



# in Schools

NORTH AMERICA

VERSION 3 UPDATED: 12/04/23



N.A. Competition Regulations

*Professional Class*

**2023-24**

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**Please note:** any amendments made prior to the event will be indicated using red underlined text. ~~The old regulation will be indicated in strike-through text.~~ Updated versions of the regulations will be posted on the official F1 in Schools North America website (within the Team Portal) as a new revision.

**Note:** These rules and regulations have been adapted from previous versions of the US Competition Regulations. Teams are expected to read through this whole document without assumptions from previous documents.

Rules related to the **REGIONAL FINALS** will be indicated in green text, as shown.

Rules related to the **NATIONAL FINALS** will be indicated in blue text, as shown.

After reading through this document, **and the technical regulations**, if you still have questions about how the competition will run, please contact **info@F1inSchoolsNA.org**. We're here for you!

# ARTICLE C1 - DEFINITIONS

## C1.1 Competitions

- C1.1.1 2024 Competition Season** – The 2024 Competition season includes three US Regional Finals and the Nationals Finals for the US and Canada (depending on a team's home country and location). The 2024 season is designed to correspond with the 2023-2024 school year and runs through the Spring of 2024.
- C1.1.2 Regional Finals** – The US Regional Finals are managed by F1 in Schools™ and NexUS North America. The competitions will be held over two days – with virtual video conferenced judging sessions events occurring on the first day and the second day will include streamed racing events and the awards ceremony. This competition serves as a qualifier for the US National Champions – the top teams from each region will advance. Please note that while there is a single date for the US Regional Finals, three regional Finals will occur at the same time.
- C1.1.2 National Finals** - The North American (NA) National Competitions are managed by F1 in Schools™ and NexUS North America. The events are held simultaneously over several days and include various programmed social and competition activities. The competition aims to provide all students with an education and personal development opportunity and aims to determine the US and Canadian National Champions that will represent the US and Canada at the F1 in Schools World Finals.

## C1.2 Parc fermé

A secure area where all submitted cars and components are held to prevent unauthorized handling, but to allow technical inspections to be conducted by the Judges. (Literal meaning in French of 'closed park').

## C1.3 Competition Schedule

The competition program will detail the schedule of judging activities for all teams. **This will be released on the F1 in Schools North America website prior to the competition.**

## C1.4 Key performance indicators (KPI's)

These are portions of text featured 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.

## C1.5 Car race time value

A 'car race time' value is the actual time taken for a F1 in Schools car to travel the track from start to finish, measured from the instant the start box fires to when the car breaks the finish line timing beam. In the case of reaction races, the 'car 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.

## C1.6 Total race time value

The 'total 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 'car race time' value and any 'reaction time' value displayed on the electronic start gate.

### **C1.7 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 activated by the driver. This value is displayed in the reaction time field on the electronic start gate.

### **C1.8 Project elements**

These are any materials and resources that the team presents as part of its entry for any judging activity.

### **C1.9 Race events**

The US and Canadian Regional Finals will each feature **one** racing session: Time Trials. To compensate for the reduced rounds of racing, the score teams received during Time Trials will be doubled and Knockouts will not be conducted (please see C3.5 for the breakdown and note the scorecard changes between the Regional and National Finals).

The US and Canadian National Finals will each include **three** separate racing events: Time Trials, Reaction Racing, and Knockout Racing. Note that the racing events may intermix Canadian and US Teams but, results will be separated per country.

### **C1.10 Engineering drawings**

Engineering drawings are CAD produced drawings, which along with relevant CAM programs, could theoretically be used to manufacture the fully assembled car by a third party. Such drawings must include all relevant dimensions, tolerances, and material information. F1 in Schools engineering drawings must include detail to specifically identify and prove compliance for the virtual cargo and wing surfaces. **Engineering drawings can include orthographic projection, auxiliary projection, section views, isometric projection, oblique projection, perspective and annotated renderings.**

### **C1.11 Renderings**

Renderings are images intended to illustrate the three-dimensional form of an object. These can be generated in isometric projection, oblique projection, or perspective.

## ARTICLE C2 - GENERAL INFORMATION

### C2.1 Competing teams

- C2.1.1** Each team must consist of a minimum of 3 students to a maximum of 6.
- C2.1.2** Only members of the official competing team (maximum 6) are permitted to wear the team's uniform.
- C2.1.3** During the competition, only the official core team members (maximum of 6) can represent the team at registration, Pit Display set up, Scrutineering review, Verbal Presentation, Design & Engineering judging and Enterprise judging, Safe/Fit to race fix, racing, on-stage presentations, and any direct communication with the Chair of Judges or Event/Competition Directors.
- Please note: this means that support members MAY NOT attend judging sessions.**
- C2.1.4** Team affiliated students (also called support members) and supervising adults/teacher must adhere to C2.1.3. If a uniform is to be worn it must be significantly different than the official core team's uniform. This is to assist the Judges in recognizing the official core students.

### C2.2 Competition program, team number ballot and team name

- C2.2.1** F1 in Schools will issue the competition program showing all scheduled judging activities, with judging times listed against team competition numbers.

**Team competition number, or Team IDs, will be assigned after registration for competition randomly to each team.**

- C2.2.2** No teams participating in the challenge are permitted to use any of the Formula One Word Marks (shown below) in their team name, logo, domain name, and/or any social media handle. For example, "Infinity F1" is not allowed and should be changed to something similar such as "Infinity" or "Team Infinity". No team will be permitted to use any of the prohibited word marks within their team name when participating in F1 in Schools from 2017 onwards.

**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 1 company. All rights reserved.**

### C2.3 Team responsibilities

- C2.3.1** Teams must read the **North American (NA) Technical Regulations** carefully to ensure their cars comply with those regulations.
- C2.3.2** Teams must read the **NA 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.
- C2.3.3** During the competition it is the team's responsibility to ensure that team members are present at the correct time and location for all scheduled activities.
- C2.3.4** Security of the pit display and its elements is the team's responsibility during competition. [At the National Finals, teams are encouraged to always have at least one team member at their Pit Display, outside of scheduled judging events.](#)



## **C2.4 Role and responsibility of supervising teacher / adult.**

- C2.4.1** It is the primary responsibility of any event accredited supervising teacher/adult to ensure duty of care/well-being for all their student team members. Any concerns arising during the event in relation to this should be brought to the attention of the F1 in Schools Event Directors immediately.
- C2.4.2** Lead Adults during scheduled judging sessions may not interact in any way with the student team, judges, or judging process. Any incident considered inappropriate will be brought to the Chair of Judges' attention and **10 penalty points** may be applied to the associated team. **This includes the virtual judging sessions during the Regional Finals.**

## **C2.5 Regulations documents**

- C2.5.1** F1 in Schools issues the regulations, their revisions, and amendments made.
- C2.5.2** **Competition Regulations** – (This document). The Competition Regulations document is mainly concerned with regulations and procedures directly related to judging and the competition event. Competition Regulation articles have 'C' prefix.
- C2.5.3** **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.

## **C2.6 Interpretation of the regulations**

- C2.6.1** 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.
- C2.6.2** Text clarification - Any frequently asked questions that are deemed by F1 in Schools to be related to text needing clarification will be answered. The question and the clarification will be published to all teams at the same time.

## **C2.7 Supplementary competition regulations**

Other documents may be issued by F1 in Schools that provide teams with further logistic and other important event information. Any supplementary regulations will be issued to all lead teachers and team managers, where the team manager has supplied F1 in Schools with a contact email address. **Copies of all supplementary regulations issued will be linked within the Team Portal.**

## **C2.8 Design Ideas and regulation compliance queries**

Teams are not permitted to seek a ruling from F1 in Schools or any competition official or judge before the event as to whether a design idea complies with the regulations. Rulings will only be made by the Judges at the National Finals. Design compliance to the regulations forms part of the competition. As in Formula 1, innovation is encouraged, and F1 in Schools teams may also find, sometimes controversial ways, of creating design features by pushing the boundaries in order to get an extra competitive edge.

## **C2.9 Team partnerships**

- C2.9.1** F1 in Schools teams are encouraged to develop mentoring partnerships with businesses, industry, or higher education organizations throughout their project.
- C2.9.2** All teams will be required to complete a 'Team Partnerships' declaration using the template issued by F1 in Schools. This is submitted as per Article C2.10.

- C2.9.3** All design work, text and scripting for all project elements presented for assessment must be wholly undertaken and created by the team. This includes all CAD and CAM data, electronic portfolio, and graphic content.
- C2.9.4** All aspects of any partnerships should also be represented in the team's portfolio. For project elements produced utilizing 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 used.
- C2.9.5** '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.

## **C2.10 Mandatory project elements required for NA National Competition entry**

A summary of the mandatory elements required for judging at the **REGIONAL FINALS EVENTS**:

- Two (2) identical F1 in Schools (no replacement parts will be permitted). These must be mailed to F1 in Schools prior to the event.
- One (1) digital Design & Engineering Portfolio
- One (1) digital Enterprise Portfolio
- One (1) digital Project Management Portfolio
- A digital "Pit Display" poster (in place of a physical Pit Display)
- A recorded 10-minute Verbal Presentation
- A digital set of engineering drawings including orthographic and 3D renders for Scrutineering judging
- A digital copy of the team's logo
- 'Team Partnerships' declaration(s)
- Car Submission Checklist which must include the official F1 Model Block holographic stickers (mailed physically with car submission)

A summary of the mandatory elements required for judging at the **NATIONAL FINALS EVENT**:

- Two (2) identical F1 in Schools cars including all optional replacement components.
- One (1) F1 in Schools display car for use in judging events.
- One (1) fully machined, unfinished, unassembled F1 model block car body identical to the car body used on car A & B.
- Two (2) identical 'hard copy' Design & Engineering Portfolios
- Two (2) identical 'hard copy' Enterprise Portfolios
- Two (2) identical 'hard copy' Project Management Portfolios
- A Pit Display
- A 10-minute Verbal Presentation
- One (1) 'hard copy' set of engineering drawings including orthographic and 3D renders for Scrutineering judging
- A digital copy of the team's logo
- A laptop containing all CAD data and relevant CAD software (needed for judging, not submission)
- 'Team Partnerships' declaration(s)
- Project Submission Checklist which must include the official F1 Model Block holographic stickers.

The above lists are detailed in the remainder of ARTICLE C2.

**C2.10.1 Cars** - Each team must produce...

**Regional Finals:** Two (2) identical F1 in Schools race cars which will be mailed in to the competition

**National Finals:** Three (3) identical F1 in Schools cars – two race cars and a third display car. **Please Note:** Only the two race cars will be submitted for scrutineering and racing. The third display car will be used at the team's pit display and should be brought by the team to engineering judging.

**C2.10.2 Portfolios** - Refer to ARTICLE C5, C6 & C7 of these regulations along with the Design & Engineering, Project Management, and Enterprise judging score cards for portfolio specification and content requirements. Each team must produce...

- **Regional Finals:**
  - One (1) digital 7-page (one-page front cover + 6 pages of content) maximum Design & Engineering portfolios
  - One (1) digital 7-page (one-page front cover + 6 pages of content) Enterprise portfolios
  - One (1) digital 5-page (one-page front cover + 4 pages of content) Project Management Portfolios
- **National Finals:**
  - Two (2) identical 'hard copy' 11-page (one-page front cover + 10 pages of content) maximum Design & Engineering portfolios
  - Two (2) identical 'hard copy' 11-page (one-page front cover + 10 pages of content) Enterprise portfolios
  - Two (2) identical 'hard copy' 7-page (one-page front cover + 6 pages of content) Project Management Portfolios

Portfolios must be presented in a Tabloid (11"x17") sized format. One (1) physical set will be submitted and kept (refer to C2.13) and one (1) for exhibition within the team's pit display.

