visual Check	-4								
ARTICLE T10 – POWER PLANT PROVISION RULES										Pass/Fail	Pass/Fail
T10.1	Cylinder must interface with launch pod	Visual Check	-20								
T10.2	CO2 cylinder chamber diameter	19mm	-1								
T10.3	Depth of chamber	Min 45mm Max 60mm	-1								
T10.4	Height of lowest point of chamber above track surface	CC: 22mm DC & PC: 20mm	-4								
T10.5	CO2 cylinder chamber completely surrounded by balsa	Min 3mm	-4								
T10.6	Paint & other materials not present in CO2 cylinder chamber	Visual Check	-1								
T10.7	CO2 cylinder inserted & withdrawn – no removal of car parts	Visual Check	-4								

LEGEND **Eligibility Regulations/Possible Disqualification** **Critical Regulations/Time Penalty** **CC = Cadet Class** **DC = Development Class** **PC = Professional Class**

CRITERIA 2 - ENGINEERING: COMPUTER AIDED DESIGN SCORE CARD

JUDGING SUB CATEGORY	**COMPUTER AIDED DESIGN**	**TEAM ID**	
PRIMARY EVIDENCE	**TEAM INTERVIEW**	**TEAM NAME**	
SECONDARY EVIDENCE	**MODELLING ON TEAM COMPUTER, ENGINEERING COMPLIANCE BOOKLET & OPTIONAL TESTING DOCUMENT**	**SCHOOL**	
CRITERIA	**2**	**COMPETITION CLASS**	

	LOW	DEVELOPING	ADVANCED	SCORE
CRITERIA	0 1 0 1 2	2 3 3 4 5 6	4 5 7 8 9 10	/5 /10
2.1 **Application of CAD**	Basic understanding and application of CAD	Good understanding and application of CAD	Advanced understanding and application of CAD throughout.	/10
2.2 **CAD Organisation**	Generally disorganised	Satisfactory organisation of data and models	Data & parts highly ordered & linked. Fully constrained CAD product assembly	/10
2.3 **CAD Based Analysis**	Minimal analysis shown	Good analysis. Results applied to development	Variety of advanced and relevant analysis techniques conducted	/10
2.4 **Overall CAD Technical Merit**	Basic CAD design with little technical merit	Developed CAD design with some technical merit	Original & clever developed CAD design with excellent technical merit	/10
2.5 **CAD Model v's Finished Product**[1]	Basic Similarity	Good Similarity	Excellent Similarity	/10
2.6 **Orthographic (Engineering Compliance Booklet)**	Little or no detail. Little or no annotation	Third angle orthographic projection. Excessive or insufficient detail	Third angle orthographic projection and unrendered isometric view or similar. Parts list / bill of materials. Additional views to show sufficient detail. Regulation compliance shown.	/10
2.7 **Rendering**	Poor quality	Different views. Some inconsistencies with final car.	Different views. Perfect match to final car including branding. Environment and lighting. High end photorealistic rendering technique	/10
			Computer Aided Design GRAND TOTAL	/70
			Minus Penalties	- /2
			Computer Aided Design GRAND TOTAL	/70

PENALTIES (1 Pt each)

T4.5 Virtual Cargo Identification - The virtual cargo location and compliance **MUST** be clearly identified within the Engineering Drawings submitted as part of the **Engineering Compliance Booklet**

T6.1 Wing Identification – The surfaces defining both the front and rear wings **MUST** be identified clearly within the drawings submitted within the **Engineering Compliance Booklet.**

NOTE: Team Engineering Portfolios are **NOT** provided to CAD judges.

1 This criteria marked using a team's Display (3rd) Car if produced by the team.

CRITERIA 3 - ENGINEERING: MANUFACTURING SCORE CARD

JUDGING SUB CATEGORY	**MANUFACTURING**	**TEAM ID**	
PRIMARY EVIDENCE	**TEAM INTERVIEW**	**TEAM NAME**	
SECONDARY EVIDENCE	**ENGINEERING PORTFOLIO, OPTIONAL TESTING DOCUMENT & DISPLAY CAR**	**SCHOOL**	
CRITERIA	**3**	**COMPETITION CLASS**	

