
NHBC Standards 2023

Conversions and renovations



Raising Standards. Protecting Homeowners

Contents

	Introduction	03
R1 - R6	Technical Requirements	05
C1	Survey of existing building	09
C2	Design standard	09
C3	Completed work	10
C4	Building Regulations	10
C5	Insurance-backed guarantees	10
C6	Timber decay and wood-destroying insects	10
C7	Vermin and pest infestation	11
C8	Foundations	11
C9	Waterproofing of basements and other below ground structures	13
C10	Drainage below ground	15
C11	Ground floors	16
C12 - 15	Walls	19
C16	Chimneys, flues and hearths	25
C17	Upper floors	26
C18	Separating floors	26
C19	Staircases, stairways and landings	27
C20	Pitched roofs	28
C21	Flat roofs and balconies	29
C22	Roof drainage	30
C23 & C24	Framed buildings	31
C25	Doors, windows and glazing	32
C26	Joinery	33
C27	Floor, wall and ceiling finishes	33
C28 - C33	Services	34
C34	Painting and decorating	35
C35 - C39	External works	35
C40 - C41	Provision of information	36
Appendix A	Useful contacts and relevant publications	37
Appendix B	Survey(s) of existing buildings	39

Purpose

The Standards for Conversions and Renovations provide guidance on the type of project that will be acceptable to NHBC, the scope of the survey(s) and work that will be required.

What are 'conversions and renovations'?

Conversions and renovations are projects that involve work to existing buildings or parts of existing buildings. Examples include:

- the conversion of non-domestic buildings into dwellings
- the conversion of an existing residential building into flats
- the renovation of an existing residential building(s)
- the subdivision or merging of existing dwelling(s) or flat(s)
- the addition of a new storey to an existing building
- façade retention schemes.

Which standards apply?

New work that forms part of the conversion or renovation should be carried out in accordance with the NHBC Standards.

Other conversion or renovation work should be carried out in accordance with these Standards for Conversions and Renovations.

The Standards for Conversions and Renovations current at the time work is started, shall apply.

Survey(s)

When a conversion and renovation scheme is registered, NHBC will undertake an assessment of the building(s) in order to understand if the scheme represents a standard insurance risk. Surveys of the building(s) and the elements which are to be retained will be requested by NHBC.

The builder should arrange for the survey(s) of the building to be carried out in accordance with Clause C1.

A copy of the survey report(s), including any specialist report(s), should be made available to NHBC for assessment. The reports will be used to establish if the project is acceptable for Buildmark cover.

NHBC may impose specific requirements for the project, which must be complied with as a condition of providing Buildmark cover.

NHBC relies on the details supplied by the builder when it accepts a project for Buildmark cover. Acceptance of a project does not absolve the builder from obligations under the 'Rules' and 'Buildmark' in respect of any defects, whether or not they are located in parts of the building covered by the reports or NHBC's specific requirements.

Technical Requirements

The Technical Requirements are shown in **blue text**. They are mandatory and **must** be met by the builder.

Technical Requirements R1 to R5 inclusive are the same as those in the NHBC Standards Chapter 2.1 'The Standards and Technical Requirements'.

Technical Requirement R6 relates specifically to the Standards for Conversions and Renovations.

Performance standards

The performance standards support the Technical Requirements and are detailed from page 9-39.

Where the performance standards are followed, the Technical Requirements for that particular item of work will be met.

Alternative standards of performance will be acceptable **only** if, in the opinion of NHBC, the Technical Requirements for that particular item of work are met and the standard achieved is not lower than the stated performance standard.

Guidance

Guidance on how the performance standard may be met is printed in black text and is based on normal construction procedures and recommended practices which have been shown to be satisfactory and acceptable over time. NHBC will consider alternative methods to meet specific requirements, subject to prior consultation and evaluation.

Due to the scope of buildings which could be considered for conversion or renovation, the guidance may need to be varied for particular cases. NHBC will consider other methods proposed to meet specific requirements, subject to consultation and evaluation.

In certain cases, it may be necessary for NHBC to decline to offer insurance cover for conversion or renovation schemes.

Some examples of construction which may not be acceptable to NHBC are: –

- scheduled and ancient monuments
- Grade 1 (England & Wales) and Grade A (Scotland & Northern Ireland) listed buildings
- buildings incorporating complex or ornate features e.g. ornate plaster or stonework, stained glass, etc
- where the design life of any major structural element, including roofs, will not achieve 60 years durability
- the addition of a new storey to an existing building
- cob construction
- through timber construction, where any part of the timber structure is exposed to the weather. e.g. Tudor timber framed buildings.

Limitations on use

The Technical Requirements, performance standards and guidance form acceptable technical benchmarks for a particular item of work, but do not form a complete specification and should not be used as such in contracts. Individual clauses cover, as far as practical, the requirements for particular elements of construction. To avoid repetition, some cross-referencing is made between clauses.

The NHBC Standards do not apply to:

- health and safety matters relating to building operations
- planning matters except where specifically referred to in these Standards.

Such matters are covered by statutory requirements.

Interpretation

Where a difference exists in how to interpret the Technical Requirements, performance standards and guidance, this would generally be resolved by further consultation, failing which, NHBC will exercise its right to decide in accordance with the NHBC Rules.

Testing

To establish whether the existing building or parts of it are adequate it may be necessary to carry out tests, both on the structure and materials that are to be retained. These tests (where required) will be at the builder's expense.

Where required, samples of materials, products and systems shall be tested in accordance with Technical Requirement R3 and the NHBC Rules. Where suitable tests are not specified in European or National Standards, then builders may be required to obtain the services of a specialist to determine them.

New materials, reclaimed or retained materials shall comply with Technical Requirement R3.

Standards, codes of practice and other authoritative documents

Where NHBC Standards refer to authoritative documents such as British Standards, the documents shall be the editions current at the time of Building Regulation approval, unless other recommendations are agreed by NHBC in writing.

The standards referred to in the NHBC Standards comprise specifications, codes of practice and published documents that are published by BSI, the European Committee for Standardization (CEN) and the International Organization for Standardization (ISO).

The Standards for Conversions and Renovations contain references to authoritative documents. These references are not exhaustive and NHBC will consider recommendations from other authoritative organisations.

Tolerances

All work shall be within acceptable tolerances. Where applicable, account should be taken of Chapter 9.1 'A consistent approach to finishes'. Discretion will need to be used in its application, particularly in the case of historic buildings.

New work

Generally, the standards for tolerances and finishes set out in NHBC Standards Chapter 9.1 'A consistent approach to finishes' should be applied. However, there will be exceptions where this may not be appropriate:— for example where the new work adjoins existing work, it may be better for a new ceiling adjoining the feature ceiling of a historic building to match the line of the feature ceiling rather than be perfectly level.

Existing work

For existing work, the standards for tolerances and finishes set out in NHBC Standards Chapter 9.1 'A consistent approach to finishes' will be a useful guide but not a pass or fail test. Discretion will need to be used in its application, particularly in the case of historic buildings.

All work

In all cases, it is essential that a looser tolerance does not compromise performance and durability of the converted or renovated building beyond acceptable limits.

Technical Requirements

The builder shall ensure that the work complies with the Technical Requirements.

R1 Statutory requirements

Work shall comply with all relevant Building Regulations and other statutory requirements relating to the completed construction work.

NHBC will generally accept work that accords with relevant Building Regulations/Building Standards and supporting documents. Exceptions would be where NHBC has a higher standard.

R2 Design requirement

Design and specification shall provide satisfactory performance.

Account shall be taken of:

- a) the land quality, including:
 - i) climate
 - ii) topography
 - iii) geology and ground conditions
 - iv) contamination
 - v) workings below ground
 - vi) previous use of the site
 - vii) any other aspect, on or adjacent to the site, which could affect the design.

Where appropriate, the land quality will have to be determined by a person acceptable to NHBC.

- b) the structural adequacy of the works. The design, with appropriate factors of safety, should satisfactorily allow for loads during and after construction and for their transfer to the supporting structure, or foundation, without undue movement, including:
 - i) self weight
 - ii) all imposed loads, including wind loads
 - iii) construction loads.
- c) the geographical location of the site, including:
 - i) exposure to the wind and rain
 - ii) topography.
- d) the position of the dwelling on the site, especially with reference to the dwelling's exposure to the weather, including exposure at early stages in the development of a site, even if it is eventually protected by structures built later.

NHBC Standards 2023 - Conversions and renovations

- e) the position of building elements within the construction works, including the inter-relationship of materials and constructions.
- f) the security of the dwellings.

R3 Materials requirement

All materials, products and building systems shall be suitable for their intended purpose.

The structure of the home shall, unless specifically agreed otherwise in writing with NHBC, have a life of at least 60 years. Individual components and assemblies, not integral to the structure, may have a lesser durability and need planned maintenance, repair or replacement during that period.

Account shall be taken of the use and location of materials, products and building systems in relation to:

- durability of both the structure and individual components and assemblies
- geographical location
- position on the site
- position within the structure.

Materials, products and building systems will normally be acceptable if they comply with the following:

a) MATERIALS AND PRODUCTS USED FOR CRITICAL FUNCTIONS

functions critical to performance are: structure, fire resistance, weatherproofing, durability, thermal and sound insulation, services including heating appliances and flues. Any of the following are acceptable:

- i) performance in accordance with standards set by NHBC, or
- ii) where no NHBC standard is set, compliance with the relevant British Standard or equivalent European Technical Specification approved by a Committee for Standardisation, provided they are used in accordance with the relevant Code of Practice, or
- iii) compliance with standards not lower than those defined in a relevant British Standard specification or equivalent, provided their use is accepted by NHBC, or
- iv) satisfactory assessment by an appropriate independent technical approvals authority accepted by NHBC, or
- v) use of materials and products in accordance with well established satisfactory custom and practice, provided that such custom and practice is acceptable to NHBC, or
- vi) acceptance, in writing, by NHBC Accepts.

b) MATERIALS AND PRODUCTS USED FOR NON-CRITICAL FUNCTIONS

compliance with the above acceptance criteria for critical functions or strictly in accordance with manufacturers' recommendations for the specific use.

c) RECLAIMED MATERIALS

reclaimed materials may only be re-used with the prior agreement of NHBC. Independent certification of suitability may be required.

d) PROPRIETARY BUILDING SYSTEMS

reference should be made to R3a iv.

e) TIMBER DURABILITY

reference should be made to Chapter 3.3 Timber preservation (natural solid timber)

f) RECOVERED AGGREGATES

aggregates derived from recovered inert waste, e.g. recycled aggregate, should only be used where it can be demonstrated that the inert waste material has been fully recovered, has ceased to be a waste as defined by the Waste Framework Directive 2008 and has become a product. To this end, recovered aggregates produced by a supplier complying with a recognised defined quality management scheme such as the WRAP Quality Protocol and meeting end-of-waste criteria, will be acceptable to NHBC.

Note

Equivalents to British Standards or technical approvals authority shall be those accepted in the UK.

NHBC Standards 2023 - Conversions and renovations

R4 Workmanship requirement

All work shall be carried out in a proper, neat and workmanlike manner.

The Builder shall ensure that:

- a) the conditions of the materials, products and the completed work are satisfactory
- b) appropriate precautions are taken to prevent damage
- c) account is taken of the following:
 - i) the requirements of the design
 - ii) suitable methods of unloading and handling
 - iii) proper protection during storage
 - iv) use of correct installation methods
 - v) protection against weather during construction (including excessive heat, cold, wetting or drying)
 - vi) protection against damage by following trades.

R5 Structural design requirement

Structural design shall be carried out by suitably qualified persons in accordance with British Standards and Codes of Practice.

The following shall be designed by Chartered Civil or Structural Engineers whose status (including professional indemnity insurance) is accepted by NHBC:

- a) foundations on hazardous ground where the hazard makes special consideration necessary. (Note: This would not apply to matters for which NHBC sets standards, such as building near trees, except where specified to the contrary)
- b) foundations and superstructure of every building over three storeys in height
- c) certain types of foundations and retaining walls, as required in the individual chapters of the NHBC Standards
- d) any structural element which is not based on specific design criteria as laid down in the chapters of the NHBC Standards
- e) any dwelling not constructed in accordance with UK traditional practice.

Note

Other structural elements may be designed by a Chartered Civil or Structural Engineer or others whose status (including professional indemnity insurance) is accepted by NHBC.

The structural design shall take account of the durability requirement in Technical Requirement R3 Materials.

In England, Wales, Northern Ireland and the Isle of Man, structural design may be undertaken by the Builder's own Engineer or a Consulting Engineer employed by the Builder. Where specialist subcontractors undertake the design, it must be separately appraised by the Builder's own Engineer or by a Consulting Engineer employed by the Builder to ensure that the site investigation, choice of foundations, siting and construction of dwellings are properly taken into account and that the design is appropriate for the loading and conditions.

