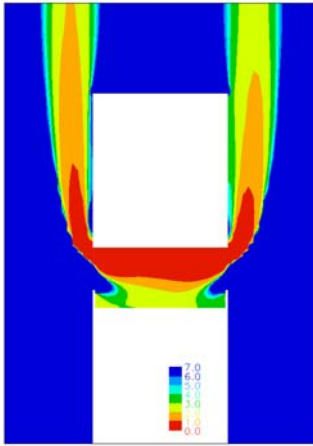


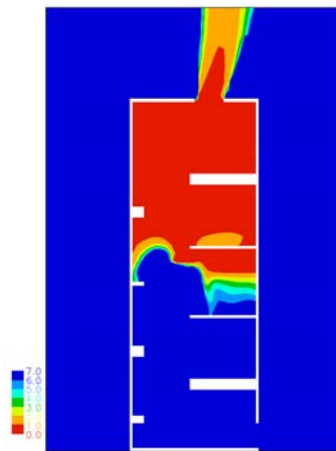


Smoke Ventilation of Common Access
Areas of Flats and Maisonettes (BD2410) -
Final Factual Report
Appendix Diii ('Lobby' scenario 'visibilities'
with 1 MW fire and 0.5 m dwelling & stair
door openings)

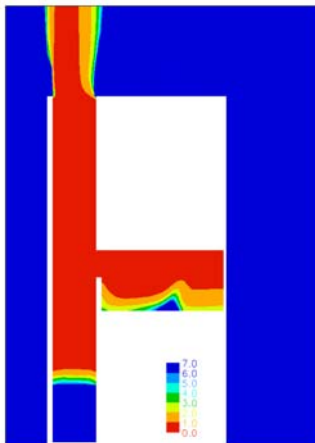
The authors of this report are employed by BRE. The work reported herein was carried out under a Contract placed by the ODPM. Any views expressed are not necessarily those of the ODPM.



Lobby: L: 1.5m² high-level wall vent
 R: 1.5m² high-level wall vent
Mean temp in occupied space = 61°C



Stair: Top and bottom vent

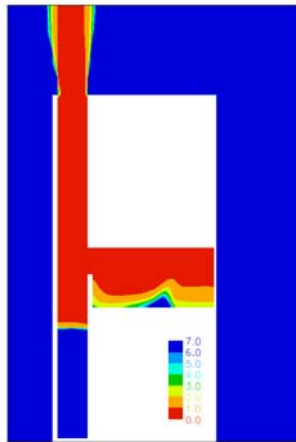


Lobby: L: Natural closed-base, 3m² shaft
 (1m² high-level vent to lobby)
 R: No vent
Mean temp in occupied space = 74°C

NO SMOKE IN STAIR

Stair: Top and bottom vent

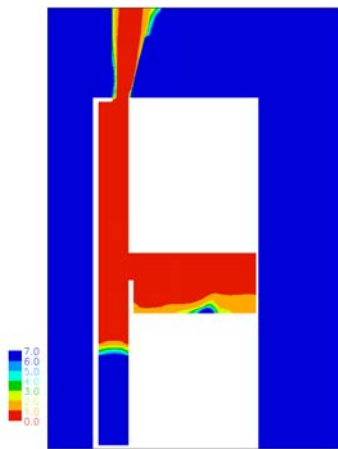




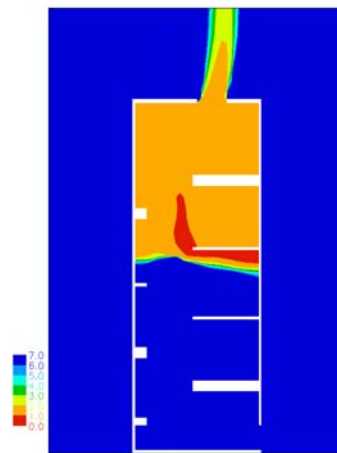
NO SMOKE IN STAIR

Lobby: L: Natural closed-base, **1.5m²** shaft
 (1m² high-level vent to lobby)
 R: No vent
Mean temp in occupied space = 75°C

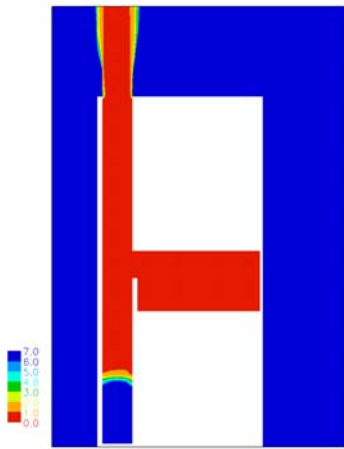
Stair: Top and bottom vent



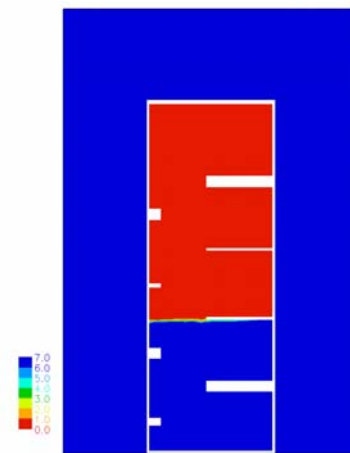
Lobby: L: Natural closed-base, **1.5m²** shaft
 (1m² high-level t vent to lobby and
 50% reduction in area at top)
 R: No vent
Mean temp in occupied space = 85°C



