DESIGN & ACCESS STATEMENT: PART 10

FOR:
20 VICAR'S ROAD
LONDON
NW5 4NL

FEBRUARY 2020

PART TEN CONTENTS

PART TEN

This DESIGN & ACCESS STATEMENT has been prepared by Emily Kennedy & Peter Morris, February 2020

TO ACCOMPANY THIS STATEMENT, PLEASE ALSO REFER TO THESE DOCUMENTS, PROVIDED SEPARATELY:

APPENDIX ONE:
DAYLIGHT & SUNLIGHT ASSESSMENT (Prepared by Jonathan Ray at Right of Light Consulting)

APPENDIX TWO:
CONSTRUCTION & MATERIALS STATEMENT (Prepared by Emily Kennedy & Peter Morris)

APPENDIX THREE:
ENERGY STATEMENT (Prepared by Tygue Doyle at Environmental Engineering Partnership)

APPENDIX FOUR:
AIR QUALITY STATEMENT (Prepared by Emily Kennedy & Peter Morris)

APPENDIX FIVE:
ACOUSTIC REPORT (Prepared by Nigel Burton at Temple Group)

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HERITAGE STATEMENT (Prepared by Nicola Furlonger)

APPENDIX SEVEN:
ARCHITECTURAL DRAWINGS & MAP (Prepared by Peter Morris)

APPENDIX EIGHT:
REPORT OF LONDON BOROUGH OF CAMDEN DESIGN REVIEW PANEL: CHAIR'S REVIEW MEETING, APRIL 2019 (Prepared by Deborah Denner at Frame Projects)

10.0 ACCESSIBILITY

Policy H6 of the Camden Local Plan seeks to secure high quality accessible homes in all housing developments, through: the inclusion of functional, adaptable and accessible spaces; compliance with nationally described space standards; and requiring 90% of new build, self-contained homes to meet the criteria of Building Regulation M4(2). Policy C6 expects all buildings to meet the highest practicable standards of accessible and inclusive design so they can be used safely, easily and with dignity by all.

The following section explains how the proposals meet the principles of lifetime homes and how high standards of accessibility and inclusivity have been achieved in The Cloud House. This includes the measures used to achieve the requirements of the relevant standards and guidance under Building Regulations Part M4(2), the Nationally Described Space Standards (2015) and the Mayor's Housing Supplementation Planning Guidance (2016), as well as the policy and guidance of Camden Council (Camden Local Plan 2017 and Camden Interim Housing Planning Guidance 2019).

1) SPACE STANDARDS

The development complies with all required planning standards regarding internal and external space and storage. For details, refer to planning drawings, including Detailed Ground Floor Plan (reference 201-300 C), Detailed First Floor Plan (reference 201-302 C) and Detailed Second Floor Plan (reference 201-303 C).

MINIMUM STANDARD SIZES (Nationally Described Space Standard): The minimum standard size for a 4-bedroom 8-person house on 3 floors is 130 square metres, with 3 square metres of built-in storage – No 20 is 167 square metres GIA, including many more metres of built-in storage than the minimum standard. The minimum standard size for a 3-bedroom 5-person house on 3 floors is 99 square metres, plus 2.5 square metres of built-in storage – 20A is 131 square metres GIA, including many more metres of built-in storage than the minimum standard.

BEDROOMS: In line with the Nationally Described Space Standards, each main double bedroom is at least 2.75 metres wide, with a floor area of at least 11.5 square metres, and a clear access zone of a minimum 750mm wide to both sides and the foot of the bed. Additional double bedrooms are at least 2.55 metres wide, with a floor area of at least 11.5 square metres, and a clear access zone of a minimum 750mm wide to both sides and the foot of the bed. Each single bedroom is at least 2.15 metres wide, with a floor area of at least 7.5 square metres, and a clear access zone of a minimum 750mm wide to one side of the bed.

10.0 ACCESSIBILITY

1) SPACE STANDARDS (CONTINUED)

CEILING HEIGHTS: No areas of the development have headroom of less than 2.5 metres, in excess of the National Described Space Standard requirement – and some areas have a ceiling height of up to 4 metres (see 201-320B_DETAIL SECTION A-A drawing).

STAIRS: All stairways are wide enough to fit a stair lift (850mm), all principal doors are wider than average (850mm) and all corridors are wide enough (900mm) to turn a wheelchair.

OUTSIDE SPACE: The minimum standard for outside space, as set out in the Mayor of London's Housing Supplementary Planning Guidance (2016) and relevant to an 8-person house is 11 square metres – at No 20, there will be 49 square metres (including plunge pool), well in excess of the minimum. The minimum standard for outside space for a 5-person house is 8 square metres – at 20A, there will be 41 square metres of outside space, again well in excess of the minimum. All external spaces are designed to be attractive, accessible and usable for a variety of purposes. Terrace areas will substantially exceed the minimum depth and width standard of 1.5m.

EXTERNAL STORAGE FOR RECYCLABLES & BICYCLES: Bespoke hedge-topped secure storage for bicycles and bins has been incorporated into the design in the front gardens of the two houses. The storage will be sheltered and well-lit.

LEVEL ACCESS TO OUTSIDE SPACE: All access to the front and back gardens on the ground floor is level, as is access to the roof terrace on the second floor at No 20. Access to the roof terrace at No 20 and the roof terrace at No 20A is to be via a staircase in each case, with an electronically operated opening boxlight with sliding glazed sections at terrace level – the rooflights will open at the push of a button, making them easy to access for the elderly. In each house, the staircase up to the roof terrace is wide enough (900mm) to fit a stair lift if necessary in the future.

