

## Overview of C2D

C2D Solutions Pte Ltd is a holistic knowledge-based engineering solutions provider with a wealth of experience. We are committed to deliver the most optimal solution based on sound engineering principles.

## Problem Statement

An Indoor badminton hall with 12 playing courts and at full capacity, there are 48 players with about 100 spectators expected. The objective of this study is to predict the flow field and temperature distribution in the indoor badminton hall.

## Challenge

Since it is an indoor badminton hall, conditioned fresh air is supplied and indoor air is extracted. This ventilation system needs to be determined whether thermal comfort is sufficient for the 48 players and about 100 spectators. Interference during game play due to the ventilation system has to be studied as well.

## Solution

The temperature will be analyzed at average human head level. This is to establish how comfortable the players and spectators are during the game. The flow field on the other hand will be studied at the approximate region where the shuttle cork is played. This is to establish the interference the flow field has on the game.

## Results

The airflow allows adequate heat extraction and provides for a comfortable environment for players and spectators. The temperature experienced by the players and spectators are about 1 to 2°C above the conditioned supply air temperature (24°C). This temperature is expected to be comfortable in the tropical context. The shuttle cork experiences a flow field of about 0.2 to 0.4m/s. This low flow is assumed to interfere minimally with the movement of the shuttle cork.