		LOW	DEVELOPING	ADVANCED	SCORE
CRITERIA		0 1 0 1 2	2 3 3 4 5 6	4 5 7 8 9 10	/5 /10
3.1	**Application of CAM / CNC**	Minimal evidence of CNC understanding	Effective use and understanding of CNC machining processes used	High level of CNC machining competence. Appropriately complex techniques and processes used to achieve manufacturing goal	/10
3.2	**Manufacturing Process: Car Body**	Little manufacturing details	Manufacturing processes and some issues presented	Detailed assessment of all manufacturing, stages, materials & issues	/10
3.3	**Manufacturing Process: Other Components**	Little manufacturing details	Manufacturing processes and some issues presented	Detailed assessment of all manufacturing, stages, materials & issues	/10
3.4	**Tolerancing / Quality Control**	Little consideration of tolerancing and quality control	Good consideration of tolerancing and quality control	Excellent consideration of tolerancing and quality control	/10
3.5	**Overall Manufacturing Technical Merit**	Basic manufacturing with little technical merit	Good manufacturing with technical merit	Original & clever manufacturing processes with excellent technical merit	/10
3.6	**Quality of Finished Product - Geometry/Form**[1]	Reasonable form with some inconsistencies	Good overall form and assembly with attention to detail	Exceptional attention to detail across all aspects of form. Two cars are identical.	/10
3.7	**Quality of Finished Product - Surface finish**[1]	Reasonable finish with some inconsistencies	Good overall finish quality with attention to detail	Showcase finish quality. Exceptional attention to detail. Two cars are identical.	/10
				Manufacturing GRAND TOTAL	/70

1 These criteria are judged by the Specifications Judges during the scrutineering process and results entered on-line

CRITERIA 3 - ENGINEERING: MANUFACTURING SCORE CARD (CADET CLASS)

Judging Sub Category	**Manufacturing**	**Team ID**	
Primary Evidence	**Examination of Car A in Parc Ferme**	**Team Name**	
Secondary Evidence	**Nil**	**School**	
Criteria	**3**	**Competition Class**	

	Low	Developing	Advanced	Score
Criteria	**0 1 2**	**3 4 5 6**	**7 8 9 10**	**/10**
3.6 **Quality of Finished Product - Geometry/Form**[1]	Reasonable form with some inconsistencies	Good overall form and assembly with attention to detail	Exceptional attention to detail across all aspects of form.	**/10**
3.7 **Quality of Finished Product - Surface finish**[1]	Reasonable finish with some inconsistencies	Good overall finish quality with attention to detail	Showcase finish quality. Exceptional attention to detail.	**/10**
			Manufacturing GRAND TOTAL	**/20**

1 These criteria are judged by the Specifications Judges during the scrutineering process and results entered on-line

CRITERIA 4 - ENGINEERING: DESIGN PROCESS SCORE CARD

JUDGING SUB CATEGORY	**ENGINEERING DESIGN PROCESS**	**TEAM ID**	
PRIMARY EVIDENCE	**TEAM ENGINEERING PORTFOLIO**	**TEAM NAME**	
SECONDARY EVIDENCE	**TESTING DOCUMENT**	**SCHOOL**	
CRITERIA	**4**	**COMPETITION CLASS**	

		LOW	DEVELOPING	ADVANCED	SCORE
CRITERIA		**0 1 2**	**3 4 5 6**	**7 8 9 10**	**/10**
4.1	**Requirements Analysis**	Limited development of objectives	Good development of objectives	Excellent statement of objectives supported by research	**/10**
4.2	**Ideas**	Single or basic concepts	Multiple concepts with links to research.	Several technically inspired ideas for different car features/functions	**/10**
4.3	**Development**	Limited development shown	Logical design developments explained	Clearly justified developments based around research and testing	**/10**
4.4	**Analysis**	Little evidence of analysis	Analysis which is relevant and results documented	Quality analysis methodologies. Accurate results and data linked to design revisions. Advanced use of CFD and other design tools.	**/10**
4.5	**Physical Testing**	Little evidence of testing	Tests which are relevant with results documented	Quality experimental methodologies. Accurate results linked to design revisions.	**/10**
4.6	**Evaluation**	No or limited evaluation	Evaluations at different stages	Excellent ongoing evaluations linked to improvement actions	**/10**
4.7	**Overall Design Technical Merit**	Basic design process with little technical merit	Developed design process with some technical merit	Original & clever developed design process with excellent technical merit	**/10**
				Design Process GRAND TOTAL	**/70**

