

# Formula 1 Engine Cover

## Software Used



## Project Overview

- Part of the Motorsport Engineering course assessment.
- Developed a high Class-A surfacing, using CATIA V5.
- Analysed curvature throughout the model to ensure G2 and G3 curve continuity.

## Design Process

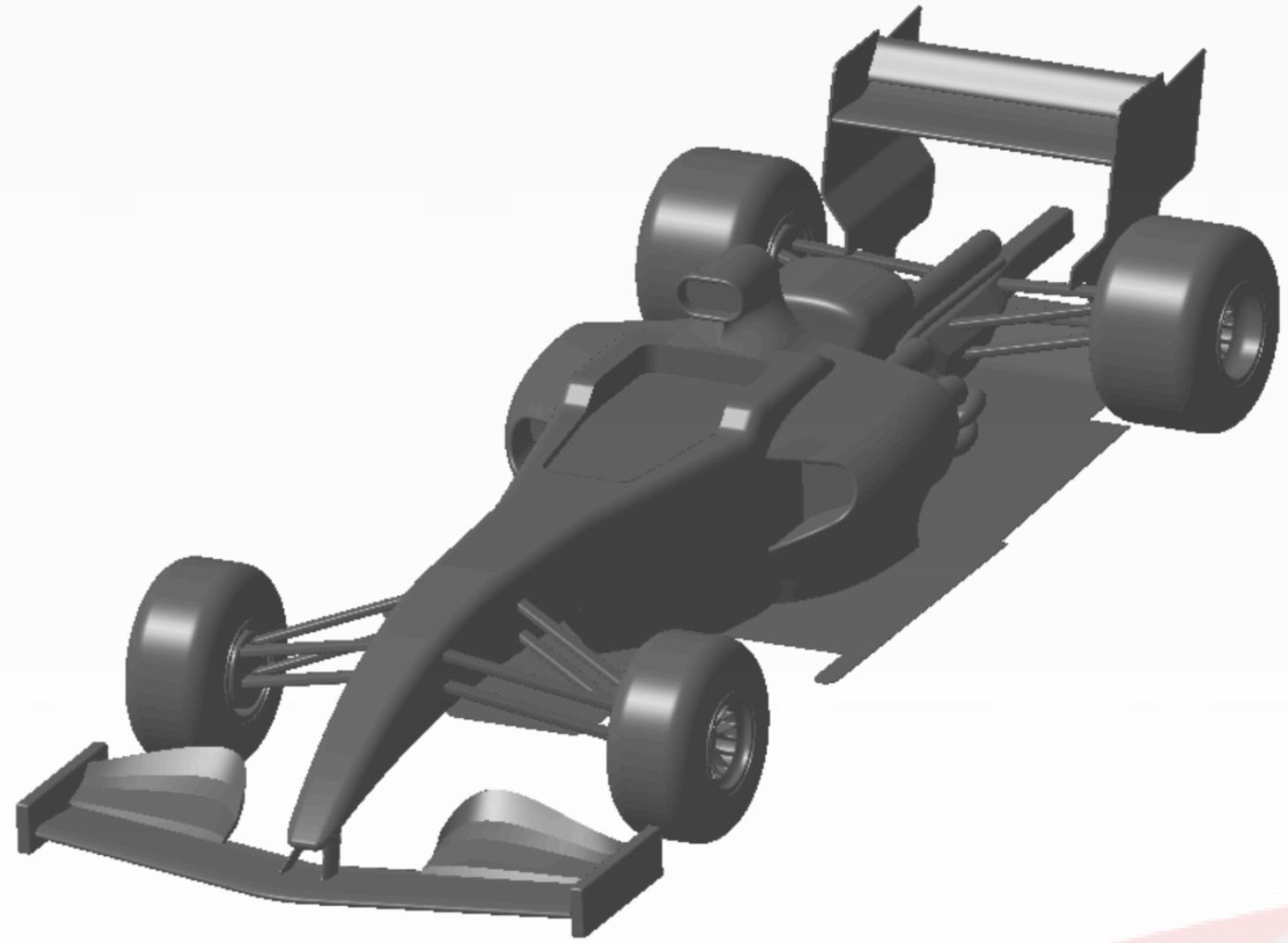
- Designed the entire engine cover following the process of:
  - a. Sidepod
  - b. Air Tank
  - c. Engine Cover
  - d. Louvres
- Each part was designed into sections to keep control over the guide curve and secure continuity.

Characteristic	Detail
Project Duration	30 hours
Design Type	Aerodynamic Suracing
Difficulty	Advanced
Application	F1 cars



