



**TAI CANOLBARTH CYMRU
MID-WALES HOUSING**

Yn barod **amdani** **Equal to the challenge**

SPECIFICATION CLAUSES

GENERALLY

To be read in conjunction with the Welsh Assembly Government Standard Documentation, the latest Building Regulations Approved Documents and contract/tender drawings.

Contractors should ensure that all elements of work comply with the current Building Regulations, The Code for Sustainable Homes, Robust Details, Lifetime Homes and Secured By Design and should allow in their tenders for all associated costs, in particular any requirements under the recently amended Part E, "Resistance to the Passage of Sound" and any sound testing that may be required by Building Control Officer.

ACCREDITED CONSTRUCTION DETAILS

Works to be carried out in strict accordance with the "Accredited Construction Details" to reduce air leakage.

The relevant checklists for the form of construction to be signed and dated by Site Manager/Supervisor to indicate that details have been complied with.

Copies of the completed checklists to be forwarded to Building Control and SAP Assessor.

AIR PERMEABILITY AND PRESSURE TESTING

Air pressure testing to be carried out for each dwelling type upon completion by Competent Qualified Persons and test results to be forward to the Building Inspector to show compliance with the airtightness requirement of the Building Regulations Approved Document Part L1A.

Where there are more than 4 but less than 40 of a dwelling type two tests will be required for that dwelling type.

Reasonable provision should be made to reduce unwanted air leakage through the building envelope to ensure an air permeability better than **5m³/hr per m² at 50Pa**.

The Building fabric to be constructed to ensure that there are no gaps or significant thermal bridges in the insulation layers and significant thermal bridges at junctions between elements and around openings.

Ensure that all window and door openings are fully draught-proofed and that all gaps are fully sealed around service penetrations to assist the airtightness of the building. Seal perimeters of rooms with sealant at junction of floor finish with skirting.

CODE FOR SUSTAINABLE HOMES

The development is to be designed and constructed to achieve Code of Sustainable Homes Level 4. The Contractor shall appoint a Code Assessor from the list of Assessors included within the Preliminaries and General Conditions. Include for all costs in complying with this requirement.

SAP CALCULATIONS

“Design Stage” Calculations and reports produced by SAP software will indicate that the predicted rate of carbon dioxide emissions from the dwelling (DER) is better than the Target Emissions Rate (TER) to comply with the Mandatory Element ENE 1 for the Code for Sustainable Homes. A 44% improvement is required for Code Level 4.

Any changes to the construction elements must be approved by the CA prior to implementation.

At handover of each dwelling provide the Employer with an accredited Energy Performance Certificate showing how the property performs, for inclusion within the Home User Guide.

SOUND TESTING/ROBUST DETAILS

The separating walls and floors are to be registered with and built to Robust Details Standards to achieve credits under Section HEA2 of the Code for Sustainable Homes.

Copies of the relevant Robust Detail registration certificates to be provided for the Code Assessor and Building Control. A copy is also to be submitted to the CA upon receipt.

The Robust Detail checklists to be completed and signed by the Site Manager/Supervisor and submitted to the Code Assessor and Building Control at the relevant stage.

SECURED BY DESIGN

The Contractor shall obtain ‘Secured by Design’ Certification for the project in consultation with the Architectural Liaison Officer.

A copy of “Secured by Design” certificate is to be provided by the Contractor to the Code Assessor for compliance with Section MAN4 of the Code for Sustainable Homes. A copy is also to be submitted to the CA upon receipt.

CONSIDERATE CONSTRUCTORS SCHEME

The site is to be registered with the Considerate Constructors Scheme. The Contractor must achieve a score of between 24 and 31.5 points for compliance with the Code for Sustainable Homes.

A copy of the Considerate Constructors Scheme Certificate/Score Sheets to be provided to the Code Assessor for Section MAN2 of the Code for Sustainable Homes. A copy is also to be submitted to the CA upon receipt.

LIFETIME HOMES

All dwellings are to be built to comply with points 1 to 16 of the Lifetimes Homes Standards.

An “As Built Lifetime Homes Checklist” indicating compliance with all points to be completed by Site Manager / Supervisor for section HEA4 of The Code for Sustainable Homes.

SITE WASTE MANAGEMENT PLAN

The Contractor will be required to provide and implement a Site Waste Management Plan. The Plan should include the following:-

- Monitoring Of Waste Generated On Site
- Targets To Promote Resource Efficiency
- The Waste Groups
- Compliance With Best Practice
- Procedures For Reducing Waste
- Commitments For Reducing Waste
- Procedures To Sort, Reuse and Recycle Waste
- Commitments To Sort, Reuse & Recycle Waste

A copy of the Site Waste Management Plan and completed final copy of Checklist WAS 2a, 2b, 2c and 2d to be provided to the Code Assessor for Section WAS2 of the Code for Sustainable Homes. A copy is also to be submitted to the CA.

CONSTRUCTION SITE IMPACTS

Where credits are being sought under Section MAN 3 of the Code for Sustainable Homes a strategy to operate site management procedures for the following items to be carried out:

- Monitor, report and set targets for CO2 production or energy use arising from site activities.
- Monitor and report CO2 or energy use arising from commercial transport to and from site.
- Monitor, report and set targets for water consumption for site activities
- Adopt best practice policies in respect of air (dust) pollution arising from site activities
- Adopt best practice policies in respect of water (ground and surface) pollution occurring on the site
- 80% of site timber is reclaimed, re-used and responsibly sourced.

One credit is available where there are procedures that cover 2 or more of the items listed above.

Two credits are available where there are procedures that cover 4 or more of the items listed above.

FLOOD RISK ASSESSMENT

A Flood Risk Assessment is to be undertaken by the Drainage Engineer.

Copy of Assessment to be provided to Code Assessor for Section SUR 2 of the Code for Sustainable Homes, to demonstrate the probability of flooding for the site. A copy is also to be submitted to the CA upon receipt.

Where sites are located in Zones 2 and 3, finished floor level of dwellings to be placed at a minimum height of 600mm above the design flood level.

DRAINAGE CALCULATIONS

All new drainage to be installed in strict accordance with the drainage scheme and calculations prepared by Suitably Qualified Drainage Engineer to comply with the mandatory section SUR 1 of the Code for Sustainable Homes, to indicate the peak discharge flow rate from both the pre-developed site and the developed site. A copy is also to be submitted to the CA upon receipt.

Attenuation methods to be installed as required to ensure that the peak discharge rate from the site is reduced to either:-

- The pre-development sites estimated mean annual flood (Qbar) or,
- 2/ls/ha or,
- A minimum flow rate (litres per second) based on good practice guidelines
- to prevent easy blockage by ensuring the outlet throttle is not too small.

If rainwater is discharged to a public sewer or adopted surface water sewer, the flow rate requirements will be defined by the Sewerage Undertaker.

Hydrobrake self activating vortex flow to be installed as required to control flow of water from site into sewers, all to the Drainage Engineer's design.

MATERIALS

Should credits be sought under sections MAT2 and MAT3 of the Code for Sustainable Homes then certification will require to be provided to the Code Assessor to indicate that the materials are responsibly sourced for the following elements:-

MAT 2

- Frame
- Ground Floor
- Upper Floors (including separating floors)
- Roof
- External Wall
- Internal Walls (Including Separate Walls)
- Foundation/ Substructure (excluding sub-base Materials)
- Staircase
- Where any timber is used, 100% must be legally sourced.

MATERIALS (Cont'd)

MAT 3

- Stair
- Windows
- External & Internal Doors
- Skirtings and Architraves
- Fascias, soffits and bargeboards
- Kitchens
- Any Other Significant Use
- Where any timber is used, 100% must be legally sourced.

INSULATION

Documentation to be provided to Code Assessor for section POL1 of the Code for Sustainable Homes to confirm the types of insulation used for the following elements, in order that the Global Warming Potential (GWP) of the insulants can be assessed. A copy is also to be submitted to the CA upon receipt.

Examples include:

- Roofs
- Loft Access Hatches
- External Walls
- Internal Walls
- Lintels
- Ground Floor
- Upper Floors
- Hot Water Cylinder
- Pipe Lagging
- Cold Water Storage Tanks (Where Provided)
- Cylinder Jacket
- Composite Doors

HOME USER GUIDE

On completion of the project all dwellings are to be supplied with a Home User Guide which contains necessary details about the everyday use of the home in a format that is easy to understand.

The Guide should include the following items, which are covered in more detail in the checklist under section MAN 1 of The Code for Sustainable Homes:

- Operational Issues
- Environmental Strategy / Design and Features
- Energy
- Water Use
- Recycling And Waste

HOME USER GUIDE (Cont'd)

- Sustainable DIY
- Emergency Information
- Links, References And Further Information
- Provision of Information In Alternative Formats i.e. CD, Braille
- Site And Surroundings
- Recycling And Waste
- Sustainable Urban Drainage System. (SUDS)
- Public Transport
- Local Amenities
- Responsible Purchasing
- Emergency Information
- Links References and Further Information.

A checklist will require to be signed upon completion by the Contractor confirming that all of the above criteria have been included in the Homes User Guide for each dwelling.

A copy of the guide for each property is to be provided to Employer at Practical Completion of the Works.

Format: One paper copy of the Home User Guide is to be provided together with an electronic copy on CD/DVD in a PDF format.

INFORMATION ON ENERGY LABELLED WHITE GOODS.

Information on the EU Energy Efficiency Labelling Scheme of Efficient White Goods to be provided to each Dwelling for section ENE5 of the Code for Sustainable Homes.

A copy of the certificate and written confirmation that the certificate has been provided to all dwellings to be issued to the Code Assessor. A copy is also to be submitted to the CA.

SUBSTRUCTURES

SITE INVESTIGATION

A copy of the site investigation report is included with the tender documents.
The Contractor shall remain responsible for the foundation design as Clause A12: 171S.

EXISTING SERVICES

Details of known existing services either crossing or adjacent to the site are included as Appendix D to these Employer's Requirements. However, the Contractor shall undertake to full CAT Scan of the site to verify the information provided.

FOUNDATIONS

The Contractor is fully responsible for designing the foundations to serve the new dwellings.

Foundation design is to take into consideration the position of any proposed underground rainwater harvesting storage tanks, drainage attenuation, soakaways, buried fuel storage tanks and the like.

GROUND FLOOR CONSTRUCTION

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 2 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials in the foundation and substructure are responsibly sourced.

All insulation within substructure to be classified Zero ODP and to have a global warming potential of less than 5 (Section POL1 of the Code for Sustainable Homes) and evidence to be provided the Code Assessor.

THERMAL PERFORMANCE:

Ground floor construction to achieve a "U" Value of **0.20 W/m²K** or better subject to SAP Calculations and type of heating and ventilation system specified.

CONSTRUCTION:

Ground floor construction can be either pre-cast or in-situ concrete.

FLOOR VOID VENTILATION:

Where a suspended ground floor is proposed with a void below, adequate ventilation is to be provided using periscope vents in accordance with the Building Regulations. Vents built into brickwork are to terminate in a clay air brick in a colour to match the adjacent brickwork. The use of a plastic air bricks is not acceptable.

SUBSTRUCTURES (Cont'd)

RECESSES IN FLOOR CONSTRUCTION

Provision to be included within the ground floor slab (including the load bearing area) for a recessed area to enable future adaptations as shown in "Diagram B" included as an Appendix to this document within the following locations:-

- beneath the bath within bungalows and ground floor flats; and
- within the downstairs toilet of houses

RADON PROTECTION:

A geological survey is to be carried out to determine the appropriate level of radon protection measures. Where required, the following radon protection is to be installed as a minimum:-

Radon Barrier: Continuous Visqueen Radon Membrane of 300 micrometre (1200 gauge) polyethylene sheet to installed to entire floor on a blinded or smooth surface with overlaps of at least 150mm between sheets to avoid bridging and to make the construction as gas tight as possible.

Visqueen Radon Membrane to be installed in accordance with BRE Certificate No. 083/01

At perimeter of floors, membrane to be turned up edge of walls (external walls, internal walls and separating walls) and lapped with damp proof course below soleplates.

Where cavity walls are present, membrane to be linked to a cavity tray (supported by lean mix cavity fill).

Sealing of Joints: All Joints to be sealed using Visqueen Double Sided Jointing Tape and Visqueen Girth Jointing Tape.

Sealing to Columns (where applicable): Sealing to steel columns to be undertaken using Visqueen Gas Resistant Self Adhesive Membrane. Installation to be in accordance with BS Code of Practice 102 and BS8102.

All surfaces to be sealed using Visqueen tanking primer solution and allowed to dry thoroughly. All laps to Visqueen Radon membrane must be a minimum of 150mm

Service Pipe Penetrations: Airtight seals to be formed around all service entry points. Prefabricated "top hat" sections to be used for sealing around pipe entries

Punctures: If punctures occur in membrane, they should be covered with another part of the sheet and overlapped by at least 150mm and sealed as described above.

Where the level of protection stipulates, provide radon sumps and radon drains/vents. Vents are to terminate flush with the surround finished ground levels to prevent it from becoming a trip hazard.

SUBSTRUCTURES (Cont'd)

DAMP PROOF MEMBRANES AND/OR FLEXIBLE SHEET TANKING

HARDCORE BEDS:

Blind with not less than 13 mm of soft sand or pulverised fuel ash and consolidate to provide a smooth bed free of sharp projections.

POLYETHYLENE DAMP PROOF MEMBRANE:

- To PIFA Standard 6/83A and Agrément certified.
Thickness/gauge: 300 microns (1200 gauge).
- Lay sheets neatly and tuck well into angles to prevent bridging.
- Joint sheets with continuous strips of mastic between overlaps of not less than 150 mm and seal with tape along the edge of the upper sheet, leaving no gaps. Ensure that sheets are clean and dry at time of jointing. Use mastic and tape recommended for the purpose by sheet manufacturer.
- If sheets cannot be kept dry, double welted joints may be used provided they are temporarily weighted to hold the folds in position prior to laying concrete.
- Form folded welts at corners in upstands.
- Link with wall DPCs to form an impervious barrier to moisture.

SELF-ADHESIVE BITUMEN DAMP PROOF MEMBRANE/TANKING:

A type currently certified by the British Board of Agrément as suitable for the purpose and laid in accordance with the certificate.

PRIMER(S):

Type(s) recommended for the purpose by the sheet manufacturer. Apply by mopping, brushing or spraying to achieve an even and full cover of the surface. Allow to dry thoroughly before covering.

PIPES, DUCTS, CABLES, ETC:

Where these pass through sheeting, make junctions completely watertight using preformed collars fully bonded/sealed to both pipes and sheeting.

FLOATING FLOORS IN INSULATING CONSTRUCTION:

Type(s): Chipboard or screed. Allow for protection to prevent surface from becoming soiled during construction operations.

Where a timber floating floor is selected, provide additional treated softwood supports beneath to support point loads such as beneath stairs, kitchen units, door thresholds, storage heaters and the like.

Where to be laid on a new concrete or screed base:

- Ensure that drying aids have been turned off for not less than 4 days, then
- Test for moisture content using an accurately calibrated hygrometer in accordance with BS 8201:1987, Appendix A.
- Take readings in all corners, around perimeter and at various points over the area being tested.
- Do not lay flooring until all readings show 75% relative humidity or less.
- Lay vapour control layer of polyethylene not less than 125 microns (500 gauge)

SUBSTRUCTURES (Cont'd)

TYPES OF FLOORING FOR TIMBER FLOATING FLOOR CONSTRUCTION:

PLYWOOD FLOORING:

- Base: 50mm timber supports.
Flooring: Plywood to an approved national standard.
Bonding quality to BS EN 31-2:1993: Class 2 in bathrooms and kitchens, Class 1 elsewhere.
Appearance class to BS EN 635: Class 11.
Finish: Sanded
Minimum thickness: 16mm.
Edges: Tongued and grooved all edges.
Lay with long edges running across joists. End joints to be central over joists and staggered.
- Fix flooring to joists with 50 x 3.35mm annular ring shank nails spaced at 150 mm centres around floor perimeter and along short edges of each board, and 300 mm centres along intermediate supports. Fixings to be 25 mm from long edges and not less than 10 mm from short edges.
- Access panels to be fixed with 50mm long No. 8 screws into pilot holes at maximum centres specified for nailing or as specified by board manufacturer.
- Joint treatment: Bonded with PVA adhesive to BS EN 204:2001, class D3.
- Expansion provision: Leave a 10mm clear expansion gap around floor perimeter of floor area and any upstands. Form intermediate expansion/movement joints as recommended by flooring manufacturer.

PARTICLEBOARD FLOORING:

- Base: 50mm timber supports.
Flooring: Particleboard to BS EN 312:2003, Type P5.
Thickness: 18/19mm with supports at 450mm maximum centres
22mm with supports at 600mm maximum centres.
Edges: Tongued and grooved all edges.
Lay with long edges running across joists. End joints to be central over joists and staggered.
- Fix flooring to joists with 50 x 3.35mm annular ring shank nails spaced at 200 mm centres around floor perimeter and along short edges of each board, and 400 mm centres along intermediate supports. Fixings to be 25 mm from long edges and not less than 10 mm from short edges.
- Access panels to be fixed with 50mm long No. 8 screws into pilot holes at maximum centres specified for nailing or as specified by board manufacturer.
- Joint treatment: Bonded with PVA adhesive to BS EN 204, class D3.
- Expansion provision: Leave 10mm clear expansion gap around floor perimeter of floor area and any upstands. Form intermediate expansion/movement joints as recommended by flooring manufacturer.

INSULATION FOR FLOATING FLOOR CONSTRUCTION:

- Expanded polystyrene to BS 3837-1:2004. (ISD grade when used for sound insulation).
- Low compressibility rigid mineral fibre board, minimum density 75 Kg/m³ specially designed for proposed use.
- Insulation to have a global warming potential of less than 5.

SUBSTRUCTURES (Cont'd)

CEMENT:SAND/CONCRETE SCREEDS/TOPPINGS

TYPES OF ACCEPTABLE SCREED/TOPPING COMPRISE THE FOLLOWING:

FINE CONCRETE SCREED LAID DIRECTLY ON CONCRETE SLABS:

- Construction: Partially bonded.
Minimum thickness at any point: 50 mm
- Mix:
Cement: Ordinary Portland to BS EN 197-1:2000 or Portland blast furnace to BS EN197-4:2002, class 42.5.
Sand: To BS EN 12620:2002+A1:2008, grading limit M, but with not more than 10% passing sieve size 150 microns.
Coarse aggregate: To BS EN 12620:2002+A1:2008, 10 mm single sized.
Mix proportions: 1:4-5 total aggregate, proportion of sand to coarse aggregate between 60/40 and 40/60 adjusted to facilitate trowelling.
Admixture: Water reducing to BS EN 480-1:1998, dosage to manufacturer's recommendations.
Other requirements: flush floor ducting to carry horizontal pipework.
- Finish: Trowelled to receive thermoplastic tiles/vinyl sheet.

FINE CONCRETE SCREED LAID OVER INSULATION:

- Construction: floating
- Minimum thickness at any point: 65 mm
Insulation: As previously noted.
- Mix:
Cement: Ordinary Portland to BS EN 197-1:2000 or Portland blast furnace to BS EN197-4:2002, class 42.5.
Sand: To BS EN 12620:2002+A1:2008, grading limit M but with not more than 10% passing sieve size 150 microns
Coarse aggregate: To BS EN 12620:2002+A1:2008, 10 mm single sized.
Mix proportions: 1:4-5 total aggregate, proportion of sand to coarse aggregate between 60/40 and 40/60 adjusted to facilitate trowelling.
Admixture: Water reducing to BS EN 480-1:1998, dosage to manufacturer's recommendations.
- Other requirements: flush floor ducting to carry horizontal pipework
- Finish: Trowelled to receive thermoplastic tiles/vinyl sheet.

PROPRIETARY QUICK DRYING SCREED LAID DIRECTLY ON CONCRETE SLABS:

- Construction: Partially bonded as recommended by screed manufacturer.
- Minimum thickness at any point: 50mm.
- Manufacturer and reference: To BS EN 998-1:2003, BS EN998-2:2003 or Agrément certified.
Cement: Portland to BS EN 197-1:2000, class 42.5.
Sand: To BS EN 12620:2002+A1:2008, grading limit M, but with not more than 10% passing sieve size 150 micrometres.
Mix proportions: 1:4, or as recommended by screed manufacturer.
Admixture: Cement set retarding/water reducing to BS EN 480-1:1998 as recommended by screed manufacturer.
- Other requirements: Flush floor ducting to carry horizontal pipework
- Finish: Trowelled to receive thermoplastic tiles/vinyl sheet.

SUBSTRUCTURES (Cont'd)

PROPRIETARY QUICK DRYING SCREED LAID OVER INSULATION:

- Construction: Floating.
- Minimum thickness at any point: 65mm.
- Manufacturer and reference: To BS EN 998-1:2003, BS EN998-2:2003 or Agrément certified.
Cement: Portland to BS EN 197-1:2000, class 42.5.
Sand: To BS EN 12620:2002+A1:2008, grading limit M, but with not more than 10% passing sieve size 150 micrometres.
Mix proportions: 1:4, or as recommended by screed manufacturer.
Admixture: Cement set retarding/water reducing to BS EN 480-1:1998: Part 1 as recommended by screed manufacturer.
- Other requirements: Flush floor ducting to carry horizontal pipework to be provided where specified.
- Finish: Trowelled to receive thermoplastic tiles/vinyl sheet.

FLOATING CONSTRUCTION:

- Insulation: As previously described.
- Lay insulation with tight butt joints and continue up at all abutments with walls, columns, etc. for full depth of screed.
- Lay separating layer of polyethylene sheet not less than 125 microns thick (500 gauge) over insulation, lapping 100 mm at joints.
- Lay wire netting to BS EN 10223-2:1998, mesh size 50 mm, wire designation 19, over separating layer with 50 mm laps and tie securely with steel wire.

FLOATING CONSTRUCTION FOR SOUND INSULATION:

- Insulation: As previously described.
- Ensure that the base has no projections that may puncture the insulation.
- Lay foamed plastics sheet insulation on base and turn up for full depth of screed at all abutments with walls, columns, etc. Lap 100 mm at joints and seal with tape.
- Lay wire netting to BS EN 10223-2:1998, mesh size 50 mm, wire designation 19, over separating layer with 50 mm laps and tie securely with steel wire.

SUPERSTRUCTURES

GENERALLY

The Contractor has the option of utilising either load-bearing masonry, timber frame construction, or SIP frame construction all of which must comply with the procedures and/or the technical requirements of the Building Regulations Approved Documents and NHBC.

Consideration must be given to the "Green Guide Rating Scheme" when choosing the method of construction.

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 2 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials in the External Walls and Frame are responsibly sourced.

SUPERSTRUCTURES (Cont'd)

All timber used in the timber frame is to responsibly and **legally** sourced. The certification must also demonstrate the scheme of compliance i.e. FSC, CSA, SFI with Chain of Custody, PEFC or reused materials.

Certification for the Sheathing Board will also be required i.e. MTTC Certified.

All insulation within the External Walls, Internal Walls, Separating Walls, Roofs and Lintels are to be classified Zero ODP and to have a global warming potential of less than 5 (Section POL1 of the Code for Sustainable Homes) and evidence to be provided the Code Assessor.

THERMAL PERFORMANCE:

The external walls construction to achieve a "U" Value of **0.20 W/m²K** or better subject to SAP Calculations and type of heating and ventilation system specified.

FRAME

Where the Contractor proposes timber frame construction, the timber frame and roof trusses must be designed and manufactured to comply with the relevant sections of BS EN 1995-1-1:2004+A1:2008 and the procedural and/or technical requirements of NHBC. Where the Contractor proposes SIP frame construction, the frame and roof trusses must be designed and manufactured to comply with the relevant sections of BS EN 1995-1-1:2004+A1:2008 and the procedural and/or technical requirements of NHBC.

Calculations: Two complete sets of the frame calculations are to be made available by the Contractor for checking by the Building Inspector.

The chosen Sub-Contractor or any person or firm employed in any design capacity will be required to enter into a collateral warranty. The Contractor must satisfy himself that the Sub-Contractor is willing and able to enter into the warranty prior to obtaining a competitive quotation from the Sub-Contractor.

TIMBER FRAME CONSTRUCTION:

Vapour permeable thermo insulating vapour permeable membrane to be installed to assist in achieving minimum wall "U" Value.

FRAME (Cont'd)

The timber frame (including roof trusses) must be supplied and erected by one of the following frame manufacturers:-

- a) Neatwood Homes Ltd
Unit 6a
Westwood Industrial Estate
Pontrilas
Herefordshire
HR2 0EL
- b) Cox Long Ltd
Airfield Industrial Estate
Hixon
Stafford ST18 0PA
- c) Taylor Lane Timber Frame
Chapel Road
Rotherwas Industrial Estate
Hereford HR2 6LD
- d) Frame Wise Limited
Unit 5 Presteigne Industrial Estate
Presteigne
Powys
LD8 2UF
- e) Timber Kit Solutions Limited
Unit 8b/c
Rodenhurst Business Park
Shrewsbury
SY4 4QU.
- f) Lowfield Timber Frames Limited
Lowfield
Marton
Nr Welshpool
Powys

If the Contractor wishes to add further names(s) to the list, he must apply in writing to the C.A. giving, for each additional name, the details of not less than three Architects prepared to give references as to the quality of work carried out by that company on similar construction contracts.

If less than three companies named in the list are able and willing to carry out the relevant work, inform the C.A. without delay and obtain instructions on the inclusion of additional company(s) before proceeding.

FRAME (Cont'd)

Before the work to which the list relates starts on site, enter into a binding sub-contract agreement and confirm to the C.A. that this has been done, giving the name of the sub-contractor selected.

Walls/partitions adjacent to stairs in houses and walk up flats must be designed to allow future installation of a stairlift. Provide additional supports as necessary.

Where indicated on the drawings, provide preservative treated and stained timber posts to support porch roofs bearing on facing brick bases with lead capping, supported on suitable foundation.

SIP FRAME CONSTRUCTION:

Panels: 142mm overall thickness SIP system faced on both sides with 15mm OSB/3 to BS EN 300 autohesively bonded to a CFC/HCFC free, zero ODP, rigid urethane core (density 33kg/m³) during manufacture.

All endplates, headplates and bottom plates to be C16 timber. All timber posts (where required) to be C24 timber.

SIP system built off 142 x 38mm C24 treated soleplate laid on Polytext 500mu d.p.c.

Compressible sealer to be provided under soleplate to minimise air leakage.

INTERNAL WALLS

GENERALLY

CODE FOR SUSTAINABLE HOMES

Where credits are being sought under Section MAT 2 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials used in the internal wall construction are responsibly sourced.

All insulation within stud partitions to be classified Zero ODP and to have a global warming potential of less than 5 (Section POL1 of the Code for Sustainable Homes) and evidence to be provided the Code Assessor.

SEPARATING WALLS

GENERAL:

Separating walls between dwellings to be registered with and constructed in strict accordance with Robust Details appropriate for form of construction.

Vertical cavity barriers (width to suit cavity) to be installed as required with vertical d.p.c between face of barrier and masonry.

INTERNAL WALLS (Cont'd)

SOCKETS:

All electrical sockets and switches where located on separated walls to be staggered either side of wall. i.e. not back to back to ensure that Robust Details are complied with for Section HEA2 of the Code for Sustainable Homes.

Chases for services to be kept to a minimum and filled well with mortar.

CODE FOR SUSTAINABLE HOMES

Where credits are being sought under Section MAT 2 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials used in the separating wall construction are responsibly sourced.

All insulation within stud partitions to be classified Zero ODP and to have a global warming potential of less than 5 (Section POL1 of the Code for Sustainable Homes) and evidence to be provided the Code Assessor.

CONSTRUCTION

Blockwork or timber studwork is acceptable dependant on construction method and Robust Details.

Separating walls to be taken up to the underside of the roof decking. Junction between separating wall and roof to be filled with a flexible closer.

Solid blockwork or timber / metal studwork is acceptable dependant on construction method.

BLOCKWORK WALLS

100mm wide concrete blockwork tied to external skin.
Minimum mass per unit area excluding finish 120kg/m².

TIMBER STUD WALLS:

Timber stud partitions to comprise of 89 x 38mm studs at 600mm centres generally with one row of staggered noggins at mid height.
Some internal partitions to be clad with 9mm OSB fixed to one face for structural purposes (all to Timber Frame Manufacturers Design).

METAL STUD WALLS:

Non load bearing internal partitions to be proprietary 'C' section galvanised metal studs, (48mm wide).

STUD PARTITIONS TO ROOMS CONTAINING WC.

- Provide acoustic insulation between studs, tightly fitted with closely butted joints, leaving no gaps. Use fastenings where necessary to prevent slumping. The partition is to achieve a weighted sound reduction index of not less than 38Db over the frequency range 100-3150 Hz when tested in accordance with BS 2750
- Provide additional noggins / boarding as required to provide secure fixings for toilet roll holders etc and grab rails.

INTERNAL WALLS (Cont'd)

- To comply with Lifetime Homes Criteria 11 walls in the Bathroom and W.C should be capable of taking adaptations such as handrails. Wall reinforcements should be located at a height between 300mm and 1500mm from the floor.
- Provide 25mm WBP plywood or cementitious board to walls to perimeter of baths and shower areas:
 - Marine Plywood manufactured to an approved national standard.
 - Appearance class to BS EN 635: Class III
 - Bond quality to BS EN 314:-2:1993: Class 3
 - Finish: Unsanded.
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C8
- Type and desired service life: CCA or Organic Solvent/60 years.
- Method of fixing: Stainless steel annular ring shank nails.

WALL LINING ON STUD PARTITIONING

- Background: Timber studs at maximum 600mm centres.
- Lining: 15mm Gyproc Wallboard. (Duplex Wallboard to Bathrooms and Shower Rooms). All wallboards to have a minimum mass per unit area of 10kg/m².
2 layers of 12.5mm Fire line board where 60 minute protection required.
- Fixing: Fix securely to all supports working from the centre of each board using the specified method of fixing using galvanised steel wire nails with flat heads to BS 1202:1:2002, size:40 x 2mm at 150mm centres. Position fixings not less than 10 mm from bound edges, 13 mm from cut/unbound edges and not less than 6 mm from the edge of the timber support.
- Finishing: Taped seamless finish
Lightly sand cut edges of boards to remove paper burrs. Apply PVAC sealer to exposed cut edges of boards and any other plaster surfaces to which tape is to be applied. Fill all joints, gaps and internal angles with joint compound and cover with continuous lengths of paper tape, fully bedded. Reinforce external angles, stop ends, etc. with the specified bead/corner tape.
When set, cover with joint finish, feathered out to give a flush, smooth, seamless surface.
Spot nail/screw depressions with joint filler to give a flush surface.
Fill minor indents. After joint, angle and spotting treatments have dried, lightly sand to remove any minor imperfections.
Apply specified primer/sealer to give a continuous consistent texture to surface of boards.

INSULATION BETWEEN STUDWORK

25mm thick (minimum) acoustic insulation with minimum density of 10kg/m³ to be installed between studwork.

INTERNAL WALLS (Cont'd)

PLASTERBOARD DRY LININGS/PARTITIONS

TYPE(S) OF DRY LINING

WALL LINING ON TIMBER STUD PARTITIONS.

- Background: Timber studs at maximum 600mm centres.
- Lining: 15mm wallboard where 30 minutes fire resistance required. 2 layers of 12.5mm Fire line board where 60 minute protection required.
- Fixing: Using galvanised steel wire nails with flat heads to BS 1202:Part 1, size:40 x 2mm.
- Finishing: Taped seamless finish, or skim coat plaster finish

METAL STUD PARTITIONS

- Strength to BS 5234-2:1995: Grade: medium
- Framing: As recommended for the purpose by the board manufacturer, fabricated from galvanized mild steel sheet to BS EN 10327:2004 designation Fe PO2 G Z 275 NA - C.
- Lining(s): 15mm wallboard where 30 minutes fire resistance required. 2 layers of 12.5mm Fire line board where 60 minute protection required.
- Finishing: Taped seamless finish; or skim coat plaster finish.

WALL LINING ON ADHESIVE TO EXTERNAL WALLS/PARTITIONS.

- Background: Concrete blockwork
- Installation: As appropriate and in accordance with manufacturers' recommendations.
- Lining: 12.5mm wallboard, or insulation backed plasterboard.
- Finishing: Taped seamless; or skim coat plaster finish.

ADDITIONAL SUPPORTS FOR FIXTURES AND FITTINGS:

Provide accurately positioned and securely fixed framing to support fixtures, fittings and services. After fixing boards, mark positions of framing for following trades.

PLASTERBOARD GENERALLY:

To BS EN 520:2004+A1:2009, types 1 to 5 with exposed surface and edge profiles suitable to receive the specified finish.

MOISTURE RESISTANT PLASTERBOARD:

To BS EN 520:2004+A1:2009, type 3 and 4 with moisture resistant core and moisture repellent paper facings.

SKIM COAT PLASTER FINISH:

Skim coat: Board finish plaster to BS EN 13279-1:2005 and BS EN 13279-2:2004, class B. Thickness: 2 - 3 mm.

- Fill and tape all joints except where coincident with metal beads.
- Trowel/float to a tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

RIGID BEADS/STOPS:

- Material: Galvanised steel to BS EN 13658-1:2005 and BS EN 13658-2:2005.

UPPER FLOORS

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 2 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials in the foundation and substructure are responsibly sourced.

All insulation within upper floors to be classified Zero ODP and to have a global warming potential of less than 5 (Section POL1 of the Code for Sustainable Homes) and evidence to be provided the Code Assessor.

DESIGN

Upper floors to be designed to ensure appropriate structural, sound and impact insulation standards to ensure compliance with current Building Regulations and Robust Details where applicable.

TIMBER JOISTS

Solid or FJI with and Agrément certificate suitable sized and spaced to suit spans. Joists to be doubled up under stud partitions running parallel to joists and underneath bath supports.

To limit air leakage no joists are to be built into the external walls.

STRUTTING

Strutting to be installed between floor joists as required to comply with the Building Regulations.