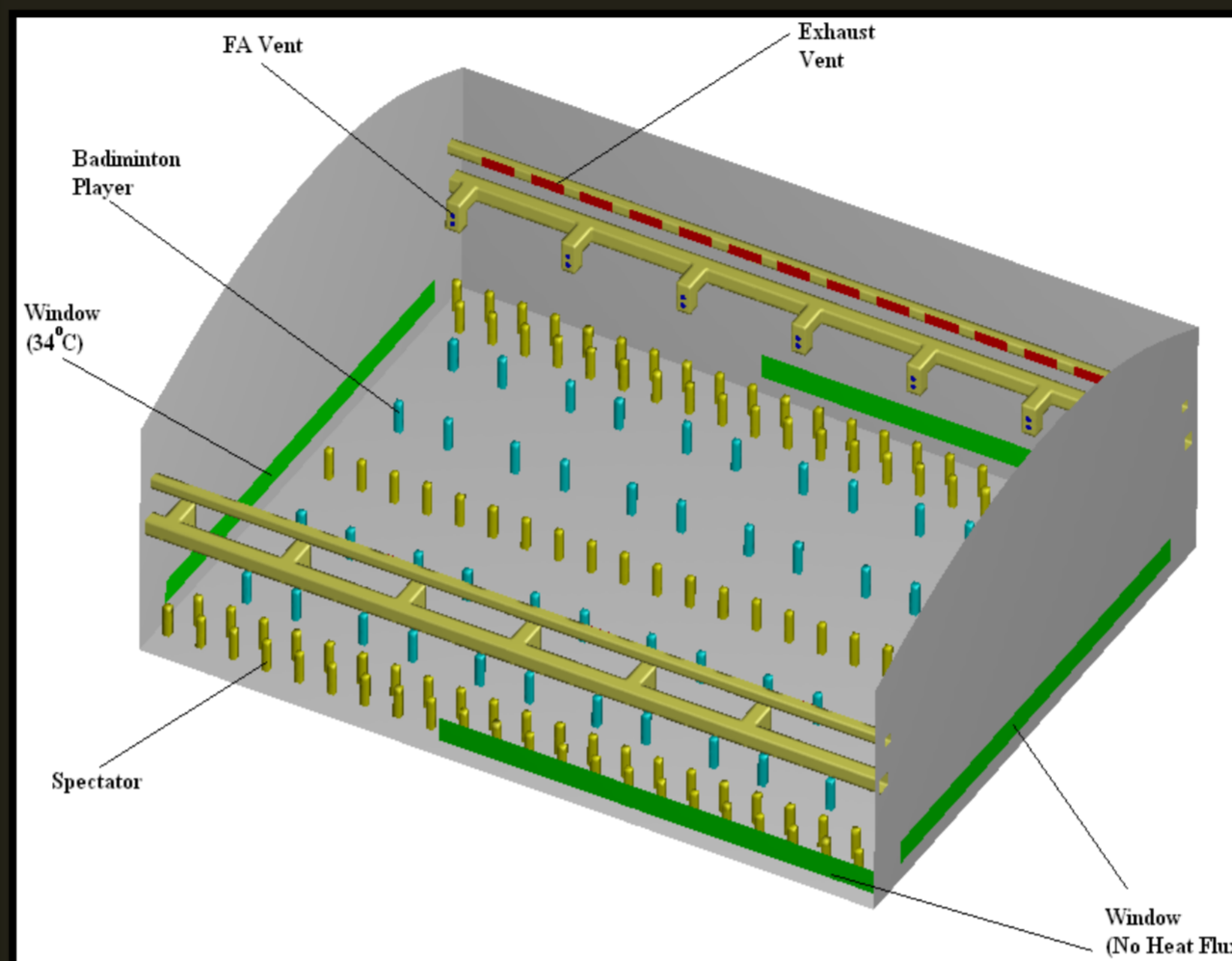


Fig 1: Computational Domain of the Indoor Badminton Hall