ACTIVE FRONTAGES: The layout of the scheme maximises active frontages on the south-facing elevation, which is the street side. Front gardens will have a balance of openness and protection, appropriate for their outlook and orientation.

2) ACCESSIBLE & ADAPTABLE DWELLINGS

The development meets the principles of 'lifetime homes' as both houses comply with accessibility legislation and would be easily adaptable, should the needs of their occupants, or future occupants, change over time. This report refers to Building Regulations Part M4 Access to and use of buildings, M4 (2) Category 2: Accessible and adaptable dwellings. Please see details below.

10.0 ACCESSIBILITY

3) APPROACH ROUTES

2.6. The approach route is safe and convenient.
2.7. The approach route is a step-free route, with a level threshold entrance.
2.9b. Private parts have a clear width of 900mm.
2.9f. Every gate (or gateway) along the approach route have both a minimum clear opening of 850mm and a 300mm nib to the leading edge of the gate.
2.10. There are no ramps on the approach route.
2.11. There are no steps on the approach route.
2.12. From the public footpath and the approach to the building and entrance, all is level and of a suitable ground surface.

DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN / 201_301A GROUND FLOOR FRONT GARDEN DETAIL).

4) PRIVATE ENTRANCES AND SPACES WITHIN THE DWELLING

Principal private entrance and alternative entrance

2.20 The principal private entrance, or the alternative private entrance where step-free access cannot be achieved to the principal private entrance, should comply with all of the following:

A) There is a level external landing with a minimum width and depth of 1200mm.
B) The landing is covered for a minimum width of 900mm and a minimum depth of 600mm.
C) Lighting is provided which uses fully diffused luminaires activated automatically by a dusk to dawn timer or by detecting motion.
D) The door has a minimum clear opening width of 850mm when measured in accordance with Diagram 2.2.
E) Where there are double doors, the main (or leading) leaf provides the required minimum clear opening width.

10.0 ACCESSIBILITY

4) PRIVATE ENTRANCES AND SPACES WITHIN THE DWELLING (CONTINUED)

F) A minimum 300mm nib is provided to the leading edge of the door and the extra width created by this nib is maintained for a minimum distance of 1200mm beyond it.
G) The depth of the reveal on the leading side of the door (usually the inside) is a maximum of 200mm.
H) The threshold is an accessible threshold.
I) Where there is a lobby or porch, the doors are a minimum of 1500mm apart and there is at least 1500mm between door swings.

Other external doors

2.21 All other external doors – including doors to and from a private garden, balcony, terrace, garage, carport, conservatory or storage area that is integral with, or connected to, the dwelling – should comply with provisions D to I of paragraph 2.20.

DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN / 201_301A GROUND FLOOR FRONT GARDEN DETAIL).

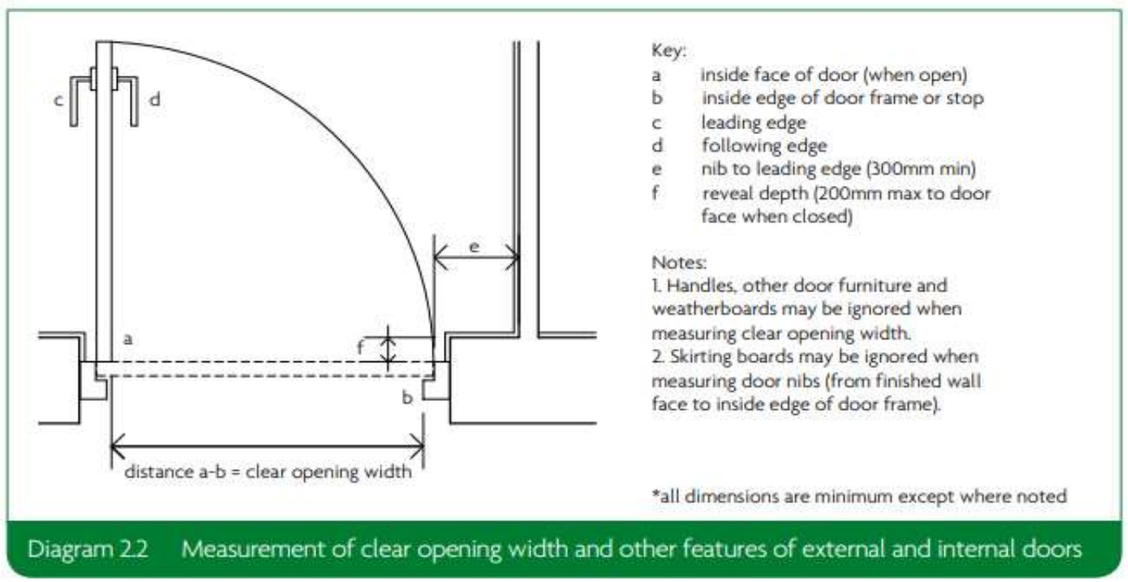


Diagram 2.2 Measurement of clear opening width and other features of external and internal doors

10.0 ACCESSIBILITY

5) CIRCULATION AREAS AND INTERNAL DOORWAYS

Door and hall widths

2.22 To facilitate movement into, and between, rooms throughout the dwelling, doors and corridors should comply with the following illustration:

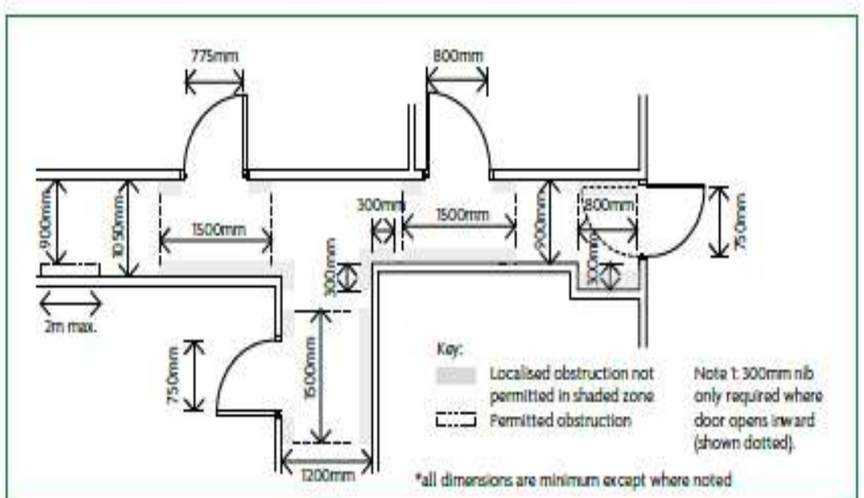


Diagram 23 Minimum door and hall widths and restrictions on localised obstructions

A) The minimum clear width of every hall or landing is 900mm.
B) Any localised obstruction, such as a radiator, does not occur opposite or close to a doorway or at a change of direction and is no longer than 2m in length; and the corridor is not reduced below a minimum 750mm width at any point.
C) Every door has a minimum clear opening width as set out in Table 2.1.
D) A minimum 300mm nib is provided to the leading edge of every door within the entrance storey.

10.0 ACCESSIBILITY

5) CIRCULATION AREAS & INTERNAL DOORWAYS (CONTINUED)

Private stairs and changes of level within the dwelling

2.23 To allow people to move between storeys, and to allow a stair-lift to be fitted to the stairs from the entrance storey to the storey above (or the storey below where this contains the bathroom required by the provisions of paragraph 2.29), stairs will comply with all of the following:

A) Access to all rooms and facilities within the entrance storey is step-free.
B) Level changes within every other storey are avoided where possible.
C) The stair from the entrance storey to the storey above (or below) has a minimum clear width of 850mm when measured 450mm above the pitch line of the treads (ignoring any newel post).
D) All stairs meet the provisions of Part K for private stairs.

DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN / 201_302C DETAIL FIRST FLOOR PLAN / 201_303C DETAIL SECOND FLOOR PLAN) / 201_304C DETAIL ROOF PLAN).

6) HABITABLE ROOMS

Living, kitchen & eating areas

2.24 To provide usable living spaces and easy, step-free access between a living area, a WC and the principal private entrance, key accommodation complies with the following:

A) Within the entrance storey there is a living area (which may be a living room, dining room or a combined kitchen and dining room).
B) A minimum 1200mm clear space is provided in front of and between all kitchen units and appliances.
C) Glazing to the principal window of the principal living area starts a maximum of 850mm above floor level or at the minimum height necessary to comply with the requirements of Part K for guarding to windows.

10.0 ACCESSIBILITY

6) HABITABLE ROOMS (CONTINUED)

Living, kitchen & eating areas

2.24 To provide usable living spaces and easy, step-free access between a living area, a WC and the principal private entrance, key accommodation complies with the following:

A) Within the entrance storey there is a living area (which may be a living room, dining room or a combined kitchen and dining room).
B) A minimum 1200mm clear space is provided in front of and between all kitchen units and appliances.
C) Glazing to the principal window of the principal living area starts a maximum of 850mm above floor level or at the minimum height necessary to comply with the requirements of Part K for guarding to windows.

DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN / 201_302C DETAIL FIRST FLOOR PLAN / 201_303C DETAIL SECOND FLOOR PLAN)

NB No 20 has two bedrooms on the entrance storey, No 20A has three bedrooms on the entrance storey. In each house, the South-facing front room, Bedroom 1, could alternatively be used as a living area – with tall doors opening to the front garden. These rooms (or indeed any of the other rooms on the ground floor of each dwelling) could easily be adapted to have a kitchen area within them if required in the future.

Bedrooms

2.25 To enable a wide range of people to access and use them, bedrooms will comply with all of the following:

A) Every bedroom can provide a clear access route a minimum 750mm wide from the doorway to the window.
B) At least one double bedroom (the principal bedroom) can provide a clear access zone a minimum 750mm wide to both sides and the foot of the bed.
C) Every other double bedroom can provide a clear access zone a minimum 750mm wide to one side and the foot of the bed.
D) All single and twin bedrooms can provide a clear access zone a minimum 750mm wide to one side of each bed.
E) It can be demonstrated that the provisions above can be achieved.