Securely fix strutting between joists as follows:

Joist spans of 2.5 to 4.5 m: One row at centre span.

Joist spans over 4.5 m: Two rows equally spaced.

- Strutting to be one of the following:
 - Herringbone strutting, at least 38 x 38 mm softwood and located clear of top and bottom edges.
 - Solid strutting, at least 38 mm thick softwood and the full depth of joist.
- Outer joists to be blocked solidly to perimeter walls.
- Fix solid strutting at all joist bearings which are not built in.

LATERAL RESTRAINT STRAPS:

30mm x 5mm galvanised mild steel or stainless steel anchor straps (minimum 1200mm long) to be installed at 2000mm maximum centres and 500mm from corners, fixed across 3 joists. Straps to be held tight against masonry.

38mm wide minimum noggins to extend at least half the depth of the joist to be installed between joists for straps to be fixed to. Joists to be blocked to wall.

JOIST HANGERS FOR BUILDING IN:

- To BS EN 845-1:2003+A1:2008, part 1, size and type to suit joist, design load and crushing strength of supporting construction.
- Material/finish to be either;
 - a. Post galvanised steel to BS EN ISO 1461:1999, minimum zinc coating 460 g/m²
 - b. Pre-galvanised steel to BS EN 10143:1993, minimum zinc coating 600 g/m²
 - c. Austenitic stainless steel to BS EN 10029:1991, BS EN 10048:1997, BS EN 10051:19 or BS 970: Part 1:1983 and BS EN 10090:1998.

UPPER FLOORS (Cont'd)

TIMBER TO TIMBER HANGERS:

- Material/finish to be either:
 - a. Post galvanised steel to BS EN ISO 1461:1999, minimum zinc coating 460 g/m²
 - b. Pre-galvanised steel to BS EN 10143:1993, minimum zinc coating 600 g/m²
 - c. Austenitic stainless steel to BS EN 10029:1991, BS EN 10048:1997, BS EN 10051:19 or BS 970:Part 1:1983 and BS EN 10090:1998.
- Size: To suit joist, design load and crushing strength of supporting construction.

THROUGH FLOOR LIFT:

To comply with Design Criteria 12 of Lifetime Homes provision should be made within the Upper floor construction for a future through floor lift. Floor joists to be trimmed as required to create a 1000mm x 1500mm opening in position indicated on drawings or in position to be agreed with Employer. Capped off electrics to be provided for future through floor lift. (Refer to Electrical Specification).

TRIMMING:

Trim out around staircase, future through floor lift (and chimney if applicable).

INSULATION BETWEEN JOISTS:

100mm minimum thickness glass mineral wool insulation CFC, HCFC Free with zero ODP with a minimum density of 10kg/m³ to be installed between all floor joist to comply with Part E of the Building Regulations.

Evidence to be provided to Code Assessor in order that GWP of the Insulant can be assessed.

TIMBER BOARD FLOORING

- Base: Timber joists
- Boards: Tongued and grooved softwood to BS 1297:1989.
Finished thickness: 18 mm for joists at 450mm centres, 19 mm for joists at 600 mm centres.
- Moisture content: Notwithstanding BS 1297:1989, clause 6.1, average moisture content at time of fixing to be 9 to 13%.
- Fixing: With 50 mm oval brad head nails, two per board. Access panels to be fixed with 50mm long no.8 screws

FLOOR TO BULKHEAD STORES

Provide horizontal floor to bulkhead stores at lowest practicable level subject to any changes in level shown on drawings. Doors and ironmongery to match internal doors generally are to be fixed to bulkhead so that it can be used as a store.

UPPER FLOORS (Cont'd)

PLYWOOD FLOORING:

- Base: 50mm timber supports.
- Flooring: Plywood to an approved national standard.
Bonding quality to BS EN 314:2-1995: Class 2 in bathrooms and kitchens, Class 1 elsewhere.
Appearance class to BS EN 635: Class 11.
Finish: Sanded
Thickness: 16mm.
Edges: Tongued and grooved all edges.
Lay with long edges running across joists. End joints to be central over joists and staggered.
- Fix flooring to joists with 50 x 3.35mm annular ring shank nails spaced at 150 mm centres around floor perimeter and along short edges of each board, and 300 mm centres along intermediate supports. Fixings to be 25 mm from long edges and not less than 10 mm from short edges.
Access panels to be fixed with 50mm long No. 8 screws into pilot holes at maximum centres specified for nailing or as specified by board manufacturer.
- Joint treatment: Bonded with PVA adhesive to BS EN 204:2001, class D3.
- Expansion provision: Leave 10 mm clear expansion gap around floor perimeter of floor area and any upstands. Form intermediate expansion/movement joints as recommended by flooring manufacturer.

PARTICLEBOARD FLOORING:

- Base: 50mm timber supports.
Flooring: Particleboard to BS EN 312:2003, Type P5.
Thickness: 18/19mm with supports at 450mm maximum centres
22mm with supports at 600mm maximum centres.
Edges: Tongued and grooved all edges.
Lay with long edges running across joists. End joints to be central over joists and staggered.
- Fix flooring to joists with 50 x 3.35mm annular ring shank nails spaced at 200 mm centres around floor perimeter and along short edges of each board, and 400 mm centres along intermediate supports. Fixings to be 25 mm from long edges and not less than 10 mm from short edges.
Access panels to be fixed with 50mm long No. 8 screws into pilot holes at maximum centres specified for nailing or as specified by board manufacturer.
- Joint treatment: Bonded with PVA adhesive to BS EN 204:2001, class D3.
- Expansion provision: Leave 10mm clear expansion gap around floor perimeter of floor area and any upstands. Form intermediate expansion/movement joints as recommended by flooring manufacturer.

ACCESS PANELS:

Agree size and position with CA before boards are fixed. Provide additional noggings, battens, etc., to all unsupported edges and to provide intermediate supports as necessary and fix in accordance with board manufacturers recommendations.

UPPER FLOORS (Cont'd)

SEPARATING FLOORS:

Separating floors between dwellings to be registered with and constructed in strict accordance with Robust Details appropriated for form of construction.

Horizontal cavity barriers (width to suit cavity) to be installed as required with vertical d.p.c between face of barrier and masonry.

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 2 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials used in the separating floor construction are responsibly sourced.

All insulation within separating floors to be classified Zero ODP and to have a global warming potential of less than 5 (Section POL1 of the Code for Sustainable Homes) and evidence to be provided the Code Assessor.

ROOFS

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 2 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials in the roof construction are responsibly sourced.

TRUSSED RAFTERS:

Designed and fabricated to BS 5268: Part 3: 2006 by a company, which is a member of the TRADA Trussed Roofing Quality Assurance Scheme, and they shall be marked accordingly.

Truss system: Galvanized Steel Plate Connectors, Agrément Certified.

Calculations: Two copies of the roof truss calculations are to be made available for checking by the Building Inspector.

TRUSS CLIPS:

Material/finish: Stainless steel

- Fix securely with 32 x 3.5 mm galvanized or sheradized square twisted nails in every hole.

PERMANENT BRACING OF TRUSSED RAFTERS:

- Fix bracing and binders to every rafter, strut or tie with not less than two 75 x 3.35 mm galvanized round wire nails.
- Any lap joints must be side by side extending over and nailed to at least two truss members.
- Where a binder crosses a brace, interrupt and plate the binder.

VERTICAL RESTRAINT STRAPS:

Material/finish: Galvanised mild steel or stainless steel.

LATERAL RESTRAINT STRAPS:

Material/finish: Galvanised mild steel or stainless steel.

ROOFS (Cont'd)

WALL PLATES: Ensure that wall plates are:

- Positioned and aligned to give the correct span and level for trusses, joists, etc.
- Fully bedded in fresh mortar.
- In lengths of not less than 3 m with half lap joints.

SOLAR PANEL FIXINGS:

Fixings to be provided in strict accordance with solar panel manufacturers instructions.

ACCESS BOARDING IN ROOF SPACE

Where tanks and/or equipment are located within the roof space, provide 8 m² of boarding within the roof spaces ensuring that any tanks or cisterns may be easily reached from the ceiling hatch. Access boarding to be capable of carrying an imposed load of 1.5KN/m². Use battens or similar as necessary to maintain full specified thickness of loft insulation beneath boarding.

ORGANIC SOLVENT PRESERVATIVE TREATMENT TO ROOF TIMBERS:

- Moisture content of timber at time of treatment to be as specified for the component at time of delivery. After treatment, timber to be surface dry before use.
- Application: Double vacuum/low pressure.
- Organic solvent type as British Wood Preserving and Damp-proofing Association Commodity Specification C8.

CEILING TRACK SUPPORT

To comply with Design Criteria 14 of Lifetime Homes provision should be made within the roof structure by means of suitably sized timber joists for possible later installation of ceiling track hoist from Main Bedroom to bathroom. Track lines should be positioned approximately as indicated on the sketch guideline details included as an Appendix. Track line should run through centre of each doorway. The joists should be capable of supporting a load of 130 kg.

VENTILATION OF ROOF SPACE

Roof spaces to be ventilated to fully comply with Building Regulations and NHBC.

FASCIAS/BARGEBOARDS/ SOFFITS

Type: Timber or PVC-U to BS 7619:1993

Colour : (to be approved by Employer)

Where credits are being sought under Section MAT 3 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all materials used for the fascias/ soffits and bargeboards are responsibly and **legally** sourced.

PVC-U FASCIAS/BARGES/SOFFITS:

- Cellular pvc-u profiles and accessories to BS 7619:1993 or Agrément Certified.
- Support timber: To be in accordance with manufacturer's instructions/recommendations. Provide additional support at joints.
- Fixings: To be in accordance with manufacturer's instructions/recommendations using stainless steel fixings.
- Installation to be carried out by a contractor approved by the system manufacturer.

ROOFS (Cont'd)

WROT TIMBER FOR FASCIAS/BARGEBOARDS

- Quality of timber: To BS 1186-3:1990: Class 2. Moisture content at time of fixing: 13 to 19%.
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C5.
Type/desired service life: Organic solvent/60 years (ensure compatibility with decorative coating system).
- Method of fixing to each support: Stainless steel lost head nails.

FIBRE CEMENT BOARD FOR SOFFITS

Non-asbestos based board designed for proposed use with BBA certificate or other third party assurance.

Nails for fixing: Stainless steel annular ring shank.

TYPE(S) OF TIMBER

GRADED SOFTWOOD FOR STRUCTURAL USE GENERALLY

- Strength graded to BS 4978:2007 or BS EN 14081-1:2005, BS EN 14081-2:2005 and BS EN 1408 or other national equivalent and so marked.
Surface finish: Sawn generally, regularised for floor joists.
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C 8
Type/desired service life: CCA or Organic Solvent/60 years.

UNGRADED SOFTWOOD FOR NON STRUCTURAL FRAMING

- Free from decay, insect attack (except pinholes borers) and with no knots wider than half the width of the section.
- Surface finish: Sawn generally, regularised for studding in partitions.
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C8
Type/desired service life: CCA or Organic Solvent/60 years.

WROT TIMBER FOR FASCIAS/BARGEBOARDS

- Quality of timber: To BS 1186-3:1990 Class 2.
Moisture content at time of fixing: 13 to 19%.
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C5.
Type/desired service life: Organic solvent/60 years (ensure compatibility with decorative coating system).
- Method of fixing to each support: Stainless steel lost head nails.

PLYWOOD GENERALLY

- Manufactured to an approved national standard.
Appearance class to BS EN 635: Class III
Bond quality to BS EN 314-2:1993: Class 3
Finish: Unsanded.
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C8
Type and desired service life: CCA or Organic Solvent/60 years.
- Method of fixing: Stainless steel annular ring shank nails.

ROOFS (Cont'd)

PLYWOOD TO RECEIVE DECORATION

- Manufactured to an approved national standard.
Appearance class to BS EN 635: Class II or III
Bond quality to BS EN 314-2:1993: Class 3
Finish: Sanded
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C8
Type and desired service life: Organic Solvent/60 years (ensure compatibility with decorative coating system).
- Method of fixing: Stainless steel lost head nails.

FIBRE CEMENT BOARD FOR SOFFITS

- Non-asbestos based board designed for proposed use with BBA certificate or other third party assurance.
- Nails for fixing: Stainless steel annular ring shank.

JOINTING/FIXING GENERALLY:

Fasteners to comply with relevant British Standards.

BLACK BOLTS AND NUTS:

To BS EN 20898

BLACK CUP AND COUNTERSUNK HEAD BOLTS AND NUTS:

To BS 4933:1973

WASHERS:

- Plain to BS 4320:1968, spring to BS 4464:1969.
Material and finish to match bolts.
- Dimensions when seated directly on timber surfaces, unless specified otherwise:
Diameter/side length: not less than 3 times bolt diameter.
Thickness: not less than 0.25 times bolt diameter.

JOINTING/FIXING GENERALLY:

Fastenings to comply with relevant British Standards.

BOLTED JOINTS:

- Locate holes accurately and drill to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger.
- Place washers under all bolt heads and nuts that would otherwise bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building.
- Tighten bolts so that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut.
- Check at agreed regular intervals up to Practical Completion and tighten as necessary to prevent slackening of joints.

BOLTED JOINTS WITH CONNECTORS:

- Connectors: To BS EN 912:2000
- Assemble joints without crushing timber, deforming washers or overstressing bolts.

ROOFS (Cont'd)

ANTICORROSION FINISH(ES) FOR FASTENERS:

- To BS EN ISO 1461:1999 for galvanizing, with internal threads tapped and lightly oiled following treatment.
- To BS 4921:1988, Class 1 for sherardizing.
- To BS 7371-3:2009, BS EN ISO 4042:2000 and passivated, for zinc plating.
- Where no particular treatment is specified, select from the above to suit service conditions.

ADDITIONAL SUPPORTS:

- Where not shown on drawings, position and fix additional studs, noggings or battens for appliances, fixtures, edges of sheets, etc., in accordance with manufacturers' recommendations.
- All additional studs, noggings or battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

VENTILATION:

BREATHER MEMBRANE:

Proprietary breather membrane with a BBA certificate to be fixed over roof timbers and allowed to drape slightly (maximum 15mm to prevent risk of wind uplift) beneath tiling battens.

EAVES SOFFIT VENTILATION:

- If required fix soffit board(s) to leave a continuous ventilation opening to conform with Building Regulations
- Fix a 3 to 4 mm mesh screen across the opening to prevent large insect entry.
- Ensure that the ventilation path is not blocked by insulation at eaves.

VENTILATED EAVES:

- Where required install proprietary eaves soffit ventilators/ventilation
- Lay mineral fibre insulation over wallplate. Fix proprietary ventilator trays between each support to provide free passage of air over insulation.
- Fix continuous support for underlay at eaves to prevent water retaining troughs.
- Fix a strip of BS EN 1307:2004+A2:2009, type 5U felt, or comparable durable underlay, to underlap first full course of underlay.
- Dress underlay or underlay carrier down into gutter.
- Fix eaves undercourse and first course tiles with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is the lesser.

DRY VENTILATED RIDGE:

- Where required lay top courses of underlay to provide an air gap at apex as recommended by tile manufacturer.
- Dry ridge fixing batten(s): battens to size and fixing recommended by tile /slate manufacturer.
- Lay eaves/top tiles and clip or nail fix as recommended by tile manufacturer or finish slating with head-nailed short course to maintain gauge and provide an air gap.
- Dry ridge tiles: proprietary dry ventilated ridge system fixed with stainless steel screws or nails as recommended by tile manufacturer.
- Fix block end ridge units at gable ends.

ROOFS (Cont'd)

DRY RIDGE:

- Where required lay top course of underlay from one side of ridge over apex to overlap top course of underlay at other side by not less than 150 mm.
- Dry ridge fixing batten(s): battens to size and fixing recommended by tile manufacturer.
- Lay eaves/top tiles and clip or nail fix as recommended by tile manufacturer.
- Dry ridge tiles: proprietary dry ridge system fixed with stainless steel screws or nails as recommended by tile manufacturer.
- Fix block end ridge units at gable ends.

DRY HIP:

- Lay courses of underlay over hip with overlaps of not less than 150 mm.
- Dry hip fixing batten(s): battens (and spacing blocks where required) to size and fixing recommended by tile manufacturer.
- Cut and fix tiles close to hip fixing battens.
- Dry hip tiles: proprietary dry hip system fixed with stainless steel screws or nails as recommended by tile manufacturer.
- Fix block end hip tiles at eaves.

ROOF SLOPE TERMINALS:

- Ventilator tiles: Three-tile unit with integral terminal outlet
- Ventilator slates: slate unit with integral tunnel outlet.
- Fix with underlay seal and connect to pipe, as follows:
Soil and vent pipes and mechanical ventilation pipes (use flexible connecting pipes)
Roof ventilation where cross ventilation is not available.

ROOF INSULATION:

To Comply with Building Regulations Approved Documents, provide a minimum thickness of 350 mm in 3 layers at horizontal ceiling level to achieve a "U" Value of **0.13W/m2K** or better subject to SAP Ratings and type of heating and ventilation system specified.

All insulating materials to have a Global Warming Potential of less than 5 (Section POL1 of the Code for Sustainable Homes) and evidence to be provided the Code Assessor.

MINERAL WOOL INSULATION LAID BETWEEN CEILING TIES/JOISTS:

Zero ODP Unfaced Glass Mineral wool mats with an A+ Green Guide Rating to BS EN 13162:2001, Kitemark certified and installed to BS 5803-5:1985.

Before laying, ensure that holes in the ceiling for pipes, lighting drops, etc. are sealed and all debris has been removed.

Fit tightly with closely butted joints, leaving no gaps and extending over wall plates.

Ensure that eaves ventilation is unobstructed and electric cables are not covered (unless they have been sized accordingly).

Do not lay insulation below water cistern platform(s) but fit tightly against cistern insulation.

ROOFS (Cont'd)

MINERAL WOOL INSULATION LAID ACROSS CEILING TIES/ JOISTS:

Zero ODP Unfaced Glass Mineral wool mats with an A+ Green Guide Rating to BS EN 13162:2001, Kitemark certified and installed to BS 5803-5:1985.

Before laying, ensure that holes in the ceiling for pipes, lighting drops, etc. are sealed and all debris has been removed.

Use widest practical widths of insulation and lay at right angles to ties/joists with closely butted joints, leaving no gaps.

Cut and fit neatly around rafter ends so that insulation extends over wall plates.

Ensure that eaves ventilation is unobstructed and electric cables are not covered (unless they have been sized accordingly).

Do not lay insulation below water cistern platform(s) but fit tightly against cistern insulation.

BLOWN CELLULOSE FIBRE LOFT INSULATION:

Wet blown recycled cellulose insulation – density 45kg/m² with an A+ Green Guide Rating

of a type currently certified by the British Board of Agrément as suitable for the purpose and installed in accordance with the certificate by a BBA approved installer or, Manufactured to BS 5803-3:1985 and installed in accordance with BS 5803:Part 5 by a firm currently registered under a quality assurance scheme operated by a certification and inspection body accredited by the United Kingdom Accreditation Service (UKAS). Before commencing, ensure that holes in the ceiling for pipes, lighting drops, etc. are sealed and all debris has been removed.

Ensure that eaves ventilation is unobstructed and electric cables are not covered (unless they have been sized accordingly).

Ensure that insulation is not laid below water cistern platform(s).

SLOPING CEILING INSULATION:

Where required the rafter level insulation to be a HCFC/CFC Zero ODP rigid urethane insulation core with low emissivity composite foil facings on both sides.

Insulated sloping ceilings to achieve a “U” Value of **0.13W/m²K** or better subject to SAP Ratings and type of heating and ventilation system specified.

SUN PIPES:

Where required proprietary sunpipes to be installed to roofs where indicated on the drawings consisting of a 230mm diameter duct with adjustable elbows as required, ceiling diffuser and UV protected diamond polycarbonate top dome with brushed nylon condensation trap between dome and duct.

Flashing with integrated collar to be provided at intersection of sunpipe and roof finish.

Installation to be in strict accordance with manufactures instructions.

ROOFS (Cont'd)

VELUX ROOFLIGHTS:

Where required, or where indicated on drawings, install proprietary centre pivot Velux double glazed rooflights.

Glazing: Velux roof lights to have Thermo-Star (--59) energy efficient 24mm double glazing option.

Inner Pane: 4mm float glass with Low E Coating
Cavity: 16mm gas filled cavity
Outer Pane: 4mm Toughened Outer Pane
Overall "U" Value: **1.1W/m²K** or better subject to SAP Ratings and type of heating and ventilation system specified.

Rooflights to be complete with all flashings installed as per manufacturer's instructions.

CEILING HATCHES

Purpose made (i.e. non proprietary) insulated loft access hatches to be provided to all roof spaces in position to be agreed with CA. Form a 717mm wide x 555mm structural opening between truss ceiling chords at 600mm centres.

Hatch opening to contain minimum 680mm x 520mm hinge down access trap with locking latch. Phenolic Board Insulation. (U-Value 0.35W/m² K to be achieved) or equal approved. To minimize air leakage loft access hatch to be fitted with draught seals.

Confirmation of the type of insulation used for the loft hatch to provided for the Code Assessor to assess the Global Warming Potential (GWP) of the insulants under section POL1 of the Code for Sustainable Homes.

Where fire resistance if required an alternative hatch is to be used in accordance with Building Regulations Approved Document B2/B3

ROOF FINISHES

Roof finishes: to be Contractor's choice (subject to approval by the Employer and the Local Authority Planning Department).

GENERALLY :

- Type: As proposed by the Contractor and to the approval of Local Authority Planning Department and with a Green Guide Rating of "A" or better.
- Pitch: As indicated on drawings.
- Colour and reference: The Employer reserves the right to approve the finish proposed by the Contractor.
- Ridge: Dry fix ridges with proprietary matching end caps.
- Dry verges to be used.
- Valleys: Prefabricated or Code 05 lead lined valleys.
- Solar Panels: As required to satisfy the requirements of the Code for Sustainable Homes.

ROOFS (Cont'd)

CONCRETE ROOF TILING :

- Pitch: As specified elsewhere.
- Underlay: Breathable Membrane or Underlay to BS EN 1307:2004+A2:2009 Type 1F reinforced bitumen felt
Lay directly over rafters or over sarking board.
- Minimum horizontal lap: 100 mm for pitches of 35 degrees and above, 150mm for pitches below 35 degrees.
- Battens: to BS 5534:2003+A1:2010
- Fixing: BS 5534:2003+A1:2010. Nails to be galvanised, sheradized or stainless steel.
- Tiles: To BS EN 490:2004+A1:2006 non-interlocking.
Colour: To the approval of Local Authority Planning Department
Size: 265 x 165 mm, minimum thickness 9.5mm.
Minimum headlap: 75 mm

FIBRE CEMENT SLATE:

- Pitch: As specified elsewhere.
- Underlay: Breathable Membrane or Underlay to BS EN 1307:2004+A2:2009 Type 1F reinforced bitumen felt.
Lay directly over rafters or over sarking board.
- Minimum horizontal lap: 100 mm for pitches of 35 degrees and above, 150mm for pitches below 35degrees
- Battens: BS 5534:2003+A1:2010
- Fixing: BS 5534:2003+A1:2010.Nails to be galvanized, sheradized or stainless steel.
- Slates: To BS EN 492:2004, Type NT.
Colour: To the approval of Local Authority Planning Department
Size: 600 x 300 mm
Minimum headlap: as recommended by manufacturer for exposure category.
Fixing: Using 2 nails and 1 disc rivet per slate.

RECONSTITUTED SLATE:

- Pitch: As specified elsewhere.
- Underlay: Breathable Membrane or Underlay to BS EN 1307:2004+A2:2009 Type 1F reinforced bitumen felt
Lay directly over rafters or over sarking board.
- Minimum horizontal lap: 100 mm for pitches of 35 degreed and above, 150mm for pitches below 35 degrees.
- Battens: BS 5534:2003+A1:2010
- Fixing: BS 5534:2003+A1:2010 .Nails to be galvanized, sheradized or stainless steel.
- Slates: Agrément or Wimlas certified.
Colour: To the approval of Local Authority Planning Department
Size: 600 x 300 mm
Minimum headlap: as recommended by manufacturer for exposure category.
Fixing: Using 2 nails per slate.

ROOFS (Cont'd)

NATURAL SLATE:

- Pitch: As specified elsewhere.
- Underlay: Breathable Membrane or Underlay to BS EN 1307:2004+A2:2009 Type 1F reinforced bitumen felt
Lay directly over rafters or over sarking board.
Minimum horizontal lap: 100 mm for pitches of 35 degrees and above, 150mm for pitches below 35 degrees.
- Battens: to BS 5534:2003+A1:2010
- Fixing: to BS 5534:2003+A1:2010. Nails to be galvanized, sheradized or stainless steel.
- Slates: To BS EN 12326-1:2004, produced by a firm currently registered under a quality assurance scheme operated by a certification and inspection body accredited by United Kingdom's Accreditation Service (UKAS). Provide independently certified evidence of compliance with BS EN 12326-1:2004 (eg. BSI Kitemark).
Minimum headlap: Comply with BS 5534:2003+A1:2010, clause 3.3.

CONCRETE ROOF TILING:

- Pitch: As specified elsewhere.
- Underlay: Breathable Membrane or Underlay to BS EN 1307:2004+A2:2009 Type 1F reinforced bitumen felt
Lay directly over rafters or over sarking board.
Minimum horizontal lap: 100 mm for pitches of 35 degrees and above, 150mm for pitches below 35 degrees
- Battens: to BS 5534:2003+A1:2010
- Fixing: to BS 5534:2003+A1:2010. Nails to be galvanized, sheradized or stainless steel.
- Tiles: To BS EN 490:2004+A1:2006 , interlocking.
Minimum thickness of body 9.5 mm, minimum thickness of interlocking portion 6.3 mm.
Type and colour as specified on the drawings
Minimum headlap: follow manufacturer's recommendations
Fixing: To BS 5534:2003+A1:2010 and to manufacturer's recommendations.

RECONSTITUTED INTERLOCKING SLATE ROOF TILING:

- Pitch: As specified elsewhere.
- Underlay: Breathable Membrane or Underlay to BS EN 1307:2004+A2:2009 Type 1F reinforced bitumen felt
Lay directly over rafters or over sarking board.
Minimum horizontal lap: 100mm for pitches of 35 degrees and above, 150mm for pitches below 35 degrees.
- Battens: to BS 5534:2003+A1:2010
Fixing: to BS 5534:2003+A1:2010. Nails to be galvanized, sheradized or stainless steel.
- Tiles: Agrément certified.
Minimum headlap: As recommended by manufacturer.
Fixing: Nail and clip every tile.

ROOFS (Cont'd)

BATTENS:

- Sawn softwood, species type A or B to BS 5534:2003+A1:2010 clause 2.12.1.
- Permissible characteristics and defects must not exceed the limits given in BS 5534:2003+A1:2010, annex E.
Moisture content: Not more than 22% at time of fixing.
- Preservative treatment: CCA vacuum pressure or organic solvent double vacuum as British Wood Preserving and Damp-proofing Association Commodity Specification C8.

TILES - MORTAR BEDDING/POINTING FOR TILES:

- Mortar: 1:3 cement:sand, with plasticizing admixtures permitted. Bond strength providing resistance to uplift must be to BS 5534:2003+A1:2010
- Do not use in wet or frosty weather or when imminent.
- Tiles to be bedded must be wetted and surface water allowed to drain before fixing.
- Finish neatly as work proceeds and remove any residue.

TILES - MORTAR BEDDED VERGE WITH BEDDED UNDERCLOAK:

- Carry underlay 50 mm onto outer leaf of gable wall and bed in mortar.
- Bed undercloak of matching plain tiles projecting 40-50mm beyond face of wall, on mortar identical to that used in gable walling. Undercloak to be level with underside of tiling battens.
- Carry tiling battens over undercloak and finish 100 mm from verge edge.
- Bed edge of verge tiles flush with undercloak on 75 mm wide bed of mortar ensuring that mortar is not displaced or cracked by mechanical fixing of tiles.

TILES - MORTAR BEDDED VERGE WITH NAILED UNDERCLOAK:

- Carry underlay over full width of verge.
- Nail undercloak of fibre cement sheet of approved colour on top of underlay, sloping away from roof and projecting 40-50mm beyond face of bargeboard.
Undercloak to be level with underside of tiling battens.
- Carry tiling battens over undercloak and finish 100 mm from verge edge.
- Bed edge of verge tiles flush with undercloak on 75 mm wide bed of mortar, ensuring that mortar is not displaced or cracked by mechanical fixing of tiles.

TILES - SMALL SCALE MORTAR BEDDED HIP FOR PORCHES, CANOPIES & THE LIKE:

- Lay courses of underlay over hip with overlaps of not less than 150mm.
- Cut and fix tiles closely at junction.
- Hip irons: To BS 5534:2003+A1:2010, clause 2.16.1 but of stainless steel, fixed to hip rafter or hip batten with stainless steel screws.
- Hip tiles: Baby ridge or equivalent.
- Make weathertight with edges of hip tiles continuously bedded and joints solidly bedded in mortar.
- Where rigid masonry walls support or abut hip, all hip tiles within 900mm of such walls must be mechanically secured. Fix to hip rafter or supplementary hip batten with stainless steel nails/wire ties or screws recommended by tile manufacturer.
- Shape first hip tile neatly to align with corner of eaves and fill end with mortar and slips of tile finished flush.

ROOFS (Cont'd)

BONNET HIP:

- Lay courses of underlay over hip with overlaps of not less than 150 mm.
- Bed bonnet hip tiles in mortar, coursing in with general tiling and fix to hip rafter or supplementary hip batten with stainless steel nails recommended by tile manufacturer. Mortar to be neatly struck back about 13 mm from edge of tile. Fill end of first hip tile with mortar and tile slips finished flush.
- Cut adjacent tiles and tile and a half tiles to fit neatly.

SLATE - DRY (CLOSED) VERGE:

- Bed undercloak of fibre cement slate or sheet on mortar identical to that used in gable walling. Undercloak to be level with underside of slating battens.
- Carry underlay over full width of undercloak and project 30 mm to turn down behind closer.
- Carry battens over undercloak and finish against verge batten, fixed from eaves to ridge at appropriate distance from verge edge.
- Fix closer to verge batten with galvanized screws and seal joints with a suitable sealant strip. Fix verge slates over closer.

SLATES - MORTAR BEDDING/POINTING:

- Mortar: 1:3 cement:sand with plasticizing admixtures permitted. Bond strength to provide resistance to uplift in accordance with BS 5534:2003+A1:2010
- Do not use in wet or frosty weather or when imminent.
- Slates and accessories to be bedded or pointed must have relevant surfaces coated with a suitable bonding agent.
- Concrete and clay tile accessories to be bedded must be wetted and surface water allowed to drain before fixing.
- Finish neatly as work proceeds and remove any residue.

SLATES - MORTAR BEDDING/POINTING:

- Mortar: 1:3 cement:sand, with plasticizing admixtures permitted. Bond strength to provide resistance to uplift must be to BS 5534:2003+A1:2010
- Do not use in wet or frosty weather or when imminent.
- Concrete and clay tile accessories to be bedded must be wetted and surface water allowed to drain before fixing.
- Finish neatly as work proceeds and remove any residue.

SLATES - MORTAR BEDDED VERGE WITH BEDDED UNDERCLOAK:

- Carry underlay 50 mm onto outer leaf of gable wall and bed in mortar.
- Bed undercloak of fibre cement slate or sheet of approved colour, sloping away from and projecting 40-50mm beyond face of wall, on mortar identical to that used in gable walling. Undercloak to be level with underside of slating battens.
- Carry slating battens over undercloak and finish 100 mm from verge edge.
- Fix short lengths of verge batten to and between ends of slating battens.
- Bed edge of verge slates flush with undercloak on 75 mm wide bed of mortar. Point to a neat, struck weathered profile giving 5 mm overhang of verge slates. Ensure mortar is not displaced or cracked by mechanical fixing of slates.

ROOFS (Cont'd)

SLATES -MORTAR BEDDED VERGE WITH NAILED UNDERCLOAK:

- Carry underlay over full width of verge.
- Nail undercloak of fibre cement slate or sheet of approved colour on top of underlay sloping away from roof and projecting 40-50mm beyond face of bargeboard.
- Carry slating battens over undercloak and finish 100 mm from verge edge.
- Fix short lengths of verge batten to and between ends of slating battens.
- Bed edge of verge slates flush with undercloak on 75 mm wide bed of mortar. Point to a neat struck weathered profile giving 5 mm overhang of verge slates. Ensure mortar is not displaced or cracked by mechanical fixing of slates.

SLATES - MORTAR BEDDED TILE HIP (MODERATE EXPOSURE):

- Lay courses of underlay over hip with overlaps of not less than 150 mm.
- Cut and fix slates closely at junction.
- Hip irons: To BS 5534:2003+A1:2010, clause 2.16.1, but of stainless steel, fixed to hip rafter or hip batten with stainless steel screws.
- Make weathertight with edges of hip tiles continuously bedded and joints solidly bedded in mortar.
- Where rigid masonry walls support or abut hip, all hip tiles within 900 mm of such walls must be mechanically secured. Fix to hip rafter or supplementary hip batten with stainless steel nails/wire ties or screws recommended by tile manufacturer.
- Shape first hip tile neatly to align with corner of eaves and fill end with mortar and slips of tile finished flush.

SLATE - SMALL SCALE MORTAR BEDDED RIDGE FOR PORCHES, CANOPIES AND THE LIKE:

- Lay top course of underlay from one side of ridge over apex to overlap top course of underlay at other side by not less than 150mm.
- Lay eaves/top tiles and clip or nail fix as recommended by tile manufacturer.
- Make weathertight with edges of ridge tiles continuously bedded and joints solidly bedded in mortar.
- Where rigid masonry walls support or abut ridge, all ridge tiles within 900mm of such walls must be mechanically secured. Fix to supplementary ridge tile fixing batten with stainless steel nails/wire ties or screws as recommended by tile manufacturer.
- Fill ends of ridges at gables with mortar and slips of tile finished flush.