CRITERIA 4 - ENGINEERING: DESIGN PROCESS SCORE CARD (CADET CLASS)

JUDGING SUB CATEGORY	**ENGINEERING DESIGN PROCESS**	**TEAM ID**	
PRIMARY EVIDENCE	**TEAM POSTER**	**TEAM NAME**	
SECONDARY EVIDENCE		**SCHOOL**	
CRITERIA	**4**	**COMPETITION CLASS**	

	LOW	DEVELOPING	ADVANCED	SCORE
CRITERIA	**0 1 2**	**3 4 5 6**	**7 8 9 10**	**/10**
4.2 **Ideas**	Single or basic concepts	Multiple concepts with links to research.	Several technically inspired ideas for different car features/functions	**/10**
4.4 **Analysis**	Little evidence of analysis	Analysis which is relevant and results documented	Quality analysis methodologies. Accurate results and data linked to design revisions. Advanced use of CFD and other design tools.	**/10**
4.6 **Evaluation**	No or limited evaluation	Evaluations at different stages	Excellent ongoing evaluations linked to improvement actions	**/10**
4.7 **Overall Design Technical Merit**	Basic design process with little technical merit	Developed design process with some technical merit	Original & clever developed design process with excellent technical merit	**/10**
			Design Process GRAND TOTAL	**/40**

CRITERIA 5 - PORTFOLIO: PROJECT MANAGEMENT & CAREER DEVELOPMENT SCORE CARD

JUDGING SUB CATEGORY	**PROJECT MANAGEMENT & CAREER DEVELOPMENT**	**TEAM ID**	
PRIMARY EVIDENCE	**TEAM ENTERPRISE PORTFOLIO:**	**TEAM NAME**	
SECONDARY EVIDENCE		**SCHOOL**	
CRITERIA	**5**	**COMPETITION CLASS**	

	LOW	DEVELOPING	ADVANCED	SCORE
CRITERIA	0 1 2 0 1 2 3 4 5	3 4 5 6 6 7 8 9 10 11 12	7 8 9 10 13 14 15 16 17 18 19 20	/10 /20
5.1 **Team Roles & Tasks**	Limited understanding of roles and responsibilities	Team roles and responsibilities identified	Highly structured team with clear roles and responsibilities. All team members provide critical contributions with evidence of supportive/overlapping interactions. Relevant skill development/mentoring undertaken. Plan Changes discussed	/10
5.2 **Scope**	Limited understanding of scope	Some attempts at scope decomposition	Excellent control of all project deliverables understanding requirements and setting goals to maintain focus Plan Changes discussed	/10
5.3 **Time Management**	Limited evidence of time management	Some planning used to guide progress of project goals and stay on task.	Extensive evidence of using effective management methods and tools to stay on task and meet deadlines.	/10
5.4 **Finance**	Limited budgeting awareness	Some resources identified, budgeting and project contingency considered.	Excellent resource management, understanding of budget control and evidence of financial accounting methods including tracking of actual spend against budget.	/10
5.5 **Risk Management**	Limited risk awareness	Some contingency plans in place.	Reasonable contingency plan and risk assessment prepared and/or undertaken.	/10
5.6 **Internal Communication**	Limited team communication	Basic team communication processes discussed.	Excellent use of multiple communication tools and methods for effective team planning and accountability.	/10
5.7 **Stakeholder Engagement**	Limited stakeholder engagement	Basic understanding and application of stakeholder engagement	Excellent understanding and application of initiating and maintaining stakeholder engagement with collaborators, sponsors, mentors and supporters using multiple tools and methods.	/10
5.8 **Skill Development for Future Careers**	No or little effort to identify skills and link them to Defence Industry Careers	A good effort by the team to identify individual skills developed but more work needed to link these with Defence Industry careers.	Demonstrable evidence in portfolio by team to identify and record several industry specific and employability skills developed through their participation in F1 in Schools and how these can link to future careers within Defence Industries.	/20
5.9 **Evaluation**	Limited evaluation	Some evaluation applied	Evaluation processes applied throughout the management of key deliverables.	/10
			Project Management & Career Dev. GRAND TOTAL	**/100**