10.0 ACCESSIBILITY

6) HABITABLE ROOMS (CONTINUED)

Bedrooms (CONTINUED)

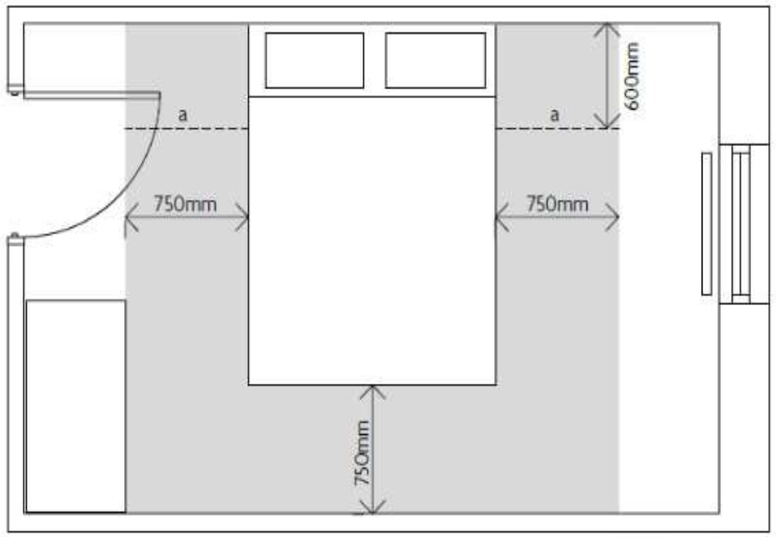


Diagram 2.4 Clear access zones to principal bedroom

DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN / 201_302C DETAIL FIRST FLOOR PLAN).

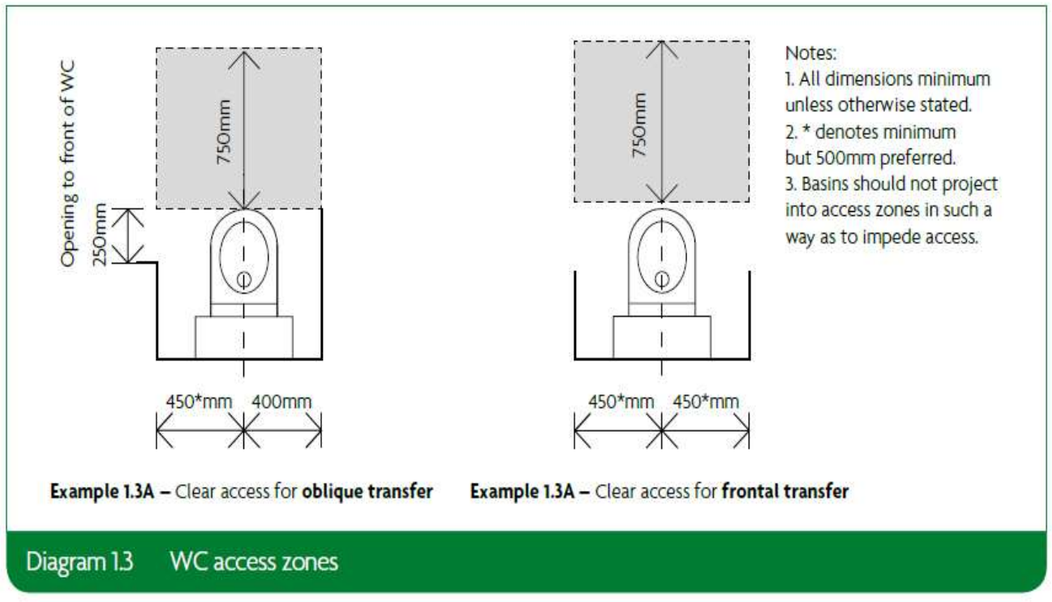
10.0 ACCESSIBILITY

6) HABITABLE ROOMS (CONTINUED)

WC facilities on the entrance storey

2.27 To provide step-free access to a WC that is suitable and convenient for some wheelchair users and, where reasonable, to make provision for showering, dwellings should comply with all of the following:

A) Every dwelling has a room within the entrance storey that provides a WC and basin (which may be within a WC/cloakroom or a bathroom).



DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN).

10.0 ACCESSIBILITY

6) HABITABLE ROOMS (CONTINUED)

WC facilities (CONTINUED)

2.27 To provide step-free access to a WC that is suitable and convenient for some wheelchair users and, where reasonable, to make provision for showering, dwellings will comply with the following:

C) In a two or three storey dwelling with three or more bedrooms, the room with the WC and basin also provides an installed level access shower or a potential level access shower, and the shower, WC and basin (together with their associated clear access zones) meet the provisions of Diagram 2.5. Examples of compliant WC layouts are shown in Diagram 2.6.

D) The door opens outwards.

2.28 Where the dwelling provides both an accessible bathroom with a WC and a WC/cloakroom within the same storey, the WC/cloakroom may comply with the provisions of Diagram 1.3.

DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN / 201_302C DETAIL FIRST FLOOR PLAN).

