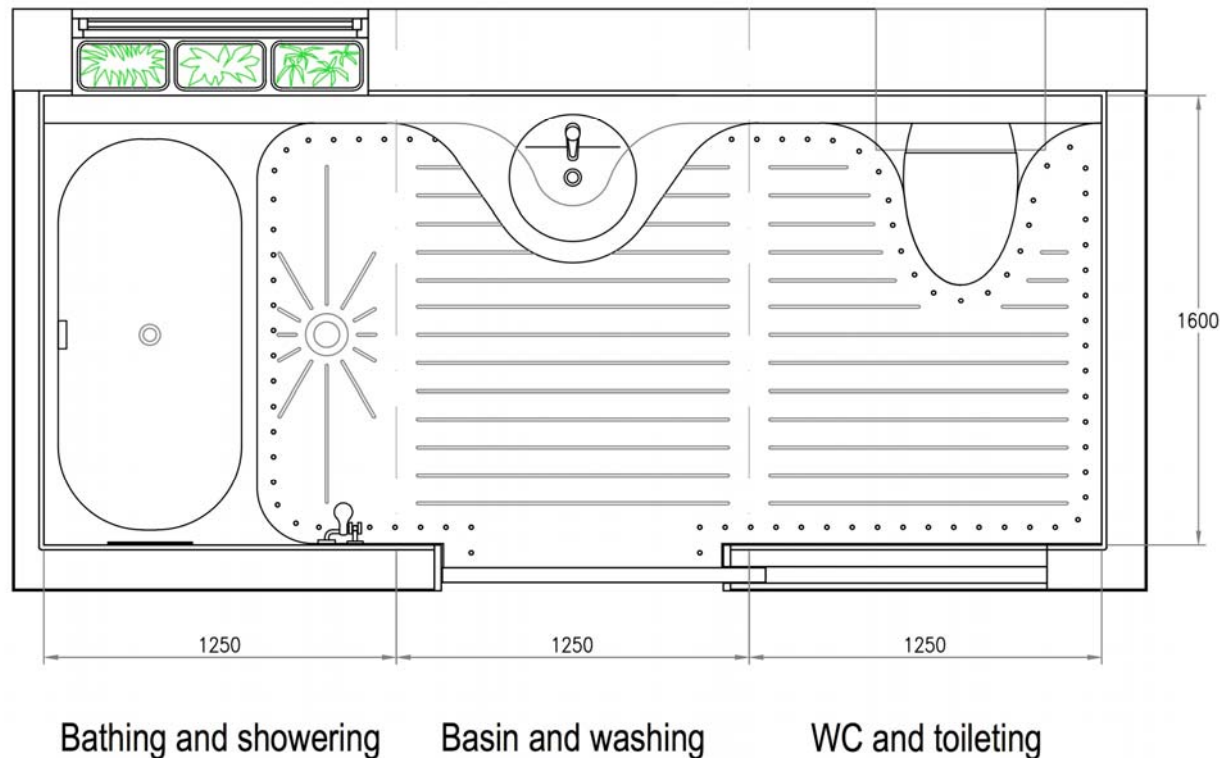


THE FUTURE BATHROOM

PLAN



KEY FEATURES

Bathing

A Japanese influenced deeper but shorter bath. The bather can shower beforehand so that the bath water is not dirty and can be re-used for other activities such as washing clothes and watering plants, saving water. A control panel allows the user to control the temperature of the bath, listen to music, call for help, remotely run the bath and even answer the door.

Showering

A wet room arrangement with floor drainage. The occupant can stand or sit and the shower head can be used at a variety of different heights.