In Scotland, the Engineer shall be independent of the Builder and specialist subcontractor.

Account shall be taken of all parts of the following British Standards:

- | | |
|-----------------------------------------------------------|----------------------------------------------------------|
| ■ Eurocodes and their respective National Annexes. | ■ BS EN 1993. Eurocode 3: 'Design of steel structures' |
| ■ BS EN 1990. Eurocode 0: 'Basis of structural design'. | ■ BS EN 1995. Eurocode 5: 'Design of timber structures' |
| ■ BS EN 1991. Eurocode 1: 'Actions on structures' | ■ BS EN 1996. Eurocode 6: 'Design of masonry structures' |
| ■ BS EN 1992. Eurocode 2: 'Design of concrete structures' | ■ BS EN 1997. Eurocode 7: 'Geotechnical design'. |

Alternatively, designs in accordance with BS 8103 'Structural design of low rise buildings' will be acceptable.

The Builder shall:

- | | |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ■ require the Engineer to issue clear instructions for site personnel | ■ require the Engineer or their representative to carry out such inspections as may be required by NHBC to ensure the adequacy of the design and construction. |
| ■ not permit departure from the design without the Engineer's written consent | |

NHBC Standards 2023 - Conversions and renovations

The Builder shall ensure that the Engineer visits the site during construction:

- when the foundations have been designed under this Technical Requirement, or
- when specifically required by NHBC in these Standards.

The Engineer shall be satisfied that the design is suitable for the conditions encountered on the site of each dwelling.

When requested by NHBC, the Builder shall:

- produce such design documents, calculations and prescribed forms of certification as NHBC requires for scrutiny
- provide design documents and assembly instructions, solely for the use of NHBC staff
- arrange for NHBC staff to have access to places where off-site fabrication is taking place.

R6 Survey requirement for conversions and renovations

Existing buildings shall be surveyed to determine their condition and the work required to bring them into a durable and habitable state.

The survey(s) should be carried out in accordance with clause C1.

Surveys should be carried out by a competent and qualified person with relevant knowledge and experience, whose status (including professional indemnity insurance) is accepted by NHBC.

Account shall be taken of:

- the former use of the building
- the present condition of the building(s)
- the condition of any adjacent building(s) whose condition may impact upon the building to be converted or renovated
- any previous conversion and renovation work
- the geographical location
- the type of foundations, depth and bearing strata
- the effects of trees on the foundations where shrinkable soils are present
- any tests required to confirm the suitability of the existing structure and/or materials
- the structural condition of the existing building and the effect of the proposed conversion and renovation works. The application of Technical Requirement R5 is appropriate where the advice of an Engineer is required
- other specialist advice
- the work necessary to ensure that the building meets the Technical Requirements
- new work which could affect the existing structure.

Past performance should not be assumed to satisfy Technical Requirements R1 to R5 as future durability will be a major consideration.

A copy of all survey reports should be made available to NHBC. The reports will be used to establish if the project is acceptable for Buildmark cover.

C1 Survey of existing building

Surveys shall be carried out by competent and qualified persons with relevant knowledge and experience, to establish the current condition of the building.

The builder should arrange for thorough internal and external surveys to assess the condition of the existing building. The causes of any damage or defect should be accurately determined and appropriate remedial work recommended.

The following surveys will normally be necessary:

- initial survey
- detailed survey
- specialist survey(s).

The initial survey should include a desktop study and a walkthrough appraisal of the building.

The detailed survey should be carried out by a competent and qualified person with relevant knowledge and experience (e.g. an MRICS Building Surveyor, or Chartered Structural Engineer), whose status (including professional indemnity insurance) is accepted by NHBC.

The specialist survey(s) should be carried out where the defect, damage or likely remedial measures are of a specialist nature. Typical examples include:

- structural waterproofing (tanking) of basements
- timber decay
- beetle infestation
- structure
- contamination
- damp-proofing
- water ingress
- wall tie replacement
- asbestos
- drainage.

The survey(s) should include for appropriate opening up to expose the vulnerable parts of the building and intrusive investigations. Where, for whatever reason, parts of the building are not surveyed, this should be clearly stated in the report(s). Further survey(s) and report(s) may be required for these parts.

The residual effects of previous use of the building e.g. agriculture or industry, should be established by the survey(s) together with detailed proposals for remediation.

Surveyors who are members of the Property Care Association (PCA) are typically acceptable to NHBC. Other surveyors and specialist contractors may be acceptable subject to NHBC's written acceptance.

Appendix B provides guidance on items to be included in the survey(s).

Appendix A provides details of useful contacts and a list of publications that are relevant to conversions and renovations.

A copy of all survey reports should be made available to NHBC.

C2 Design standard

Design shall meet the Technical Requirements.

New work should be designed in accordance with NHBC Standards.

Conversion and renovation work should be designed in accordance with these Standards for Conversions and Renovations.

Recommendations contained within the survey report(s) should be incorporated in the design.

Copies of planning approvals and consents should be made available to NHBC upon request. NHBC should be made aware of any planning conditions or restrictions that could result in a failure to comply with the Technical Requirements. NHBC will decide on the most appropriate course of action to resolve such matters. In certain cases it may be necessary for NHBC to decline to offer cover for the conversion or renovation.

C3 Completed work

Completed work shall meet the Technical Requirements, take account of the design and follow established good practice and workmanship.

Work should be carried out in accordance with the design and NHBC requirements. Recommendations contained within the survey report(s) should be implemented.

New building work should be carried out in accordance with NHBC Standards.

Conversion and renovation work should be carried out in accordance with these Standards for Conversions and Renovations.

C4 Building Regulations

Design and completed work shall comply with Building Regulations.

NHBC will generally accept work that accords with relevant Building Regulations/Building Standards and supporting documents. Exceptions would be where NHBC has a higher standard.

C5 Insurance-backed guarantees

Proprietary remedial treatment relating to wood rot, beetle infestation, damp-proofing, structural waterproofing (tanking), wall tie replacement and other specialist work shall be the subject of a suitable insurance-backed guarantees.

Where such remedial work is carried out the insurance-backed guarantee should:

- be provided by the specialist contractor
- cover any failure of the work
- cover any consequent opening up and making good
- remain valid for a minimum period of 10 years
- be in favour of the homeowner (provided it is automatically transferred at no cost to subsequent owners) and not detrimental to NHBC.
- be backed by a UK registered insurer and cover the specialist contractor's insolvency
- specify the property covered and the specialist works undertaken.

The following companies currently offer insurance-backed guarantees which meet NHBC requirements:

- Guarantee Protection Insurance Ltd.
- Construction Guarantee Solutions Ltd.

C6 Timber decay and wood-destroying insects

Specialist advice shall be obtained to identify all sources of timber decay and wood-destroying insect attack, and to recommend a suitable method of treatment. Remedial work shall be carried out taking account of specialist advice.

For all retained timber elements a suitably qualified and experienced surveyor should carry out intrusive surveys for timber decay and wood-destroying insects. The survey(s) should not be confined to easily inspected areas, or to areas where rot or infestation are obvious. Members of the Property Care Association (PCA) are typically acceptable. Acceptable qualifications include Certified Surveyor in Remedial Treatment (CSRT) or Certificated Surveyor of Timber & Dampness in Buildings (CSTDB). Other surveyors and specialist contractors may be acceptable subject to NHBC's written acceptance.

Where the structural integrity of the timber has been affected, an Engineer should be consulted and the remedial work should ensure satisfactory structural performance.

Remedial work should be:

- agreed in principle with NHBC prior to implementation
- designed, taking account of the specialist reports, by a suitably qualified and experienced surveyor
- carried out, in accordance with the design, by a competent specialist contractor approved by NHBC
- the subject of a suitable insurance-backed guarantee in accordance with Clause C5
- supervised, by the author of the specialist report, where deemed necessary by the NHBC.

NHBC Standards 2023 - Conversions and renovations

Copies of the specialist reports detailing the remedial work and identifying the affected areas, together with copies of the insurance-backed guarantee should be made available to NHBC.

a) Timber decay

The remedial work should ensure that:

- the source of all water and damp ingress is eliminated along with measures to prevent future moisture ingress
- the causation of the timber decay and the full extent of spread of timber decay is determined
- all timber elements that have been denatured or structurally weakened by decay must be removed
- all structurally weakened timber is replaced with pre-treated timber or repaired with a proprietary structural repair resin system ⁽¹⁾
- any new or replacement timbers must be pre-treated
- all new timber should be isolated from the existing masonry, subject to Engineers acceptance
- all sawn ends should be treated with a fungicide/insecticide preservative
- where fungal decay has been identified and the affected timber is considered suitable for protection and treatment rather than replacement, this should be undertaken in accordance with BS 8417
- any plaster affected by fungi is removed
- any masonry affected by fungi is treated with a fungicidal fluid.

b) Wood-destroying insect attack

The remedial work should ensure that:

- the wood-destroying insects are identified and the treatment is appropriate for the type of wood boring insect found
- all insect activity ceases
- all structurally weakened timber is replaced with pre-treated timber or repaired with a proprietary structural repair resin system. ⁽¹⁾

Further guidance may be obtained from 'Recognising wood rot and insect damage in buildings' published by BRE and BS 8417.

For additional guidance on existing timber joists, roof framing and lintels, see the relevant clauses within these standards.

⁽¹⁾ Timber resin repairs should only be undertaken by specialist companies that have suitable experience and understanding of the design, materials and workmanship to achieve a satisfactory repair. All timber resin repairs should be designed and specified by an Engineer. Where required by NHBC the builder shall ensure their Engineer monitors the remediation process and confirms that the completed repair is in accordance with the design.

C7 Vermin and pest infestation

Vermin and pest infestation in the building shall be identified and eliminated.

Where there is evidence of vermin or pest infestation, the extent of the damage should be established, and remedial treatment carried out.

The treatment necessary will depend on the type of vermin or pest. Specialist advice can be obtained from the British Pest Control Association (BPCA).

The remedial work should include prevention measures that will reduce the likelihood of re-entry of the vermin or pest into the building, its fabric or voids.

C8 Foundations

Foundations shall be capable of transmitting existing and proposed loads to the ground without excessive movement.

New foundations should be designed and carried out in accordance with NHBC Standards Part 4 'Foundations'.

The condition of the existing foundations and supporting ground should be assessed as part of the survey(s). A detailed investigation into the underlying ground conditions may be required in order to aid the design of any foundation remedial work. The foundations should provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

a) Subsidence and settlement

Where there is evidence of subsidence or settlement and the cause of the failure is weak bearing strata such as peat layers, fill, etc, foundations should be strengthened or replaced. This may involve underpinning or other specialist foundation techniques. Subsidence caused by clay shrinkage may also necessitate underpinning.

All underpinning and associated foundation work should be designed and supervised by an Engineer or as required by NHBC.

Subsidence caused by mining or other underground workings will require specialist advice from an Engineer. The Engineer may be required to supervise the work on site.

The potential for future subsidence and settlement from historical mining, wells, etc., and other natural geotechnical hazards, such as gypsum dissolution needs to be considered.

The potential for differential settlement between new, existing and underpinned foundations/structures should be taken into account.

Where leaking drains have caused foundation failure they should be replaced. Drains that are to be re-laid should, if possible, be re-routed so that if leakage occurs again, foundations will not be affected. New work should comply with Chapter 5.3 'Drainage below ground'.

b) Heave

The minimum depth of foundations in shrinkable soils, whether existing or proposed, should be in accordance with Table 1 of Chapter 4.3 'Strip and trench fill foundations' of the NHBC Standards. Where existing foundation depths are less than given in the table, they should be appropriately underpinned to meet NHBC requirements. Any existing, removed and proposed planting should be taken into account and, where appropriate, an arboriculturist survey should be commissioned, to aid the foundation design and/or remedial works.

Foundations that have been damaged by clay heave, which occurs when desiccated shrinkable clay re-hydrates and is commonly associated with moisture recovery following the removal of trees or vegetation, should be underpinned.

Underpinning should be designed and supervised by an Engineer or as required by NHBC.

Compressible material should be installed as required by the design to accommodate movement resulting from further clay heave. Refer to NHBC Standards Chapter 4.2 'Building near trees', Chapter 4.4 'Strip and trench fill foundations' and Chapter 4.5 'Raft, pile, pier and beam foundations' as appropriate.

c) Chemical attack

Foundations that have been or could be damaged by high sulfate levels or other aggressive elements in the soil or ground water, should be repaired or replaced as directed by an Engineer.

