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## Overview

This standard is about supervising the installation, commissioning and handover of retrofit works in accordance with organisational requirements which are equal to or exceed current statutory and legislative requirements

This standard is for people working in the occupational area of construction site supervision which is defined as the supervision of multiple construction trades and disciplines and can be used by operatives, supervisors and managers

## Performance criteria

### *You must be able to:*

P1 observe and apply organisational requirements appropriate for the protection of the workforce, sub-contractors, suppliers, consultants, occupants, visitors, the general public, and the environment by the application of information relating to:

1.1 methods of work	1.2 risk assessments	1.3 safe use and storage of tools
1.4 safe use and storage of materials and components	1.5 traffic management	1.6 emergency plans
1.7 fire safety	1.8 acoustic and sound insulation	1.9 thermal insulation
1.10 workforce competency	1.11 site constraints	

P2 supervise implementation of the retrofit plan ensuring effective and efficient working practices compliant with design and quality standards, for a given occupational area

P3 review and record works progress against the project programme, resources and planned sequencing of works, and recommend and take corrective action when required

P4 recognise and report defects in installation with specific reference to five of the following:

4.1 gaps in installation	4.2 missing and inappropriate fixings	4.3 detailing at corners, edges, junctions and openings
4.4 interaction with building services	4.5 combustion appliances, flues and ventilation	4.6 fire safety
4.7 acoustic and sound insulation	4.8 thermal bypass and thermal bridges	4.9 loading

P5 check, record and report that ventilation is not compromised and complies with all relevant standards for the following:

5.1 gas and other combustion appliances	5.2 flues
5.3 general ventilation	

P6 Carry out specified checks of the retrofit works and record that the works conform to quality, standards and compliance with the retrofit design, and manufacturers' instructions, throughout the installation process, for at least eight of the following:

6.1 alterations to the structure	6.2 loadings	6.3 fixings
6.4 corners, junctions and edges of building elements	6.5 interfaces between the building fabric, services and the occupants	6.6 windows and doors
6.7 thermal bypass	6.8 thermal bridges	6.9 air tightness
6.10 vapour barriers	6.11 moisture movement	6.12 moisture

ingress 6.13 condensation risks 6.14 rainwater  
goods 6.15 mechanical, electrical and plumbing (MEP)  
6.16 fire safety 6.17 acoustic and sound insulation

P7 identify, record and implement agreed corrective actions  
when required for at least nine of the following: 7.1  
alterations to the structure 7.2 loadings 7.3  
fixings 7.4 corners, junctions and edges of building  
elements 7.5 interfaces between the building fabric, services  
and the occupants 7.6 windows and doors  
including reveals, sills and soffits 7.7 thermal bypass  
7.8 thermal bridges 7.9 air tightness 7.10 vapour  
barriers 7.11 moisture movement 7.12 moisture  
ingress 7.13 condensation risks 7.14 rainwater  
goods 7.15 mechanical, electrical and plumbing (MEP)  
7.16 combustion appliances, flues and ventilation 7.17 fire  
safety 7.18 acoustic and sound insulation

P8 schedule and coordinate the inspection testing and  
commissioning, and communicate the outcomes for retrofit works

P9 identify, implement and record agreed corrective actions for  
retrofit works following commissioning including but not limited to  
two of the following: 9.1 ventilation 9.2 combustion  
appliances 9.3 heat recovery devices 9.4 heating  
systems 9.5 hot water systems 9.6 lighting  
fittings 9.7 systems and controls 9.8 insulation  
9.9 draught proofing 9.10 windows and doors 9.11  
solar blinds, shutter and shading devices 9.12 renewable energy  
installations 9.13 fire safety 9.14 acoustic and sound  
insulation

P10 contribute to the project handover on completion of  
the installation of retrofit works

## Knowledge and understanding

*You need to know and understand:*

### **Performance Criteria 1** Observe and apply organisational requirements

K1 what organisational requirements apply to the protection of the workforce, sub-contractors, suppliers, consultants, occupants, visitors, the general public, and the environment in relation to the following:

- K1.1 methods of work
- K1.2 risk assessments
- K1.3 safe use and storage of tools
- K1.4 safe use and storage of materials and components
- K1.5 traffic management
- K1.6 emergency plans
- K1.7 fire safety
- K1.8 acoustic and sound insulation
- K1.9 thermal insulation
- K1.10 workforce competency
- K1.11 site constraints

### **Performance Criteria 2** Supervise implementation of the retrofit plan

K2 why it is required, and how to supervise the implementation of the retrofit plan ensuring effective and efficient working practices compliant with design and quality standards for a given occupational area

K3 why it is required, and how to ensure operatives undertaking the installation, commissioning and handover are qualified to do so for a given occupational area

K4 why it is required, and how to ensure operatives have access to adequate knowledge of the retrofit works and the behaviours required for their safe, efficient and effective operation and maintenance

### **Performance Criteria 3** Review and record on works progress

K5 why reviewing and recording works progress against the project programme, resources and planned sequencing of works is required

K6 how to review, record and report works progress against the project programme, resources and planned sequencing of work

K7 when and how to recommend and take corrective action

K8 how the following increase the risk of failure of the installation works:

- K8.1 technical and performance issues:
  - thermal bridges
  - heating
  - ventilation
  - thermal

bypass • condensation and interstitial  
 condensation • alterations in structure •  
 moisture movement • fire safety •  
 acoustic and sound insulation K8.2 inefficiencies K8.3  
 additional costs K8.4 delays to programme K8.5  
 abortive works K8.6 duplication K8.7 damage  
 K8.8 latent defects

#### **Performance Criteria 4 Recognise and report defects in**

**installation** K9 how to recognise and report defects in installation  
 with specific reference to: K9.1 gaps in installation  
 K9.2 missing and inappropriate fixings K9.3 detailing at  
 corners, edges, junctions and openings K9.4 interaction with  
 building services K9.5 combustion appliances, flues and  
 ventilation K9.6 fire safety K9.7 acoustic and sound  
 insulation K9.8 thermal bypass and thermal bridges  
 K9.9 loading

K10 how and when to propose suitable corrective action for any  
 defects in installation

#### **Performance Criteria 5 Check, record and report that ventilation is not compromised**

K11 why it is required, and how to check, record  
 and report that ventilation is not compromised and complies with  
 all relevant standards for the following: K11.1 gas and  
 other combustion appliances K11.2 flues K11.3 general  
 ventilation

#### **Performance Criteria 6 Carry out checks and record installation of works**

K12 why it is important to carry out specified checks of the  
 retrofit works during installation and record the works conform  
 to: K12.1 quality K12.2 standards K12.3  
 manufacturers' instructions, technical information and  
 product data sheets K12.4 retrofit design

K13 how to carry out checks and record installation of works  
 for quality, standards and compliance with the retrofit design,  
 and manufacturers' instructions, for the following: K13.1  
 alterations to the structure K13.2 loadings K13.3  
 fixings K13.4 corners, junctions and edges of building  
 elements K13.5 interfaces between the building fabric, services  
 and the occupants K13.6 windows and doors  
 including reveals, sills and soffits K13.7 thermal bypass  
 K13.8 thermal bridges K13.9 air tightness K13.10  
 vapour barriers K13.11 moisture movement K13.12  
 moisture ingress K13.13 condensation and interstitial

condensation risks      K13.14 rainwater goods      K13.15  
mechanical, electrical and plumbing (MEP)      K13.16 fire  
safety      K13.17 acoustic and sound insulation

K14 the potential risks and implications of non-compliance and  
poor quality installations over time, for active and passive fire  
safety measures

K15 the potential risks and implications of non-compliance and  
poor quality installations over time, including but not limited  
to: K15.1 occupant health and safety      K15.2 indoor air  
quality      K15.3 mould      K15.4 performance gaps  
K15.5 rot      K15.6 building fabric decay      K15.7  
overheating

K16 the importance of maintaining ventilation

K17 why it is important to recognise ventilation and air  
movement pathways through buildings and ensure that these  
are maintained, whilst balancing the need for airtightness