**C2.10.3 'Online' submission of both portfolios, set of engineering drawings including orthographic and 3D renders for judging preview** - teams must submit their three portfolio documents (Design & Engineering, Project Management, and Enterprise) and one set of engineering drawings including orthographic and 3D renders in digital format to F1 in Schools before the **Sunday prior to project check-in for the Regional Finals, and Sunday prior to project check in for the National Finals at 11:00pm (23:00) EST**. Late submission will incur a **20-point penalty**. The official date and submission link will be posted on the F1 in Schools NA Team Portal website for registered teams.

It is recommended that when creating the PDF file, teams consider embedding any unusual font types they may have used within their portfolio documents to help ensure they display correctly when opened by the Judges. The following file conventions must be adhered to:

- a) Documents must be submitted in separate single Portable Document Format (PDF) files.
- b) PDF files must be no greater than 75MB.
- c) The files must be named:  
**"your\_team\_number\_team\_name\_engineering.pdf"**,

"your\_team\_number\_team\_name\_projectmanagement.pdf",  
 "your\_team\_number\_team\_name\_enterprise.pdf" and  
 "your\_team\_number\_team\_name\_engineering\_drawings\_renders.pdf"

For example: "T01\_Infinity\_Racing\_enterprise.pdf".

**C2.10.4 Pit Display** – Refer to ARTICLE C7 for further pit display specifications and content requirements. For the...

**Regional Finals:** Each team will be provided with a template for a Pit Display poster, in place of a physical display for the Regional Finals. Teams must submit their digital Pit Display Poster before the **Sunday prior to project check-in for the Regional Final at 11:00pm (23:00) EST**. Late submission will incur a **20-point penalty**.

**National Finals:** Each team will be provided with a dedicated exhibition style space for set-up of their pit display elements. The specific style and size of this space will be announced in supplementary event competition regulations (approximately 3m wide x 1m deep x 2.4m high).

**C2.10.5 Verbal Presentation** - Refer to ARTICLE C8 of these regulations for details regarding presentation content and other requirements. For the...

**Regional Finals:** Teams will be required to submit a recording of a Verbal Presentation in relation to their project to the Judges **in a video format. The presentation must not last longer than 10 minutes**. Additionally:

- No editing is permitted – the presentation must be a "one-take" video and may not include any editing.
- The presentation may be screen recorded if members are remote and give the presentation via video conferencing.
- Videos must be uploaded to YouTube as an unlisted link. The link must be submitted before the **Sunday prior to project check in for the Regional at 11:00pm (23:00) EST**. Late submission will incur a **20-point penalty**.

**National Finals:** Teams will be required to deliver a Verbal Presentation in relation to their project to the Judges. **The presentation must not last longer than 10 minutes**. Teams should bring their own laptop with any slide show or other multimedia files that need to be shown as part of their Verbal Presentation.

**C2.10.6 Engineering drawings (refer ARTICLE C1.10) and Renderings (refer ARTICLE C1.11) for specification judging** – Refer to ARTICLE C5 of these regulations for details regarding the engineering drawings and 3D renderings. For the...

**Regional Finals:** Teams must submit a digital copy of their engineering drawings and 3D renders. These drawings must be presented as a .pdf with unlimited pages, no larger than letter size (8.5" x 11") in size. A physical copy is not required for competition.

**National Finals:** Teams must produce and submit one (1) 'hard copy' of their engineering drawings and 3D renders for scrutineering judging presented in a landscape letter (8.5" x 11") sized format. One (1) set will be submitted and kept (refer to C2.13). **Please note, Engineering Drawings and Renderings will be stored along with your car and spare parts after Check-In, so hard covers and / or large bindings are not advisable. A digital copy will also be submitted, per C2.10.3.**

**C2.10.7 Electronic data** – **[Applicable to Nationals Finals ONLY]** Teams must submit digital copies of all project elements and engineering files on a storage device compatible with the windows operating system e.g. USB memory stick.

Data submitted must include:

- All CAD parts and assembly files
- Hi-res realistic renders
- Full Design & Engineering, Project Management, & Enterprise portfolios
- Engineering drawings and Renderings submitted for judging
- Any pit display multimedia files

This data may be referred to for judging purposes and possible marketing and promotion following the event. **Note that the storage device will not be returned to the team.**

**C2.10.8 Laptop for Design & Engineering judging** - A laptop with the CAD software used by the team and with all CAD parts and assembly data should be used during the Design & Engineering judging session so that the team can demonstrate their CAD work and better explain how they engineered their car design.

**C2.10.9 'Team Partnerships' declaration** – Every team must complete the declaration template as issued by F1 in Schools. All partnerships and any outside assistance must be included. This document will be referenced by Judges so they can better understand team partnerships, ask questions, and therefore must be a full and accurate declaration.

**C2.10.10 Car Submission Checklist / Project Submission Checklist** – Please see the appendix for a copy of this form. The team must print out and submit a copy at Team Registration at the National Finals along with the team's other project elements.

**Regional Finals** – The Car Submission Checklist must be submitted with the team's cars via mail. The official holographic stickers must be included on this form. The Project Submission checklist is not applicable for the Regional Finals.

**National Finals** – The Project Submission Checklist must be submitted at Check-in along with the team's other project elements. The Car Submission checklist is not applicable for the National Finals.

## **C2.11 Team Registration (AKA Event Check In)**

**C2.11.1** Teams will be required to register with F1 in Schools during the specified times set in the event schedule and program. At this registration, teams will submit project elements (per C2.12) and may be distributed additional event information. At a minimum, the student Team Manager and supervising teacher of each team should attend. **Please have all submission materials ready to turn in at this time. Teams that are missing any project elements will not be allowed to complete registration until all elements are present.**

**For the Regional Finals, Team Check-In will be completed virtually. More information on the virtual check-in process will be released in the Team Portal.**

## **C2.12 Submission of project elements**

**C2.12.1** Teams will submit their project elements during Team Registration (C2.11) at the National Finals, and digitally prior to the Finals (C2.10.3). Both deadlines occur before judging commences. All elements must be submitted complete and ready for judging. The following list is a list of the elements which must be submitted by each team.

### **FOR THE REGIONAL FINAL:**

#### **Physical Project Elements (to be mailed to F1 in Schools NA)**

- 1x nominated Car A identified using a white or black background F1 in Schools logo decal with the Car A
- 1x nominated Car B identified using a white or black background F1 in Schools logo decal with the Car B
- Car Submission Checklist which must include the official F1 Model Block holographic sticker

Car submission deadline – Cars (including all the above mentioned) are to be shipped to the designated address (SEE TEAM PORTAL) and **arrive no later than the Wednesday** before competition.

#### **Digital Project Elements**

- One (1) digital Design & Engineering Portfolio
- One (1) digital Project Management Portfolio
- One (1) digital Enterprise Portfolio
- A digital “Pit Display” poster (in place of a physical Pit Display)
- A recorded 10-minute Verbal Presentation (in the form of a YouTube unlisted Link)
- A digital set of engineering drawings including orthographic and 3D renders for Scrutineering judging
- ‘Team Partnerships’ declaration(s)

All elements must be digitally submitted complete, ready for judging via the provided submission links (see Team Portal) by the **Sunday prior to project check in for the Regional Finals at 11:00pm (23:00) EST (as mentioned in C2.10).**

### **FOR THE NATIONAL FINALS:**

#### **Digital Submission (prior to Nationals):**

- One (1) digital Design & Engineering Portfolio
- One (1) digital Project Management Portfolio
- One (1) digital Enterprise Portfolio
- A digital set of engineering drawings and 3D renders
- ‘Team Partnerships’ declaration(s)

All elements must be digitally submitted complete, ready for judging via the provided submission links by the **Sunday prior to project check in for the National Finals at 11:00pm (23:00) EST (as mentioned in C2.10).**

#### **Physical Submission of Project Elements (at National Finals Team Check-In):**

- 1x nominated Car A identified using a white or black background F1 in Schools logo decal with the Car A
- 1x nominated Car B identified using a white or black background F1 in Schools logo decal with the Car B
- One (1) fully machined, unfinished, unassembled F1 model block car body identical to the car body used on car A & B.
- Optional Replacement Components
  - Front wing / support structure / or nose cone – maximum of three (3)

- Rear wing / support structure – maximum of three (3)
- Wheel / wheel support structure – maximum of three (3) car sets
- 1x printed Design & Engineering Portfolio
- 1x printed Enterprise Portfolio
- 1x printed Project Management Portfolio
- Letter-Sized (8.5"x11") Engineering drawings including orthographic view and Car Renders for Scrutineering judging and Car Renders
- Electronic copy of all specified project data (on a flash drive that will not be returned to team)
- 'Team Partnerships' declaration(s)
- Project Elements Submission Checklist which must include the official F1 Model Block holographic sticker. **Teams must bring this printed sheet to project check in – one will not be provided.**

**C2.12.2** During project submission at the National Finals, each team will be given the opportunity to check the weight of their cars on the official National Finals scales. If either car being submitted is under the minimum weight, the team will be given until the end of the registration period to fix any issue in order that both cars can be submitted at or above the minimum weight.

For the Regional Finals, teams will be asked to submit the weight of their cars prior to shipping. This weight will be considered by the judges during scrutineering.

**C2.12.3** Once cars and replacement components have been submitted, they are considered as being in parc fermé.

### **C2.13 Project elements to be retained by F1 in Schools**

It is a condition of competition entry that each team permits F1 in Schools to retain one (1) car, the three portfolios (Design & Engineering, Project Management, and Enterprise) and the electronic copies of all specified project data submitted (including the digital storage device on which it has been submitted). Teams also permit F1 in Schools to use any of these project elements for marketing purposes and/or publication as exemplar projects for reference by others. **Note: the car that is retained by F1 in Schools may be the team's display car, as long as the car is outwardly identical to the team's racecars.**

### **C2.14 Benefit of doubt**

The chair of judges will, where appropriate, seek to use 'benefit of doubt' when the assessment of compliance is marginal or unclear. In this situation, teams will be given the benefit of doubt rather than a firm penalty if a penalty cannot be clearly measured or identified.

### **C2.15 Spirit of the competition**

Teams are expected to act in the spirit of the competition, both before and during the F1 in Schools N.A. Competitions. Any team deemed by the chair of judges to be acting outside of the spirit of the competition, can be removed from certain or all aspects of the competition. For example, a team attempting to abuse the technical regulations to their advantage may, at the discretion of the chair of judges, be removed from racing and receive no points for this activity. A team deemed to be acting in an unsportsmanlike manner towards another team or other persons may be removed from some or all judging areas.

The spirit of the competition is simple: embrace and respect the rules and regulations, do your very best to compete legally and fairly, while contributing positively to the F1 in Schools N.A. competitions. Make friends, create positive relationships, network professionally and enjoy yourselves.

## **C2.16 Plagiarism**

F1 in Schools LTD welcomes and endorses innovation and does not consider that plagiarism should play any part in any of the disciplines that make up the competition. Competing teams at all levels of the competition that intentionally plagiarize any part of their assessed work, undermines the credibility and integrity of the F1 in Schools challenge and the spirit of the competition.

Plagiarism within any project work submitted by teams is not permitted. All teams must sign the supplied Originality Declaration at project submission and check-in along with all other project elements. Where plagiarism has been detected, the Chair of Judges may choose to exclude the team from that element of the competition.

**At project check-in the Team Manager will sign on behalf of the team to pledge that they agree with the plagiarism statement. The plagiarism statement will be released to all registered teams a month before the competition for their review.**



# ARTICLE C3 - COMPETITION AND JUDGING FORMAT

## C3.1 Competition program

**C3.1.1** Each team will be judged as per the competition program. The competition program will be formulated by F1 in Schools to best and fairly accommodate all judging and other competition activities. Teams will rotate around judging activities as per this program, with each rotation usually of 20-30 minutes in duration.

**C3.1.2** Judging Streams – The competition program will normally be divided into two parallel judging streams (Stream A and Stream B), to help ensure quality judging time intervals within the event time constraints. 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.