Basin

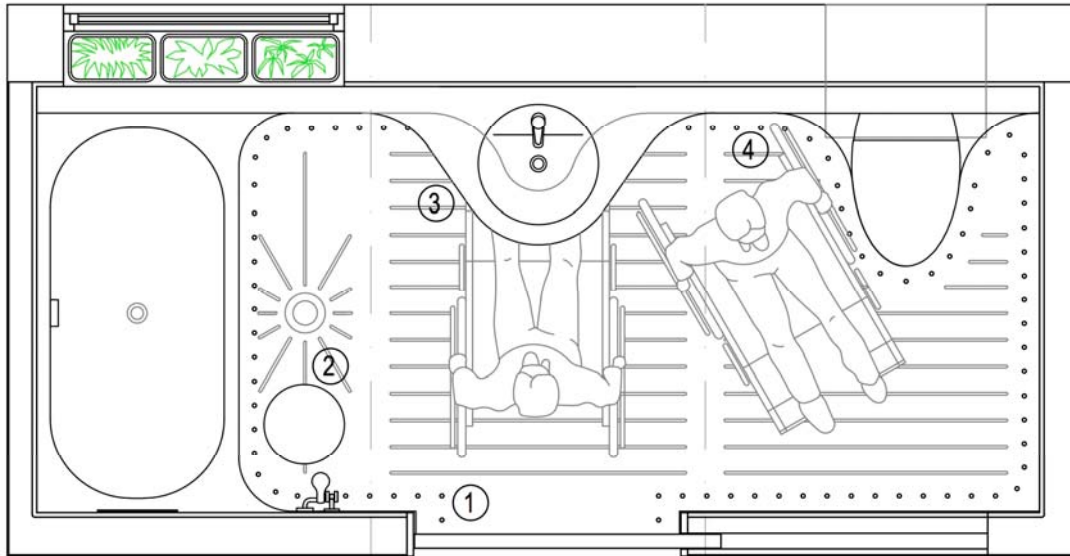
The basin is mounted within a shelf forming part of the overall finish for the bathroom and is fitted with a water-saving mixer tap. The waste is concealed so that the basin appears to float making it easy to keep clean.

WC

If the bathroom is located on the ground floor a composting toilet can be used and could reduce overall household water use significantly. This is less easy to achieve on upper floors but technical innovations have meant that flushing WCs are available with much lower water use. The WC can incorporate front and rear washing facilities, warm air drying, hands-free opening and LED night light.

ACCESSIBILITY

Life expectancy and health have improved and the home of the future needs to be suitable for both old and young, including those with mobility impairments.