# Work Flow

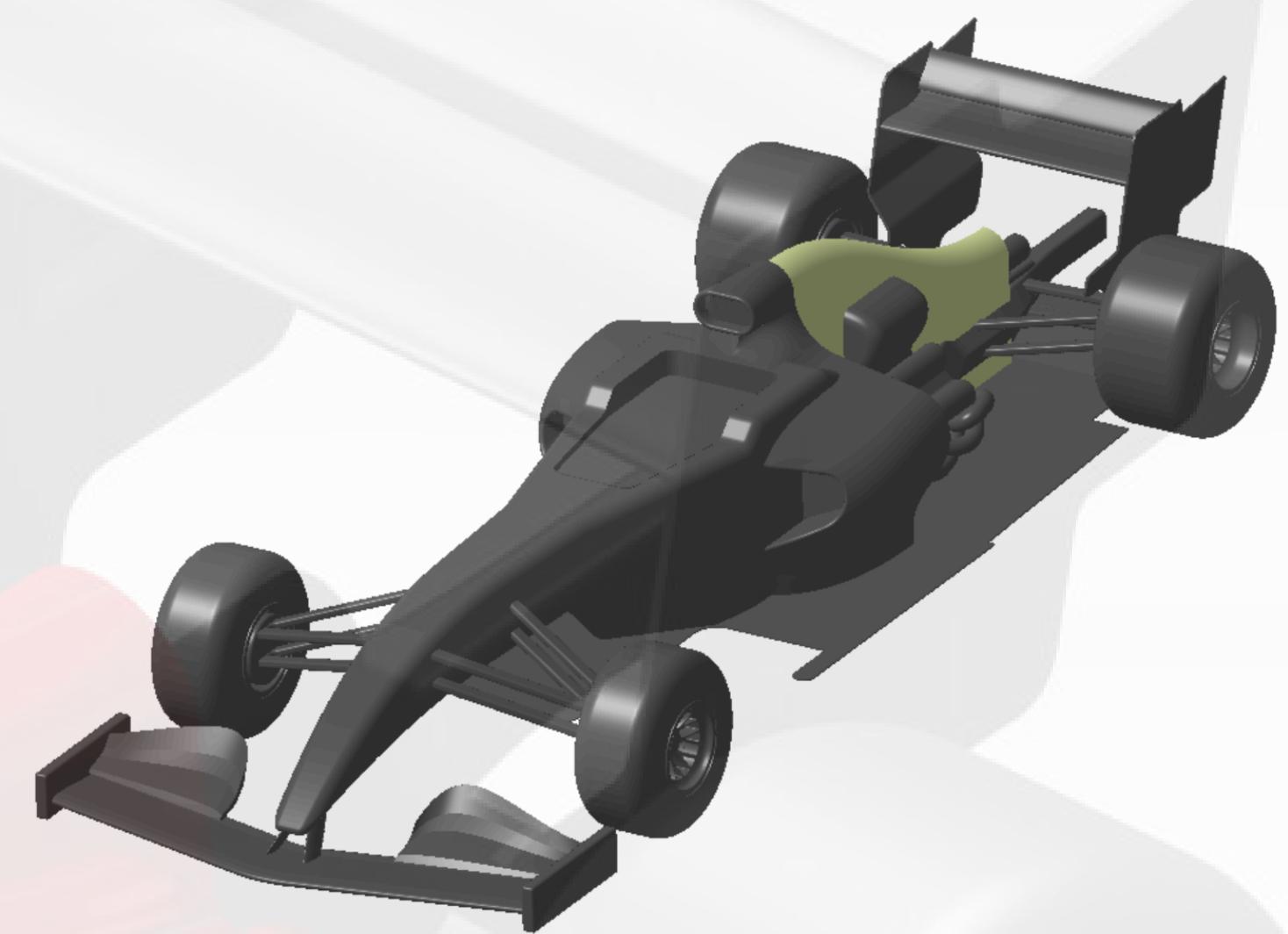
Reference Model



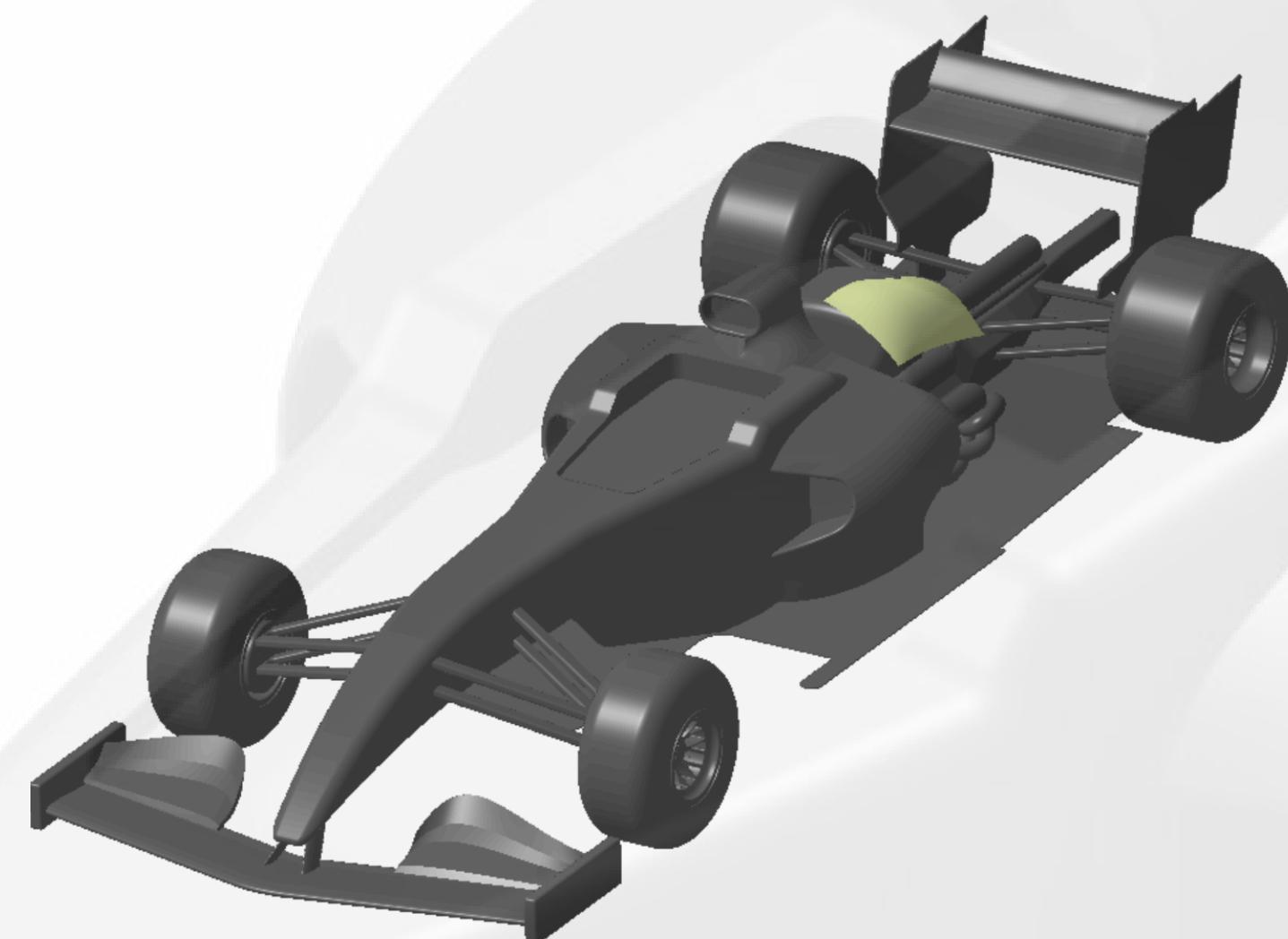
SidePod



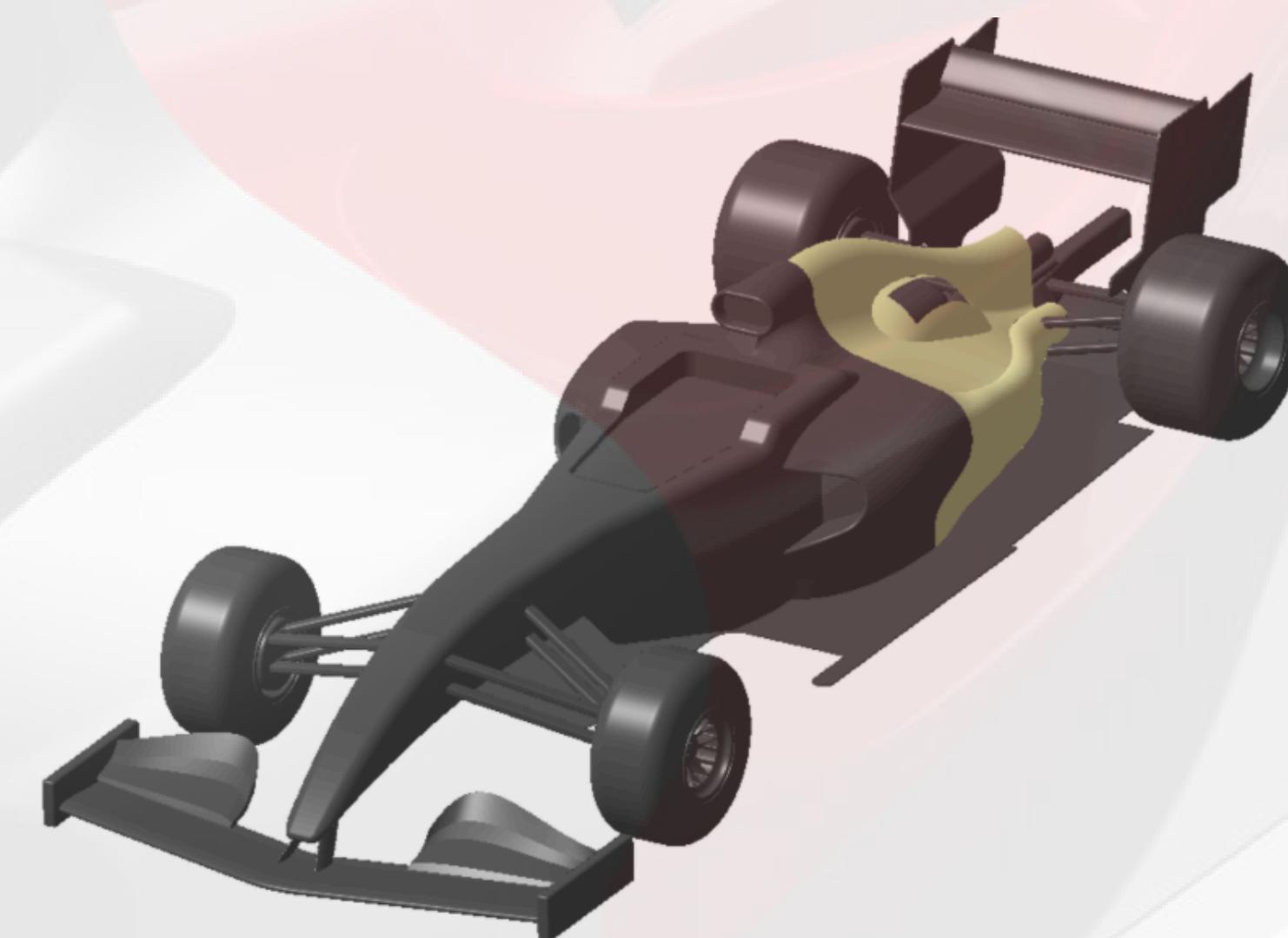
Air Tank



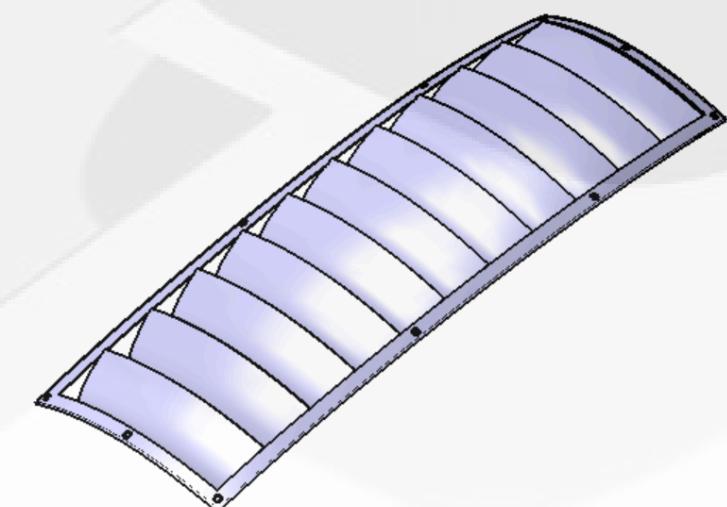