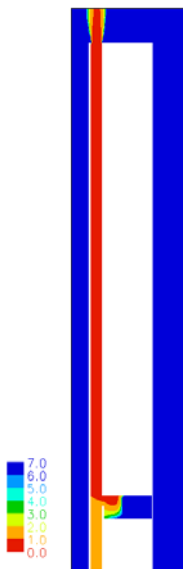
Stair: Top and bottom vent



Lobby: L: Natural closed-base, **1.5m²** shaft
(1m² high-level vent to lobby)
R: No vent
Mean temp in occupied space = 119°C



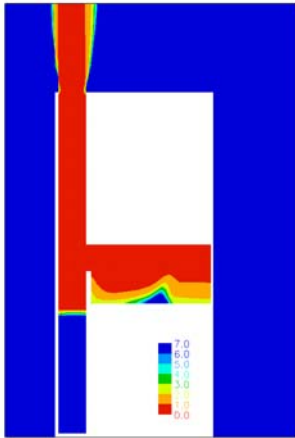
Stair: **No vent**



20 stories
Lobby: L: Natural closed-base, **1.5m²** shaft
1m² high-level vent to lobby)
R: No vent
Mean temp in occupied space = 44°C

NO SMOKE IN STAIR

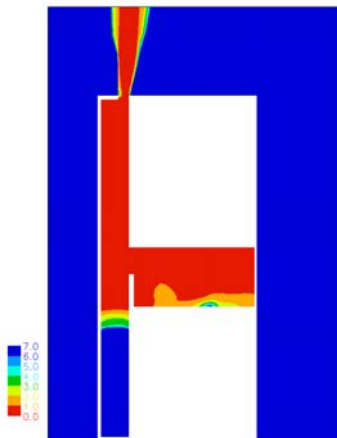
Stair: Top and bottom vent



NO SMOKE IN STAIR

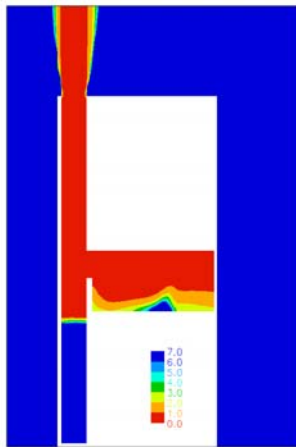
Lobby: **L:** Natural closed-base, **1.25m²** shaft
 (1m² high-level vent to lobby)
R: No vent
Mean temp in occupied space = 76 °C

Stair: Top and bottom vent



Lobby: **L:** Natural closed-base, **1.25m²** shaft
 (1m² high-level vent to lobby and
 50% reduction in area at top)
R: No vent
Mean temp in occupied space = 99 °C

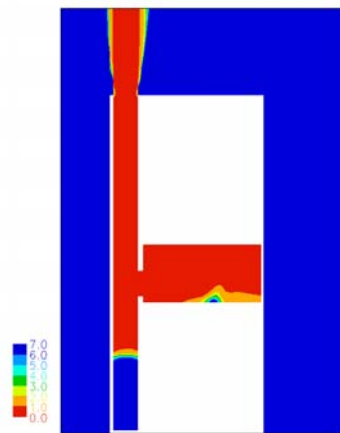
Stair: Top and bottom vent



NO SMOKE IN STAIR

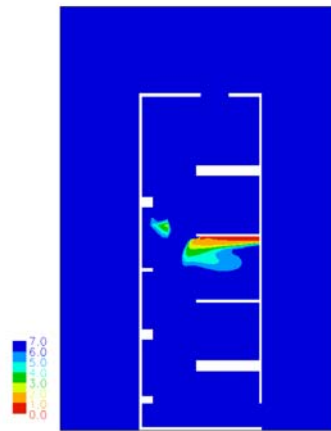
Lobby: L: Natural closed-base, **1m²** shaft
 (1m² high-level vent to lobby)
 R: No vent
Mean temp in occupied space = 79°C

Stair: Top and bottom vent

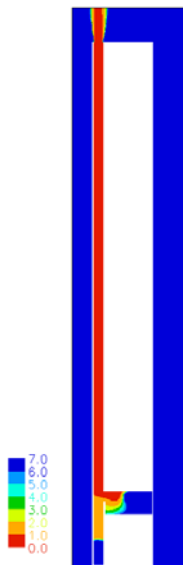


Lobby: L: Natural closed-base, **1m²** shaft
 (1m² low-level vent to lobby)
 R: No vent
Mean temp in occupied space = 114°C