CRITERIA 6 - PORTFOLIO: PORTFOLIO DESIGN - CLARITY & QUALITY SCORE CARD

Judging Sub Category	**Design: Clarity & Quality**	**Team ID**	
Primary Evidence	**Team Enterprise & Engineering Portfolios**	**Team Name**	
Secondary Evidence	**Nil**	**School**	
Criteria	**6**	**Competition Class**	

	Low	Developing	Advanced	Score
Criteria	**0 1**	**2 3**	**4 5**	**/5**
6.1 **Production Quality of Materials**	Poor quality.	Basic printing and binding.	Quality printed document on quality paper in appropriately durable binding	/5
6.2 **Production Quality of Content**	Missing documentation	Basic documentation provided.	Correct number of pages. All required documentation included and professionally presented. Car rendering and team logo on cover page in keeping with branding.	/5
6.3 **Content Organisation**	Disorganised content	Some content organisation	Highly organised and managed portfolio content with logical structure and flow of information.	/5
6.4 **Layout Design**	Distracting imperfections weaken the work	Some layout design format attempted.	Well formatted layout design consistently applying margins, alignment, spacing, graphics and design elements with consideration of visual balance and flow. All pages optimally used and uncluttered. Creative style realised.	/5
6.5 **Typography**	Font choices distracting or weaken the work	Some consideration for type treatment.	Consistent use of typography with appropriate choices and limited number of text and headline font sizes, styles, colours and hierarchy. In keeping with branding. Easy to read.	/5
6.6 **Photos & Images**	Poor quality or use of images. No captioning.	Basic quality and use of images. Some reasonably concise captioning.	Justified use of excellent, un-pixellated, clear, undistorted photos and images that are concisely and accurately captioned. Properly sized, coloured and integrated with text to illustrate key messages. Considers branding.	/5
6.7 **Creative Graphics (Visual effects and infographics)**	Poor graphics and/or execution. No captioning.	Graphics attempted with some success. Some reasonably concise captioning.	Justified, well executed and placed, un-pixellated, undistorted graphics that are concisely and accurately captioned. Consistent use of colour/ tones/ shapes, without visual overload, in keeping with branding.	/5
6.8 **Editing/Proofreading**	Error ridden. Poor attempt at proofreading.	Good attempt with additional editing required for clarity.	No errors detected in text and graphics	/5
6.9 **Referencing**	Obvious failures in referencing.	Some attempt at referencing. Some errors evident.	Excellent use of referencing for author's written word, graphics/photos and video sources etc	/5
6.10 **Writing & Readability**	Difficult to understand. Unable to read.	Does not sustain reading or interest. Does not 'flow'.	Concise, appropriate, grammatically correct text, captions and headlines. Inviting and engaging. Sustains the reader's interest.	/5
			Clarity & Quality GRAND TOTAL	**/50**

CRITERIA 7 - MARKETING: BRANDING SCORE CARD

JUDGING SUB CATEGORY	**BRANDING**	**TEAM ID**	
PRIMARY EVIDENCE	**TEAM INTERVIEW AT TRADE BOOTH**	**TEAM NAME**	
SECONDARY EVIDENCE	**TEAM ENTERPRISE PORTFOLIO**	**SCHOOL**	
CRITERIA	**7**	**COMPETITION CLASS**	