## C3.2 Judging categories

There are six (6) main judging categories, each with its own team of Judges and specified judging activities as detailed in further articles.

- Specification & Scrutineering Judging
- Design & Engineering Judging
- Project Management Judging
- Enterprise Judging
- Verbal Presentation Judging
- Racing Officials (AKA "Track Team")

## C3.3 Judging score cards

The F1 in Schools N.A. Competition 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. The judging score cards can be found in the appendix of this document.

**READING THE SCORE CARDS CAREFULLY IS IMPORTANT. THEY PROVIDE CRITICAL INFORMATION FOR TEAMS AS TO WHAT NEEDS TO BE PRESENTED FOR EACH JUDGING CATEGORY.**

## C3.4 N.A. National Champions

The F1 in Schools NA National Champions trophy and title will be awarded to the team with the highest sum total from all judging categories (ARTICLE C3.5). In the case of a tied points score, the team with the highest time trial score will be determined the winner.

**THE CHAIR OF JUDGE'S DECISION IS FINAL.**

### C3.5 Point allocations

Points will be awarded to teams across six (6) categories with maximum possible scores as detailed in the following table:

North America Judging Categories and Point Allocations		
<b>Specification &amp; Scrutineering Judging</b>		
Specifications	100 points	
Engineering Drawings	20 points	
Rendering	20 points	
Quality of Finish and Assembly	20 points	
<b>Design &amp; Engineering Judging</b>		
Design & Engineering Portfolio	180 points	
<b>Project Management Judging</b>		
Initiating	35 points	
Planning	25 points	
Executing	20 points	
Monitoring and Controlling	10 points	
<b>Enterprise Judging</b>		
Enterprise Portfolio Only Assessment	100 points	
Team Identity	20 points	
Pit Display	40 points	
<b>Verbal Presentation Judging</b>		
Technique	60 points	
Composition	40 points	
Subject Matter	60 points	
<b>Racing</b>		
	<b>Regionals</b>	<b>Nationals</b>
Time Trials	220 points	110 points
Reaction Racing	0 points	110 points
Knock-Out Racing	0 points	30 points
<b>TOTAL</b>	<b>970 points</b>	<b>1000 points</b>

### C3.6 Classification of technical regulations

C3.6.1 The technical regulations are classified as either: **GENERAL**, **SAFETY**, **PERFORMANCE**.

<b>GENERAL</b>	<b>SAFETY</b>	<b>PERFORMANCE</b>
Regulations that shape the way the car fundamentally looks and works, vital to the style of an F1 in Schools car.	Mandatory rules that govern the safe running of the car. Cars must meet these rules to be considered 'safe to race'.	Rules that have a direct impact on the performance of the vehicle, these typically carry the heaviest penalties.

C3.6.2 If a race car is judged as being NON-COMPLIANT with any Performance regulation, they will be **INELIGIBLE** for the awards of: '**Fastest Car**' and '**Best Engineered Car**'. All

Performance regulations are highlighted in yellow throughout the Technical Regulations Document. For more information regarding Compliance with regulations please consult T2.4.2 and T2.5 of the Technical Regulations document.

For the Knock-out Competition, should there be any teams with performance regulation failure(s) for both cars seeded in the top 24 teams then they will only be permitted to race in round one of the knock-out competition and will be automatically knocked out during round one regardless of the race result.

# ARTICLE C4 - SPECIFICATION & SCRUTINEERING JUDGING (160 points)

## C4.1 What will be Judged?

Specification & Scrutineering judging is a detailed inspection process where BOTH race cars plus the optional replacement components are assessed for compliance with the F1 in Schools NA Technical Regulations. The Engineering drawings, renderings and quality of finish & assembly will also be assessed. Refer to the scrutineering and specification judging score cards for scoring details.

**C4.1.1 [National Finals Only]** Optional replacement components must be identical to those fitted to both cars (Car A & Car B) and must be submitted with the cars. Only the following replacement components are permitted:

- Front wing / support structure / or nose cone – maximum of three (3)
- Rear wing / support structure – maximum of three (3)
- Wheel / wheel support structure – maximum of three (3) car sets

Submitted replacement components that are determined by the Judges to not be identical to that which are fitted to the car will not be allowed to be used. Submitted components will remain in parc fermé and only be handed back to the team if needed during racing and/or car servicing. **Teams will be allowed to take home their unused replacement components after the competition. Please Note: You will not be permitted to replace components on your cars that with parts that were not submitted at project check-in for scrutineering.**

## C4.2 Team preparation

Teams must ensure that their cars (Car A & Car B) and any optional replacement components are complete and ready for specification judging and racing before they are submitted. Notice is also drawn to the performance regulations, refer ARTICLE C3.6. Teams must have also submitted an electronic copy of all specified project data such as scrutineering engineering drawings, which may all be referenced. Refer ARTICLE C2.10.

## C4.3 Who needs to attend?

Specification & Scrutineering judging is a closed activity that no team member or supervising teacher may attend. **During the National Finals ONLY, there will be a specification review session scheduled that must be attended by the team manager, team design and manufacturing engineers as a minimum.**

## C4.4 Judging process / procedure

Teams begin specification judging with a full allocation of 100 points. Any infringements of the Technical Regulation articles, on either car, will result in points being deducted as detailed in the Technical Regulations.

There are three (3) parts to the specification & scrutineering judging process.

- A. Specifications** – this is conducted within the confines of parc fermé, where the specification Judges will scrutineer both cars and optional replacement components 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 calipers will then be used to closely inspect any dimensions found to be near to dimensional limits per the initial gauge inspection. Scrutineering commences as cars and optional replacement components are submitted. During specification judging, **T3.6, T3.8, T5.2, T5.4, T5.6, T7.6, T7.11** (please refer to the NA Technical regulations) will be measured with a full 8g race cartridge inserted into the cartridge chamber.

- B. **Scrutineering Judging (Engineering Drawings, Rendering and Quality of Finish & Assembly)** - this is conducted within the confines of parc fermé, where the specification Judges will assess both cars and the Engineering Drawings and 3D Renders and Quality of Finish & Assembly as per the Scrutineering score card.
- C. **[Not Applicable for Regionals; Nationals ONLY] Specification Review Interview** – each team will be scheduled a period of time for a review of any specification infringements ruled. The Judges will highlight to the team any regulation infringements and provide necessary explanations. The team is then given opportunity to explain to the Judges why they feel any identified infringements should be considered as permissible. Following the team’s explanation, the Judges may choose to reverse their original decision or uphold it. No further discussion will then be permitted (refer C4.6).
- D. **F1 in Schools Judges will periodically inspect cars for regulation compliance throughout the duration of the competition. If cars are found at any time to be non-compliant with a rule, there is the potential for points to be deducted at the Chair of Judges discretion.**

#### C4.5 Safe/Fit to race fix

**For the Regional Finals:** Due to the virtual format of the Regional Finals, after scrutineering teams will be given the chance to video conference with a member of the scrutineering staff to potentially fix safety violations (and T3.7 and T7.8). The scrutineering staff will have access to a basic toolkit; no special tool requests may be made.

**For the National Finals:** Teams that have been judged during initial scrutineering to have incurred a regulation failure from the list below will be provided with a special 20-minute car service time, prior to the commencement of racing. Cars must meet these rules to be considered ‘safe/Fit to race. If during this service time the car can be modified so as to comply with the failed regulation(s), the team will then only incur HALF the point’s penalty for that infringement, without being classified as having incurred a **SAFETY** infringement.

**T3.2, T3.7, T5.1, T5.3, T5.4, T5.5, T5.6, T6.1, T6.2, T6.3, and T7.8**

**IMPORTANT: If after the special 20-minute car service time the team is unable to modify the car to comply with the technical regulations listed above the car(s) will be considered unsafe/unfit to race and may not participate in racing events.**

#### C4.6 Specification judging decision appeals

**[N/A for Regionals; Nationals ONLY]** Teams may appeal the specification judge’s decision if they still believe their justification for regulation compliance should be accepted. An appeal must be submitted in writing directly to the Chair of Judges within two (2) hours of the team completing their scrutineering review session. Refer ARTICLE C11. The Chair of Judges will discuss the appeal with the scrutineering Judges and may seek additional advice from F1 in Schools regulation authorities. The Chair of Judges will then meet with the team, to discuss the appeal and explain the final decision.

# ARTICLE C5 - DESIGN & ENGINEERING JUDGING (180 points)

## C5.1 What will be Judged?

The Design & Engineering Judges will examine each team's Design & Engineering portfolio so that they can assess the team's car design and use of CAD/CAM technologies along with the quality of manufacture of both race cars submitted. The specific areas to be assessed are:

- Design Concepts
- CAD 3D Modelling
- Application of Computer-Aided Analysis
- Use of CAM/CNC
- Other Manufacturing & Assembly
- Research & Development
- Testing
- Design Process Evaluation
- Document Presentation

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

## C5.2 Team preparation

A laptop needs to be ready and taken to Design & Engineering judging along with any other items which may help the team explain any engineering or manufacturing concepts. The Design & Engineering Judges will not have access to the team pit display for judging purposes, or the team's official race cars. Teams should bring their display car to Design & Engineering judging. Preparation should include careful reading of the score card. The key performance indicators for the design process, application of CAD / CAM, analysis and associated data organization, describe what the Judges will be looking for.

## C5.3 Who needs to attend?

This judging session must be attended by the team manager and team design and manufacturing engineers at a minimum.

## C5.4 Judging process / procedure

Teams will be awarded points as per the key performance indicators shown on the Design & Engineering score card. Judges will review the Design & Engineering portfolio in a 'closed to teams' session programmed before the commencement of scheduled judging sessions. The scheduled Design & Engineering judging interview session will focus on the overall engineering and design of the car. This is an informal interview where Judges will ask the team to demonstrate their CAD / CAM work and query teams on what they have done. The quality of car manufacture and car assembly will be judged during a separate 'closed to teams' session.

## C5.5 Design & Engineering Portfolio requirements

The Design & Engineering portfolio must be a Tabloid (11"x17") or similar size. The portfolio is limited to **digital copy of 7-pages (one-page front cover + 6 pages of content) for the Regional Finals** and **physical 'hard copy' of 11 pages (1-page front cover + 10 pages of content) for the National Finals**. This can be a single page front cover plus 6/10 single sided or 3/5 double sided sheets. If a portfolio comprises more than 7/11 pages, the Judges will only review the first 7/11 pages for assessment purposes. There MUST be content related to the use of CAM and CNC manufacturing included in the portfolio and this will be referenced by the Engineering Judges.

**Content related to the car, design ideas, design development, research, testing and evaluation should be presented within the portfolio.**

# ARTICLE C6 - PROJECT MANAGEMENT JUDGING (90 points)

## C6.1 What will be Judged?

The Project Management Judges will examine each team's Project Management Portfolio so that they can assess the following specific areas.

- Initiating
  - Initiation Process
  - Project schedule
- Planning
  - Budget & Resource management
  - Roles and Responsibilities
- Executing
  - Team & Stakeholder Communications
  - Risk Management
- Monitor and Controlling

Refer to the Project Management judging score card for detailed point scoring and key performance indicator information.

## C6.2 Team preparation

Each team must prepare one (1) Project Management portfolio as per ARTICLE C2.10. Most importantly, teams need to read the Project Management scorecard carefully to ensure that all areas to be assessed are included within the context of their Project Management portfolio.

## C6.3 Who needs to attend?

All team members must be present during the Project Management judging session.

## C6.4 Judging process / procedure

The Project Management interview judging session is a scheduled informal interview where team members may be asked questions by Judges to help them find certain content and or seek further explanation. In addition to the scheduled judging session, the Judges will also be given time to conduct pre-judging and review of each team Project Management portfolio. This will be a 'closed to teams' session programmed before the commencement of scheduled judging sessions.

