# BROXTOWE BOROUGH COUNCIL

## 32 HILLFIELD ROAD, STAPLEFORD

## PROPOSED DISABLED ADAPTATION

Broxtowe Borough COUNCIL

## PRICED SCHEDULE OF WORKS

**November 2018**

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## PROPOSED DISABLED ADAPTATIONS

**ADAPTATION AND EXTENSION**

**1:00 DEMOLITION and ALTERATION:**

1:01 GENERAL

All work is to be carried out in accordance with all relevant building regulations, planning approval and building control instructions and to the satisfaction of the Contracts Administrator. Please note Building Regulations will apply for this development (to be obtained by the Council). If, in the opinion of the contractor, any detail or part of the specification does not conform to current Building Regulations, they should contact the Contract Administrator before submitting a tender. All work should be based upon drawing Nos. CW19:003:001 – 005

1:02 SITE PREPARATION

The Contractor will need to allow for all site preparation to facilitate the works; including but not limited to:
Removal of all debris arising from demolition in a timely manner.
Retaining safe access to the house and parking for the tenant and their family throughout the works.
Protection and security of the site.
Protection of existing structures and landscaping.
Areas disturbed must be made good and left clean and tidy upon completion.
Provision of onsite welfare facilities, including WC.
Provide protection from dust and debris.
Before commencement the contractor should take photographs of the area of works, as existing and keep these on record.

1:03 DEMOLITION

1:03:01 Remove timber decking and balustrade from rear of property and dispose, as indicated on drawing CW19.003.003.

1:03:02 Lift slabs as necessary to form new concrete ramp as shown on drawing CW19.003.003

1:03:03 Drain down and remove radiator from bedroom and dispose (ExRAD01).

1:03:04 Remove internal doors ExD01/ExD02 and dispose, ready for replacement.

1:03:05 Widen doorway ExD02 to install new 926mm wide door.

1:03:06 Remove Window ExW01 and cart away from site.
**Allow to temporary prop structure.**

1:03:07 Form opening in internal masonry wall between bedroom and lounge.
**Allow to temporary prop structure as necessary.**

1:03:08 Remove external door (ExD03) from lounge to back garden
**Allow to temporary prop structure as necessary**

**Note:** The ceiling track hoist will be removed by the client before removal of the wall. The client will also arrange re-install in collaboration with the contractor

1:03:09 Remove section of external wall to bedroom as indicated.
**Allow to temporary prop structure as necessary**
**NOTE: Opening to be secured throughout works.**

1:03:10 Cart away from site all debris arising from the demolitions.

**2:00 SUBSTRUCTURE & FLOOR**:

2:01 EXISTING DRAINS

2:01:01 Protect all drains, manholes, gullies, vent pipes, rainwater pipes and fittings that are retained for use and ensure that they are kept free of debris at all times.

2:01:02 Make good any damage to existing drains arising from demolition work and leave clean and in working order on completion.

2:02 FOUNDATIONS

2:02:01 Excavate and prepare ground for strip foundations, provide CA with specialist design and calculations prior to commencement. Actual size and depth to be agreed with the Building Control officer. Allow for excavation to a depth of 700mm, and a width of 600mm.

2:02:02 Prepare level base and sand blind ready to cast C35 reinforced concrete strip foundation. Allow for chasing out existing foundations and incorporating starter bars, tying new foundation to existing as required. Allow for 150x600mm (dxw) reinforced concrete strip foundation.

2:02:03 Remove all organic materials to full extent of extension, excavate to reduced levels and prepare ready for ground floor. Apply weed killer to full extent of excavations.

2:02:04 Brickwork below ground level to be Class A BLUE engineering bricks in 1:3 cement: sand mortar.

2:02:05 Blockwork below dpc level to be underground quality blocks in 1:3 cement:sand mortar as recommended by the manufacturer.

2:02:06 Cavity below ground level to be filled with weak mix concrete sloped to the outside.

2:03 GROUND FLOOR

2:03:01 Lay a min. 200mm graded, well compacted hardcore to extent of floor, as indicated on drawing CW18.006.003/005. Hardcore to receive 25mm sand blinding.

2:03:02 Cast 100 mm reinforced concrete slab to full extent of excavations, concrete to be C35 grade tamped and vibrated.

2:03:03 Lay 1200g DPM above concrete slab and run up external wall to lap into and be jointed continuously

with the polymer DPC within the external walls.

2:03:04 Lay 100 mm Celotex FR5000 (or similar approved) rigid floor insulation slab to full extent of excavations.

Allow for min 25mm thick perimeter edge insulation cut and placed to full depth of screed as 'edge-of-screed' insulation.

2:03:05 Lay a 500g polythene separating/vapour control layer over the insulation to prevent risk of condensation.

2:03:06 Lay a 65 mm screed, with D49 fabric mesh reinforcement as necessary.

2:03:07 Screed finish to extension to be trowelled smooth
Floor finish to be level with screed in existing house.

**3:00 SUPERSTRUCTURE:**

3:01 BEAMS:

3:01:01 Supply and install beam to opening formed in external wall, according to engineer's details provided in appendix 3 to option. Allow to provide 10mm thick plate welded locally to receive hoist – see engineer's details – Contractor to confirm location of existing hoist with client on site prior to ordering.