Additional guidance on the concrete grade to ensure adequate durability may be obtained from:

- NHBC Standards Chapter 3.1 'Concrete and its reinforcement'
- BS EN 206
- BS 8500
- BRE Special Digest 1.

d) Frost damage

Damage that has been caused by frost heave in susceptible soils or by ice formation in the pores of poorly compacted concrete should be repaired or replaced as directed by an Engineer. Frost damage normally occurs to very shallow foundations.

The effect of frost heave can be overcome by deepening the foundations by underpinning. This should be designed and supervised by an Engineer or as required by NHBC. Defective concrete should be replaced.

e) Adjacent work

Existing foundations that have been damaged due to the proximity or depth of other foundations or services should be repaired or replaced as directed by an Engineer.

New foundations or service excavations should be designed so as not to adversely affect adjacent existing foundations.

Connections between new and existing foundation arrangements, should be designed by an Engineer taking account of the potential for differential settlement.

f) Underground erosion

Granular subsoils such as sand and gravel may suffer from erosion of fine particles by movement of ground water leading to subsidence.

The introduction of new drains with a granular bed and surround may also take ground water from the site and could have the same effect on otherwise sound existing foundations. Where this is likely, alternatives should be considered.

g) Changes in loading

The effects of proposed changes to the superstructure should be taken into account.

The loading on existing foundations may become excessive or unevenly distributed, necessitating replacement, underpinning or otherwise improving inadequate existing foundations.

C9 Waterproofing of basements and other below ground structures

All elements including walls, floors and foundations below, or near to, ground level that are intended to prevent the passage of water from the ground (including from sources such as run-off, burst pipes etc.) entering the building, shall be suitable for their intended use.

Construction types that are at risk of coming into contact with water and generally require waterproofing include:

- basements
- semi-basements
- lift pits
- light wells or structures adjacent to external steps
- cellars
- service ducts, or similar, that are connected to the below ground structure
- stepped floor slabs where the retained ground is greater than 150mm
- any area where the below ground structure may extend beyond the footprint of the above ground building i.e. buried podiums.

Whether existing or proposed, these construction types should typically meet the requirements of NHBC Standards Chapter 5.4 'Waterproofing of basements and other below ground structures'. When existing, their condition should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

a) Structural stability

Any alterations, even temporary, to the loading on existing structurally sound basements and other below ground structures, may cause structural damage.

An Engineer should design all structural alterations to basements, such as:

- increasing the height of the retaining walls
- reducing the ability of the floor above to provide lateral support to the walls
- lowering floor levels to increase ceiling heights or number of storeys below ground
- alterations to the existing applied loadings
- additional loading from adjacent structures.

Particular care should be taken when dealing with historic masonry structures that are leaking, before instigating remedial work to stop any leak, as this could be relieving hydrostatic pressure elsewhere on the structure.

b) Control of water and damp ingress

Basements and other below ground structures should have adequate resistance to the passage of water/moisture to the inside and should typically meet the requirements of NHBC Standards Chapter 5.4 'Waterproofing of basements and other below ground structures'.

Due to the scope of buildings which could be considered for conversion or renovation, NHBC may decline to offer cover for the conversion or renovation when:-

- the required waterproofing grade cannot be achieved
- a building is of historical importance, where restrictions have been placed upon the building or its internal features, which prevent a waterproofing grade being achieved
- the introduction of a waterproofing solution may have a detrimental effect on adjacent parts of the building.

The design should ensure that the level of protection against water and moisture reaching the internal surfaces is appropriate for the proposed use. Where there is any doubt about the use, the level of protection required for habitable accommodation, i.e. Grade 3 protection should be provided. To achieve Grade 3 protection no water ingress or damp areas are acceptable, and ventilation, dehumidification or air conditioning will be necessary, appropriate to the intended use (also see below regarding condensation).

The design should also demonstrate how waterproofing integrity is maintained up to damp proof course (DPC) level or 150mm above ground level and at junctions with internal wall(s), staircases etc.

Areas to be used for parking cars, for storage or as plant rooms, should achieve the waterproofing grade as per NHBC Standards Chapter 5.4 'Waterproofing of basements and other below ground structures'.

It should not be assumed that a wall or floor, that is dry at the time of the survey, would not cause a problem at a future date.

Existing basements and other below ground structures should typically be provided with a new structural waterproofing (tanking) system.

Structural waterproofing should be:

- designed by a waterproofing design specialist, in accordance with NHBC Standards Chapter 5.4 'Waterproofing of basements and other below ground structures'
- carried out by a competent specialist contractor/accredited installer approved by NHBC
- the subject of a suitable insurance-backed guarantees in accordance with Clause C5.

Where internal waterproofing solutions are adopted, additional internal walling and flooring may be necessary. The effect on room size, especially height, should be taken into account. The electrical installation should be on the dry side of the waterproofing.

Structural waterproofing should be continuous and designed to accommodate service inlets and openings. Fixings should not penetrate the structural waterproofing.

Any waterproofing systems that rely on draining or mechanical pumping systems must be maintainable and be subject to regular servicing and maintenance. This requirement must be conveyed to the homeowner.

A copy of the Certified Surveyor in Structural Waterproofing (CSSW) design philosophy report, including all relevant details and product information, should be provided to NHBC at least eight weeks in advance of the works starting on site, in accordance with NHBC Rules.

c) Condensation

Adequate provision should be made to prevent surface and interstitial condensation.

The following should be considered:

- appropriate ventilation
- adequate heating
- appropriate insulation
- avoiding cold bridging
- dehumidification.

Further guidance is given in BS 5250 'Management of moisture in buildings'.

d) Redundant basements and other below ground structures

Redundant basements and other below ground structures, forming common/shared parts of a building, may be acceptable to NHBC without the need to provide structural waterproofing.

Redundant basements or other below ground structures should form a void i.e. no storage use proposed, no mains services and/or plant equipment contained within.

Basements and other below ground structures, with maintenance access directly from within a homeowner's plot or boundary, should be waterproofed in accordance with NHBC Standards Chapter 5.4 'Waterproofing of basements and other below ground structures'.

Where existing basements and other below ground structures are to become redundant and a void(s) with access for maintenance only, the following should be considered:-

- how future ground water ingress and dampness are to be managed
- potential effects on the structure
- ventilation strategies
- the potential for any detrimental effect on the existing property
- fire stopping/compartmentation requirements
- insulation requirements.

Where a basement or other below ground structure is to be permanently infilled and/or floored over, in addition to the above points, consideration should be given to:-

- the potential risks due to the lack of access for maintenance
- the use of suspended floors where the depth of fill would be in excess of 600mm
- ventilation of any sub-floor voids.

For guidance relating to common elements of construction found within basements or other below ground structures, please refer to the relevant clause(s) within these standards.

Where NHBC has concerns over the proposals and detailing to form a redundant basement or other below ground structure without waterproofing, they must be waterproofed in accordance with NHBC Standards Chapter 5.4 'Waterproofing of basements and other below ground structures'.

Further guidance can be found in BS 8102 'Protection of below ground structures against water ingress.'

C10 Drainage below ground

Drainage systems shall convey foul effluent and rainwater satisfactorily to an appropriate outfall.

Drainage systems should have adequate capacity for the proposed use of the building and take account of the number of people who will use it.

New drainage should be designed and constructed in accordance with NHBC Standards Chapter 5.3 'Drainage below ground'.

The existing below ground drainage should form part of the survey(s) and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

a) Existing drainage

Existing drainage should be replaced unless it can be demonstrated that it will provide satisfactory in-service performance for the design life of the building. Pitch fibre drainage is not acceptable to NHBC and should be replaced.

Where it is proposed to retain existing drainage, a thorough survey of the whole system, including a CCTV survey, should be carried out to establish its current condition, including access points and connections to main sewers.

The report of the CCTV survey should identify which drainage runs require repair or replacement. A copy of the report should be made available to NHBC. Where drainage runs cannot be surveyed, they should be replaced.

Disused drains should be removed or filled and sealed to prevent the entry of vermin and the possibility of future collapse.

b) Access

Where the existing drainage system is to be retained, and lengths do not have access in accordance with current requirements, additional access points should be provided.

c) Inspection chambers, manholes, interceptors, septic tanks and cesspools

Existing inspection chambers and manholes may need rebuilding e.g. walls of manholes may need upgrading due to inadequate structural sufficiency or ground water ingress etc.

Inspection chambers and manholes located within habitable parts of the building will not normally be acceptable.

New covers will be required where existing covers are defective or where chambers will be subject to increased loading. Locked covers to prevent accidents may be required.

Existing interceptors should normally be replaced or removed from the drainage system.

Existing septic tanks or cesspools should be replaced.

d) Soakaways

Existing soakaways should typically be replaced, unless it can be demonstrated that they comply with NHBC Standards Chapter 5.3 'Drainage below ground'.

Where an existing soakaway is to be retained the following should be considered: -

- the construction method
- the current condition
- the porosity of the ground/infiltration rate
- location on site/proximity to adjacent building(s), including any planned extensions
- the size and capability to deal with current and any additional drainage areas
- the Building Regulations.

C11 Ground floors

Ground floors shall have adequate durability and support and transfer loads to the substructure or the ground safely without undue movement, and shall resist the passage of moisture, contaminants and gases to the inside of the building.

New ground floors should be designed and constructed in accordance with NHBC Standards Chapters 5.1 'Substructure and ground bearing floors' or 5.2 'Suspended ground floors.'

The condition of existing floors should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

The effect of any change in loading should be taken into account. In some cases, e. g. listed buildings, specialist advice may be required.

Items to be taken into account include:

a) Ground-bearing floors

Ground-bearing floors that have suffered damage or are in poor condition, should be removed and replaced in accordance with NHBC Standards Chapter 5.1 'Substructure and ground bearing floors'.

b) Damp-proofing of ground-bearing floors

The survey should identify if the ground-bearing floor has a suitable damp proof membrane (DPM). Where existing concrete ground-bearing floors do not have adequate protection against damp from the ground, a new DPM, linked to the DPC, should be provided. It is unlikely that floors laid before the mid 1960's will have adequate protection against damp.

Where the existing ground floor slab requires alteration (e.g. cut to incorporate new drainage runs, services or foundations), a new DPM should be provided.

Appropriate DPM materials are listed in NHBC Standards Chapter 5.1 'Substructure and ground-bearing floors'.

If the existing floor is other than concrete (e.g. flags laid directly on consolidated sub soil), specialist advice should be sought in order to ensure the existing building pathology is understood and fully considered prior to any remedial works being undertaken and the floors being replaced.

c) Suspended timber floors

Where an existing timber floor is proposed to be retained, a specialist timber survey should be undertaken to ascertain the strength and condition of all timber members, including the condition of the timber at its bearing ends through an intrusive investigation. The survey(s) should identify the causation and proposed remediation strategy for any defects.

The existing external ground level and its proximity in height to the underside of the timber, needs to be established and considered, along with the proposed ground levels. A minimum of 150mm should be present between the external ground level and underside of timber joists any alternate provision must be agreed with NHBC prior to implementation.

Where existing timber joists do not have adequate protection against damp, appropriate damp-proofing work should be carried out to ensure durability.

Joists shown to have inadequate strength by the survey(s) should be replaced, strengthened, strutted or reduced in span, or additional joists should be added as appropriate.

The effects of long-term creep deflection should be taken into account.

Joists with excessive notches and/or holes should be replaced or repaired, in accordance with an Engineers design.

Where timber joists are to be retained, any remedial treatment work should be carried out in accordance with Clause C6.

d) Sub-floor voids

Where suspended floors are present the survey should identify the existing sub-floor void arrangement.

The following should be considered:

- condition of the ground below the floor e.g. current treatment to prevent vegetation/fungal growth, water ingress and current measures preventing evaporation of moisture from the ground to the inner surface of any part of a dwelling that it could damage
- depth of void
- existing ventilation provision
- condition of intermediate supports i.e. sleeper walls
- presence of DPCs
- external ground levels.

A minimum ventilated void of 150mm should be present between the underside of the suspended floor and ground below the floor.

Voids beneath existing ground floors should be ventilated by openings providing no less than 1500mm² per metre run of external wall or 500mm² per m² of floor area, whichever is the greatest. Ventilators should be provided on two opposite external walls. Where timber floors are present, ventilators should be spaced at no more than 2m centres and within 450mm of the end of any wall. The external ground levels should not impair the ventilation to the sub-floor void.

Where the sub-floor void is below external ground level and there are indications of previous water ingress:

- the level of the void should be raised, provided ventilation, existing DPCs and durability are not compromised. (a minimum ventilated void of 150mm should be present below the underside of joist)
- the void should be drained to an appropriate outfall
- maintainable land drains should be provided to the perimeter of the building to prevent the void being flooded. (the land drains should be connected to a suitable outfall).

Any debris beneath the floor likely to create dampness or affect the ventilation should be removed. Vegetation and items liable to decay within the sub-floor void should be removed.