Stair: Top and bottom vent



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NO SMOKE IN STAIR

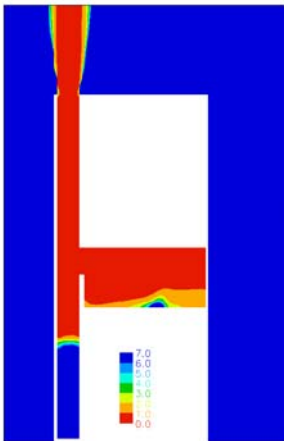
20 stories

Lobby: L: Natural closed-base, **1m²** shaft
(1m² high-level vent to lobby)

R: No vent

Mean temp in occupied space = 45°C

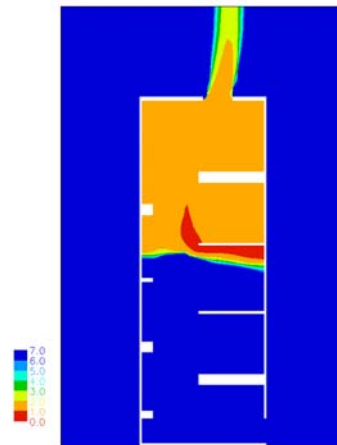
Stair: Top and bottom vent



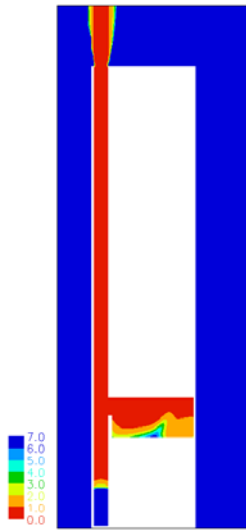
Lobby: L: Natural closed-base, **0.75m²** shaft
(0.85m² high-level vent to lobby)

R: No vent

Mean temp in occupied space = 87°C



Stair: Top and bottom vent



NO SMOKE IN STAIR

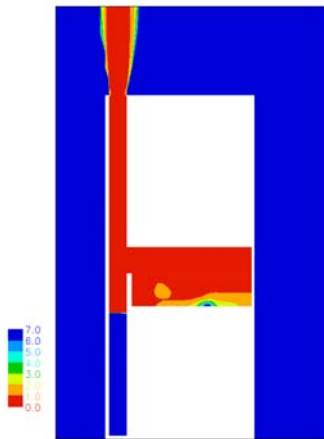
10 stories

Lobby: L: Natural closed-base, **0.75m²** shaft
(**0.85m²** high-level vent to lobby)

R: No vent

Mean temp in occupied space = 75°C

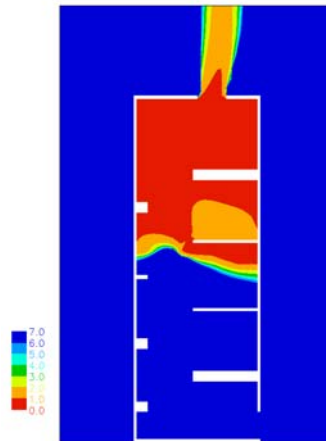
Stair: Top and bottom vent



Lobby: L: Natural closed-base, **0.5m²** shaft
(**0.7m²** high-level vent to lobby)

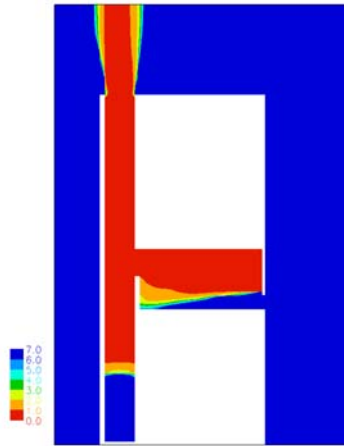
R: No vent

Mean temp in occupied space = 98°C

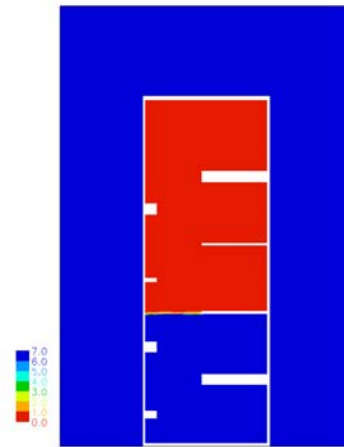


Stair: Top and bottom vent

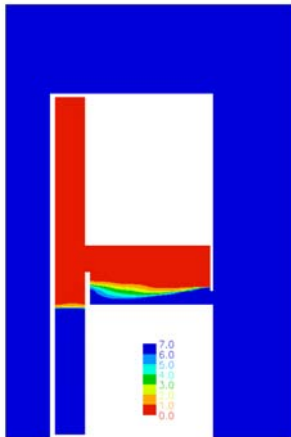
bre



Lobby: L: Natural closed-base, **1.5m²** shaft
(1m² high-level vent to lobby)
R: 0.5m² low-level vent
Mean temp in occupied space = 76°C