3:02 EXTERNAL WALL CONSTRUCTION:

3:02:01 OUTER SKIN:

- 102mm facing brickwork to be Forterra Rustic Antique London Brick 73mm (to match existing), laid in approved 1:3 cement: sand mortar in accordance with manufacturer's instructions.
- Laid with flush joints in approved mortar to manufacturer's instructions, including all necessary expansion joints where appropriate.

3:02:02 INSULATION:
97mm CELOTEX CF5000 insulation batts (or equal approved to provide a u-value ≤0.20 W/($m^2$K) ) in 100mm cavity, held in position with manufacturer approved stainless steel wall ties.

3:02:03 INNER SKIN:
100mm Thermalite Shield close textured load bearing lightweight block work laid with recessed joints in approved mortar according to manufacturer's guidelines, including all necessary joints where appropriate.

3:02:05 Allow for Ancon Staifix universal wall starter system or equal approved, fixed to existing external wall as necessary. Mastic sealant to joint.

3:02:06 WALL TIES:
First run of wall ties to be fixed at 600mm spacing horizontally, and then at max 900 centres, and maximum 450mm centres vertically (300mm within 225mm of all jambs). Wall ties to slope down to outer leaf to prevent water ingress.

3:02:07 LINTELS

- New window and back door opening to receive Catnic CG90/100 lintel, length to suit
  Lintels must have at least 150mm bearing on each side.

3:03 ROOF

The roof structure is to be formed from the existing concrete balcony. Details are provided on drawing CW19.003.005

3:03:01 Supply and fix 120mm Celotex XR4000 to underside of concrete slab, and install vapour control barrier as indicated.

3:04. CEILING

3:03:01 Underside of insulation to lined with 2 layers of 15mm Gyproc Wallboard using approved fixings. Include for continuation to box around beam.

3:05 INTERNAL WALLS

3:05:01 Construct timber stud partition to infill redundant back door opening.

Construction to be 63x38 timber studs at maximum 600mm centres, with noggins as necessary.

Allow to fix 2no. layers 12.5mm Gyproc Wallboard to each side of studs, with 25mm Acoustic partition insulation between studs.

**4:00 WINDOWS AND DOORS:**

4:01 WINDOWS

Allow for fitting of 1 no. PVCU windows in accordance with the attached specification – see Appendix 1 attached – PVCU windows. Windows configuration to be as indicated on drawing CW19.006.004.

W:01 1190 x 1150(w x h)

The windows to be complete with insulated DACATIE ref: TF1000 (or equal approved) cavity closer/plastic vertical dpc to sides new window opening.

4:02 DOORS

4:02:01 EXTERNAL DOOR Ext D01

Supply and fit White UPVC door, opening out. Door to have level threshold and to provide a minimum 900mm clear opening width.

- Door must comply with the relevant British Standard, secured by design principles and PAS023 and 024 integrity test. Parts E, L and M Building Regulations must be achieved. All units installed must be certified that the specification and installation has been achieved.
- Glazing systems will be laminated and double glazed in plain glass. The units shall be capable of quick, easy replacement via fixed internal beads. Glazing shall meet the requirement of BS6262. All external-glazing beads will be bonded to the surface of the door unless otherwise agreed.
- Threshold sills will not exceed 15mm complying with Part M of the building regulations. The unit must provide an efficient weather seal and thermal breaks and will have chamfered or pencil rounded edges. Care must be taken to meet the requirements of the Disabled Discrimination Act (DDA) for disabled residents.
- Door handles to meet part m of the building regulations.
- Mastic sealing externally to edges of brickwork will be in brown mastic sealant. Internal joints will be in white.
- The contractor shall include for supplying and installing white PVCU cover strips fixed to all internal reveals using silicone adhesive.
- Door to be supplied with at least 3 keys.

The door is to be complete with insulated DACATIE ref: TF1000 (or equal approved) cavity closer/plastic vertical dpc

to sides of opening.

4:02:02 INTERNAL DOORS

DOOR D:01

Replace Kitchen door - Supply and fit Howdens Flush Plywood Lipped 44mm 30 minute fire door, or similar approved. Adjust door frame, linings and architrave and add intumescent strip to provide ½ hour fire rating. Allow for Size 762 x 1981. (to be confirmed on site)
Ironmongery:

- 1½ pairs 98 mm support hinges
- Union lever handle set – 1000RRS18SS
- 1 no. Union heavy duty tubular latch HD26

DOOR D:02

Provide new sw door frame, lining and architrave to door opening.
Door to be Howdens Burford Four Panel moulded glazed door or similar approved.
Allow for Size 926 x 2040.

- Include for 1½ pairs 98 mm support hinges,
- 1 no. Union lever handle set – 1000RRS18SS
- 1 no. Union heavy duty tubular latch HD26

DOOR D:03

Provide new sw door frame, lining and architrave to door opening.
Door to be Howdens Plywood Lipped Flush Internal door or similar approved.
Allow for Size 926 x 2040.