DPCs should typically be present beneath ground floor joists and/or their wall plate. Honeycomb sleeper walls, including DPCs, should be repaired if defective.

Where adequate cross-ventilation cannot be achieved and/or the existing sub-floor arrangement is not acceptable to NHBC, specialist advice should be sought, in order to ensure the existing building pathology is understood and fully considered prior to any remedial works being undertaken and the floors being replaced.

e) Contaminants and gases

New and existing ground-bearing or suspended ground floors should resist the entry of ground contaminants, radioactive and other toxic or inflammable gases to the inside of the building, in accordance with the Building Regulations.

f) Screeds and other finishes

Damaged screeds and other finishes should be replaced, together with the reinstatement of any DPM.

g) Flooring and decking

New flooring/decking should be in accordance with NHBC Standards Chapter 6.4 'Timber and concrete upper floors'.

Unsound or contaminated flooring/decking should be removed and replaced. Loose boards should be re-fixed. The upper surface may be improved by punching nail heads and sanding.

h) Thermally upgrading existing ground floors

Existing floors should be thermally upgraded in accordance with the Building Regulations. Certain types of building may be exempt from thermally upgrading due to their listed status or being in a conservation area; on such occasion, NHBC will require evidence of the restrictions placed upon the building.

The effects of condensation and changes in moisture movement should be considered where floors are to be thermally upgraded, to ensure that the structure and health of building(s) are not compromised.

Any thermal upgrade proposals should be designed and assessed in accordance with BS 5250:2021 'Management of moisture in buildings'. The whole building should be considered holistically when being thermally upgraded.

Dependent upon the existing construction, insulation will likely be added below or above the existing ground floor. The effect of thickening the existing floor construction by introducing insulation needs to be considered as, this may have an impact on other aspects of compliance with the Building Regulations.

i) Existing concrete floors (ground-bearing or suspended)

Where existing concrete floors are to be thermally upgraded, it is recommended that insulation is laid over a new DPM, as the condition of any existing DPM will be unknown. The DPM should link to the DPC and upturned at the wall junction. An air vapour control layer (AVCL) should be laid on the warm side of the insulation prior to the floor finishes being installed.

All new floor finishes should comply with NHBC Standards Part 9 'Finishes'.

Care should be taken to avoid the effects of cold bridging with DPMs, and edging insulation provided, in order to protect against interstitial condensation or mould growth.

The external ground level should be positioned a minimum of 150mm below the DPC.

ii) Suspended timber ground floors

Where suspended timber ground floors are present, the position of the external ground level, sub-floor ventilation and the ground below the floor should be treated in accordance with the relevant guidance in this clause.

Existing timber suspended floors can be affected by moisture and air leakage from penetrations such as water mains, drains and other plumbing. Air leakage can have systemic effects on the building as well as leading to localized condensation. Therefore, care should be taken to avoid the effects of cold bridging and interstitial condensation or mould growth.

Works to existing timber floors should not commence until the moisture content of the floor is less than 20%. Floorboards or finishes might have to be removed to enable the moisture content of timbers to be lowered.

A suspended timber floor might be insulated by applying insulation above, between or beneath the joists, separately or in any combination of these three locations.

When thermal insulation is applied above the joists, there is no risk of surface condensation, but interstitial condensation can occur on the timber. To avoid this, an AVCL should be laid between the thermal insulation and the floor finish.

When thermal insulation is applied between the joists, it should not be supported on a material which offers a vapour resistance higher than that of the thermal insulation.

When thermal insulation with a high vapour resistance is applied beneath the joists an AVCL should be installed on the warm side of the insulation.

Further guidance is given in BS 5250 'Management of moisture in buildings'.

C12 Walls - structure

Walls shall support and transfer loads to the foundations safely and without undue movement.

New walls should be designed and constructed in accordance with NHBC Standards Part 6 'Superstructure (excluding roofs)'.

The condition and structural performance, of existing walls should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

a) Cracking

The cause of any cracking, regardless of width, should be identified and addressed.

Cracks should be repointed to reduce the possibility of moisture ingress.

Cracks over 1.5mm wide in masonry should be cut out and repaired to obtain acceptable bonding and appearance. The reconstruction of panels may be necessary.

Where work is necessary, the following may be considered:

- cracked bricks or stone may be removed and replaced with bricks or stone to match the existing
- cracked joints may be raked out to a depth of 15mm and be re-pointed to match the existing
- proprietary crack repair resin products may be used, in accordance with the manufacturer's recommendations ⁽¹⁾.

⁽¹⁾ Resin repairs should only be undertaken by specialist companies that have suitable experience and understanding of the design materials and workmanship to achieve a satisfactory repair. All resin repairs should be designed and specified by an Engineer. Where required by NHBC the builder shall ensure their Engineer monitors the remediation process and confirms that the completed repair is in accordance with the design.

b) Mortar

Eroded or friable mortar joints should typically be repointed.

The specification for repointing mortar should be correct and specific to the requirements of the building. Specialist advice may be required for buildings of historical interest.

The repointing mortar should be chosen on the basis of the resistance of the masonry unit to weathering and should match the appearance, permeability and mechanical properties of the original mortar, including adhesion, ability to tolerate movement, strength and durability (resistance to damage by frost and salts).

Further guidance is given in BS 8221-2 'CoP for cleaning and surface repair of buildings' and PD 6678 'Guide to the specification of masonry mortar'.

c) Spalling masonry

Work to improve the weather resistance of buildings may relate to repair of surface defects likely to have a long-term detrimental effect on the whole or part of the structure.

The remedial works to any spalling masonry should be of correct specification and specific to the requirements of the building.

Where spalling of existing masonry is extensive, and the stability, durability or weather resistance of the wall is adversely affected, damaged units should be cut out and replaced.

Further guidance is given in BS 8221-2 'CoP for cleaning and surface repair of buildings'.

d) Corroded cavity wall ties

Where the extent of corrosion might affect the stability or durability of the wall, one of the following remedial measures should be used:

- removal and rebuilding of the wall or parts thereof and installation of suitable new wall ties to meet BS EN 845-1 or wall ties assessed in accordance with Technical Requirement R3
- installing proprietary remedial wall ties assessed in accordance with Technical Requirement R3.

This work should be:

- designed by a suitably qualified and experienced specialist surveyor
- the subject of a suitable insurance-backed guarantee in accordance with Clause C5.
- carried out by a competent specialist contractor approved by NHBC

Other wall tie replacement work may be acceptable subject to NHBC's written acceptance.

Old wall ties should be removed if corrosion is severe.

e) Damage caused by sulfate attack

i) Brickwork

Suitable work should be carried out to ensure sources of dampness associated with the sulfate attack are removed. Work could include the repair or replacement of brickwork, damaged or ineffective copings and other weathering details.

Where it is necessary to rebuild parts of walls damaged by sulfate attack, replacement bricks should be of low soluble salt content (S2 designation to BS EN 771-1) and mortar should contain sulfate-resisting cement.

NHBC Standards Chapter 6.1 'External masonry walls' gives guidance on brickwork and mortar specifications.

ii) Render

All new render should be designed and constructed in accordance with NHBC Standards Chapter 6.11 'Render'.

Where render is damaged by sulfate reaction, it should be replaced. Prior to re-rendering, the presence of sulfate-resisting mortar in the existing masonry should be established. Where sulfate-resisting cement has not been used in the construction, an alternative render method, isolated from the existing background, will be required (i.e. render on backed lath or backing board).

Any re-rendering should be carried out using a suitable mix for the background (i.e. not stronger than the background) and should contain sulfate-resisting Portland cement.

Any new render mix should be appropriate to the exposure rating of the wall.

Further guidance is given in BS EN 13914.

f) Lintels

Replacement lintels will be required where:

- existing lintels or their bearings are defective (inadequate bearings should also be made good)
- existing lintels have suffered fire damage or significant corrosion
- openings, other than brick arches, do not have adequate support (e.g. where masonry is inadequately supported by door and window frames)
- NHBC has concerns over the condition of existing timber lintels (internal facing) or they are significantly affected by decay and/or wood-destroying insects.
- existing lintels will be subjected to increased loading, and their ability to carry the increased load cannot be substantiated

Load-bearing embedded timber lintels located on the exposed face of the external wall are not acceptable to NHBC and should be replaced, using appropriately durable materials i.e. concrete, steel or stone.

g) Embedded timber

For guidance on embedded timber joists, timber lintels and roof framing please see the relevant clauses within these standards.

All internal embedded timber elements i.e. timber plates, pattresses or other supporting timbers within the fabric of the walls should typically be replaced with suitable durable materials. Where it can be demonstrated that the existing embedded timber elements are not suffering from decay, effects from wood-destroying insects or other deterioration and that there are no other changes to the exposure conditions of the wall, subject to Technical Requirement R5 being met and NHBC consultation and evaluation, they may be retained.

Survey(s) of the embedded timbers should be in accordance with Clause C6.

Load-bearing structural timbers should be intrusively inspected.

C13 Walls - damp-proofing

Walls shall resist the passage of water and moisture from the ground.

New walls should be designed and constructed in accordance with NHBC Standards Part 6 'Superstructure (excluding roofs)'.

The condition of the damp-proofing arrangements for existing walls should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

It should not be assumed that a wall that is dry at the time of the survey would not cause a problem at a future date.

Typically, existing DPCs should not be breached by external ground levels.

External ground levels should be a minimum of 150mm below the DPC. Where suspended timber ground floors are present, external ground levels should be in accordance with Clause C11.

Remedial DPC solutions should typically have a satisfactory assessment by an independent technical approvals authority in accordance with Technical Requirement R3.

Physical damp proof systems

Depending on the existing construction, it may be possible to install a physical DPC. Installation should be carried out, as advised by an Engineer, typically in short lengths. The correct material specification for the DPC should be selected in accordance with BS 6515 and BS 8215. The minimum lap should be 100mm.

Chemical damp-proof systems

A suitably qualified and experienced surveyor should carry out surveys for rising dampness.

Remedial work should be:

- suitable for the construction it is to be installed into
- designed by a suitably qualified and experienced specialist surveyor
- carried out by a competent specialist contractor approved by NHBC
- the subject of a suitable insurance-backed guarantee in accordance with Clause C5.

To ensure chemical DPCs will function correctly:

- chemical DPCs should be installed at the correct level in relation to the level of any adjacent floor structure
- in the case of timber ground floors, the DPC should be formed below the level of the joist end; alternatively, the joists should be independently supported e.g. on hangers or sleeper walls, where acceptable to the Engineer
- chemical DPCs in walls adjacent to solid floors should be linked with the floor DPM
- associated re-plastering work should be carried out by the specialist contractor or approved sub-contractor, all in accordance with the specialist report; plasterboard on adhesive dabs should not be used in conjunction with a chemical DPC system.

C14 Walls - weatherproofing

External walls shall be suitable for their exposure and resist the passage of moisture to the inside of the building.

New walls should be designed and constructed in accordance with NHBC Standards Part 6 'Superstructure (excluding roofs)'.

The existing walls are required to be suitable for their exposure and resist the passage of moisture to the inside of the building. The exposure rating of the site should be determined in accordance with NHBC Standards Chapter 6.1 'External masonry walls'. The suitability of the existing walls to resist the passage of moisture to the inside of the building can then be understood, and precautions to mitigate penetrating moisture can be considered.

Solid external walls, including walls with a nominal cavity, should typically be provided with an independent internal lining system. Cavity walls may also require an independent internal lining e.g. where the cleanliness of the cavity cannot be established or the existing construction is unable to direct penetrating moisture to the external face of the wall. Independent internal linings are required to extend into the reveals, heads and sills of all openings.

Further guidance on independent internal linings can be found in Clause C25 and C27.

The condition of existing walls should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

a) Moisture resistance from outside

Measures to prevent moisture penetration from outside could include:

- installing a proprietary cladding system assessed in accordance with Technical Requirement R3
- applying a render system in accordance with NHBC Standards Chapter 6.11 'Render'
- installing a proprietary insulated render system that has been assessed in accordance with NHBC Standards Chapter 6.9 'Curtain walling and cladding'
- re-pointing defective mortar joints
- installing remedial cavity trays
- installing a specialist internal lining system that is not affected by dampness in the existing wall.

NHBC will not normally accept the use of masonry paint or the application of surface treatment to improve moisture resistance.

Attention should be given to openings where replacement or additional DPCs and trays may be required.

Existing lintels with evidence of damp penetration from the outside should be protected with a suitable cavity tray.

Where cavity insulation is to be installed, cavity trays are required over all existing openings, irrespective of previous damp penetration problems. Further guidance is given in NHBC Standards Chapter 6.1 'External masonry walls'.

b) Existing render

The condition of the existing render should be assessed as part of the survey(s), in order to ensure the render will provide appropriate weather-tightness and durability.