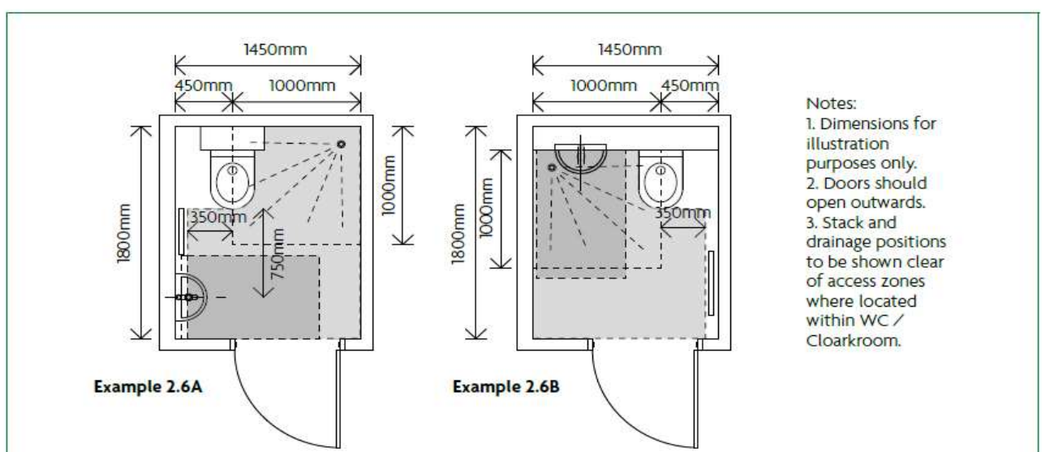
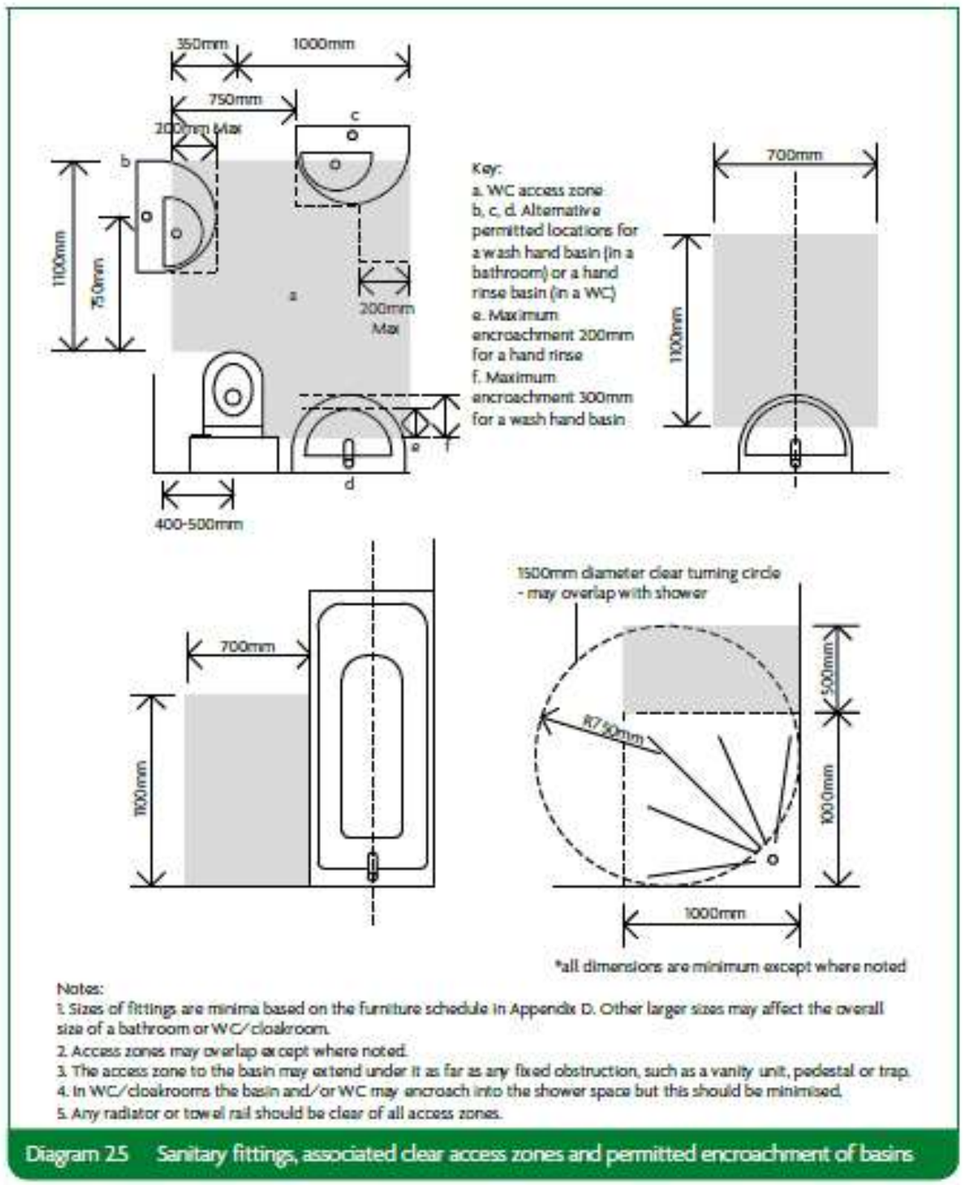


Diagram 2.6 Examples of WC/cloakroom layouts

10.0 ACCESSIBILITY

6) HABITABLE ROOMS (CONTINUED)

WC facilities (CONTINUED)



Notes:
1. Sizes of fittings are minima based on the furniture schedule in Appendix D. Other larger sizes may affect the overall size of a bathroom or WC/cloakroom.
2. Access zones may overlap except where noted.
3. The access zone to the basin may extend under it as far as any fixed obstruction, such as a vanity unit, pedestal or trap.
4. In WC/cloakrooms the basin and/or WC may encroach into the shower space but this should be minimised.
5. Any radiator or towel rail should be clear of all access zones.

Diagram 2.5 Sanitary fittings, associated clear access zones and permitted encroachment of basins

10.0 ACCESSIBILITY

6) HABITABLE ROOMS (CONTINUED)

Bathrooms

2.29 To provide convenient access to a suitable bathroom, the dwelling will comply with all of the following:

A) Every dwelling has a bathroom that contains a WC, a basin and a bath, that is located on the same floor as the double bedroom, described as the principal bedroom in para 2.25b.
B) The WC, basin and bath (together with their associated clear access zones) meet the provisions of Diagram 2.5. Examples of bathroom layouts are shown in Diagram 2.7.
C) Provision for a potential level access shower is made within the bathroom if not provided elsewhere within the dwelling.