- Include for 1½ pairs 98 mm support hinges,
- 1 no. Union lever handle set – 1000RRS18SS
- 1 no. Union heavy duty tubular latch HD26

## 6:00 PLASTERER

6:01 GENERAL

6:01:01 New plasterboard walls and ceilings to be tape jointed prior to receiving a 2 mm plastered skim finish using Gypsum Thistle Multi-Finish to manufacturer's recommendations.

6:01:02 All exposed brick or blockwork and plaster patching (including new walls and existing walls stripped of plaster) to receive a plastered finish comprising of not less than 2mm thick British Gypsum Thistle MULTI-FINISH plaster on not less than 11mm thick Thistle Bonding coat plaster undercoat in accordance with BS 13914-2:2005, BS 8481:2006 and manufacturer's recommendations.

## 7:00 HEATING AND PLUMBING INSTALLATION

7:01 EXISTING INSTALLATION

The existing plumbing installations must be tested prior to any alterations in the presence of the Clients' representative. Any defects which affect the operation of the system, which become apparent, to be rectified by the contractor at the Clients expense or the Client may at his discretion employ others to carry out the work. On completion of work to the existing system it shall be fully operational to the satisfaction of the Clients' representative.

7:02 GENERAL

The whole of the work shall be carried out by experienced plumbers under the direction of a registered Master Plumber.

7:03 HOT AND COLD WATER SYSTEM

Modify existing hot and cold water system as necessary to supply facilities to the new bathroom. Allow for all pipework and installation together with insulation of all pipework within unheated roof voids. No dead legs are to left in the pipework.

7:04 SANITARY INSTALLATION

- The whole of the sanitary installation and cold water and hot water installation shall be executed in accordance with the Regulations and Bye-Laws of the Water Authority, and all pipes shall be of the weights and gauges required by them.

- All valves, including any valves supplied by a Nominated Supplier, shall be submitted to, tested approved and stamped by such Authority before being used in the work.

- Immediately upon completion of the installations, the Authority shall be notified and all requisite tests carried out, including tests to ensure that the water is uncontaminated and suitable for drinking.

- All plastic overflow pipes to have plastic 'T' piece solvent welded onto external end as it passes through fascia or walling to prevent wind ingress and hence freezing.

7:05 CENTRAL HEATING

- It is essential that heating and hot water to the dwelling is maintained at all times. The tenant must be notified when it is proposed to carry out the work.

- Allow for removal of all unused materials and rubbish appertaining to the installation.

- Allow for new distribution pipework, drain cocks, vents, pipework, etc. required for extending existing system, together with the replacement of any ports and/or equipment due to the increase in the existing system.

- Allow for all builders' work commissioning and testing in connection with the below installation.

8:05:01 Install 1no. new Stelrad elite K2 600x600 radiator in bedroom (Rad01), as indicated on drawing CW19.003.002

Allow for Danfoss (Randall) Thermostatic Radiator valves to new radiator.

7:06 <u>GAS SAFETY REGULATIONS</u>

- The whole of this contract must be carried out in accordance with Statutory Instrument 1998 No. 2451 Health and Safety The Gas Safety (Installations and Use) Regulations 1998 and any subsequent amendments.

- This will include certifying that the appliance is checked for electrical or gas supply safety.

- A certificate will be completed on the completion of any servicing or pipe work alterations and submitted to the employer on a daily basis. In addition any work carried out during a breakdown visit will be recorded and a copy of the report submitted to the employer at the end of each day.

- Each person employed to carry out this work will be competent to carry out such work. Broxtowe Borough Council defines competence as that detailed in the Health and Safety Commission Approved Code of Practice Standards of Training in Safe Gas Installation (ISBN 07176 06031). The criteria for qualification, training and experience of gas fitting operatives will be employed to carry out repairs and maintenance of the Council's gas appliances. Furthermore they shall have reached the Health and Safety Commission Approved Code of Practice and Standards of Training in Safe Gas Installation or Nationally Accredited Certification Scheme Assessment courses in the following elements (if relevant):

  Safety Legislation and Basic Safety
  Combustion and Control
  Flues and Ventilation
  Pressure and Flow
  Domestic Pipework Installation
  Electricity and Its Control
  Control System
  Central Heating Wet Systems

Domestic Cookers
Domestic Space Heaters
Domestic Hot Water Heaters
Fault Diagnosis, Service and Maintenance

- Evidence will be required that all operatives employed on the works are qualified prior to the contract commencing.
  Note: Any work carried out during the out of hours service will be carried out by staff who reach the qualification criteria described above.

a) Appliances and Services

All appliances and services must be installed in strict accordance with the manufacturer's instructions and Gas Safety Regulations. On completion of the final checks to ensure the system is fully commissioned the contractor will submit to the employer a completion certificate.

b) Registration of Gas Safe.

- All contractors who submit tenders must be or use a subcontractor who is a member of Gas Safe, the Council for registered gas installers and be approved for the type of work relating and described in this document.
- As part of the tender the contractor will be required to submit details of his membership, and/or the details of any sub contractors who are to be employed.

c) Attendance by other trades

- Should any other trades be employed on the works the contractor must make them aware of the Gas Safety (Installations and Use) Regulations 1998 and any subsequent amendments.