## C6.5 **[Updated 10/27/23] Project Management Portfolio requirements**

The Project Management portfolio must be a Tabloid (11"x17") or similar size. The portfolio is limited to **digital copy of 5-pages (one-page front cover + 4 pages of content) for the Regional Finals** ~~digital copy of 7-pages (one-page front cover + 6 pages of content) for the Regional Finals~~ and **physical 'hard copy' of 7 pages (1-page front cover + 6 pages of content) for the National Finals** ~~physical 'hard copy' of 11 pages (1-page front cover + 10 pages of content) for the National Finals~~. This can be a single page front cover plus ~~4/6~~ **6/10** single sided or ~~2/3~~ double sided sheets. If a portfolio comprises more than ~~5/7~~ **7/11** pages, the Judges will only review the first ~~5/7~~ **7/11** pages for assessment purposes. Content should detail the team's project management processes. Teams may use the F1 in Schools Project Management Guide as a reference.

## ARTICLE C7 - ENTERPRISE JUDGING (160 points)

### C7.1 What will be judged?

The Enterprise Judges will examine each team's Enterprise Portfolio and Pit Display so that they can assess the following specific areas.

- Enterprise Portfolio Only:
  - Marketing
  - Sponsorship
  - Digital Media
  - Sustainability
  - Documentation
  - Presentation
- Team Identity
  - Overall Team Identity Across Project Elements
- Pit Display
  - Design Process
  - Content

Refer to the Enterprise scorecard for detailed point scoring and KPI information.

### C7.2 Team preparation

Each team must prepare one (1) Enterprise portfolio and Pit Display as per ARTICLE C2.10. Most importantly, teams need to read the Enterprise scorecard carefully to ensure that all areas to be assessed are included within the context of their Enterprise Portfolio and Pit Display.

### C7.3 Who needs to attend?

All team members must be present during the portfolio and display judging session.

### C7.4 Judging process / procedure

The Enterprise interview will take place at the team's Pit Display. The Judges will usually introduce themselves then ask the team to stand clear of their display so the Judges can conduct assessments. Team members may be asked questions by Judges to help them find certain content and or seek further explanation. In addition to the scheduled judging session, the Judges will also be given time to conduct prejudging and review of each teams' Pit Display and Enterprise portfolio. This will be a 'closed to teams' session programmed before the commencement of scheduled judging sessions.

### C7.5 Enterprise Portfolio requirements

The Enterprise portfolio must be a Tabloid (11"x17") or similar size. The portfolio is limited to **digital copy of 7-pages (one-page front cover + 6 pages of content) for the Regional Finals** and **physical 'hard copy' of 11 pages (1-page front cover + 10 pages of content) for the National Finals**. This can be a single page front cover plus 6/10 single sided or 3/5 double sided sheets. If a portfolio comprises more than 7/11 pages, the Judges will only review the first 7/11 pages for assessment purposes. Content should include:

**Marketing and Sponsorship:** For the marketing element, teams are asked to summarize their approach and reasoning to gaining awareness, engagement, sponsorship, and any other marketing activities.

**Digital Media:** For this element, teams are asked to outline their approach and reasoning for social media platforms, electronic mailings, website, and other online communications. The



Digital Media element within the document will be assessed in conjunction with a review of the team's Digital Media campaign executed.

**Sustainability:** For this new assessed criterion, teams are to outline their sustainability strategy and activities which give consideration to economic, environmental, and social factors.

## **C7.6 [REGIONALS ONLY] Pit Display setup and parameters**

Teams will develop their Pit Display content and display it virtually within a Pit Display poster in place of a physical display, similar to a technical poster.

**C7.6.1** Teams will display their content with a 36" x 48" .pdf poster.

**C7.6.2** The Pit Display poster may include images and **embedded** videos. Submissions may not link to outside files (including videos or websites). Judges will only review the content within the poster itself.

**C7.6.3** The submitted .pdf file may be no larger than 75MB, as defined in C2.10.3

## **C7.7 [NATIONALS ONLY] Pit Display setup and parameters**

**C7.7.1** Teams will be provided a display space approximately dimensions 3m wide x 1m deep x 2.4m high. The precise space description and dimensions will be announced closer to the event. Each allotted space will have access to one (1) power outlet.

**C7.7.2** **[Updated 12/04/23]** Pit display content should be transported to the competition venue as hand carried items. Cases with wheels to be rolled in are allowed. We recommend that the dimensions would be acceptable by an airline for checked baggage into the hold of an aircraft. All materials brought into the venue must be taken away at the end of the event. Production companies will not be allowed to assist teams on the transportation or assembly of pit displays. **There will be no waste disposal options during pit build and breakdown.** Your pit display area must be left as you found it.

*F1 in Schools recommends no item should weigh more than 70lbs and total length + height + depth of any item should not exceed 240cm.*

**C7.7.3** A time period will be scheduled for when all teams will set-up their pit displays. A time limit of two hours will be enforced; this will be confirmed in supplementary regulations. F1 in Schools reserves the right to apply a penalty of **up to 20 points** at the discretion of the Chair of Judges for teams that do not complete their set-up within the time limit, do not leave their stand in a safe state and clear their pit and surrounding area of all rubbish.

**C7.7.4** No part of the teams completed Pit Display is allowed to protrude beyond the physical dimensions of their allocated pit space. This includes anything that might protrude above the pit space highest point e.g. flags. **This also includes projections on areas outside of team's allocated space.** Teams are not permitted to remove any part of the provided exhibition booth to fit the pit display. A penalty of **up to 10 points** may be applied at the chair of judge's discretion.

**C7.7.5** Only student team members are permitted to set-up their pit displays. There must be no supervising teacher/adult or other outside assistance, unless deemed by F1 in Schools to be a health and safety issue.

**IMPORTANT HEALTH & SAFETY:** Health and Safety measures must be considered when working on all aspects of your Pit Display. F1 in Schools expects teams to produce a risk assessment and method statement to ensure all team members are aware of any risks in the construction of the pit display. This is to also ensure displays are safe for other participants and visitors to the event. F1 in Schools reserves the right to apply a penalty of **up to 20 points** at the discretion of the Chair of Judges for unsafe activity.

**C7.7.6** F1 in Schools and / or the Chair of Judges may instruct a team to take action to reduce noise or remove display inclusions deemed to be inappropriate. F1 in Schools will instruct teams to remove or alter any display inclusions considered to be a safety hazard.

**C7.7.7** Any electrical appliance connected to the power supply must be safe.

# ARTICLE C8 - VERBAL PRESENTATION JUDGING (180 points)

## C8.1 What will be Judged?

The Verbal Presentation Judges will assess each teams' 10-minute verbal presentation across the areas of technique, composition, and subject matter:

- Technique
  - Use of visual aids – effective use of multimedia and / or other 'props'
  - Team contribution – effective participation by all team members
  - Engagement – levels of enthusiasm, energy, audience interest, and excitement
- Composition
  - Concepts clarification – clear and concise explanations where required
  - Use of time – how effectively was the 10 minutes used
  - Presentation structure – overview explained and connection between topics
- Subject Matter (the topics which need to be talked about)
  - Innovation – detail key innovations related to car design, project management, marketing or any other aspect of the team's project
  - Collaboration – detail any partnerships or mentoring from outside the team and justify in terms of improving project outcomes
  - Learning experiences – explain how the F1 in Schools project has benefited team members

Refer to the Verbal Presentation score card for detailed point scoring and KPI information.

## C8.2 Team preparation

Each team is required to prepare a Verbal Presentation as per the requirements in ARTICLE C2.10. Any multimedia content, slides, etc. must be saved on, and shown, using the team's own laptop. Teams need to have all presentation resources tested and ready with them for verbal presentation judging. Most importantly, teams should read the Verbal Presentation judging score card carefully to ensure their verbal presentation features all elements and content that the verbal presentation Judges will be looking for.

## C8.3 Who needs to attend?

All team members must be present during the Verbal Presentation judging session.

## C8.4 Judging process / procedure

Verbal Presentation judging is scheduled for the same duration of other judging sessions, usually 20 minutes. **During the Regional Finals, the team will join a video conference after the judges have viewed the team's pre-recorded video submission, where they then may be asked clarifying questions by the judges. During the National Finals, teams will present a physical verbal presentation.** Teams will be given an opportunity 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 teams' presentation time, the Judges may choose to provide some feedback and / or ask any clarifying questions they feel necessary.

**C8.5 Verbal presentation judging provisions**

F1 in Schools 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 projector and screen, or TV and multimedia sound system. 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.

**C8.6 Verbal presentation video recordings**

The Verbal Presentations of all teams may be video recorded by F1 in Schools for the purpose of judging review and/or post event publicity and promotional purposes by F1 in Schools.

## ARTICLE C9 - RACING (250 points)

### C9.1 What races will be conducted?

The N.A. Competition racing points will be awarded through the staging of various racing events:

#### For the Regional Finals:

- Time Trials Racing – automatic launch mode, 4 races in total, 2 races in each lane. Racing will be held during one session and will be livestreamed for team viewing. The average 'car race time' value from time trial races will determine the Fastest Car Award.

#### For the National Finals:

- Time Trials Racing – automatic launch mode, 4 races in total, 2 races in each lane
- Reaction Racing – manual/driver launch mode, 4 races in total, 2 races in each lane
- Knock-out Competition Races – manual/driver launch mode, one race in each lane per round of competition.

**The average 'car race time' value from reaction races will determine the Fastest Car Award (refer C10.6).** The knock-out competition is the last of the scheduled races. Refer to ARTICLE C3.5 and further information following for details on how points are calculated and awarded.

### C9.2 Team preparation [N/A for Regionals, Nationals ONLY]

- C9.2.1** Teams should be familiar with the operation of the F1 in Schools Race System. Time may be offered for teams to practice race starts during free time prior to racing events.
- C9.2.2** Manual / driver starts - One or more team members (driver/s) must be appointed for launching of the teams' car using the manual launch method. Each lane of the track has a dedicated starting area 1m x 1m which shall be clearly marked on the floor. The driver must only make contact with the floor within this dedicated area and must not touch or lean on the track.
- C9.2.3** Finish line management - At least one member of the team must be appointed as responsible for managing the finish line Car Deceleration System or team's own system (refer C9.11) and return of car along the track to the start.
- C9.2.4** Start line car staging – one team member may be appointed as being responsible for 'aligning' the car. This team member is only permitted to set the alignment of the car behind the start line, with respect to the start box and track under close supervision from the racetrack Judges. Team members are NOT permitted to interfere in any way with the compressed air cartridge or vertical alignment of the start box. This process must be completed within a time limit of 30 seconds. Appointment of this team member is optional. All four wheels must be in contact with the track surface after completion of the car staging time. **The race Judges will stage the car before the team is allowed 30 seconds to make adjustments (see C9.4 and C9.7.2). Team members must have staged the car BEHIND the start line during the 30 seconds. Car forward the start line or not in contact with the start box will count as a DNF.**
- C9.2.5** Teams must ensure that both cars are race ready, a car service session will be provided before the next race event (refer C10.2). If a teams' car is damaged beyond achievable repair, then teams will forfeit any races that the car would have been used for.

### C9.3 Who needs to attend?

All team members must be present during their scheduled racing sessions and should assemble at the track start for briefing by the racetrack Judges at their scheduled time.

