# David Ross AECOM

Part F 2010: An outline of key technical changes All proposals subject to ministerial approval.

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### Part F requirement

– Requirement F1:

"There shall be adequate means of ventilation provided for people in the building"

- Approved Document F (ADF) provides practical guidance of how this Requirement can be met in common situations
- ADF recommends that a ventilation system should be provided which restricts the build-up of moisture and other pollutants originating within a building that would become a hazard to the occupants' health



#### Why is Part F important?

- Typically, over 80% of our time is spent indoors
- We want the air we breathe to be healthy
- This is especially important for vulnerable groups
- Ventilation dilutes and removes pollutants from the indoor air to provide a healthy indoor environment



### Indoor pollutants



#### Gas cooking fumes



#### Volatile organic compounds

### Setting ADF ventilation provisions

- Indoor air quality guidelines (Appendix A)
  - Cover a range of IAQ concerns including mould, VOCs, combustion pollutants, SBS, body odour
  - Based on health-based standards/guidelines
- Recommend ventilation rates and system designs to meet these guidelines
  - Extract pollutants at source
  - Provide adequate whole-building ventilation
  - Purge high concentrations of infrequent pollutants



#### Why change Part F?

- The proposed changes in Part F are particularly to harmonise with changes to Part L
- They focus on new dwellings
- New requirements/guidance is provided for
  - The ventilation of more airtight dwellings
  - The installation and commissioning of ventilation systems
  - Sound levels from continuous mechanical ventilation
  - Making domestic ventilation systems a controlled service



#### Indoor Air Quality vs Energy



#### Ventilation rate



### Ventilation of new dwellings

Ventilation rate required

ADF 2006 Ventilation system design









#### Infiltration in new dwellings

Domestic ventilation system design	
Allowance for infiltration (3-4 m <sup>3</sup> h <sup>-1</sup> m <sup>-2</sup> )	Purpose provided ventilation

– Allow for minimum air permeability of 3-4m<sup>3</sup>h<sup>-1</sup>m<sup>-2</sup>, but

- ~30% of new dwellings tested < 5  $m^{3}h^{-1}m^{-2}$
- ~3-5% of new dwellings tested < 3  $m^{3}h^{-1}m^{-2}$
- Future dwellings are expected to become tighter

# New guidance for ventilation of airtight homes

- New guidance for dwellings designed to an air permeability of 5 m<sup>3</sup>h<sup>-1</sup>m<sup>-2</sup> or better
- System 1: Increased sizing of trickle ventilation
- System 2: All PSVs to be 125 mm duct diameter and increase sizing of trickle ventilation
- System 3: Need for trickle vents in habitable rooms
- System 4: Increased air flow rate requirements

## Installation and commissioning

- Study of 22 Part L 2006 naturally ventilated dwellings:
  - Under-performance of intermittent extract fans
  - Door under-cuts typically less than 10mm
- Study of nine Part L 2006 dwellings with MEV
  - In eight dwellings, the MEV systems failed to achieve their design flow rates, in some cases by as much as 63%
  - Poor installation and commissioning of system
- Supports wider anecdotal evidence, and problems in other European countries
- Under-performance is most important in airtight homes which are more reliant on ventilation provisions

# Installation and commissioning (contd)

- Make clear in Part F requirement for ventilation systems to be installed and commissioned to operate as designed
- For new dwellings only, new requirements for:
  - Air flow rates of mechanical systems to be measured on-site
  - Owner to be given information to operate and maintain system properly
  - Check list to be given to Building Control as evidence of commissioning

# Installation and commissioning (contd)

- Domestic ventilation: installation and commissioning compliance guidance has been prepared to aid installers
  - Installation instructions
  - Commissioning instructions
  - Check list for building control

# Installation and commissioning (contd)

- ADF 2006 recommends an internal door under-cut of 10 mm above floor finish
- This is not being achieved a reason being the floor finish is not fitted when the door installed
- ADF 2010 recommends that if the floor finish is not yet fitted, an undercut of 20mm should be made above the floorboards, or other surface
- The size of the door undercuts is included in the check list for building control

# Noise limits for domestic continuous mechanical ventilation

- Sales of continuous mechanical ventilation may increase
- System noise may result in the occupant turning the units to a lower setting or off
- This may be a bigger issue in airtight dwellings
- Noise limits have been set in other countries

# Noise limits for domestic continuous mechanical ventilation (contd)

- Part F to require installations in new or existing dwellings to meet specified noise limits
- ADF includes noise limits and test specifications
- Furthermore, the new commissioning guide should reduce noise from poorly installed systems

# Making domestic ventilation systems a controlled service

- Propose to make all domestic ventilation systems controlled services
- Thus, when replacing a ventilation system, the new system provides at least the same air flow capacity
- Only replacement of continuous mechanical systems should be notifiable to Building Control

Fitting trickle ventilators in replacement windows

- ADF states that it would be 'good practice' to fit trickle ventilators in replacement windows
- This is to address concern that replacement windows are more airtight and result in under-ventilation
- CLG is considering making fitting trickle ventilators in replacement windows the recommended approach

# Some potential changes to ADF post 2010

- Updated in line with performance in practice, new research and market trends
- Guidance on automatic demand controlled ventilation
- Address ventilation consequences of energy efficiency improvements in existing buildings

# Conclusions

- The proposed changes in Part F are particularly to harmonise with changes to Part L
- They focus on new dwellings
- Requirements/guidance is particularly provided for
  - The ventilation of more airtight dwellings
  - The installation and commissioning of ventilation systems
  - Sound levels from continuous mechanical ventilation
  - Making domestic ventilation systems a controlled service

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