- On completion of works by other trades appliances must not be used, until this installation has been checked for correct operation and installation together with safety checks which must be carried out by a person qualified as described in the Gas Safety Regulations.

In completing the proposed works the following statutory documents must be complied with ( This is not an exhaustive list):-

Health & safety At Work Etc Act 1974
Gas Act 1986
Latest Edition of Building Regulations
Gas Safety (Installation and Use) Regulations 1998

## 8.00 ELECTRICAL INSTALLATION

Please note, the contractor is not required to rewire the whole dwelling. This specification is given to the quality and type of equipment expected to the new extension.

8:01 GENERALLY

Regulations

The work must be carried out by a member of the National Inspection Council for Electrical Installation Contracting and shall comply with the latest edition of the Regulations for the Electrical Equipment of Buildings issued by the Institution of Electrical Engineers including all current amendments, the 17th Edition of the IEE Wiring Regulations, Building Regulations, Regulations of the local electricity supply authority, British Standards Code of Practice, Health and Safety at Work Act, Electrical Equipment (Safety) Regulations, Plug and Socket (Safety) Regulations and the Gas Safety (Installation and Use) Regulations 1998.

8:02 Testing

- The contractor will supply all notices upon the supply Authority for testing, pay all fees in connection therein and any additional fees required for re-testing.
- The Contract Administrator shall have the authority to require any material or work to be tested at the contractor's expense, in order to prove both soundness and good practice.
- The installation shall be tested for insulation and continuity in accordance with the I.E.E. Regulations as the work proceeds and before any connection is made to the switch or consumer unit terminals.
- In the event of either materials or work, with or without being tested, be considered defective, such materials or work at the contractor's own expense, shall be amended immediately in a proper and satisfactory manner, upon notification by the Contract Administrator.

8:03 Earthing and Bonding

- The whole of the Electrical Installation and all other equipment and apparatus connected thereto, shall be earthed in accordance with the I.E.E. Regulations and the Supply Authority. P.M.E. earthing shall be used if the local supply authority will make it available. All installations must be fitted with R.C.D. Protection.
- The contractor shall include for bonding all services and ascertain from the supply authority that they will supply an earthing terminal or allow earthing to their incoming

cables.

- If the Supply Authority will not accept the above methods, for earthings, the Contract Administrator must be informed forthwith.

8:04 Position of Points

- The position of switches and sockets will nominally be as follows,
  Exact locations and heights etc will be agreed with tenants prior to fixing to suit disabled tenants needs.

| | | |
|---|---|---|
| Light Switches | 1350mm | |
| Switched Socket Outlets | 900mm | |
| Spur switches | 2180mm | |
| Luminaire | 2400mm (Min) | To the underside. |
| Ceiling switch pull cords | 600-800mm | To the end of cord. |
| Shower pull switch | 1000mm | To the end of cord. |

8:05 Description of Work

Consumer unit located in cupboard by front door.

9:05:01 All wiring to run from the new consumer unit and will include provision for cutting chases, cutting holes capping and making good of plaster. Location of fittings indicated on drawing CW19.003.002

Bedroom 3 new Double sockets with outboard rockers

**9:00** **EXTERNAL WORKS**

9:01 Form concrete ramp to the back door as shown on drawing CW19.003.002/003. 1500×1200mm platform in front of back door to be laid level with internal finished floor level. Aco Threshold drain with silver aluminium finish to be fitted in front of door threshold (as shown on drawing CW19.003.002) and drained to side. Surface of both platform and ramps to be tamped to provide non-slip surface.
Concrete to be laid at a min depth of 150 mm below ground level, on bed of sand blinded hardcore min 100 mm deep. Concrete to be a C10 mix with steel reinforcement as required. Ramp to be laid at a max. gradient of 1:15. Slabbed upstand to be used to form edge with a min upstand of 100 mm.

9:02 Supply and fix polyester powder coated (white) galvanised mild steel handrail on platform and ramp (outer edge only). All to comply with the requirements of BS 8300 (latest version)

9:03 Relay slabs on compacted sand bedding adjacent to ramp as indicated on drawing CW19.003.003

**10:00** **DECORATION**

10:01 Walls & Ceilings:
Generally prepare walls and ceilings and apply one mist coat and two full coats of matt emulsion to bedroom, and make good around door new door and blocked up external door.

10:02 Timberwork & Doors:
Prepare, prime and coat timberwork with min. two coats of Brilliant white gloss paint

**32 HILLFIELD ROAD, STAPLEFORD, NOTTINGHAM**

COLLECTION

| | | |
|---|---|---|
| 1.0 | Demolition and Alterations | £ |
| 2.0 | Substructure & Ground Floor | £ |
| 3.0 | Superstructure | £ |
| 4.0 | Windows and Doors | |
| | 4.01 Windows | £ |
| | 4.02 Doors (Internal and External) | £ |
| 5.0 | Sanitary Fittings | £ |
| 6.0 | Plasterer | £ |
| 7.0 | Heating and Plumbing Installation | £ |
| 8.0 | Electrical Installation | £ |
| 9.0 | External Works | £ |
| 10.0 | Decoration | £ |

**TOTAL CARRIED FORWARD TO PRICE BREAKDOWN** _____

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# APPENDICES

## Appendix 1 – Window Specification

## Appendix 2 – Asbestos surveys

## Appendix 3 – Structural Calculations

# APPENDIX 1

# STANDARD SPECIFICATION FOR HIGH IMPACT PVCU WINDOW SYSTEMS

PLEASE NOTE: Latest editions of all regulations and standards to be adhered to, with any subsequent amendments.