MORTAR BEDDED AND MECHANICALLY FIXED TILE HIP (SEVERE EXPOSURE):

- Lay courses of underlay over hip with overlaps of not less than 150 mm.
- Hip tile fixing batten: battens to size and fixing recommended by tile manufacturer.
- Make weathertight with edges of hip tiles continuously bedded and joints solidly bedded in mortar. Fix to hip rafter or hip batten with stainless steel nails/wire ties or screws recommended by tile manufacturer.
- Shape first hip tile neatly to align with corner of eaves and fill end with mortar and slips of tile finished flush.

ROOFS (Cont'd)

MORTAR BEDDED TILE RIDGE (MODERATE EXPOSURE):

- Lay top course of underlay from one side of ridge over apex overlapping top course of underlay at other side by not less than 150 mm.
- Finish slating with head-nailed short course to maintain gauge.
- Make weathertight with edges of ridge tiles continuously bedded and joints solidly bedded in mortar.
- Where rigid masonry walls support or abut ridge, all ridge tiles within 900 mm of such walls must be mechanically secured. Fix to supplementary ridge tile fixing batten with stainless steel nails/wire ties or screws recommended by tile manufacturer.
- Fill ends of ridges at gables with mortar and slips of tile finished flush.

MORTAR BEDDED AND MECHANICALLY FIXED TILE RIDGE (SEVERE EXPOSURE):

- Lay top course of underlay from one side of ridge over apex overlapping top course of underlay at other side by not less than 150 mm.
- Ridge tile fixing batten: battens to size and fixing recommended by tile manufacturer.
- Finish slating with head-nailed short course to maintain gauge / headlap.
- Make weathertight with edges of ridge tiles continuously bedded and joints solidly bedded in mortar. Fix to ridge tile fixing batten with stainless steel nail/wire ties or screws as recommended by ridge tile manufacturer.
- Fill ends of ridges at gables with mortar and slips of tile finished flush.

LEAD VALLEYS:

- Ensure that valley board, plywood valley sheathing and tilting fillets provide full support for valley.
- Cut underlay to rake and dress over tilting fillets to lap onto lead valley. Ensure that underlay is not laid under lead.
- Cut tile and a half tiles neatly and fix with a gap 125mm wide centred on gutter. Bed on mortar on fibre cement undercloaks laid loose on each side of valley.

CURVED PLAIN TILE VALLEY:

- Ensure that bearers or boards provide continuous support for ends of tiling battens on each side of valley.
- Cover valley with a strip of underlay not less than 600mm wide, underlapping general underlay.
- Cut adjacent tile and a half tiles so that valley tiles course in and fit neatly.

SIDE ABUTMENT:

- Turn underlay at least 100 mm up abutment.
- Cut tiles / slates as necessary and interleave with lead soakers. Fix soakers by turning down over the head of each tile.
- Fix tiles /slates close to abutment to enable a weathertight junction to be formed by lead step flashing.

TOP EDGE ABUTMENT:

- Turn underlay not less than 100 mm up abutment.
- Lay eaves/top tiles and clip or nail fix as recommended by tile manufacturer or finish slating with a head-nailed short course to maintain gauge.
- Fix tiles /slates close to abutment to enable a weathertight junction to be formed by lead apron flashing.

ROOFS (Cont'd)

ROOF EDGES/JUNCTIONS/FEATURES -

GENERALLY:

- Form details using the specified and manufacturer's recommended fittings and accessories; do not improvise without approval.
- Exposed fittings and accessories must match tile / slate colour and finish unless specified otherwise.
- Cut tiles / slates only where necessary, with an appropriate tool, to give straight, clean edges.
- Fix edge tiles / slates and fittings securely to neat, true lines.
- Ensure that all flashings are fixed with or immediately after the tiling, and are neatly dressed down.

FIRE SEPARATING WALLS:

- Ensure that separating wall is cut on the rake 25 mm to 50 mm below top of adjacent rafters.
- Fill space over top of wall with mineral fibre quilt so that, when overlaid, it is lightly compressed. Tuck edges of quilt between edges of wall and adjoining rafters.
- Lay 300 mm wide pads of mineral fibre quilt thick enough to seal all gaps and cut to fit snugly between battens. Fix in position with continuous self-adhesive tape from ridge to eaves before tiling.
- At boxed eaves completely seal air paths in the plane of the separating wall with wire reinforced mineral fibre, 50 mm thick, nailed to rafter and carefully cut to shape.

JUNCTIONS:

Cut tiles / slates and fix closely to enable a weathertight junction to be formed by lead flashing between:

- Junction of ridge with hip
- Junction of ridge with valley
- Junction of ridge with abutment
- Junction of ridge with higher roof slope
- Top junction of two valley gutters
- Butterfly junction

LEAD SHEET COVERINGS/FLASHINGS

TYPES OF LEADWORK

PITCHED LEAD VALLEY GUTTER LINING:

- Drawing reference(s): The lead sheet manual Volume 1, Figure 62
- Base: Plywood valley boards
- Type of lead: Code 4 in lengths not exceeding 1500 mm and with laps of not less than the following:

ROOFS (Cont'd)

Roof pitch	Valley pitch	Lap
20°-25°	15°-18.5°	300mm
25°-30°	18.5°-22°	250mm
30°-35°	22°-26°	200mm
35°-40°	26°-30.5°	175mm
Over 40°	Over 30.5°	150mm

- Fixing: Dress lead sheet over, and beyond, tilting fillets and welt edges. Nail top edge of each sheet. Dress bottom end neatly into eaves gutter.

APRON FLASHINGS AT TOP EDGE ABUTMENTS

- Drawing reference(s): The lead sheet manual Volume 1, Figure 21
- Lead: Code 4 in lengths not exceeding 1500 mm.
- End to end joints: Laps of not less than 100 mm.
- Dimensions:
Upstand: Not less than 75 mm.
Cover to abutment: Not less than the following:

Roof pitch	Lap
15° to 20°	300mm
20° to 30°	220mm
Over 30°	150mm

- Fixing: Lead wedges and point.

SOAKERS AND STEP FLASHINGS FOR SIDE ABUTMENTS WITH PLAIN TILE ROOFS

- Drawing reference(s): The lead sheet manual Volume 1, Figure 13
- Soakers:
Lead: Code 3 cut and dressed to shape for fixing by roofer.
Dimensions:
Length: Slate/tile gauge + lap + 25 mm.
Upstand: Not less than 75 mm.
Underlap: Not less than 100 mm.
- Step flashings:
Lead: Code 4 in lengths not exceeding 1500 mm.
End to end joints: Laps of not less than 100 mm.
Cover : Overlap to soaker upstands of not less than 65 mm.
Fixing: Lead wedges at every course.

SINGLE STEP AND COVER FLASHINGS FOR SIDE ABUTMENTS WITH SINGLE LAP PROFILED CONCRETE INTERLOCKING TILE ROOFS:

- Drawing reference(s): The lead sheet manual Volume 1, Figure 15
- Lead: Code 4 in lengths not exceeding 1500mm
- Single step flashings:
End to end joints: Laps of not less than 50mm.
Cover: Overlap to cover flashing upstands of not less than 65mm.

ROOFS (Cont'd)

Fixing: Lead wedges at every step.

- Cover flashings:
End to end joints: Laps of not less than 100mm.
Dimensions:
Upstand: Not less than 85mm.
Cover to roof: Not less than 150mm and over first full tile corrugation.
Fixing: Turn over head of tile and clip at not more than 500mm centres along free edge. Plug and screw upstand to abutment in top third of each length only.

STEP AND COVER FLASHING WITH SECRET GUTTER FOR SIDE ABUTMENTS WITH FLAT CONCRETE TILE, FIBRE CEMENT OR NATURAL SLATE ROOFS.

- Drawing reference(s): The lead sheet manual Volume 1, Figure 18 and 19.
- Step and cover flashing:
Lead: Code 4 in lengths not exceeding 1500 mm.
End to end joints: Lap of not less than 100 mm.
Dimensions:
Upstand: Not less than 85 mm with overlap to gutter lining upstand of not less than 65 mm.
Cover to roof: Not less than 150 mm.
Fixing: Lead wedges at every course and clips at not more than 500 mm centres along free edge.
- Secret gutter lining:
Lead: Code 4 in lengths not exceeding 1500 mm.
End to end joints: Laps of not less than the following:

Roof pitch	Lap
15° to 20°	300mm
20° to 30°	220mm
30° to 40°	150mm
40° to 50°	115mm
50° to 60°	100mm

Upstand: Not less than 65 mm above tiles.

Fixing: Dress into secret gutter and form a welted edge at side to be tiled. Nail top edge of each sheet. Dress bottom end neatly into eaves gutter.

LEAD SLATES FOR PIPES PROJECTING THROUGH ROOF FINISH

- Lead: Code 4 cut and dressed to shape for fixing by roofer.
- Dimensions:
Base: Not less than 400 x 400 mm
Upstand: Not less than 150 mm, to fit pipe and at angle to suit roof pitch.

ROOFS (Cont'd)

COMBINED LEAD DAMP PROOF COURSE/CAVITY TRAY AND COVER FLASHING AT HORIZONTAL ABUTMENTS

- Drawing reference(s): The lead sheet manual Volume 1, Figure 32, 33 and 34.
- Lead: Code 4 fully coated on both sides with high-build, bitumen based paint on the surfaces which are to be embedded
Length of each piece to be not more than 1500 mm.
- Joints: Leadweld gusset upstand at end of each length within wall and coinciding with vertical mortar joint. Lap adjoining length not less than 100 mm and over gusset upstand.
- Lay on a thin even bed of wet mortar. Without delay bed next layer of overlying construction and finish joint neatly.

WORKMANSHIP GENERALLY:

- Cut, joint and dress lead neatly and accurately, to provide fully waterproof coverings/flashings, free from ripples, kinks, buckling and cracks.
- Comply with BS 6915:2001 and current good practice as described in the latest editions of 'The Lead Sheet Manual' published by the Lead Sheet Association, unless specified or agreed otherwise.
- Do not use scribes or other sharp instruments to mark out lead.
- Use solder only where specified.
- Ensure that finished leadwork is fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.

IN SITU LEAD WELDING: will not be permitted.

LEAD SHEET:

Colour marked for thickness and weight and of the type and code specified:

- Milled, to BS EN 12588:1999, or
- Machine cast, to BS EN 12588:1999 in respect of general quality, chemical composition and tolerance on thickness.

SUITABILITY OF BASES:

- Bases to be dry and free of dust, debris, grease and other deleterious matter.

TIMBER FOR USE WITH LEADWORK:

- Planed, free from wane, pitch pockets, decay and insect attack except pinhole borers.
- Moisture content: Not more than 22% at time of covering.
- Preservative treatment: CCA as British Wood Preserving Association Commodity Specification C8.

FIXING/JOINTING LEAD -

HEAD FIXING LEAD SHEET:

- Where not specified otherwise, secure top edge of lead sheets with two rows of fixings, 25mm and 50mm from top edge of sheet, at 75mm centres in each row, evenly spaced and staggered.
- Sheets less than 500mm deep may be secured with one row of fixings, 25mm from top edge of sheet and evenly spaced at 50mm centres.

ROOFS (Cont'd)

FIXINGS:

- Where not specified otherwise, fix lead sheet to timber substrates with:
Copper clout nails to BS 1202-2:1974, table 2, with annular ring, helical ring or serrated shank, length not less than 20mm, shank diameter not less than 3.35mm and head diameter not less than 8mm, or
Stainless steel (austenitic) clout nails with annular ring, helical ring or serrated shank, length not less than 19mm, shank diameter not less than 2.65mm and head diameter not less than 8mm.
- Where not specified otherwise, fix lead sheet to concrete or masonry substrates with:
Brass or stainless steel screws to BS 1210:1963, table 3, length not less than 19mm and diameter not less than 3.35mm, with washers of the same material and plastics plugs of length and diameter to suit screws.

CLIPS:

- Generally 50 mm wide where not specified to be continuous, length to suit detail.
- Lead clips to be cut from sheets of same code as sheet being secured.
- Copper clips to be cut from 0.7 mm thick sheet to BS EN 1172:1997, BS EN 1652:1998 and BS EN 1653:1998, temper grade 1/4H, dipped in solder if exposed to view.
- Unless specified otherwise fix each clip with two fastenings not more than 50 mm from edge of lead sheet. Clips welded around edges of sheets to be turned over 25 mm.

FORMING OF DETAILS:

May be by bossing or leadwelding.

- Leadwelded seams must be neatly and consistently formed. Do not undercut or otherwise reduce the thickness of the sheets at seams. Filler strips are to be of the same compositions as the sheets being joined. Butt joints are to be formed to a thickness one third more than the sheets being joined. Lap joints are to be formed with 25mm laps and two loadings to the edge of the overlap.
- Bossing must be carried out without thinning, cutting or otherwise splitting the lead sheet.

WEDGE FIXING INTO DAMP PROOF COURSE JOINTS:

- Carefully rake out joint under damp proof course to a depth of not less than 25 mm while mortar is still green.
- Dress lead into joint and fix with lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Prepare joint and apply sealant.
Sealant: one part polysulphide to BS EN ISO 11600:2003

FINISHING:

- As soon as practical, apply a smear coating of patination oil, evenly in one direction and in dry conditions to all visible lead.

ROOFS (Cont'd)

CANOPIES:

Canopies to be installed over front entrance doors to comply with Lifetime Homes Criteria 4c.

The canopy should cover the entire doorset and any associated ironmongery/access controls.

The depth of the canopy for an individual dwelling should exceed 600mm (900mm preferable) and for a communal entrance should be in excess of 900mm (1200mm preferred).

Canopies to be designed to ensure that heights and location of supports to porches do not cause a hazard or obstruction.

CODE FOR SUSTAINABLE HOMES

Where credits are sought under sections MAT2 and MAT3 of the Code for Sustainable Homes then certification will require to be provided to the Code Assessor to indicate that the materials used on the Porch / Canopy construction are responsibly sourced. All timber to be **legally** sourced.

EXTERNAL WALLS

MASONRY WALLS:

Design to BS EN 1996-1-1:2005, BS EN 1996-2:2006 and BS EN 199.

FACING BRICKWORK:

To the external elevations.

MANUFACTURER:

To comply with the requirements of the Local Planning Authority. Prior to seeking the approval of the Local Planning Authority the Employer reserves the right to approve the specification for facing bricks proposed by the Contractor, i.e. the contractor should seek the approval of the Employer as to the specification for facing bricks.

MORTAR COLOUR:

Tilcon pigmented or equivalent.

REFERENCE / PATTERN:

As indicated on the elevation drawings and to comply with the requirements of the Local Planning Authority.

COLOUR:

To comply with the requirements of the Local Planning Authority. The Employer reserves the right to approve the colour proposed by the Contractor, i.e. the contractor should seek the approval of the Employer as to the colour for facing bricks.

JOINT:

EXTERNAL WALLS (Cont'd)

Bucket handle or weathered struck joint, no recessed pointed joints are acceptable.

SPECIAL FEATURES:

Soldier courses etc. all as indicated upon the elevation drawings or proposed by the Contractor.

Contrasting brickwork below d.p.c

AIRBRICKS:

Where airbricks are incorporated into the external wall or foundation design, clay units are to be utilised. The use of plastic units is not permissible.

CLAY FACING BRICKWORK:

- Bricks: To BS EN 771-1:2003 and BS EN 772-2:1998 and BS EN 772-7:1, designation FL.
- Bond: Stretcher (unless otherwise stated)
- Mortar: To BS EN 998:2003.
- Mortar Colour: To the approval of the Local Planning Authority.
- Joint: To be agreed
- Mix: Group 3

CONCRETE FACING BRICKWORK:

- Bricks: To BS EN 771-1:2003 and BS EN 772-2:1998
- Mortar: To BS EN 998:2003.
- Mix: Group 3
- Mortar Colour: To the approval of the Local Planning Authority.
- Joint: To be agreed

BLOCKWORK AND RENDER

CONCRETE COMMON BLOCKWORK:

- Blocks: To BS EN 771-1:2003 and BS EN 772-2:1998
- Mortar: To BS EN 998:2003.
- Mix: Group 3
- Bond: Stretcher

CONCRETE BLOCKWORK TO RECEIVE RENDER:

Location: As shown on elevation drawings.

- Blocks: to BS EN 771:2003.
- Mortar: To BS 1200 unless specified otherwise.
- Mix: Group 3
- Joints: Rake out joints as work proceeds, to a depth of approximately 15 mm where blockwork is to be rendered.
- Bond: Stretcher

RENDER: TO EXTERNAL WALLS:

Type : To suit the weather exposure for the geographical area. Smooth / semi -smooth self finish render to comply with the requirements of the Local Planning Authority. The Employer reserves the right to approve the specification proposed by the Contractor.

EXTERNAL WALLS (Cont'd)

PROPRIETARY ONE-COAT RENDER:

- Location: Where identified on drawings or other Contract Documents.
- Background: Masonry suitable to take a designation III (1:1:6) mix (should be confirmed by block manufacturer).
- Preparation: The nature and condition of the background is a prime consideration in deciding the preparatory treatment prior to the application of the render. Substrate must provide suitable key / suction. Guidance in respect to movement joints and bed joint reinforcement should be obtained from block manufacturer and MUST be adhered to. The recommendations detailed in BS EN 1996-1-2:2005 and BS EN 1996-1-2:2006 and BS EN 1996 should be observed.
- Colour: To be agreed
- Finish: Scrape textured finish. When the surface is sufficiently hard, normally between 5-16 hours after application, scrape the surface in small circular motions using a scraping tool to remove all laitance and bring the application to the specified thickness. Remove no more than 3mm from the surface thickness. Immediately after scraping, brush using a clean soft bristle brush to remove dust. Ensure scraped finish is even over the entire surface, with no areas missed.
- Accessories: Render only beads, if required by the system or product, or if specified, shall be of appropriate design gauge and material as approved by Manufacturers building solutions. Beads to be located and fixed as detailed on Architect's drawings or System Manufacturer's details. Where meshcloth is being incorporated as treatment to areas of potential high stress it shall be a standard duty, balanced, open weave, glass fibre meshcloth, coated for alkaline resistance, available in 1m x 50m rolls.

CEMENT:LIME:SAND RENDER (SEVERE EXPOSURE):

- Location: Where shown upon the drawings
 - Background: Concrete blockwork
 - Undercoats:Cement: Portland
- Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.
- Mix proportions: Mix designation 2 (See Chart Below)
- Thickness (excluding dubbing out): First undercoat 8-12mm
Second undercoat 6-10mm
- Final coat: Cement: Portland
- Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.
- Proprietary reference and colour: To Local Authority Planning Department Approval.
- Mix proportions: Mix designation 2 (See Chart Below)
- Thickness: 6-8 mm
- Finish: Tyrolean
- Accessories: Bell cast, stop and angle beads stainless steel corrosion resistance at least equal to grade 304 of BS EN10029:1991.

EXTERNAL WALLS (Cont'd)

CEMENT:LIME:SAND RENDER (MODERATE EXPOSURE):

- Location: Where shown upon the drawings
- Background: Concrete blockwork
- Undercoat: Cement: Portland

Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.

Mix proportions : Mix designation 2 (See Chart Below)

Thickness (excluding dubbing out): 8-12 mm

- Final coat: Cement: Portland

Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.

Proprietary reference and colour: To Local Authority Planning Department Approval.

Mix proportions : Mix designation 2 (See Chart Below)

CEMENT:LIME:SAND RENDER (MODERATE EXPOSURE) (Cont'd):

Thickness: 6-8 mm

Finish: Tyrolean

- Accessories: Bell cast, stop and angle beads stainless steel corrosion resistance at least equal to grade 304 of BS EN10029:1991.

ROUGHCAST (HARLING) CEMENT:LIME:SAND RENDER (SEVERE EXPOSURE):

- Location: Where shown upon the drawings
- Background: Concrete blockwork
- Undercoat: Cement: Portland.

Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.

Mix proportions : Mix designation 2 (See Chart Below)

Thickness (excluding dubbing out): First undercoat 8-12mm

Second undercoat 6-10mm

- Final coat: Cement: Portland.

Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.

Proprietary reference and colour: To Local Authority Planning Department Approval

Coarse aggregate: Single size to BS 63:Part 2, maximum size: Subject to sample panel.

Mix proportions (cement: lime: sand: coarse aggregate): 1:0.5:3:1.5

Thickness: 6-10mm

Finish: Roughcast

- Accessories: Bell cast, stop and angle beads stainless steel corrosion resistance at least equal to grade 304 of BS EN10029:1991.

ROUGHCAST (HARLING) CEMENT:LIME:SAND RENDER (MODERATE EXPOSURE):

- Location: Where shown upon the drawings
- Background: Concrete blockwork F10/350
- Undercoat: Cement: Portland.

Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.

Mix proportions : Mix designation 2 (See Chart Below)

Thickness (excluding dubbing out): 8-12 mm

- Final coat: Cement: Portland.

EXTERNAL WALLS (Cont'd)

Lime: sand mix: Ready-mixed to BS EN 998-1:2003 using sand to BS EN13139:2002, type A.

Proprietary reference and colour: To Local Authority Planning Department Approval

Coarse aggregate: Single size to BS EN 13043:2002, maximum size: Subject to sample panel.

- Mix proportions (cement:lime:sand:coarse aggregate): 1:1:3:2
- Thickness: 6-10 mm
- Finish: Roughcast.
- Accessories: Bell cast, stop and angle beads stainless steel corrosion resistance at least equal to grade 304 of BS EN10029:1991.

PROPRIETARY CEMENT BASED RENDER:

- Location: Where shown upon the drawings.
- Background: Concrete blockwork
- Preparation: As recommended by render manufacturer.
- Accessories: Bell cast, stop and angle beads stainless steel corrosion resistance at least equal to grade 304 of BS EN10029:1991.

PROPORTIONS FOR CEMENT GAUGED MORTARS:

Except where stated otherwise, mix proportions for rendering and cement gauged plaster/render undercoat and render final coat mortars are to be in accordance with the following designations:

Mix Type	Mix Designation				
	1	2	3	4	5
Cement: lime: sand	1: ¼: 3	1:½: 4 to 1:½: 4½	1:1.5 to 1:1.6	1:2.8 to 1:2.9	1:3:10 to 1:3:12
Cement: premixed lime & sand(proportion of lime to sand given in brackets)	1:3 (1: 12)	1:4 to 1:4½ (1:9)	1:5 to 1:6 (1:6)	1:8 to 1:9 (1:4 ½)	1:10 to 1:12 (1:4)
Cement:sand (using plasticizer)	—	1:3 to 1:4	1:5 to 1:6	1:7 to 1:8	—
Masonry Cement:sand	—	1:2½ to 1:3½	1:4 to 1:5	1:5½ to 1:6½	

EXTERNAL WALLS (Cont'd)

BEADS/STOPS GENERALLY:

- Provide beads/stops at all external angles and stop ends except where specified otherwise.
- Provide bell cast stop above all external openings in render and at dpc level.
- Cut neatly, form mitres at return angles and remove sharp edges, swarf and other potentially dangerous projections.
- Fix securely, using the longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with background. Use mechanical fixings for external beads/stops.
- After coatings have been applied, remove coating material while still wet from surfaces of beads/stops which are to be exposed to view.

MOVEMENT JOINTS:

Form joints in coatings to coincide with movement joints in background using:
Two stop beads with sealant infill or proprietary movement joint bead.

- Locations: to be agreed with CA.

TIMBER WEATHERBOARDING

This section includes sides and horizontal soffits of open porches.

18mm thick cedar, larch or 25mm thick Finnforest ThermoWood boarding where indicated on the elevation drawings or proposed by the Contractor to approval of Local Authority Planning Department. All timber to be legally and responsibly sourced.

- Base: studs or battens at 600 mm maximum centres
- Breather membrane: As noted below.
- Quality of timber and fixing: To BS 1186-2:1988
Class: 2 or 3
Profile: tongued and grooved
Nominal size: 25 x 100 mm (or 125mm if using ThermoWood)
Moisture content at time of fixing: 13 to 19%.
- Preservative treatment: CCA or organic solvent with water repellent (without water repellent where microporous decoration is specified) to British Wood Preservation and Damp Proofing Association Commodity Specification C6.
- Method of fixing to each support: Two 50 mm stainless steel annular ring shank nails. Where ThermoWood is being used, the boards are to be fixed fully in accordance with the Manufacturer's written instructions.

BREATHER MEMBRANE:

- Material: Vapour resistant to less than 0.6MNs/g when calculated from the results of tests carried out in accordance with BS 3177:1959 at 25degreesC and relative humidity of 75%.
of resisting water penetration.
Self extinguishing.
Durable.
Strong when wet to resist site damage.
Have current Agrément Certificate and where ThermoWood is used, the membrane shall be in accordance with Finnforest's written instructions.

EXTERNAL WALLS (Cont'd)

- Fix carefully and neatly to provide a complete barrier to water, snow and wind blown dust.
- Fix with galvanized, sheradized or stainless steel large head nails or stainless steel staples.
- Horizontal laps to be 100 mm, vertical laps 150 mm and staggered, to shed water away from substrate and structure.
- Ensure that membrane extends below lowest timber member and into reveals of openings.

TIMBER BATTENS:

Regularized softwood free from decay, insect attack (except pinholes borers) and with no knots wider than half the width of the section.

Size: 19 x 38mm minimum

- Preservative treatment: CCA as British Wood Preserving and Damp Proofing Association Commodity Specification C8.
- Moisture content at time of fixing: Not exceeding 24%.

NATURAL STONE RUBBLE WALLING

UNCOURSED RANDOM RUBBLE WALLING:

- Stone: As specified elsewhere or by agreement with the Employer and Local Planning Authority, thoroughly seasoned and free from cracks, vents, fissures or other defects which may adversely affect appearance, strength or durability. Range of sizes to be agreed.
Finish: As found to match approved sample.
- Mortar: Using graded crushed stone sand, colour matched to approval.
Mix: 1:1:6
- Joints: Flush.

CAVITIES

CONCRETE FILL:

Fill cavities with concrete up to 225 mm below ground level d.p.c. Concrete mix to BS 8500-1:2002, BS8500-2:2002, BS EN 206-1:2000
Designated mix GEN 1 or Standard mix ST2, high workability.

CLEANLINESS:

Clean off surplus mortar from joints on cavity faces as the work proceeds. Keep cavities, ties and dpcs free from mortar and debris with laths or other suitable means.

WEEP HOLES:

Leave perpends at 900 mm centres completely open in the brick course immediately above base of cavity, external openings and stepped d.p.c's. Provide not less than two weep holes over openings.

VENTILATION DUCTS:

Manufacturer and Reference: Contractor's choice.

- Install across cavity, sloping away from inner leaf, bedding fully in mortar to seal cavity.

EXTERNAL WALLS (Cont'd)

PROPRIETARY VENTILATION DUCT FOR TUMBLE DRYER CONNECTION

Manufacturer and Reference: Contractor's choice.

- Type: Cavity liner with airbrick externally and blanking panel or hit and miss vent internally, capable of receiving a proprietary adaptor which is compatible with a flexible hose from a tumble dryer.
- Location: Kitchen or utility room, refer to floor plans.
- Install across cavity, sloping away from inner leaf, bedding fully in mortar to seal cavity.

CAVITY CLOSERS FOR USE AT JAMBS TO DOOR AND WINDOW OPENINGS:

Manufacturer and Reference: Contractor's choice.

Where used: All window and door openings in cavity walls at reveals to be closed with proprietary cavity closers, consisting of PVC-U extrusions with a CFC/HCFC free rigid insulation core, suitable for a cavity width and fixed to Manufacturers instructions, providing a minimum 30mm overlap between the window / door frame and the cavity closer.

Manufacturer and reference: to have current Agrément Certificate.

Cavity closers to be installed in strict accordance with relevant accredited construction details and signed off.

WALL TIES FOR CAVITY WALLS GENERALLY:

To BS EN 845-1:2003+A1:2008, type: Butterfly or double triangle

Material: Stainless steel wire to BS EN 10088-3:2005 of 18/8 composition and excluding free machining specification.

Types 1, 2, 3 & 4', as defined in BS DD 140-2 and as tested to BS DD 140: Part 1: 1986. Manufactured from stainless steel wire to BS 1554 or from stainless steel strip to BS EN 10029:1991, BS EN 10048:1997 and BS EN 10051:19 of 18/8 composition and excluding free machining specifications.

Vertical twist wall ties to BS EN 845-1:2003+A1:2008. Manufactured from stainless steel strip to BS EN 10029:1991, BS EN 10048:1997 and BS EN 10051:19 of 18/8 composition and excluding free machining specifications.

WALL TIES FOR USE WITH PARTIAL FILL CAVITY INSULATION

- BBA approved for use with insulation product.

WALL TIES FOR USE IN TIMBER FRAME CONSTRUCTION

- Type 5 or 6 as defined in BS DD 140-2 and as tested to BS DD 140-1.

Material: Stainless steel wire to BS EN 10088-3:2005 or stainless steel strip to BS EN 10029:1991, BS EN 10048:1997 and BS EN 10051:19, of 18/8 composition and excluding free machining specification.

EXTERNAL WALLS (Cont'd)

FIXING TIES IN MASONRY CLADDING TO TIMBER FRAMES:

- Fix ties securely to the timber frame with 50mm x 11 gauge stainless steel annular ringed shank nails, and bed not less than 50mm into bed joint of the masonry leaf. Do not bend ties to suit coursing.
- Slope downwards away from the timber frame.
- Space horizontally to suit stud centres and at 375mm centres vertically, unless specified otherwise by timber frame manufacturer.
- Provide additional ties within 225mm of reveals of unbonded openings at 225mm centres vertically.
- Repair any damage to the breather membrane before erecting the masonry skin.

FIXING TIES IN MASONRY CAVITY WALLS WITH PARTIAL FILL CAVITY INSULATION:

- Bed not less than 50mm into bed joint of each leaf.
- Slope downwards towards outer leaf with drip centred in the cavity and pointing downwards. Do not bend ties to suit coursing.
- Evenly space horizontal and vertical rows (i.e. not staggered) at 600mm centres horizontally and 450mm centres vertically, unless specified otherwise by insulation manufacturer.
- Provide additional ties within 225mm of reveals of unbonded openings at 225mm centres vertically.

FIXING TIES IN MASONRY CAVITY WALLS WITH NO CAVITY INSULATION:

- Bed not less than 50mm into bed joint of each leaf.
- Slope slightly downwards towards outer leaf with drip centred in the cavity and pointing downwards. Do not bend ties to suit coursing.
- Evenly space at 900mm centres horizontally for cavities up to 75mm wide, 750mm centres horizontally for cavities over 75mm wide, staggered in alternate courses, and at 450mm centres vertically.
- Provide additional ties within 225mm of reveals of unbonded openings at 225mm centres vertically.

FIXING TIES IN MASONRY CAVITY WALLS WITH FULL FILL CAVITY INSULATION:

- Bed not less than 50mm into bed joint of each leaf.
- Slope downwards towards outer leaf with drip centred in the cavity and pointing downwards. Do not bend ties to suit coursing.
- Evenly space at 900mm centres horizontally for cavities up to 75mm wide, 750mm centres horizontally for cavities over 75mm wide, staggered in alternate courses, and at 450mm centres vertically.
- Provide additional ties within 225mm of reveals of unbonded openings at 225mm centres vertically.

LATERAL RESTRAINT TIES FOR MOVEMENT JOINTS

- Ties: Stainless steel
- One half of length to be debonded by using plastic sleeve before building into joint.
- Fixing centres.

EXTERNAL WALLS (Cont'd)

INSPECTION:

The Employer will inspect the cavity using a boroscope. The Contractor will be expected to drill the inspection holes in agreed positions and make good afterwards. The Contractor shall also provide a suitable generator for the provision of an electrical supply for the boroscope apparatus.

CAVITY INSULATION

“Full fill” cavity insulation may **not** be used.

Notwithstanding Building Regulations Approved Documents requirements; partial fill cavity insulation is permitted but minimum 50mm cavity to be maintained in all areas.

Mineral fibre quilts or batts are **not** permitted.

The following insulations are permitted subject to Building Control approval.

<u>Insulation Type</u>	<u>Density</u>	<u>Green Guide Rating</u>
Expanded Polystyrene batts	10 – 48 kg/m ³	A+
Rigid Urethane (Pentane Blown)	32kg/m ³	A

All insulants to have a global warming potential of less than 5. Evidence to be provided to the Code Assessor for section POL1 of the Code for Sustainable Homes.

PARTIAL FILL CAVITY INSULATION:

- Insulation: To be one of the following:-
- Agrément certified HCFC/ CFC free Zero ODP rigid urethane core (pentane blown) with low emissivity composite foil facings on both sides to BS4841-1:2006
- Agrément certified expanded polystyrene (EPS) HCFC/ CFC free Zero ODP to BS 3837-1:2004, Part 1.

Size to suit wall tie spacings.

- Fix securely to inner leaf ensuring that:
- edges are not damaged
- boards are close butted at horizontal and vertical joints and at closures.
- joints between boards are kept clean and dry and free from mortar droppings, grout and other debris
- The residual cavity is not blocked or bridged by offcuts of insulation
- maintain 50mm minimum clear cavity
- Place and secure each course of insulation before building up inner leaf above level of previous course of insulation.

BLOWN CELLULOSE FIBRE WALL INSULATION BETWEEN STUDWORK:

Wet blown recycled cellulose insulation – density 45kg/m² with an A+ Green Guide Rating of a type currently certified by the British Board of Agrément as suitable for the purpose and installed in accordance with the certificate by a BBA approved installer, or manufactured and installed to BS 5803-3:1985 by a firm currently registered under a quality assurance scheme operated by a certification and inspection body accredited by the United Kingdom Accreditation Service (UKAS).

Before commencing, ensure that holes in the ceiling for pipes, lighting drops, etc. are sealed and all debris has been removed.

EXTERNAL WALLS (Cont'd)

Ensure that eaves ventilation is unobstructed and electric cables are not covered (unless they have been sized accordingly).

Ensure that insulation is not laid below water cistern platform(s).

FIBRE/BEAD CAVITY WALL INSULATION:

Suitability of walls: Before and during filling of cavities, check suitability of walls. Report any defects to CA as soon as possible and stop filling until rectified.