Engine Cover



Louvres

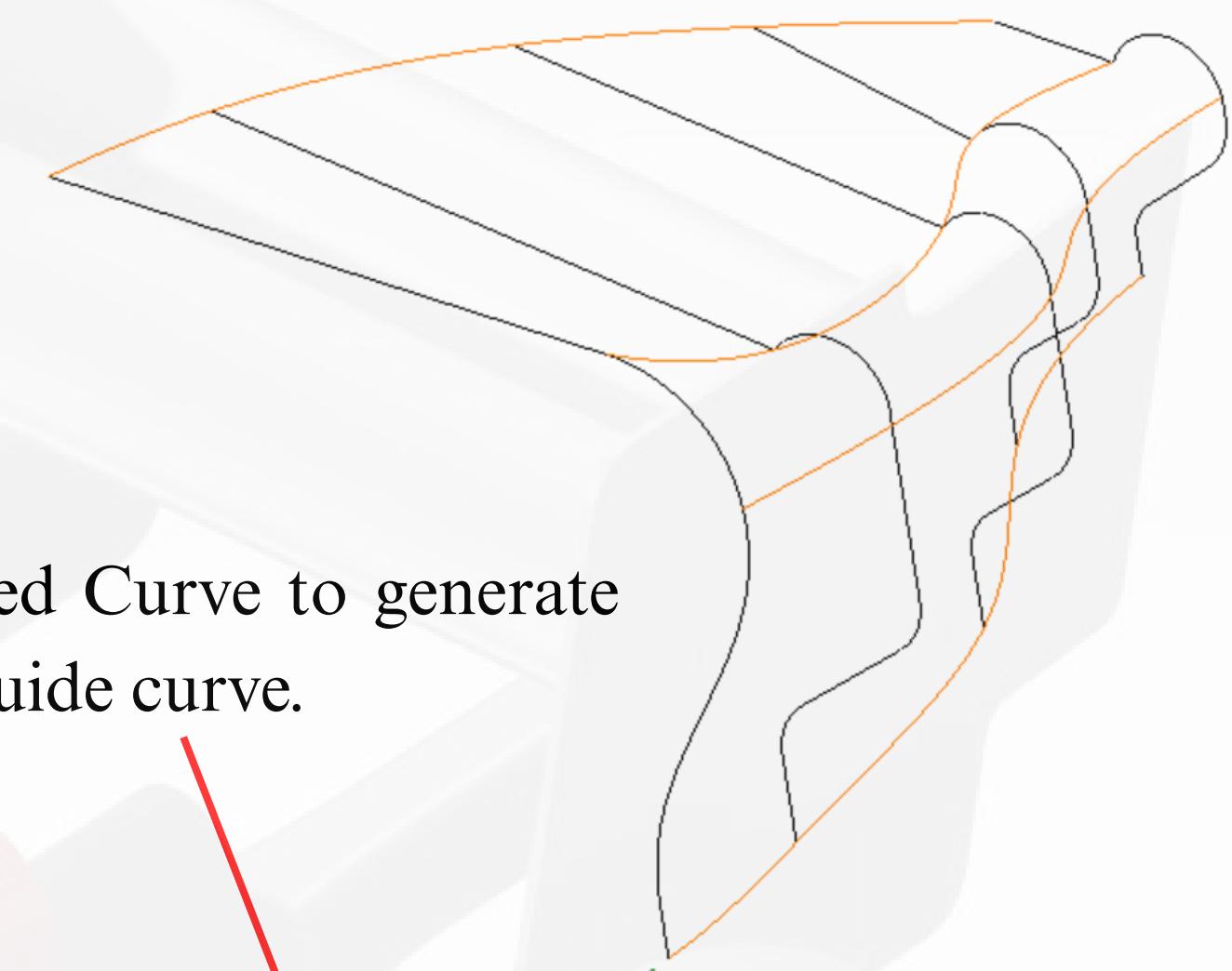


Cover

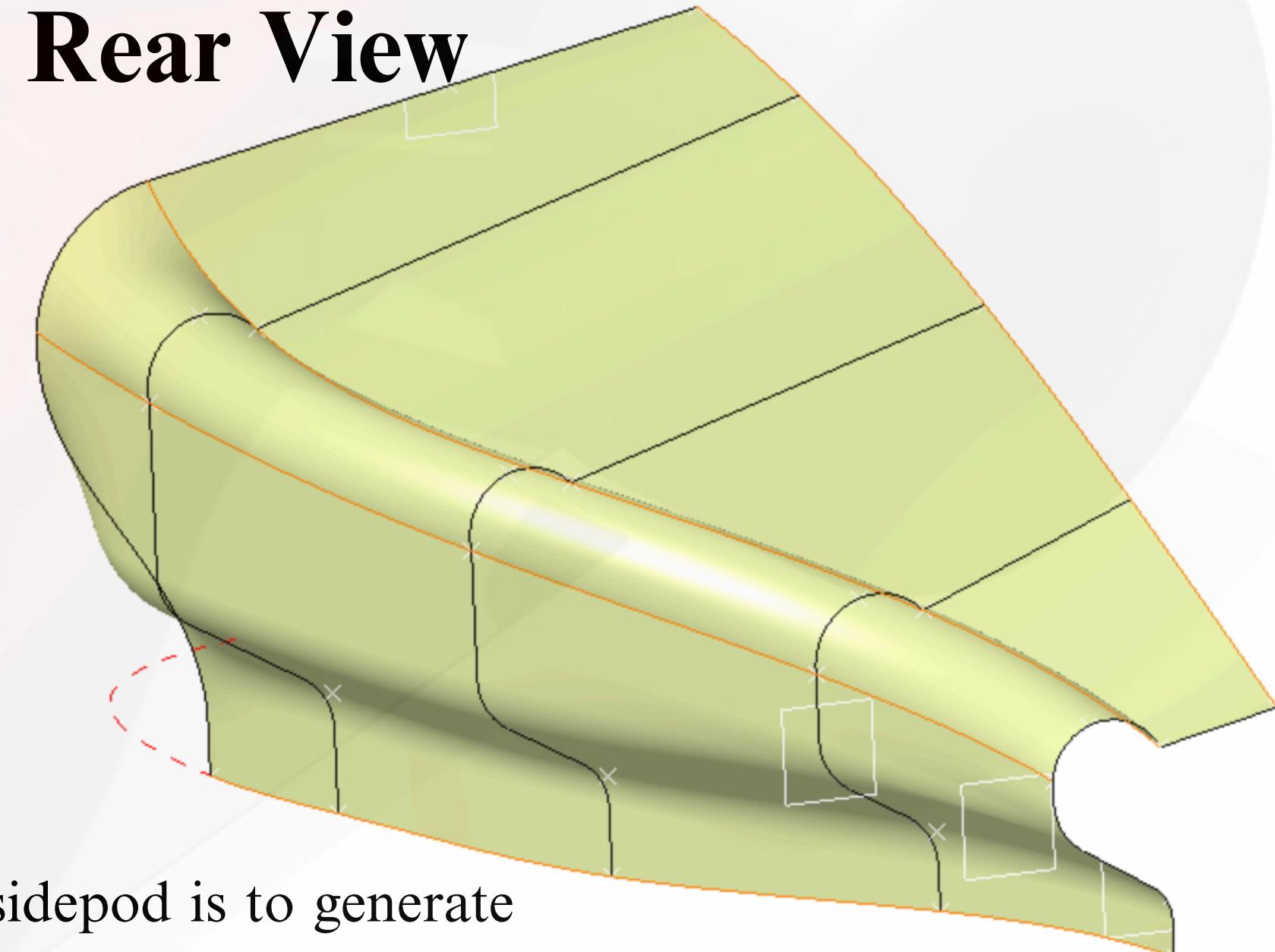


# Side Pod

## Profiles View

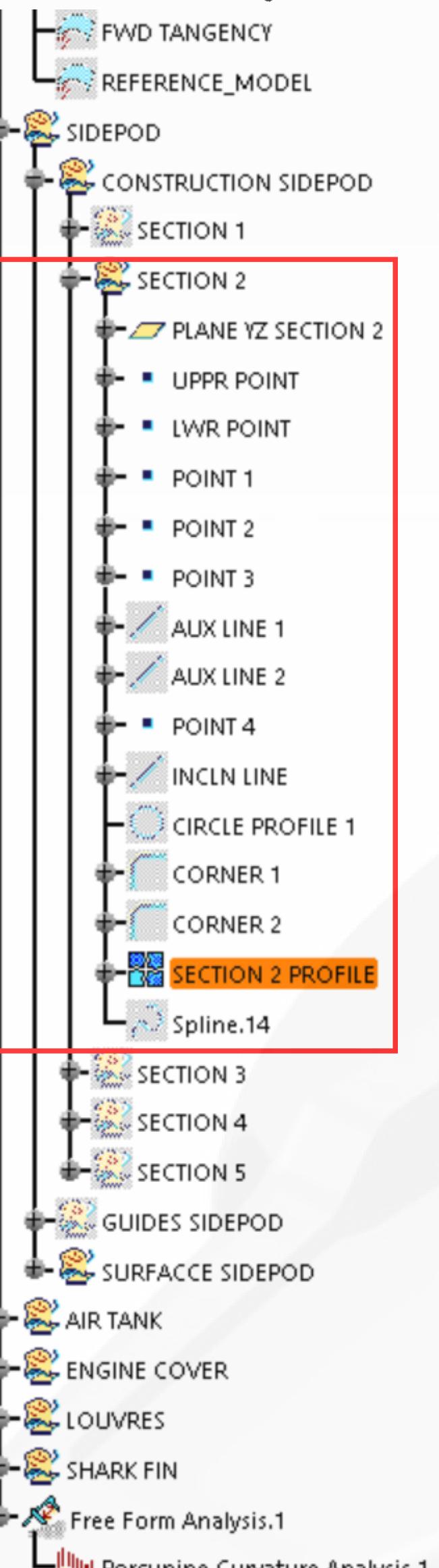
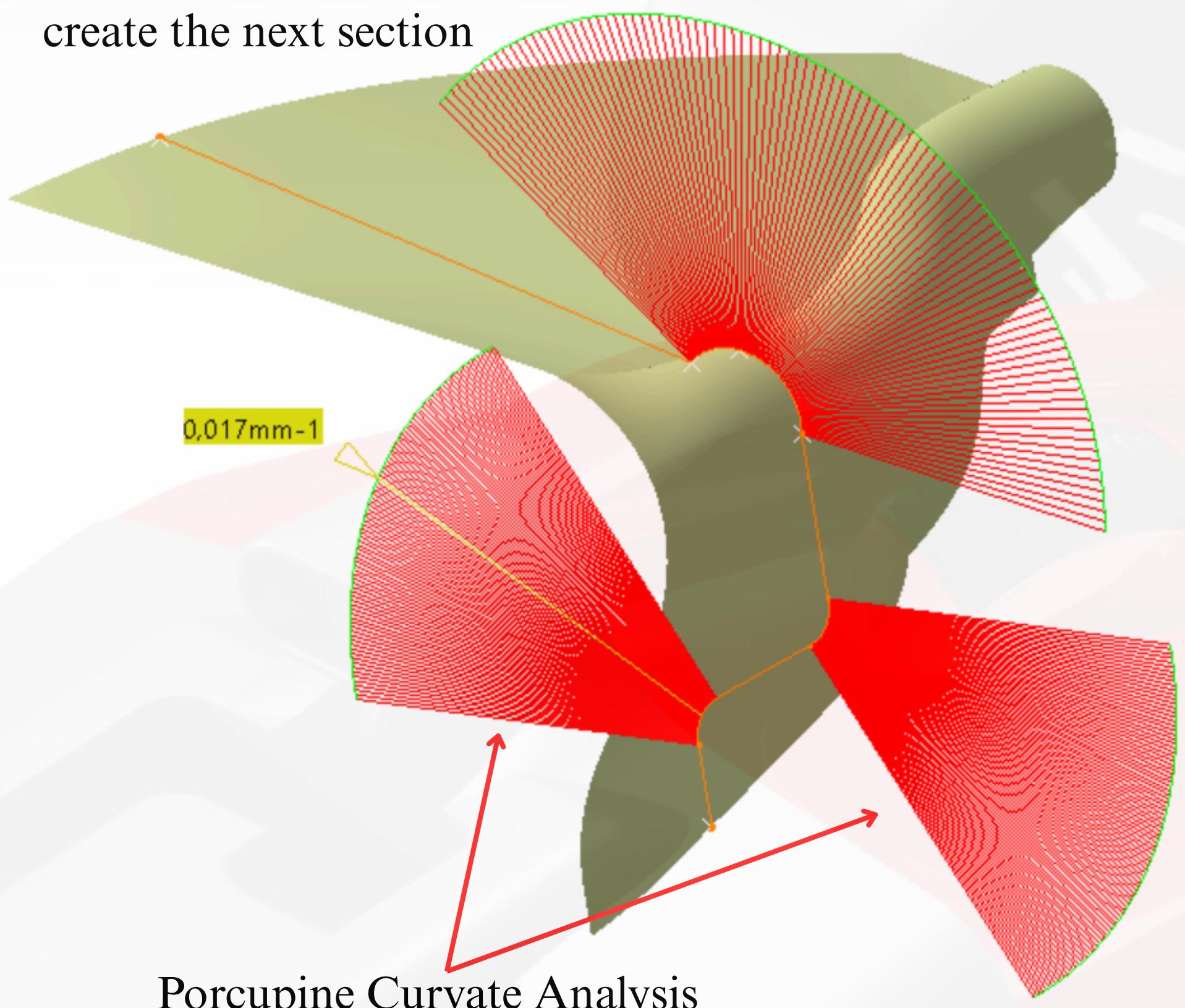