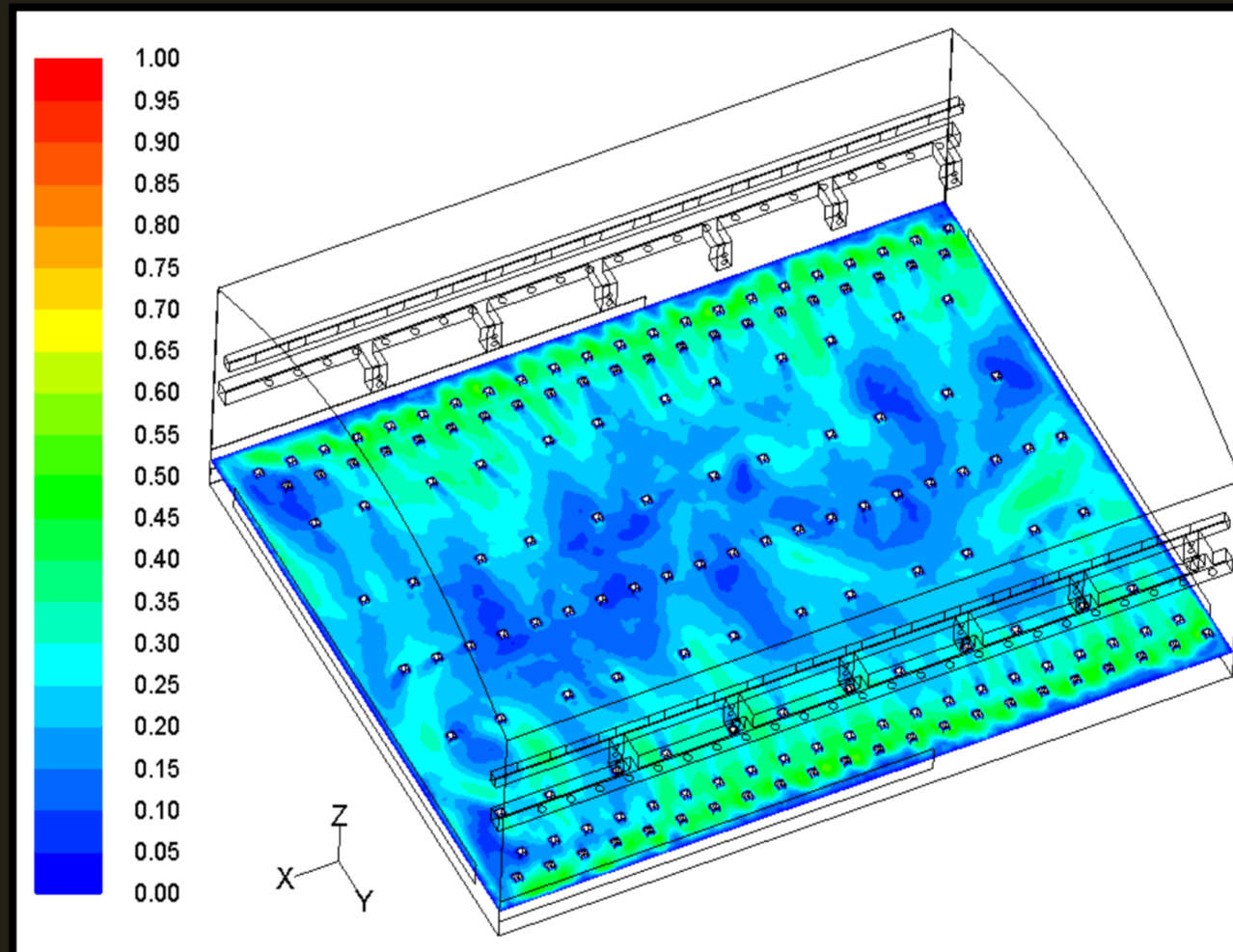
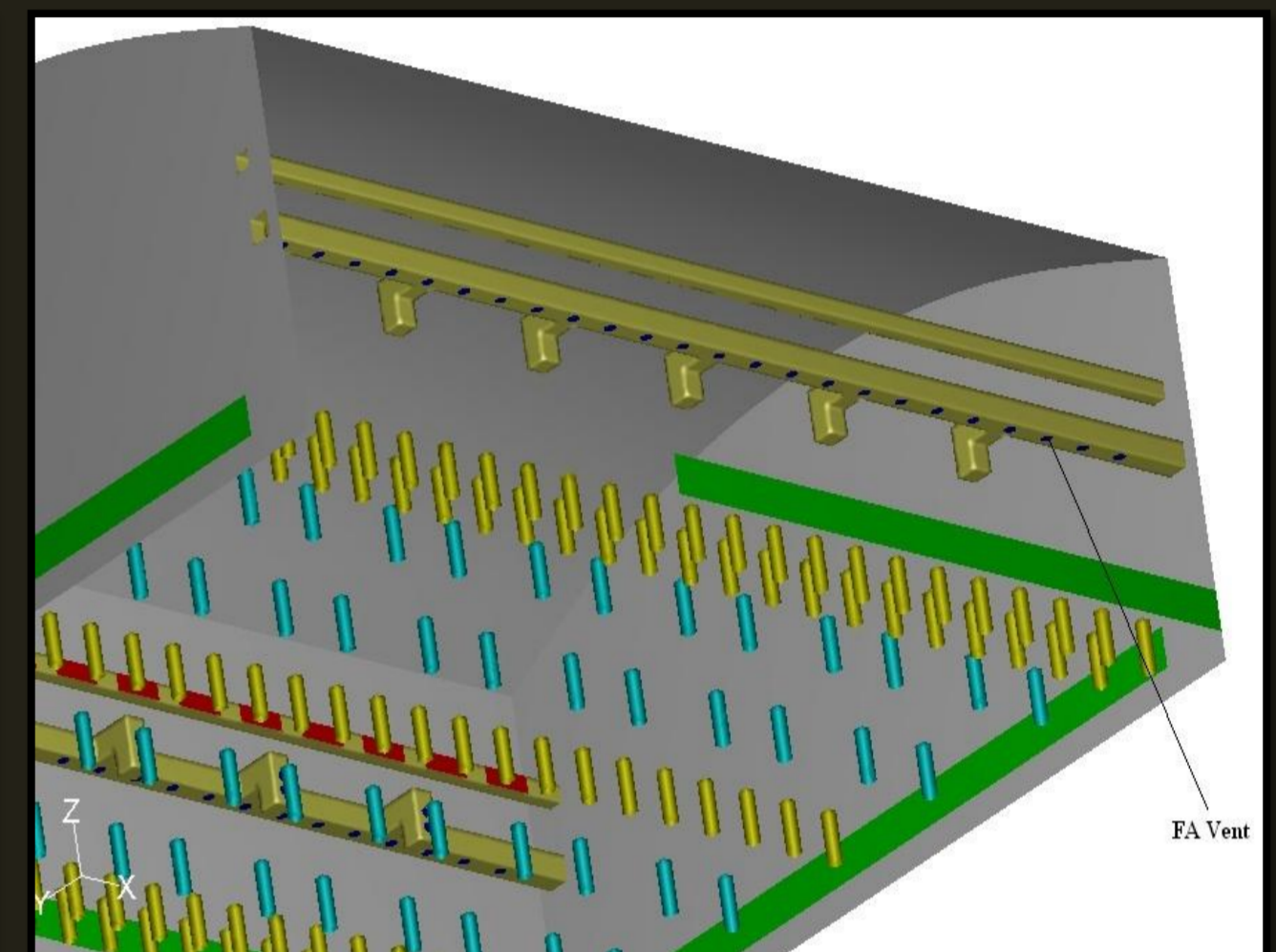