**Profile and Material**

**1.1**

(All profiles shall be impact modified PVCU (polyvinyl chloride unplasticised).

The profile shall be multi-chambered with an external wall thickness of 3mm minimum. The external thickness of the frame front to back shall be no less than 70mm.

**1.2**

The material from which the profiles are made shall consist of white polyvinyl chloride. Only those additives and pigments may be used that are needed for the manufacturer of the compound and its subsequent conversion into sound, durable extrusions of good surface finish and mechanical strength, as assessed by the requirement of the trade standard for PVCU windows published jointly by the British Plastics Federation, 6 Bath Place, Rivington Street, London, EC2 3JE, and The Glass and Glazing Federation, 44 - 48 Borough High Street, London, SE1 1XB.

**1.3**

PVCU extruder shall operate under a quality management system complying with the requirements of the National Standard for Quality Assurance, BS EN ISO 9001:2000 or latest equivalent. The extrusion shall also comply with the requirements of, and be extruded in accordance with BS EN ISO 9001:2000 and QAS4834/18 1987 or latest equivalent.

**1.4**

The windows shall not contain materials which by direct contact or otherwise be detrimental to the comfort and safety of the users, or which are liable to emit abnormally toxic products. There shall be no detrimental reactions from contact between the windows and their fixings or adjoining materials - COSHH Regulations shall apply throughout.

**1.5**

The finish of the profile as extruded shall be white in colour.

**1.6**

The cross section of the profile shall conform in shape and dimensions to the manufacturers specification. Surface dimension shall deviate by no more than +/- 1.5mm.

**1.7**

The colour of the profile shall be uniform and free from foreign bodies, cracks, scratches and sink marks.

**1.8**

The profiles shall be straight so that the longitudinal axis of the profile as measured on the base surfaces shall deviate from the straight line by no more than 1mm per metre.

**1.9**

The main frame and sash profiles of each window shall be permanently marked approximately 1m intervals with an identifying mark which will enable the manufacturers name, date of manufacture and extruder to be identified without extraction of the window.

**1.10**

The profile shall show no bubbles, cracks or de lamination when subjected to ageing as defined by BPF/GGF Trade Standards.

**1.11**

The main frame and sash profile shall resist impact at low temperature and no sample, when tested, shall exhibit cracking through the entire wall thickness of the profile.

**1.12**

Profile material shall be tested in accordance with BS EN 20105-A03: 1994 for colour fastness and the maximum colour change shall not be more than 3 on the grey scale. It shall be tested in accordance with BS2782: 1976 (ISOR/182 Method A), and shall be stable for not less than 85 minutes. **The system shall be through coloured**

**1.13**

All frames shall meet the regulations of BS 6375-1:2004 for air and water tightness with a minimum wind loading of 1,500 Pascals.

**1.14**

No profile shall contain or be produced from reformed material or reworked material of any kind.

**1.15**

The system shall be resistant to chemicals and be fungal and vermin proof. Profiles must also be resistant to attack by cement mortars and other materials used in building construction and refurbishment.

**1.16**

PVCU shall be classed as self-extinguishing to prevent support or enhancement of accidental fires to class 1, i.e., most resistant as defined in BS476 Part 1.

**1.17**

**Combination Windows and Screens**

Where combination windows or screen are specified the frame shall be manufactured complete and shall incorporate panels manufactured from the colour coat HP200 range with an insulated panel to an overall thickness of 24mm. The contractor must allow for a choice of colours.

**1.18**

New PVCU window boards **shall** be incorporated except for kitchen and bathroom windows. The window boards will be a minimum thickness of 8mm, and be fitted with all end caps, trims and the like. Take care to ensure they do not protrude too far from the wall. Fit on top of existing timber boards unless otherwise agreed.

**1.19**

**Bathroom Windows**

The contractor must check and allow for an appropriate profile to allow for internal beading where ceramic tiling has been carried out on internal reveals.

**Reinforcement**

**2.1**

**Length and Fitment**

Window design calculations require that the reinforcement is continuous within the profile and that it does not move relative to the profile under load, reinforcing shall meet 1,500 pascals wind pressure loading.

**2.2**

The system suppliers reinforcement should be designed to fill the reinforcing space provided within the profile after allowance for extrusion tolerances. In order to achieve the maximum rigidity from the reinforcement, it should be fixed to the PVCU profile at a maximum distance of 100mm from either end and at the maximum of 400mm centre thereafter.

**2.3**

**Definitions**

The definitions given in BS6100 and the Codes of Practice for installation apply, together with the following.

**Design Wind Loading**

That load, determine by calculation, which the window is designed to withstand.

**Load Span**

The effective length of the member upon which the design acts.

**Loaded Area**

The expanse of the designed wind load which acts upon the member under design.