## Rear View

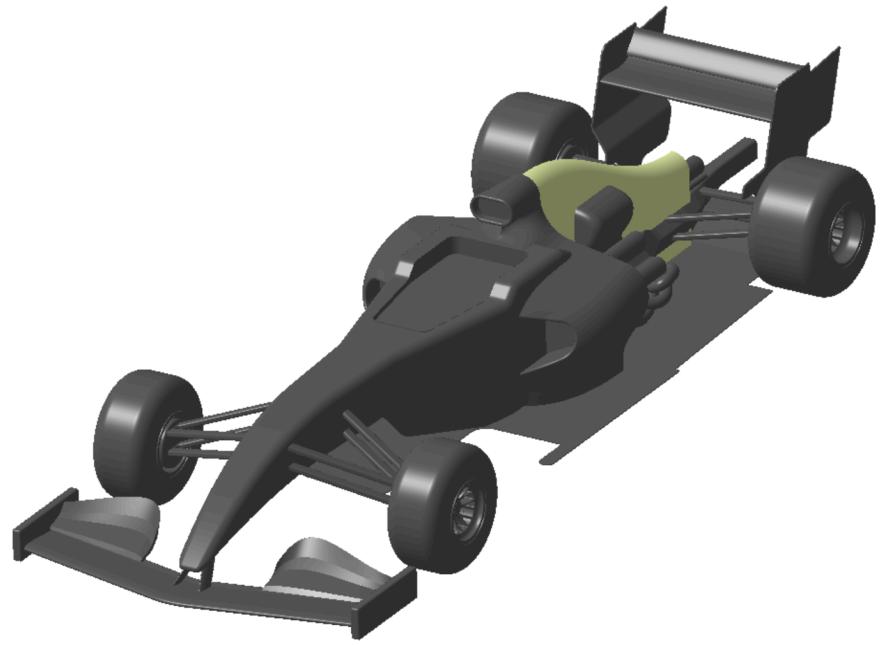


The concept of this sidepod is to generate downwash at the rear of the car.

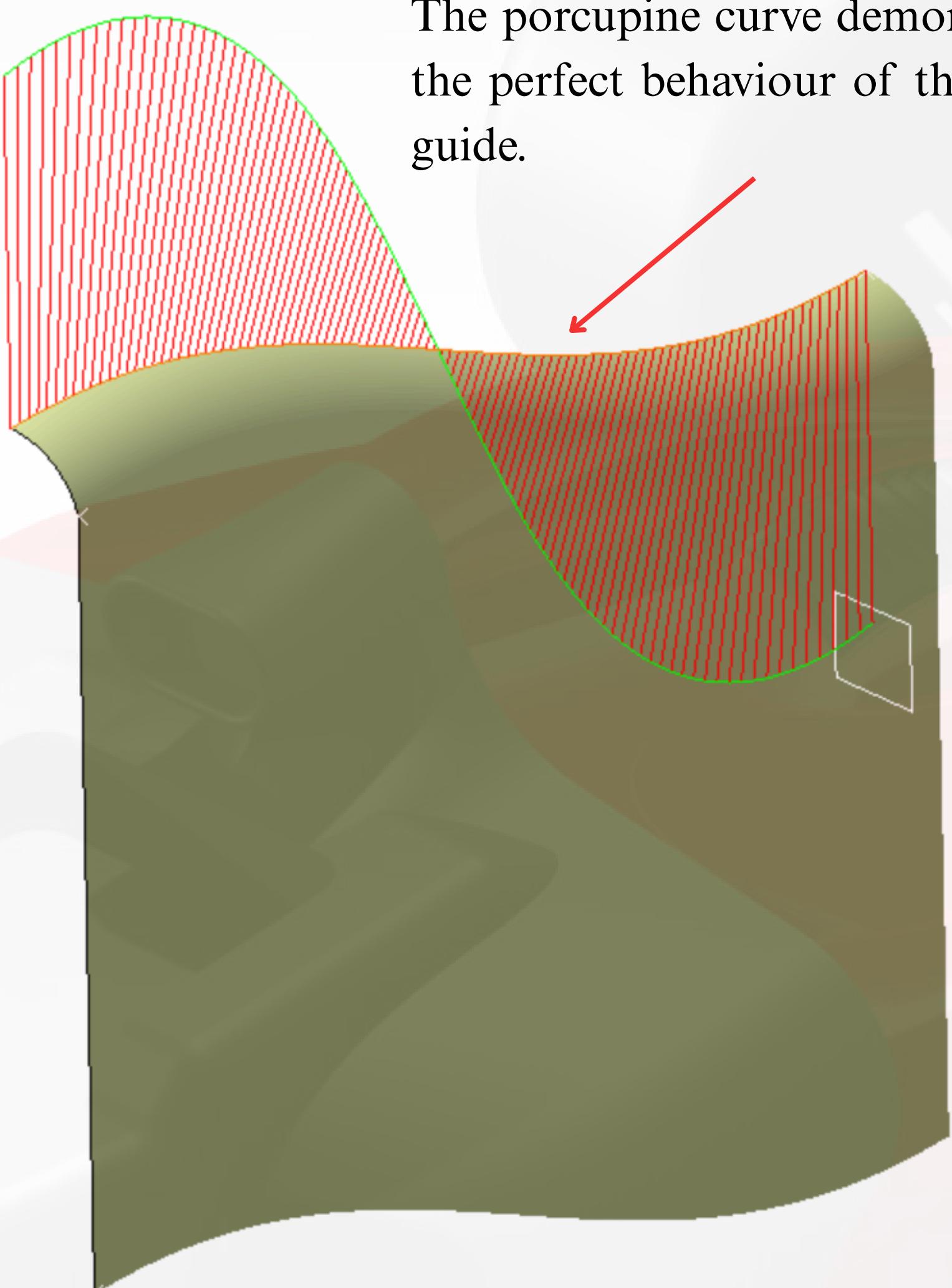
**Section 2** contains variables to create the profile, which are supported by the section plane. “When section 2 is finished, you can copy and paste to create the next section