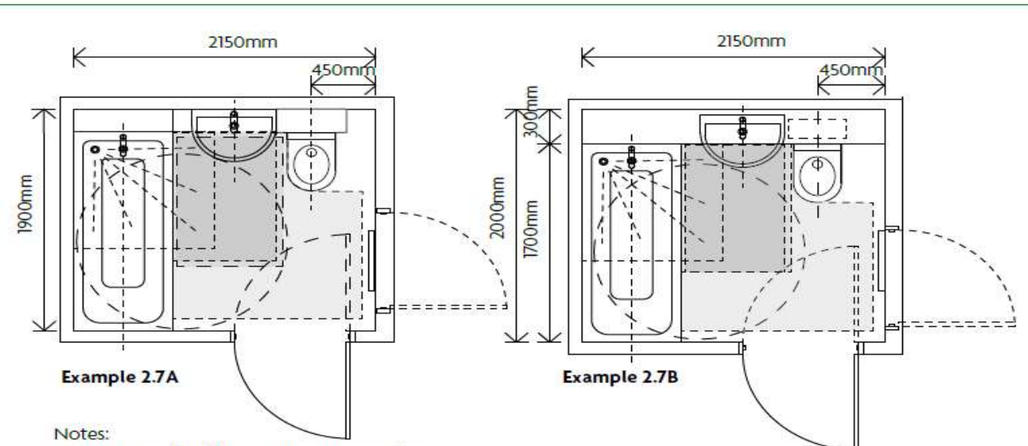


Diagram 2.7 Examples of Category 2 bathrooms

DOES THE DESIGN COMPLY?

Yes – please refer to floorplans submitted with this application (201_300C DETAIL GROUND FLOOR PLAN / 201_302C DETAIL FIRST FLOOR PLAN).

10.0 ACCESSIBILITY

7) SERVICES & CONTROLS

2.30 To assist people who have a reduced reach, services and controls should comply with all of the following:

A) Consumer units are mounted so that switches are between 1250mm and 1450mm above floor level.
B) Switches, sockets, stopcocks and controls have their centre line between 450mm and 1200 above floor level and a minimum of 300mm (measured horizontally) from an inside corner.
C) The handle to at least one window in the principal living area is located between 450mm and 1200mm above floor level, unless the window is fitted with a remote opening device that is within this height range.
D) Handles to all other windows are located between 450mm and 1400mm above floor level, unless fitted with a remote opening device that is within this range.
E) Either:
Boiler timer controls and thermostats are mounted between 900mm and 1200mm above finished floor level on the boiler, or
Separate controllers (wired or wireless) are mounted elsewhere in an accessible location within the same height range.

DOES THE DESIGN COMPLY?

Yes – the proposal will achieve all these.

11.0 SUSTAINABILITY

1) POLICY CONTEXT

Camden Council's policies for climate change mitigation and adaptation are set out within Policies CC1 and CC2 of the Camden Local Plan (2017). Policy CC1 requires … *"all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation."* All developments are required to follow the steps in the energy hierarchy in order to reduce emissions. Policy CC2 requires that development is resilient to climate change and promotes sustainable design and construction.

In relation to demolition, Policy CC1 of Camden Local Plan confirms that the Council will; … "require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building."

At paragraph 8.17, the Local Plan states that:

"All proposals for substantial demolition and reconstruction should be fully justified in terms of the optimisation of resources and energy use, in comparison with the existing building. Where the demolition of a building cannot be avoided, we will expect developments to divert 85% of waste from landfill and comply with the Institute for Civil Engineer's Demolition Protocol and either reuse materials on-site or salvage appropriate materials to enable their reuse off-site. We will also require developments to consider the specification of materials and construction processes with low embodied carbon content."

Further detail on the above requirements is contained within Camden Planning Guidance on Energy Efficiency and Adaptation, 2019.

2) DEMOLITION

The development involves the knocking down of an existing house to facilitate the development of two new family dwellings. In these circumstances, Policy CC1 of the Camden Local Plan requires that applicants demonstrate that it is not possible to retain and improve the existing building.

The existing dwelling is in a poor state of repair, with a great deal of damp in evidence. The applicants have done as much as possible in their three years of living in the house to keep it in a good state, and invested in the building when they first bought it by installing a new bathroom and a new kitchen, and replastering and repainting the interior of the whole house, but the dampness in the walls and the fact that the house has earth directly beneath it means that no amount of work – short of digging out the entire floor, propping up the house, and rebuilding from the ground up – can really prevent long-term damp problems.

11.0 SUSTAINABILITY

2) DEMOLITION (CONTINUED)

It is likely that when the house was first built, in the late nineteenth century, it will have had wooden floors with a void underneath, allowing air to circulate and prevent damp. But at some point in the building's history, this void was filled with concrete and no damp proof membrane was installed, so the house now sits directly on earth and is very damp as a result – and also, in the case of the back extension, unpleasantly smelly. Throughout the house, paint puffs up and peels off the walls, mould grows behind pictures, and new screed laid on the floor in the hallway and kitchen by the owners has swollen and broken up.

In addition to the damp, the existing house is hugely inefficient from an environmental perspective. The windows are single-glazed, the doors are ill-fitting with large gaps above and below them, and the house is not remotely airtight. Heating and hot water currently run on gas.

By contrast, this pair of new-build houses will each be equipped with an air source heat pump, providing renewable energy, as part of a hybrid air to water heating system; every window will be double-glazed, with solar glazing used on the South elevation to limit solar gain; and the main perimeter wall of the building will be made from highly-insulated ICF, which will lead to near Passivhaus levels of airtightness.