Cavity fill:

- Expanded polystyrene bead (with binding agent) or mineral wool cavity wall insulation, installed by injection, of a type currently certified by the British Board of Agrément (BBA) as suitable for the purpose and exposure situation.
- Installed by an approved firm in accordance with the BBA Surveillance Scheme.

Gaps/openings:

- Seal openings into cavity where necessary to prevent loss of fill, using mineral fibre packed tightly.
- Remove air bricks/grilles of untrunked vents. Seal openings into cavity with mineral fibre or insert an approved sleeve to keep opening permanently clear.

Injection holes: Form neatly to a regular pattern and to sizes recommended by cavity fill manufacturer. Avoid damage to dpcs, cavity trays, flues, etc. and prevent debris falling into cavity. Form all holes in any one wall before commencing filling of that wall.

FLEXIBLE DAMP PROOF COURSES/CAVITY TRAYS

DAMP PROOF COURSE:

Bitumen Polymer and Pitch Polymer with current Agrément Certificate.

FLEXIBLE SHEET CAVITY TRAYS:

Locations and types

Horizontal abutments:

Over steel lintels:

PREFORMED DPC/CAVITY TRAY JUNCTION CLOAKS/STOP ENDS:

- Manufacturer: to have current Agrément Certificate
Locations and types
Sloping roof abutments: Stepped cavity tray with stop end at lowest point.
Ends of horizontal cavity trays: Stop ends
- Seal all laps with d.p.c's and/or cavity trays using adhesive/mastic in accordance with manufacturer's recommendations to ensure a fully watertight installation.

STEPPED DPCS:

Where dpcs are installed in external walls on sloping ground, ensure that they are never less than 150mm above finished ground level.

EXTERNAL WALLS (Cont'd)

JOINTS

MOVEMENT JOINTS WITH SEALANT IN EXTERNAL FACING BRICKWORK

- Filler: Cellular polyethylene, cellular polyurethane or foam rubber.
Locate joints in unobtrusive positions.
Build in as the work proceeds ensuring no projections into cavities and correct depth of joint to receive sealant system. Thickness of filler to match design width of joint.
- Sealant: Polysulphide to BS EN ISO 11600:2003 or silicone to BS EN ISO 11600:2003, type A.
Colour: To match wall finish.

CONTRACTION JOINTS which will not be exposed to view to be close-butt joints formed as the work proceeds.

TOPS OF NON LOAD-BEARING WALLS:

- Restraint: Comply with BS EN 1996-1-1:2005, BS EN 1996-2:2006 and BS EN 1996.
- Securely fix restraints to soffit and completely fill space between wall and soffit leaving no gaps to ensure compliance with design requirements.

PROPRIETARY SILLS/LINTELS/COPINGS/DRESSINGS

SILLS

- To BS 5642-1:1978.
Finish: As indicated on drawings.
Finish, colour and texture to match approved sample.
- Leave bed joints open under one piece sills except under end bearings and under any masonry mullions. On completion point with mortar to match adjacent work.

PRECAST CONCRETE LINTELS:

- To BS 5977 and BS EN 845-2:2003 and table 3.4 of BS 8110-1:1997, with minimum cement content of 325 Kg/m³ and with third party assurance.
- Bed on mortar used for adjacent work with bearing of not less than 150 mm.

COPING UNITS

- To BS 5642-2:1983.
- Lay on a full bed of group 2 mortar as used for adjacent work, accurately to line and level with all joints filled and neatly finished flush.

PREFABRICATED STEEL LINTELS:

- To BS EN 845-2:2003.
Material/finish: Austenitic stainless steel or galvanised mild steel with protection as BS 5977-2, Table 1 where lintels have separate d.p.c cavity tray over, Table 2 where lintels have integral damp-proof system. Lintels which do not require a d.p.c cavity tray over must have stop ends.
- Bed on mortar used for adjacent work with bearing of not less than 150 mm.
All insulants within lintels to have a global warming potential of less than 5. Evidence to be provided to the Code Assessor for section POL1 of the Code for Sustainable Homes.

EXTERNAL WALLS (Cont'd)

CAST STONE DRESSINGS:

- To BS 1217:2008
- Manufacturers and Reference: Contractor's choice.
- Components: As indicated on the elevation drawings.
- Finish/colour: To approval of Local Authority Planning Department.
- Mortar for bedding/jointing: Cement gauged.
- Mix: Group 3 or as manufacturer's recommendation.
- Unless specified otherwise, lay on a full bed of mortar, colour matched to approval. Fill all joints and neatly finish flush.
- Leave bed joints open under one piece sills/thresholds except under end bearings and under any masonry mullions. On completion, point with mortar to match adjacent work.

PAINTING AND DECORATING WORKS

MICROPOROUS PAINT ON EXTERNAL JOINERY:

Where timber is not prefinished apply a microporous paint/stain.

Application: in accordance with Manufacturer's recommendations

Colour: To be agreed with the Employer and the Local Planning Authority.

Type: Micro porous paint, 2 Nr top coats minimum to manufacturer's instructions.

- Preparation: To BS 6150:2006, Section 4.
- Application: Follow manufacturer's instructions.
- Ensure preservative treatment used on joinery does not include a water repellent.

EXTERNAL ALUMINIUM

Type: Factory finished

METER BOX CUPBOARDS

Type: Factory finished

ALKYD GLOSS, EXTERNAL ON NEW JOINERY

- Initial coat: Primer to BS 7596:2000 or BS 4756:1998
- Finishing coats: Two coats undercoat, two coats gloss.

EXTERNAL GALVANISED STEEL

Type: Alkyd Gloss

- Preparation: Pre-treatment primer
- Initial coat: Zinc phosphate primer or primer recommended by manufacturer of finishing coats.
- Finishing coats: Two coats undercoat, two coats gloss.

MICROPOROUS PAINT ON EXTERNAL JOINERY

- Application: Follow manufacturer's instructions.
- Ensure preservative treatment used on joinery does not include a water repellent.

PRESERVATIVE STAIN ON EXTERNAL WOODWORK

- Application: Follow manufacturer's instructions.

WINDOWS AND EXTERNAL DOORS

GENERAL GLAZING

WORKMANSHIP GENERALLY:

- Glazing generally: to BS 6262:2005 and to "Secured by Design" performance standards for external doors and windows.
- The glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
- Panes/sheets to be accurately sized, with clean, undisfigured surfaces and undamaged edges.
- Avoid contact between glazing panes/units and alkaline materials such as cement and lime.
- Keep materials dry until fixed. Keep insulating glass units and plastics glazing sheets protected from the sun and away from heat sources.
- Ensure that glass/plastics, surround materials, sealers, primers and paints/clear finishes to be used together are compatible. Comply with glazing and sealant manufacturers' recommendations.

GLASS GENERALLY:

- To BS 952-1:1995 and the relevant part(s) of:
BS EN 572:2004 for basic soda lime silicate glass.
Free from scratches, bubbles, cracks, rippling, dimples and other defects.
- Panes/sheets to be clean and free from obvious scratches, bubbles, cracks, rippling dimples and other defects.
- Edges generally undamaged. Sheels and chips not more than 2mm deep and extending not more than 5 mm across the surface are acceptable if ground out.

LINEAR PATTERNED/WIRED GLASS:

To be aligned vertically/horizontally as appropriate and pattern matched across adjacent panes in close proximity.

EDGE TAPES TO INSULATING UNITS:

Report to CA any damage to edge tapes. Obtain approval of proposed method of repair.

BEAD FIXING WITH PINS:

Space pins evenly at not more that 150 mm centres, and within 50 mm of each corner. Punch pins just below the timber surface.

BEAD FIXED INSULATING GLAZING TO PVC-U WINDOWS/DOORS:

- Pane material: Insulating glass units to BS 5713:1979 hermetically sealed and kitemark certified. Laminated glass (where specified) to BS EN 12600:2002
- Surround/bead: Internal or external beading as supplied by window manufacturer.
- Bead fixing: Clipped.
- Glazing system: Insert gasket sections. Where bead is fitted externally glass units are to be fixed with security glazing tape or security clips.
- Locate insulating unit centrally in surround using setting and location blocks.
- Install gaskets and fit beads as recommended by the frame manufacturer. Cut gasket sections over length to ensure a tight fit without gaps at corners.
- Ensure that drainage and ventilation holes are not obstructed.

WINDOWS AND EXTERNAL DOORS (Cont'd)

BEAD FIXED INSULATING GLAZING TO TIMBER WINDOWS/DOORS

- Pane material: Insulating glass units to BS 5713:1979, hermetically sealed and kitemark certified. Laminated glass (where specified) to BS EN 12600:2002
- Bead: As supplied loose pinned by window manufacturer
Preparation: Use sealant primer recommended by sealant manufacturer.
Bead fixing: Bonded and pinned with brass pins.
- Glazing system:
Inner sealant: Low permeability sealant.
Outer sealant: Moisture vapour permeable sealant.
- Apply inner sealant to full height to rebate. Use distance pieces to give not less than 3mm bed between rebate and unit.
- Locate insulating unit centrally in surround using setting and location blocks.
- Fill edge clearance void with outer sealant and apply a substantial bead between the unit and the rebate platform. Insert distance pieces to give not less than 3mm bed between unit and beads.
- Bed the beads on outer sealant and apply sufficient pressure to extrude the sealant up between beads and unit. Fix beads securely.
- Apply further outer sealant to complete the bedding up to sight line and finish with a smoother chamfer.
- Finish off outer and inner sealant to a smooth chamfer.

WINDOWS GENERALLY

Windows dimensions and type as indicated on drawings and in accordance with the local Planning Authority & Building Regulations / FENSA requirements (as appropriate).

Openable parts of windows as indicated on drawings to provide purge ventilation to comply with Building Regulations.

Timber windows to conform with BS 644: 2009

PVC-U windows to conform with BS 7412:2007

Aluminium Windows to conform with BS 4873:2009

GLAZING:

Hermetically sealed double glazing units to BS 5713:1979, with clear double glazing with the exception of the Bathroom and Shower Room, which should be obscure;

All glazing to have a minimum of 16mm wide air gap.

6.4mm thick laminated glass to be installed in windows adjacent to doors, in ground floor windows and windows provided for emergency egress and those easily accessible above ground floor to comply with both Building Regulations Secured By Design requirements.

Where glazing in windows is below 800mm from F.F.L. or within 300mm to the side of a door opening to a height of 1500mm, glazing to be laminated glass to conform to BS6206:1981 and marked accordingly.

WINDOWS AND EXTERNAL DOORS (Cont'd)

THERMAL PERFORMANCE:

All windows to achieve a "U" Value of **1.5 W/m²K** or better subject to SAP Calculations and type of heating and ventilation system specified.

EGRESS WINDOWS:

Any window provided for emergency egress purposes in accordance with the Building Regulations Approved Document B1 Section 2 to have an unobstructed openable area of at least 0.33m² and at least 450mm high or 450mm wide. The bottom of the openable area should be not more than 1100mm above the floor.

Where required windows to have either removable central mullion or mullions planted to one casement to achieve the required unobstructed opening width.

SECURED BY DESIGN:

Ground floor windows and those easily accessible above ground floor, must be successfully tested to BS 7950:1997 'Specification for enhanced security performance of casement and tilt/turn windows for domestic applications'.

Window should also be assessed by a suitably qualified and recognised third party Certification Authority to the relevant material.

Provide independently certified evidence that all specified variants of components comply with specified performance requirements and the Architectural Liaison Officer 'Secured by Design' performance standards.

Windows to be secured to the fabric of the building in accordance with manufacturer's instructions. Anti lift blocks to be provided at the top and bottom of the frame to help prevent against forced attack.

All windows to be complete fitted with reflex hinges, shoot bolt espagnolette locking systems.

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 3 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all window materials are responsibly sourced. Where applicable all timber to be **legally** sourced with Chain Of Custody Certification.

GREEN GUIDE RATING:

All timber windows to be "Timber Window Accreditation Scheme" (TWAS) certified and to achieve a Green Guide "**A**" **Rating** or better.

LIFETIME HOMES:

To comply with Design Criteria 15 of Lifetime Homes the glazing in the principle window in the Living Room should begin at 800mm or lower.

All handles and controls to all windows within the dwelling should be **no higher than 1200mm** from the floor.

WINDOWS AND EXTERNAL DOORS (Cont'd)

TIMBER WINDOWS:

- To BS 644: 2009
- Exposure category (Design wind pressure): 2000 (Pa).
- Timber to receive paint finish: to BS EN 942:2007
Wood species: Class J10 for glazing beads, drip mouldings and the like.
Class J40 for all other members.
Preservative treatment: Refer To Green Guide.
Organic solvent (without water repellent) as British Wood Preserving and Damp-proofing Association Commodity Specification C5.
Desired service life: 30 years.
- Timber to receive stain finish: to BS EN 942:2007
Class J2 for glazing beads, drip mouldings and the like.
Class J30 for all other members.
Knots on arrises and finger jointing will not be permitted where exposed to view.
Preservative treatment: Organic solvent (without water repellent) as British Wood Preserving and Damp-proofing Association Commodity Specification C5.
Desired service life: 30 years.
- Moisture content on delivery: 13 to 19%
- Finish as delivered: Prepare and prime for paint finish. Prepare and apply basecoat and 1 coat of stain for stain finish.

PVC-U WINDOWS:

- Manufactured from reinforced white PVC-U extruded hollow profiles under a third party certified quality assurance scheme. (e.g. BBA or UKAS accredited body such as BSI)
- Fabricated windows to conform with BS 7412:2007 or a current Agreement Certificate including Enhanced Resistance to Intrusion issued by BBA. Testing to BS 7950:1997 must be carried out at a UKAS accredited test house.
- White extruded PVC-U hollow profiles to conform with BS 514:20020 and BS EN12608:2003 7413 or a current Agrément Certificate issued by BBA.
- Reinforcement to be stainless steel, aluminium or pre-galvanized (min G275) mild steel.
- Exposure category (Design wind pressure): 2000 Pa

DIMENSIONS: The Contractor will be responsible for taking sufficient on site measurements to ensure the correct fittings of Windows.

SEALING: All window frames to be sealed around their perimeter with a silicon mastic sealant (colour white). Sealant to be provided to front and back of all new windows frames to minimize air leakage.

PRIMING/SEALING: Before fixing components ensure that surfaces of timber which will be inaccessible after installation are primed or sealed as specified.

INSTALL PVC-U WINDOWS: In accordance with the British Plastics Federation window installation guide, reference COP 3-B.

WINDOWS AND EXTERNAL DOORS (Cont'd)

FIXING CENTRES FOR TIMBER FRAMES:

- Using screws, cramps or lugs as recommended by window manufacturer.
- When not predrilled or specified otherwise, position fixings not more than 150 mm from each end of jamb, adjacent to each hanging point of opening lights and at maximum 450mm centres.

FIXING OF PVC-U FRAMES:

- Using screws, cramps or lugs as recommended by window manufacturer.
- When not predrilled or specified otherwise, position fixings 150-250mm from each end of jamb, adjacent to each hanging point of opening lights, but no closer than 150mm to a transom or mullion centre line, and at maximum 600mm centres.

SEALANT JOINTS:

- Sealant: Gun applied silicone or polysulphide mastic, colour matched to external wall finish.
- Prepare joints and apply sealant. Finish triangular fillets with a flat or slightly convex profile.

GUARANTEE: All windows must carry a minimum 10 Year guarantee against manufacturing defects colour stability, bow, warping, water ingress with a written guarantee supplied upon Practical Completion.

EVIDENCE OF PERFORMANCE:

Provide independently certified evidence that all specified variants of components comply with specified performance requirements and the ACPO 'Secured by Design' performance standards.

WINDOW IRONMONGERY

High level adjustable flush trickle ventilators incorporating external weather proofing canopy to provide background ventilation in accordance with the Building Regulations. Colour to match windows.

Hinges or window design to permit safe cleaning from internally - refer to BS 8213-1:2004.

Window handles and key locking hardware to all ground floor windows not providing emergency egress. Key operated locks must have a key to lock function - push to lock mechanisms and automatic locking mechanisms which require a key to unlock must not be used. Refer to elevation drawings for identification and location.

Restrictor to limit initial opening to 100mm with a release mechanism which is inaccessible to a young child or otherwise difficult for a young child to operate.

WINDOWS AND EXTERNAL DOORS (Cont'd)

Hinges and window restrictors to be of corrosion resistant stainless steel, fixed with 300 series austenitic (non-magnetic) stainless steel screws or other specification to meet BS 7950:1997 performance standards if required.

Fixing: In accordance with relevant **Accredited Construction Details**.

General: Assemble and fix carefully and accurately using fastenings with matching finish supplied by ironmongery manufacturer. Prevent damage to ironmongery and adjacent surfaces. At completion check, adjust and lubricate as necessary to ensure correct functioning.

EXTERNAL DOORS

GENERAL:

Door dimensions and type as indicated on drawings and in accordance with the local Planning Authority & Building Regulations requirements.

SECURED BY DESIGN:

All external doorsets including French Doors to be successfully tested to BS PAS 24-1:1999 "Doors of enhanced security" and PAS 23-1:1999 "General requirements for door assemblies" with high quality police approved modern three point espagnolette locking systems complete with lever handles and laminated glass to comply with SBD requirements. Doorsets to be secured to the fabric of the building in accordance with manufacturer's instructions.

Letter Plates to be no larger than 250 x 38mm and to be located at least 450mm away from any locks. An internal deflector shall be fitted over the letter plate.

All dwellings to be clearly identified with a house number fixed to the doors.

Door chain to be fitted to all doors and spy holes inserted.

LIFETIME HOMES:

To comply with Lifetime Homes Criteria 6, the clear opening width of the front door should be a minimum 800mm. There should be a 300mm nib to the side of the leading edge of doors at entrance door.

To comply with Lifetime Homes Criteria 4b, all entrances should have a level access over the threshold which should not exceed 15mm.

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 3 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all external door materials are responsibly sourced. Where applicable all timber to be **legally** sourced with Chain Of Custody Certification.

The Insulation Core is to be CFC free Zero ODP with a Global Warming Potential of less than 5 for section POL 1 of the Code for Sustainable Homes.

THERMAL PERFORMANCE:

All **doorsets** to achieve a "U" Value of **1.5 W/m²K** or better subject to SAP Calculations and type of heating and ventilation system specified.

WINDOWS AND EXTERNAL DOORS (Cont'd)

GLAZING TO DOORS & SIDELIGHTS:

Double glazed units with 6.4mm laminated outer pane, 15.5mm chrome spacer bar and 4mm toughened inner pane.

Glazing to be of a cassette system which enables the double glazed unit to be replaced if required. The size of the double glazed units is to remain a standard size for each type of door style. Cassettes are to be coloured to match the skin of the door, Glass to be Pilkington "Cotswold" Obscured glass. Pilkington 'K' Glass is required to meet current Building Regulations requirements where installed, this includes toughened / laminated safety glass.

All necessary beads, packers etc, for the double glazed sealed units are to be supplied by the window fabricator.

Where glazing in doors is below 800mm from F.F.L. or within 300mm to the side of a door opening to a height of 1500mm, glazing to be laminated glass to conform to BS6206:1981 and marked accordingly.

GUARANTEE

All doorsets / combination frames must carry a minimum 10 Year guarantee against manufacturing defects colour stability, bow, warping, water ingress with a written guarantee supplied upon Practical Completion.

EXTERNAL COMPOSITE DOORS

Material: GRP doors constructed using two 2mm thick GRP woodgrain skins permanently bonded to a perimeter sub-frame of synthetic material and filled with an insulating polyurethane core. CFC and HCFC free, with an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than five.

Pattern: All doors to be of a type/style as indicated on the drawings or agreed with the Employer.

Leaf size: To comply with Lifetime Homes for wheelchair access..

Frame: Factory assembled pre-hung units.

Fixing: As recommended by manufacturer and in accordance with Accredited Construction Details.

Colour: All doors to be: agreed with the Employer and the Local Planning Authority.

Finish: Factory Finish with Grained Effect.

WINDOWS AND EXTERNAL DOORS (Cont'd)

EXTERNAL TIMBER DOORS: (Only to be used if “U” Value of 1.5 W/m²K or better can be achieved, otherwise use composite doors)

- Pattern: As indicated on drawings
- Timber to receive paint finish to BS EN 942:2007
Wood species: Class J10 for glazing beads and the like.
Class J40 for all other members.
Preservative treatment: Organic solvent (without water repellent) as British Wood Preserving and Damp-proofing Association Commodity Specification C5.
- Desired service life: 30 years
- Timber to receive stain finish: to BS EN 942:2007
Knots on arrises and finger jointing will not be permitted where exposed to view.
Preservative treatment: Organic solvent (without water repellent) as British Wood Preserving and Damp-proofing Association Commodity Specification C5.
- Leaf size: As previously noted.
- Adhesive: Synthetic resin to BS EN 301:1992 and BS EN 302-1:1992, type WBP
- Workmanship: To BS 1186:1988.
- Moisture content on delivery: 13 to 19%
- Accuracy: to BS 4787-1:1980.

EXTERNAL TIMBER DOOR FRAMES:

- Timber to BS EN 942:2007
Class: J40 for paint finish, J30 for stain finish.
- Preservative treatment: Organic solvent (without water repellent) as British Wood Preserving and Damp-proofing Association Commodity Specification C5.
- Desired service life: 30 years
- Rebates: At least 18 mm deep and cut out of the solid frame, not planted.
- Moisture content on delivery: 13 to 19%
- Weatherstripping: compression or wiper seals
- Fixing: Screws and pelleting or build in with cramps behind a 12 mm rebate between outer leaf and cavity closure or as manufacturer's recommendation or requirements of Structural Insurance organisation.

IRONMONGERY TO EXTERNAL DOORS

THRESHOLDS:

For disabled access to meet current Building Regulations using proprietary seals.
Preference: Exitex or equal approved.

- Extruded aluminium incorporating weatherboard and replaceable gaskets, maximum height of threshold section 15 mm and to comply with Part M of Building Regulations and Lifetime Homes criteria 04.
- Fixing: Follow manufacturer's instructions/recommendations.
- Dimension between top of threshold and finished floor level to be minimum 25 mm to allow for a carpet zone of 15mm.

LOCKS:

To comply with BS PAS 24-1:1999 and PAS 23-1:1999.

High quality police approved modern three point espagnolette locking systems complete with lever handles.

WINDOWS AND EXTERNAL DOORS (Cont'd)

Doors to be fitted with a multi-point locking system incorporating a stainless steel cover plate to BS EN 10029:1991. Lock gearboxes must be screw fixed to connecting rod mechanism, (riveted systems are not acceptable).

Locks must be tested (with reports available for inspection) for an anticipated 30 year life span, be guaranteed for 10 years, including lock and handles, and every lock must be stamped with Secure By Design logo to prove testing compliance.

Lock handles and any additional furniture should be matching, in both colours and finish.

GENERAL:

Letter plates to be provided to Front Doors only and must be sleeved and draught stripped and no larger than 250 x 38mm and to be located at least 450mm away from any locks and not less than 600mm from the floor level. An internal deflector is to be fitted over the letter plate.

180 degree "Security Viewer" to be fitted to doors at a height of 1500mm above floor (not required when unobscured glazing is fitted to door or side panel).
Door chain to be fitted to Front Doors only.

Numerals: 50mm high. Location to be at top of front door only.

Door stops: To be provided where required to prevent doors from damaging finishes, fittings, etc.

WINDOW BOARDS

- Quality of timber: To BS 1186-3:1990.
Class: 2 and 3 or MDF to BS EN 316:2009 and BS EN 321:1993 and BS EN 322:1993.
Moisture content at time of fixing: 8 to 10%
Finished thickness: Minimum 20 mm.

CURTAIN RAIL BATTENS

- Quality of timber: To BS 1186-3:1990.
Class: 2 and 3 or MDF to BS EN 316:2009 and BS EN 321:1993 and BS EN 322:1993.
Moisture content at time of fixing: 8 to 10%
Finished size: 20 x 70 mm (minimum).
- Fixing: Fix 100 mm above all window heads, extend 150 mm beyond each reveal.

PAINTING AND DECORATING

ALKYD GLOSS ON NEW JOINERY

- Location: new timber except where factory applied pre-finished.
- Initial coat: Primer to BS 7596:2000 or BS 4756:1998
- Finishing coats: One coat undercoat, one coat gloss.

INTERNAL DOORS

LIFETIME HOMES:

To comply with Lifetime Homes Criteria 6, the clear opening width of the internal doors should conform to the specification below.

<u>Doorway Clear Opening Width (mm)</u>	<u>Corridor/ Passageway Width (mm)</u>
Minimum	Minimum
750mm or wider	900mm (when approach is head on)
750mm or wider	1200mm (when approach is not head on)
775mm or wider	105mm (when approach is not head on)
900mm or wider	900mm (when approach is not head on)

There should be a 300mm nib to the side of the leading edge of doors at entrance door.

CODE FOR SUSTAINABLE HOMES:

Where credits are being sought under Section MAT 3 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all internal door materials are responsibly sourced. All timber to be **legally** sourced with Chain of Custody Certification.

INTERNAL TIMBER DOORS:

Core: Solid

Type: Howden's Developer range with linings and stops.

Facings: Primed ready to receive a site applied gloss paint finish.

Lippings: Hardwood lippings to stiles

Moisture content on delivery: 10% + 2

Finish as delivered: Primer.

Leaf Size: Refer to Lifetime Homes Requirements noted above.

FIRE RESISTING TIMBER DOOR/DOORSETS:

Provide evidence in the form of a product conformity certificate, test report or engineering assessment that each fire door/doorset supplied will comply with the specified requirements for fire resistance if tested in accordance with BS 476-22:1987 or BS EN 1634-1:2008. Such certification must cover door and frame materials, glass and glazing materials and installation, essential and ancillary ironmongery, hinges and seals.

Completely fill gap between back of frame and reveal with plaster or mineral wool packing.

INTERNAL DOORS (Cont'd)

DOOR LININGS WITH PLANTED STOPS

Timber to BS EN 942:1996.

Class: 2 and 3.

Moisture content on delivery: 8 to 12%.

Lining fixing: Screws and pelleting.

Stop fixing: Screws and pelleting or pinned to door linings as appropriate 150mm from top and bottom and at 300mm maximum centres.

EVIDENCE OF PERFORMANCE:

Provide independently certified evidence that all specified variants of components comply with specified performance requirements and the ACPO 'Secured by Design' performance standards for external doors.

PROTECTION OF COMPONENTS:

Do not deliver to site components which cannot be put immediately into suitable dry, floored and covered storage. Stack on bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

MOISTURE CONTENT:

During delivery, storage, fixing and thereafter to Practical Completion maintain conditions of temperature and humidity to suit specified moisture content(s) of timber components. When instructed by CA, test components with an approved moisture meter used in accordance with manufacturer's recommendations.

PRIMING/SEALING:

Before fixing components ensure that surfaces of timber which will be inaccessible after installation are primed or sealed as specified.

PREPARED OPENINGS:

Ensure that d.p.c's are positioned correctly in relation to frames and prevent displacement during fixing operations.

FIXING CENTRES FOR TIMBER FRAMES:

When not predrilled or specified otherwise, position fixings 150 mm from each end of jamb, adjacent to each hanging point and at 600 mm maximum centres.

LOOSE THRESHOLDS:

Fix 150 mm from each end and at 600 mm maximum centres.

SEALANT JOINTS:

- Sealant: Gun applied silicone or polysulphide mastic, colour matched to external wall finish.

INTERNAL DOORS (Cont'd)

INTERNAL DOOR IRONMONGERY:

Furniture: Mortice latch to BS 12209:2003 and "D" lever furniture.

Manufacturer and reference: Sample to be agreed.

Hinges: 1½ pair 75 mm butts to BS 1935:2002 (medium duty). Where not specified otherwise, position hinges with centre lines 250 mm from top and bottom of door leaf.

Position third hinge (where specified) on centre line of door leaf.

Position hinges for fire resisting doors in accordance with door leaf manufacturer's recommendations.

Other requirements:

Fit door handles 900 mm above floor level.

Bathrooms and wc door furniture must incorporate a privacy latch capable of emergency opening from outside.

Provide doorstops where doors open against adjacent walls or fixtures.

Provide 20 mm minimum high hardwood thresholds beneath doors.

Fit automatic self-closing device to doors requiring a fire resistance to comply with Building Regulations.

Provide a 75mm necked bolt or a flush bolt to one door leaf where pairs of doors are fitted.

FIXING IRONMONGERY GENERALLY

- Assemble and fix carefully and accurately using fasteners supplied by the ironmongery manufacturer, with matching finish and equivalent corrosion resistance.
- Holes for components to be no larger than the minimum required for satisfactory fit/operation.
- Protect ironmongery and adjacent surfaces as necessary to prevent damage.
- At completion, check, adjust and lubricate as necessary to ensure correct functioning of all moving parts.

FIXING IRONMONGERY TO FIRE RESISTING DOOR ASSEMBLIES

- Fix all items in accordance with door leaf manufacturer's recommendations.
- Ensure that, when fixed, ironmongery does not compromise the integrity of the assembly as established by testing/assessment.
- Cut holes for through fixings and components accurately. Clearances must not be greater than 8 mm unless protected by intumescent paste or similar.
- Coat lock/latch cases for FD60 doors with intumescent paint or paste before fitting.

LOCATION OF HINGES

- Where not specified otherwise, position hinges with centre lines 250 mm from top and bottom of door leaf.
- Position third hinge (where specified) on centre line of door leaf.
- Position hinges for fire resisting doors in accordance with door leaf manufacturer's recommendations.

INTERNAL DOORS (Cont'd)

ARCHITRAVES:

- Quality of timber: To BS 1186-3:1990.
Class: 2 and 3 or MDF to BS EN 316:1993 and BS EN 322:1993.
Moisture content at time of fixing: 8 to 10%
Profile: Pencil rounded to front edges.
Finished size: 13 x 45 mm (minimum) or 13 mm (minimum) quadrant where full architraves cannot be achieved.

PAINTING AND DECORATING

ALKYD GLOSS ON NEW JOINERY

- Initial coat: Primer to BS 7596:2000 or BS 4756:1998
- Finishing coats: One coat undercoat, one coat gloss.

FLOOR FINISHES

INTERNAL JOINERY

SKIRTINGS:

- Profile: Pencil rounded to front edges.
Quality of timber: To BS 1186-3:1990.
Class: 2 and 3 or MDF to BS EN 316:1993.
Moisture content at time of fixing: 8 to 10%
Finished size: 13 x 95 mm (minimum).

PAINTING AND DECORATING

ALKYD GLOSS ON NEW JOINERY

- Initial coat: Primer to BS 7596:2000 or BS 4756:1998
- Finishing coats: One coat undercoat, one coat gloss.

SLIP RESISTANT VINYL SHEET FLOORING

Locations: Kitchens, Kitchen/Dining Rooms

Type: Slip Resistant Vinyl sheet

Manufacturer/reference: Polysafe Standard or equal approved laid strictly in accordance with the Manufacturer's written recommendations.

Colour: A choice of 3 No. To be decided by Employer.

- Base: Trowelled screed or rigid sheet flooring
- Flooring roll: to BS EN 685:2007 class 23
- Seam welded joints.
- Special requirements: Seal to skirtings at perimeter and at junctions with kitchen fittings with silicone mastic.

INTERNAL FLOOR FINISHES (Cont'd)

Locations: Bathrooms, Shower Rooms and W.C. Compartments.

Type: Slip Resistant Vinyl sheet

Manufacturer/reference: Polysafe Standard or equal approved laid strictly in accordance with the Manufacturer's written recommendations.

Colour: A choice of 3 No. To be decided by Employer.

- Base: Trowelled screed or rigid sheet flooring
- Flooring roll: to BS EN 685:2007 class 23
- Seam welded joints.
- Special requirements: Seal to skirtings at perimeter and at junctions with sanitary fittings with silicone mastic or form cove.

VINYL SHEET FLOORING

Locations: All floor locations where the background is a timber floating floor except where a Slip Resistant Vinyl Sheet is required (see above).

Type: Vinyl sheet.

Manufacturer/reference: Polysafe Standard XL or equal approved.

Colour: A choice of 3 No. to be decided by Employer-

- Base: rigid sheet flooring
- Flooring roll: to BS EN 685:2007 class 23
- Seam welded joints.
- Special requirements: Seal to skirtings at perimeter with silicone mastic.

THERMOPLASTIC FLOOR TILING

Locations: All floor locations where the background is either a cementitious screed or a concrete slab except where a Slip Resistant Vinyl Sheet is required (see above).

Type: Thermoplastic vinyl tiles to BS EN 649 and BS EN 685 Class 23.

Manufacturer/reference: Marley or equal approved.

Colour: A choice of 3 No. to be decided by Employer-

Finishing: Wash and polish as clause 820

Special requirements: Seal to skirtings at perimeter with silicone mastic.

PREPARING BASES -

DAMPNESS:

Where coverings are to be laid on new wet-laid bases:

- Ensure that drying aids have been turned off for not less than 4 days, then
- Test for moisture content using an accurately calibrated hygrometer in accordance with BS 5325:2001, Annex B or BS 8203:2001+A1:2009, Annex A.
- Take readings in all corners, along edges, and at various points over the area being tested.
- Do not lay coverings until all readings show 75% relative humidity or less.

SET OUT TILES from centre of space/room unless specified otherwise, so that wherever possible:

- Tiles along opposite edges are of equal size, and
- Edge tiles are more than 50% of full tile width.

INTERNAL FLOOR FINISHES (Cont'd)

COLOUR CONSISTENCY:

In any one area/room use only coverings from the same production batch to prevent banding or patchiness resulting from colour/flash variation.

ADHESIVE FIXING GENERALLY:

- Adhesive: when not specified otherwise, type to be as recommended by covering manufacturer or, in the absence of such recommendation, type to be approved.
- Use a primer where recommended by adhesive manufacturer. Allow to dry thoroughly before applying adhesive.
- Spread adhesive evenly and lay covering, pressing down firmly and rolling laterally and transversely (if recommended) to ensure full contact and a good bond overall. Reroll (if recommended) within 30 minutes.
- Remove all surplus adhesive from exposed faces of coverings as the work proceeds.
- Trowel ridges and high spots caused by particles on the substrate will not be accepted.