Where the render or its components are showing signs of failure, the render should typically be replaced.

All new render should be in accordance with NHBC Standards Chapter 6.11 'Render'. The mix should be appropriate for the substrate and the exposure rating of the site.

c) Existing cladding

All new cladding(s) should be in accordance with NHBC Standards.

Existing cladding(s) should typically be replaced; in particular, where the cladding or its components are showing signs of failure.

Where the existing cladding(s) can be proven to offer a satisfactory in-service performance, subject to NHBC consultation and evaluation, they may be retained.

The condition of existing cladding should be assessed as part of the survey(s), in order to ensure the cladding will provide the appropriate level of weather-tightness and durability.

NHBC Standards 2023 - Conversions and renovations

Existing curtain walling and cladding systems should be surveyed by a suitably qualified and experienced specialist surveyor.

The following should be taken into account:

- replacement systems should be fixed to the structure
- existing masonry cladding should be assessed in accordance with Clauses C12, C13 and C14
- the Building Regulations.

d) Timber framed walls

Timber framed walls should be protected with a suitable breather membrane and cladding(s). Timber framed walls with any part of the frame exposed to the weather are not acceptable to NHBC.

The condition of existing timber frame walls, including the presence and condition of breather membranes, cavity trays and air vapour control layers, should be assessed as part of the survey(s), in order to ensure the timber frame walls will provide satisfactory in-service performance for the design life of the building.

Specialist advice from an Engineer should be obtained where repairs to a timber frame building are required.

All sources of dampness should be investigated and eliminated before remedial work is carried out.

Further guidance is given in NHBC Standards Chapter 6.2 'External timber framed walls'.

e) Parapet walls

New parapet walls should be designed and constructed in accordance with NHBC Standards Chapter 6.1 'External masonry walls'.

Parapet walls are required to be structurally stable and resist the passage of moisture to the inside the building.

Typically, existing parapet walls should be taken down and re-built, incorporating new DPCs and leadwork.

Where the existing parapet(s) can be proven to be in excellent structural condition, weathertight and able to provide satisfactory in-service performance for the design life of the building, subject to NHBC consultation and evaluation, the existing arrangement may be retained.

The condition of the existing parapet walls should be assessed as part of the survey(s).

Items to be taken into account when assessing the parapet wall include:

- structural stability
- potential for, or actual water penetration
- that all necessary cappings, copings, DPCs and flashings are present and correctly installed
- that the copings will shed water clear of the wall
- mortar condition
- the condition of the parapet gutter, where necessary carrying out appropriate remedial action to ensure satisfactory in-service performance.

Where the parapet gutter has an upstand on all sides, an overflow outlet should be provided, as close as possible to the outlet, through either the parapet or the upstand.

The size of the overflow outlet should not be less than the size of the rainwater outlet (or outlets if there are several) and its discharge should be visible and directed away from the building.

f) Thermally upgrading existing walls

Existing walls should be thermally upgraded in accordance with the Building Regulations. Certain types of building may be exempt from thermal upgrading due to their listed status or being in a conservation area; on such occasion, NHBC will require evidence of the restrictions placed upon the building.

Adding insulation to walls can alter the temperature of the external wall and may affect drying out and moisture movement within the wall. If the design of retro fit insulations to walls is not correct, it can lead to problems with condensation, mould growth and the life expectancy of the wall structure.

The effects of condensation and changes in moisture movement should be considered where walls are to be thermally upgraded, to ensure that the structure and health of building(s) are not compromised. The whole building should be considered holistically when thermally upgrading. Consideration should be given to the potential for cold bridging with associated risks mitigated.

NHBC Standards 2023 - Conversions and renovations

To avoid thermal bridging, the insulation, together with any finish and AVCL (on internal applications), should be returned into the heads, reveals and sills of any openings.

Any thermal upgrade proposals should be designed and assessed in accordance with BS 5250:2021 'Management of moisture in buildings.' Condensation risk calculations/hygrothermal assessments should be provided to NHBC as necessary.

i) Internal thermal upgrades of external walls

Internally applied thermal insulation can increase the condensation risk by isolating the existing structure from the heated interior, decreasing the temperature of the existing structure, and subsequently increasing the risk of condensation and mould growth behind the thermal insulation layer. Driving rain and external conditions can also lead to moisture being driven through the external walls, potentially damaging the internal finishes.

Where independent internal linings are to be introduced, a minimum 25mm cavity should be provided between the existing wall and lining. The lining system should be fixed at the base and head and restrained back to the wall, only as necessary for stability of the lining system. An AVCL should be provided. Independent internal linings are required to extend into the reveals, heads and sills of all openings.

For solid wall construction, adhesive dabs should not be used to fix the insulation/plasterboard to the existing structure.

ii) External thermal upgrades of external walls

Where external wall insulation (EWI) is to be applied the system should minimise rainwater penetration and allow drying of unintended moisture available in the structure, due to previous and in-service conditions. A protective render should be provided over the insulation. The system should not reduce or prevent the evaporation of water from the wall. The EWI system, including both insulation and render, should allow vapour transfer to promote drying.

All EWIs should have independent certification from an appropriate independent technical approvals authority acceptable to NHBC, and be suitable for the substrate and exposure rating of the site.

An independent internal lining system may be required.

Further guidance is given in BS 5250:2021 'Management of moisture in buildings'.

C15 Separating walls

Separating walls shall have reasonable resistance to the passage of sound.

Separating walls shall be designed and constructed in such a way that they provide a reasonable resistance to sound from other parts of the same building and from adjoining buildings.

New separating walls should be designed and constructed in accordance with the Building Regulations and NHBC Standards Chapter 6.3 'Internal walls'.

The condition of existing separating walls should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

- the construction and condition of existing walls
- the removal of any existing timber or steel lintels in walls
- adequate making good of previous openings in walls
- adequate making good of voids and hidden areas in or around walls
- satisfactory support of new and existing walls
- satisfactory sealing of penetrations to accommodate new or existing services in walls
- the ability of the existing construction to resist the passage of sound and meet the requirements of the Building Regulations.

The advice of an acoustician may be required.

C16 Chimneys, flues and hearths

Chimneys, flues and hearths shall be structurally stable, resistant to the effects of gases and heat and resistant to the passage of moisture into the building.

New chimneys, flues and hearths should be designed, constructed and installed in accordance with the NHBC Standards Chapter 6.8 'Fireplaces, chimneys and flues'.

Chimneys shall provide fire protective casing for flues and shall be capable of adequately supporting the flue liner, while resisting damp penetration and the products of combustion.

Typically, existing chimneys should be taken down and rebuilt to incorporate new lead trays and flashings.

Where the existing chimney(s) can be proven to be in excellent structural condition, weathertight and able to provide satisfactory in-service performance for the design life of the building, subject to NHBC consultation and evaluation, the existing arrangement may be retained.

The condition of the existing chimneys, flues and hearths should be assessed as part of the survey(s).

The following should be taken into account:

- the future use of the chimney
- structural stability
- porosity of construction
- penetrating damp
- eroded, cracked, crumbling mortar/render/masonry
- weatherproofing, e.g. that all necessary cappings, copings, lead trays and flashings are present and functioning
- that copings will shed water clear of the chimney
- condition of the flue
- the hearth, including its material suitability, size and suitability for intended use
- that the existing chimney or flue will achieve satisfactory performance.

a) Redundant chimneys

Where existing chimneys and flues are to be retained but no longer used, they should be swept and fitted with a suitable capping and be ventilated. The effects of possible sound transmission or spread of fire through the ventilation openings should be taken into account.

Where chimneys and flues are to be removed, they should be either totally removed or have any parts that remain adequately supported.

Where a chimney is to be either redundant or partially removed, this does not remove concerns over the weathertightness of the existing chimney and flue arrangement.

Salts associated with the burning of fossil fuels should be considered when plastering or specifying wall finishes around chimneys or where chimneys have been removed. Independent internal lining systems or salt resistant plasters are required where salt contamination could lead to salt staining.

b) Recommissioned chimneys

Existing chimneys and flues may be unsuitable to serve new appliances either using the same or a different fuel.

Where a chimney is to be used, flue linings should be provided as necessary to achieve satisfactory in-service performance.

Existing chimneys in some older buildings may not be suitable for installation of approved linings. Specialist advice should be sought.

The installation of new appliances should comply with the Building Regulations.

C17 Upper floors

Upper floors shall have adequate durability and support, and transfer loads to the supporting structure safely without undue movement.

New upper floors should be designed and constructed in accordance with NHBC Standards Chapter 6.4 'Timber and concrete upper floors'.

The condition of existing upper floors should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

The effect of any change of use or loading should be taken into account.

In some cases, e.g. listed buildings, specialist advice may be required.

Items to be taken into account include:

a) Timber upper floors

Timber upper floors which have suffered damage should be removed and replaced in accordance with NHBC Standards Chapter 6.4 'Timber and concrete upper floors'.

Where an existing timber upper floor is proposed to be retained, a specialist timber survey should be undertaken to ascertain the strength and condition of all timber members, including the condition of the timber at its bearing ends, through an intrusive investigation. The survey(s) should identify the causation and proposed remediation strategy for any defects. Remedial work should be carried out in accordance with Clause C6.

Joists shown to have inadequate strength by the survey should be replaced, strengthened, strutted or reduced in span, or additional joists should be added as appropriate.

The effects of long-term creep deflection should be taken into account.

Joists with excessive notches and/or holes should be replaced or repaired in accordance with an Engineer's design.

Works to existing timber upper floors should not commence until the moisture content of the floor is less than 20%. Floorboards or finishes may need to be removed to enable the moisture content of timbers to be lowered.

b) Floor/decking

New flooring/decking should be in accordance with NHBC Standards Chapter 6.4 'Timber and concrete upper floors'.

Unsound or contaminated flooring/decking should be removed and replaced. Loose boards should be re-fixed. The upper surface may be improved by punching nail heads and sanding.

c) Other floors

Structural alterations should only be carried out on the advice of an Engineer.

d) Screeds and other finishes

Damaged screeds and other finishes should be replaced.

C18 Separating floors

Separating floors shall have reasonable resistance to the passage of sound.

Separating floors shall be designed and constructed in such a way that they provide a reasonable resistance to sound from other parts of the same building and from adjoining buildings.

New separating floors should be designed and constructed in accordance with the Building Regulations and NHBC Standards Chapter 6.4 'Timber and concrete upper floors'.

The condition of existing separating floors should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

- the construction and condition of existing floors
- adequate making good of previous openings in floors
- adequate making good of voids and hidden areas in or around floors
- satisfactory support of new and existing floors
- satisfactory sealing of penetrations to accommodate new or existing services in floors
- the ability of the existing construction to resist the passage of sound and meet the requirements of the Building Regulations.

Remedial works should be in accordance with Clause C17.

The advice of an acoustician may be required.

C19 Staircases, stairways and landings

Staircases, stairways and landings shall provide a safe passage for users.

New staircases, stairways and landings should be in accordance with NHBC Standards Chapter 6.6 'Staircases'.

Existing staircases should be upgraded to meet the requirements of the Building Regulations, where necessary.

The condition of existing staircases, stairways and landings should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Items to be taken into account include:

a) Suitability of existing structure

Staircases and stairways should be suitable for the new use of the building. Where an existing private staircase becomes a common staircase, it will be subject to increased design loads. This should be a consideration in deciding if the existing staircase can be retained.

Timber staircases that have been in damp conditions may be unsound due to rot and should be replaced.

Where timber staircases are suitable for retention, detailed investigations will be required to ensure the staircase is free from fungal decay and/or wood-destroying insects. Any necessary timber treatment should be in accordance with Clause C6. Where there is any doubt that effective repair is possible, the staircase should be replaced.

Staircases that are to be retained may require suitable repair.

b) Rise and going

The thickness of new screeds, floor finishes, and any repairs to treads should be taken into account to ensure an equal rise and equal going for all steps in each flight and, where applicable, series of flights.

c) Guarding

Guarding should be suitable and safe for the end user of the building.

d) Health and safety

Where an existing staircase, stairway or landing is to be retained that does not appear to meet the guidance that supports the Building Regulations, a risk assessment should be provided to NHBC to justify the safety of the stair for its intended use. Items to be taken into consideration include:

- full specification of the stair, including width, rise, going, headroom, landing areas, guarding and balustrading
- the intended function of the stairs
- the residential end use with occupants/visitors of all ages
- risk of falling and/or injury posed by the existing arrangement
- statutory requirements i.e. means of escape
- details of proposed alterations to stairs if applicable.

C20 Pitched roofs

Pitched roof structures shall support and transfer loads to the supporting structure and provide restraint to the structure without excessive deflection or undue movement or distortion and resist the passage of rain and snow to the inside of the building.