Stair: **No vent**



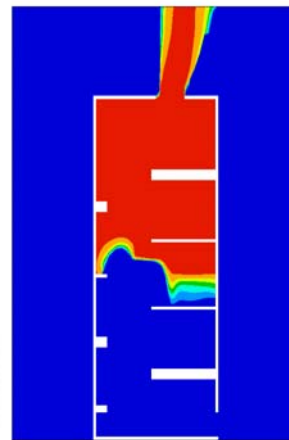
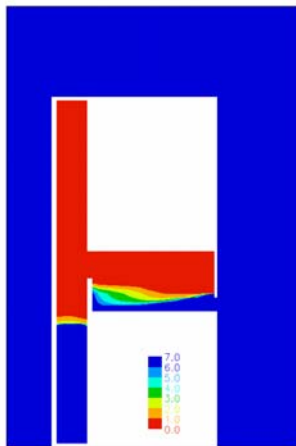
Lobby: L: Mechanical closed-base, **1.5m²** shaft
(**40 ach⁻¹** ($0.3 \text{ m}^3\text{s}^{-1}$) and
1m² high-level vent to lobby)

R: 0.5m² low-level vent

Mean temp in occupied space = 108 °C

Closed door $\Delta P = <1 \text{ Pa}$; open door vel = 0.1 ms^{-1}

Stair: Top and bottom vent



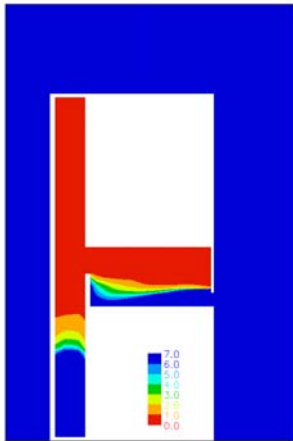
Lobby: L: Mechanical closed-base, **1.5m²** shaft
(**80 ach⁻¹** ($0.6 \text{ m}^3\text{s}^{-1}$) and
1m² high-level vent to lobby)

R: 0.5m² low-level vent

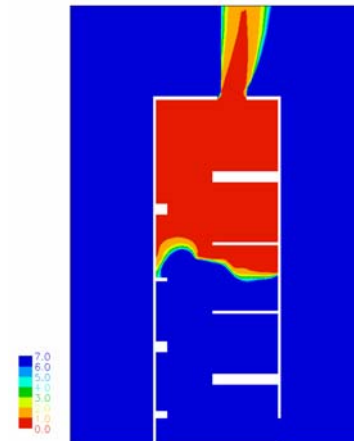
Mean temp in occupied space = 90 °C

Closed door $\Delta P = 2 \text{ Pa}$; open door vel = 0.3 ms^{-1}

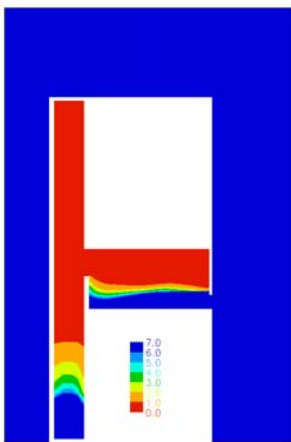
Stair: Top and bottom vent



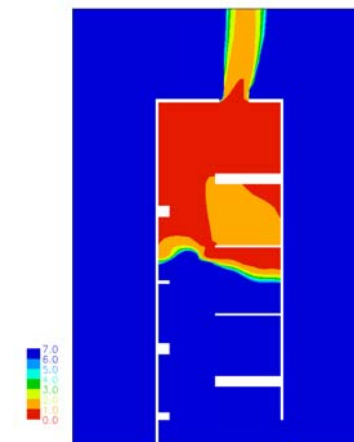
Lobby: L: Mechanical closed-base, **1.5m²** shaft
 (**160 ach⁻¹** (1.2 m³s⁻¹) and
 1m² high-level vent to lobby)
 R: 0.5m² low-level vent
Mean temp in occupied space = 73°C
Closed door ΔP = 6 Pa; open door vel = 0.5 ms⁻¹



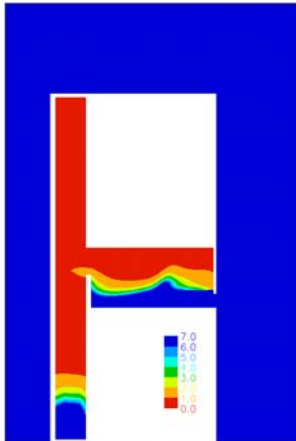
Stair: Top and bottom vent



Lobby: L: Mechanical closed-base, **1.5m²** shaft
 (**320 ach⁻¹** (2.4 m³s⁻¹) and
 1m² high-level vent to lobby)
 R: 0.5m² low-level vent
Mean temp in occupied space = 69°C
Closed door ΔP = 25 Pa; open door vel = 1.0 ms⁻¹



Stair: Top and bottom vent



NO SMOKE IN STAIR

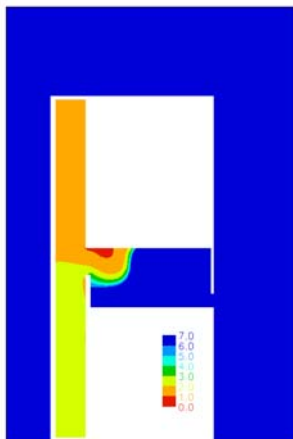
Lobby: L: Mechanical closed-base, **1.5m²** shaft
(**640 ach⁻¹** (4.9 m³s⁻¹) and
1m² high-level vent to lobby)