### C9.4 Reaction race procedure [N/A for Regionals, Nationals ONLY]

Cars are launched in manual/driver reaction mode during one racing session, comprising of four (4) races total per team, two (2) races in each lane. The TOTAL RACE TIME displayed and the REACTION TIME displayed for each race is recorded. The reaction races will be conducted as follows:

- 1) Teams race in order as shown in the competition program. To begin, the lowest team number will start in lane 1. All cars will be loaded onto the track, Car A first then Car B
- 2) One team member to track finish for deceleration system control
- 3) Judge arms Start Box - SAFETY ON
- 4) Race 1 (Car A) - Judge sets cars on track / tether line and inserts a compressed air cartridge – makes initial start box adjustments
- 5) A team member is then allowed 30 seconds to 'fine tune' the alignment of their car, please see C9.2.4 for more detail. **The deceleration system must also be set during this time.**
- 6) Driver and team stand trackside with corresponding lane start trigger. Please note, if space is limited, team members aside from the driver may be asked to stand behind the start of the track.
- 7) Judge checks deceleration system is ready, all team members to stand in designated safety zone as instructed by track judges, track is clear for racing, team information on race system is correct, switches Start Box - SAFETY OFF
- 8) Judge presses the start system reset button – cars are launched by driver pressing start trigger
- 9) Judge records TOTAL RACE TIME and REACTION TIME displayed on start gate
- 10) Team member at finish moves car into storage zone at the end of the track
- 11) Race 2 (Car B) conducted in same lane as above, driver can be inter-changed as nominated
- 12) Team member at finish control returns car and empty compressed air cartridge along track to the start with **minimum handling**. **Please note: if breakage occurs, the race Judge at the end of the track will determine if the car and parts should be returned by a member of the judging staff instead of team members.**
- 13) Judges remove cars from tether line and change lanes, team information on race system is correct
- 14) Race 3 (Car A) and Race 4 (Car B), driver can be inter-changed as nominated
- 15) Cars removed from track and returned to Parc Fermé

### C9.5 Reaction race scoring [N/A for Regionals, Nationals ONLY]

All four (4) 'total race times' recorded from the reaction races are considered. The fastest of these four (4) times is used in the following formula to calculate the points awarded:

- Fastest 'total race time' = 110 pts
- 2<sup>nd</sup> fastest 'total race time' = 105 pts
- 3<sup>rd</sup> fastest 'total race time' = 100 pts
- Slowest 'total race time' = 5 pts
- Base Time = 120% of 3<sup>rd</sup> fastest 'total race time'
- 4<sup>th</sup> fastest and all other teams score points using the following formula:

- Team Points = 5 + (95 / (Base Time – fastest 'total race time')) x (Base Time – teams fastest 'total race time')
- Any team with a best 'total race time' that is slower than the base time will score 5 points. To further discriminate between any teams scoring 5 points, a deduction of 1 point will be made for any did not finish (DNF) reaction race result.

## C9.6 Time trial race scoring

The four (4) 'car race times' recorded during racing will be considered. From these four (4) races, the team's 1st, 2nd, and 3rd best '**car race times**' will be averaged. This average time is used in the following formula to calculate the points awarded:

- Fastest average (avg.) time = 110 pts
- Second fastest avg. time = 105 pts
- Third fastest avg. time = 100 pts.
- 'Base Time' = 115% of the third fastest avg. time of all teams avg. times.
- Fourth (4<sup>th</sup>) to slowest avg. time score points using the following formula:
  - Team Points = 20 + (80/(Base Time – 3<sup>rd</sup> fastest avg.)) x (Base Time – teams avg.)
- Any team that has an average slower than the base time will score 20 points. To further discriminate between these teams, a deduction will be made of 2.5 points for any did not finish (DNF) time trial result.
- If after discarding a team's **slowest** time there remains less than **3** times from races finished, due to DNF's, the slowest time recorded is input to the average equation until there are a total of **three** times to average.

**NOTE: For the Regional Finals, using the calculations above, the team's Time Trials Score will be double (i.e. max possible score of 220 points for racing) to account for the reduced racing sessions due to the virtual format.**

## C9.7 Knock-out Competition

Teams will take part in a knock-out (single elimination) competition. Teams will be issued the knock-out competition seeding and competition bracket prior to the race event commencing. Only the top 24 teams will participate in the knock-out competition.

**C9.7.1** Seeding - The seeding order for the first knock-out round is determined through seeding all teams using the average fastest 'total race time' they achieved from the reaction racing event.

Cars judged to have critical ("performance") regulation failures will have 0.5 seconds per performance regulation failure per car added on to their fastest 'total race time' for seeding purposes, see formula below:

$$\text{Seeding Time} = \frac{\left( \begin{array}{l} \textit{Car A fastest 'total race time'} \\ + (0.5 \times \textit{Car A Performance Regulations}) \\ + \textit{Car B fastest 'total race time'} \\ + (0.5 \times \textit{Car B Performance Regulations}) \end{array} \right)}{2}$$

Should there be any teams with performance regulation failure(s) for only one of their cars seeded in the top 24 teams, they will only be permitted to race that car in round one

of the knock-out competition and its time will not count towards the team's progression in the competition.

Should there be any teams with performance regulation failure(s) for both cars seeded in the top 24 teams then they will only be permitted to race in round one of the knockout competition and will be automatically knocked out during round one regardless of the race result.

**C9.7.2** Knock-out competition procedure - During the knock-out competition BOTH race cars will be used. 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. In case of a tied result, a further 'sudden death' race will be conducted, this will be a repeat of race 2. The knock-out competition will be conducted as follows:

- 1) Teams race in order of the competition draw. Top of draw in lane 1.
- 2) Prior to the cars being set on the track for each round, each team will be required to nominate which car (A or B) they will use for their first race. Each teams' other car will be used for the second race.
- 3) One team member to track finish for deceleration system control.
- 4) Judge arms start box - SAFETY ON – makes initial start box adjustments.
- 5) Race 1 - Judge sets all cars on track/tether line and inserts compressed air cartridge
- 6) A team member is then allowed 30 seconds to 'fine tune' the alignment of their car, please see C9.2.4 for more detail. **The deceleration system must also be set during this time.**
- 7) Driver stands trackside with corresponding lane start trigger.
- 8) Judge checks deceleration system is ready, all team members to stand in designated safety zone as instructed by track judges, team information on race system is correct, track is clear for racing, switches start box - SAFETY OFF.
- 9) Judge presses the start system reset button – cars are launched by driver pressing start trigger.
- 10) Judge records TOTAL RACE TIME displayed on start gate.
- 11) Team member at finish moves car into storage zone at the end of the track Judges set cars for Race 2.
- 12) Check team information on race system is correct
- 13) Race 2, driver can be inter-changed.
- 14) Cars removed from track and returned to Parc Fermé.

**C9.7.3** Knock-out competition scoring

Points are awarded based on the round of competition a team is eliminated as follows:

- Seeded outside top 24 = 4 pts
- Eliminated in Round 1 = 6 pts
- Eliminated in Round 2 = 8 pts
- Eliminated in Quarter Final = 15 pts
- Eliminated in Semi Final = 22 pts



- Eliminated in Final = 26 pts
- Knock-out Winner = 30 pts

### **C9.8 DNF (Did not Finish) race results**

Damage or part separation occurring during a race, before the car crosses the finish line, (e.g. wheel or any other part of the car separating), or a car not crossing the finish line at all, effects in a DNF race result. The Judges may refer to video evidence to verify a DNF result.

### **C9.9 False starts**

**C9.9.1** A false start (jump start) occurs when the driver depresses the trigger button before the 5 start gate lights have extinguished. The screen will display a false start message.

**C9.9.2** All reaction false starts will incur a 2.5-point penalty and by default forfeit that race. This penalty does not apply to knock-out racing.

**C9.9.3** 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 a DNF, and the other team's time is recorded. If both teams false start, the race counts as one of the two (2) runs.

**C9.9.4** During any manual / driver starts, if a driver false starts and distracts the other driver the race will be re-run and the driver who caused the distraction will forfeit their race.

**C9.9.5** Distractions outside of the race start area will be assessed by the lead track judge and track officials to determine if the race should be re-run. All competitors must, and other spectators will be instructed to, keep noise down to a minimum and to not use flash photography.

**C9.9.6** If a false start occurs on race 1 or 3 of a racing session or the first race of a knock-out then the car(s) shall be walked to the end of the track and placed in the storage zone (refer C9.11.4).

### **C9.10 Track, tether line and timing system information**

**C9.10.1** The F1 in Schools Elevated Racetrack, supplied by Denford Ltd will be used. The official length of the track, from start line to finish is 20 meters. A monofilament tether line of diameter 0.6mm, fixed at the finish end, passes down the center of each lane. At the start end the line passes through 90 degrees over a single pulley then attached to a 1.0kg mass suspended above the floor.

**IMPORTANT: Teams are not permitted to add anything to the racetrack until 250mm after the finish line/gate.**

**C9.10.2** Launch/Timing - The F1 in Schools Launch/Timing System will be used for launching cars and timing races and driver reaction times to 1/1000th of a second.

### **C9.11 Car Deceleration System**

**C9.11.1** The Car Deceleration System acts to bring cars to rest once crossing the finish line. F1 in Schools will provide a standard Car Deceleration System, consisting of tapered brushes positioned behind the finish line of each lane. Please see Appendix V of the NA Technical Regulations for dimensions of the F1 in Schools Car Deceleration System.



**C9.11.2 [N/A for Regionals; Nationals ONLY]** Teams may supply their own deceleration system and the team will be responsible for its management. The Car Deceleration System maximum length is 1500mm. The Car Deceleration System cannot have any electronic components. **Any system supplied by a team must be simple to setup within 1 minute and must not impede the opposing track lane, race car or the race schedule in any way.** Teams must be able to safely reset their deceleration system by the time the start line car staging time is complete. The Judges, at their discretion, can rule any system supplied by a team to be inappropriate and revert to use of the standard deceleration system.

**C9.11.3** Deceleration systems must be located a minimum of 250mm after the finish line.

**C9.11.4** The final 350mm of the track after deceleration systems is reserved for a storage zone to store raced cars before they are returned to the track start.

## **C9.12 Compressed Air Race Cartridges**

Compressed air cartridges to be used for all North American competition races will be supplied by F1 in Schools. Each compressed air cartridge will be separately weighed before competition to ensure that all compressed air cartridges used for races are within a weight range of 0.5 grams. All race cartridges will be kept in a temperature-controlled environment of 21 degrees Celsius.

## **C9.13 Car weight checks**

Cars will have their weight checked at the racetrack prior to commencing a race event. This is done to ensure each car remains at a legal weight during all races. If a car is judged to have gone under weight whilst stored in parc fermé, the Judges will add ballast to return the car weight to what it was when first submitted to parc fermé, without penalty.

## **C9.14 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.

## ARTICLE C10 - CAR REPAIRS AND CAR SERVICING

### C10.1 Car repairs

- C10.1.1** All damage issues and related repair work during racing is at the Judge's discretion and may be referred to the scrutineering Judges and/or Chair of Judges for a final decision.
- C10.1.2** No items can be removed or added to a car during racing, other than compressed air cartridges, except in the case of a repair.
- C10.1.3** **For the Regional Finals:** If a race car sustains damage during racing and this damage is ruled to be related to engineering deficiencies and a repair is achievable then a repair will be allowed. If this repair can be undertaken using any of the defined replacement components (including those already part of the car assembly, refer T3.10) in under 30 seconds and be race ready, then no penalty will be applied. A designated race staff official will attempt to make repairs that do not require adhesive (i.e the official will attempt to fix a wheel that has fallen off but not regluing of broken nose cone).  
**For the National Finals:** If a race car sustains damage during racing and this damage is ruled to be related to engineering deficiencies and a repair is achievable then a repair will be allowed. If this repair can be undertaken using any of the defined replacement components (including those already part of the car assembly, refer T3.10) in under 30 seconds and be race ready, then no penalty will be applied. A timer will start when the race official places the damaged car on the official repair table. If the repair takes longer than 30 seconds, doesn't use the defined replacement components or the car is not race ready, then a 5-point penalty will be applied. A repair time limit of 120 seconds (2 minutes) will be applied, if the car is not race ready at the end of this time then any further repairs must take place in the next service session (refer C10.2). Please note, the Best Engineered Car award is calculated using a number of scores from the competition, including penalty points incurred through damage during racing. Please see the Awards Matrix in the appendix of this document for more information.
- C10.1.4** Engineering deficiencies may include but not limited to damage to car body, wings & wheels as part of racing including damage occurring within the deceleration area.
- C10.1.5** Curing time for adhesives must be included in 30 second repairs.
- C10.1.6** **[N/A for Regionals; Nationals ONLY]** Tool kits are allowed to be taken racing. 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. **If a team has a tool kit, they should bring it with them to each racing session.**
- C10.1.7** If the Judges rule that damaged sustained was not due to engineering deficiencies, immediate repairs will be permitted without penalty.
- C10.1.8** No penalty is applied for damage incurred during knock-out racing or a car's final race of any race event.