Fig. 2: Velocity Contour at 1.7m Height

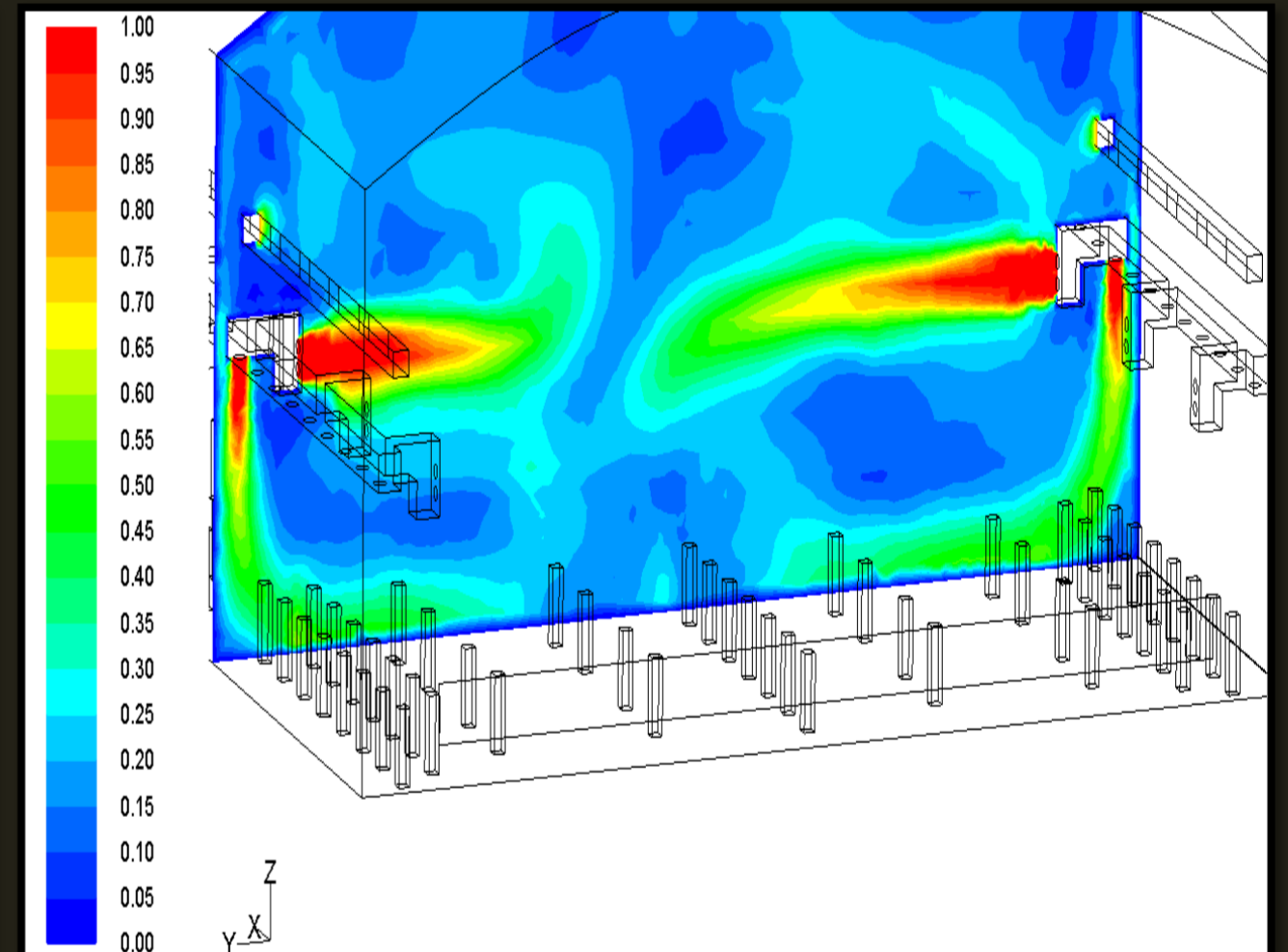


Fig. 3: Velocity Contour