

## 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

Due to operational requirements of the proposed rubber producing plant, air conditioning in the plant was not possible. The operators were concerned that the proposed natural ventilation via louvers will not be sufficient to ensure adequate thermal comfort.

## Challenge

The interior of the plant contains several heat radiating entities like manufacturing equipment, forklifts, conveyor system, finished products and human occupants. The ventilation within the facility takes place naturally, assisted by louvers installed around the building and roof ventilators.

## Solution

Computational Fluid Dynamics (CFD) was used to simulate operating conditions in the plant and to investigate if there are any significant hot spots that may undermine thermal comfort. An accurate model of the rubber plant, manufacturing equipment, conveyor system and flow devices were created for the CFD simulation. To increase the accuracy of the results, solar radiation and metrological wind data were also considered.

## Results

By using CFD to analyse the proposed ventilation design, the design can be validated before construction to prevent future alterations. Hot spots predicted by the CFD were rectified by adjusting louver positions and/or introducing targeted mechanical ventilation systems. This helped the client save cost and time. From the optimized CFD results (Fig. 2 & Fig. 3), it shows that there is no stagnation zones and the temperature is within the comfort range.

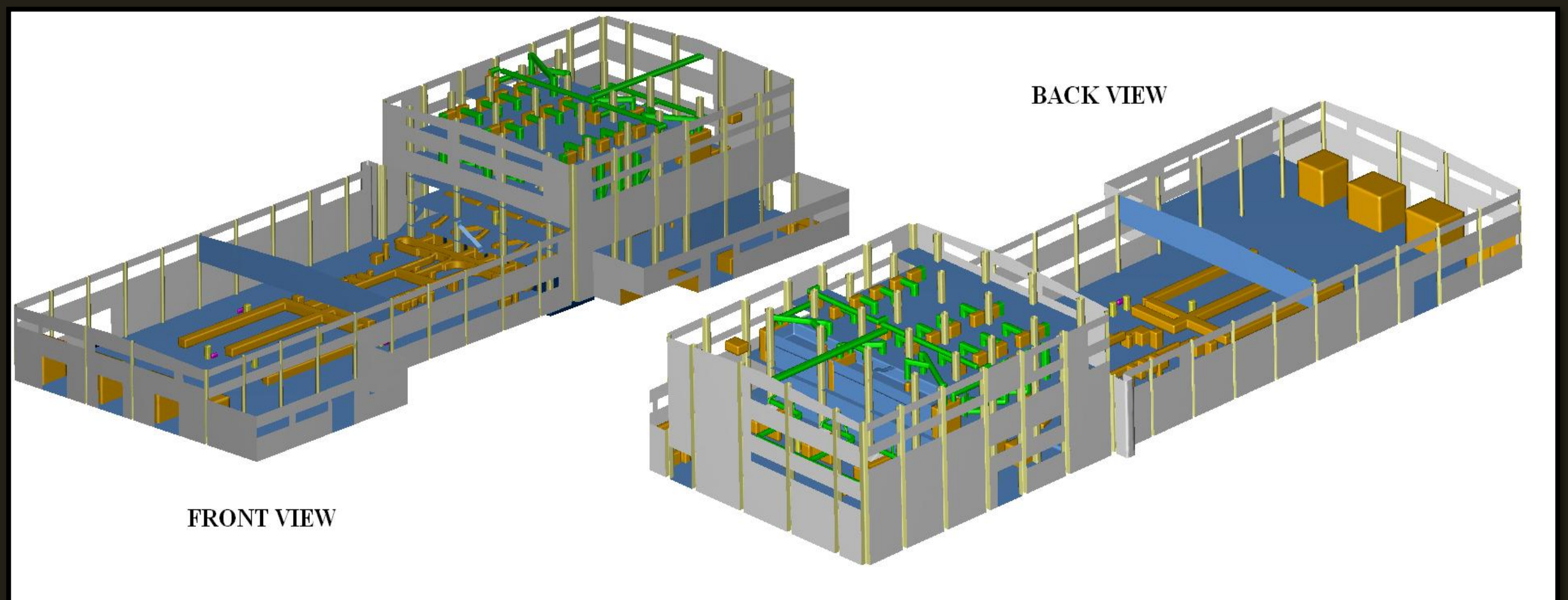


Fig 1: Computational Domain of the Rubber Plant

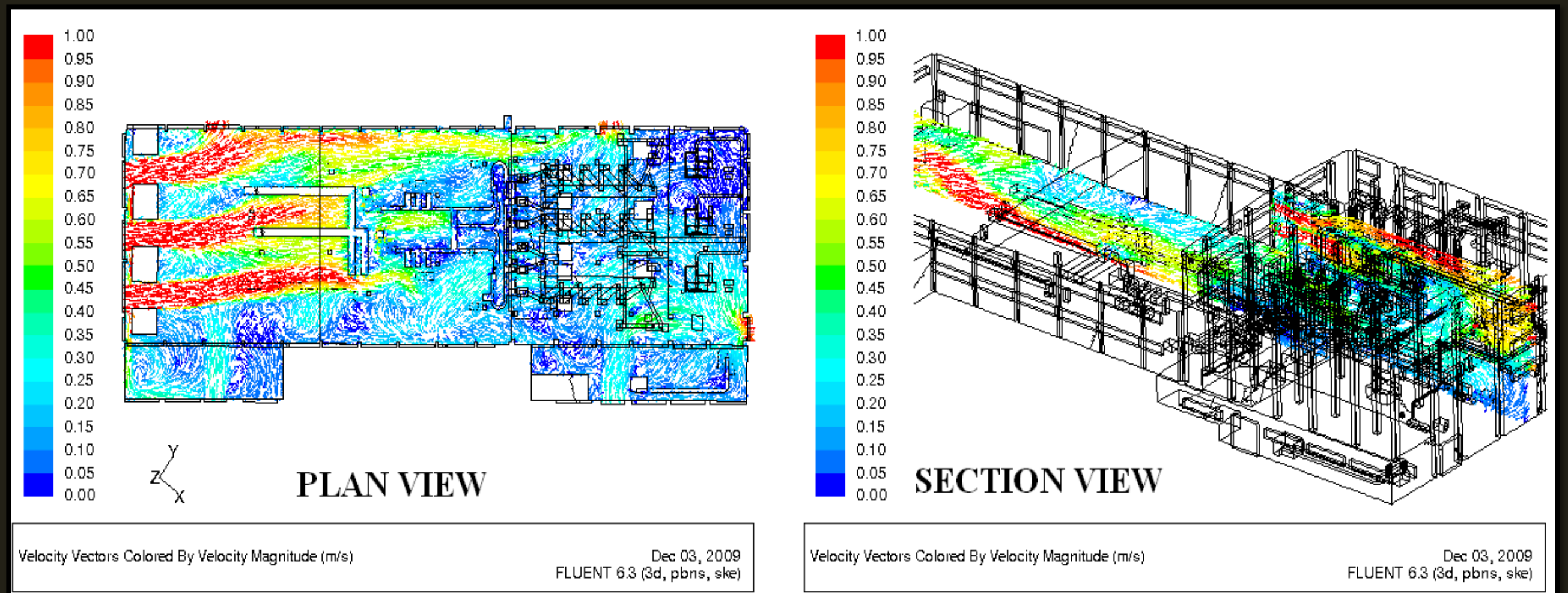


Fig. 2: Velocity Vectors

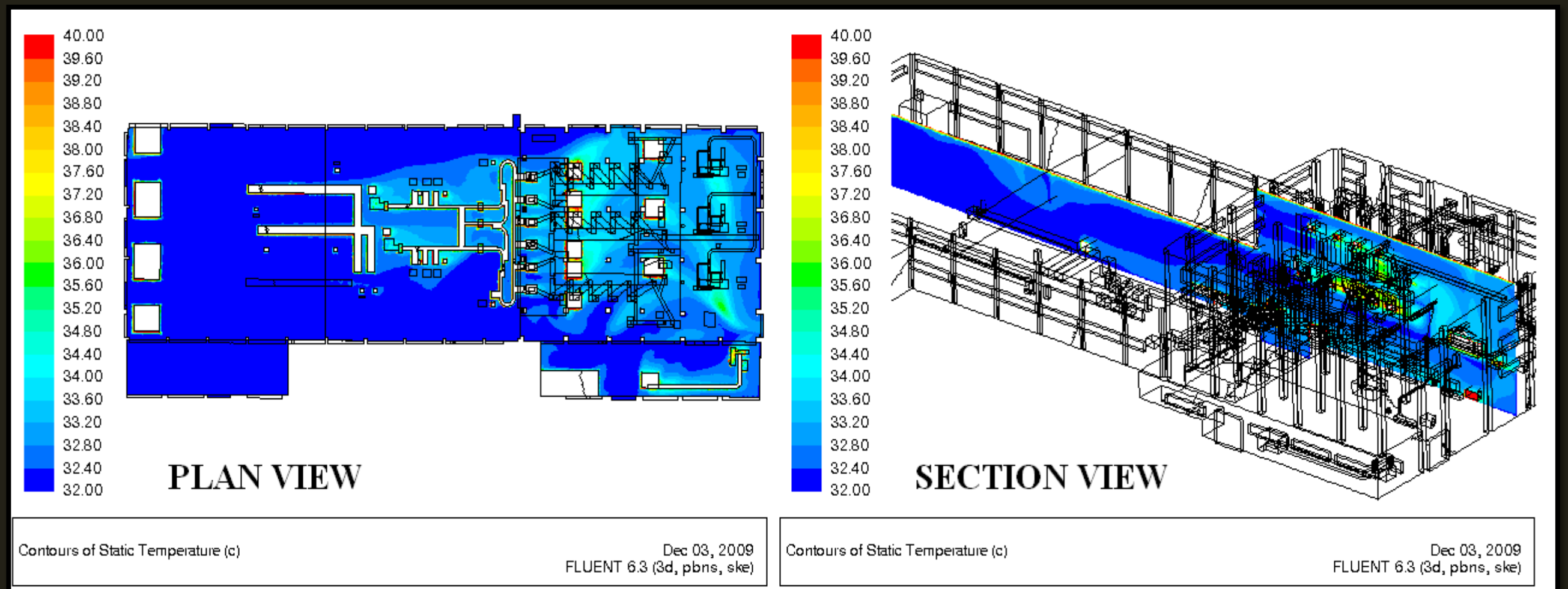


Fig. 3: Temperature Contour