New pitched roofs should be designed and constructed in accordance with NHBC Standards Chapter 7.2 'Pitched roofs'.

The condition of existing pitched roofs should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Certain roofs, e.g. on listed buildings or in conservation areas, may require specialist advice and appropriate skills.

Items to be taken into account include:

a) Existing structure

It should not be assumed that roof members that are performing satisfactorily at the time of the survey would not cause a problem at a future date.

Changes in structure and loading should be taken into account. The existing structure should be strengthened where replacement roof coverings are heavier than the existing.

Intermediate support should be provided to reduce spans where members would otherwise be over-stressed.

Roof triangulation should be checked and, where considered inadequate, appropriate remedial measures undertaken to mitigate potential roof spread at eaves level.

Improved strutting to purlins should be provided where the struts are:

- at inadequate centres
- not braced to prevent movement.
- not propped from load-bearing structure

Additional support to water tanks should be provided where the existing support is inadequate.

Bracing to trussed rafter roofs should be upgraded in accordance with current requirements.

Holding down/restraint strapping should be provided to meet current requirements where it is necessary.

Where wood is showing signs of fungal decay or infestation by wood-destroying insects, remedial work should be carried out in accordance with Clause C6. Load-bearing ends of structural timbers should be intrusively inspected.

All structural strengthening/alterations should be designed by an Engineer.

b) Roof coverings

All existing roof coverings should typically be replaced.

Installation of new roof coverings over the existing coverings will not be permitted.

The 'turning' of roof coverings, so that the non-weathered face becomes the weathered external face, is not acceptable to NHBC.

Where the existing slates/tiles are to be re-used or where second hand (re-claimed) slates and tiles may be required for matching, these should only be used if they are accepted by NHBC, in accordance with Technical Requirement R3. Independent certification of suitability may be required.

Appropriate tests should be carried out to check the strength, porosity and frost resistance of tiles. These tests should be carried out by a UKAS accredited laboratory.

c) Underlay

A new underlay should be provided in accordance with NHBC Standards Chapter 7.2 'Pitched roofs'. To avoid the effects of condensation, roofs should be designed in accordance with BS 5250:2021 'Management of moisture in buildings.'

d) Flashings and weatherings

All flashing and weatherings should typically be replaced in conjunction with the new roof covering.

New flashings and weatherings should be in accordance with NHBC Standards 7.2 'Pitched roofs'.

Cement fillets will not be accepted as flashings or weatherings.

Further guidance can be found in BS 5534 'Slating and tiling for pitched roofs and vertical cladding'.

e) Thermally upgrading existing roofs

Existing roofs should be thermally upgraded in accordance with the Building Regulations. Certain types of building may be exempt from thermal upgrading due to their listed status or being in a conservation area; on such occasion, NHBC will require evidence of the restrictions placed upon the building.

The effects of condensation and changes in moisture movement should be considered where roofs are to be thermally upgraded, to ensure that the structure and health of building(s) are not compromised. The whole building should be considered holistically, when thermally upgrading.

Consideration should be given to the potential for cold bridging, with associated risks mitigated. To reduce the risk of condensation occurring on the ceiling of the occupied space, thermal insulation should be continuous, and particular attention should be paid to the wall/roof junction, with service penetrations minimised.

Any thermal upgrade proposals should be designed and assessed in accordance with BS 5250:2021 'Management of moisture in buildings'. An AVCL should be installed where required.

C21 Flat roofs, terraces and balconies

Flat roofs and balcony structures shall support and transfer loads to the supporting structure without excessive deflection, deformation or distortion, and resist the passage of rain and snow to the inside of the building.

New flat roofs, terraces and balconies should be designed and constructed in accordance with NHBC Standards Chapter 7.1 'Flat roofs, terraces and balconies'.

The condition of existing flat roofs, terraces and balconies should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

The use of timber in balconies should be limited to secondary elements, which in turn are supported by materials other than timber. Further guidance is given in NHBC Standards Chapter 7.1 'Flat roofs, terraces and balconies'. The use of timber in balcony and terrace constructions may also be restricted by the Building Regulations.

Certain flat roofs, terraces and balconies, e.g. on listed buildings or in conservation areas, may require specialist advice and appropriate skills.

Items to be taken into account include:

a) Existing structure

It should not be assumed that flat roofs, terraces or balconies that are performing satisfactorily at the time of the survey would not cause a problem at a future date.

Changes in structure and loading, particularly replacement flat roof, terrace or balcony coverings, should be taken into account.

Where wood is showing signs of fungal decay or infestation by wood-destroying insects, remedial work should be carried out in accordance with Clause C6. Load-bearing ends of structural timbers should be intrusively inspected.

The existing structure should be strengthened where replacement flat roof, terrace or balcony coverings are heavier than the existing. Existing reinforced concrete or steel flat roof, terrace or balcony structures should be in satisfactory condition.

Intermediate support should be provided to reduce spans on timber roofs where members would otherwise be overstressed or are excessively deflected.

Upgrading of strutting may be required. Holding down/restraint strapping should be provided to meet current requirements where it is necessary.

All structural strengthening/alterations should be designed by an Engineer.

A cold flat roof system should be avoided as per the guidance in BS 6229 'Flat roofs with continuously supported flexible waterproof coverings'.

b) Waterproofing

Existing roof coverings, associated flashings and weatherings should typically be replaced.

Correct detailing of the various interfaces, particularly those beneath balcony door openings and at roof abutments, will be required to prevent water entering the building. Further guidance is given in NHBC Standards Chapter 7.1 'Flat roofs, terraces and balconies'.

Installation of new flat roofs, terraces and balcony coverings over the existing covering will not be permitted.

c) Thermally upgrading existing flat roofs or terraces

Existing roofs should be thermally upgraded in accordance with the Building Regulations. Certain types of building may be exempt from thermal upgrading due to their listed status or being in a conservation area; on such occasion, NHBC will require evidence of the restrictions placed upon the building.

The effects of condensation and changes in moisture movement should be considered where roofs are to be thermally upgraded, to ensure that the structure and health of building(s) are not compromised. The whole building should be considered holistically when thermally upgrading.

Consideration should be given to the potential for cold bridging, with associated risks mitigated. To reduce the risk of condensation occurring on the ceiling of the occupied space thermal insulation should be continuous, and particular attention should be paid to the wall/roof junction, with service penetrations minimised.

Any thermal upgrade proposals should be designed and assessed in accordance with BS 5250:2021 'Management of moisture in buildings'. An air vapour control layer (AVCL) should be installed where required.

Any thermal upgrade of the existing roof should not comprise roof drainage or provision of suitable upstands to waterproofing membranes.

C22 Roof drainage

Roof drainage shall adequately carry rainwater to a suitable outfall.

New rainwater drainage systems should be installed in accordance with NHBC Standards Chapter 7.1 'Flat roofs, terraces and balconies' or Chapter 7.2 'Pitched roofs'.

The condition of the existing roof drainage, including parapet and other hidden gutters, should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance.

Existing lead gutters should be reconstructed and re-lined. Existing rainwater outlets from lead gutters may need to be increased in size.

Cast iron drainage which is suffering from loss of section, due to corrosion, should be replaced. Cast iron drainage which has adequate durability, and is to be retained, should be refurbished. Cast iron drainage should be free of corrosion, correctly prepared for painting, and re-painted with a suitable anti-corrosion primer and topcoat. Joints should be resealed with a low modulus sealant.

All roofs should have adequate rainwater drainage, in accordance with NHBC Standards.

Items to be taken into account include:

- provision of falls
- evidence of blockages
- condition of rainwater goods, fixings and bracketry etc.
- capacity of rainwater system, particularly where new roof areas are to be connected to existing
- upstands (where the roof area has an upstand on all sides, at least two outlets or one outlet plus an emergency overflow shall be provided for each roof area - the size of the overflow outlet should not be less than the size of the rainwater outlet or outlets if there are several)
- location of downpipes (existing rainwater downpipes located internally should normally be replaced and relocated externally)
- discharge (rainwater downpipes should discharge directly into rainwater gullies, as opposed to over, in order to avoid overspill).

C23 Framed buildings - structure

The load-bearing structure of framed buildings shall transfer loads to the foundations safely and without undue movement.

Examples of framed buildings include:

- steel frame
- reinforced concrete frame
- timber frame
- oak frame.

Examples of construction which may not be acceptable to NHBC can be found in the 'Guidance' section of these standards.

Existing framed buildings should be:

- assessed in accordance with Technical Requirements R3 and R5
- assessed by an Engineer in accordance with advice given in:
 - i) CIRIA report 111
 - ii) Institution of Structural Engineers report, 'Appraisal of existing structures'
 - iii) Concrete Society's TR54 'Diagnosis of deterioration in concrete structures: identification of defects, evaluation and development of remedial action'
 - iv) BRE Digest 366.

A detailed structural and condition report of the existing framed building should be submitted for review. The report should highlight all defective elements, proposed remedial works and schedule of maintenance works to enable the structure to attain the minimum 60-year service life required for residential buildings in accordance with Technical Requirement R3.

Where structural strengthening/alterations are necessary, they should be designed by an Engineer.

C24 Framed buildings - weatherproofing

The external walls of framed buildings shall be suitable for their exposure and resist the passage of moisture to the inside of the building.

All new cladding(s) should be in accordance with NHBC Standards.

Existing cladding(s) should typically be replaced; in particular, where the cladding or its components are showing signs of failure.

Where the existing cladding(s) can be proven to offer a satisfactory in-service performance, subject to NHBC consultation and evaluation, the existing arrangement may be retained.

Existing curtain walling and cladding systems should be surveyed by a suitably qualified and experienced specialist surveyor.

The condition of existing cladding should be assessed as part of the survey(s), in order to ensure the cladding will provide the appropriate level of weather-tightness and durability.

The following should be taken into account:

- replacement systems should be fixed to the structure
- existing masonry cladding should be assessed in accordance with Clauses C 12, C 13 and C 14
- the Building Regulations.

C25 Doors, windows and glazing

Doors, windows and glazing shall ensure satisfactory in-service performance.

New doors, windows and glazing should be designed, specified and installed in accordance with NHBC Standards Chapter 6.7 'Doors, windows and glazing'.

Doors, windows and glazing should typically be replaced with new ones.

Items to be taken into account include:

a) Historic doors, windows and glazing

Where doors, windows and glazing are listed or of historic importance, their condition should be assessed as part of the survey(s). Where the existing doors, windows and glazing can be proven to have a satisfactory in-service performance, subject to NHBC consultation and evaluation, they may be retained.

In certain cases it may be necessary for NHBC to decline to offer cover for the conversion or renovation, where the existing historic doors, windows and glazing cannot be demonstrated to provide adequate weatherproofing and/or where there is insufficient frame thickness to permit an independent internal lining system to be introduced, if required.

Where historic doors, windows and glazing are to be retained, the following should be taken into account:

i) Doors and windows

Rotten timber sections should be replaced with durable or preservative treated timber. A proprietary repair system used in accordance with the manufacturer's recommendations may be an acceptable alternative.

Door and window frames may act as integral members of partition framing or walling; reinstatement/repair should not reduce structural integrity.

Excessively warped or twisted doors and windows should be repaired or replaced.

Where stone mullions are present, an independent internal lining should be provided with adequate detailing to prevent damp issues and cold bridging. Further guidance on independent internal linings can be found in Clause C14 and C27.

ii) Glazing

Insulating glass units should normally be replaced in accordance with NHBC Standards Chapter 6.7 'Doors, windows and glazing'.

Replacement glazing units should comply with the relevant Building Regulations, where applicable.

b) Health and safety

Where existing doors, window(s) and glazing arrangements are retained that do not appear to meet the guidance that support the Building Regulations, a risk assessment should be provided to NHBC to justify the safety of the window or door for its intended use.

Items to be taken into consideration include:

- the intended function of the door/window
- the residential end use with occupants/visitors of all ages
- risk of falling and/or injury posed by the existing arrangement
- location and sill height of the opening in the building
- containment.

c) Security

Locks and ironmongery to main and secondary access doors and to windows should be provided in accordance with NHBC Standards Chapter 6.7 'Doors, windows and glazing'.

C26 Joinery

Joinery shall provide satisfactory in-service performance.

New internal and external joinery should be fitted in accordance with NHBC Standards.

The condition of all existing joinery, internal and external, should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

The following should be taken into account:

- where the wood is sound, this may be retained, although refixing may be required
- decayed or damaged joinery should be repaired or replaced
- reinstatement of existing work should include appropriate treatment where necessary in accordance with Clause C6.

C27 Floor, wall and ceiling finishes

Materials and workmanship shall provide a satisfactory finish.

New floor, wall and ceiling finishes should be applied in accordance with NHBC Standards Chapters 9.2 'Wall and ceiling finishes' and 9.3 'Floor finishes.'