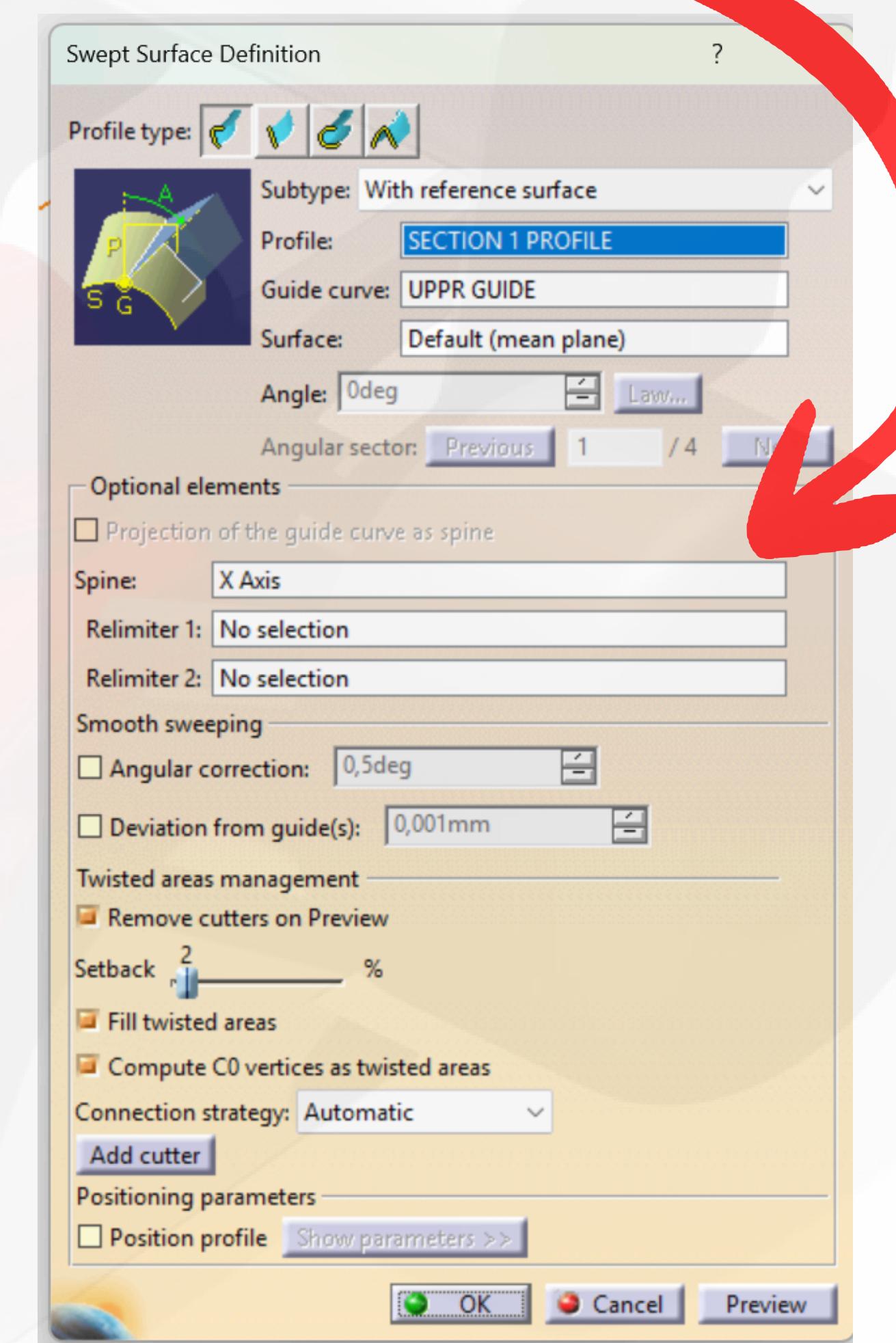
# Air Tank



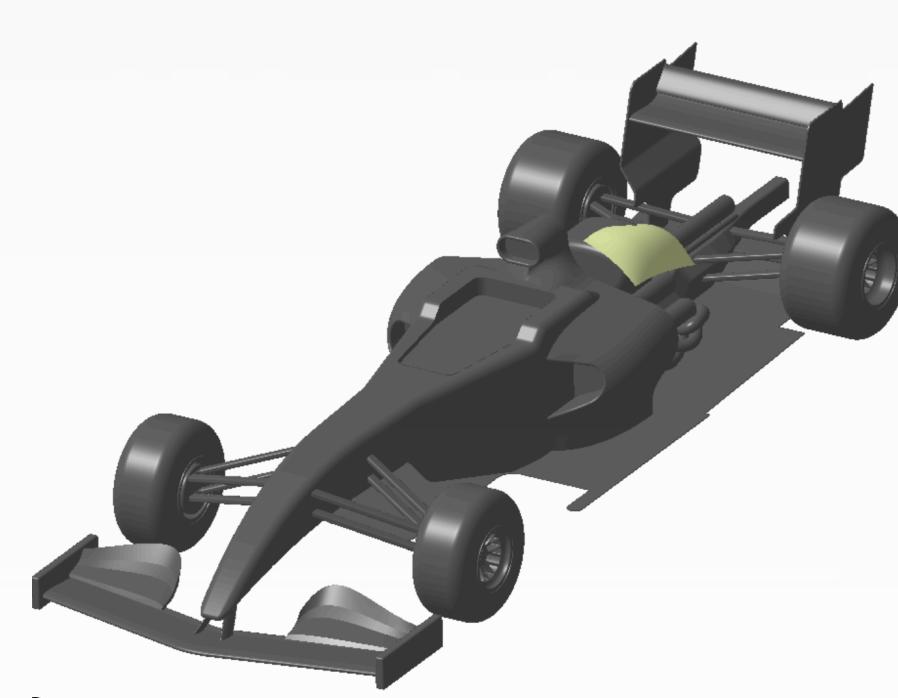
Section 1 was created from the reference model with an extract operation.



Extend along the X direction to complete the sweep surface.