at Vertical Plane

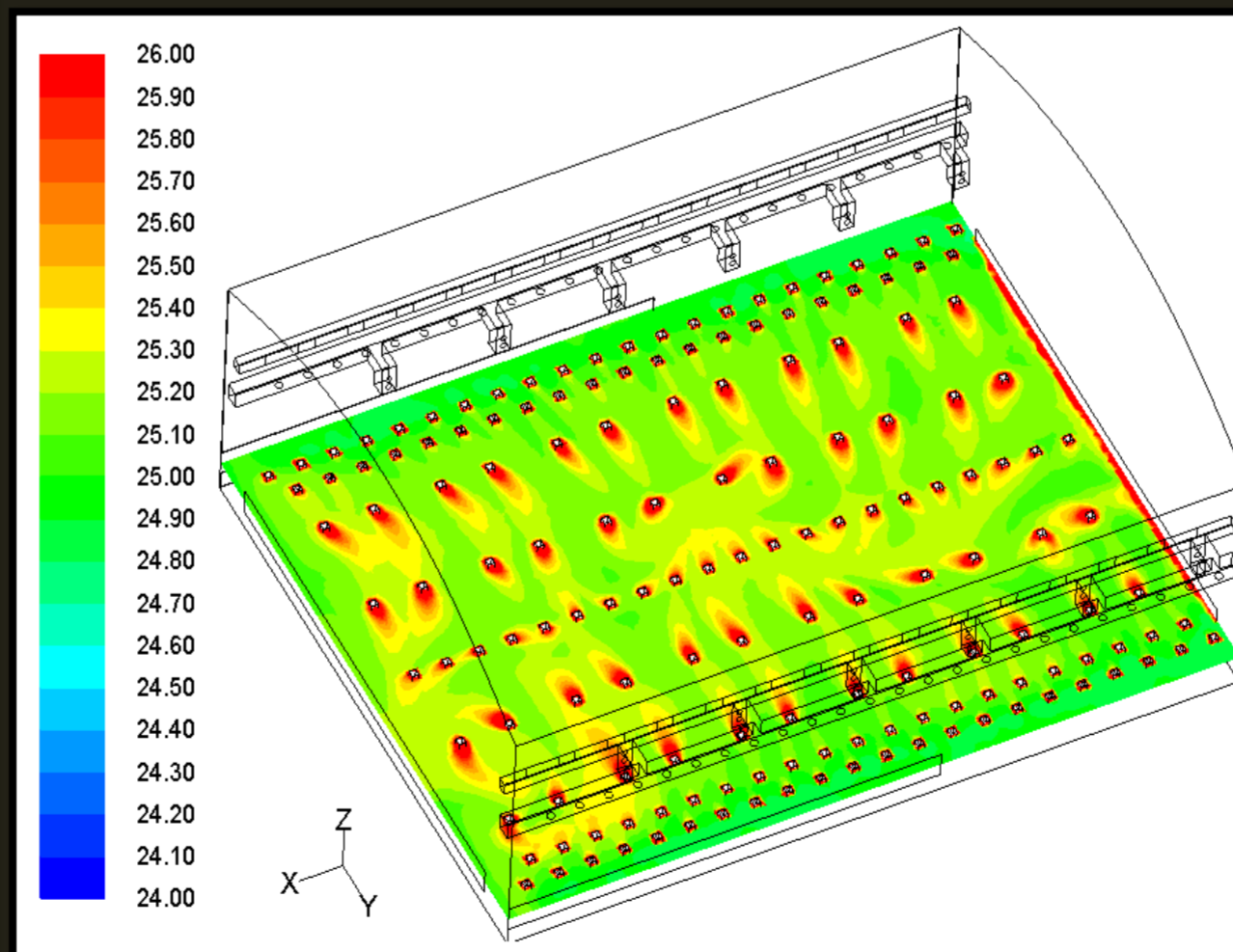


Fig. 4: Temperature Contour at 1.7m Height