		LOW	DEVELOPING	ADVANCED	SCORE
CRITERIA		**0 1 1 2 3**	**2 3 4 5 6**	**4 5 7 8 9 10**	**/5 /10**
7.1	**Team Name***	Irrelevant choice	Limited consideration of meaning	Well considered, meaningful team name appropriate to goals and image projection	**/5**
7.2	**Logo Development***	Limited ideas & development. No original work evident	Some logo idea progression & creative logo modification of type or graphics noted	A number of logo ideas considered with attention to team goals and identity. Creative & original logo development clearly relates to the team's chosen name, identity and purpose	**/5**
7.3	**Final Logo Design***	Team logo is absent or confusing	Logo message is simple and obvious	Strong team logo that grabs attention, generates a positive response, and is easily recognised and recalled. Well considered use of colours, type and shapes enhance meaning. In keeping with branding	**/5**
7.4	**Logo Application**	Poor quality reproduction, limited team logo badging	Most items are badged with team logo. Team logo quality diminished when enlarged or reduced across applications.	Team logo scales well to large and small badging applications. All applications are of high quality and appropriately positioned for strong impact	**/5**
7.5	**Team Branding**	Branding message is weak with inconsistent application across the project	Effective team branding consistently applied across project components	Excellent and highly effective messaging of team image. Quality and consistent branding of team name, logo, typography, & colours applied across all project elements: portfolio, uniforms, car, display, social media and collateral. Icon, tagline or mascot added to strengthen branding	**/10**
7.6	**Media Exposure**	Limited or ineffective	Some development, some impact, some consideration of audience and platforms	Clear, developed, high impact media strategy, including social media. Careful consideration of target audience and suitable platforms. Evidence of attempt to work with media broadcasters/publishers with some documented success	**/5**
7.7	**Team Sponsors & REA Corporate Partners ROI**	Little or no ROI	Sponsorship acknowledged. Some logos included in project collateral	Clear and appropriate visibility of team sponsors and REA Corporate Partners. Quality reproduction of appropriate sponsor and REA Corporate Partner logos across all project collateral as required	**/10**
7.8	**Team Uniform**	Ineffective or inconsistent, same or similar to supporters	Basic and consistent across the team, distinct from supporters	Creative and considered use of branding and appropriate styling for all members. Team member names and roles clearly identified. Clearly distinct from supporters	**/5**
7.9	**Team Presence**	Not all present / Poor energy	Generally enthusiastic	All team members are appropriately engaging and enthusiastic about their work	**/5**
7.10	**Team Knowledge**	Limited engagement	Some members knowledgeable	Each member is highly knowledgeable in their role and also broadly knowledgeable about details of their entry. Able to defer to others with confidence and share project ownership	**/5**
				Branding GRAND TOTAL	**/60**

CRITERIA 8 - MARKETING: TRADE DISPLAY SCORE CARD

JUDGING SUB CATEGORY	**TRADE DISPLAY**	**TEAM ID**	
PRIMARY EVIDENCE	**TRADE DISPLAY**	**TEAM NAME**	
SECONDARY EVIDENCE	**TEAM INTERVIEW, ENTERPRISE PORTFOLIO & DESIGN DEVELOPMENT BRIEF**	**SCHOOL**	
CRITERIA	**8**	**COMPETITION CLASS**	

	CRITERIA	**LOW**	**DEVELOPING**	**ADVANCED**	**SCORE**
		0 1 2 0 1 2 3 4	**3 4 5 6 5 6 7 8 9 10**	**7 8 9 10 11 12 13 14 15**	**/10 /15**
8.1	**Trade Display Design Development**	Single or basic concepts and limited development shown.	Mulitple concepts with links to research. Logical design developments explained.	Several inspired design ideas for different booth features/functions. Clearly justified developments based around research, C8.3 Trade Display Design Developments and other competition requirements. 3D CAD used to design and organise booth elements effectivley to maximise use of space and provide an realistic graphical representation of the final display.	**/15**
8.2	**Car Display**	Little consideration given to vehicle representation	Some attempt to represent vehicle as key feature	Excellent design materials and methods used to display the vehicle and its key components to make it a feature of the display.	**/10**
8.3	**Information Design**	Limited or repeat of portfolio	Project message is expanded beyond portfolio	Clean, uncluttered and well organised layout of written and graphical information. Conclusive snapshot of team's key messages.	**/10**
8.4	**Use of ICTs**	Limited ICTs	ICTs used to enhance presentation.	Excellent integration of multimedia technologies and interactive ICTs to demonstrate, engage and inform.	**/10**
8.5	**Visual Design & Impact**	Limited or low impact creativity, branding, messaging and recognition of sponsors.	Some relevant creative messaging evident with consideration for a range of factors	Creative design which is attractive and impactful. Excellent representation of the team name, brand and brand colours. Team message and/or slogan is clearly evident and sponsors are appropriately recognised. Innovative elements add interest and support team messaging.	**/10**
8.6	**Structural Design**[1]	No consideration for constraining factors.	Some good evidence of consideration for constraining factors.	Creative and justified structural design with excellent use of space for primary display components. Evidence for considering functionality at events, branding and team messaging, materials, budget, sustainability, transport and assembly constraints.	**/15**
8.7	**Materials Selection & Use**	No or limited research into materials with constraining factors in mind. Some problems are evident.	Generally effective and relevant choice of materials considering some factors	Highly effective choice of materials. Evidence of development considering factors including appearance, budget, sustainability, transport and assembly constraints. Team understands properties of materials used and is able to justify their choices, achieving an excellent finish with evident attention to detail.	**/15**
8.8	**Sustainability**	No or limited evidence of sustainability factors taken into consideration.	Some evidence of sustainability considerations by team.	Strong demonstrated evidence of team reusing or recycling project components with consideration for the environment where possible.	**/10**
8.9	**Packaging Restrictions**[2]	Team complies with ALL packaging restrictions as per C8.4 of the Australian Competition Regulations (0 or 50)			**/50**
				Trade Booth GRAND TOTAL - Development Class	**/130**
				Trade Booth GRAND TOTAL - Professional Class	**/145**