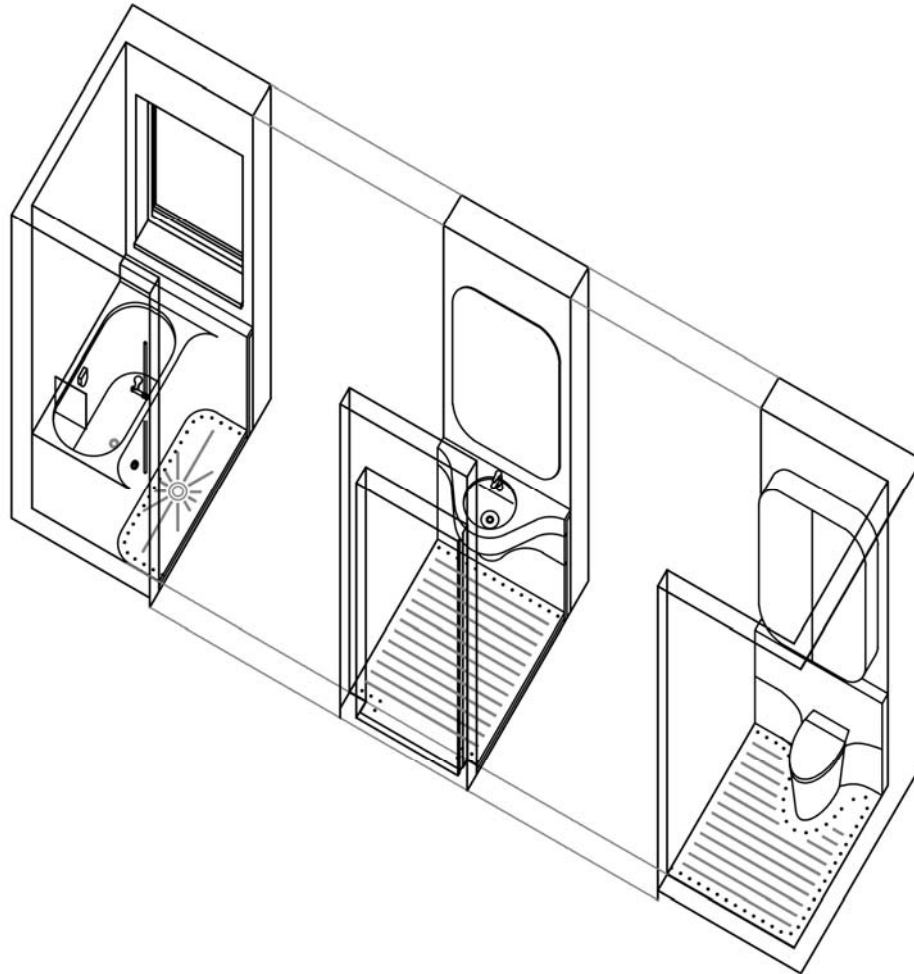


1. Floor mounted LED lighting provides clearer paths for those with visual impairments.
2. Showering is wet room style with space for a chair or stool for seated washing. The wall panel includes a 'Call for Assistance' feature.
3. The basin has a wide lipped edge so that it can be used in a seated position.
4. There is enough space between the basin and the WC to fit a wheelchair.

AFFORDABILITY

The home of the future needs to be of high quality but also cost-effective and form part of a solution to the shortage of affordable housing. A way of achieving this would be to use mass production techniques rather than bespoke solutions.

MODULARITY

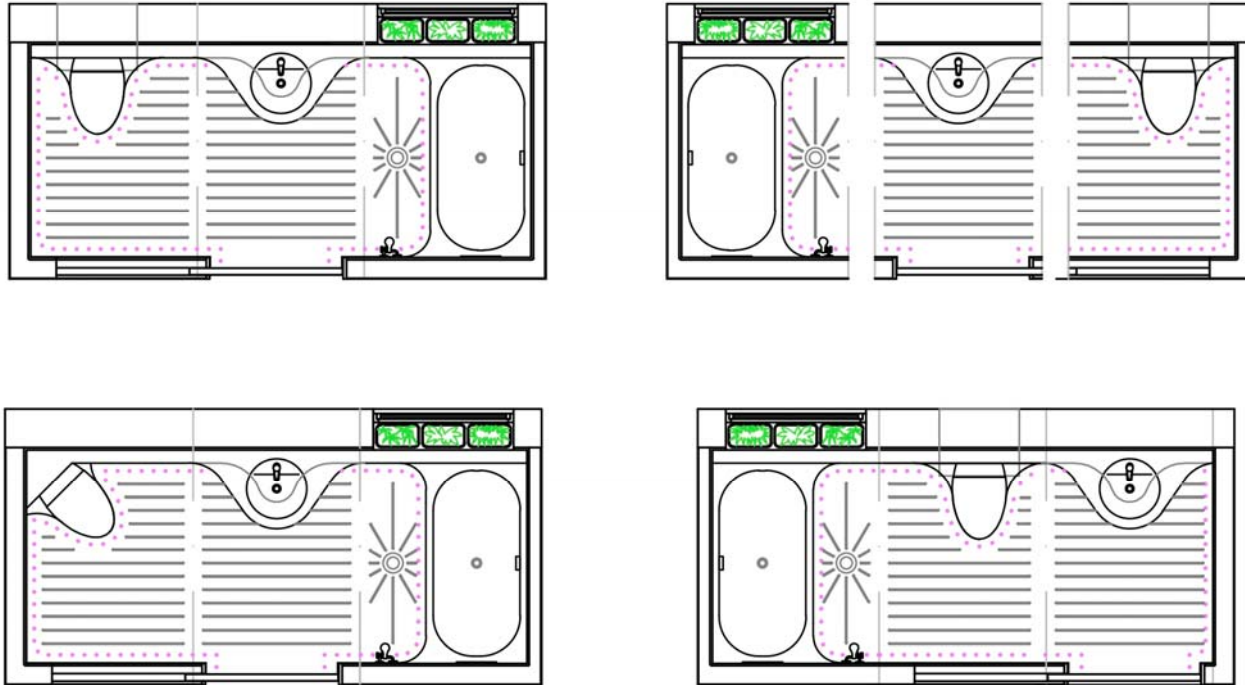


MANUFACTURE

The Future Bathroom will be manufactured Off-Site using 3D-Printing construction methods. The principal construction material will be 3D-Printed fibre reinforced concrete: FRC (or GRC) where speed of construction and high quality of finish can be achieved, with zero wastage and the bathroom enclosure ground-up and recycled when required.

This mass-production manufacturing process using free-form robotic or gantry factory-based digital fabrication will cost-effectively respond to the housing shortage and can allow for adaptability and variations of components and assemblies, with modular potential. In addition to housing, this principle can be applied to student accommodation, hostels and hotels.