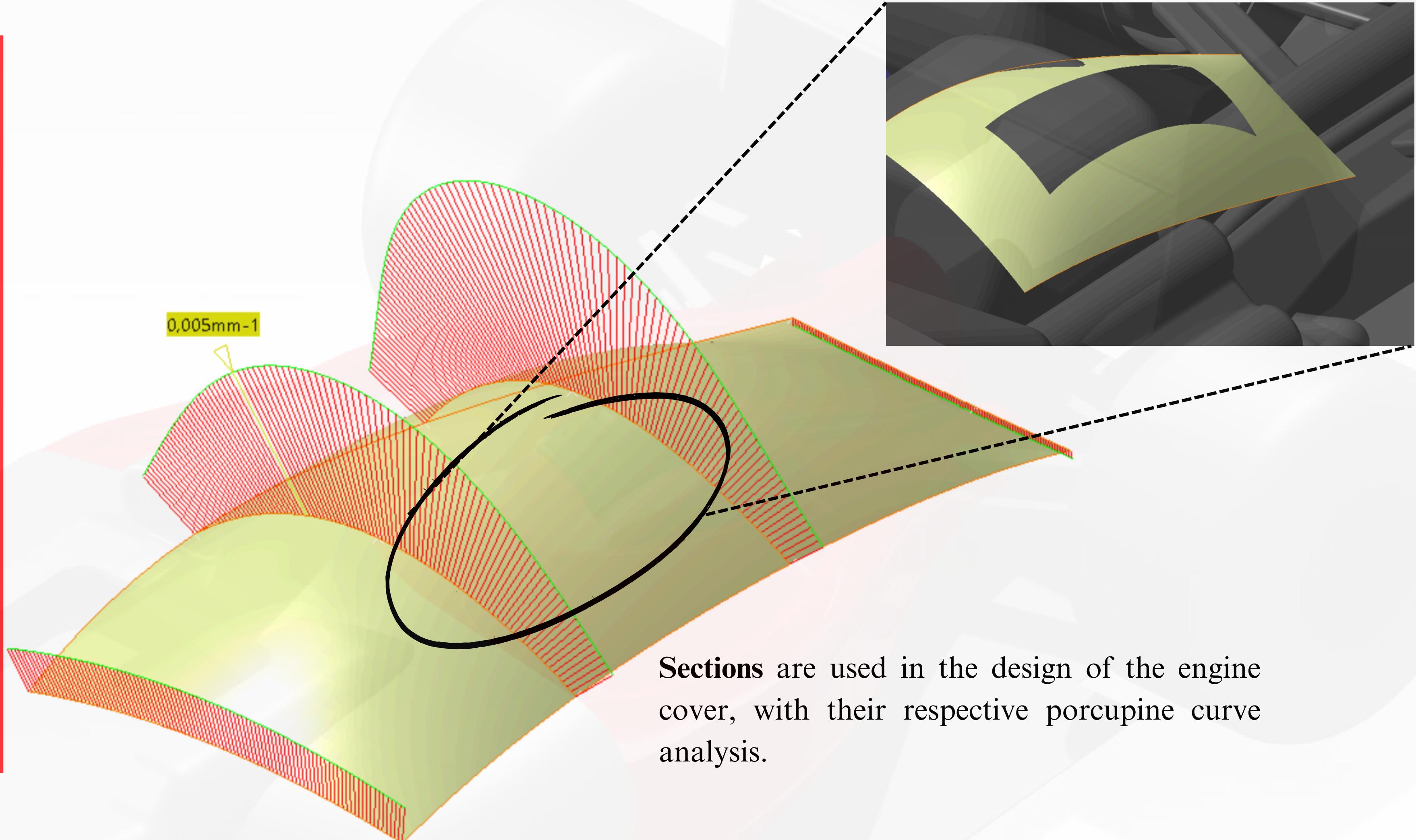


# Engine Cover



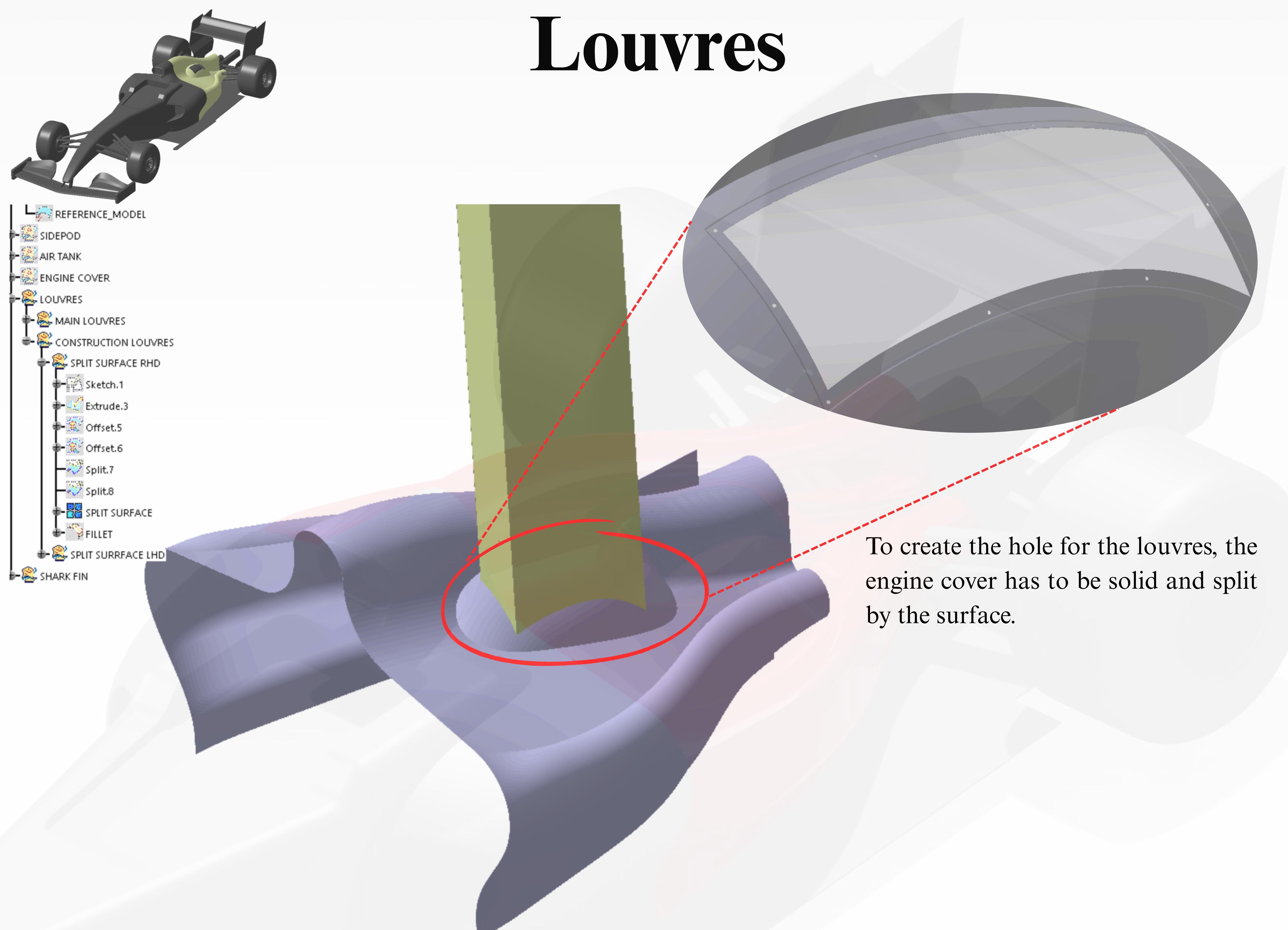
Slip operation is used to create a hole where the louvres will be inserted for cooling the engine.

ENGINE COVER
CONSTRUCTION ENGINE COVER
SECTION 1
SECTION PLANE
■ POINT 1
■ POINT 2
■ POINT 3
SECTION 1 PROFILE
SECTION 2
SECTION PLANE
■ POINT 1
■ POINT 2
■ POINT 3
SECTION 2 PROFILE