1 Not applicable to the Development Class at State Finals
2 This criteria marked by the Chair of Judges prior to start of booth setup & results entered online.

CRITERIA 9 – VERBAL PRESENTATION: PRESENTATION TECHNIQUE SCORE CARD

Judging Sub Category	**Presentation Technique**	**Team ID**	
Primary Evidence	**Team Presentation**	**Team Name**	
Secondary Evidence	**Visual Aids**	**School**	
Criteria	**9**	**Competition Class**	

	Low	Developing	Advanced	Score
Criteria	**0 1 2**	**3 4 5 6**	**7 8 9 10**	**/10**
9.1 **Presentation Energy**	Artificial and/or low energy	Speakers generally enthusiastic with lively delivery	Passionate with effective and appropriate levels of liveliness	**/10**
9.2 **Team Contribution**	Minimal team participation	Good contributions from most team members	Excellent team work with all members participating effectively	**/10**
9.3 **Visual Aids**	Little use of aids	Some aids used effectively	Well produced, highly relevant and integrated aids effectively improve communication	**/10**
9.4 **Audience Engagement**	Minimal engagement	Some audience connection at times	Audience fully engaged and excited throughout presentation	**/10**
9.5 **Articulation**	Difficult to understand and/or hear most presenters	Inconsistent speaking ability	Excellent articulation, use of language and voice projection by all members throughout the assessment.	**/10**
9.6 **Structure**	No structure presented, difficult to follow.	A basic structure / outline provided and could be followed by audience	Clear presentation outline / overview. Excellent connections between topics and easy for audience to follow	**/10**
9.7 **Timing**	Too fast or ran out of time.	Good timing. Balanced topic depth and pace.	Ran on time or just under. Excellent balance of depth for each topic.	**/10**
			Presentation Technique GRAND TOTAL	**/70**

CRITERIA 10 – VERBAL PRESENTATION: CONTENT SCORE CARD

JUDGING SUB CATEGORY	**PRESENTATION CONTENT**	**TEAM ID**	
PRIMARY EVIDENCE	**TEAM PRESENTATION**	**TEAM NAME**	
SECONDARY EVIDENCE	**VISUAL AIDS**	**SCHOOL**	
CRITERIA	**10**	**COMPETITION CLASS**	

		LOW	DEVELOPING	ADVANCED	SCORE
CRITERIA		0 1 0 1 2 3 4 0 1 2 3 4 5	2 3 5 6 7 8 9 10 6 7 8 9 10 11 12	4 5 11 12 13 14 15 13 14 15 16 17 18 19 20	/5 /15 /20
10.1	**Team objectives**	Limited statement of objectives	Good statement of objectives	Excellent statement of objectives supported by sound reasoning	/5
10.2	**Description of Car Product**	Basic descriptions	Good description of components and features.	Excellent description of components and features including design decisions.	/5
10.3	**Innovation**	Little innovation presented	Innovations described and justified	Originality. Clever innovations with high positive project impact	/15
10.4	**Refinement**	Little refinement presented	Refinement described and justified	Clever refinement with high positive project impact	/15
10.5	**Collaboration**	Little collaboration discussed	Links with industry or higher education described	Collaborations justified with links to learning and project outcomes	/20
10.6	**Learning outcomes**	No real reflections discussed	Good explanation of some learning outcomes	A range of personal, life-long learning and career skills acquired and identified as project outcomes for a range of team members	/15
10.7	**Future Career Aspirations & Research**	Little or no thought had been given to future career aspirations.	Evidence of some team members researching careers generally but no linkage to opportunities in Defence or Defence Industries.	It is evident that team members had thoughtfully considered their future career aspirations and undertaken research into how these might be linked with opportunities being offered in Defence Industries.	/15
10.8	**Overall clarity**	Several concepts lacked clarification	Clear and appropriate concept explanations	Everything presented was understood through excellent explanations	/5
				Content GRAND TOTAL	/95