FLEXIBILITY OF LAYOUT



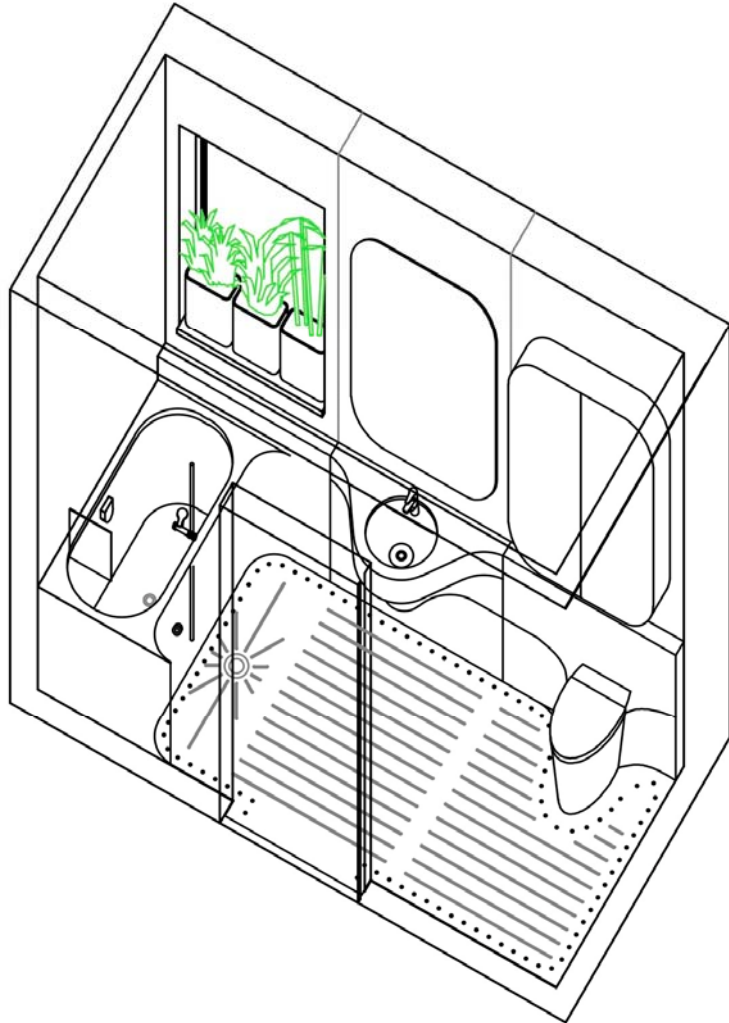
MODULAR CONSTRUCTION ALLOWS FOR FLEXIBILITY IN LAYOUT

The design is divided into 3 zones of equal size and these can be configured in different ways to provide different layouts all within the 6 metre parameter.

The sanitary ware and the walls could all be of the same material, allowing organic shapes to be formed without gaps or joints.

SOME OF THE POSSIBLE LAYOUTS THAT CAN BE ADOPTED WITH THIS TYPE OF MODULAR CONSTRUCTION

AXONOMETRIC



ROBOTIC 3D PRINTING CONSTRUCTION



Factory-based computer-controlled 3D printers fitted to a gantry and robotic arm would enable a component-based strategy of assemblies to be produced with all the various services integrated for connection on site.

SUSTAINABILITY

Sustainability is an essential part of the design. The use of low energy features, such as LED lighting, recycled and recyclable components and low water use, all form a very important part of the approach.

Low energy in use:

LED lighting provides a low energy solution and can be used for a variety of different effects. The bathroom design includes LED lights recessed into the floor, guiding the user at night. The floor might be constructed of crystalline quality recycled glass with underfloor LEDs. The LED under-floor lighting can be mood-enhancing with subtle colour changes controlled as required. The bathroom will need to be air-tight and heat recovery systems can be used where there is a need to break the envelope such as the ventilation grilles and the access panel if a composting WC is used.

Recycle-ability of components:

The bathroom of the future will be constructed from recycled concrete and glass materials which can then be dismantled and again recycled at the end of their use.

Low water use:

High tech and low tech solutions can be found to achieving a reduction in water use. For example, a composting WC has zero water use but is not always practical. New designs for WCs significantly reduce water use. Aerator taps and shower heads reduce water consumption without compromising the bathing experience.