The condition of existing floor, wall and ceiling finishes should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

The moisture content of external walls, floors and ceilings should be taken into account where separate internal frames and linings are proposed.

Items to be taken into account include:

a) Linings

Linings and separating frames, with or without an air vapour control layer, should only be installed when the background is dry and stable.

For solid wall construction, adhesive dabs should not be used for fixing the insulation/plasterboard to the existing structure.

Solid external walls, including walls with a nominal cavity, should typically be provided with an independent internal lining system. Cavity walls may also require an independent internal lining e.g. where the cleanliness of the cavity cannot be established or the existing construction is unable to direct penetrating moisture to the external face of the wall.

Where independent internal linings are to be introduced, typically a minimum 25mm cavity should be provided between the existing wall and lining. Any alternate provision, e.g. detailing around stone mullions, should be agreed in principle with NHBC prior to implementation. The lining system should be fixed at the base and head and restrained back to the wall, only as necessary for the stability of the lining system. An AVCL should be provided. Independent internal linings are required to extend into the reveals, heads and sills of all openings.

Ventilation behind the independent internal lining frame may be required.

b) Existing wall and ceiling finishes

Where existing backgrounds are to be retained, they should be sound and provide an adequate backing for the proposed finish.

Plaster that is not keyed should typically be removed and/or replaced in its entirety.

Lath and plaster finishes should typically be removed.

Over-cladding of existing finishes is not typically acceptable.

Where reliance is to be placed on the existing plasterwork for fire resistance, specialist reports may be required.

C28 Services - water

Every home shall have an adequate hot and cold water supply.

New hot and cold water services should be installed in accordance with NHBC Standards Part 8 'Services'.

Existing hot and cold water services should typically be replaced.

The size and condition of the existing supply should be assessed as part of the survey(s) and upgraded as necessary to provide satisfactory in-service performance for the design life of the building. Any existing service should meet current requirements.

C29 Services - electrical

Every home shall have an adequate and safe electrical installation.

New electrical services should be installed in accordance with NHBC Standards Part 8 'Services'.

Existing electrical installations should typically be replaced, unless it can be demonstrated that they are in a safe working condition, have a reasonable life expectancy and meet current requirements.

All electrical installations should be designed and installed in accordance comply with BS 7671 'Requirements for electrical installations'.

The provision of socket outlets, lighting and television reception should be in accordance with NHBC Standards Chapter 8.1 'Internal services'.

C30 Services - gas

Where provided, gas services shall be in accordance with current standards and codes.

New gas services should be installed in accordance with NHBC Standards Chapter 8.1 'Internal services'.

All gas services should comply with the Gas Safety (Installation and Use) Regulations current at the time of the conversion or renovation.

Existing gas services should typically be replaced.

C31 Services - space heating

Where provided, space heating shall be in accordance with Building Regulations, standards and codes.

New systems should be installed in accordance with NHBC Standards Part 8 'Services'.

Existing heating systems should typically be replaced unless it can be demonstrated that they comply with NHBC Standards Part 8 'Services' and are in a safe working condition with a reasonable life expectancy.

C32 Services - ventilation

Homes shall be adequately ventilated.

All homes should be provided with adequate ventilation, which meet with current Building Regulations.

New extract fan systems should be installed in accordance with NHBC Standards Part 8 'Services'.

C33 Services - above ground drainage

Above ground drainage systems shall ensure satisfactory in-service performance.

New above ground soil and waste systems should be installed in accordance with NHBC Standards Part 8 'Services'.

The condition of the existing soil and waste system should be assessed and tested as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Existing systems to be retained or extended should meet with current requirements.

C34 Services - painting and decorating

Paint and decorative systems shall provide an acceptable finish.

New and existing work should be thoroughly cleaned down and prepared, and a new finish applied in accordance with NHBC Standards Chapter 9.5 'Painting and decorating'.

Where windows and doors are listed or of historic importance and are to be retained, they should typically be stripped before decoration.

Decoration should allow walls to 'breathe' so that vapour pressure does not build up behind the surface.

C35 External works - access

Adequate access shall be provided to and around the home.

Access, including private roads, shared private drives, private drives, car parking areas and paths, should typically be provided in accordance with NHBC Standards Chapter 10.2 'Drives, paths and landscaping'.

The condition of the existing access should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

Where new external accessways are to be introduced, they should not increase the risk of long-term deterioration to the building fabric or fittings. Care should be taken not to bridge damp-proofing measures within the existing building.

Items to be taken into account include:

- the applicable sections of the Building Regulations, for buildings undergoing a 'Material change of use'
- the type of ground floor construction
- the void beneath a floor, where present
- the existing DPC level
- structural waterproofing requirements
- presence of existing below ground drainage (requirements for protection).

Further guidance can be found in Clause's C11 and C13.

All access surfacings should typically fall away from the building.

C36 External works - garages and outbuildings

Garages and converted outbuildings shall be suitable for their intended purposes.

New garages should be designed and constructed in accordance with NHBC Standards Chapter 10.1 'Garages'.

The condition of existing garages and outbuildings should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for their intended purpose for the design life of the building.

Outbuildings converted into garages should meet the requirements of NHBC Standards Chapter 10.1 'Garages'.

In accordance with requirements for new garages, walls of converted garages do not normally need to be totally weather resistant and floors do not normally require a DPM.

C37 External works - freestanding walls and retaining structures

Freestanding walls and retaining structures shall be adequate for their intended purpose.

New freestanding walls and retaining structures should be designed and constructed in accordance with NHBC Standards Chapter 10.2 'Drives, paths and landscaping'.

NHBC Standards 2023 - Conversions and renovations

The condition of existing freestanding walls and retaining structures should be assessed as part of the survey(s), and remedial work carried out as necessary to provide satisfactory in-service performance for the design life of the building.

The following should be taken into account:

- the stability of the wall or structure and any proposed increased loading or height
- assessment of damage or deterioration
- that the wall or structure has all the necessary cappings, copings and DPCs
- that the copings shed water clear of the wall
- changes in ground levels and guarding requirements
- recladding or reskimming of existing walls and movement joint requirements.

C38 External works - garden areas

Garden areas shall be adequately prepared, stable and provided with reasonable access.

Garden areas should be in accordance with NHBC Standards Chapter 10.2 'Drives, paths and landscaping'.

Garden areas up to 3m from the habitable parts of the home shall not be waterlogged.

Garden areas within 20m of habitable accommodation shall be adequately prepared, stable and provided with reasonable access.

C39 External works - landscaping

Planting shall be completed in a manner appropriate for the site conditions and layout. Possible future damage to the home caused by planting shall be minimised.

Works should be carried out in accordance with NHBC Standards Chapter 10.2 'Drives, paths and landscaping'.

Where trees or shrubs have been removed, are to be retained or are to be planted by the builder, precautions should be taken to reduce the risk of future damage to homes and services, in accordance with NHBC Standards Chapter 4.2 'Building near trees'.

C40 Provision of information

Designs and specifications shall be produced in a clearly understandable format and include all relevant information.

All relevant information relating to the conversion or renovation should be stated clearly and unambiguously, and be readily available.

C41 Provision of information

All relevant information shall be distributed to appropriate personnel.

The design and specification should be made available to all appropriate personnel, including site supervisors and relevant specialists, sub-contractors and/or suppliers.

Appendix A

Useful contacts

Association of British Insurers (ABI) www.abi.org.uk	Guarantee Protection Insurance Ltd (GPIC) www.gp-insurance.co.uk
British Pest Control Association (BPCA) www.bpca.org.uk	Institute of Historic Building Conservation (IHBC) www.ihbc.org.uk
Building Research Establishment (BRE) www.bregroup.com	Royal Institution of Chartered Surveyors (RICS) www.rics.org
Centre for Window and Cladding Technology (CWCT) www.cwct.co.uk	The Institution of Structural Engineers www.istructe.org
Construction Industry Research and Information Association (CIRIA) www.ciria.org	Timber Research and Development Association (TRADA) www.trada.co.uk
English Heritage www.english-heritage.org.uk	Property Care Association (PCA) www.property-care.org
Environment Agency www.environment-agency.gov.uk	

Useful publications

BRE	Digest	366	Structural appraisal of existing buildings for change of use
ISE	Report		Appraisal of existing structures
BRE	Report	167	Assessing traditional housing for rehabilitation
BRE	Digest	251	Assessment of damage in low-rise buildings
BRE	Digest	343	Simple measuring and monitoring of movement in low-rise buildings – Part 1
BRE	Digest	344	Simple measuring and monitoring of movement in low-rise buildings – Part 2
BRE	Digest	361	Why do buildings crack?
BRE	Report	453	Recognising wood rot and insect damage in buildings
BRE	DAS	103	Wood floors: reducing risk of recurrent dry rot
BRE	DAS	74	Suspended timber ground floors: repairing rotted joists
BRE	Digest	444	Parts 1, 2 & 3 – Corrosion of steel in concrete
BRE	Digest	352	Underpinning
DETR			Asbestos and man-made mineral fibres in buildings – practical guidance
BSI	BS EN	752	Drain and sewer systems outside buildings
BRE	GRG	17	Repairing and replacing ground floors
BRE	DAS	73	Suspended timber ground floor: remedying dampness due to inadequate ventilation

NHBC Standards 2023 - Conversions and renovations

BRE	Report	466	Understanding Dampness – effects, causes, diagnosis and remedies
BRE	Digest	245	Rising damp in walls: diagnosis and treatment
BRE	Report	117	Rain penetration through masonry walls: diagnosis and remedial measures
BRE	DAS	71	External masonry walls: repointing – specification
BRE	DAS	72	External masonry walls: repointing
BRE	Report	466	Understanding dampness – effects, causes, diagnosis and remedies
BRE	DAS	107	Cavity parapets: installation of copings, DPCs, trays and flashings
BRE	Reports		BRE building elements: Foundations, basements and external works
BRE	GRG	33	Assessing moisture in building materials: sources of moisture
BRE	GBG	2	Surveying masonry chimneys rebuilding or repair
CIRIA	C579		Retention of masonry facades – best practice guide
BRE	GBG	20	Removing internal load-bearing walls in older property
BRE	GRG	22	Parts 1 & 2 – Improving sound insulation
BRE	Report	267	BRE Report 267 Major alterations & conversions: a BRE guide to radon remedial measures in existing dwellings

Appendix B

Survey(s) of existing buildings

The survey(s) should be carried out in accordance with Clause C1. The items listed in this appendix should be considered and included in the survey(s) as appropriate. Causes of defects and damage should be accurately identified.

a) Previous usage

The survey(s) should establish to what extent the land and buildings included in the conversion or renovation project have been adversely affected by the former use and occupancy.

Any residual contamination caused by the previous use, e.g. agriculture/industry, should be established by the survey(s).

b) Contaminants

The survey(s) should identify contaminants – which may be harmful, including radon, radioactive and other toxic, explosive or asphyxiant gases.

Where the ground covered by the building is within 250m of landfill, or where there is reason to suspect that there may be gaseous contamination of the ground, or where the building will be within the likely sphere of influence of a landfill where gas production is possible, further investigation should be made to establish what protective measures may be necessary.

Further guidance may be found in NHBC Standards Chapter 4.1 'Land quality – managing ground conditions'.

c) Timber decay and wood-destroying insects

The survey(s) should be appropriate for the building, taking account of the likelihood of rot and pest infestation. The survey(s) should not be confined to easily inspected areas, or to areas where rot or infestation are obvious. Load-bearing ends of structural timbers should be intrusively inspected.

The source, cause and extent of current wood-destroying insect infestation or wood rot should be identified.

The BRE publication "Recognising wood rot and insect damage in buildings" gives guidance.

d) Vermin and pest infestation

Points of entry for vermin and pest should be identified.

e) Foundations

Items to be taken into account include:

- ground conditions/type of soil/varying ground levels
- level of the water table, which may have altered since construction
- existing water courses
- level and type of foundations
- trees, mature height and root growth
- structural defects e. g. cracking, signs of movement, deterioration of concrete etc.
- condition of foundations where drains/services pass through or beneath
- evidence of sulfate attack.

Where appropriate, the effect on foundations of proposed alterations or extensions to the building should be accounted for in the survey(s).