SEAM WELDING:

- Do not commence welding of coverings until a minimum of 24 hours after laying or until adhesive has completely set.
- Form a neat, smooth, strongly bonded joint, flush with finished surface.

FINISHING THERMOPLASTIC VINYL AND LINOLEUM FLOORING AT COMPLETION:

- Wash floor using mops dampened with water containing neutral (ph 6-9) detergent. If necessary, lightly scrub heavily soiled areas using a brush or synthetic fibre web pad.
- Thoroughly rinse with clean water, removing surplus to ensure no damage to adhesive, and allow to dry.
- Apply two coats of emulsion polish of a type recommended by covering manufacturer.

SUITABILITY OF BASES:

Before starting work ensure that backgrounds/ bases:

Are sufficiently flat to permit specified flatness/regularity of finished surfaces bearing in mind the permissible minimum and maximum thicknesses of the bedding material.

Have been allowed to dry out by exposure to the air for not less than the following:

- Concrete slabs: 6 weeks.
- Cement:sand screeds: 3 weeks.

SETTING OUT:

- Joints to be true to line, continuous and without steps.
- Joints on walls to be truly horizontal, vertical and in alignment round corners.
- Joints in floors to be parallel to the main axis of the space or specified features.

COVED TILE SKIRTINGS:

Bed solid to wall with cement based adhesive before laying floor tiles. Ensure joints in skirtings match and align with joints in floor tiling.

INTERNAL FLOOR FINISHES (Cont'd)

SIT-ON TILE SKIRTINGS:

Bed solid to wall with cement based adhesive after laying floor tiles. Ensure joints in skirtings match and align with joints in floor tiling.

THICK BED ADHESIVE - SOLID (FLOORS):

Apply floated coat of adhesive to dry base and comb the surface with the recommended solid bed trowel. Apply adhesive to backs of tiles as necessary to fill any depressions or keys. Press tiles firmly into position to give finished bed thickness within the range recommended by the manufacturer.

GROUTING:

Grout tiles as soon as possible after bedding has set sufficiently to prevent disturbance of tiles.

- Ensure that joints are 6 mm deep (or the depth of the tile if less), and are free from dust and debris.
- Fill joints completely, tool to an approved profile, clean off surface and leave free from blemishes.

Polish wall tiling with a dry cloth when joints are hard.

INTERNAL WALL FINISHES

PAINTING/CLEAR FINISHING

Locations:

INTERNAL WALLS GENERALLY.

Type: Vinyl Matt emulsion

- Emulsion: Water-borne emulsion paint to BS 7719: 1994.
- Manufacturer: Glidden or Dulux
- Surfaces: Plaster/plasterboard with surface suitable for direct decoration.
Preparation: To BS 6150:2006, Section 4.
- Initial coat: One thinned coat applied prior to commencement of second fix works.
- Finishing coat: Two full coats.
- Colour: Magnolia BS 08 B15

INTERNAL WALLS TO KITCHENS, BATHROOMS, WC COMPARTMENTS AND SHOWER ROOMS.

Type: Acrylic eggshell

- Emulsion: Water-borne acrylic paint.
- Manufacturer: Glidden or Dulux
- Surfaces: Plaster/plasterboard with surface suitable for direct decoration.
Preparation: To BS 6150:2006, Section 4.
- Initial coat: One thinned coat applied prior to commencement of second fix works.
- Finishing coat: Two full coats.
- Colour: Magnolia BS 08 B15

INTERNAL WALL FINISHES

EXPOSED PIPEWORK GENERALLY.

Paint: Satinwood

- Manufacturer: Dulux
- Surfaces: Copper pipework
- Initial coat: one coat zinc phosphate primer
- Finishing coat: Two full coats Satinwood
- Colour: White

TILING TO WALLS AND WINDOW CILLS

Locations:

KITCHENS:

450 mm high splash backs above all kitchen units or to underside of wall cupboards; and from floor to 450 mm above adjacent work surfaces in cooker position.

BATHROOMS:

Tile to ceiling around baths
450 mm above wash basins

SHOWER ENCLOSURE:

Tile from top of shower tray or floor finish to underside of ceiling to perimeter walls.

ABOVE ALL WASH HAND BASINS:

450 mm above wash hand basins.
Generally: Sills and reveals to windows occurring in areas of tiling.

CERAMIC WALL TILES:

- Tiles: To BS EN 14411:2003, group B
Size: 150 x 150mm nominal
Colour: White with matching edge trims to all exposed edges.
- Background/Base: Plaster/Plasterboard/Plywood.

Preparation: Use primers/sealers recommended by adhesive manufacturer

Bedding: Thin bed adhesive: Apply floated coat of adhesive to dry background in areas of approximately 1 sq m and comb the surface with the recommended solid bed trowel.

Apply thin even coat of adhesive to backs of dry tiles. Press tiles onto bedding with twisting/sliding action to give finished bed thickness of not more than 3 mm.

Adhesive: Water resistant organic based from Building Adhesives Ltd or similar product.

- Grouting material: Water resistant as recommended by adhesive manufacturer
- Grout tiles as soon as possible after bedding has set sufficiently to prevent disturbance of tiles.
- Ensure that joints are 6 mm deep (or the depth of the tile if less), and are free from dust and debris.
Fill joints completely, tool to an approved profile, clean off surface and leave free from blemishes. Polish wall tiling with a dry cloth when joints are hard.
Joint width: 2 mm
- Accessories: Plastics tile edge trim where the edges are exposed.
- Point junction between tiles and sanitary/kitchen fittings with silicone based sealant to BS EN ISO 11600:2003, Type B with fungicide.

INTERNAL WALL FINISHES (Cont'd)

MIXING GENERALLY:

- Check that there are no unintended colour/shade variations within the tiles for use in each area/room. Thoroughly mix variegated tiles.
- Check that adhesive is compatible with background/base. Use a primer where recommended by adhesive manufacturer.
- Cut tiles neatly and accurately.
- Unless specified otherwise fix tiles so that there is adhesion over the whole of the background/base and tile backs.
- Before bedding material sets make adjustments necessary to give true, regular appearance to tiles and joints when viewed under final lighting conditions.
- Clean surplus bedding material from joints and face of tiles without disturbing tiles.

SETTING OUT:

- Joints to be true to line, continuous and without steps.
- Joints on walls to be truly horizontal, vertical and in alignment round corners.
- Joints in floors to be parallel to the main axis of the space or specified features.

FLATNESS/REGULARITY OF TILING:

Sudden irregularities not permitted. When checked with a 2 m straight edge with 3 mm thick feet at each end, placed anywhere on the surface, the straightedge should not be obstructed by the tiles and no gap should be greater than 6 mm.

THIN BED ADHESIVE - SOLID (WALLS):

Apply floated coat of adhesive to dry background in areas of approximately 1 sq m and comb the surface with the recommended solid bed trowel. Apply thin even coat of adhesive to backs of dry tiles. Press tiles onto bedding with twisting/sliding action to give finished bed thickness of not more than 3 mm.

GROUTING:

- Grout tiles as soon as possible after bedding has set sufficiently to prevent disturbance of tiles.
- Ensure that joints are 6 mm deep (or the depth of the tile if less), and are free from dust and debris.
- Fill joints completely, tool to an approved profile, clean off surface and leave free from blemishes.

Polish wall tiling with a dry cloth when joints are hard.

INTERNAL CEILING FINISHES

PLASTERBOARD DRYLINING CEILINGS

TYPE(S) OF DRY LINING

CEILING LINING ON TIMBER JOISTS

- Background: Timber joists or trussed rafters at maximum 600mm centres.
- Lining: 15mm Wallboard with a density of 10kg/m² where 30 minutes fire resistance is required. 2 layers of 12.5mm fireline board with staggered joints where 60 minute fire resistance is required.
- Fixing: Using galvanised steel wire nails with round flat heads to BS 1202-1:2002, size 40 x 2mm.
- Finishing: Textured plastic compound, or skim coat plaster finish.

CEILING LINING ON TRUSSED RAFTERS.

- Background: Timber joists or trussed rafters at maximum 600mm centres.
- Lining: 15mm Wallboard.
- Fixing: Using galvanised steel wire nails with round flat heads to BS 1202-1:2002, size 40 x 2mm.
- Finishing: Textured plastic compound, or skim coat plaster finish

ADDITIONAL SUPPORTS FOR FIXTURES AND FITTINGS:

Provide accurately positioned and securely fixed framing to support fixtures, fittings and services. After fixing boards, mark positions of framing for following trades.

ADDITIONAL SUPPORTS FOR BOARD EDGES AND PERIMETERS:

Provide additional framing, accurately positioned and securely fixed, to give full support to board edges and lining perimeters in accordance with board manufacturer's recommendations.

PLASTERBOARD GENERALLY:

To BS EN 520:2004+A1:2009, types 1 to 5 with exposed surface and edge profiles suitable to receive the specified finish.

MOISTURE RESISTANT PLASTERBOARD:

To BS EN 520:2004+A1:2009, type 3 and 4 with moisture resistant core and moisture repellent paper facings.

DRY LINING GENERALLY:

- Fixing, jointing and finishing materials and accessories, where not specified otherwise, to be as recommended by the board manufacturer.
- Handle and store materials in accordance with BS 8212:1995, section 5. Do not use damaged boards.

INTERNAL CEILING FINISHES (Cont'd)

- Use operatives properly trained for dry lining work and who have attended a recognised training scheme.
- Fix boards only in areas which have been made weathertight. Prevent frost damage.
- Cut boards neatly and accurately without damage to core or tearing of paper facing. Keep cut edges to a minimum and position at internal angles wherever possible. Mask with bound edges of adjacent boards at external corners.
- Fix boards securely and firmly to suitably prepared and accurately levelled backgrounds. Set heads of fastenings in a depression; do not break paper or gypsum core. Finish neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

CEILINGS:

Fix boards to ceilings before walls and partitions. Fix boards with bound edges at right angles to supports and with ends staggered in adjacent rows.

FIRE STOPPING TO FIRE RESISTING PARTITIONS/WALLS:

Seal any gaps at junctions of linings and cavity barriers with perimeter abutments, service penetrations, etc. using tightly packed mineral wool or approved intumescent sealant, to prevent penetration of smoke and flame.

JOINTS BETWEEN BOARDS:

- Tapered edged plasterboards: Lightly butted. Leave a 3 mm gap where cut/unbound edges occur.
- Square edged plasterboards to be finished with textured plastic compound: 3 mm gap.

JOINTS:

- For two layer boarding, stagger joints between layers.

FIXING PLASTERBOARD TO TIMBER SUPPORTS:

- Fix securely to all supports working from the centre of each board using the specified method of fixing at the following maximum centres:
Nails: 150 mm centres.
- Position fixings not less than 10 mm from bound edges, 13 mm from cut/unbound edges and not less than 6 mm from the edge of the timber support.

TAPED SEAMLESS FINISH TO PLASTERBOARD:

- Lightly sand cut edges of boards to remove paper burrs. Apply PVAC sealer to exposed cut edges of boards and any other plaster surfaces to which tape is to be applied.
- Fill all joints, gaps and internal angles with joint compound and cover with continuous lengths of paper tape, fully bedded. Reinforce external angles, stop ends, etc. with the specified bead/corner tape.
- When set, cover with joint finish, feathered out to give a flush, smooth, seamless surface.
- Spot nail/screw depressions with joint filler to give a flush surface.
- Fill minor indents. After joint, angle and spotting treatments have dried, lightly sand to remove any minor imperfections.
- Apply specified primer/sealer to give a continuous consistent texture to surface of boards.

INTERNAL CEILING FINISHES (Cont'd)

SKIM COAT PLASTER FINISH:

Skim coat: Board finish plaster to BS EN 13279-1:2005 and BS EN 13279-2:2004, class B.
Thickness: 2 - 3 mm.

- Fill and tape all joints except where coincident with metal beads.
- Trowel/float to a tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

PAINTING AND DECORATING

Locations:

CEILINGS GENERALLY.

Type: Vinyl Matt emulsion

- Emulsion: Water-borne emulsion paint to BS 7719: 1994.
- Manufacturer: Glidden or Dulux
- Surfaces: Plaster/plasterboard with surface suitable for direct decoration.
Preparation: To BS 6150:2006, Section 4.
- Initial coat: One thinned coat applied prior to commencement of second fix works.
- Finishing coat: Two full coats.
- Colour: Brilliant white

CEILINGS TO KITCHENS, BATHROOMS, WC COMPARTMENTS AND SHOWER ROOMS.

Type: Acrylic eggshell

- Emulsion: Water-borne acrylic paint.
- Manufacturer: Glidden or Dulux
- Surfaces: Plaster/plasterboard with surface suitable for direct decoration.
Preparation: To BS 6150:2006, Section 4.
- Initial coat: One thinned coat applied prior to commencement of second fix works.
- Finishing coat: Two full coats.
- Colour: Brilliant white

FITTINGS AND FURNISHINGS

MATERIALS:

Where credits are being sought under Section MAT 3 of the Code for Sustainable Homes, certification to be provided to Code Assessor to indicate that all Kitchen materials are responsibly sourced. All timber to be **legally** sourced with Chain of Custody Certification.

FITTED KITCHEN UNITS:

Manufacturers:

- | | |
|-----------|--|
| MOORES: | Fanfare Jazz / Calypso range |
| RIXONWAY: | Trieste range |
| SYMPHONY: | Galway range |
| HOWDENS: | Greenwich maple range or equal approved. |

FITTINGS AND FURNISHINGS (Cont'd)

Colours: The colours of units and worktops are to be to the Associations approval.

Drawings: refer to kitchen layout drawings.

Special requirements: Care must be taken to ensure that the 620mm wide refrigerator space will accommodate a 'tall' fridge/freezer and is not obstructed above. (All electrical sockets to be located to side). The end panel should not be fixed until the anti slip flooring has been laid.

Contractor to allow 620mm wide space under worktops (including plumbing and electrics) for washing machines, tumble dryers.

Contractor to allow 620mm wide space (including electrics) for freestanding cooker. Contractor must also install a heat insulation panel where ever cooker space is directly next to fridge or fridge/ freezer space.

Storage Capacity:

The following minimum cubic capacity of the kitchen units for each dwelling is as follows;

One Bedroom Dwelling	1.5 m3
Two Bedroom Dwellings	2.1 m3
Three Bedroom Dwellings	2.3 m3
Four Bedroom Dwellings	2.5 m3
Five Bedroom Dwellings	2.6 m3

Layout: To meet DQR requirements.

Types of unit: Base units to be 900mm high x 600mm deep (nominal) and to have one internal shelf and full height doors. Drawer units to have three or four drawers. Wall units to be 600mm/900mm x 300mm deep (nominal) and to have one or two internal shelves.

Metal fittings: All steel fittings must be zinc/nickel plated or epoxy resin coated.

Strength requirements: To BS 6222-2:2009, level H.

Worktops: Post formed rounded edge chipboard to BS EN 312:2003, grade P5, faced and edged with high pressure laminate, fully lipped and sealed on unseen surfaces.

Thickness: 30 mm minimum or 40mm grade P3 board

Forming L-shapes: Use anodized aluminium corner jointing strip or Mason's mitre.

Worktop supports: Do not obstruct spaces reserved for appliances. Provide intermediate support to worktops over double appliance spaces.

Carcase: Metal box drawers, 15 mm minimum melamine faced chipboard to BS 6222 Part 2 Level H, grade P3/P5. All exposed edges lipped with 0.30 mm minimum PVC bonded with hot melt adhesive. Rails and muntins in timber, or vinyl wrapped MDF.

Backs: Provide backs in all base units. Back of cabinets to be white hardboard inset by 66mm to allow space for service runs.

Door and drawer fronts: Must be replaceable/ interchangeable. All cupboard doors to be fully lipped with PVC lippings minimum 3mm thick to match the colours of the fittings.

Handles: "D" type with back fixing and metal inserts to be approved by the Employer.

FITTINGS AND FURNISHINGS (Cont'd)

Drawer runners: With integral safety stops.

Hinges: Metal hinges to doors to be 170 degree opening, fully concealed with three way adjustment and integral catches. Hinges to comply with BS 6222 Part 2 Level H.

Sink: Austenitic 18/8 stainless steel to BS EN 13310:2003, (inset) with overflow. Thickness of material before forming to be a minimum of 0.83mm. Minimum depth of bowl to be 180mm from top edge of bowl to the deepest part including double recess for waste outlet.

Taps: ½inch chrome plated 75mm lever type mixer tap with dual flow swivel to BS EN 200:2008.

Refer to water consumption calculations for tap flow rate to comply with Section WAT1 of the Code for Sustainable Homes. **Flow restrictors or aerators to be installed as required to reduce flow rate of taps to reduce the water consumption.**

Wastes: Chrome plated brass waste to BS EN 274:2002 with plug and chrome plated chain and stay.

Trap: 40mm diameter, 75mm deep seal trap to BS EN 274:2002.

Sealing: Joint between sink and worktop, Silicone based to BS EN ISO 11600:2003 with fungicide. Colour: To CA approval.

Joint between worktop and wall, Silicone based to BS EN ISO 11600:2003 with fungicide. Colour: To CA approval, or approved proprietary sealing strip.

Joint between base unit and floor, Silicone based to BS EN ISO 11600:2003 with fungicide.

Colour: To CA approval.

Joint between jointing strip and worktop, Silicone based to BS EN ISO 11600:2003 with fungicide. Colour: To CA approval.

INSTALLATION

MOISTURE CONTENT:

During delivery, storage, fixing and thereafter to practical completion maintain conditions of temperature and humidity to suit specified moisture content(s) of timber components. When instructed by CA, test components with an approved moisture meter to manufacturer's recommendations.

WALL MOUNTED UNITS:

Fix with underside of unit 450 mm above worktop.

INSTALLATION GENERALLY:

Comply with BS 6222-2:2009.

CUT EDGES:

Where site cutting of chipboard materials cannot be avoided, seal cut edges immediately with 2 coats oil-based gloss paint or other sealer recommended by manufacturer.

TAPS:

Fix securely, making a watertight seal with the appliance.

FITTINGS AND FURNISHINGS (Cont'd)

WASTES/OVERFLOWS: Bed in waterproof jointing compound and fix with resilient washer between appliance and backnut.

SEALANT POINTING:

Sealant: Silicone based to BS EN ISO 11600:2003, Type B with fungicide.

Colour: To CA approval.

TRIMS:

Wherever possible to be in unjointed lengths between angles or ends of runs. Mitre angle joints unless otherwise specified.

RECYCLING BINS:

To comply with the mandatory section WAS1 of the Code for Sustainable Homes, supply and install to each dwelling a proprietary recycling bin to fit within a Kitchen base unit, with three separate different coloured containers. No individual container to be less than 15 litres. Minimum total capacity 60 litres.

Manufacturer:

Trio 3 x 10 Litre (30 litre total capacity) Multibox Built in Cupboard Recycler by Laundry Company Limited. **To fit into 300mm Kitchen Base Unit.**

Space Saving Triple Waste Bin (35 litre total capacity) supplied by The Bin Company UK. **To fit into 400mm Kitchen Base Unit.**

Space Saving Multi Bin (40 litre total capacity) supplied by The Bin Company UK. **To fit into 500mm Kitchen Base Unit.**

Literature to be provided to Code Assessor to demonstrate type of bin installed in each dwelling.

WHITE GOODS:

Where no "White Goods" are to be provided in the dwellings, Information on the EU Energy Efficiency Labelling Scheme of Efficient White Goods to be provided to each Dwelling for section ENE5 of The Code for Sustainable Homes.

A copy of the certificate and written confirmation that the certificate has been provided to all dwellings to be issued to the Code Assessor.

STORAGE FITTINGS

AIRING CUPBOARD:

Ensure each dwelling has an Airing Cupboard. Size of cupboard to suit all equipment required for solar water heating kit.

Provide a minimum of 1 metre square of removable slatted shelving to BS 1186-3:1990, Class: 2 and 3;

Moisture content at time of fixing: 8 to 10%

- Finished size of slats: 47 x 22 mm (minimum), arrises sanded smooth
- Fixing: To supports at 47 mm centres with countersunk screws or glued and dowelled.

FITTINGS AND FURNISHINGS (Cont'd)

Minimum distance between shelves 400 mm within the cupboard.

Wherever central hot water storage is not used, provide an additional radiator of output 300-400 watts.

STORE CUPBOARDS:

Ensure each dwelling has storage cupboards with a total capacity (including airing cupboard and accessible under stair space of :

3m ² minimum	3 person dwellings
4m ² minimum	4 person dwellings
5m ² minimum	5 person dwellings and above

BUILT IN WARDROBES (WHERE PROVIDED)

- Hanging rail: Provide 20 mm diameter chrome plated/plastics coated tubular steel hanging rail for full width of wardrobes, maximum unsupported span 600mm.
- Shelf: Provide 500 mm wide x 22 mm lipped block board shelf at 1800 mm from floor level for full width of wardrobe, maximum unsupported span 600mm.

ANCILLARY FITTINGS

FIRE BLANKETS

Supply and fix a minimum of 1 No. fire blanket to BS EN 1869:1997 per dwelling to be located within each kitchen and suitable for a domestic kitchen location. The fire blanket must display the current British Standard Kite Mark.

HAT AND COAT HOOKS

Supply and fix a minimum of 5 No. hat and coat hooks to each dwelling fixed on a stained softwood batten. Location to be agreed with Employer.

PURPOSE MADE JOINERY -FABRICATION GENERALLY:

- Fabricate joinery components to BS 1186-2:1988.
- Form sections out of the solid when not specified otherwise. Carefully machine timber to accurate lengths and profiles. After machining, sections to be free from twist and bowing and surfaces to be smooth and free from tearing, wooliness, chip bruising and other machining defects.
- Assemble with tight, close fitting joints to produce rigid components free from distortion.
- All screws to have pilot holes. Screws of 8 gauge or more and all screws into hardwood to have clearance holes. Screw heads to be countersunk not less than 2 mm below timber surfaces that will be visible in completed work.

PRESERVATIVE TREATED TIMBER:

- Carry out as much cutting and machining as possible before treatment.
- Retreat all timber which is sawn along the length, ploughed, thickened, planed or otherwise extensively processed.
- Treat surfaces exposed by minor cutting and drilling with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

FITTINGS AND FURNISHINGS (Cont'd)

MOISTURE CONTENT:

Moisture content of timber and wood based boards to be maintained within the range specified for the component during manufacture and storage.

FINISHING AND PROTECTING:

- Sand all joinery to give smooth, flat surfaces suitable to receive specified finishes. Arrises to be eased unless specified otherwise.
- Before assembly, seal all end grains for external components with primer or sealer and allow to dry.
- Protect completed joinery against damage, dirt, moisture and other deleterious substances.

PRESERVATIVE TREATMENT -GENERALLY:

- Application to be carried out after cutting and machining, but before assembly, by a processor licensed by the treatment solution manufacturer for the specified treatment.
- For each batch of timber, provide a certificate of assurance that treatment has been carried out as specified.

EXTERNAL WORKS

FENCING/GATES

Provide fencing as indicated on the tender / contract drawings

CLOSE BOARDED FENCING TO BOUNDARIES ENCLOSING REAR GARDENS:

- To BS1722-5:2006, type BW 180B or BCR 180B, or BCM 180B, but
Height: 2000 mm
Boards: Feather edged, 100mm wide tapered from 13mm to 6mm.
Rails: 87 x 87 mm triangular arris or 50 x 100mm rectangular.
Posts: 100 x 150mm timber, Appendix B, or
140 x 115mm concrete, Appendix A.
Maximum centres of posts: 3 m
Method of setting posts: Concrete in 300 diameter (minimum) x 750 deep holes filled to not less than half the depth.
Other requirements: Gravel boards.
Preservative treatment: CCA, Category A to all timber components.
Provide 'privacy panels' to match the specification of the 1.8m high closed boarded fencing where indicated on the tender / contract drawings.

CLOSE BOARDED FENCING TO INTERMEDIATE BOUNDARIES BETWEEN REAR GARDENS:

- To BS1722-5:2006, type BW 120, or BCR 120, or BCM 120.
Height: 1200 mm
Boards: Feather edged, 100mm wide tapered from 13mm to 6mm.
Rails: 75 x 75 mm triangular arris or 75 x 38mm rectangular.
Posts: 100 x 125mm timber, Appendix B, or
140 x 115mm concrete, Appendix A.
Maximum centres of posts: 3 m
Method of setting posts: Concrete in 300 diameter (minimum) x 600 deep holes filled to not less than half the depth.
Other requirements: Gravel boards.
1800mm x 1800mm high close boarded privacy panel to be provided to the intermediate boundary fence between each property. Specification to be as the Close Boarded Fencing to Boundaries Enclosing Rear Gardens specified above.
Preservative treatment: CCA, Category A to all timber components.

WOODEN PALISADE FENCING TO FRONT GARDENS:

- Provide fencing to front gardens where indicated on the drawings:
To BS 1722-5:2006, type WPW120.
Height: 1200mm
Palisades: 150 x 20mm spaced 25mm apart. Top of palisades to be cut square.
Rails: 90 x 38mm rectangular with 600 x 50 x 50mm centre stumps to bottom rail.
Posts: 100 x 125mm timber, Appendix B, or 140 x 115mm concrete Appendix A.
Maximum centres of posts: 2 m
Method of setting posts: Concrete in 300mm diameter (minimum) x 600mm deep holes filled to not less than half the depth.
Preservative treatment: CCA, Category A to all timber components.

EXTERNAL WORKS

FENCING/GATES (Cont'd)

WOODEN PALISADE FENCING TO BOUNDARIES ENCLOSING REAR GARDENS ADJACENT TO PUBLIC AREAS (INCLUDING THE SITE BOUNDARY BETWEEN THE REAR GARDENS OF PLOTS 1 AND 5) :

- To BS 1722-5:2006, type WPW180B, or WPC 180B, but
- Height: 2000mm
Palisades: 75 x 20mm spaced 25mm apart. Top of palisades to be cut square.
Rails: 87 x 87mm triangular arris or 50 x 100mm rectangular with 600 x 50 x 50mm centre stumps to bottom rail.
Posts: 100 x 150mm timber, Appendix B, or 140 x 115mm concrete, Appendix A.
Maximum centres of posts: 3 m
- Method of setting posts: Concrete in 300mm diameter (minimum) x 750mm deep holes filled to not less than half the depth.
- Preservative treatment: CCA, Category A to all timber components.

WOODEN PALISADE FENCING TO ENCLOSE FRONT GARDENS AND TO INTERMEDIATE BOUNDARIES BETWEEN REAR GARDENS:

- To BS 1722-5:2006, type WPW120, or WPC 120
- Height: 1200mm
Palisades: 75 x 20mm spaced 25mm apart. Top of palisades to be cut square.
Rails: 75 x 75mm triangular arris or 75 x 38mm rectangular with 600 x 50 x 50mm centre stumps to bottom rail.
Posts: 100 x 125mm timber, Appendix B, or 140 x 115mm concrete Appendix A.
Maximum centres of posts: 3 m
- Method of setting posts: Concrete in 300mm diameter (minimum) x 600mm deep holes filled to not less than half the depth.
- Preservative treatment: CCA, Category A to all timber components.

TIMBER GATES

- Size: 900 mm wide x height to match the maximum height of the fence in which the gate is located.
Construction: Ledged and braced
- Appearance: To match fencing.
- Timber to BS EN 942:2007, Class J40
Species: Softwood
- Preservative treatment: As British Wood Preserving and Damp-proofing Association Commodity Specification C3.
- Type and desired service life: CCA/40 years
- Adhesive: Synthetic resin to BS EN 301:2006, type 1.
- Fittings: 200 mm padlock bolt, 1 pair 300 mm heavy duty steel tee hinges, size 4 suffolk latch, all hot dip galvanised and fixed with zinc plated screws.

KNEE RAILS

Provide 450mm high trip rails in the middle of the landscaped areas between the parking spaces 2 and 3 plus 6 and 7, as indicated on the Proposed Site Plan comprising minimum 100mm x 100mm posts and rails in pressure impregnated preservative treated timber. Posts to be a minimum of 1050mm long at a minimum of 3.0m centres in 600mm deep x 300mm diameter holes set in concrete. Provide galvanised steel straps to secure rails to posts.

EXTERNAL WORKS

FENCING/GATES (Cont'd)

STEEL GATES/GATE POSTS:

Where specified on the drawings or proposed by Contractor

- Materials: Mild steel.
Jointing: Welded.
Finish as delivered: Hot dip galvanized after fabrication to BS EN ISO 1461:1999 (but only if at least 5 mm thick) or BS EN ISO 12944-1:1998 and BS EN ISO 12944-2:1998, specification SB1.
- Fittings: Auto gate latch.
- Finish: Galvanised self finish.

SETTING POSTS IN CONCRETE:

Mix: To BS 8500:2002, Designated mix not less than GEN 1 or Standard mix not less than ST2 (alternative mix for small quantities: 50 kg Portland cement, class 42.5, to 150 kg fine aggregate to 250 kg 20 mm nominal maximum size coarse aggregate, medium workability). Do not use admixtures.

Excavate holes neatly and with vertical sides.

- Position post/strut and fill hole with concrete to not less than the specified depth, well rammed as filling proceeds and consolidated.
- Holes not completely filled with concrete to be backfilled with excavated material, well rammed and consolidated.

INSTALLATION:

Set out and erect fencing:

- In straight lines or smoothly flowing curves as shown on drawings,
- With tops of posts following profile of the ground,
- With posts set rigid, plumb and to specified depth, or greater where necessary to ensure adequate support.
- With correct fastenings and all components securely fixed.

SITE CUTTING OF TIMBER:

To be kept to a minimum with no cutting where to be used below or near ground level. Treat surfaces exposed by minor cutting and drilling with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

DAMAGE TO GALVANIZED SURFACES:

Touch up minor damage, including on fastenings and fittings, using low melting point zinc alloy repair rods or powders made for this purpose or at least two coats of zinc-rich paint to BS 4652:1995. Apply sufficient material to provide a zinc coating at least equal in thickness to the original layer.

EXTERNAL WORKS

PATHS

LIFETIME HOMES

Where there is car parking adjacent to the home it should be wide enough for a 2400mm car parking space and 900mm for a footpath.

The distance from the car parking space to the home should be kept to a minimum and should be gently sloping to comply with Lifetime Homes Criteria 2.

Approach gradients to all entrances should be level or gently sloping to comply with Lifetime Homes Criteria 3.

PATHS WITHIN CURTILAGE OF DWELLINGS

Provide paths where indicated on the tender drawings.

Generally: Suitable for wheelchair accessibility.

All paths must be set back 150mm from external walls, with the intervening gap in filled with decorative slate pieces (See detail required for 'Free Draining Margin to Perimeter of Dwellings' described later.

PATHS TO REAR GARDENS:

Provide paths where indicated on the tender drawings.

Width: Minimum 900 mm (refer to tender / contract drawings).

Type: Concrete slabs: To BS EN 1339:2003.

- Method of manufacture: Wet press process.
Finish: Textured non slip finish
Nominal thickness: 50 mm
- Granular sub-base: Thickness: 100 mm. Free from harmful matter and excessive dust, well graded, passing a 75 mm BS sieve and in any one layer only one of the following:
Crushed hard rock or quarry waste (other than chalk), with not more binding material than is required to help hold the stone together.
Crushed concrete, crushed brick or tile, free from plaster, timber or metal.
Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
Sound blast furnace slag (other than from steelmaking foundries)
Unburnt colliery spoil (minestone).
- Bedding: Full mortar bed.
Nominal thickness of bed: 50 mm
- Joints: 3 mm wide dry mortar.

FRONT PATHS:

Provide paths where indicated on the tender drawings

Width: minimum 900 mm (refer to tender / contract drawings),

Type: Concrete slabs: To BS EN 1339:2003.

- Method of manufacture: Wet press process.
Finish: Textured non slip finish
Nominal thickness: 50 mm
Granular sub-base: Thickness: 100 mm (as rear paths).

EXTERNAL WORKS

PATHS, ETC (Cont'd)

GENERALLY:

Gradients: To suit Lifetime Homes Criteria 2 and 3 suitable for wheelchair accessibility. The preferred maximum gradient for a footpath is 1:20 maximum. Footpaths with gradients steeper than 1:20 but not steeper than 1:15 are permitted for distances not exceeding 10m. A kerb upstanding is required if the ground flanking the path is lower than the path. The first 1200mm of the path from the door shall fall away from the threshold at a gradient of 1:80. The threshold shall have a maximum up stand of 15mm as clause 331 and in accordance with the sketch details and threshold contained in Appendix K.

Where steps are unavoidable the maximum rise shall be 150mm and the minimum going shall be 280mm.

Dimensions between paths and top of main entrance door threshold: 15mm. Lay any path/platform adjacent to a dwelling with a slight fall away from the dwelling.

PAVED AREAS TO REAR GARDENS OF DWELLINGS:

In accordance with the requirements shown on the tender drawings, provide the following to the rear garden of each dwelling:

Immediately adjacent to the rear entrance door there shall be a rectangular, nominally level, paved area with no dimension less than 3.0m x 3.3m.

Type: Concrete slabs: To BS EN 1339:2003.

- Method of manufacture: Wet press process.
Finish: Textured non slip finish
Nominal thickness: 50 mm
Granular sub-base: Thickness: 100 mm

CONCRETE SLAB PAVING WITHIN DWELLING CURTILAGE

- Slabs: To BS EN 1339:2003
Method of manufacture: Wet press process.
Finish: Textured non slip finish
Nominal thickness: 50 mm
- Granular sub-base: As specified elsewhere, Thickness: 100 mm
- Bedding: Full mortar bed
Nominal thickness of bed: 50 mm
- Joints: 3 mm wide dry mortar.