R: 0.5m² low-level vent

Mean temp in occupied space = 53°C

Closed door $\Delta P = 92 \text{ Pa}$; open door vel = 2.1ms⁻¹

Stair: Top and bottom vent



NO SMOKE IN STAIR

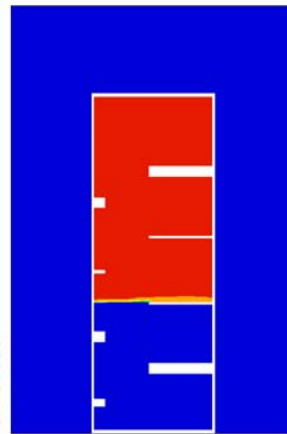
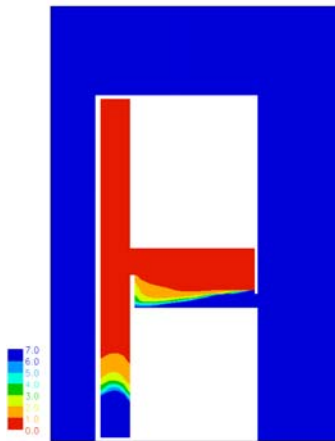
Lobby: L: Mechanical closed-base, **1.5m²** shaft
(**1280 ach⁻¹** (9.8 m³s⁻¹) and
1m² high-level vent to lobby)

R: 0.5m² low-level vent

Mean temp in occupied space = 40°C

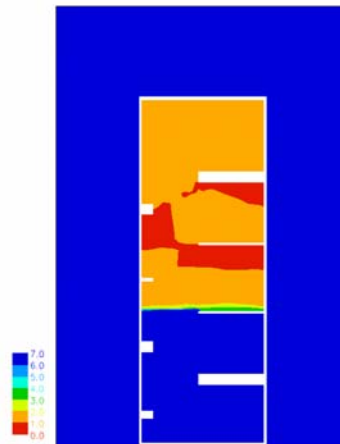
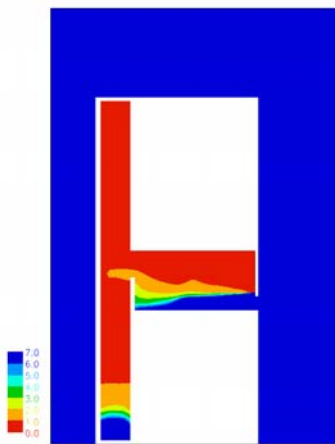
Closed door $\Delta P = 365 \text{ Pa}$; open door vel = 4.1 ms⁻¹

Stair: Top and bottom vent



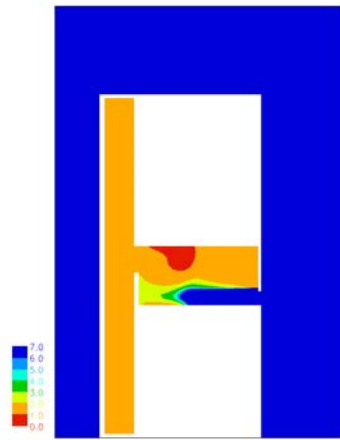
Lobby: L: Mechanical closed-base, **1.5m²** shaft
 (**320 ach⁻¹** (2.4 m³s⁻¹) and
 1m² high-level vent to lobby)
 R: 0.5m² low-level vent
Mean temp in occupied space = 75°C

Stair: **No vent**

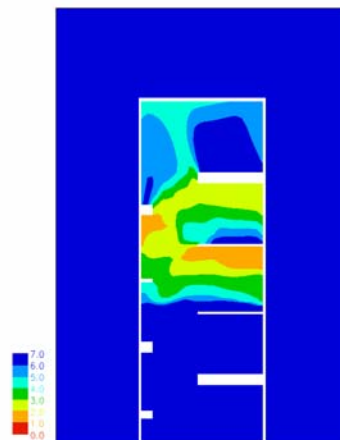


Lobby: L: Mechanical closed-base, **1.5m²** shaft
 (**640 ach⁻¹** (4.9 m³s⁻¹) and
 1m² high-level vent to lobby)
 R: 0.5m² low-level vent
Mean temp in occupied space = 76°C

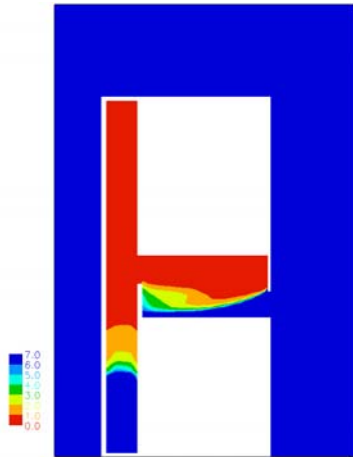
Stair: **No vent**



Lobby: **L:** Mechanical closed-base, **1.5m²** shaft
 (**1280 ach⁻¹** (9.8 m³s⁻¹) and
 1m² high-level vent to lobby)
R: 0.5m² low-level vent
Mean temp in occupied space = 67°C