Air Quality:

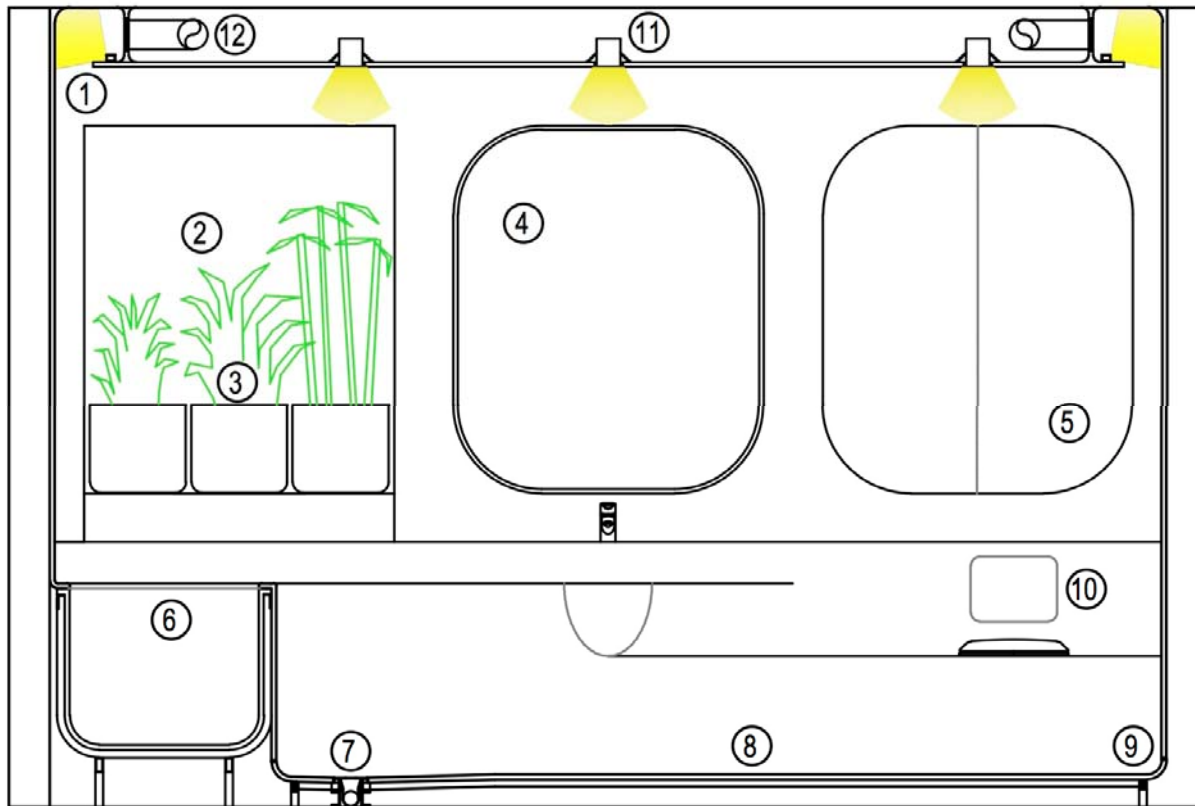
A far more low-tech feature is the use of common house plants as a means of improving air quality. Research has shown that bringing nature into buildings improves the occupants' sense of well-being. It has also shown that many house plants are very effective at removing toxins especially those in cleaning products and air fresheners, while reducing humidity and inhibiting mould growth.



Recycled glass flooring product



SECTION



1. Recessed LED cove feature strip lighting up-lights and wall-washes providing a floating ceiling effect.
2. Window allows natural light into the room.
3. Plants: recent research has shown that house plants can remove toxins from the environment and combat 'sick building syndrome'.
4. Mirror with recessed LED strip light surround.
5. Storage for toiletries and medical items with LED lighting within the storage unit.
6. The bath is insulated around the shell to reduce heat loss.
7. Floor drain.
8. The floor is constructed from slip-resistant recycled glass, with under-floor heating beneath.
9. LED strip lights, sealed and waterproof, are set beneath the floor to provide a subtle perimeter lighting effect.
10. Access panel for WC if using a composting WC.
11. LED down-lights.
12. Around the perimeter recessed mechanical ventilation grilles remove stale and moist air. A heat recovery system is used to reduce energy required for heating the space.

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