### C10.2 Car servicing **[N/A for Regionals, Nationals ONLY]**

- C10.2.1** Teams will be scheduled time to carry out penalty free maintenance on their race cars in the designated car service area. The car service session shall last 25 minutes. The service session will occur after time trials as per the competition program, and after reaction racing per the competition program. No other car service times will be permitted.
- C10.2.2** Only two service periods will be provided; no additional session before knockout.

- C10.2.3** Only team members and Judges are allowed to enter the car service area.
- C10.2.4** Tool kits are allowed to be taken into car service. 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.
- C10.2.5** Maintenance and alterations can only be made to the front and rear wings, nose cone, tether line guides, wheels and wheel support systems. The car body MUST NOT be modified or substituted.
- C10.2.6** Each team will be required to complete a car service log form, declaring any maintenance or repair work completed. This will be validated by the Judges.
- C10.2.7** Teams must hand their race cars and completed car service log to the service area Judges BEFORE the conclusion of their scheduled service interval. A penalty will apply for exceeding the scheduled service time limit of 5 points for every minute late.

## ARTICLE C11 - PROTESTS

### C11.1 Scrutineering decision appeals

These must be submitted within two hours of the team completing their specification review judging. Other rules for submitting these will be the same as for protests.

### C11.2 Submitting a protest

Any protest issues must be submitted by the team manager to an Event Director, who will register this and immediately lodge it with the Chair of Judges. This must occur by the date and time stated in the event supplementary regulations. Any protest or appeals submitted after this time may be disregarded. All protests must be lodged in writing via the official protest form available from the Event Directors. The Chair of Judges decision related to any protest is final.

### C11.3 Unsuccessful protests

Teams should carefully consider their grounds for submitting a protest or appeal. Any protest or appeal that is unsuccessful, with the Judges initial decision remaining unchanged, will result in the team having a **15-point penalty** applied against their total score. **THE CHAIR OF JUDGE'S DECISION IS FINAL**

## ARTICLE C12 - JUDGES

### C12.1 Overview

There will be six (6) teams of Judges plus officials that form the entire judging panel. Each judging team will have one judge appointed as the Lead Judge. Judges are nominees from F1 in Schools and other education and industry experts invited by F1 in Schools. All Judges sign a 'declaration' and code of conduct to ensure there are no conflicts of interest with respect to Judges and the teams they are judging.

### C12.2 Chair of Judges

An independent authority appointed by F1 in Schools to oversees all judging procedures. The Chair of Judges will determine the final judging decision where a protest 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 along with nominations and winners for relevant awards.

### C12.3 The Judging teams

- C12.3.1** Specification & Scrutineering Judges - will assess both race cars plus the rendered images and engineering drawings as per the Specification & Scrutineering score cards.
- C12.3.2** Design & Engineering Judges - will assess each team as per the Design & Engineering score card.
- C12.3.3** Verbal Presentation Judges – will assess each team as per the Verbal Presentation score card.
- C12.3.4** Project Management & Enterprise Judges – will assess each team as per the Project Management & Enterprise score card.
- C12.3.5** Race Judges – will oversee and rule on all race events and any incidents.
- C12.3.6** Car servicing officials – will oversee all car service activities and rule on any infringements that may occur.

### C12.4 Judging Decisions

**THE DECISION OF THE JUDGES AND OFFICIALS IS FINAL.**

## ARTICLE C13 - AWARDS

### C13.1 Awards Celebration

The N.A. Competition awards will be presented at an Awards Ceremony at the conclusion of the competition. Details of this event will be released closer to the event.

### C13.2 Participation Recognition

All students will receive an official participation certificate.

### C13.3 List of awards to be presented

All awards below will be presented to the team that achieves the highest score in each category taken from the score cards unless otherwise indicated (\*) below (This list may be amended at the discretion of F1 in Schools).

- 1<sup>st</sup> Place
- 2<sup>nd</sup> Place
- 3<sup>rd</sup> Place

Special Awards (this is the full list of *potential* awards; not all may be awarded at every competition)

- |   |                                |
|---|--------------------------------|
| • Best Newcomer Award                               | • Fastest Car Award            |
| • Best Engineered Car Award                         | • Team Identity Award*         |
| • Scrutineering Award                               | • Pit Display Award*           |
| • Sponsorship & Marketing Award*                    | • Verbal Presentation Award*   |
| • Innovative Thinking Award*                        | • Project Management Award*    |
| • Chair of Judges Recognition of Achievement Award* | • Digital Media Award*         |
| • Research and Development Award*                   | • Sustainability Award*        |
|   | • Knockout Competition Winners |

The highest ranking US, and the highest ranking Canadian teams, will be crowned the US National Champions and Canadian National Champions, respectively.

### C13.4 Qualifying for the Regional Finals

All teams may participate in the Regional Finals.

### C13.5 Qualifying for the National Finals

Qualifying teams from the Regional Finals will advance to the National Finals. The number of teams from each region will be determined and announced at a later date (prior to the competition).

### C13.6 Qualifying for the World Finals

**[Updated 12/04/23]** Teams that place within the top ~~three~~ **two** at the National Finals are eligible to represent the United States and Canada at the F1 in Schools World Finals.



## APPENDIX...

1. Awards Matrix
2. 2023/24 NA Score Cards
3. Race Procedure & Troubleshooting Flowchart
4. Car Submission Checklist
5. Project Submission Checklist



### Awards Matrix

Please find below a matrix that shows which judging categories contribute towards each award:

Judges	Heading	Sub Heading	First Place	2 <sup>nd</sup> Place	3 <sup>rd</sup> Place	Best International Collaboration	Best Newcomer	Best Engineered Car	FIA Scrutineering Award	Sponsorship & Marketing Award	Innovative Thinking Award	Team Identity Award	Pit Display Award	Verbal Presentation Award	Sustainability Award	Research & Development Award	Digital Media Award	Project Management Award	Fastest Car Award		
Scrutineering	Scrutineering	Specifications	•	•	•	•	•	•	•												
		Engineering Drawings	•	•	•	•	•	•	•												
		Rendering	•	•	•	•	•	•	•												
		Quality of Finish and Assembly	•	•	•	•	•	•	•												
Design & Engineering	Design & Engineering Portfolio	Design Concepts	•	•	•	•	•	•													
		3D Modelling	•	•	•	•	•	•	•												
		Application of CAA	•	•	•	•	•	•	•								•				
		Use of CAM/CNC	•	•	•	•	•	•	•												
		Other Manufacturing & Assembly	•	•	•	•	•	•	•												
		Research & Development	•	•	•	•	•	•	•									•			
		Testing	•	•	•	•	•	•	•									•			
		Design Process Evaluation	•	•	•	•	•	•	•												
		Document Presentation	•	•	•	•	•	•	•												
Project Management	Initiating	Initiation Process	•	•	•	•	•	•											•		
		Project Schedule	•	•	•	•	•	•											•		
	Planning	Budget and Resource Management	•	•	•	•	•	•											•		
		Roles and Responsibilities	•	•	•	•	•	•											•		
	Executing	Team & Stakeholder Comm.	•	•	•	•	•	•											•		
		Risk Management	•	•	•	•	•	•											•		
	Mon. and Cont.	Monitoring & Controlling	•	•	•	•	•	•											•		
Enterprise	Enterprise	Marketing	•	•	•	•	•												•		
		Sponsorship	•	•	•	•	•			•									•		
		Digital Media	•	•	•	•	•				•							•			
		Sustainability	•	•	•	•	•								•						
	Document Presentation	•	•	•	•	•															
	Team Identity	Overall Team Identity	•	•	•	•	•			•		•							•		
	Pit Display	Pit Display Design Process	•	•	•	•	•						•								
	Pit Display Content	•	•	•	•	•						•									
Verbal Presentation	Technique	Visuals	•	•	•	•	•							•							
		Team Contribution	•	•	•	•	•							•							
		Engagement	•	•	•	•	•							•							
	Composition	Concept Clarification	•	•	•	•	•							•							
		Time / Presentation	•	•	•	•	•							•							
	Subject	Innovation	•	•	•	•	•				•			•							
		Collaboration	•	•	•	•	•							•							
F1 in Schools Learning Experiences		•	•	•	•	•							•								
Racing	Racing	Time Trials	•	•	•	•	•												•		
		Damage During Racing	•	•	•	•	•	•													



<b>Scrutineering Judging Score Card</b>				Team Number:			
				Team Name:			
				School:			
<b>Scrutineering</b>							
<b>Engineering Drawings</b>	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/ <u>bill of materials</u> . Additional views to show sufficient detail and regulation compliance shown				
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20				
<b>Rendering</b>	Poor quality	Different views, some inconsistencies with final car.	Different Views. Perfect match to final car including branding. Environment and lighting. High end render technique				
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20				
<b>Quality of Finish and Assembly</b>	Reasonable finish with some inconsistencies	Good overall finish quality and assembly with attention to details	'Showcase' finish quality on all components. Exceptional attention to detail across all assembly and finishing. Two cars are identical.				
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20				
<b>Scrutineering Total =</b>							<b>/60</b>
<b>Notes:</b>							

<b>Design &amp; Engineering Score Card</b>		Team Number:	
		Team Name:	
		School:	
<b>Design &amp; Engineering Portfolio Only Assessment</b>			
<b>Design Concepts</b>	Single or basic concepts	Multiple concepts with links to research.	Several technically inspired ideas for different car components
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>3D Modelling</b>	Basic application. Only final design 3D modelled	Appropriate 3D modelling in development stages. Dimensional constraints of F1 model block considered.	Advanced use of 3D modelling techniques through. Highly detailed modelling. Designed for manufacture considerations (i.e. fillets)
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Application of Computer Aided Analysis</b>	No or minimal CFD/FEA analysis shown	Appropriate analysis shown. Results applied to development	Advanced and relevant. Virtual analysis integrated throughout design development.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Use of CAM/CNC</b>	No or minimal evidence of CAM /CNC understanding	Effective use and understanding of CAM/CNC processes used	Evidence of excellent understanding of CAM/CNC technologies. Appropriate techniques and processes used to achieve manufacturing goals
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Other Manufacturing &amp; Assembly</b>	No or minimal manufacturing presented. Outsourcing with minimal understanding or justification.	Manufacturing process and stages described. Appropriate use of manufacturing resources documented (i.e. tools, finishes, jigs, fixtures)	Details all manufacturing stages and processes. Quality assurance and workplace safety considerations evident. Appropriate outsourcing justified.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Research &amp; Development</b>	No or limited evidence of R&D	Some scientific & mathematical theories and principles considered. Logical research-based design developments explained.	Relevant R&D throughout the entire product design & development cycle. Design concept developments justified from research & test findings
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Testing</b>	No or little evidence of testing	Limited testing. Some evidence of method and outcomes.	Purposeful testing with method and outcomes documented. Evidence of virtual and physical testing on the fully assembled car and individual components.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Design Process Evaluation</b>	No or limited design process evaluation	Ideas or process evaluations at different stages	Excellent ongoing idea evaluations linked to improvement actions
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Document Presentation</b>	Difficult to follow with basic presentation standard.	Clear structure, well organized.	High impact and professional throughout. Consistent and clear organization.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Design &amp; Engineering Portfolio Only Assessment Total =</b>			<b>/180</b>
<b>Notes:</b>			