**2.4**

**Selection of Reinforcement Materials**

Reinforcement for PVCU windows are to be either cold rolled, mild steel suitably protected against corrosion, mill finish aluminium or stainless steel.

Where curved or radius profiles are mechanically jointed, aluminium reinforcement shall be incorporated. It shall be used:-

b. to hold and clamp the joint

c. to provide reinforcement and rigidity.

**Mild Steel**

Mild steel sheet hot dip zinc coated upgrade Z2G275N complying with BS EN 10143:1993. Alternatively, reinforcement shall be manufactured from mild steel of a similar grade which is subsequently given a corrosion resistant coating to equal the above. Reinforcement of this quality shall be used only in profiles or systems so designed and sealed so that no exterior moisture can come into contact with the reinforcement. All cut ends of Reinforcement must be recoated with zinc to prevent atmospheric attack.

**Note**: In practice this means that the reinforcement must be in fully welded frames, and that the reinforcement cavity is not breached on the weather side of the windows.

**Stainless Steel**

Austenitic stainless steel sheet or strip of grade 304, or ferritic stainless steel grade 403 complying with BS EN 10095:1999. Reinforcement of this quality can be used in any type of profile or system.

**Aluminium**

Extruded aluminium alloy 6063 condition TB, TE or TF or 6082 conditioned TB, TE or TF

complying with British Standards BS4174. Reinforcement to this quality can be used in

any type of profile or system.

**Use of Reinforcement Materials**

Design

All PVCU windows should be manufactured to resist the designed wind loads. Methods of calculation, these are given in CP3 Chapter V Part 2, the abbreviated version given in BS 6375-1:204 can be used when buildings are of simple rectangular shape and up to 10M high to the eaves from ground level, unless there are special conditions see notes 1 and 2 to 83, BS 6375-1:2004. The components of the window that will deflect under wind loads are transoms including door sides and rails, mullions including composites. Reinforcement shall be installed so that it does not move or rattle when the window is in use and so that it makes an immediate and consistent contribution to the stiffness of the profile during bending.
Frames, Transoms, mullions and casements exceeding 750-800mm to be fully reinforced. Reinforcements shall be fitted to receive fixings at all hinges, fasteners and stays.

**Deflection**

The calculation of deflection for mullions, transoms and sashes at the right angles to the window pane must not exceed 1/200 of the support width for the most unfavourable loading of support widths of up to 3.00M and must not exceed 1/300 of the supported widths over 3.00M. When insulating glass panes are used data supplied by the manufacturer must be taken into consideration when calculating the permissible deflection.

Horizontal members of windows which support the dead weight of the glass or infill panels will deflect under the loads. To maintain the proper functioning of the hardware, glazing gaskets and weather seals, to prevent excessive strain on sash joints, and to avoid unsightly visual distortion, deflection under dead load shall be limited to a maximum of 3mm.

## Structural Design

It must be ensured by appropriate structural measures, that the maximum variation in a position of structural elements deflection, thermal movement etc, to which the window frame is secured, is such that forces do not act upon the panes either in plans or at right angles to it.

### Anchorage at the Window Frame to the Building Structure

The type and installation of the anchorages must be established when planning the assembly. The anchorages must not in any way impair the load carrying capacity of the structural element of the surrounding structure to which they are fixed.

Because of the maximum deflection of 8mm permissible for insulation glass, pane lengths will be restricted to a maximum of 2.4M.

## Wind Loading

The system shall be so designed to suffer no permanent distortion or other damage when subject to positive and negative pressure as determined by in accordance with BS Code of Practice CHV Part 2.

## Thermal Movement

The PVCU frame work and glazing assemblies shall be constructed and installed in the prepared location with sufficient tolerance and where necessary expansion incorporated within the couplings, to provide for expansion and contraction as will be caused by the climatic conditions and temperature changes, winter to summer, day to night, without buckling, distortion of joints, ability of fit, damage to sealants or other detrimental effects over the temperature range of -20°C to +45°C (surface temperature). The design shall accommodate noiselessly, thermal movement within the combination units and the curtain wall without distortion. Details shall be prepared based upon dimensions at 20°C and take account of the ambient temperatures at the time of the assembly and installation. Details and joint positions of expansion joints to be shown on the contractor's submission drawings.

## Fabrication

**3.1**

All corners, mullions and transoms shall be heat welded and finished with a groove, the weld factor to conform to the requirements of BS 2782, method 320C. They are not to less than 0.7. The strength of the corner weld to comply with appendix N and the BPF/GGF standards. **All glazing beads to be internal**. Reinforcing shall meet 1,500 pascals wind pressure loading.

**3.2**

In all cases, it must not be possible for any opening light to become accidentally disengaged from the outer frame.

**3.3**

The seam on the outer edge of the frame shall be milled off and the seam on the inner edge be removed.

**3.4**

Under no circumstances will adhesive bonding be permitted.

**3.5**

A corner weld test shall be carried out daily during the manufacture using a calibrated machine capable of carrying out such test.

Welds should be capable of withstanding a deflection of a minimum of 4mm as defined by the BFP/GGF Trade Standards without fracturing. Testing can continue to destruction of the weld and records kept of all tests and findings. The corner when fractured shall not split more than 70% along the line of the weld.