SECTION 3
SECTION PLANE
■ POINT 1
■ POINT 2
■ POINT 3
SECTION 3 PROFILE
SECTION 4
SECTION PLANE
■ POINT 1
■ POINT 2
■ POINT 3
SECTION 4 PROFILE
GUIDE ENGINE COVER
SURFACE ENGINE COVER
LOUVRES
SHARK FIN
Free Form Analysis.1
Porcupine Curvature Analysis.1

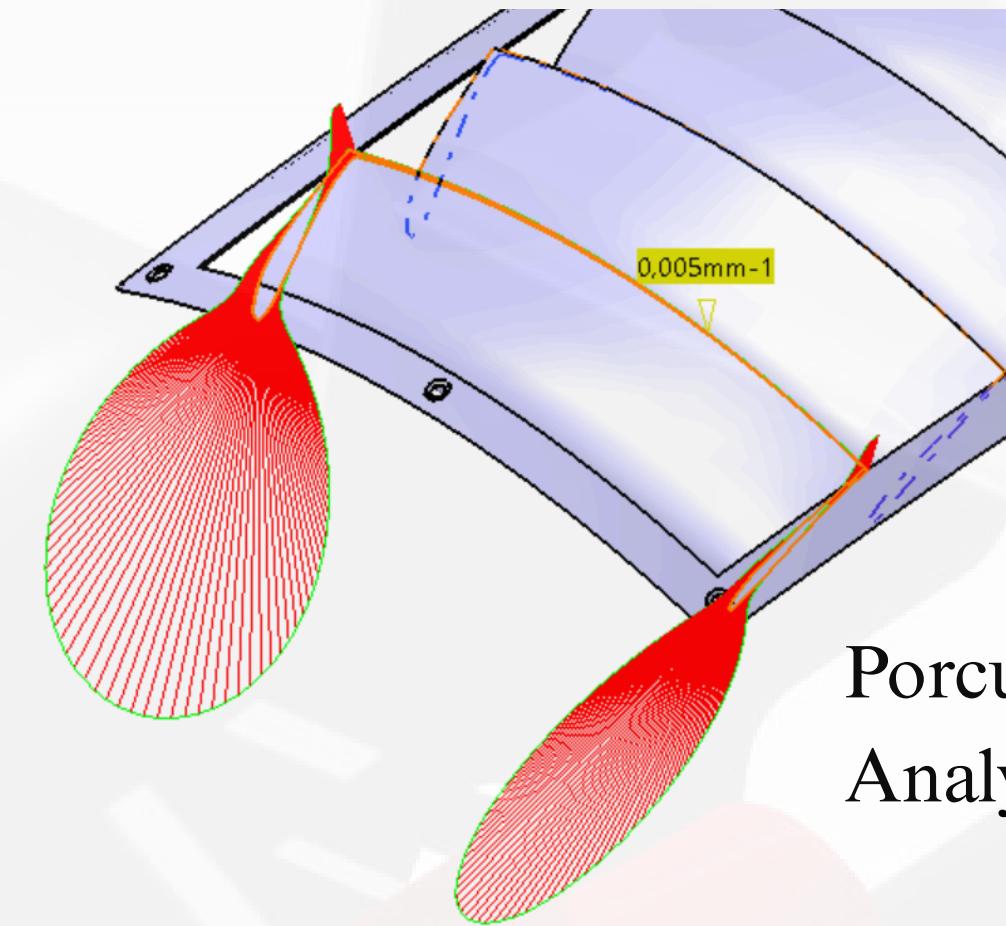
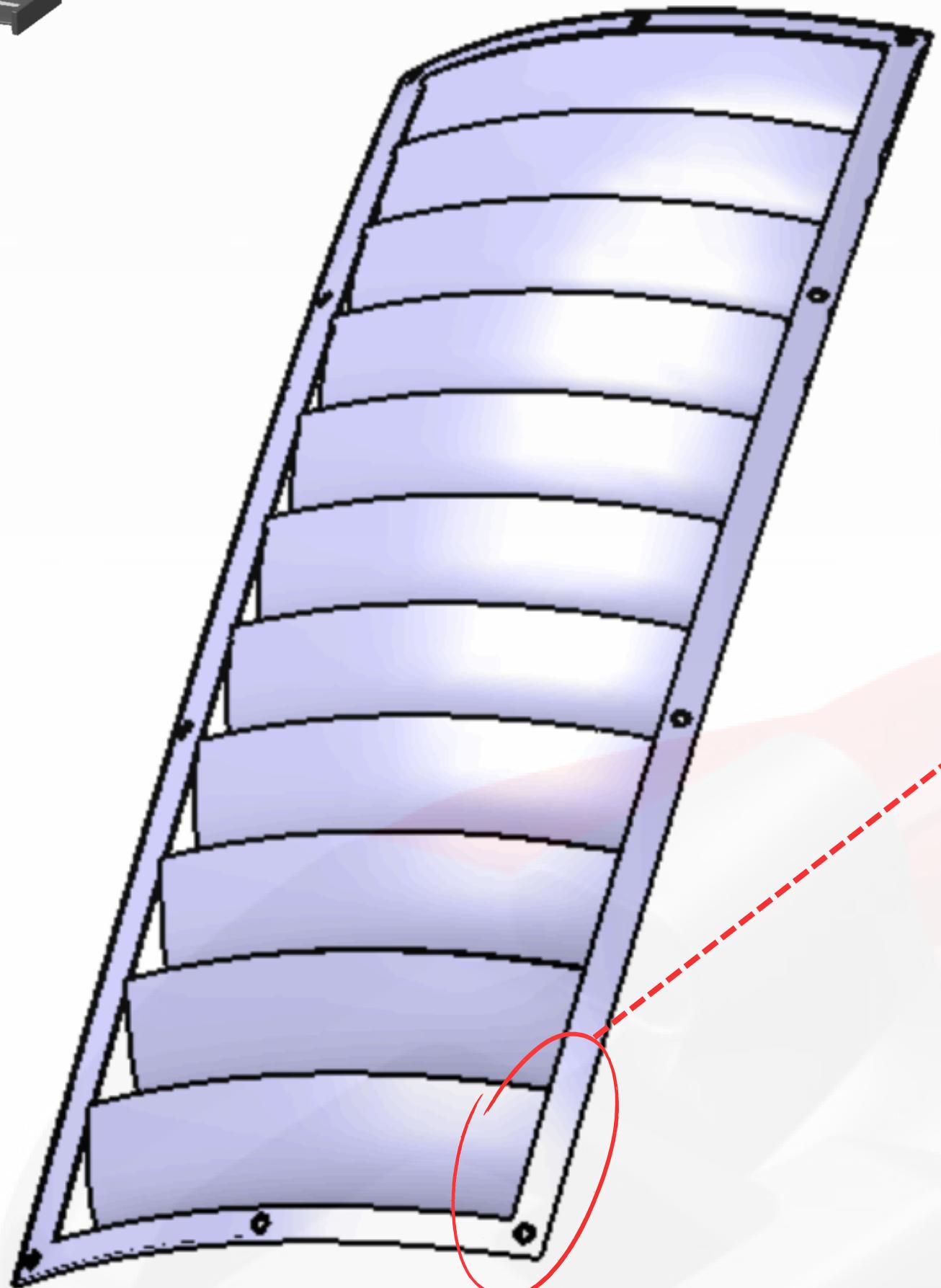
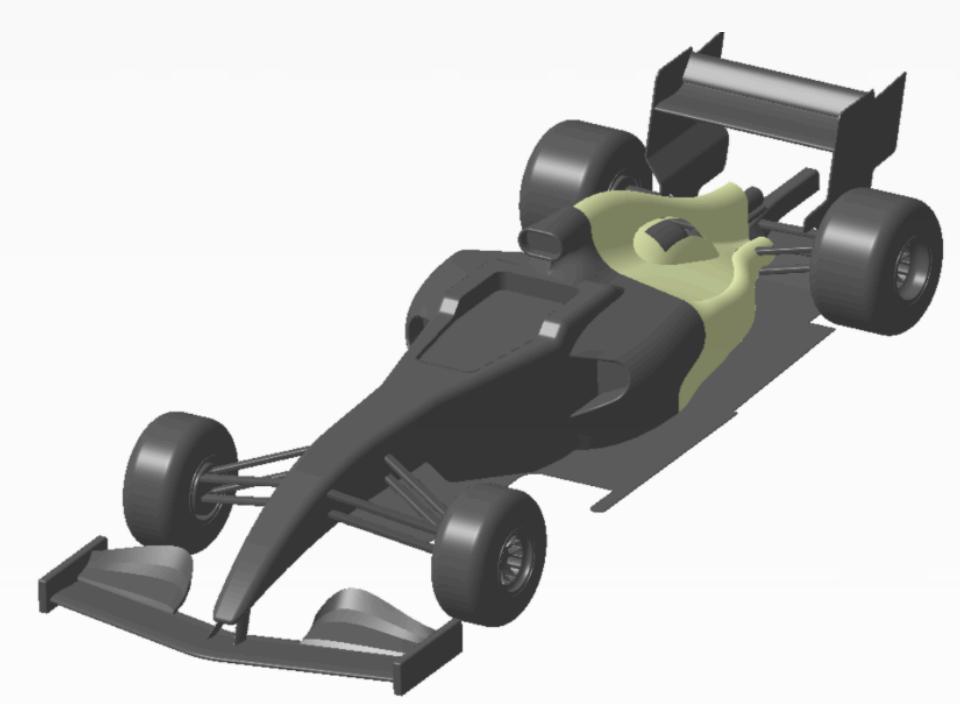