Satisfactory past performance of foundations may, at NHBC's discretion, be accepted as demonstrating adequacy, provided alterations would not adversely affect the foundations.

f) Basements

Items to be taken into account include:-

- future use
- structure (ability of the structure to take any proposed loading)
- condition of the structural floor above
- the external risk and desktop study
- the type of basement – e.g. full or semi basement, number of storeys below ground, steps in external ground levels
- basement features – e.g. lightwells, pavement lights, podium decks, buried roofs or any area where the basement may extend beyond the footprint of the above ground building
- internal and external drainage surcharge risk
- attached structures/abutments, i.e. buildings, garden walls, arches under entranceways as these can act as a source of moisture
- detailing of DPCs and cavity trays in the above ground building including, their condition and detailing at risk areas above ground construction, e.g. podium deck abutment, to ensure continuity of waterproofing
- ventilation issues, including the feasibility of installing ventilation
- condensation issues, including damage to the existing structure caused by condensation – e.g. corrosion of structural steel
- external surface finishes, including their proximity to existing DPC and cavity tray arrangements, and the direction and presence of falls to aid prevention of surface water entering the existing basement
- condition of rainwater goods and their connections to the below ground drainage system
- condition of the below ground drainage, including the presence of soakaways and historic floor channels
- condition of any land drainage systems, including discharge point and provision for maintenance
- penetrations into the basements e.g. mains services, drainage, etc
- condition of the structure, including faults which may allow the ingress of water, and damage to the existing structure caused by dampness/moisture penetration
- obstructions which may be masking issues, requiring subsequent opening up to be carried out
- the feasibility of installing new structural waterproofing where required
- presence of timber or other organic material within the basement which may influence the remedial works design
- existing contamination protection measures e.g. ground gasses, radon etc
- any known current or historical problems with the basement.

g) Below ground foul and surface water drainage

Existing drainage should normally be replaced.

Items to be taken into account when assessing existing drainage include:

- the results of the CCTV survey (any drainage runs which cannot be surveyed should be replaced)
- adequacy of existing system (capacity related to proposed use and number of people who will use the building)
- evidence of leakage
- evidence of surcharging or blockage such as soiled benching
- suitable outfall
- evidence that the flow is self-cleansing
- condition of pipework, manholes and inspection chambers
- location of manholes and inspection chambers
- adequate access for cleaning
- sealing of redundant drainage
- proposals for dealing with existing cesspools and septic tanks and their removal
- material properties of pipework (pitch fibre drainage is not acceptable to NHBC).

h) Ground floors

Effects of proposed alterations on existing floors, and related ground levels should be taken into account.

Additional items to be taken into account include:

Timber floors

- joist size, span, strutting and condition
- bearings to joists
- sleeper walls
- DPCs provided beneath wall plates
- effective ventilation of sub-floor void
- subfloor void configuration
- position of external ground level
- excessive drilling and notching of joists
- condition of related DPM, DPCs (bridged, damaged and not adequately linked)
- sloping or sagging floors and gaps below skirting
- any existing insulation.

NHBC Standards 2023 - Conversions and renovations

Concrete floors

- type and condition of floor
- gaps below skirting which may indicate settlement of fill, or subsidence
- bowing and cracking of screed
- cracked or sloping slab which may indicate heave
- evidence of sulfate attack
- effective DPM – adequate linking with DPCs
- effective ventilation of sub-floor void.

i) Walls

The type of wall construction should be identified e.g. masonry with cavity, solid masonry, masonry with rubble fill, timber frame, external leaf fair face brick, rendering or cladding, regional (eg. stone or cob), concrete, steel or cast iron frame, or proprietary system.

The structural condition should be identified, including suitability for alteration.

Items to be taken into account include:

Cracking

The cause of cracking should be identified together with the likely effect on stability.

Cracking should be monitored where continuing movement that could adversely affect the structure is suspected.

More serious cracks can be caused by:

- sulfate attack (expansion of jointing mortar)
- wall tie corrosion (cracking of mortar beds)
- roof spread (walls pushed out of plumb)
- outer leaf pushed outwards, rotation of sills, heads etc. (timber frame ties unsuitable or wrongly fixed)
- subsidence, ground movement (cracks widening and extending to the outer edge of walls).

Rendering

- many fine cracks (shrinkage or over-strong mix)
- detached from substrate (shrinkage, or effect of sulfate reaction)
- render should not bridge the DPC.

Weathering details should be checked e.g. parapet copings, sills, eaves and the bottom edge of rendering.

Lateral restraint

- walls that provide end restraint or intermediate buttressing to external walls should be effectively bonded or tied to the relevant external wall
- floor and roof timbers should have effective bearing on supporting walls; lateral restraint straps may be required. Effective anchorage may be required.

Stability of cavity walls

The survey(s) should establish whether there is corrosion of wall ties and recommend appropriate remedial action.

Curtain walling and cladding

- condition of existing system, including glazing units, gaskets and seals
- damaged or defective fixings
- damaged or detached cladding panels
- damaged felt or breather membrane.
- detached or missing insulation

j) Support of openings

Existing lintels and structural bearings should be examined to establish their structural stability, taking account of possible altered loadings caused by the conversion or renovation of the building.

k) External walls – rain penetration and dampness

Items to be taken into account include:

- evidence of rain penetration
- evidence of rising damp e.g. lack of, discontinuous, or defective DPC, or bridged DPC, cavity trays or vertical DPCs
- mortar condition
- evidence of internal condensation (staining)
- erosion
- blocked rainwater goods.
- frost attack

NHBC Standards 2023 - Conversions and renovations

It should not be assumed that solid walls that are dry on the inner face at the time of survey(s) would remain so during adverse weather conditions.

l) External walls – exposure rating

The survey(s) should establish the exposure rating of the building. Buildings that were not previously dwellings will require particular attention, as the exclusion of dampness into the building may not have been critical in the former use.

m) Internal partitions

The survey(s) should confirm that existing internal partitions have adequate strength for their purpose. The effect of alterations on existing partitions should be ascertained.

n) Separating walls and floors

The survey(s) should identify the adequacy of existing separating walls and floors, including their resistance to:

- spread of fire and smoke (separating walls in some older houses may not continue into the roof space)
- sound.

The above should also be established for walls and floors which will act as separating elements in the converted building.

o) Chimneys, flues, fireplaces and hearths

Items to be taken into account include:

- structural stability, including whether rebuilding is necessary
- condition of mortar, pointing, brickwork, rendering, masonry
- condition of flashings and soakers, capping, flaunching, chimney pots
- suitability of flues for proposed appliances
- condition of linings/parging to flues
- proximity of combustible materials to flues/flue pipes
- condition of existing fireplaces, hearths.

p) Timber upper floors

Items to be taken into account include:

- joist size, span, strutting and condition
- bearings to joists where bedded in solid brickwork, or joist hangers
- excessive drilling and notching of joists
- sloping or sagging floors, gaps below skirting
- effect of proposed alterations.

q) Concrete upper floors

Items to be taken into account include:

- type and condition of floor
- where bearing on walls, condition of supporting area of wall
- condition of supporting beams, and supporting area of wall
- suitability of floor to take new loadings
- condition of screed.

r) Staircases

Items to be taken into account include:

- structural stability e.g. condition of timber generally, excessive movement/sloping of treads, risers, landings, reliability of handrails/balusters
- consistency of rise and going, pitch and headroom
- safety aspects where staircase is lit by glazing
- whether the stairs are safe to use and unobstructed by opening of doors
- suitability for possible use as means of escape in case of fire
- risk to health and safety of proposed occupants.

s) Pitched roofs

Structure

Items to be taken into account include:

- size, span and condition of structural members
- evidence of spread
- undulations in ridge line, or in slating/tiling
- adequate triangulation, purlin support
- proper support of water tanks and possibility of extra loading
- joints and connections between members, including metal fasteners (signs of corrosion)
- bracing, lateral restraint
- bearing on supporting structure
- location, dimensions and structural condition of access to loft space
- condition of sarking boards.

Weatherproofing/insulation

Roof coverings, underlay, flashings and weatherings will typically be removed and replaced with new.

Additional items to be taken into account include the condition and adequacy of existing:

- flashings
- soffits, fascias, bargeboards etc.
- sarking felt etc.
- rainwater disposal goods, gutters, downpipes etc.
- insulation
- ventilation.

t) Flat roofs, terraces and balconies

Roof coverings and flashings will typically be removed and replaced with new.

Additional items to be taken into account include:

- adequacy of joist bearings, lateral restraint, condition of joists, size and span of joists
- condition of reinforced concrete
- condition/adequacy of insulation within roof system
- condition of guarding, and its fixings
- adequacy of falls, signs of ponding
- condition of flashings, eaves details
- condition of rainwater disposal.

u) Doors, windows, external joinery and metalwork

Windows, doors and glazing should typically be removed and replaced with new.

Items to be taken into account when assessing existing doors, windows, external joinery and glazing include:

- material properties
- weather-tightness and durability
- whether the door or window frames are thermally broken
- extent of damage or deterioration to aluminium windows
- extent of corrosion to metal windows (whether restoration is feasible)
- extent of rot in timber windows, doors including frames, sills and thresholds
- effectiveness of throatings, weather bars and other weatherings
- the condition of existing soffits, fascia, bargeboards etc.
- the condition of existing ironmongery
- security – existing ironmongery may be inappropriate
- safety – additional guarding to openings may be required
- risk to health and safety of proposed occupants.

v) Glazing

Existing insulating glass units should typically be removed and replaced with new.

Items to be taken into account when assessing existing glazing include:

- security – existing glazing systems may be inappropriate
- safety – where there is a risk of accidental breakage
- risk to health and safety of proposed occupants.

w) Internal joinery

Items to be taken into account include:

- condition of joinery
- condition of ironmongery
- condition of internal partitions
- decay or rot.

x) Finishes

Items to be taken into account include:

- soundness of plaster, plasterboard on walls and ceilings etc. where they are to be retained
- condition of decorative work e.g. friezes, cornices and ceiling roses
- feasibility of providing matching work as required.

y) Services**Water**

Existing hot and cold water services should typically be replaced with new. Where existing hot and cold water services are to be retained their current condition should be established.

Items to be taken into account include:

- drinking water
- cold water storage
- hot water storage
- water heating
- distribution – lead pipework should be removed and replaced
- flow rates and capacities
- protection against frost
- controls.

Electrical

Existing electrical installations should be replaced with new, unless it can be demonstrated that they are in a safe working condition, have a reasonable life expectancy and meet current requirements.

Items to be taken into account include:

- the age of the existing installation
- whether the existing installation is suitable for extending/upgrading.

Gas

existing gas services should be replaced with new, unless it can be demonstrated that they are in a safe working condition, have a reasonable life expectancy and meet current requirements.

Items to be taken into account include:

- condition/suitability of flues for gas installation
- gas pipes in unventilated voids
- corrosion of steel pipes
- whether the existing installation is suitable for extending/upgrading.

Space heating

existing heating systems should be replaced with new, unless it can be demonstrated that the existing service will achieve the required capacity, is in a safe working condition, with a reasonable life expectancy and meets current requirements.

The condition and capacity of any existing means of space heating should be established.

Above ground drainage systems

Where existing systems are to be retained and/or extended the new system should meet with current requirements.

z) Painting and decorating

Items to be taken into account include:

- the condition of existing painting and decoration
- whether existing painting, when cleaned down can provide a stable substrate for new work to enable satisfactory and durable finish
- where windows and doors are listed or of historic importance and are to be retained, they should typically be stripped before decoration
- any special coatings required e.g. breathable paints.

aa) Access

Items to be taken into account include:

- condition of existing paths and drives
- levels of paths etc and ground adjacent to the buildings
- the applicable sections of the Building Regulations, for buildings undergoing a 'Material change of use'.

ab) Garages and outbuildings

The survey(s) should identify the condition of buildings which will be used for garages, workshops or storage etc. and establish their suitability for that use.

Reference should be made to the individual clauses within these Standards for guidance on report requirements.

ac) Freestanding walls and retaining structures

Items to be taken into account include:

- the stability and condition of freestanding and retaining structures
- the effect of any proposed changes in loading
- the effect of any adjacent excavations or changes in ground levels etc
- that all weatherproofing details necessary to ensure durability are present and in satisfactory condition.

ad) Garden areas and landscaping

Items to be taken into account include:

- the effect of any changes in levels
- any waterlogging within 3m of the habitable parts of the building
- whether garden areas within 20m of habitable accommodation are adequately prepared, stable and provided with reasonable access
- whether proposed works increase the risk of such waterlogging
- the effect of any trees or shrubs that have been, or will be, removed.

National House-Building Council is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority.

National House-Building Council is registered in England & Wales under company number 00320784. National House-Building Council's registered address is NHBC House, Davy Avenue, Knowlhill, Milton Keynes, Bucks MK5 8FP.

NHBC Standards 2022 have been printed on material which is produced from sustainable forests and is fully

recyclable and biodegradable, ECF (elemental chlorine free) and is made to ISO 14001 Environmental Certification.



NHBC, NHBC House,
Davy Avenue, Knowlhill,
Milton Keynes,
Bucks MK5 8FP
Tel: 0344 633 1000
Fax: 01908 747255
www.nhbc.co.uk