**3.6**

All frames shall incorporate internal drainage, this shall be isolated from chambers into which reinforcement can be placed or through which frame fixings pass, and drainage shall be through the base.

**3.7**

Pressure equalization holes shall be drilled in accordance with the system extruder recommendations to ensure efficient drainage in adverse conditions.

**3.8**

**Handling and Transport**

Windows may be transported either glazed or unglazed.

All windows or prefabricated units shall be transported and stacked in a vertical position and properly anchored to prevent movement in transit, windows shall be separated from each other by adequate packing pieces during transit. All frames shall be delivered to site protected by self adhesive tape which shall be left on the frames for as long as possible before removing.

**4.0**

**Furniture and Ironmongery**

**4.1**
**Handles (to be the "Virage" Espagnolette range or similar approved)**

**Ground Floor** - All windows to have Satin Anodised Aluminium (SAA) or white plastic coated key locking handles (offset style). Except dedicated egress openings in conjunction with ground floor flats and bungalows.

**First Floor –** All windows to have SAA or white plastic coated push button handles.
Dedicated fire egress window to be identified by green push button handle (offset style).

**Second Floor** – All windows to have SAA or white plastic coated push button handles (offset style).

The locking mechanism is to be the Vector Excluder high security locking mechanism, to satisfy BS 7950 (see also item 9.1) operated by a single handle using securing corner keeps. Window casements above the height of 900mm to be fitted with a central locking bolt. All to meet BS 7479:1991, ISO 9227:1990, 500 hr neutral salt spray test and to comply with BS 7412:2002 accreditation. (BS EN 1670:1998 Class 4 corrosion resistance)

Two handles to casements exceeding 800mm on any side. Also careful consideration needs to be given to handle positions to allow easy access i.e. such as over kitchen units, and also for cleaning to BS 8213-1:2004 Code of Practice.

The locking system should operate normally at ambient air temperatures within the range of
$-20^{o}$ C to $+35^{o}$ C.

**4.2**

**Hinges**

**Ground Floor** - Stainless steel friction type hinge with integral button operated child restriction mechanism to meet BS EN 12046-1:2003. In Ground Floor Flats and Bungalows, dedicated fire egress windows will be used in accordance with the First floor recommendations.

**First Floor** - Stainless steel friction type hinge with integral button operated child restriction mechanism to meet BS EN 12046-1:2003.
Dedicated fire egress window to be provided to each habitable room and to be stainless steel friction type hinge to allow a clear unobstructed opening of at least $0.33m^2$ and being at least 450mm high and 450mm wide. The bottom of the operable area should not be more than 1100mm above finished floor level.
The above all in accordance with the Building Regulations Approved Document B or BS 5588.
N.B. In some instances it may be permissible to utilise a hinge that both provides child restriction and gives unobstructed opening in line with the above fire egress requirements.

**Second Floor** - Stainless steel friction type hinge with integral button operated child restriction mechanism to meet BS EN 12046-1:2003.

All hinges to be austenitic 304 stainless steel friction type to withstand corrosion to BS 7479:1991, ISO 9227:1990 and should be the right size to suit window size and weight.

All windows to be fitted with the “Vector excluder” anti wrenching fixing fitted to hinged cavity.

Manufacturers recommendations for hinges in respect of size and weight limitations must be strictly observed. It is the responsibility of the Fabricator to ensure the correct size of hinge is chosen for the weight of each opening casement or sash. For further information contact the manufacturer’s Customer Help Desk.

**Tenants are to be instructed on how to operate the windows including restrictors and designated fire egress window.**
Note: Some design changes may be needed if existing window designs are unsuitable to meet this requirement.

**4.3**

**Keys**
Keys should be supplied for each window where required and one key should fit all windows or all windows in one property.

**4.4**

All screws, nuts, bolts or other fastenings or fixings to be austenitic 304 stainless steel to BS EN ISO 3506-1:1998. Coatings shall either be sheradised according to B.S. 4921:1998, diacromate, zinc coated, or bright zinc plated and recommended for the use in the fabrication of PVCU windows. Pop riveting shall not be permitted.

**4.5**

Metals that are in contact with each other shall be compatible so as to prevent galvanic corrosion of electronic metals by electrolytic action.

**4.6**

Coated steel shall be resistant to corrosion such that when subjected to 95 hours of exposure in a natural salt spray test, as defined in BS 7479:1991, ISO 9227:1990, there is no corrosion exceeding one spot per 600mm$^2$ of significant surface visible to the unaided eye, and no spot shall be larger than 1.6 in diameter.

**4.7**

Where external butt hinges are used they must be of the security pin types that do not allow removal of the hinge pin from outside.

**4.8**

Top and side hung opening lights shall have 2 No. stainless steel (see previous grade type) friction stays per light sized and fixed in accordance with the system manufacturers instructions.

**4.9**

The size of the stay shall not be less half the height of the vent. The stay shall be carefully positioned to ensure good sealing and shall be fixed using non-ferrous self-tapping screws with countersunk heads.

**4.10**

Hardware with provision for adjustment shall be accessible for adjustment after the window has been installed. Hardware used to open/close the window shall have the facility to be replaced without removing the outer frame from the structure.