The existing house is also very small, with a GIA of just 75 square metres, two bedrooms and one bathroom. A bigger house on the site, with four bedrooms and three bathrooms, is more sustainable in the longer term, as in the future it will better meet the needs of a borough with a rapidly expanding population (a recent ONS study revealed that Camden's population has grown by 13.7% in the last five years, representing the third highest growth of any borough in the UK).

The objective of the proposal is to create a new family home for the applicant, alongside the delivery of an additional family home for sale. Refurbishment alone would not provide the quality of accommodation or space to deliver on these objectives.

The applicant has been through extensive design discussions with officers at Camden, including looking at alternative options to improve and expand the residential accommodation on the site to enable it to provide a high-quality family dwelling and add to the stock of residential accommodation in the borough. While this has included options for both re-use/extension of the existing dwelling and redevelopment of the site, officers and the Camden Design Panel (Chair's Review) – all of whom have been to visit the site – have supported the principle of redeveloping 20 Vicars Road to provide a unique pair of semi-detached homes.

In light of the above, it has been concluded that the most sustainable solution for this site is to demolish the old house and replace it with an energy-efficient high-quality development, built with sustainable materials, that will be designed to last for many years into the future.

The sustainability principles that have been adopted in the design and construction are further summarised below:

11.0 SUSTAINABILITY

3) RE-USE OF MATERIALS AND CONSTRUCTION WASTE

Demolition will be carried out by a company (likely to be Greater London Demolition) that recycles a very high percentage of its waste – Greater London Demolition have a recycling rate of 99%. It is anticipated that nothing on site within the existing house will need to be sent to landfill, as all materials in the building have the potential to be ground down to become aggregate for the construction industry.

The demolition will be done very carefully, as the bricks of the existing house will be used to create attractive herringbone paths and paved areas in the front gardens of both houses, the back gardens of both houses, and in the alleyway between the new building and the school.

This use of the recycled brick from the original house will not only improve the built environment for occupants of the dwellings and school, and passers-by; it will also very much reduce construction waste, and allow local people with memories of the original house still to feel connected to its history.

4) PROPOSED MATERIALS

The aim is to use sustainable materials with low embodied energy. But the single most important factor in reducing the impact of embodied energy is to design long-life, durable and adaptable buildings, and that's what this development represents.

A key construction material is the ICF (Insulated Concrete Forms) to be used in the perimeter walls of the development.

These consist of two panels of Expanded Polystyrene (EPS) that are 67mm in thickness and connected together with a web system that is made of 100% recycled material. The forms (likely to be made by Nudura) are stacked, steel reinforced and filled with concrete. These forms provide greater energy solutions for the houses, providing a standard U-Value of 0.24, while some elements offer U-Values as low as 0.11, resulting in energy savings over 70% when compared to traditional building methods. The superior value comes from the stable thermal mass that the concrete provides. The forms provide a solid concrete core of up to 305mm, providing maximum energy efficiency, strength, safety and comfort. Using the high thermal mass of concrete to minimise heating and cooling energy requirements results in saving lots of energy that creates a carbon neutral outcome over the life of the building.

All windows and glass doors will be double-glazed, with all glazing on the South elevation using solar control glass to reduce solar gain – it will be 70/35 glass with 14% external reflection.

11.0 SUSTAINABILITY

4) PROPOSED MATERIALS (CONTINUED)

The ICF perimeter walls will be paired with a light steel structure used internally. Both ICF and steel structure builds take significantly less time to construct than more traditional construction methods. Building the development faster means less energy is required to transport workers to the building site.

All materials used will be durable and long-lasting, sourced as close to site as possible, and transported efficiently. Environmentally friendly materials will be used wherever possible, referring to the Building Research Establishment's Green Guide to Specification of Materials.

An area of more than 40 square metres will be green-roofed, at ground floor level in 20A, using the KemperGro Green Roof System, with sedum plants. The roof base is to be solvent-free Kemperol 2K-PUR liquid waterproofing which is sustainably sourced and inherently root resistant (FLL certified). 80% of the applied polyols or resins in the Kemperol waterproofing are obtained from the seeds of the tropical castor plant, a renewable resource, combined with a polyester reinforcing fleece containing up to 25% recycled material. The growing media is manufactured using 100% recycled materials. The base felt is composed of 100% recycled materials. The reservoir core is composed of 90% recycled materials. The hard-top on the insulation board is 100% recycled.

5) CLIMATE CHANGE ADAPTATION

Steps will be taken to mitigate climate change both during the construction period, and for the building once it's being lived in. Best practice measures will be adopted to reduce emissions at every stage.

The development has taken into account opportunities for greening in all gardens and terraces, and the street frontage will be much improved, as both houses will have attractive front gardens, with planting. And residents of the flats to the north of the development will also have an improved view, as there'll be an attractive curved green roof to look down onto at the back of the building.

The green sedum roof, sitting on top of the curved roofs across the ground floor in 20A, will cover an area of more than 40 square metres. Green roofs have significant advantages for the environment; climate control, stormwater attenuation, noise and pollution reduction and heat insulation. They also protect against thermal gain and offer an additional habitat for flora and fauna.

There will be plenty of opportunities for greenery in each house, with hedging, flower beds, window boxes and plants in pots. A pergola has also been designed to go in the alleyway between Cloud House and the school next door up which climbing plants will be trained.