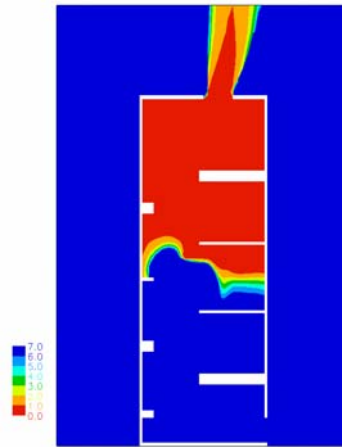


Stair: **No vent**

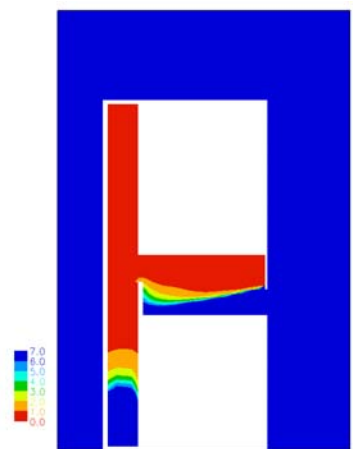


Lobby: L: Mechanical closed-base, 1.5m^2 shaft
 (160 ach^{-1} ($1.2\text{ m}^3\text{s}^{-1}$)) and
 1m^2 high-level vent to lobby)
 R: 1m^2 low-level vent

Mean temp in occupied space = 68°C
Closed door $\Delta P = 2\text{Pa}$; open door vel = 0.4ms^{-1}

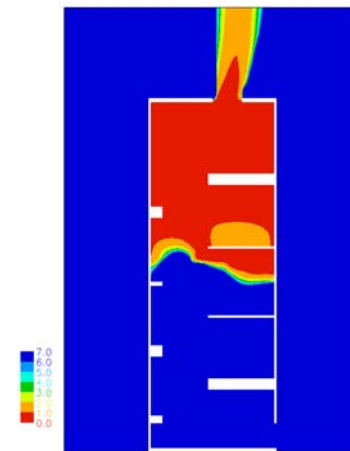


Stair: Top and bottom vent

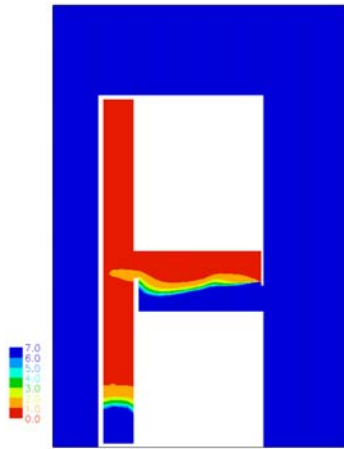


Lobby: L: Mechanical closed-base, 1.5m^2 shaft
 (320 ach^{-1} ($2.4\text{ m}^3\text{s}^{-1}$)) and
 1m^2 high-level vent to lobby)
 R: 1m^2 low-level vent

Mean temp in occupied space = 64°C
Closed door $\Delta P = 8\text{ Pa}$; open door vel = 0.8ms^{-1}



Stair: Top and bottom vent

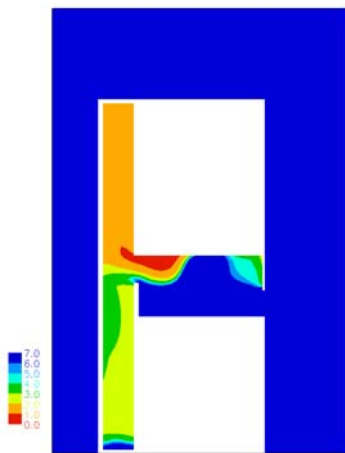


NO SMOKE IN STAIR

Lobby: L: Mechanical closed-base, **1.5m²** shaft
 (640 ach⁻¹ (4.9 m³s⁻¹) and
 1m² high-level vent to lobby)
 R: 1m² low-level vent

Stair: Top and bottom vent

Mean temp in occupied space = 48°C
 Closed door $\Delta P = 28 \text{ Pa}$; open door vel = 1.7 ms⁻¹



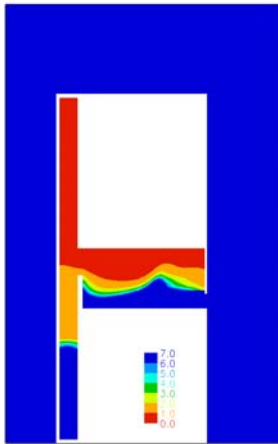
NO SMOKE IN STAIR

Lobby: L: Mechanical closed-base, **1.5m²** shaft
 (1280 ach⁻¹ (9.8 m³s⁻¹) and
 1m² high-level vent to lobby)
 R: 1m² low-level vent