CRITERIA 11.1 & 11.2 – GRAND PRIX RACE & REACTION TIME SCORE CARD SAMPLE

SAMPLE GRAND PRIX RACE SPREADSHEET

State and National Finals

Team		REACTION LAUNCH RACING Lane 1 Run 1	Lane 1 Run 2	Lane 2 Run 3	Lane 2 Run 4	AUTOMATIC LAUNCH RACING Lane 1 Run 1	Lane 1 Run 2	Lane 2 Run 3	Lane 2 Run 4	BEST NET LAP Fastest	Time Penalty	Corrected	Rank	REACTION TIME Best	Rank	BEST GROSS LAP Corrected	Rank	GRAND PRIX Laps	Finished	Time	Rank
Team Name	Total	1.300	1.345	1.276	1.328	1.122	1.144	1.060	1.075												
A High School	React	0.219	0.202	0.189	0.223					1.060	0.000	1.060	2	0.189	12	1.276	2	8	TRUE	6.613	2
Team ID 1	Net Lap	1.081	1.143	1.087	1.105	1.122	1.144	1.060	1.075												
Team Name	Total	1.261	1.323	1.275	1.235	1.077	1.087	1.073	1.079												
School Name	React	0.153	0.179	0.179	0.144					1.073	0.100	1.173	9	0.144	3	1.335	8	8	TRUE	7.138	8
Team ID 2	Net Lap	1.108	1.144	1.096	1.091	1.077	1.087	1.073	1.079												
Team Name	Total	1.298	1.370	1.356	1.296	1.162	1.219	1.119	1.103												
School Name	React	0.098	0.173	0.270	0.164					1.086	0.000	1.086	4	0.098	1	1.296	4	8	TRUE	6.913	7
Team ID 3	Net Lap	1.200	1.197	1.086	1.132	1.162	1.219	1.119	1.103												
Team Name	Total	2.176	1.317	1.417	1.307	1.169	1.117	1.100	1.090												
School Name	React	1.000	0.172	0.306	0.175					1.090	0.150	1.240	11	0.172	10	1.457	10	8	TRUE	7.674	10
Team ID 4	Net Lap	1.176	1.145	1.111	1.132	1.169	1.117	1.100	1.090												
Team Name	Total	2.104	1.451	1.353	1.346	1.162	1.175	1.141	1.135												
School Name	React	1.000	0.267	0.241	0.216					1.104	0.300	1.404	15	0.216	15	1.646	15	8	TRUE	8.655	15
Team ID 5	Race	1.104	1.184	1.112	1.130	1.162	1.175	1.141	1.135												
Team Name	Total	1.335	1.385	2.112	1.382	1.155	1.144	1.060	1.085												
School Name	React	0.165	0.166	1.000	0.220					1.060	0.150	1.210	10	0.165	6	1.485	11	8	TRUE	7.728	11
Team ID 6	Net Lap	1.170	1.219	1.112	1.162	1.155	1.144	1.060	1.085												
Team Name	Total	1.241	1.278	1.451	1.252	1.083	1.116	1.055	1.056												
School Name	React	0.142	0.156	0.387	0.203					1.049	0.000	1.049	1	0.142	2	1.241	1	8	TRUE	6.473	1
Team ID 7	Net Lap	1.099	1.122	1.064	1.049	1.083	1.116	1.055	1.056												
Team Name	Total	1.392	1.504	1.358	1.374	1.208	1.263	1.182	1.174												
School Name	React	0.194	0.229	0.175	0.193					1.174	0.150	1.324	12	0.175	11	1.508	12	8	TRUE	8.115	12
Team ID 8	Net Lap	1.198	1.275	1.183	1.181	1.208	1.263	1.182	1.174												
Team Name	Total	1.373	1.350	1.306	1.458	1.159	1.156	1.149	1.131												
School Name	React	0.170	0.195	0.176	0.314					1.130	0.000	1.130	7	0.170	8	1.306	6	8	TRUE	6.894	6
Team ID 9	Net Lap	1.203	1.155	1.130	1.144	1.159	1.156	1.149	1.131												
Team Name	Total	1.427	2.198	1.311	1.318	1.193	1.199	1.157	1.127												
School Name	React	0.159	1.000	0.167	0.171					1.127	0.25	1.377	14	0.159	5	1.561	13	8	TRUE	8.538	13
Team ID 10	Net Lap	1.268	1.198	1.144	1.147	1.193	1.199	1.157	1.127												
Team Name	Total	2.226	1.438	1.343	1.367	1.166	1.207	1.223	1.107												
A High School	React	1.000	0.187	0.177	0.168					1.107	0.050	1.157	8	0.168	7	1.393	9	8	TRUE	7.487	9
Team ID 11	Net Lap	1.226	1.251	1.166	1.199	1.166	1.207	1.223	1.107												
Team Name	Total	1.423	1.365	2.179	1.406	1.125	1.245	1.156	1.111												
School Name	React	0.208	0.171	1.000	0.216					1.111	0.250	1.361	13	0.171	9	1.615	14	8	TRUE	8.559	14
Team ID 12	Net Lap	1.215	1.194	1.179	1.190	1.125	1.245	1.156	1.111												
Team M	Total	1.298	1.295	1.385	DNS	1.127	1.138	1.096	1.119												
School Name	React	0.165	0.155	0.279						1.096	0.000	1.096	5	0.155	4	1.295	3	7	TRUE	6.763	4
Team ID 13	Net Lap	1.133	1.140	1.106		1.127	1.138	1.096	1.119												
Team N	Total	1.430	1.335	1.335	1.362	1.094	1.086	1.109	1.085												
School Name	React	0.269	0.200	0.239	0.250					1.085	0.000	1.085	3	0.200	14	1.335	7	8	TRUE	6.632	3
Team ID 14	Net Lap	1.161	1.135	1.096	1.112	1.094	1.086	1.109	1.085												
Team O	Total	1.305	1.332	1.355	1.433	1.161	1.184	1.111	1.127												
School Name	React	0.202	0.204	0.192	0.246					1.103	0.000	1.103	6	0.192	13	1.305	5	8	TRUE	6.874	5
Team ID 15	Net Lap	1.103	1.128	1.163	1.187	1.161	1.184	1.111	1.127												