CUTTING CONCRETE SLABS:

- Cut with a masonry saw or disc cutter only.
- When cutting a notch from the corner of a slab which exceeds 25% of the slab area, mitre cut the remaining shape from the internal corner of the notch to the opposite external corner.
- Diagonally cut slabs or portions of slabs to form a mitre at abrupt changes of level at the ends of ramped footpath crossings and the like.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

FULL MORTAR BEDDING OF SLABS:

Mix: 1:3-4 lime: sand, or 1:4-5 cement:sand.

Consistency: Semi-dry

Sand: To BS EN 12620:2002+A1:2008, grading limit M or F.

- Spread and level mortar to give the specified average nominal thickness after bedding of slabs.
- Lay slabs on a full mortar bed and bed down to line and level with a maul.

DRY MORTAR JOINTS TO SLABS:

- Mortar mix: 1:3 cement:slightly damp sand to BS EN 12620:2002+A1:2008, grading limit M.
- When the paving is dry and rain is not expected, brush dry mortar into joints, ram firmly home with a smooth wooden lath, then repeat the operation until the joints are filled solid and flush. Brush off all residue without delay.
- Do not wet the paving: allow the joints to hydrate naturally. Immediately after filling joints, cover paving with polyethylene sheeting for three days to protect from rain.

ACCEPTANCE OF NEW SUB-BASES:

Before starting work ensure that:

- The base is sound, clean and close-textured enough to prevent loss of bedding materials into it during compaction and use, free from movement under compaction plant and free from compaction ridges, cracks and loose materials.
- The levels and falls of the base are as detailed, within the specified tolerance of +/- 12mm.
- Drainage outlets are within +0 to -10mm of the required finished level.

WORK TO EXISTING ROAD JUNCTION

The existing public highway is to be modified to permit the formation of a new site entrance. The modification shall include the formation of a raised junction and the introduction of bollards all as indicated on the Proposed Site Plan.

Ensure all work is carried out to adoptable standards and to the satisfaction of the Local Authority Highways Department.

Arrange with the Local Authority for a Section 278 Agreement to be completed and any bonds required are secured prior to any work commencing.

Ensure that all works are completed to meet the requirements of the Local Authority. Comply with their requirements for the inspection of the works during construction.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

BLOCK PAVING TO PEDESTRIAN AREAS, PRIVATE PARKING SPACES AND ACCESS ROADWAY

BLOCK PAVING GENERALLY: Contractor's choice (Subject to approval by the Local Planning Authority) and Code for Sustainable Homes compliance. Provide to areas indicated on the tender drawings.

Construct to adoptable standards with contrasting coloured blocks to identify demarcation between parking bays. All parking spaces are to be numbered to identify the property to which they belong and to indicate which spaces are for visitors.

Ensuring that all hardstandings are adequately drained so that ponding does not occur.

Where there is a separate pedestrian approach to the dwelling the gradient of the sloping portion of the parking space or driveway must not exceed 1:8. Where the driveway or car parking space provides the only pedestrian approach to the dwelling the gradient requirements for footpaths apply.

PUBLIC AND PRIVATE FOOTPATHS:

- Construct to adoptable standards.
- Avoid steps, but where unavoidable;
 - Maximum rise: 150 mm
 - Maximum going: 280 mm
- Protect any abrupt change in level with a handrail or other suitable barrier.
- Provide dropped kerbs for wheelchair use.

PUBLIC AND PRIVATE ROADS/ACCESS ROADS/PARKING AREAS:

- Construct to adoptable standards.
- Provide dropped kerbs and tactile paving where pedestrian routes traverse roads.

KERBS

- Provide precast concrete kerbs and edgings to roads, car parking, footpaths etc.
- Provide a concrete kerb edging to the intermediate front boundary between dwellings where the boundary is located within a turfed or grass seeded area with the top of the edging laid flush with the top of the grass.

CONCRETE BLOCK PAVING

- Locations: pedestrian areas and vehicular areas
- Blocks: To BS EN 1338:2003
- Granular sub-base as described elsewhere.

CLAY BRICK PAVING

- Locations: pedestrian areas and vehicular areas
- Pavers: To BS 7533-2:2001, Classification PA.
- Granular sub-base as described elsewhere.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

BLOCK PAVING TO PEDESTRIAN AREAS, PRIVATE PARKING SPACES AND ACCESS ROADWAY (Cont'd)

LAYING GENERALLY:

- Ensure that sub-bases are suitably accurate and to specified gradients before laying paving.
- Cut blocks/pavers neatly and accurately without spalling to give neat junctions at edge restraints and changes in bond.
- Select blocks/pavers vertically from at least 3 separate packs in rotation or as recommended by manufacturer to avoid colour banding.
- Lay blocks/pavers on a well graded sand bed and vibrate to produce a thoroughly interlocked paving of even overall appearance with regular sand filled joints and accurate to line, level and profile.

LAYING PAVINGS:

- Lines and levels of finished surface to be smooth and even with regular falls to prevent ponding.
- Bed paving units firmly so that rocking does not occur or develop.
- Lay paving units upwards from the bottom of slopes where creep may occur.
- Finished paving to have an even overall appearance with even joint widths and free of mortar and sand stains.

ADVERSE WEATHER:

- Do not lay paving if the temperature is below 3 deg C on a falling thermometer or below 1 deg C on a rising thermometer.
- Do not use frozen materials or lay bedding on frozen or frost covered sub-bases.
- Protect stockpiled bedding material to ensure it does not become saturated.
- Protect exposed areas of sand bedding and uncompacted areas of paving from heavy rainfall.
- Remove and replace any sand bedding which becomes saturated before laying paving, or allow to dry before proceeding.
- When conditions are damp, brush in as much jointing sand as possible and minimize site traffic over the paving. As soon as paving is dry, top up joints and complete the compaction.

ACCEPTANCE OF NEW SUB-BASES: Before starting work ensure that:

- The sub-base surface is sound, clean and close textured enough to prevent loss of sand bedding into it during compaction and use.
- The levels and falls of the sub-base are as detailed and within the specified tolerance of +/-12 mm.
- Drainage outlets are within +0 to -10 mm of the required finished level.
- Edge restraints, manhole covers, drainage outlets and the like are complete, to the required levels, and adequately bedded and haunched in mortar that has reached sufficient strength.
- Haunching to gullies, manhole covers and the inside face of edge restraints is vertical so that pavings do not 'ride up' when compacted.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

BLOCK PAVING TO PEDESTRIAN AREAS, PRIVATE PARKING SPACES AND ACCESS ROADWAY (Cont'd)

MORTAR BEDDED EDGE RESTRAINT TO PAVING:

- Bed units with mortar on concrete foundation, and secure with a continuous haunching of mortar. Keep exposed faces of units clean and free from mortar.
- Jointing: Concrete units to be dry tightly butted. Clay units to have tooled coloured mortar .
- Form movement joints as recommended by manufacturer.
- Mortar for bedding: Mix 1:3 Portland cement clause 42.5: BS EN 12620:2002+A1:2008 sand, grading M or F.
- Bed thickness: 10mm minimum to 40mm maximum.

TOOLED COLOURED MORTAR JOINTS:

- Butter ends of units with bedding mortar as work proceeds to completely fill joints.
- Rake out to a depth of 10mm and point with 1:3 cement:sand mortar with pigment, colour to approval.

SAND FOR BEDDING - LIGHT USE

- Naturally-occurring clean sharp sand or crushed rock fines, graded to BS 7533-3:2005+A1:2009, Annex D, Category IV
- Free from deleterious salts, contaminants and cement.
- Obtain from only one source and ensure that all sand supplied has consistent grading.
- Maintain at an even moisture content which will give maximum compaction. Sand squeezed in the hand should show no free water and bind together when pressure is released.

SAND FOR JOINTING:

- Clean free flowing dried silica sand graded to BS 7533-3:2005+A1:2009, table D3.
- Do not use sand that will stain paving blocks.
- Free from deleterious salts, contaminants and cement.

JOINT SEALER/STABILISER:

- Use where recommended by paving manufacturer.
- Type: As recommended by paving manufacturer.
- Ensure that joints are full of sand and sweep the paving surface clear of loose sand before sealing.

LAYING BEDDING GENERALLY:

- Determine by trial on site the depth of loose bedding material needed to ensure the specified thickness after final compaction of paving.
- Maintain a prepared area of bedding not less than 1 m and not more than 3 m in advance of the laying face at all times, and not more than 1 m at the conclusion of any working period.
- Do not leave areas of bedding exposed; proceed with laying blocks/pavers immediately.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

BLOCK PAVING TO PEDESTRIAN AREAS, PRIVATE PARKING SPACES AND ACCESS ROADWAY (Cont'd)

- Do not deliver bedding sand to working area over uncompacted paving. Prevent disturbance to the bedding course by pedestrian or wheeled traffic.
- Fill, rescreed and recompact any parts of the bedding layer disturbed by removal of screed rails or trafficking.

LAYING BEDDING (PRECOMPACTED):

Spread bedding material in one loose layer. Compact with a plate compactor and level the surface by screeding.

LAYING BEDDING (PARTIALLY PRECOMPACTED):

Spread, in a loose uncompacted layer, approximately the required final thickness of bedding material and compact with a plate compactor. Spread a further loose layer approximately 15mm thick, and screed to levels.

LAYING BEDDING (POSTCOMPACTED):

Spread bedding material in one loose uniform layer and screed to levels.

LAYING BLOCKS/PAVERS:

- Commencing from an edge restraint, lay blocks/pavers hand tight with a joint width of 2-5 mm. Maintain an open working face and do not use mechanical force to obtain tight joints. Place blocks/pavers squarely with minimum disturbance to bedding.
- Supply blocks/pavers to laying face over newly laid paving but stack at least 1 metre back from laying face. Do not allow plant to traverse areas of uncompacted paving.
- Continually check alignment of pavers with string lines as work proceeds to ensure maintenance of accurate bond.
- Infill at edge restraints as work proceeds. Wherever the type of bond and angle of edging permit, avoid very small infill pieces at edges by breaking bond on the next course in from the edge, using cut blocks/pavers not less than 1/3 full size.

OBSTRUCTIONS

- After laying full paving units, trim blocks/pavers neatly around drainage fittings and other obstructions, with joints not exceeding 5mm and without reducing the thickness of the blocks/pavers.
- Where this is not possible, form a rectangular in situ surround of grade C35 air entrained concrete, maximum aggregate size 10mm, to BS 8500-1:2002, BS 8500-2:2002 and BS EN 206-1:2000, with a minimum thickness of the combined depth of blocks/pavers and sand bedding, and a minimum width of 100mm all round the obstruction, colour matched to approval.

COMPACTING AND JOINTING:

- Thoroughly compact blocks/pavers with vibrating plate compactor as laying proceeds but after infilling at edges. Apply the same compacting effort over the whole surface.
- Do not compact within 1m of working face.
- Do not leave uncompacted areas of paving at the end of working periods, except within 1 metre of unrestrained edges.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

BLOCK PAVING TO PEDESTRIAN AREAS, PRIVATE PARKING SPACES AND ACCESS ROADWAY (Cont'd)

- Check paving after compacting first few metres, then at frequent intervals to ensure that surface levels are as specified; if they are not, lift blocks/pavers and relay.
- Brush sand into joints, revibrate surface and repeat as required to completely fill joints.
- Avoid damaging kerbs and adjacent work during vibration. Do not begin vibration until kerb haunchings have matured.

LEVELS OF PAVING:

Permissible deviation from specified levels to be +/-6 mm generally. Set paving 6-10mm above gullies, 3-6 mm above surface drainage channels and 3mm above kerbs to allow for settlement.

REGULARITY:

- Sudden irregularities not permitted.
- Where appropriate in relation to the geometry of the surface, the variation in gap under a 3 metre straight edge placed anywhere on the surface to be not more than 10 mm.
- The difference in level between adjacent blocks/pavers to be not more than 2 mm.

AFTER COMPLETION OF PAVING:

- Do not use vacuum cleaning machines.
- Spread a thin (1-2mm) layer of jointing sand over the paving.

REMEDIAL WORK:

During the Contract or Defects Liability Period:

- Any areas of paving which settle must be relaid as specified.
- Where early trafficking leads to settlement of the jointing sand, refill the joints as specified.

PROTECTION:

- Keep paving clean and free from mortar droppings, oil and other materials likely to cause staining.
- Do not overload pavings with stacks of materials.
- Handle pavings with care to avoid damage to corners and arrises, and to previously laid paving.
- Pavings bedded on mortar must be kept free from pedestrian traffic for 4 days and vehicular traffic for 10 days after laying.
- Restrict access to paved areas as necessary to prevent damage from site traffic and plant.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

MACADAM SURFACING TO PEDESTRIAN AREAS, PRIVATE PARKING SPACES AND ACCESS ROADWAYS:

Contractor's choice (Subject to approval by the Local Planning Authority and Code for Sustainable Homes Compliance) provide to areas on the tender drawings.

Type: Coated macadam constructed to adoptable standards with concrete paviors or Thermoplastic paint to create a demarcation between bays. All parking spaces are to be numbered to identify the property to which they belong and to indicate which spaces are for visitors.

Ensure that hardstandings are adequately drained so that ponding does not occur.

Where there is a separate pedestrian approach to the dwelling the gradient of the sloping portion of the parking space or driveway must not exceed 1:8. Where the driveway or car parking space provides the only pedestrian approach to the dwelling the gradient requirements for footpaths apply.

PUBLIC AND PRIVATE FOOTPATHS:

- Construct to adoptable standards.
- Avoid steps, but where unavoidable;
 - Maximum rise: 150 mm
 - Maximum going: 280 mm
- Protect any abrupt change in level with a handrail or other suitable barrier.
 - Ensure that footpaths are adequately drained so that ponding does not occur.
 - Provide dropped kerbs for wheelchair use.

PUBLIC AND PRIVATE ROADS/ACCESS ROADS/PARKING AREAS:

- Construct to adoptable standards.
- Provide dropped kerbs and tactile paving where pedestrian routes traverse roads.
- Ensure that parking areas are adequately drained so that ponding does not occur.
- Provide brick paviors demarcation strip at end of existing turning head as indicated upon the site works drawing.

KERBS

Provide precast concrete kerbs and edgings to roads, car parking, footpaths etc.

Provide a concrete kerb edging to the intermediate front boundary between dwellings where the boundary is located within a turfed or grass seeded area with the top of the edging laid flush with the top of the grass.

EXTERNAL WORKS

PATHS, ETC (Cont'd)

GRANULAR SUB-BASES TO ROADS/PAVINGS

HERBICIDE:

Apply an approved type of herbicide in accordance with manufacturer's recommendations to subgrade of macadam footways.

SUBGRADE FOR PEDESTRIAN AREAS:

Immediately before placing sub-base thoroughly compact subgrade with a roller weighing not less than 2.5 tonnes or equivalent other plant.

GRANULAR MATERIAL:

Free from harmful matter and excessive dust, well graded, passing a 75 mm BS sieve and in any one layer only one of the following:

- Crushed hard rock or quarry waste (other than chalk), with not more binding material than is required to help hold the stone together.
- Crushed concrete, crushed brick or tile, free from plaster, timber or metal.
- Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
- Sound blast furnace slag (other than from steelmaking foundries)
- Unburnt colliery spoil (minestone).

LAYING GRANULAR SUB-BASES FOR PEDESTRIAN AREAS:

Spread and level and, as soon as possible thereafter, compact with a roller weighing not less than 2.5 tonnes or other equivalent plant to minimum thickness 150 mm.

BLINDING:

Surfaces to receive interlocking brick or block paving to have sufficient sand, fine gravel, PFA or other approved fine material applied and surface vibrated to provide a close and smooth surface.

COLD WEATHER WORKING:

- Do not use frozen materials containing ice.
- Do not lay materials on frozen surfaces.

PROTECTION:

- Cover sub-bases as soon as practicable with subsequent layers, specified elsewhere.
- Prevent damage to subgrades and sub-bases from construction traffic, construction operations and inclement weather.

FREE-DRAINING MARGIN TO PERIMETER OF DWELLINGS

Allow for a free-draining margin to the external perimeter of each property. Margin to be 150mm wide of loose inert granular material and finished off with 'plum' coloured decorative slate pieces. This detail shall not apply to door thresholds where the level access is provided using hard paving (See standard detail included within Appendix K).

EXTERNAL WORKS

RETAINING WALLS

Location: where required to suit site levels

Type: Brickwork - bricks to be to BS EN771:2003 designation FL.

Manufacturer/reference: to the approval of the Local Planning Authority

Joint: bucket handle

Mortar: To BS 1200 unless specified otherwise.

Mortar Colour: To the approval of the Local Planning Authority.

Bond: English garden wall

Minimum thickness: 1 brick up to 1.175m height 1½ brick up to 2m height including copings. In all other respects, comply with Building Research Establishment Good Building Guide 14.

Height: As shown on drawings and where the Contractor considers they are required to suit the site levels.

Special features: Brick on edge coping. Treated softwood protective fencing to the pattern shown on the elevation drawings faced one side with a plastic coated chain link mesh, all to a height to comply with the building Regulations and to prevent injury from falls.

STREET LIGHTING

There is an existing adopted lamp post and electricity box that will require relocation to enable the new site access to be constructed. Liaise with the Local Authority and ensure all work is carried out to adoptable standards.

Design and construct a non-adopted external lighting installation to the private access road and parking areas which should comply with requirements of Secured-by Design, designed and installed to adoptable standards (See Electrical Specification for more details).

- Ensure that pedestrian areas are well lit with no dark areas.
- Position lamp standards so that a minimum 1200 mm clear width of footpath is maintained.
- Relocate existing lamp post as indicated upon site works drawing.
- Installation is to be supplied from a separately metered Landlord's electricity supply. Pay all connection charges in this respect.

Contractor to produce "as built" street lighting drawing for the installation(s) including test Certificates and column keys.

LANDSCAPING

GENERALLY:

- Provide landscaping as detailed in the landscaping schedules/ drawings contained in the tender documents and as required to secure Planning Permission and/or Code for Sustainable Homes Level 4 Compliance.
- Provide shrubs/ground cover planting as referred to on the site works drawing to all topsoil/planted areas.
- After settlement, bark mulch should be recessed to 25 mm below kerb and path levels.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

CODE FOR SUSTAINABLE HOMES:

Should credits be sought for Section ECO2 of the Code for Sustainable Homes then Landscaping scheme to be in strict accordance with a scheme / specifications prepared by a suitably qualified Ecologist.

30% additional recommendations will also be required such as;

- Bird, bat and/ or insect boxes to be installed at appropriate locations on the site.
- The Planting of Native Species
- The adoption of horticultural good practice (e.g. no, or low use of residual pesticides)

Should credits be sought for Section ECO3 of the Code for Sustainable Homes then all existing features of ecological value on the development site potentially affected by the works are to be maintained and adequately protected during site clearance, preparation and construction works as recommended by a Suitably Qualified Ecologist.

Written and photographic evidence will require to be provided to the Code Assessor.

GROUND PREPARATION:

- Preparation: Do not use materials containing concentrations of toxins, pathogens or other extraneous substances harmful to plant, animal or human life.

Herbicide: Apply a suitable type to perennial weeds and allow period of time to elapse as recommended by manufacturer before cultivation.

Cultivation: Break up any compacted topsoil to full depth.

- Reduce top 100 mm of all topsoil to a tilth suitable for blade grading (10 mm down particles).
- Remove undesirable material brought to the surface including stones and clay balls larger than 50 mm in any dimension, roots, tufts of grass and foreign matter.
- Grading: When topsoil is reasonably dry and workable grade to smooth, flowing contours, with falls for adequate drainage, removing all minor hollows and ridges.

Unless otherwise stated, finished levels after settlement to be 25 mm above adjoining paving, kerbs, manholes etc.

Topsoil levels may be adjusted by blade grading ensuring that there is nowhere less than 100 mm of topsoil.

- Fertilizer: Three to five days before seeding/turfing and before final cultivation apply both the following fertilizers evenly over all grassed areas, each at 70g/sq m, in transverse directions:
Superphosphate with a minimum of 18% water soluble phosphoric acid.
A sulphate of ammonia with a minimum of 20% nitrogen.
- Final cultivation: After grading and fertilizing carry out further cultivation to reduce top 25 mm to a fine firm seed bed with good crumb structure.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

Rake with chain harrow, drag mat or hand rake to a true, even surface, lightly firmed but not over compacted, removing all stones and earth clods more than 50 mm in any dimension on general areas and 25 mm on fine lawns.

Extend cultivation into any adjacent existing grass areas to ensure full marrying in of levels.

Obtain approval of appearance of prepared soil areas before seeding/turfing.

TURFING

- Provide turfing to front and rear gardens to BS 3969:1998, general purpose utility turf with perennial ryegrass and from an approved source. Free from undesirable grasses and weeds. Treated with herbicide not less than four weeks and not more than three months before lifting.
- Banks exceeding 30 degree slope: Lay turves diagonally or horizontally and secure with: pointed softwood pegs, 200 mm long x 25 mm square, or galvanised wire pins, bent or hairpin pattern, 200 mm long x 4 mm diameter.
- Remove all pegs or pins when turf is well established.
- Laying to be programmed so that turfing is established and pegs or pins can be removed prior to Practical Completion, or where this is not possible, areas to be protected with temporary fencing until turfing is established.

DELIVERY AND STORAGE:

- Take all necessary precautions to avoid drying out and deterioration of turf.
- Arrange supply of turf to avoid excessive stacking.
- Do not stack to a height of more than 1 m.
- Use turf which shows any signs of deterioration without delay or lay out on topsoil and keep moist.

TURFING GENERALLY:

- Lay turf within 18 hours of delivery in spring or summer and within 24 hours of delivery in autumn or winter.
- Do not lay turf when persistent cold or drying winds are likely to occur or soil is frost bound, waterlogged or excessively dry.
- Lay turf with broken joints, well butted up, working from planks laid on previously laid turf. Do not stretch turf.
- Use whole turves at edges. Trim to a true line.
- Adjust levels by raking out or infilling with fine soil, and ensuring full contact with the substrate.
- Consolidate by lightly and evenly firming with wooden beaters as the laying proceeds. Do not use rollers.
- Dress turf with finely sifted topsoil/peat/sand and brush well in to completely fill all joints.
- Thoroughly water the completed turf immediately after laying. Check by lifting a corner of turf that water has penetrated to the soil below.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

BANKS EXCEEDING 30 DEGREE SLOPE:

- Lay turves diagonally or horizontally and secure with: pointed softwood pegs, 200 mm long x 25 mm square, or galvanised wire pins, bent or hairpin pattern, 200 mm long x 4 mm diameter.
- Remove all pegs or pins when turf is well established.
- Laying to be programmed so that turfing is established and pegs or pins can be removed prior to Practical Completion, or where this is not possible, areas to be protected with temporary fencing until turfing is established.

NEWLY PLANTED TREES:

Neatly cut away turf to a diameter of 800 mm around individual trees and leave soil exposed.

PROTECTING/WATERING/CUTTING -

PROTECTIVE FENCING:

Protect newly turfed banks with 900mm high chainlink fencing to BS 1722-1:2006 or chestnut pale fencing to BS 1722-4:1986. Maintain fencing until grass is well established then remove and reinstate ground. Make good any damage to grass. The fencing will remain the property of the Contractor.

WATERING:

During establishment of grass areas ensure that sufficient water is applied using a fine sprinkler or oscillating spray to maintain healthy growth.

FIRST CUT OF ALL GRASSED AREAS

- Before Practical Completion and when grass is between 40 and 75mm high, remove debris, litter and all stones and earth clods larger than 25 mm in any dimension, and when grass is reasonably dry, cut to approximately 35mm high
- Arisings: Remove from site.

CLEANLINESS:

Remove soil and arisings from all hard surfaces and leave the works in a clean, tidy condition at Practical Completion and after any maintenance operations.

MAINTENANCE:

Carry out the following operations from completion of seeding/turfing until the end of the defects liability period or as instructed by the CA.

FAILURES OF SEEDING/TURFING:

Bare areas and areas of dead grass that have failed to thrive, will be regarded as defects due to materials or workmanship not in accordance with the Contract and must be made good by recultivation and reseeded/returfing at times agreed with the CA.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

GRASSED AREAS:

- The height of growth must not exceed 75mm at any time. Cut as and when necessary to a height of 35mm, and remove all arisings.
- Before each cut remove all litter, debris and all stones and earth clods larger than 25mm.
- At the time of each cut, trim all grass edges round the base of trees, manholes, etc. and remove arisings. Sweep all adjoining hard areas clear of cuttings and remove.
- Keep the sward substantially free of broad leaved weeds by applying a suitable selective herbicide.

CLIMATIC CONDITIONS: Carry out the work while soil and weather conditions are suitable. Carry out seeding during April to October.

MACHINES AND TOOLS: Use only machinery and tools suitable for the site conditions and the work to be carried out. Use hand tools around trees, plants and in confined spaces where it is impracticable to use machinery.

WATERING GENERALLY:

- Ensure the full depth of topsoil is thoroughly wetted.
- Use a fine sprinkler or oscillating spray.

PREPARATION MATERIALS GENERALLY:

- Do not use materials containing concentrations of toxins, pathogens or other extraneous substances harmful to plant, animal or human life.

HERBICIDE:

- Apply a suitable type to perennial weeds and allow period of time to elapse as recommended by manufacturer before cultivation.

CULTIVATION:

- Break up any compacted topsoil to full depth.
- Reduce top 100 mm of all topsoil to a tilth suitable for blade grading (10 mm down particles).
- Remove undesirable material brought to the surface including stones and clay balls larger than 50 mm in any dimension, roots, tufts of grass and foreign matter.

GRADING:

- When topsoil is reasonably dry and workable grade to smooth, flowing contours, with falls for adequate drainage, removing all minor hollows and ridges.
- Unless otherwise stated, finished levels after settlement to be 25 mm above adjoining paving, kerbs, manholes etc.
- Topsoil levels may be adjusted by blade grading ensuring that there is nowhere less than 100 mm of topsoil.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

FERTILIZER:

Three to five days before seeding/turfing and before final cultivation apply both the following fertilizers evenly over all grassed areas, each at 70g/sq m, in transverse directions:

- Superphosphate with a minimum of 18% water soluble phosphoric acid.
- A sulphate of ammonia with a minimum of 20% nitrogen.

FINAL CULTIVATION:

- After grading and fertilizing carry out further cultivation to reduce top 25 mm to a fine firm seed bed with good crumb structure.
- Rake with chain harrow, drag mat or hand rake to a true, even surface, lightly firmed but not over compacted, removing all stones and earth clods more than 50 mm in any dimension on general areas and 25 mm on fine lawns.
- Extend cultivation into any adjacent existing grass areas to ensure full marrying in of levels.
- Obtain approval of appearance of prepared soil areas before seeding/turfing.

SEEDING TO GRASSED AREAS WHERE TURF IS NOT SPECIFIED

GRASS SEED FOR ALL SEEDED AREAS

- Rate of application: 35g/square metre

QUALITY OF SEED

- Purchase fresh seed for each growing season. Do not use seed purchased for previous seasons.
- Use blue label certified seed varieties complying with EC regulations for purity and germination.
- When requested, supply to CA samples of mixtures as delivered to site or copy of original certificate of germination, purity and composition carried out by an Official Seed Testing Station.

SOWING:

- Sow seed in calm weather during April to October.
- Spread seed evenly at the specified rate applied in two equal sowings in transverse directions.
- Lightly harrow or rake.
- On light soils roll and cross roll after seeding using a lightweight roller.

PRE-EMERGENT HERBICIDE:

Where soil has not been allowed to lie fallow apply a suitable pre-emergent herbicide immediately after sowing.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

TURF EDGING TO SEEDED AREAS:

- Before sowing, rake back a 750 mm wide margin around prepared seed beds where shown on drawings.
- Lay a single row of turves to BS 3969:1998, with no perennial ryegrass and of a similar seed composition to the seeded area, end to end and trim to a line.
- Marry in level of seed bed with the turf and water turf on completion.

SOIL CONDITIONS:

- Cultivate and plant into moist friable soil that is not waterlogged.
- Do not plant into frozen or snow covered soil

CLIMATIC CONDITIONS:

Carry out the work while soil and weather conditions are suitable for the relevant operations. Do not plant during periods of frost or strong winds. Plant only during the following periods:

- Deciduous trees and shrubs: Late October to late March.
- Conifers and evergreens: September/October or April/May.
- Container grown plants: At any time if ground and weather conditions are favourable. Ensure that adequate watering and weed control is provided.

WATERING GENERALLY:

- Ensure the full depth of topsoil is thoroughly wetted.
- Use a fine rose where appropriate to avoid damaging or loosening plants.

WATERING:

Water as necessary to ensure the establishment and continued thriving of all planting.

PREPARATION, PLANTING AND MULCHING MATERIALS GENERALLY:

- Do not use materials containing concentrations of toxins, pathogens or other extraneous substances harmful to plant, animal or human life.

TREES/PLANTS

GENERAL:

- Materially undamaged, sturdy, healthy, vigorous, of good shape and without elongated shoots.
- Grown in a suitable environment and hardened off.
- Free from pests, diseases, discoloration, weeds and physiological disorders.
- Budded or grafted plants to be bottom worked, unless otherwise specified or approved.
- With balanced root and branch systems, root system and condition in accordance with the relevant part of the National Plant Specification.
- True to name.
- Origin/Provenance: British grown.
Origin and Provenance have the meaning given in the National Plant Specification.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

TREES/PLANTS:

Name, forms, dimensions and other criteria as scheduled and defined in the National Plant Specification.

CONTAINER GROWN PLANTS:

- Supplied in a growing medium with adequate nutrients for the plant to thrive until permanently planted.
- Centred in the container, firmed and well watered.
- With root growth substantially filling the container, but not root bound, and in a condition conducive to successful transplanting.
- Grown in the open for at least two months before being supplied.
- Grown in containers with holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

LABELLING AND INFORMATION:

- Provide each tree/plant or group of trees/plants of a single species or cultivar with supplier's labelling for delivery to site, showing:
 - The full botanical name
 - Total number
 - Number of bundles
 - Part bundles
 - Supplier's name
 - Employer's name and project reference
 - Plant specification, in accordance with the scheduled National Plant Specification categories.

PLANT/TREE HANDLING STORAGE AND TRANSPORT:

- Comply with CPSE 'Handling and establishing landscape plants' (obtainable from the Horticultural Trades Association) Part E I, Part II and Part III, paragraphs 1.3.3 to 1.3.6, 3.0, and 4.0.
- Protect plants/trees from frost.
- Handle plants/trees with care. Protect from mechanical damage and do not subject to shock, e.g. by dropping from a vehicle.

PLANTING GENERALLY:

- Comply with CPSE 'Handling and establishing landscape plants' (obtainable from the Horticultural Trades Association) Part III, paragraphs 6.2 to 6.6.
- Plant upright or well balanced with best side to front.

HERBICIDE

Prevent weeds from seeding and perennial weeds from becoming established, by applying a suitable herbicide. Allow period of time to elapse as recommended by manufacturer before cultivation.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

COMPOST:

One of the following:

- Mushroom compost: Spent mushroom beds containing only well rotted manure, peat, chalk and residual mushroom growth.
- Leaf mould: Well rotted broad leaves from deciduous trees but not ash, poplar or sycamore leaves.
- Other well rotted organic material, subject to approval.
- Do not use peat based compost.

CULTIVATION:

- Break up any compacted topsoil to full depth.
- Within a few days before planting, but in suitably dry weather and ground conditions, cultivate top 300mm of all planting beds, using suitable plant to loosen, aerate and break up the soil into particles of 2-8 mm.
- Leave surface regular and even, with levels as required.
- Remove weeds, perennial weed roots and undesirable material brought to the surface including stones and clods larger than 50 mm in any dimension, roots, tufts of grass and foreign matter.
- Do not dig or cultivate within the root spread of trees and shrubs to be retained.

SHRUB PLANTING PITS:

- Excavate pits and retain topsoil for re-use.
Size(s): 150mm wider than roots when fully spread and 400mm deep.
- Break up bottoms of pits to a depth of 150mm.

CONIFERS/EVERGREENS: Dip in antidesiccant before delivering to site. Spray with antidesiccant soon after planting. Do not apply in rainy or frosty weather.

GROUND COVER PLANTS: When using climbing plants as ground cover, remove canes or other supports and spread stems, pinning to ground where appropriate to ensure good contact to encourage rooting and early establishment.

CLIMBING PLANTS:

- Plant 150 mm clear of wall/fence etc. with roots spread outward. Lightly secure branches to support. Retain canes of plants which are too small to reach supports.
- Climber supports: Green plastics coated steel wire, 1 mm diameter fixed horizontal to wall/fence etc. at 300mm centres starting 600mm from ground level. Stretch wire tight between galvanized screw eyes screwed into wall plugs at 2 m centres.

HEDGES:

- Shrubs for hedges: To be consistent in species, cultivar and clone to ensure a uniform hedge.
- Plant shrubs in trenches large enough to take full spread of roots. Set out plants evenly.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

BACKFILLING MATERIAL:

A previously prepared mixture of 7 parts topsoil excavated from the pit and additional topsoil as required, together with 3 parts compost.

AFTER PLANTING:

- Water plants thoroughly immediately after planting, using a fine rose or sprinkler where necessary to avoid damaging plants.
- Lightly firm soil around plants and fork and/or rake soil, without damaging roots, to a fine tilth with approved gentle cambers and no hollows.

MULCHING PLANTING BEDS:

- Material: Shredded bark, cocoa fibre or compost, free of pests, disease, fungus and weeds.
- Clear all weeds, water soil thoroughly, and mulch the whole surface of planting beds at 1 m³ of material per 20 m².

CONIFERS/EVERGREENS:

Dip in or thoroughly spray with anti-desiccant before delivering to site. Apply again soon after planting. Do not apply in rainy or frosty weather. Ensure full coverage of underside of foliage.

TREE PITS:

- Excavate with slightly raised centre. Retain topsoil for re-use. In sloping ground, maintain horizontal bases and vertical sides with no less than minimum depth throughout.

Size(s): Not less than the following:

	<u>Diameter</u>	<u>Depth</u>
Bush, whip and small feathered trees	600 mm	450 mm
Standard and large feathered trees	900 mm	600 mm
Tall standard trees	1200 mm	750 mm

Where necessary increase these dimensions to ensure that pits are at least 75 mm deeper than root system and wide enough to accommodate roots when fully spread.