Stair: Top and bottom vent

Mean temp in occupied space = 37°C
 Closed door $\Delta P = 111 \text{ Pa}$; open door vel = 3.3 ms⁻¹

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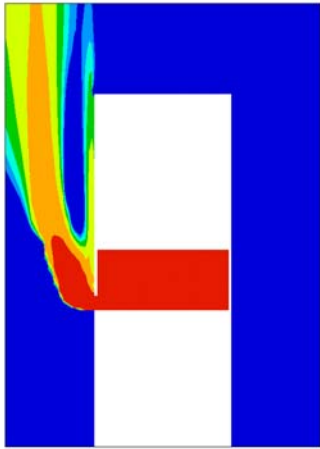
NO SMOKE IN STAIR

Lobby: **L:** Mechanical closed-base, **0.5m²** shaft
(**40 ach⁻¹** (0.3m³s⁻¹) and
1m² high-level vent to lobby)
R: 0.5m² low-level vent

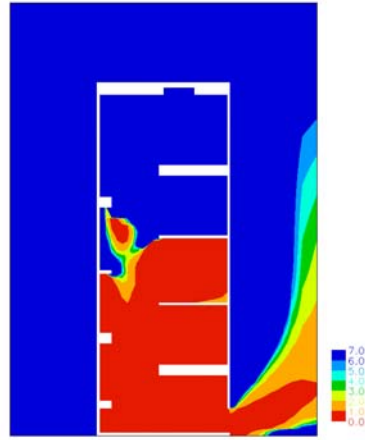
Stair: Top and bottom vent

Mean temp in occupied space = 52°C

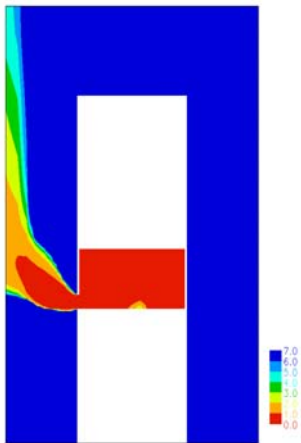
Closed door $\Delta P = <1Pa$; open door vel = 0.1 ms⁻¹



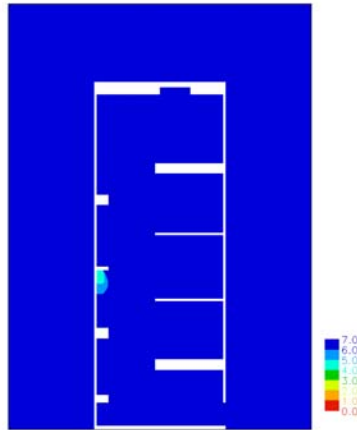
Lobby: L: 0.5m² low -level vent
 R: No vent
Mean temp in occupied space = 129°C
 Closed door $\Delta P = 6 \text{ Pa}$; open door vel = 0.4 ms⁻¹



Stair: Mechanical supply at top
 (40 ach⁻¹ (1.6 m³s⁻¹)) and
 and bottom vent

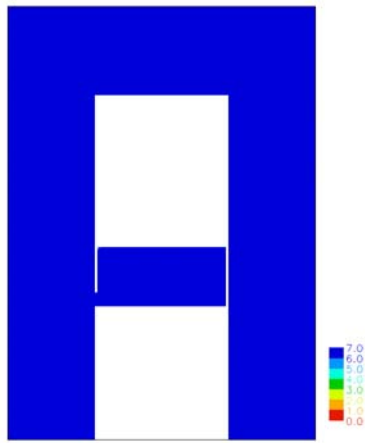


Lobby: L: 0.5m² low -level vent
 R: No vent
Mean temp in occupied space = 92°C
 Closed door $\Delta P = 23 \text{ Pa}$; open door vel = 0.8 ms⁻¹