<b>Enterprise Score Card</b>		Team Number:	
		Team Name:	
		School:	
<b>Enterprise Portfolio Only Assessment</b>			
<b>Marketing</b>	Limited evidence	Some evidence of marketing strategy, delivery and marketing materials.	Clear, well thought through documentation of planning and delivery of an effective marketing strategy, including development of suitable marketing materials.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Sponsorship</b>	Limited evidence.	Sponsor/partner hierarchy and benefits identified. Some evidence of return of investment (ROI) to relevant sponsors.	Sponsor/partner hierarchy and benefits detailed and justified. Range of relevant sponsors/partners showing mutually beneficial relationships. Creative activities linked to return of investment (ROI).
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Digital Media</b>	Limited or low level of documented planning, understanding and execution.	Some evidence of strategic planning and execution in line with documented strategy, consideration for audience and platforms.	Clear, structured and well-communicated digital strategy with execution in line with documented plans, proactive use of platforms, creativity and audience engagement.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Sustainability</b>	No or limited sustainability considered.	Sustainability strategy identified with some evidence of implementation.	Sustainability strategy and activities evidenced considering economic, environmental, and social factors.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Document Presentation</b>	Difficult to follow with basic presentation	Clear structure, well organized.	High impact and professional throughout. Consistent and clear organization.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Enterprise Portfolio Only Assessment Total</b>			/100
<b>Team Identity</b>			
<b>Overall Team Identity</b>	Inconsistent, limited or obscure identity	Effective team identity consistent through various project elements e.g. car matches team uniform	Excellent and highly effective team identity. Team 'brand' consistently applied through all project elements.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Team Identity Total</b>			/20
<b>Pit Display</b>			
<b>Pit Display Design Process</b>	Limited evidence of design process	Some ideas & justification of design. Some consideration of constraints e.g. freight packing	A range of ideas; clearly justified creative final design. Evidence of development considering factors including team identity, budget, sustainability and time constraints.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Pit Display Content</b>	Repetition of Portfolio contents. Disorganized layout.	Clear and effective presentation and messaging. Multimedia used to enhance display	Clean, well-organized with high impact. Highly professional with attention to detail. Excellent integration of technology and multimedia
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Pit Display Total</b>			/40
<b>Enterprise Portfolio Only Assessment + Team Identity Total + Pit Display Total = Enterprise Total =</b>			<b>/160</b>
<b>Notes:</b>			

<b>Project Management Score Card</b>		Team Number:	
		Team Name:	
		Country:	
<b>Project Management Assessment</b>			
<b>Initiating</b>			
<b>Initiating Process</b>	Limited evidence of an Initiation process	Evidence of an Initiation process with goals and deliverables identified, leading to a basic scope statement	Kick-off meeting evidenced. Detailed Project Charter created, clearly defining all deliverables and Stakeholders. Scope statement developed, identifying acceptance criteria for each deliverable
	<b>1 2 3 4</b>	<b>5 6 7 8 9 10 11</b>	<b>12 13 14 15 16 17 18 19 20</b>
<b>Project Schedule</b>	Limited evidence of tasks to be completed	Evidence of a project schedule, showing a breakdown of time required to complete essential tasks	Clear evidence of a project schedule and Work Breakdown Structure. Detailed Gantt chart created to identify all tasks, dependencies and time estimations
	<b>1 2</b>	<b>3 4 5 6 7 8 9</b>	<b>10 11 12 13 14 15</b>
<b>Planning</b>			
<b>Budget and Resource Management</b>	Limited evidence of strategies to manage budget and/or resources	Some evidence of resources required and how they are to be acquired and managed. Some evidence of budgeting	Clear evidence of budgeting and use of accounting methods to track expenditure. Clear identification of where, when and how resources are to be acquired and used
	<b>1 2</b>	<b>3 4 5 6 7 8 9</b>	<b>10 11 12 13 14 15</b>
<b>Roles and Responsibilities</b>	Limited evidence of clear roles and responsibilities within team	Team roles and responsibilities identified, with some evidence of task and/or activity breakdown	Team members identified and a highly structured team created with clearly defined job functions and appropriate responsibilities. Evidence of a Responsibility Assignment ('RACI') Matrix
	<b>1 2</b>	<b>3 4 5 6</b>	<b>7 8 9 10</b>
<b>Executing</b>			
<b>Team &amp; Stakeholder Communication</b>	Limited evidence of engagement between team members and stakeholders	Evidence of a communication plan and engagements between team members and with stakeholders	Clear communication plan implemented between team members and stakeholders. Key stakeholders registered and reported to regularly. Multiple communication tools used
	<b>1 2</b>	<b>3 4 5 6</b>	<b>7 8 9 10</b>
<b>Risk Management</b>	Limited evidence of risk identification and management	Evidence of risk identification and response management plans in place	Clear evidence identifying all relevant risks, area(s) of impact and response planning. Assessment of impact on resources, timing, scope and quality
	<b>1 2</b>	<b>3 4 5 6</b>	<b>7 8 9 10</b>
<b>Monitoring and Control</b>			
<b>Monitoring / control and Closing Process</b>	Limited or isolated project evaluation	Ongoing evaluation of most areas. Documented evidence of problems identified and suggested solutions	Excellent ongoing 'Status Reports', documenting tasks signed off and highlighting areas of concern. Scope creep identified with a clear action plan for tasks that overrun.
	<b>1 2</b>	<b>3 4 5 6</b>	<b>7 8 9 10</b>
<b>Project Management Total</b>			<b>/90</b>

Pit Display Build Assessment Score Card [N/A for Regionals; Nationals ONLY]		Team Number: Team Name: School:		
Pit Display Build Assessment Points may be deducted as per the criteria below				
Heading	Penalty	Assessment Details	Notes	Points
<b>Freight C6.6.2</b>	-5	Pit display content should be transported to the competition venue as hand carried items. If freight is not delivered as instructed in the freighting information released closer to the event a penalty of up to 5 points may be applied at the chair of judge's discretion.		
<b>Set-up Time C6.6.3</b>	-5 points per 5 minutes over time rounded up to the nearest 5 minutes*	A time period will be scheduled for when all teams will set-up their pit displays. A time limit of two hours will be enforced; this will be confirmed in supplementary regulations. F1 in Schools reserves the right to apply a penalty of up to 20 points at the discretion of the Chair of Judges for teams that do not complete their set-up within the time limit, do not leave their stand in a safe state and clear their pit and surrounding area of all rubbish.		
<b>Pit Display Size C6.6.4</b>	-10	No part of the teams completed Pit Display is allowed to protrude beyond the physical dimensions of their allocated pit space. This includes anything that might protrude above the pit space highest point e.g. flags. Teams may be instructed by the chair of judges to rectify and infringements. Time taken to rectify outside of the outside of the set-up time limit will incur penalty points as per C 6.6.3. Teams are not permitted to remove any part of the provided exhibition booth to fit the pit display. A penalty of up to 10 points may be applied at the chair of judge's discretion.		
<b>Only student team members C6.6.5</b>	-5	<b>ONLY</b> student team members are permitted to setup their pit displays. There must be no supervising teacher / adult or other outside assistance, unless deemed by F1 in Schools to be a health and safety issue.		
<b>Health &amp; Safety C6.6.5</b>	Up to -20	Health & Safety measures must be considered when working on all aspects of your Pit Display. A penalty of up to 20 points may be applied at the discretion of the Chair of Judges		
<b>Pit Display Build Assessment =</b>				
<b>Completed by (initials):</b>				
<b>Checked by (initials):</b>				
<b>Notes:</b>				
*A team that runs over by 30 seconds would be rounded up to 5 minutes and therefore will incur a 5pt penalty.				
<b>Please note:</b> These points are deducted from your Pit Display Total score.				

<b>Verbal Presentation Score Card</b>			
			Team Number:
			Team Name:
			School:
<b>Technique</b>			
<b>Visuals</b>	Little use of aids.	Some aids used effectively	Highly professional aids effectively improve communication
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Team Contribution</b>	Minimal team participation	Good contributions from most team members	Excellent teamwork with all members participating effectively
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Engagement</b>	Artificial and/or low energy. Minimal engagement.	Speakers generally enthusiastic with lively delivery. Some audience connection at times.	Passionate with effective and appropriate levels of liveliness. Audience fully engaged and excited throughout presentation.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
			<b>Technique Total</b> /60
<b>Composition</b>			
<b>Concept Clarification</b>	Several concepts lacked clarification	Clear and appropriate concept explanations	Everything presented was understood through excellent explanations
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Time / Presentation</b>	Too fast or ran out of time. No structure presented	Good timing. Balanced topic depth and pace. A basic structure/outline provided and could be followed by audience	Ran on time or under. Excellent balance of depth for each topic. Clear presentation outline/overview. Excellent connections between topics and easy to follow.
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
			<b>Composition Total</b> /40
<b>Subject</b>			
<b>Innovation</b>	Little project innovation presented	Project innovations described and justified	Originality. Clever innovations related to car design, project management, marketing or other aspect with high positive project impact
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>Collaboration</b>	Little collaboration discussed	Links with industry or higher education described	Collaborations justified with links to learning and project outcomes
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
<b>F1 in Schools Learning Experiences</b>	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
	1 2 3 4	5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20
			<b>Subject Total</b> /60
			<b>Technique Total + Composition Total + Subject Total = Verbal Presentation Total =</b> /160
<b>Notes:</b>			



<b>Specifications Score Card</b>	Team Number:	Page 1	Total	<b>Total Score:</b>
For clarification on individual regulations, refer to the Technical Regulations.	Team Name:	Deductions:	Deductions:	<b>/100</b>

Please enter **P** for a pass and **F** for a fail

**(CO<sub>2</sub>) – measured with full 8g CO<sub>2</sub> cartridge**

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering			Post Safety Fix			Post Review Interview			Remarks
				Car A	Car B	CoJ CS	Car A	Car B	CoJ CS	Car A	Car B	CoJ CS	
<b>ARTICLE T3 – FULLY ASSEMBLED CAR</b>													
T3.1.1	Designed and engineered using CAD/CAM		-5										
T3.1.2	Body manufactured using CNC only	Check unfinished body	-5										
T3.1.3	F1 in Schools holographic sticker	Must be supplied	-5										
T3.1.4	Race cars identical geometry	Visual check	-5										
T3.2.1	Safe Construction – Specification judging	Check T3.2.1	-10										
T3.3	Undefined features	Check T1.1	-20										
T3.4	Total length	Min:170 Max:210	-5										
T3.5	Total width	Max: 85	-5										
T3.6	Total height (CO <sub>2</sub> )	Max: 65	-5										
T3.7	Total weight	Min: 50.0g	-10										
T3.8	Track clearance (CO <sub>2</sub> )	Min: 1.5	-10										
T3.9	Status during racing	Nothing removed	-5										
<b>ARTICLE T4 – BODY</b>													
T4.1	Body construction	F1 Model Block only	-20										
T4.2	Virtual cargo – See T4.2 for dims	Between axles	-25										
T4.3	Virtual cargo identification	Check Eng. drawing	-5										
T4.4	F1 in Schools logo decal location	Between Front & Rear wheels 100% Visible Max:10 Degrees Angle	-5										
T4.5	Decal Thickness	Max: 0.5	-5										
T4.6	Team Number Decal	Min Text Size: 4mm	-2										
<b>Assessed by: (Initials)</b>													
<b>Checked by: (Initials)</b>													

Page 1 Notes:



<b>Specifications Score Card</b>	Team Number:	Page 2 of 4	Page 2 Deductions:
For clarification on individual regulations, refer to the Technical Regulations. Please enter <b>P</b> for a pass and <b>F</b> for a fail	Team Name:		