**4.11**

**Strength and Safety of Moving Parts**

The moving parts of the window shall have sufficient strength and robustness to withstand incidental static and dynamic loads occurring during use, without any permanent deflection or breakage.

**4.12**

All openable windows to have night vent facility.

**4.13**

All furniture and ironmongery should be clearly marked so as to identify manufacturer.

**4.14**

All furniture and ironmongery can be supplied by:-

Securistyle Limited
Kingsmead Industrial Estate
Princess Elizabeth Way
Cheltenham
Glos. GL51 7RE
Tel: (01242) 221200
Fax: (01242) 234034

Or equally approved.

**5.0**

**Glazing**

All glazing shall be at the required thickness to meet wind load safety requirements of BS 6262-4:1994 Code of Practice for Glazing of Buildings. All glass shall comply with BS 952-1:1995. All windows and doors shall be glazed using dry glazing within **internal snap in PVCU beads** with black internal EPDM gasket. Double glazed units are to be a minimum of 26mm over all manufactured and approved under BS kite mark scheme, to BS 5713:1979, with Pilkington K glass to the inner leaf.

The spacer bar is to be marked with the manufacturers name and BS 5713:1979. Glazing shall be in accordance with BS 6262-4:1994 and BS8000 Part 7 1990, Workmanship on Building Sites, Code of Practice for Glazing. Safety glass shall conform to BS 6262-4:1994 where specified or required by the relevant British Standard. Safety glass shall be 6.4mm laminated/toughened. All toughened or laminated glass should be marked as such. Windows to bathroom, W C's, pantry walls and (landings where appropriate) shall be glazed in obscure glass (Cotswold) or other as identified. All glazing to windows, doors and screens to comply with the Building Regulations **Approved Document N – "Glazing – Safety in relation to impact, opening and cleaning."**

**5.1**

For the gaskets to be extruded from non-migratory EPDM based material which has compounded to comply with BS4255 Part 12 Class A 1986. The gaskets are to be

supplied via the systems extruder and may be subjected to random testing. Glazing gaskets to be co-extruded.

**5.2**

No opening light (or glass within a fixed light) shall be openable or removable from the outside when it is fastened in the closed position.

**5.3**

**Fixed panes or opening sashes shall have glazing beads fitted internally.**

**5.4**

Weather seals shall consist of a double sealing system. Seals shall be a continuous length; all joints must be at the top.

**5.5**

Weather seals shall consist of a double sealing system. Seals shall be a continuous length, all joints must be at the top of the opening centrally located and glued together. The glue must be approved by the PVCU extrusion manufacturer.

**5.6**

Composite panels must be beaded in, as specified for glass. Where aggregate panels are required they will require fixing so that an adequate seal is made with a gasket.

**5.7**

The windows shall be constructed in such a manner that the glazing or de-glazing can take place internally without removal of the sash or frame.

**6.0**

**Couplings**

**6.1**

Projecting sills are to be incorporated wherever practical

**6.2**

Where couplings and extrusion profiles, i.e. sills or flanges are used, these shall be through fixed into the outer frame ensuring that all the fixing has penetrated into the reinforcement. All visible fittings must suit the profile colour.

**6.3**

Projecting sub-sills shall be manufactured by the window extrusion manufacturer so as to attain a perfect colour and technical performance match. The sills and main profiles shall be manufactured from CPE modified PVCU (to minimise the risk of impact damage by ladders etc). Sills should be of multi-chambered design.

**6.4**

Expansion shall be allowed for where necessary and couplings shall be sealed with silicone to produce a weather seal.

**6.5**

**Sills, etc. are to incorporate end caps where necessary and fixed/sealed securely.**

**7.0**

**Ventilation**

**7.1**

All window frames shall have adjustable trickle ventilators providing not less than 8,000mm$^2$ of ventilation without loss of security. It this is not possible, the area must be maximised. The contractor must check and ensure that the ventilators have enough clearance from the window head reveal to allow satisfactory operation. The preferred method of installation is through the top of opening sashes. Kitchen and Bathroom window to be permanently vented.

**7.2**

**The Contractor must ensure that any permanent ventilation is not removed for gas appliances.**

Where an existing circular fixed vent is installed allow for a "Titon" permanent ventilator

(or similar approved) conforming with the current Gas Regulations.

**8.0**

**Security**

**8.1**

The latest security standard PAS 11 now BS 7950:1997 (ISO 9000) as produced by the GGF and BSI November 1997 shall apply, window contractors are required to supply windows that will pass the specification. Evidence of compliance will be required. Windows will be tested to the standard and paid for by the employer, but if a window fails, the testing shall be paid for by the contractor. **Locking handles are required to all ground floor windows Except egress openings (push button above ground floor) and all glazing beads are to be internal. Window contractors shall furnish proof that the security standard can be met by their window suppliers.**

On completion the frame shall be washed down using general household detergents to remove building residue. The use of solvent based cleaners shall be kept to an absolute minimum and specific advice on types and approved brands may be obtained by the systems manufacturers.

**9.0**
**Standard**

All windows are to be designed, manufactured, supplied and installed in accordance with

the latest edition of BS 8213-1:2004, Windows, doors and roof lights.

END OF DOCUMENT