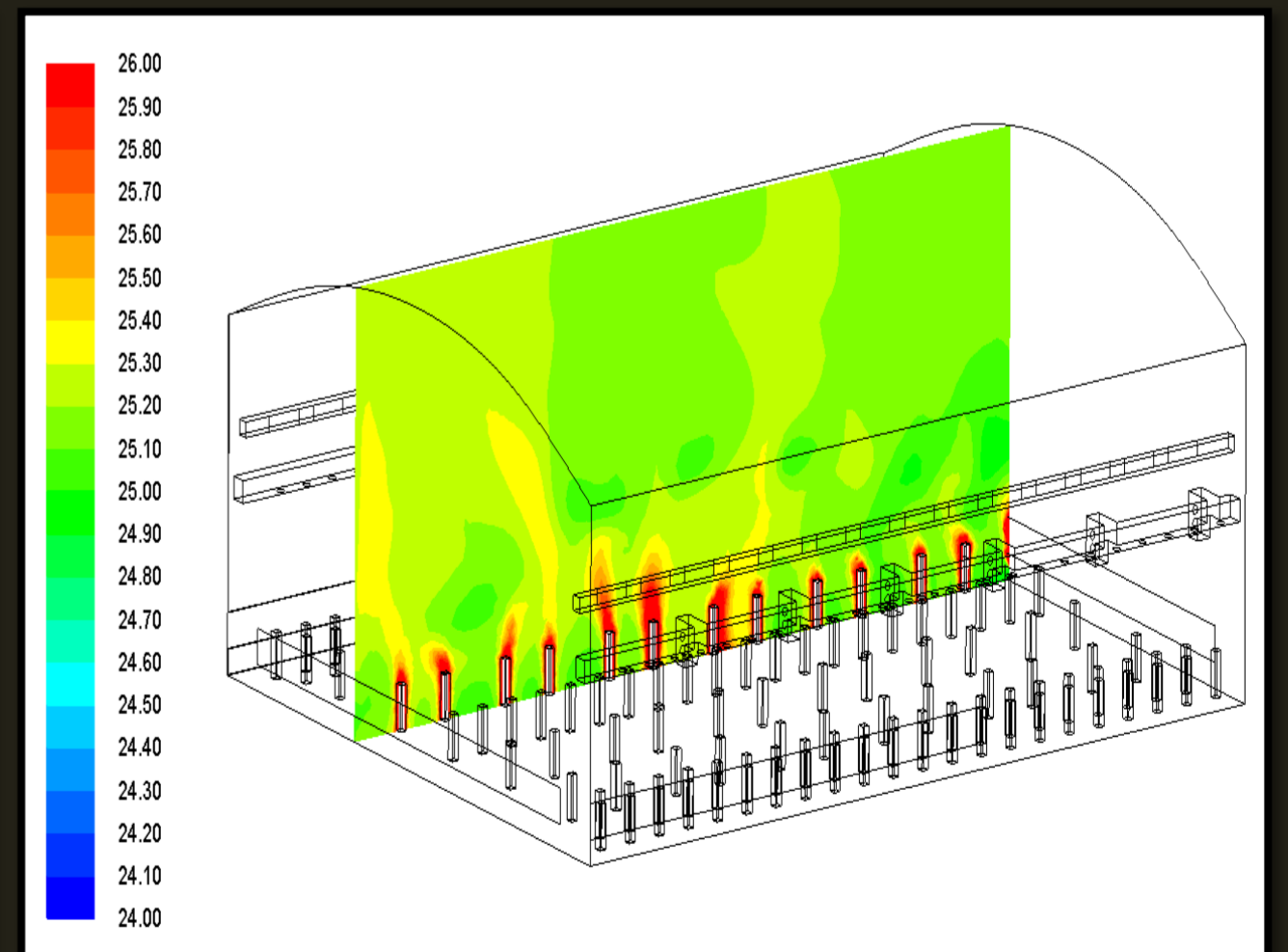


Fig. 5: Temperature Contour at Vertical Plane along Axis of Domain