Sections are used in the design of the engine cover, with their respective porcupine curve analysis.

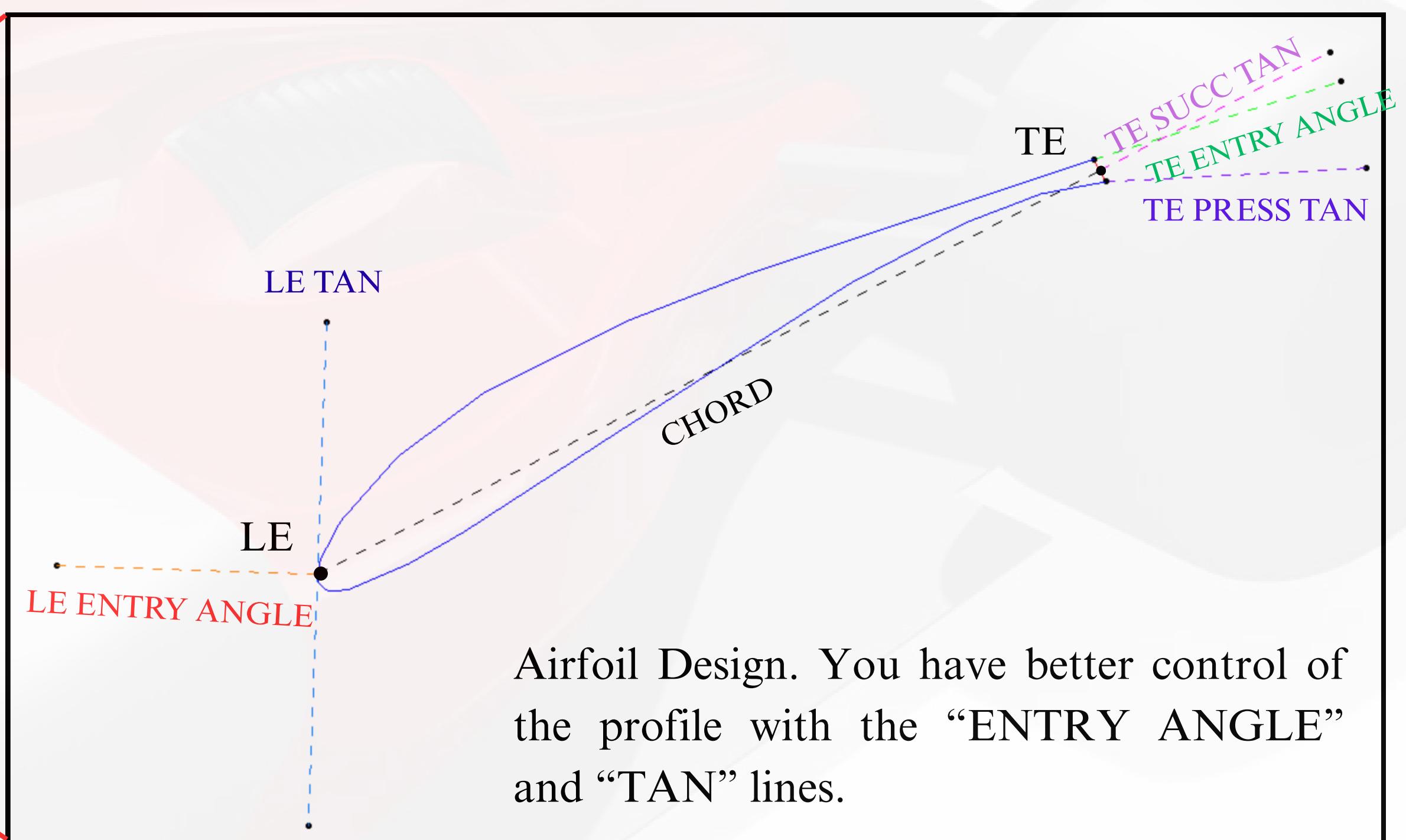
# Louvres



# Louvres Flaps

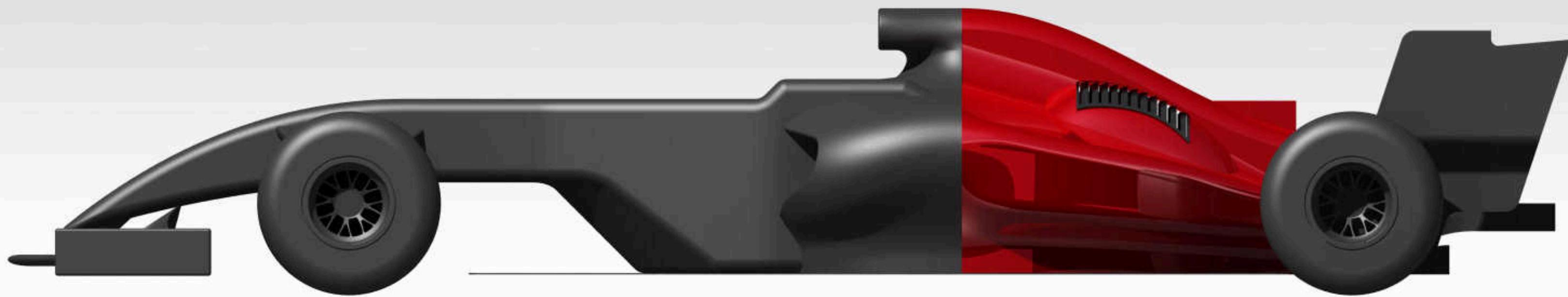


Porcupine Curve  
Analysis of the airfoil

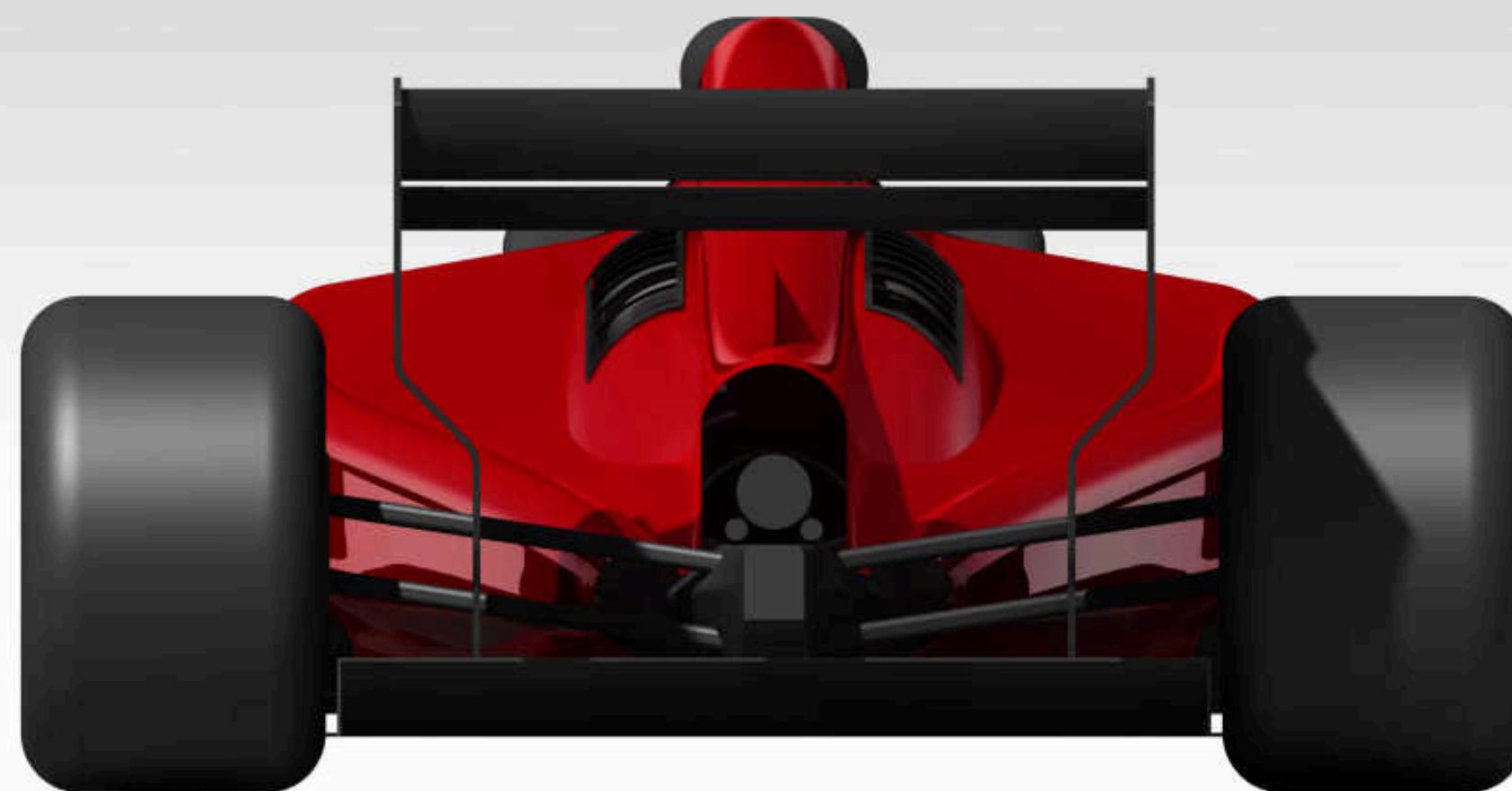


# Renders

Side View

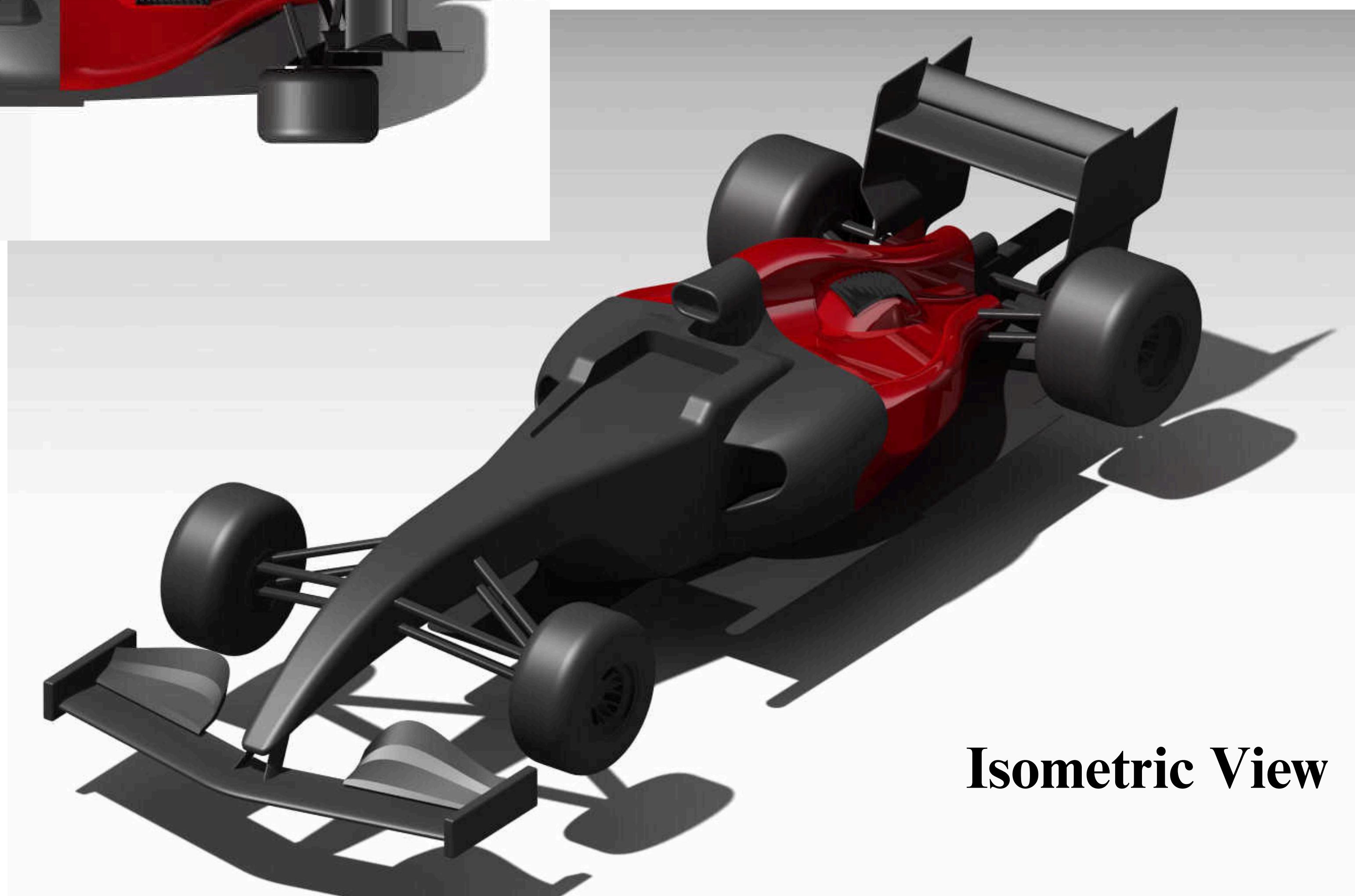
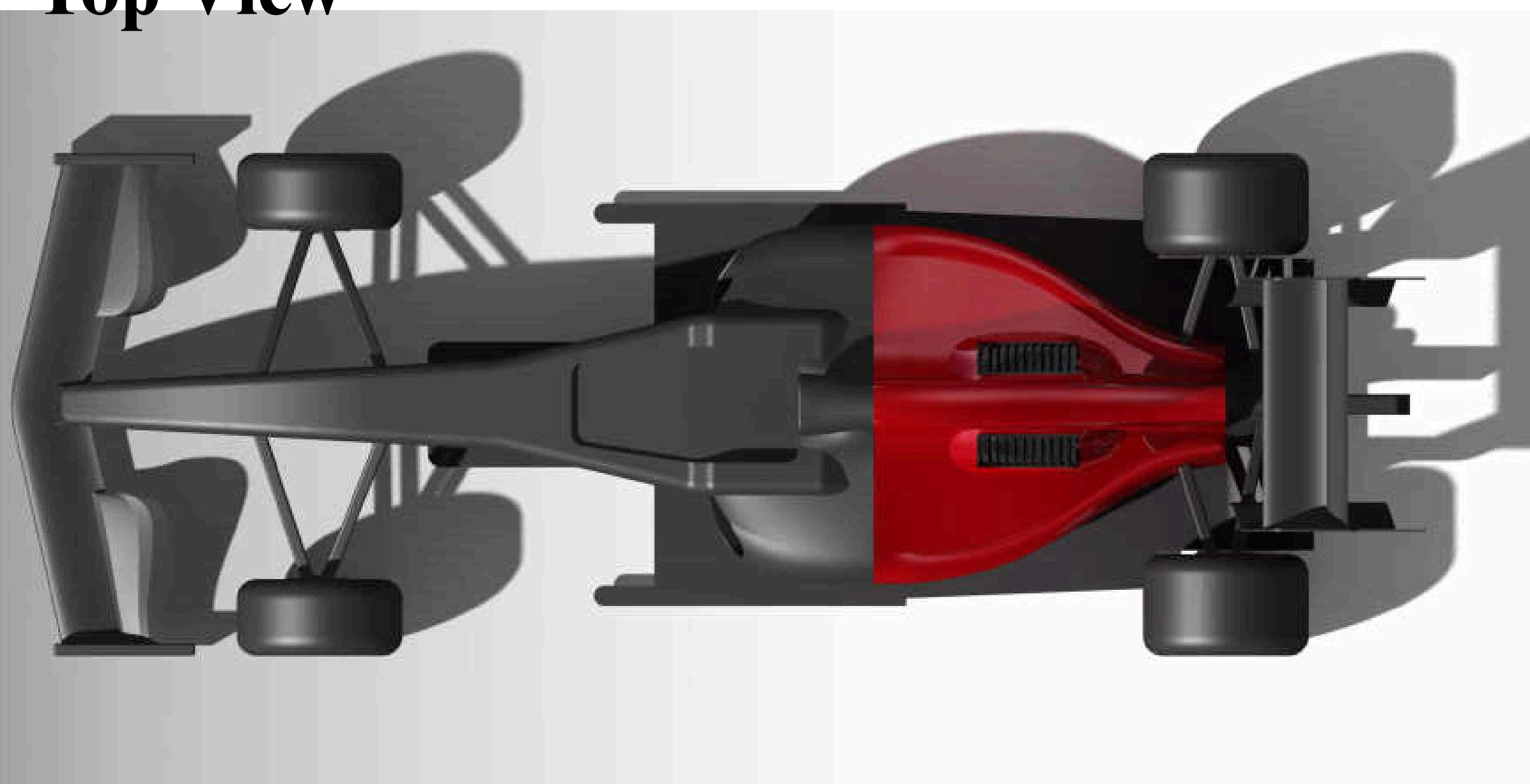


Rear View



# Renders

Top View



Isometric View