- Break up bottoms of pits to a depth of 150mm and scarify sides.

STAKING GENERALLY:

- Stakes: Softwood, peeled chestnut, larch or oak, free from projections and large or edge knots and with pointed lower end.
- Nails: To BS 1202-1:2002, galvanized, minimum 25 mm long and with 10 mm diameter heads.
- Minimum stake sizes: 75mm thick (100 mm for trees over 3m high).

EXTERNAL WORKS

LANDSCAPING (Cont'd)

SHORT SINGLE STAKING FOR TREES GENERALLY

- Position stake close to tree on windward side and drive vertically at least 300 mm into bottom of pit before planting. Consolidate material around stake during backfilling.
- Cut stake to approximately 600 mm above ground level.
- Secure tree firmly but not rigidly to the stake with approved tie within 25 mm of top of stake.

SHORT DOUBLE STAKING FOR TALL STANDARD AND ROOT BALLED TREES

- Drive stakes vertically at least 300 mm into bottom of pit on either side of tree position before planting.
Consolidate material round stakes during backfilling.
- Cut stakes to approximately 600mm above ground level.
- Firmly fix cross bar on windward side of tree and as close as possible to stem.
- Secure tree firmly but not rigidly to cross bar with approved tie.

BACKFILLING MATERIAL:

A previously prepared mixture of 7 parts topsoil excavated from the pit and additional topsoil as required, together with 3 parts compost.

MULCHING TREES:

- Material: shredded bark, cocoa fibre or compost, free of pests, disease, fungus and weeds.
- Clear all weeds, water soil thoroughly, and mulch around each tree at 1 cu m of material per 20 m².

TREE PROTECTION:

Ensure that protection methods do not impede the natural movement of trees or restrict growth.

MAINTENANCE:

- Carry out the following operations from completion of planting until the end of the defects liability period or as instructed by the CA.
- Make visits at approximately monthly intervals during the growing season and as necessary to fulfil the requirements of this specification.

FAILURES OF PLANTING:

- Excepting theft or malicious damage after practical completion, any trees/shrubs/plants that have failed to thrive, will be regarded as defects due to materials or workmanship not in accordance with the Contract. Unless otherwise instructed they must be replaced by approved equivalent trees/shrubs/plants during the next suitable planting season.
- Replacements must match the size of adjacent or nearby plants of the same species or should match the original specification, whichever is the greater.

EXTERNAL WORKS

LANDSCAPING (Cont'd)

CLEANLINESS:

At completion and at each visit, remove soil and other debris from all hard surfaces and grassed areas and leave the works in a clean tidy condition.

PLANTING MAINTENANCE GENERALLY:

- Maintain a weed free area around each tree and shrub, minimum diameter the larger of 1 m or the surface of the original planting pit. Keep planting beds clear of weeds, by cultivating and use of approved herbicides. Fork over beds as necessary to keep soil loose, with gentle cambers and no hollows, taking care not to reduce depth or effect of mulch.
- Ensure that trees and shrubs are not damaged by the use of mowers, nylon filament rotary cutters and similar powered tools.
- Check condition of stakes, ties, guys and guards. Replace broken or missing items. Adjust if necessary to allow for growth and prevent rubbing of bark. Cut back any damaged bark.
- Spray crown of trees when in leaf during warm weather. Carry out in the evening.

PLANTING MAINTENANCE - FERTILIZER:

Once during the period, in March or April, evenly spread an approved fertilizer, carefully incorporating below mulch materials:

- 70g per feathered, standard or larger tree
- 40g per whip or shrub.

PLANTING MAINTENANCE - PRUNING:

Prune at appropriate times, to remove dead or dying and diseased wood and suckers, to promote healthy growth and natural shape. Prune trees to favour a single central leading shoot, unless specified otherwise.

PLANTING MAINTENANCE - WATERING:

Water using a fine rose or sprinkler until full depth of topsoil is saturated.

MAINTENANCE INSTRUCTIONS:

Before the end of the period stated, submit printed instructions recommending procedures to be established by the Employer for maintenance of the planting work for one full year.

FINAL MULCHING:

At the end of the period previously stated:

- Ensure that the soil is thoroughly moistened prior to remulching, applying water where necessary.
- Remulch the whole surface of planting beds as specified so as to maintain a depth of 50mm.
- Remulch trees as specified so as to maintain a depth of 50mm.

EXTERNAL WORKS

CLOTHES LINES

Provide a rotary clothes dryer located within rear secure garden of each dwelling comprising a four arm heavy duty construction with a minimum of 50m of PVC covered line complete with a ground socket set in concrete. Manufacturer: Hills Portadry 3/120 or equal approved.

Clothes lines to comply with requirements of section ENE 4 of the Code for Sustainable Homes.

EXTERNAL STORAGE

Provide each house 1 Nr minimum garden shed with space for cycle storage (as noted below for various dwelling types to obtain credits under Section ENE8 of the Code for Sustainable Homes) located where indicated on drawings with direct easy access to dwellings. Ensure that there is an additional minimum 1m² space for the storage of garden tools. Height to be 2.4m reducing to 1.8m.

Studios or Dwellings with One Bedroom.

Minimum 2000mm x 750mm space per cycle for storage of one cycle per dwelling.

Dwellings with Two and Three Bedrooms.

Minimum 2000mm x 750mm space per cycle for storage of two cycles for each dwelling.

Dwellings with Four or more Bedrooms.

Minimum 2000mm x 750mm space per cycle for storage of four cycles for each dwelling.

Fit 750mm wide x 950mm high "Sheffield" type galvanised steel cycle rail cast in concrete slab within shed. Cut out required in shed floor for cast in upstand for cycle rail.

Sheds to comply with "Secured By Design" requirements and be constructed off and securely fixed to a minimum 100mm thick concrete hard standing (thickened out around cycle rail for casting in) incorporating a damp proof membrane. Sheds to be constructed in treated tongue and groove shiplap cladding. The roof is to be duo-pitch construction using WBP ply roof boarding with high performance green felt finish.

Doors are to be ledged and braced in a minimum size of 2.0 x 0.61m wide complete with concealed hinges fixed with security screws and dome head bolts externally.

Sheds to be fitted with a permanent lock that conforms to BS 3621:2004 (not padlock).

EXTERNAL WORKS

BIN STORAGE

STORAGE SPACE:

100mm minimum thickness concrete base or paved area to be formed to create external space for storing both Non- recyclable waste and recyclable waste for Section WAS1 of The Code for Sustainable Homes.

All storage spaces must be level and located within reasonable distance of the external door to the dwelling (no more than 30 metres) and be accessible to wheelchair users.

NON RECYCLABLE WASTES:

The space allocated for waste storage (for each dwelling) should be able to accommodate wheelie bins with the following volumes in accordance with BS5906: 2005.

One, Two & Three Bedroom Dwellings	240 Litres
Four Bedroom Dwellings	310 Litres
Five bedroom Dwellings	380 Litres

Bins – To be supplied by Local Authority.

RECYCLABLE WASTES:

The space allocated for recyclable waste storage (for each dwelling) should be able to accommodate a green waste bin 240 litres volume and two 30 Litres recycling boxes. The recycling boxes should not be stacked.

COMMUNAL BIN STORES FOR PLOTS 1 TO 4

Bin Stores are to be located where indicated on the tender drawings and are to be sized by a Private Recycling Scheme Operator, dependant on frequency of collection.

Storage areas to be provided within the Bin Store for at least three types of recyclable waste in independently different bins.

Bin stores to have individual compartments for each of the four dwellings, with gates to each. Stores are to have an in-situ concrete base. Walls are to be constructed of facing bricks. Gate are to be provided to each compartment finished with close boarded timber with galvanised steel ironmongery. Roofs are to be pitched and finished with roof coverings to match those used to the dwellings. Numerals are to be placed on each gate to indicate which property the bin store relates.

EXTERNAL WORKS

RAINWATER

RAINWATER COLLECTION

Where rainwater harvesting has not been installed and credits are being sought under section WAT 2 of the Code for Sustainable Homes, rainwater butts to be provided for each dwelling to collect and store rainwater for irrigation purposes. The water butts must have a child proof lid and a provision of a tap for drawing off water. The water butts must also be durable and opaque to sunlight.

A connection from the rainwater downpipe must be provided with an automatic overflow into the main rainwater drainage system.

It must be possible to detach the rainwater pipe to allow the rainwater water butt to be detached for cleaning interior.

The water butts must be suitably sited and supported on a stable base.

Volume requirements for water butts to be as follows

Terraces and Patios: 100 litres minimum.

Dwellings with One or Two Bedrooms and private garden: 150 litres minimum.

Dwellings with Three or more Bedrooms and private garden: 200 litres minimum.

COMPOSTING

Where credits are being sought for Section WAS3 of the Code for Sustainable Homes, dedicated external home composting container specifically designed for composting to be provided to each dwelling.

Composters to be suitably sited to allow access for wheelchair users. The composters should not be located in close proximity of windows, doors and ventilation intakes to dwellings

Information leaflet to be provided to each dwelling indicating how composting works and why it is important and the materials that can be composted.

SIGNAGE

Provide bilingual street signs in accordance with the requirements of the Local Authority. Location to be agreed with Employer.

DRAINAGE

CODE FOR SUSTAINABLE HOMES

All new drainage to be installed in strict accordance with the drainage scheme and calculations prepared by Suitably Qualified Drainage Engineer to comply with the mandatory section SUR 1 of the Code for Sustainable Homes, to indicate the peak discharge flow rate from both the pre-developed site and the developed site.

Attenuation methods to be installed as required to ensure that the peak discharge rate from the site is reduced to either:

- The pre-development sites estimated mean annual flood (Qbar) or,
- 2/ls/ha or,
- A minimum flow rate (litres per second) based on good practice guidelines
- to prevent easy blockage by ensuring the outlet throttle is not too small.

If rainwater is discharged to a public sewer or adopted surface water sewer, the flow rate requirements will be defined by the Sewerage Undertaker.

Hydrobrake self activating vortex flow to be installed as required to control flow of water from site into sewers, all to Drainage Engineer's design.

EXISTING DRAINS:

- Before starting work, check invert levels and positions and condition of existing drains, sewers, inspection chambers and manholes.
- Adequately protect existing drains and maintain normal operation during construction.

PERFORMANCE CRITERIA

- Design, construct and test drainage below ground to BS EN 752-1:1996, BS EN752-2:1997 and BS EN 752-3:1.

TYPE(S) OF PIPELINE -

CLAY PIPELINES GENERALLY

- Pipes, bends and junctions: Vitriified clay to BS EN 295-1:1991, with flexible joints, Kitemark certified.

CONCRETE PIPELINES

- Pipes, bends and junctions: Precast concrete to BS 5911-1:2002, BS EN 1916:2002, with flexible joints, Kitemark certified.

PLASTICS PIPELINES

- Pipes, bends and junctions: PVC-U to BS EN 13598-1:2003, with flexible joints, Kitemark certified.

PIPES PASSING THROUGH WALLS

Pipes penetrating structural walls to have relieving arch or concrete lintel over with 50mm clearance around pipe, sealed using fibreboard inserts pre-cut to pipe diameter and mastic seal to wall face and pipe. First joint in drainage to be within 150mm of each side of wall face followed by a short length of "rocker" pipe no longer than 600mm.

DRAINAGE (Cont'd)

EXCAVATING/BACKFILLING -

LOWER PART OF TRENCH: From bottom up to 300 mm above crown of pipe the trench must have vertical sides and be of a width as small as practicable but not less than external diameter of pipe plus 300 mm or larger dimension if specified.

FORMATION FOR BEDS GENERALLY:

- Excavate to formation immediately before laying beds or pipes.
- Remove mud, rock projections, boulders and hard spots and replace with consolidated bedding material.
- Harden local soft spots by tamping in bedding material.

COMBINED TRENCHES:

Where one pipe is at a lower level than another adjacent pipe in a common trench:

- A subtrench is permissible provided the soil of the step is stable and unlikely to break away.
- If a subtrench is not permissible, the whole trench must have a depth related to the lower pipe, with increased thickness of bedding to the upper pipe as necessary.
- The lower pipe must be backfilled with compacted granular material to not less than half way up the higher pipe.

BACKFILLING TO PIPELINES GENERALLY:

Unless specified otherwise, backfill from top of surround or protective cushion with material excavated from the trench, compacted in layers not exceeding 300 mm thick. Do not use heavy compactors before there is 600 mm of material over pipes.

BEDDING/JOINTING-

INSTALLATION GENERALLY:

- Obtain pipes and fittings for each pipeline from the same manufacturer unless otherwise specified. Joint differing pipes and fittings with adaptors recommended by pipe manufacturer.
- Lay pipes to true line and regular gradient on an even bed for the full length of the barrel with sockets (if any) facing up the gradient.
- Joint using recommended lubricants, leaving recommended gaps at ends of spigots to allow for movement.
- Adequately protect pipelines from damage and ingress of debris. Seal all exposed ends during construction.
- Arrange the work to minimise time between laying and testing. Backfill after successful testing.
- Comply with manufacturer's recommendations/ instructions.

TERMINAL/ACCESS FITTINGS-

MANUFACTURE:

Obtain each complete assembly of fittings, traps, etc., including appropriate couplings, from the same manufacturer, and check compatibility of components with each other and with the pipe system.

DRAINAGE (Cont'd)

INSTALLATION OF FITTINGS:

- Set fittings square with and tightly jointed to adjacent construction as appropriate. If open to doubt obtain instructions.
- Bed and surround fittings, traps, etc. in concrete, 150 mm thick.
- Permissible deviation in level of gully gratings to be +0 to- 10 mm,
- Fit purpose made temporary caps over exposed openings in fittings and protect from site traffic.

MANHOLES/CHAMBERS/SOAKAWAYS/TANKS -

MANHOLES/INSPECTION CHAMBERS:

Position so that access covers occur completely in paving of one type or completely in topsoiled areas.

ENGINEERING BRICKWORK IN MANHOLES

- Clay Bricks: To BS EN 771-1:2003, BS EN 772-3:1998 and BS EN 772-7:19, Engineering Class B OR concrete bricks to BS EN 771-1:2003, BS EN 772-3:1998, minimum average compressive strength 21 N/sq mm.
- Mix: Group 1
- Bond: English
- Joints: Flush.

CAST IRON ACCESS COVERS AND SEATING:

- Covers: Grey iron or ductile iron to BS EN 124:1999.
- Seating: Make up in engineering bricks to BS EN 771-1:2003, BS EN 772-3:1998 and BS EN 772-7:19 Class B, laid in 1:3 cement:sand mortar, or precast concrete cover frame units, Type 1 or Type 2 to suit cover shape.
- Bed and haunch frame solidly in 1:3 cement:sand mortar over its whole area, centrally over opening, top level and square with joints in surrounding finishes. Cut back top of haunching to 30 mm below top of surface material.

STEEL ACCESS COVERS AND SEATING:

- Covers: Steel to BS EN 124:1999, where applicable.
Finish: Hot dipped galvanised.
Types: Recessed covers for concrete and paviour block infill
- Seating: Make up in engineering bricks to BS EN 771-1:2003, BS EN 772-3:1998 and BS EN 772-7:19
Class B, laid in 1:3 cement:sand mortar or precast concrete cover frame units, Type 1 or Type 2 to suit cover shape.
- Bed and haunch frame solidly in 1:3 cement:sand mortar over its whole base area, centrally over opening, top level and square with joints in surrounding finishes. Cut back top of haunching to 30 mm below top of surface material.

CONNECTIONS TO SEWERS:

Connect new pipework to existing adopted sewer(s) to the requirements of the Sewerage Authority or its agent.

DRAINAGE (Cont'd)

CLEANING/TESTING/INSPECTION

CLEANING:

- Flush out the whole of the installation with water to remove all silt and debris before final testing, and immediately before handover.
- Safely dispose of washings and any detritus without discharging them into sewers or watercourses.

TESTING/INSPECTION GENERALLY:

- Give CA advance notice to allow the opportunity to attend all tests and inspections.
- Give the Statutory Authority appropriate notice to enable pipelines to be inspected and tested as required.
- Provide water, assistance and apparatus as required.
- All lengths of drain, manholes and inspection chambers must pass the tests specified. If permitted test loss or infiltration is exceeded, remedy defect(s) before retesting after an appropriate period.

WATER/AIR TESTING OF GRAVITY DRAINS AND PRIVATE SEWERS UP TO DN 300:

- To ensure that pipelines are sound and properly installed, air test short lengths to BS EN 752-1:1996, BS EN 752-2:1997 and BS EN 752-3:19, paragraph 25.6.3 immediately after completion of bedding/surround.
- For final checking and statutory authority approval, water test to BS EN 752-1:1996, BS EN 752-2:1997 and BS EN 752-3:19, paragraph 25.6.2 all lengths of pipeline from terminals and connections to manholes/chambers and between manholes/chambers.

WATER TESTING OF MANHOLES/INSPECTION CHAMBERS:

Before backfilling test each manhole or chamber in accordance with BS EN 752-1:1996, BS EN 752-2:1997 and BS EN 752-3:19, paragraph 25.7 for:

- Exfiltration: Drop in water level to be not more than relevant dimension in Table 9.
- Infiltration: Inflow to be not more than 5 litres per hour per manhole.



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Detailed Specification for Electrical Installations

SPECIFICATION CLAUSES

To be read in conjunction with the Welsh Assembly Government Standard Documentation, the latest Building Regulations Approved Documents and contract/tender drawings.

Contractors should ensure that all elements of work comply with the current Building Regulations and should allow in their tenders for all associated costs, in particular any requirements under the recently amended Part E, "Resistance to the Passage of Sound", and any sound testing that may be required by Building Control Officer.

ELECTRICAL SERVICES

REGULATIONS: Comply with:

- BS 7671 'Requirements for Electrical Installations'(The IEE Wiring Regulations).
- Requirements of the Electricity Supply Company.

All installers must be on the roll of the National Inspection Council for Electrical Installation Contracting.

INSTALLATION GENERALLY:

- Install, test and commission the electrical work in accordance with BS 7671 (The IEE Wiring Regulations), ensuring compliance with design and performance requirements, to provide a safe, well insulated, earth protected system capable of supplying the anticipated maximum demand.
- Installation work to be carried out by qualified electricians fully conversant with BS 7671 (The IEE Wiring Regulations).
- Fastenings, bushes, glands, terminals, connectors, clips, clamps and all other minor accessories necessary to complete the installation to be types recommended for the purpose by relevant equipment, accessories, etc. manufacturer.
- In locations where moisture is present or may occur, use corrosion resisting fastenings and avoid contact between dissimilar metals.

CABLES to be BASEC certified. Select types and sizes to suit operating conditions, ensuring compliance with BS 7671 (The IEE Wiring Regulations).

CABLE ROUTES to be:

- Straight, vertical or horizontal and parallel.
- Positioned at least 150 mm clear of other services. Cables running parallel and adjacent to heating pipes to be located below the pipes.
- Concealed horizontal runs in walls, if unavoidable, to be located within 150 mm of ceiling or between 150 and 300 mm of floor.
- Concealed cable runs to wall switches and outlets to be vertically in line with the accessory.

INSTALLING CABLES GENERALLY:

- Do not commence internal cabling until the building is sufficiently enclosed to ensure permanently dry conditions.

-
- Install cables neatly and securely, adequately protected against accidental damage, adverse environmental conditions, mechanical stress and deleterious substances.
 - Install cables without joints other than at equipment and terminal fittings.
 - Sleeve cables passing through masonry walls with conduit bushed at both ends.
 - Do not run cables in spaces where they will be surrounded or covered by insulation. Where this is not practical, size cables accordingly.

PVC SHEATHED CABLES:

- Do not install cables when the temperature is near or below freezing.
- Do not install in cavities of external walls.
- Fit insulating cable glands at entries to equipment.
- Terminate cable sheaths within boxes.

CABLES ENTERING BUILDING(S) FROM BELOW GROUND: Seal both ends of pipeduct to a depth of not less than 150 mm, with an approved nonhardening, noncracking, water resistant compound. Alternatively, fit a proprietary moulded pipeduct seal.

ARRANGEMENT OF CIRCUITS: Divide the installation into separately controlled circuits as described below, further subdividing where necessary to ensure compliance with BS 7671 (The IEE Wiring Regulations):

- Separately metered installations for each dwelling further sub-divided for:
 - ground floor lighting
 - first floor lighting (where appropriate)
 - ground floor ring circuit
 - first floor ring circuit (where appropriate)
 - cooker
 - immersion heater
 - external lighting
 - smoke alarm
- Separately metered/unmetered landlords supply to external non-adoptable lighting.

EQUIPOTENTIAL BONDING: Install main and supplementary bonding conductors in accordance with the requirements of BS 7671 (The IEE Wiring Regulations).

HOME OFFICE:

Additional services must be provided in a suitable room intended as a Home Office (refer to the schedule of electrical fittings later in this document). In properties with more than one bedroom, the Home Office must not be located within the principal bedroom.

FUTURE STAIRLIFT:

To comply with Lifetime Homes Criteria 12a provide capped off electrical supply at a suitable location to assist in installation of a future stair lift.

FUTURE THROUGH FLOOR LIFT:

To comply with Lifetime Homes Criteria 12b provide a capped off electrical supply at a suitable location to assist in installation of a future through floor lift.

FUTURE INTRUDER ALARM (SEE SCHEDULE BELOW):

A 13 amp non-switched fused spur, suitable for a future alarm system (alarm system to be installed by others) to all dwellings (in a position to be agreed) to comply with Secured By Design requirements.

SOCKETS GENERALLY:

All electrical sockets and switches where located on separated walls to be staggered either side of wall. i.e. not back to back to ensure that Robust Details are complied with for Section HEA2 of the Code for Sustainable Homes.

Chases for services to be kept to a minimum and filled well with mortar

FIXING ELECTRICAL ACCESSORIES/EQUIPMENT:

- Position accurately and square to vertical and horizontal axes.
- Where not shown otherwise, align adjacent accessories on the same vertical or horizontal axis as appropriate.
- Accessories must not be fitted within 300 mm (in the horizontal plane) of the sink bowl in kitchens/utility rooms.
- Fit pendant light fittings clear of door swings and stair wells.
- Where not shown otherwise, fix accessories/equipment at the following heights above finished floor level:

	<u>mm</u>
Light switches	1000
Power socket outlets and spurs	450 (1000 in wheelchair house)
Power socket outlets and spurs above worktops (in kitchens)	1050
Power socket outlets below worktops (in kitchens)	450
Cooker control unit	1050
Immersion heater control	1000
Room thermostat/time clock	1000
TV aerial socket	450 (1000 in wheelchair house)
Bell push (front door)	1000
Unswitched socket outlet	450 (1000 in wheelchair house)
Shaver point and strip light	1800

Measurements are from finished floor level to the bottom of the accessory.

LIFETIME HOMES:

All electrical sockets, switches, ventilation, services controls to be located at a height between 450mm and 1200mm from the finished floor level to comply with Lifetime Homes Standards. Boiler controls are to be integrated with the front panel of the boiler.

Electrical Consumer Units to be fixed to a wall at a maximum height of 1200mm (to top) from floor level. Location preferably in a cupboard, dependant on distance regulations from external meter (i.e. 3m tails). Final position to be agreed with the Employer.

CONSUMER CONTROL UNIT(S):

- To BS 5486:Part 13 or BS EN 60439-3
- Main control: Switch disconnector to BS EN 60439-3
Rating: To suit maximum demand.
- Number of ways: One per circuit plus 1 spare.
Each way to be permanently labelled to identify circuit and rating.
- Circuit protection:
Miniature circuit breakers to BS EN 60898.
30 MA RCCB to BS 4293, BS EN 61008-1 or BS EN 61009-1 to protect circuits.
- Enclosure: Surface mounted plastics with lid.
- In wheelchair housing ensure unit is located in a position accessible to a wheelchair user.

METER BOXES:

Externally wall mounted GRP meter box to be installed at a minimum height of 600mm from finished floor level (to base of box) to comply with the regulations of the Electricity Company.

All external electricity meter cupboards to be located on front elevation of property or to the side but not within enclosed rear secure garden area to comply with Secured By Design requirements.

ELECTRICITY SUPPLY:

- Liaise with the Electricity Supply Company as necessary to confirm or determine:
 - The maximum demand of the installation.
 - The nature of the supply, its suitability for the installation and the type of earthing arrangement.
 - The location of the incoming supply.

SMART METERS:

'Smart meters' are to be fitted to all dwellings to monitor energy consumption.

ELECTRICAL ACCESSORIES: To be of the following types and from a single manufacturer:

- Switches: In bathrooms and wc compartments, surface mounted ceiling switches; elsewhere, flush mounted rocker plate switches to BS 3676:1989.
- Light fittings to bathrooms, wc compartments - sealed low energy fitting including low -energy lamp. IP rating of fitting to comply with the IEE Wiring Regulations.
- Lampholders: In accessible loft spaces, walk-in stores; surface mounted heat resistant batten holder with shield: elsewhere, ceiling rose with dedicated energy efficient type pendant lampholder (see Internal Lighting Installation) with cord grip.
- Socket outlets: Types flush mounted to BS 1363:1984. Spurs/connection units to BS 5733:1979. (note: unswitched fused spur in hall to have neon indicator). Inform CA of selected manufacturer and submit relevant catalogues if requested.
- Cooker control units: To BS 4177.

PHOTOVOLTAICS:

Where code level 04 is being sought, consideration to be given to installing Photovoltaics (PV) technology to assist in achieving required Dwelling Emission rate to comply with section ENE 1 of the Code for Sustainable Homes.

MECHANICAL VENTILATION HEAT RECOVERY (MVHR):

To be provided where Mechanical Ventilation Heat Recovery systems are required to be installed to dwellings to assist in achieving required Dwelling Emission Rate for the SAP rating and section ENE 1 of the Code for Sustainable Homes.

System to have an efficiency of 85% minimum and 1W / (l.s) specific fan power.

The efficiency of the unit should retain up to 90% of the temperature differential of out going air.

IMMERSION HEATER TIMSWITCH:

Provide an electronic immersion heater switch.

Location: Airing cupboard

FUSED SPUR FOR SOLAR HOT WATER HEATING: Provide a fused spur outlet adjacent to the hot water cylinder within the airing cupboard/store cupboard to supply power for the pump/controls for the solar hot water installation.

DOOR BELL:

Mains operated with transformer (which may be incorporated into consumer unit) to front door. Bell to be located within the Hall.

SHAVER POINT AND LIGHT STRIP (SEE SCHEDULE BELOW):

To be BEAB Approved positioned above or to the side of the mirrors above wash hand basins (Final positions to be agreed with CA).

THE INSTALLATION GENERALLY:

Provide power outlets, spurs, shaver points, etc all as detailed in the Schedule below. Final positions to be agreed with the Employer.

In addition, provide electrical isolation switches for central heating boilers, solar hot water, etc as necessary. Agree positions with the Employer.

Designs shall incorporate all electrical accessories listed in the following table, suitably located in relation to heat sources, other fittings and likely furniture.

SCHEDULE OF MINIMUM REQUIREMENTS FOR ELECTRICAL FITTINGS TO EACH PROPERTY:

	Switched double socket	Switched single socket	Cooker control unit	Single T.V. Aerial socket	Double T.V. Aerial socket	Telephone point	Shaver point /strip light	Unswitched fused spur
Kitchen area in kitchen / dining room	3*	3@	1					
Dining area in kitchen / dining room	1							
Living room	5\$				1	1~		
Primary bedroom	3			1				
Single bedroom including Home Office	3					1		
Hall	1							1#
Landing	1							
Bathroom							1	
<p><u>Key</u></p> <p>* These are for general purposes above worktop level. Additional switched sockets are to be provided at appliance positions</p> <p># For future connection to intruder alarm panel (located in cupboard)</p> <p>@ Separate switch to power sockets to fridge/freezer, washing machine and tumble dryer. Switch at worktop level.</p> <p>\$ Two of the double sockets to be located adjacent to the TV aerial point.</p> <p>~ Living Room telephone point to be located adjacent to the TV aerial point.</p>								

INTERNAL LIGHTING INSTALLATION:

All new internal light fittings in all dwellings to be dedicated energy efficient type for Section ENE 3 of the Code for Sustainable Homes.

Energy efficient light fittings capable of only using lamps with a luminous efficiency greater than 40 lumens per circuit-watt. Light fittings that accept GLS tungsten lamps with bayonet caps or Edison screw bases are NOT to be used. All fittings to be provided with the energy efficient

Where heating/plumbing or other similar equipment is located within the loft space which will require periodic future maintenance, provide within the loft space a low energy light fitting switched from a switch incorporating a neon indicator, located within the hallway adjacent to the loft access hatch.

LIGHTING GENERALLY:

Provide switched lighting to all rooms, walk in stores (i.e. stores with a floor area of 1.5m² or greater). Control lighting to stores with neon indicator switches, mounted outside the store.

In kitchen/dining and living/dining rooms provide two lights, separately switched with two-way switching. Provide two way switched lighting at the head and foot of stairs and at each end of corridors. In addition, provide two-way switched lighting to any room with an external rear or side door with switches being located adjacent to both the external door and internal door.

EXTERNAL LIGHTING:

Provide to front and rear entrance doors of all houses and bungalows and front doors of individually accessed flats. All external lights fixed to a building (including common areas) to be fitted with dedicated low energy fittings (maximum lamp capacity 150w per light fitting) and the lights are to be controlled by a PIR sensor, or a "dusk to dawn" daylight sensor or time switches for Section ENE 6 of the Code for Sustainable Homes.

Energy efficient light fittings capable of only using lamps with a luminous efficiency greater than 40 lumens per circuit-watt. Light fittings with GLS tungsten lamps with bayonet caps or Edison screw bases are NOT to be used. All fittings to be provided with an energy efficient lamp.

External lighting also to comply with requirements of Architectural Liaison Officer for Secured by Design certification.

Provide an external street lighting installation to the new access road and car park areas supplied off a dedicated Landlord's electrical supply. Lamp standards are to be galvanised tubular steel. Lighting heads are to include low energy lamp fittings, shade and reflector to minimise light pollution. Lighting to be controlled via a photocell and timer operation.

TELEPHONE INSTALLATION:

Provide to the telephone points indicated on the electrical fittings schedule. Provide BT approved telephone points to match the other electrical fittings within the room.

AERIALS IN HOUSES/BUNGALOWS:

Provide two low-loss coaxial cables to the aerial points indicated on the electrical fittings schedule. Both cables to terminate within the loft space to permit future connection to aerials (aerials to be supplied and fixed by others).

SMOKE ALARMS:

Self-contained type to BS 5446:Part 1 (optical type), Kitemark certified.

Operation: Mains with capacitor or sealed in, tamper proof battery back-up. The back-up must provide in excess of 72 hours power supply in the event of mains failure or disconnection, in accordance with clause 13.5 of BS 5839:Part 6.

- The installer must certify that the installation conforms with the relevant sections of BS 5839 :Part 6 for a Grade D system to LD3 level of cover.

EXTRACT/VENTILATING FANS:

To BS EN 60335-2-80 or CENELEC Harmonization Document HD 280 S1; with integral electronic humidistat, manual override and back draught shutter.

Provide to each kitchen, kitchen/dining room, W.C. and bathroom.

INSPECTION AND TESTING:

- To BS 7671 (The IEE Wiring Regulations: Part 7).
- Give not less than 24 hours notice before commencing tests.
- In addition to items required to be inspected or tested, ensure that labels and signs required by the Regulations are securely fixed in the correct locations.
- After satisfactory completion of tests submit two copies of inspection and completion certificates to Employer.

DOCUMENTATION: Hand over to the Employer at Practical Completion:

- Copies of manufacturers' operating and maintenance instructions for all fittings and apparatus.
- As-installed drawings showing all circuits and their ratings and the locations of all fittings and apparatus.



TAI CANOLBARTH CYMRU
MID-WALES HOUSING

Yn barod **amdani** Equal to the challenge

Detailed Specification for Heating and Plumbing Installations

SPECIFICATION CLAUSES

To be read in conjunction with the Welsh Assembly Government Standard Documentation, the latest Building Regulations Approved Documents and contract/tender drawings.

Contractors should ensure that all elements of work comply with the current Building Regulations and should allow in their tenders for all associated costs, in particular any requirements under the recently amended Part E, "Resistance to the Passage of Sound", and any sound testing that may be required by Building Control Officer.

RAINWATER GOODS:

PVC-U to BS 4576:Part 1, Kitemark certified or
LINDAP self finished metal

Type of pipe: Black plastic or self finished metal

Colour: Self finished

Type of gutter: Half round black plastic or self finished metal

Colour: Self finished

Accessories: All accessories to be obtained from the rainwater pipe/gutter supplier and designed specifically to suit the selected system.

BEFORE COMMENCING WORK: ensure that:

- Below ground drainage is ready to receive rainwater or that the discharge can be dispersed by approved means to prevent damage or disfigurement of the building fabric.
- Any specified painting of surfaces which will be concealed or inaccessible is completed.

INSTALLATION GENERALLY:

- Install pipework/gutters to ensure the complete discharge of rainwater from the building without leaking.
- Obtain all components for each type of pipework/guttering from the same manufacturer unless specified otherwise.
- Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
- Avoid contact between dissimilar metals and other materials which would result in electrolytic corrosion.
- Do not bend pipes.
- Adequately protect pipework/gutters from damage and distortion during construction. Fit purpose made temporary caps to prevent ingress of debris. Fit all access covers, cleaning eyes and blanking plates as the work proceeds.
- Where not specified otherwise use plated, sherardized, galvanized or nonferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed.

FIXING GUTTERS:

- Set out to a true line and even gradient to ensure no ponding or backfall. Position high points of gutters as close as practical to the roof and low points not more than 50 mm below the roof.
- Position outlets to align with connections to below ground drainage, unless shown otherwise on drawings.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Overlap joints in direction of fall and seal as specified to make watertight.
- Ensure that roofing underlay is dressed into gutter.
- Fix gutter brackets securely at centres recommended by manufacturer and at all joints in gutters, with additional brackets near angles and outlets.