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CRITERIA 11.3 – KNOCKOUT RACE SCORE CARD SAMPLE

SAMPLE KNOCKOUT RACE SPREADSHEET

State and National Finals

1	Team ID 7				0.000	Team ID 7	1.256	FS		1.256	Team ID 7	1.268	1.360		1.268	Team ID 7	1.254	1.224		1.224	Team ID 7
16	Bye				0.000																
8	Team ID 2	1.357	1.325	0.050	1.375	Team ID 2	1.393	FS	0.050	1.443											
9	Team ID 11	DNS	1.311	0.100	1.411																
4	Team ID 3	1.425	1.330		1.330	Team ID 3	1.412	1.346		1.346	Team ID 3	1.386	FS		1.386						
13	Team ID 10	1.357	1.390	0.250	1.607																
5	Team ID 15	1.453	1.370		1.370	Team ID 15	1.360	1.422		1.360											
12	Team ID 8	1.364	1.348	0.150	1.498																
6	Team ID 9	1.447	1.447		1.447	Team ID 9	1.443	1.325		1.325	Team ID 13	1.100	1.376		1.100	Team ID 13	1.294	1.273		1.273	
11	Team ID 6	1.466	1.438	0.150	1.588																
3	Team ID 13	1.395	1.393		1.393	Team ID 13	1.341	1.313		1.313											
14	Team ID 12	1.281	1.326	0.250	1.531																
7	Team ID 14	1.264	1.343		1.264	Team ID 14	1.312	1.433		1.312	Team ID 1	FS	1.267		1.267						
10	Team ID 4	1.351	1.288	0.150	1.438																
2	Team ID 1	1.403	1.390		1.390	Team ID 1	1.274	1.327		1.274											
15	Team ID 5	1.410	DNS	0.300	1.710																

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