11.0 SUSTAINABILITY

5) CLIMATE CHANGE ADAPTATION (CONTINUED)

The rainwater collection tanks in the gardens and on the terraces will allow the residents to water plants whenever required, without using potable water from the main system, encouraging the growth of flowers and other plants, which will in turn absorb carbon and release oxygen, and create a better environment for bees, butterflies and other insects. The rainwater collection tanks have been designed with bird perches, to encourage birdlife in the gardens.

The development also prioritises sustainable modes of transport and the house at 20A will be a car-free household, meaning there'll be no additional pollution on the street from car fumes. Both houses will have bespoke covered bicycle shelters built into their front gardens to encourage residents to cycle as a mode of transport. The site is accessible to public transport, with a PTAL of 3, and within easy reach of the shops and services of nearby town and local centres, including Kentish Town.

The development has been designed to reduce emissions by being energy efficient. The perimeter walls will be constructed from ICF, which will make each house highly insulated and very air-tight, close to Passivhaus standards – this will reduce the need for heating, and any heating that is needed will not escape the building into the atmosphere, helping to mitigate climate change. The building will have underfloor heating powered by air source heat pumps, and solar glazing on the South elevations, so the ambient temperature in each house should be comfortable year-round. There will be plenty of openable windows for natural ventilation.

6) WATER EFFICIENCY

The plumbing system will be designed for maximum water efficiency. All toilets will be dual flush, resulting in lower water usage. And taps will be new models, which do not drip.

The development will incorporate sustainable drainage systems, as well as using the Main sewer, including:

- Slot drains on terraces and in gardens to allow rainwater to drain into soil below;
- Flower beds, window boxes and pots containing plants which will soak up water;
- Box hedging with 40cm of soil beneath it, acting as a green roof for the bespoke bin and bike stores in the front gardens;
- Un-mortared herringbone recycled brick paving in the front gardens, back gardens and the school alleyway – this will allow rainwater to drain into soil below;
- Rainwater tanks in the front gardens, back gardens, and on the roof terrace, from which water will be drawn for watering the plants.

11.0 SUSTAINABILITY

6) WATER EFFICIENCY (CONTINUED)

- A green roof on 20A, able to manage rainwater on its surface with a pattern of holes and waterproof membrances, providing light-weight drainage and storage for rainwater. NB The upper filter fleece supports the growing medium and prevents substrate fines from blocking the reservoir but allows percolation of rainwater. The reservoir core holds a predetermined amount of rainwater whilst allowing excess water to pass through percolation holes to the base layer. The base felt layer provides physical protection to the waterproofing but also attenuates run-off to regulate flow to outlets and drains during flash floods and storms.

7) ENERGY

The approach to energy usage would follow the principles of the energy hierarchy, focussing first on the objective to 'Be Lean'; the aim is to use energy saving techniques as much as possible throughout the project. It will be a low carbon project, using renewable energy, via air source heat pumps in each house.

The building will be designed to reduce energy consumption. First and foremost, the building will be well-insulated, so reducing energy demands associated with heating systems. The perimeter walls for the development will be built with ICF – Insulated Concrete Forms. These consist of two panels of Expanded Polystyrene (EPS) that are 67mm in thickness and connected together with a web system that is made of 100% recycled material. The forms (likely to be made by Nudura) are stacked, steel reinforced and filled with concrete. These forms provide greater energy solutions for the houses, providing a standard U-Value of 0.24, while some elements offer U-Values as low as 0.11, resulting in energy savings over 70% when compared to traditional building methods. The superior value comes from the stable thermal mass that the concrete provides. The forms provide a solid concrete core of up to 305mm, providing maximum energy efficiency, strength, safety and comfort.

Further, the south-facing orientation of the building and generous window openings will optimise light into the new dwellings, minimising the need for artificial lighting during daylight hours. To ensure the building does not overheat, however, solar control glass will be used on the south elevation. Opening windows on the north and south elevations will allow natural ventilation to the interior. Internally, low energy lighting and appliances will be utilised to further minimise energy consumption and reduce heat gains, while the introduction of smart devices will contribute to the lowering of energy usage and the minimising of carbon emissions.

11.0 SUSTAINABILITY

7) ENERGY (CONTINUED)

From a construction perspective, the steel frame and use of ICF in the perimeter walls means that the build can be done speedily, so reducing energy consumption.

Moving further down the hierarchy, a hybrid heating system, using air source heat pumps, has been incorporated into the design. Each house is likely to be using the Mitsubishi Ecodan PUHZ-SW split air source heat pump in 7.5kw size, in conjunction with the Mitsubishi Ecodan FTC5 split cylinder and a Worcester Bosch Greenstar 8000 style 40kw combi gas boiler, which has an efficiency rating of 94% and complies with Boiler Plus legislation, lowering emissions with a smart thermostat.

The hybrid system will have smart controls enabling maximum carbon pollution savings – the controls will switch between the heat pump and gas boiler to use whichever is lowest carbon at the time.

The Energy Statement accompanying the planning application further demonstrates how the development will follow the steps in the energy hierarchy to reduce carbon dioxide emissions, in line with Policy CC1 of the Camden Local Plan. It concludes that the measures implemented through the energy hierarchy would result in two dwellings that achieve over 30% reductions in carbon dioxide emissions, well in excess of the Camden Local Plan policy requirement for 19% carbon dioxide reductions below Part L of the 2013 Building Regulations.

PLEASE ALSO REFER TO THE SEPARATE ENERGY REPORT FOR THIS PROJECT PRODUCED BY TYGUE DOYLE AT EEP (ENVIRONMENTAL ENGINEERING PARTNERSHIP)