Stair: Mechanical supply at top
 (80 ach⁻¹ (3.2 m³s⁻¹)) and
 and bottom vent

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NO SMOKE IN STAIR

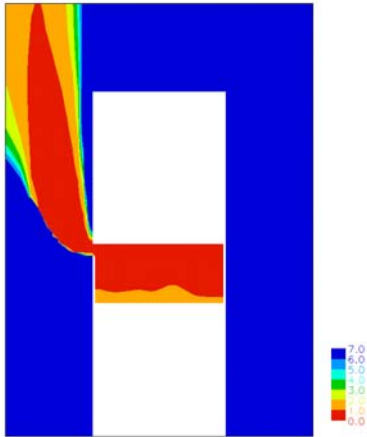
Lobby: L: 0.5m² low-level vent

R: No vent

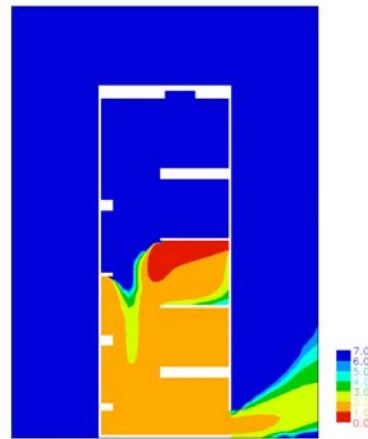
Mean temp in occupied space = 21°C

Closed door $\Delta P = 90\text{Pa}$; open door vel = 1.6 ms⁻¹

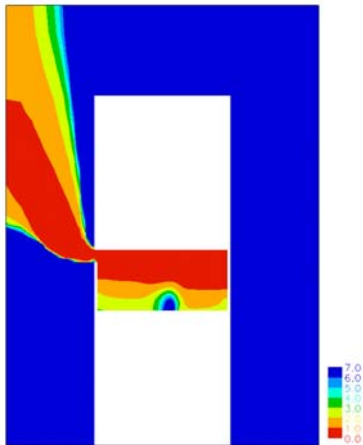
Stair: Mechanical supply at top
(**160 ach⁻¹** (6.4 m³s⁻¹)) and
and bottom vent



Lobby: L: 0.5m² high-level vent
 R: No vent
Mean temp in occupied space = 67°C
 Closed door $\Delta P = 6Pa$; open door vel = 0.4 ms⁻¹



Stair: Mechanical supply at top
 (40 ach⁻¹ (1.6 m³s⁻¹)) and
 and bottom vent

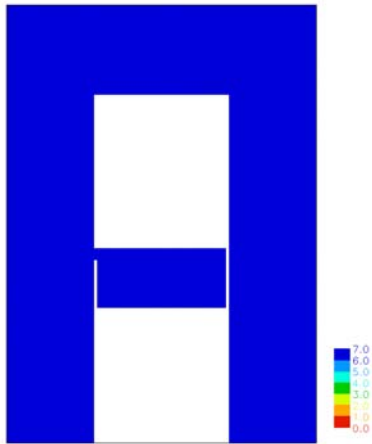


Lobby: L: 0.5m² high-level vent
 R: No vent
Mean temp in occupied space = 41°C
 Closed door $\Delta P = 23Pa$; open door vel = 0.7ms⁻¹

NO SMOKE IN STAIR

Stair: Mechanical supply at top
 (80 ach⁻¹ (3.2 m³s⁻¹)) and
 and bottom vent

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Lobby: L: 0.5m² high-level vent

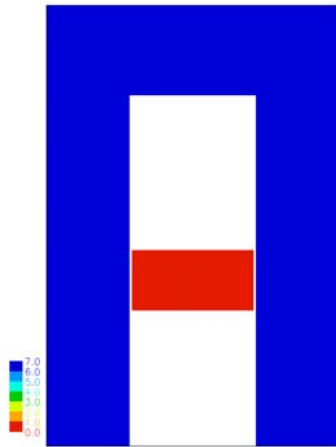
R: No vent

Mean temp in occupied space = 20°C

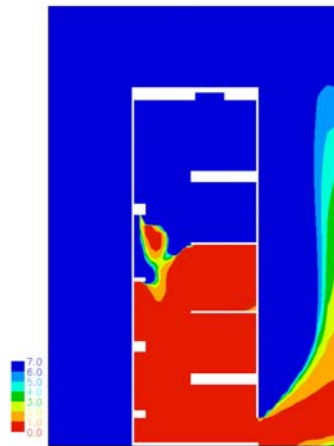
Closed door $\Delta P = 90 \text{ Pa}$; open door vel = 1.4 ms⁻¹

NO SMOKE IN STAIR

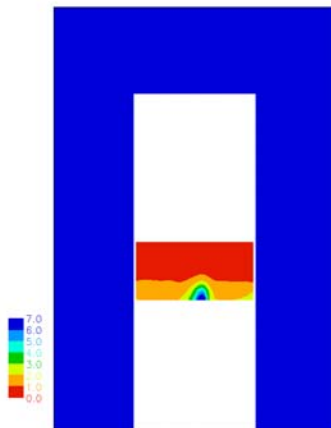
Stair: Mechanical supply at top
(**160 ach⁻¹** (6.4 m³s⁻¹)) and
and bottom vent



Lobby: L: No vent
R: No vent
Mean temp in occupied space = 90°C



Stair: Mechanical supply at top
(40 ach⁻¹ (1.6 m³s⁻¹))
and bottom vent

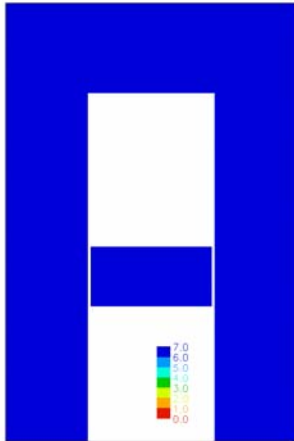


Lobby: L: No vent
R: No vent
Mean temp in occupied space = 42°C

NO SMOKE IN STAIR

Stair: Mechanical supply at top
(80 ach⁻¹ (3.2 m³s⁻¹))
and bottom vent

bre



NO SMOKE IN STAIR

Lobby: L: No vent

R: No vent

Mean temp in occupied space = 20°C

Stair: Mechanical supply at top
(**160 ach⁻¹** (6.4 m³s⁻¹))
and bottom vent