RAINWATER OUTLETS: Ensure that:

- Outlets are securely fixed before connecting pipework.
- Junctions between outlets and pipework can accommodate all movement in the structure and pipework.

FIXING PIPEWORK:

- Fix securely at specified centres plumb and/or true to line.
- Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
- Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.
- Fix externally socketed pipes/fittings with sockets facing upstream.
- Provide additional supports as necessary to support junctions and changes in direction.
- Fix every length of pipe at or close below the socket collar or coupling.
- Provide a load bearing support for vertical pipes at not less than every storey level. Tighten fixings as the work proceeds so that every storey is self supporting and undue weight is not imposed on fixings at the base of the pipe.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Fix expansion joint pipe sockets rigidly to the building and elsewhere use fixings that allow the pipe to slide.
- Do not position pipes within 900mm of upstairs windows.

JOINTING PIPEWORK/GUTTERS:

- Joint using materials, fittings and techniques which will make effective and durable connections.
- Joint differing pipework/gutter systems with adaptors recommended by manufacturer(s).
- Cut ends of pipes to be clean and square with burrs and swarf removed. Chamfer pipe ends before inserting into ring seal sockets.
- Ensure that jointing or mating surfaces are clean, and where necessary lubricated, immediately before assembly.
- Form junctions using fittings intended for the purpose ensuring that jointing material does not project into bore of pipes, fittings and appliances.
- Remove surplus flux/solvent/cement/sealant from joints.

PIPEWORK WITH UNSEALED JOINTS: Ensure that pipes are firmly secured to prevent rattling at joints and fixings.

IMMEDIATELY BEFORE HANDOVER:

- Remove swarf, debris and temporary caps from the entire rainwater installation.
- Ensure that all access covers, rodding eyes, outlet gratings, etc. are secured complete with all fixings.

WASTE, SOIL AND VENT PIPES

SOIL AND VENT PIPES:

Pipes, fittings and accessories: PVC-U to BS 4514:2001 and BS EN 1329-1:2000, Kitemark certified.

Colour where exposed externally: Pipework is not to be exposed externally.

Conceal internal pipes in ducts.

Where pipes pass through habitable rooms, provide 25 mm thick duct walls consisting of with two layers of 12.5mm Gyproc Wallboard (combined nominal 16kg/m²).and wrap pipe in 25mm (min) mineral wool quilt insulation (10-36kg/m²) around

Provide removable access panels where access may be required for maintenance.

All service penetrations including top and bottom of SVP enclosures to be sealed with expanded foam or other suitable sealants to minimise air leakage.

Colour where exposed externally: to be approved by Employer

PERFORMANCE CRITERIA: Design above ground foul drainage to BS EN 12056-2000.

Install pipework, fittings and accessories to ensure that:

- Appliances drain quickly, quietly and completely at all times without nuisance or risk to health.
- Discharge is conveyed without crossflow, backfall, leakage or blockage.
- Air from the drainage system does not enter the building.
- Pressure fluctuations in pipework do not vary by more than ± 38 mm water gauge and traps retain a water seal of not less than 25 mm.
- The system can be adequately tested, cleaned and maintained.

INSTALLATION GENERALLY:

- Before commencing work specified in this section, ensure that any specified painting of surfaces which will be concealed or inaccessible is completed.
- Install pipes, fittings and accessories in accordance with BS EN 12056-2000..
- Obtain all components for each type of pipework from the same manufacturer unless specified otherwise.
- Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
- Avoid contact between dissimilar metals and other materials which would result in electrolytic corrosion.
- Do not bend pipes.
- Adequately protect pipework from damage and distortion during construction. Fit purpose made temporary caps to prevent ingress of debris. Fit all access covers, cleaning eyes and blanking plates as the work proceeds.
- Where not specified otherwise use plated, sherardized, galvanized or nonferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed.

PIPE ROUTES:

Routes to be the shortest practical, with as few bends as possible and no bends in wet portion of soil stacks, unless specified otherwise. Pipe routes not shown on drawings to be approved before commencing work.

FIXING PIPEWORK:

- Fix securely at specified centres plumb and/or true to line.
- Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
- Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.
- Fix externally socketed pipes/fittings with sockets facing upstream.
- Provide additional supports as necessary to support junctions and changes in direction.
- Fix every length of pipe at or close below the socket collar or coupling.
- Provide a load bearing support for vertical pipes at not less than every storey level. Tighten fixings as the work proceeds so that every storey is self supporting and undue weight is not imposed on fixings at the base of the pipe.
- Isolate from structure where passing through walls or floors.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Fix expansion joint pipe sockets rigidly to the building; elsewhere use fixings that allow the pipe to slide.

JOINTING PIPEWORK:

- Joint using materials, fittings and techniques that will make effective and durable connections.
- Joint differing pipework systems with adaptors recommended by manufacturer(s).
- Cut ends of pipes to be clean and square with burrs and swarf removed. Chamfer pipe ends before inserting into ring seal sockets.
- Ensure that jointing or mating surfaces are clean, and where necessary lubricated, immediately before assembly.
- Form junctions using fittings intended for the purpose ensuring that jointing material does not project into bore of pipes, fittings and appliances.
- Remove surplus flux/solvent/cement/sealant from joints.

AIR ADMITTANCE VALVES: Agrément certified.

- Install in a vertical position, above the flood level of the highest appliance served, and so that insulation materials (other than the manufacturers insulating cover) are kept clear of the valve body.
- Fit using a ring seal connection, or in such a way that the valve can easily be removed to allow the discharge stack to be rodded.
- Fit the manufacturers insulating cover in roof spaces and other unheated locations.

ACCESS FOR TESTING AND MAINTENANCE:

- Install pipework with adequate clearance to permit testing, cleaning and maintenance.
- Position access fittings and rodding eyes so that they are not obstructed by other pipework, framing, etc.

PIPEWORK TEST:

- Temporarily seal open ends of pipework with plugs.
- Connect a 'U' tube water gauge and air pump to the pipework via a plug or through the trap of an appliance.
- Pump air into pipework until gauge registers 38 mm.
- Allow a period for temperature stabilisation, after which the pressure of 38 mm is to be maintained without loss for not less than 3 minutes.

SIPHONAGE AND BACK PRESSURE TESTS:

- Test WC pans by flushing and test other appliances by filling to overflow level, then removing the plug.
- Carry out tests at least 3 times with traps recharged before each test.
- Test each appliance individually for self siphonage, then test for induced siphonage and back pressure by discharging the following numbers of appliances simultaneously on each stack:
 - WCs: 1
 - Washbasins: 1
 - Sinks: 1Agree selection of appliances with CA.

IMMEDIATELY BEFORE HANDOVER: Ensure that temporary caps have been removed and that permanent blanking caps, access covers, rodding eyes, floor gratings and the like are secured complete with all fixings.

SANITARY FITTINGS

LIFETIME HOMES STANDARD:

All bathrooms and ground floor W.C layouts to comply with Criteria 10 and 11 of Lifetime Homes Standards and to meet with space requirements as illustrated in both Criteria.

Where a ground floor W.C. is required on the drawings (in addition to a Bathroom), provision is to be made for future shower to ground floor W.C. where indicated in drawings.

Within bungalows and ground floor flats, the floor is to be recessed below the bath with a waste pipe provided to accommodate the installation of a future shower.

DOCUMENTATION:

On completion, documentation to be provided to the Employer to indicate a record of all the sanitary appliances, taps and showers installed in the building (as indicated in the Water Consumption Calculations). The documentation should also include maintenance requirements to allow the water efficiency of the building to be maintained.

CODE FOR SUSTAINABLE HOMES:

Sanitaryware, showers and taps to be installed in strict accordance with the drawings and specifications and water consumption calculations to ensure that the following criteria can be met under the Mandatory Section WAT1 of the Code for Sustainable Homes.

<u>Water Consumption</u>	<u>Code Level</u>
Equal to or less than 105 litres/person/day	Level 03
Equal to or less than 90 litres/person/day	Level 04
Equal to or less than 80 litres/person/day	Level 05 & 06

The choice of fittings will also depend on whether rainwater harvesting is being used.

WC PAN AND FLUSHING ARRANGEMENT:

- To the DETR WC Suite performance specification or equivalent approved by the relevant water undertaker.
- Arrangement: Washdown pan with independent low level or close coupled cistern.
- Pan: Vitreous china to BS EN33:1999, colour White
- Pan connector: To BS 5627:1984, colour White
- Seat: Plastic seat and cover to BS 1254:1981, colour White
- Cistern: Vitreous china to BS 7357:1990, colour White
- Valve and float: Float operated to BS 1212:1990 with plastics float, size to suit water pressure.
- Flush type: Dual
- Operating mechanism: Chrome plated lever handle.
- Sealing: Joint between pan and floor finish with silicone based sealant to BS EN ISO11600:2003 Type B with Fungicide, Colour to CA approval.
Refer to water consumption calculations for W.C flush volumes to comply with Section WAT1 of the Code for Sustainable Homes.
- Screw fix floor mounted pans and fit cover caps over screw heads. Unless specified otherwise, do not use mortar or other beddings.
- Ensure that the seat and lid are stable when raised.
- Unless specified otherwise obtain cistern operating components from cistern manufacturer. Ensure that ballvalve matches pressure of water supply.
- Fix at the height recommended by manufacturer.
- Ensure that overflow pipe is fixed to falls, and located to give visible warning of discharge.

WASH BASIN IN BATHROOMS:

Type: Vitreous china with pedestal to BS 1188:1974: size 2, colour White .

Waste: Chrome plated brass waste to BS EN 274:2002 with plug and chrome plated bead chain.

Trap: 75mm seal plastic bottle trap to BS EN 274:2002

Sealing: Joint between basin and wall tiles and pedestal and floor finish with silicone based sealant to BS EN ISO11600:2003 Type B with Fungicide, Colour to CA approval.

Bed wastes/overflows in waterproof jointing compound and fix with resilient washer between appliance and backnut

TAPS FOR WASH BASINS:

½ inch chrome plated brass pillar taps to BS EN200:2008.

Separate hot and cold taps are to be provided and not a “mixer” type.

Mechanism: Quarter turn ceramic disk cartridge.

Handles: 75mm Chrome plated metal lever handles.

Refer to water consumption calculations for tap flow rate to comply with Section WAT1 of the Code for Sustainable Homes. **Flow restrictors or aerators to be installed as required to reduce flow rate of taps to reduce the water consumption.**

Fix securely, making a watertight seal with the appliance. Place hot tap to left of cold tap as viewed by user of appliance.

SHOWERS OVER BATHS:

Refer to water consumption calculations for required shower flow rates to comply with Section WAT1 of the Code for Sustainable Homes.

Provide a Mira Vie 9kw electric shower for each bathroom including the handset and rail. Shower rail to be provided spanning wall to wall for the full length of the bath with a white pvc shower curtain.

BATHS:

Height applicable to all baths: Height of rim above finish floor level : 525 mm maximum
Height of rim above floor level: 450mm.

Refer to water consumption calculations for required bath capacity and height to overflow to comply with Section WAT1 of the Code for Sustainable Homes.

Type: Vitreous enamel pressed steel to BS EN 232:2003, grade 22, type 1, size 1700 x 700mm with handgrips, overflow, slip resistant base and matching removable side/end panels, colour White.

Waste: Chrome plated brass waste to BS EN 274:2002 with plug and chrome plated bead chain and overflow grid.

Sealing: Joint between bath and wall/surround tiling and also bath panel supports and floor finish with silicone based sealant to BS EN ISO11600:2003 Type B with Fungicide, Colour to CA approval.

Bed wastes/overflows in waterproof jointing compound and fix with resilient washer between appliance and backnut

BATH TAPS:

$\frac{3}{4}$ inch chrome plated brass pillar taps to BS EN200:2008.

Separate hot and cold taps are to be provided and not a "mixer" type.

Mechanism: Quarter turn ceramic disk cartridge.

Handles: 75mm Chrome plated metal lever handles.

Refer to water consumption calculations for tap flow rate to comply with Section WAT1 of the Code for Sustainable Homes. **Flow restrictors or aerators to be installed as required to reduce flow rate of taps to reduce the water consumption.**

Fix securely, making a watertight seal with the appliance. Place hot tap to left of cold tap as viewed by user of appliance.

ANTI-SCALD CONTROL TO HOT WATER SUPPLIES:

The temperature of hot water to all sanitaryware, with the exception of the kitchen sink, is to be thermostatically controlled using thermostatic mixer valves to prevent possible scalding. The mixer valves are to incorporate an anti-tamper facility to prevent unauthorised adjustment.

TOILET ROLL HOLDER:

To be wall mounted and provided adjacent to each WC.

BATHROOM MIRROR/ SHOWER ROOM:

Minimum size: 700 x 450

Mirror material: Float glass, silvered to give maximum reflection, free from tarnishing, discolouration, scratches and other defects visible in the designed viewing conditions.

- Thickness: 4 mm
- Backing: Plastics safety film
- Edge treatment: Polished
- Fixing method: Chromium plated domehead mirror screws with polyethylene sleeves and washers.
- Fix accurately and securely, but without overtightening fastenings, to provide a flat surface giving a distortion free reflection.

LOCKABLE MEDICINE CABINET:

Provide a wall mounted lockable medicine cabinet located adjacent to the fire blanket in kitchen of each dwelling. Minimum dimensions 300mm x 300mm x 150mm deep manufactured from moisture resistant melamine faced board. Single door complete with brass hinges, door knob, mortice lock with 3 Nr keys and retaining catch. Provide self adhesive notice containing the words "Medicine Cabinet" or equal approved to be approved by Employer.

WATER BYELAWS SCHEME APPROVAL:

All sanitary appliances, taps and water fittings must be approved by the Water Byelaws Scheme administered by WRc plc, or otherwise be tested and approved to the satisfaction of the water undertaker to whose supply they will be connected.

NOGGINGS/BEARERS:

Ensure that noggings, bearers, etc. required to support sanitary appliances and fittings are accurately positioned and securely fixed.

TILED BACKGROUNDS (other than splashbacks):

Ensure that:

- Tiling is complete before fixing appliances.
- Fixings do not overstress tiles.

HOT AND COLD WATER SUPPLY

THE INSTALLATION:

Provide cold supplies to all WC's and electric showers and hot and cold supplies to all sinks, wash hand basins, baths and washing machine positions.

Obtain approval from the Employer to all pipeline routes, access panels, etc before commencing work.

Install systems so that they comply with BS 6700 and water supply byelaws/regulations and are free from leaks and water hammer. All installation work to be carried out by qualified operatives. Electrical work in connection with the installation must be in accordance with BS 7671 (The IEE Wiring Regulations).

In locations where moisture is present or may occur, use corrosion resistant fittings/fixings and avoid contact between dissimilar metals by use of suitable washers, etc.

All equipment, pipework, components, valves, etc. to be fully accessible for maintenance, repair or replacement. Installation to be fitted with vents at high points and draining taps at low points to facilitate purging and draining.

STOP TAP AND WATER METER LOCATION:

Internal stop tap and water meter to be located in a wheelchair accessible position under kitchen sink, 500mm from the finished floor level.

REMOTE WATER SWITCH:

A 'Sure Stop' remote water switch is to be provided to isolate the incoming water supply.

- Location for switch to be agreed with Employer.

WASHING MACHINE POSITION:

Taps: ½ inch chrome plated brass washing machine valves, threaded for hose union.

Trap: 40 mm diameter, 75 mm deep seal trap to BS EN-274:2002 with upstand to receive washing machine waste.

HOT WATER STORAGE:

Type of system: gas fired.

- System: Unvented indirect, including thermostat.
Capacity: 250 litres minimum capacity stainless steel cylinder for houses/bungalows.
Insulation: Factory fitted.
- Heat source: Primary circuit from heating boiler to be capable of raising temperature of water from 10 degC to 60 degC within 1 hour. Secondary circuit from solar panel(s).
- Maximum temperature of stored hot water: 65 degC.
- Immersion heater: To BS EN 60335-2-73, with thermostat, BEAB Approved.
- Installation: The assembled system with all its components must be covered by a BBA or WIMLAS certificate or meet the requirements of BS 7206 with third party assessment such as Kitemarking. Unvented hot water storage systems should be installed by a competent person as defined in Approved Document G3.

VALVES:

- Types approved for the purpose by the local water company and of the appropriate pressure/temperature ratings.
- Provide in convenient locations for isolation and regulation of all equipment and subcircuits.
- Fit with handwheels where appropriate for isolation by the building user.

SERVICE PIPELINE INTO BUILDING:

- Tube: Blue polyethylene to BS 6572, Kitemark certified.
- Jointing: As recommended by tube manufacturer.
- Lay not less than 750 mm below finished ground level.
- If rising into building within 750 mm of external wall or passing through a void below floor level, fit insulation from floor level to 600 mm beyond external face of building.

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- Seal both ends of pipeducts with nonhardening, noncracking, water resistant compound.
 - Testing: Disconnect from the mains, fill with potable water, and apply at least twice the working pressure for one hour, during which there must be no leakage.
 - Fit stopcock as near as possible to point of entry and in a conveniently accessible position.

POLYBUTYLENE PIPELINES: May be used.

- Pipes and fittings: To BS 7291: Parts 1 and 2. Kitemark certified to Class S.
- Supports: Screw clips where exposed to view, nail clips where concealed.
- All bends to be cold formed.
- Use purpose designed fittings and accessories for all joints, do not improvise.
- Make connections to equipment with demountable fittings or compression fittings to BS 864: Part 2, Kitemark certified.
- Cut pipes square using cutter recommended by the manufacturer. Do not use hacksaws. Remove burrs and make neat, clean, fully sealed joints.
- Do not overtighten compression fittings.
- Give at least three days notice to CA before testing.
- Ensure that all components and equipment are disconnected prior to testing.
- Completely fill with water and remove all air before testing.
- Apply 12 bar (174 psi) water pressure and tug sharply on all pipes where they enter a joint.
- Leave under pressure for 15 minutes and check for leaks.
- If leaks are evident, repair and repeat test.

COPPER PIPELINES: May be used.

- Tube: To BS EN 1057 half hard temper R250, Kitemark certified.
- Joint fittings: To BS EN 1254, Kitemark certified. Capillary fittings to be lead-free.
- Supports: Plastics spacers
- Form changes of direction with radius fittings or formed bends.
- Use purpose designed adaptors for connecting dissimilar materials: do not improvise.
- Protect background and plastic pipes and fittings from heat damage when forming soldered joints. Clean off all flux residue. Do not use 'self-cleaning' fluxes.

WATER PIPELINE SIZES: Calculate sizes to suit the probable simultaneous demand for the building and to ensure:

- A water velocity of not more than 1.3 m/s for hot water and 2.0 m/s for cold water.
- Suitable discharge rates at draw off points.
- A filling time for the cold water storage cistern of not more than one hour.

FIXING PIPELINES:

- Runs to be straight and parallel or perpendicular to walls, floors, ceilings, etc. as appropriate. Obtain approval of routes before commencing work.
- Where reasonably possible, conceal pipe runs within floor, ceiling or roof voids..
- Run hot pipes above cold where routed together horizontally. Do not run pipes through electrical enclosures or above switch gear, distribution boards or the like.
- Fix at adequate centres with minimum of bends and offsets.

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- Allow for thermal movement and isolate from structure where necessary to prevent noise or abrasion caused by movement. Pipes passing through walls to be sleeved.
 - Prevent ingress of dirt during installation.
 - Completed pipelines to be of consistent bore, clean and free from external scratching toolmarks, distortion, cracks and other defects.

INSULATION TO PIPELINES:

- Fit to all pipelines within 1m of the central hot water storage vessel and in unheated spaces.
- Material: Preformed flexible closed cell or mineral fibre preformed split tube with thermal conductivity not exceeding 0.045 W/mK and thickness equal to outside diameter of pipe up to a maximum of 40 mm.
- Fit insulation after completion of testing, ensuring continuity over fittings and at supports, leaving no gaps and with the split on 'blind' side of pipeline.

EXTERNAL WATER PIPELINES:

To be insulated where exposed to air and where less than 750 mm below ground level.

WARNING PIPE:

- Material: UPVC or ABS to BS 5255 with solvent welded joints. Outside diameter to be greater than that of the inlet pipe, but not less than 22 mm
- Difference between normal water level and overflow level to be not less than 25 mm.
- Fall to be not less than 1 in 10 with supports to prevent sagging, outlet projecting 100 mm with turned down end, discharging in approved prominent position.
- Turn down end within the cistern, terminating 50 mm below normal water level.
- Fit with insulation where the pipe is in an uninsulated space.

VENT PIPE:

To be not less than 20 mm diameter with no restrictions or valves and to discharge over cistern.

TESTING THE SYSTEM: Notwithstanding the requirement of BS 6700, Clause 31.1.12:

- Give at least 3 days notice to CA before testing.
- Thoroughly flush out all parts of the system, fill with water, remove all air and check for leaks. Carry out hydraulic pressure test to twice the working pressure on all inaccessible or buried pipelines. If leaks are evident, repair and repeat test.
- Run system to maximum operating temperature and check for leaks. Allow system to cool, leave in cold condition for at least 3 hours and check for leaks. Carry out hydraulic pressure test to twice the working pressure on all inaccessible or buried pipelines. If leaks are evident, repair and repeat test.
- Check and adjust operation of all equipment, controls and safety devices. Check operation of all outlets for satisfactory rate of flow and temperature.

RAINWATER HARVESTING

SYSTEM:

To reduce consumption of potable water for Section WAT1 of the Code for Sustainable Homes and to assist with the management of surface water run off from the developments for Section SUR 1 of the Code for Sustainable Homes, rainwater harvesting systems to be installed within all dwellings.

Individual proprietary **Gravity** rainwater harvesting systems to be installed to each property to meet BS 8515:2009 (Rainwater Harvesting Code Of Practice) and / or have an independent third party assessment e.g. BBA.

Rainwater drainage from roof of dwellings to be taken below ground and connected into external rain filter before being taken to an underground water storage tank containing pump and float switch with outlet for pipework to in-line filter 120 microns and Main Control Panel within dwelling. Tanks to be sited where indicated on drawings and to have suitable manhole cover and overflow.

<u>Size of Tank</u>	<u>Roof Area</u>
1200 litres	up to 100 m ²
3000 litres	up to 160 m ²
6000 litres	up to 280 m ²

Internal pipework from control panel to distribute harvested water to header tank located in loft space. **A direct system may not be used.**

Mains water supply to be also provided to header tank (with double ballcock) to top up system when required.

Internal pipework to distribute harvested water from header tank to W.C's, washing machine and outside tap.

"Level display units" to be wall mounted in a suitable place within dwelling to allow occupants to monitor water levels within tank.

System to be installed in strict accordance with Manufacturers Instructions.

Allow for all excavation works including side supports as required for tanks and allow for all ducting back to building.

GAS SUPPLY

INSTALLATION:

Provide a gas supply to the cooker and boiler positions. Provide a security chain to the cooker space to prevent a tenant's cooker from being pulled away from the gas supply point.

PIPELINES:

- Install and test to BS 6891 and the requirements of British Gas.
- Ensure that gas supply meter and distribution pipelines are adequate for the maximum anticipated demand. Ensure that external meter reading cabinets are

positioned so as to be accessible to supply company staff without entering private garden space.

- Fit service cocks to permit removal of appliances.
- Terminate supply to cooker positions with bayonet socket incorporating spring loaded valve complying with BS 669.

SPACE AND WATER HEATING

TYPE OF SYSTEM:

Gas fired low temperature hot water heating: Locate radiators in positions to be agreed with the Employer but generally positioned below windows.

Obtain approval of all pipeline routes, access panels, etc. before commencing work.

BASIC DESIGN TEMPERATURES: Design the systems so that they comply with BS 5449, 1990 to achieve the following temperatures assuming the stated ventilation rates and a base external air temperature of no higher than - 1°C.

<u>Room</u>	<u>Temp.</u> (°C)	<u>Air changes/hr</u>
Living Room	21	1.5
Dining Room	21	1.5
Kitchen	18	2.0
Hall and Landing	18	1.5
Bedrooms	18	1.5
Bathroom	22	2.0
WC	18	2.0

The above standards apply to all houses. In flats design the system to achieve 22°C in the bathroom and 21°C elsewhere.

WATER TEMPERATURE AND VELOCITY: Design the system to operate within the following maxima:

- Boiler flow temperature: 82°C.
- Velocity: no higher than 1.5 m/sec.

SYSTEM CAPACITY:

- Output of heating surface area in any space to be near to, but not less than, the design heat loss for that space, making appropriate additional allowances for anticipated pattern of use, thermal capacity of the construction and any special exposure conditions.
- Boiler output to be not less than the total calculated heat loss, including emission from the system pipelines.
- Boiler output must, at the same time, be capable of meeting the hot water supply requirements.

SYSTEM CONTROL:

- Provide fully automatic and independent temperature and time control of the system. Ensure that all controls are compatible with each other and with the central heating boiler and are in compliance with the Building Regulations particularly in respect to the number of heating circuits, timers and thermostats within each property.

Controls are to include:

Time controller with separate electronic control over space heating and water heating, with manual override and one hour boost facility.

Independent thermostatic control of heating and hot water circuits using room thermostats in main living rooms and thermostatic radiator valves to all radiators except those in main living rooms.

- Gravity circulation must not occur in the heating circuit. Design the system accordingly or fit an antigravity valve.
- Bypass and pump overrun to be fitted if recommended by the boiler manufacturer.

INSTALLATION GENERALLY:

- Install and balance the system so that it complies with the water supply byelaws/regulations, and is safe, efficient, free from leaks, excessive noise and vibration.
- All installation work to be carried out by qualified operatives.
- Electrical work in connection with the installation must be in accordance with BS 7671 (The IEE Wiring Regulations).
- Comply with restrictions on the cutting of holes, chases, notches, etc. specified in section P31.
- In locations where moisture is present or may occur, use corrosion resistant fittings/fixings and avoid contact between dissimilar metals by use of suitable washers, etc.
- All equipment, pipework, components, valves, etc. to be fully accessible for maintenance, repair or replacement.
- Installation to be fitted with vents at high points and draining taps at low points to facilitate purging and draining.

TYPE OF BOILER:

Gas fired, to be room sealed, fan-flued non condensing conventional boiler from Worcester Bosch or equal approved.

- Fuel: When gas is available, boiler to be gas fired meeting the essential requirements of the Gas Appliance Directive and Boiler Efficiency Directive and British Gas Service Listed. When gas supply is unavailable, boiler to be oil fired. Boiler to have full sequence automatic ignition. Install to BS 6798, 1987. Flue: Balanced flue or fan assisted balanced flue.

LOCATION AND PROTECTION OF FLUE TERMINALS

- Comply with technical requirements of British Gas. Provide robust galvanised or stainless steel guard wherever terminal is within 2 metres of any accessible level.

CIRCULATING PUMPS:

- To BS 1394:Part 2, and BS EN 60335-2-51.
- Adjustable to give the required temperature differential between flow and return and with a facility for venting.

RADIATORS:

- To BS EN 442 with top and bottom tappings.
- Material: Steel
- Finish: Stoved primer or self finished.

MANUAL RADIATOR VALVES

- Copper alloy to BS 2767.
- Fit handwheel on flow side of radiator and lock shield valve on return side.

THERMOSTATIC RADIATOR VALVES:

- To BS EN 215-1 and capable of providing isolation.
Features: Locking and limiting conical domestic type.
- Fit to top tapping of radiator.

LOCKSHIELD VALVES:

- Valves kitemarked to BS 2767 and/or BS 5154 with non-rising stems and fully replaceable 'O' ring seals; valve seals in the open position to enable gland replacement without draining down; valve seals in the closed position to facilitate radiator removal.

VALVES GENERALLY:

- Types approved for the purpose by the local water supply undertaker and of the appropriate pressure/temperature ratings.
- Provide in convenient locations for isolation and regulation of all equipment, heat emitters and subcircuits.
- Fit with handwheels where appropriate for isolation by the building user.

MOTORISED VALVES:

- To BS 1415 part 1/part 2, Kitemark certified.

POLYBUTYLENE PIPELINES: may be used.

- Pipes and fittings: To BS 7291: Parts 1 and 2.
Kitemark certified to Class S.
- Supports: Screw clips where exposed to view, nail clips were concealed.
- All bends to be cold formed.
- Use purpose designed fittings and accessories for all joints, do not improvise.
- Make connections to equipment with Demountable fittings for compression fittings to BS 864: Part 2, Kitemark certified.
- Cut pipes square using cutter recommended by the manufacturer. Do not use hacksaws. Remove burrs and make neat, clean, fully sealed joints.
- Do not overtighten compression fittings.

Testing:

- Give at least three days notice to CA before testing.
- Ensure that all components and equipment are disconnected prior to testing.
- Completely fill with water and remove all air before testing.
- Apply 12 bar (174psi) water pressure and tug sharply on all pipes where they enter a joint.
- Leave under pressure for 15 minutes and check for leaks.
- If leaks are evident, repair and repeat test.

COPPER PIPELINES: may be used.

- Tube: To BS EN 1057 soft coil temper R220, or half hard temper R250, Kitemark certified.
- Joint fittings: To BS EN 1254, Kitemark certified. Capillary fittings to be lead-free.
- Supports: Plastics spacers.
- Form changes of direction with radius fittings or formed bends.
- Use purpose designed adaptors for connecting dissimilar materials: do not improvise.
- Protect background and plastic pipes and fittings from heat damage when forming soldered joints. Clean off all flux residue. Do not use 'self cleaning' fluxes.

FIXING PIPELINES:

- Runs to be straight and parallel or perpendicular to walls, floors, ceilings, etc. as appropriate. Obtain approval of routes before commencing work.
- Where reasonably possible, conceal pipe runs within floor, ceiling or roof voids.
- Run hot pipes above cold where routed together horizontally.
- Do not run pipes through electrical enclosures or above switch gear, distribution boards or the like.
- Fix at adequate centres with minimum of bends and offsets.
- Allow for thermal movement and isolate from structure where necessary to prevent noise or abrasion caused by movement. Pipes passing through walls to be sleeved as specified in section P31.
- Prevent ingress of dirt during installation.
- Completed pipelines to be of consistent bore, clean and free from external scratching, toolmarks, distortion, cracks and other defects.

INSULATION TO PIPELINES:

- Fit to all pipelines within 1m of the central hot water storage vessel and in unheated spaces.
- Material: Preformed flexible closed cell or mineral fibre preformed split tube with thermal conductivity not exceeding 0.045 W/mK and thickness equal to outside diameter of pipe up to a maximum of 40 mm.
- Fit insulation after completion of testing ensuring continuity over fittings and at supports, leaving no gaps and with the split on 'blind' side of pipeline.

WARNING PIPE:

- Material: UPVC or ABS to BS 5255, with solvent welded joints, outside diameter to be greater than that of the inlet pipe, but not less than 22 mm.
- Difference between normal water level and overflow level to be not less than bore of warning pipe.
- Fall to be not less than 1 in 10 with supports to prevent sagging, with turned down end, discharging in an approved prominent position.
- Turn down end within the cistern, terminating 50 mm below normal water level.
- Fit with insulation where the pipe is in an uninsulated space.

VENT PIPE to be not less than 20 mm diameter with no restrictions or valves and to discharge over feed and expansion cistern.

CORROSION INHIBITOR: Prepare system and apply an approved corrosion inhibitor in accordance with BS 7593:1992.

NO_x EMISSIONS:

All boilers for the primary space heating and hot water system to be a "Class 5" type to BS EN 297:1994 with a dry NO_x level of <70 mg/kWh to achieve credits under section POL 2 of the Code for Sustainable Homes. Manufacturer's literature to be provided to the Code Assessor confirming the dry NO_x levels and/or boiler class

GAS METER CUPBOARDS:

All gas meter cupboards to be located on front elevation of property or to the side but not within enclosed rear secure garden area to comply with Secured By Design requirements.

INSULANTS:

Confirmation of the type of insulation used for the hot water cylinder, cold water storage tanks and pipe insulation to be provided to the Code Assessor to assess the Global Warming Potential (GWP) of the insulants for Section POL1 of the Code for Sustainable Homes.

All insulation to have a GWP of less than 5.

SOLAR PANELS:

Solar water heating system to comply with the provisions of BS EN 12976-1:2006 4m² of flat plate collectors to be installed to pitched roof of Southerly facing side of dwellings. The installation is to comprise the Velux un-vented system and shall be installed fully in accordance with the manufacturer's written instructions.

Install to the roof of each dwelling 2 No U12 Panel Type solar panel flat plate collector. Include for the appropriate flashing kit for the panel to suit a slate roof.

All pipework is to be pre-insulated stainless steel as recommended by the Manufacturer. Insulation used must have a ozone depletion of zero and a global warming potential (GWP) of less than 5. Provide a statement to this effect upon request.

Include for all Velux control equipment and the wiring thereto.

Connect to the stainless steel hot water cylinder located within the airing cupboard. Use stainless steel fittings throughout.

The pump station equipment is to be installed within the airing cupboard. A fused spur will be provided by others for a power supply to power the system.

Fill the system with Glycol providing -30°C freeze protection.

Commission and test the installation upon completion.

Complete the MCS certificate for each dwelling to enable funding through the RHI scheme.

LOAD COMPENSATOR:

A load compensator must be installed to the heating system to adjust the temperature of the water circulating through the heating system according to the temperature measured inside the building to assist with achieving the percentage improvement of Dwelling Emission Rate over the Target Emission rate for the SAP ratings.

TESTING AND BALANCING:

- Give at least 3 days notice to CA before testing.
- Thoroughly flush out all parts of the system with cold and hot water from all drawn points without contaminating circulating pump. Remove pump if necessary. A suitable chemical cleanser should be used to cleanse the system where recommended by the system's components manufacturers.
- Completely fill system, remove all air and check for leaks.
- Run system to maximum operating temperature and check for leaks. Allow system to cool, leave in cold condition for at least 3 hours and check for leaks. Carry out hydraulic pressure test to twice the working pressure on all inaccessible or buried pipelines. If leaks are evident, repair and repeat test.
- When boiler is operating check and adjust operation of all equipment, controls and safety devices. Balance system to achieve satisfactory temperature at each heat emitter and in the hot water system.