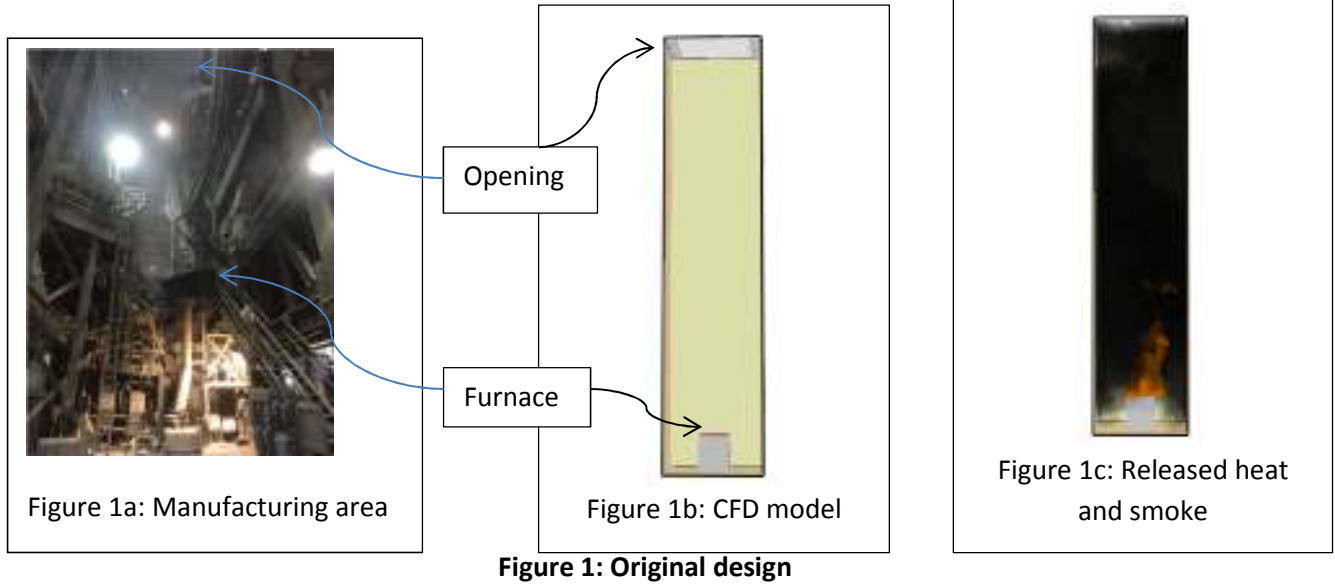


## CFD assessment of a Ventilation system for a smoke removal

A CFD assessment was performed to design a ventilation system in order to remove a smoke exhausted from a furnace into the atmosphere in a manufacturing plant. The furnace is located in the middle of the building. The opening area to the atmosphere is located 180ft above the ground. The heat released from the furnace is about 5KW/m<sup>2</sup>. Figures 1a and 1b show the furnace area and corresponding CFD model.



The existing ventilation system was not designed to absorb the released smoke due to the high released heat. Therefore, the smoke was exhausting to the atmosphere through the open area. This smoke was of concern by local authorities to pollute the environment. This issue was confirmed by the CFD results shown in figure 1c.

A new ventilation system design was proposed based on installing an exhausted fan on the right side of the furnace. After studying different scenarios, the location of the exhaust fan and the appropriate CFM needed to absorb the smoke were determined (Figure 2).