K18 the different properties of insulation materials and how  
these relate to thermal, moisture, condensation, acoustic and  
sound, and fire safety

K19 the different types of air and vapour control layers and  
breather membranes, where and how they should be used, and  
why it is important to install them correctly

K20 the importance of ensuring the integrity of air and vapour  
control layers and breather membranes following installation and  
the need to ensure continuity

K21 how condensation forms in buildings, how this relates to  
moisture and moisture movement and what steps can be taken to  
mitigate potential risks

K22 why a *Whole Building* approach is taken to retrofit works and  
how this relates to building performance and building use

**Performance Criteria 7** Identify, implement and record agreed  
**corrective actions** K23 how and when to identify, implement and  
record agreed corrective actions for the following: K23.1  
alterations to the structure      K23.2 loadings      K23.3

fixings K23.4 corners, junctions and edges of building  
 elements K23.5 interfaces between the building fabric, services  
 and the occupants K23.6 windows and doors  
 including reveals, sills and soffits K23.7 thermal bypass  
 K23.8 thermal bridges K23.9 air tightness K23.10  
 vapour barriers K23.11 moisture movement K23.12  
 moisture ingress K23.13 condensation and interstitial  
 condensation risks K23.14 rainwater goods K23.15  
 mechanical, electrical and plumbing (MEP) K23.16 combustion  
 appliances, flues and ventilation K23.17 fire safety K23.18  
 acoustic and sound insulation

**Performance Criteria 8** **Schedule and coordinate, and communicate the outcomes**  
 K24 why the scheduling and coordination of the inspection testing and commissioning for retrofit works is required

K25 how to schedule and coordinate the inspection testing and commissioning of retrofit works

K26 why it is required, and how to record outcomes for retrofit works, services and fabric

K27 the range of non-destructive testing and investigation methods including but not limited to: K27.1 thermal imaging K27.2 moisture content of building fabric K27.3 air tightness for building envelope and identifying air filtration and air leakage points K27.4 energy use of buildings from meters and sub-meters for individual systems K27.5 sound insulation testing K27.6 borescope testing

K28 why the final commissioning of all building services is done together, rather than separately

K29 the stages of commissioning including but not limited to:  
 K29.1 setting-to-work K29.2 regulation K29.3 performance optimisation K29.4 recording K29.5 post-commissioning checks K29.6 fine tuning during occupancy

**Performance Criteria 9** **Identify, record and implement agreed corrective actions following commissioning**  
 K30 why identifying, recording and implementing agreed corrective actions is required following commissioning

K31 how to identify, record and implement agreed corrective actions following commissioning

## **Performance Criteria 10 Contribute to the project handover**

why it is required, and how to contribute to the project handover on completion of the installation of retrofit works

K33 how to supply the relevant information in relation to the project handover in accordance with the 'handover strategy' and requirements of relevant certification schemes

K34 how to gather and record information

K35 how to convey the following information about the installed measures:

- K35.1 physical inspection and explanation of function and operation
- K35.2 demonstrate the safe operation of any components, devices and controls
- K35.3 visual checks to ensure the recipient is able to operate the components, devices and controls
- K35.4 care needed to avoid detrimental effects
- K35.5 maintenance, including requirements to comply with guarantees and warranties
- K35.6 efficient operation to facilitate the delivery of intended reduction in energy use
- K35.7 importance of ventilation
- K35.8 post completion services
- K35.9 provision of documentation including end-user advice information

K36 how to present information and recommendations for any remedial actions or changes to the retrofit process required, to relevant stakeholders including, but not limited to:

- K36.1 clients
- K36.2 designers and contract administrators
- K36.3 installers and contractors
- K36.4 end-users
- K36.5 external enforcement and quality assurance bodies
- K36.6 funding organisations
- K36.7 guarantee or warranty providers

K37 who the recipients of the handover process are

K38 why is it important to supply copies of the following documentation:

- K38.1 test certificates and commissioning records
- K38.2 operation and maintenance instructions and manuals
- K38.3 warranty and guarantee certificates
- K38.4 *As Constructed* plans

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