				Initial Scrutineering			Post Safety Fix			Post Review Interview			
Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Car A	Car B	CoJ CS	Car A	Car B	CoJ CS	Car A	Car B	CoJ CS	Remarks
<b>ARTICLE T5 – CO<sub>2</sub> CARTRIDGE CHAMBER</b>													
T5.1	Diameter	Min: 18 Max: 18.5	-5										
T5.2	Distance from track surface (CO <sub>2</sub> ) <b>PP+</b>	Min: 30 Max: 40	-5										
T5.3	Depth	Min: 45 Max: 58	-5										
T5.4	Max angle of chamber (CO <sub>2</sub> )	Min: -3° Max: 3°	-5										
T5.5	Chamber safety zone (CO <sub>2</sub> )	Min: 3	-10										
T5.6	CO <sub>2</sub> cartridge visibility (CO <sub>2</sub> ) <b>PP+</b>	Min: 5mm top view	-10										
<b>ARTICLE T7 – TETHER LINE GUIDES</b>													
T6.1	Location	15mm in front/front axle 15mm behind/rear axle	-10										
T6.2	Internal diameter	Min: 3.5 Max: 6	-5										
T6.3	Tether line guide safety	200g test, safe to race	-10										
<b>Assessed by: (Initials)</b>													
<b>Checked by: (Initials)</b>													

Page 2 Notes:





<b>Specifications Score Card</b>	Team Number:	Page 3 of 4	Page 3 Deductions:
For clarification on individual regulations, refer to the Technical Regulations.	Team Name:		

Please enter **P** for a pass and **F** for a fail

**(CO<sub>2</sub>) – measured with full 8g CO<sub>2</sub> cartridge**

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering			Post Safety Fix			Post Review Interview			Remarks	
				Car A	Car B	CoJ CS	Car A	Car B	CoJ CS	Car A	Car B	CoJ CS		
<b>ARTICLE T7 – WHEELS</b>														
T7.1	Number and location	4, 2 x 2	-25											
T7.2	Distance between opposing wheels <b>PP+</b>	Min: 30	-2.5	F: mm R: mm	F: mm R: mm									
T7.3	Wheelbase <b>PP+</b>	Abs Min:100	-5											
T7.4	Track contact width <b>PP+</b>	Front: Min: 12 Rear: Min: 15	-2.5 per wheel	FL: mm FR: mm RL: mm RR: mm	FL: mm FR: mm RL: mm RR: mm									
T7.5	Diameter <b>PP+</b>	Min: 28 Max: 34	-2.5 per wheel	FL: mm FR: mm RL: mm RR: mm	FL: mm FR: mm RL: mm RR: mm									
T7.6	Racetrack Contact	All touching at the same time	-2.5 per wheel											
T7.7	Rolling Surface	Surface must be consistent	-2.5 per wheel	mm	mm									
T7.8	Rotation	Must rotate freely on 2 deg incline	-5 per wheel	FL: mm FR: mm RL: mm RR: mm	FL: mm FR: mm RL: mm RR: mm									
T7.9.1	Visibility In Front of Front Wheels	Min: 3	-2.5											
T7.9.2	Visibility Behind Front Wheels	Min: 15	-5											
T7.9.3	Visibility in Front of Rear Wheels	See Diagram	-5											
T7.9.4	Visibility Behind Rear Wheels	Min: 3	-2.5											
T7.10	Visibility in Side View	No obstruction	-10 per wheel											
T7.11	Visibility in Front View <b>PP+</b>	Max: 15	-10											
T7.12.1	Wheel support systems	Cylindrical volume	-5											
T7.12.2	Wheel support systems identification	Check Eng. Dwg.	-5											
<b>ARTICLE T8 – NOSE CONE</b>														
T8.2	Nose cone identification	Check Eng. dwg.	-5											
				<b>Assessed by: (Initials)</b>										
				<b>Checked by: (Initials)</b>										



<b>Specifications Score Card</b>	Team Number:		Page 4 of 4	Page 4 Deductions:
For clarification on individual regulations, refer to the Technical Regulations.	Team Name:			

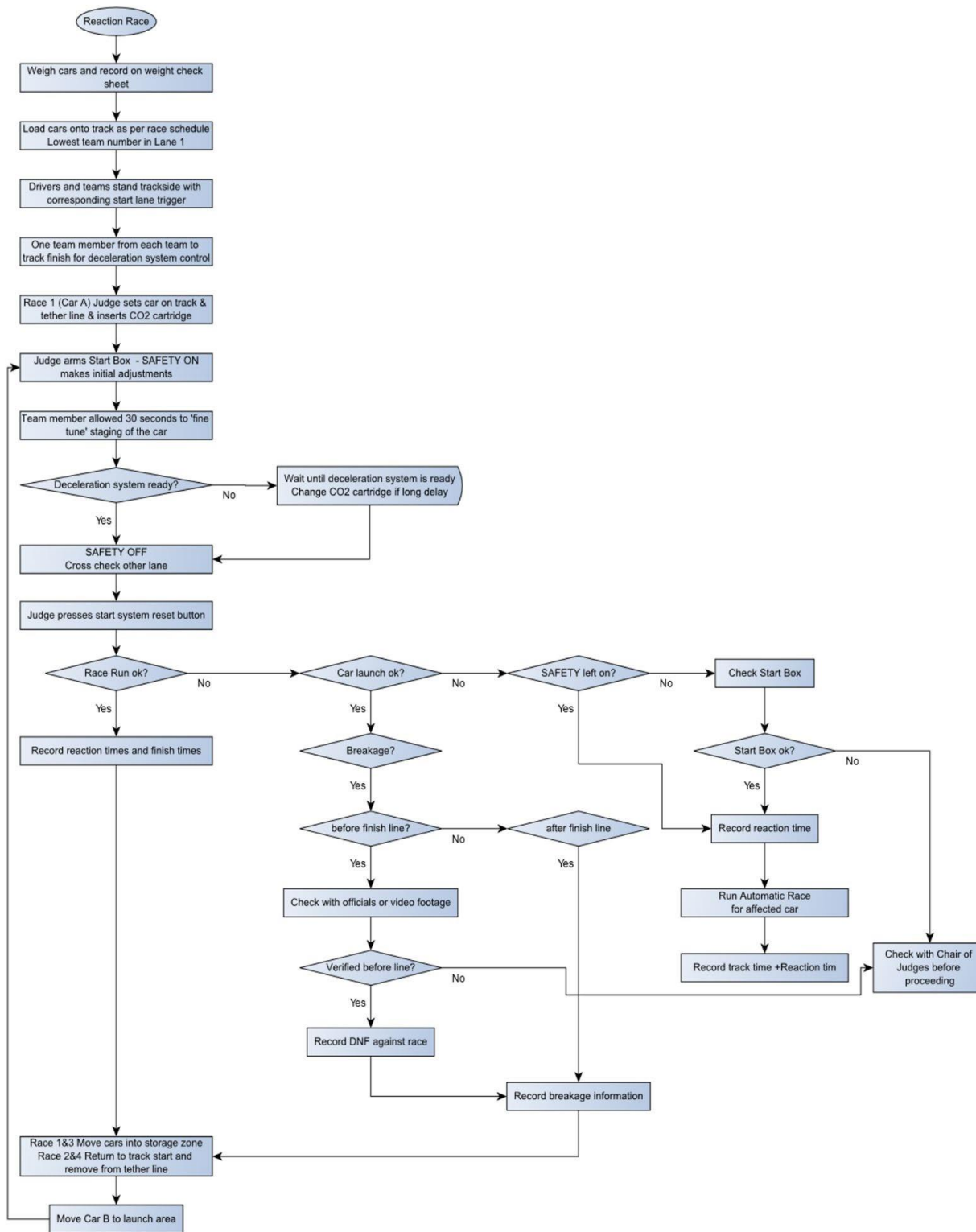
Please enter **P** for a pass and **F** for a fail

**(CO<sub>2</sub>) – measured with full 8g CO<sub>2</sub> cartridge**

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering			Post Safety Fix			Post Review Interview			Remarks
				Car A	Car B	CoJ CS	Car A	Car B	CoJ CS	Car A	Car B	CoJ CS	
<b>ARTICLE T9 – FRONT WINGS AND WING SUPPORT STRUCTURE</b>													
T9.1	Front wing & wing support identification	Check Eng drawing	-5										
T9.2	Front wing(s) description and placement	Check Eng drawing	-5										
T9.3	Construction and Rigidity		-5										
T9.4	Front wing and wing support structure	In front of CL of front wheel & below 30mm	-10										
T9.5.1	Front Wing Span <b>PP +</b>	Min Segment: 25 Min:50	-2										
T9.5.2	Front wing chord <b>PP +</b>	Min: 15 Max: 25	-1	mm	mm								
T9.5.3	Front wing thickness <b>PP +</b>	Min:2 / Max:6	-1	mm	mm								
T9.6	Front wing clear airflow	Min: 5	-5	mm	mm								
T9.7	Front Wing Visibility	Not obstructed in Front view	-10										
<b>ARTICLE T10 – FRONT WINGS AND WING SUPPORT STRUCTURE</b>													
T10.1	Rear wing & wing support identification	Check Eng drawing	-5										
T10.2	Rear wing(s) description and placement	Check Eng drawing	-5										
T10.3	Construction and Rigidity		-5										
T10.4	Rear wing and wing support structure	In rear of CL of rear wheel & below 65mm	-10										
T10.5.1	Rear Wing Span <b>PP +</b>	Min:50	-2	mm	mm								
T10.5.2	Rear wing chord <b>PP +</b>	Min: 15 Max: 25	-1	mm	mm								
T10.5.3	Rear wing thickness <b>PP +</b>	Min:2 / Max:6	-1	mm	mm								
T10.6	Front wing clear airflow	Min: 5	-5	mm	mm								
T10.7	Rear Wing Visibility	Not obstructed in Front view	-10										
<b>Assessed by: (Initials)</b>													
<b>Checked by: (Initials)</b>													

Page 4 Notes:

# Race Procedure & Troubleshooting Flowchart



## Car Submission Checklist (Regional Finals)

Team ID: \_\_\_\_\_ Team Name: \_\_\_\_\_

### Return Address (Where your *one* car will be returned after competition)

Addressee: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Car	Team Member's Initials	Weight (When shipped)	Car to be retained by F1iS (check one)	Car to be returned to team (check one)
Car A		g		
Car B		g		
Display Car (If Included)*				

\*teams may provide a display car to be the car that is kept by F1 in Schools instead of their official race cars, provided the car is outwardly identical, raceable, and similar in weight to your actual racecars.

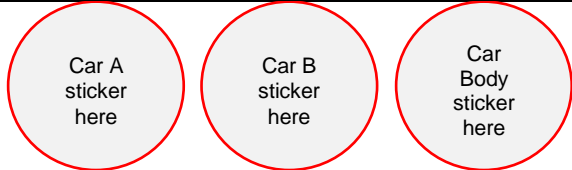
### F1 in Schools Holographic Stickers (From the Official F1 in Schools Model Block):



Team Member's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Project Element Submission Checklist (National Finals)

<b>Team ID:</b>		<b>Team Name:</b>										
<b>School:</b>												
Project Element	Checked by Team	Received by F1 in Schools	Comments: (Completed by F1 in Schools Officials only)									
2 x Identical 11-Page Design & Engineering Portfolio (11"x17")												
2 x Identical 7-Page Project Management Portfolio (11"x17")												
2 x Identical 11-Page Enterprise Portfolio (11"x17")												
Engineering drawings (8.5"x11")												
Car renderings (8.5"x11")												
1 x Car A			Weight: g									
1 x Car B			Weight: g									
1x Fully machined, unfinished, unassembled F1 model block car body												
Electronic copy of all specified project data												
Team Partnerships declaration												
3 x Official F1 Model Block Holographic Stickers												
Replacement Components												
	#	Team Check	F1iS Check		#	Team Check	F1iS Check		#	Team Check	F1iS Check	
Front Wing / Support Structure (Optional, Max 3 sets)				Rear Wing / Support Structure (Optional, Max 3 sets)				Wheel / Wheel Support System (Optional, Max 3 sets)				
Sign-off by	Name						Signature					
<b>Team Manager:</b>												
<b>F1 in Schools Official:</b>												

You will be required to submit all project elements as detailed in ARTICLE C2.12.1. **ALL ELEMENTS MUST BE SUBMITTED COMPLETE AND READY FOR JUDGING & RACING.**