GREENHOUSE, MIXED USE DEVELOPMENT LEEDS

WEST AND MACHELL ARCHITECTS


7


9


1


6


8

1. Office courtyard
2. New entrance facade
3. After
4. Before
5. Archive photo
6. Original entrance
7. Courtyard before retrofit
8. Interior before retrofit
9. Courtyard allotment
10. Office


10


2


5


4


3

Selected products

Insulated render system
WBS External Wall Insulation Render System incorporating 130mm Kingspan Kooltherm K5 External Wall Board Insulation
www.wbs-ltd.co.uk
www.insulation.kingspan.com

Roof insulation
Kingspan Insulation Thermataper TT47

Roof membrane
Sarnafil G410-12EL membrane. Finish light grey
www.sarnafil.com

Acoustic flooring to new upper timber floor
Regupol 7210C
www.regupol.com

Acoustic flooring to new concrete floor
Regupol 4515

Frame
GGBS concrete

Acoustic insulation to party walls
Isowool Glass Quilt
www.isowool.com

Floor Slab Insulation
Kingspan Thermafloor TF70+65mm screed

Acoustic Ceiling System:
Lafarge Acoustic MF Ceiling System
www.lafargeplasterboard.co.uk

Project data

Name of Project Greenhouse, Leeds
Name of client Citu
Main contractor Clegg Construction
Quantity surveyor Sum
Structural engineer Thomasons
Services engineer Woods Environmental
Procurement route Design and Build
Gross internal floor area 12,623 m^2
Construction cost £12.5 million
Start on site December 2008
Completion April 2010
Estimated annual CO_2 emissions for a typical flat 0.5 tonnes

Insulation has helped this pioneering mixed-use refurbishment to achieve a 60 per cent increase in overall energy efficiency, using high specification insulation and the latest renewable energy technology.

The seven-storey development has been refurbished and extended to provide 172 one, two and three-bedroom eco-apartments, plus office space, transforming the original 1930s Art Deco brick-and-concrete former workers' hostel.

Compared to a standard approach, it is expected to save 169 tonnes of carbon and 3.8m litres of water each year and it has achieved Level 4 of the Code for Sustainable Homes.

The thermal performance of all building elements has been considered to create an airtight building envelope with the following U-values: walls, 0.15; windows, 1.32; roof, 0.1; floor, 0.15 W/m^2K.

The existing building was wrapped in a new high-performance insulated skin. The new roof has now achieved a U-value of 0.10 W/m^2K.

A ground source heat pump supplements heating and solar panels provide hot water. Roof wind turbines provide electricity for communal lighting and lifts and water is recycled. Residents can control their energy and CO_2 emissions using the IPTV energy-monitoring system, which allows them to view utility bills and CO_2 output on their televisions.

Craig Bolton, architect, West and Machell Architects

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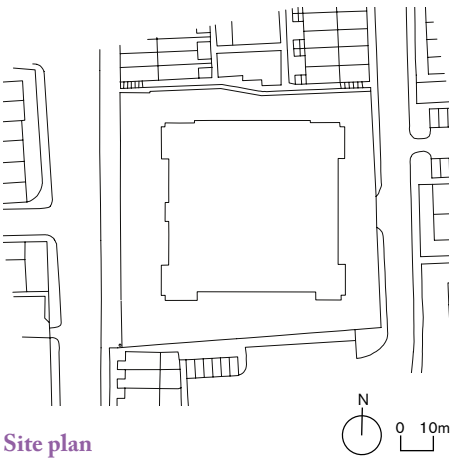
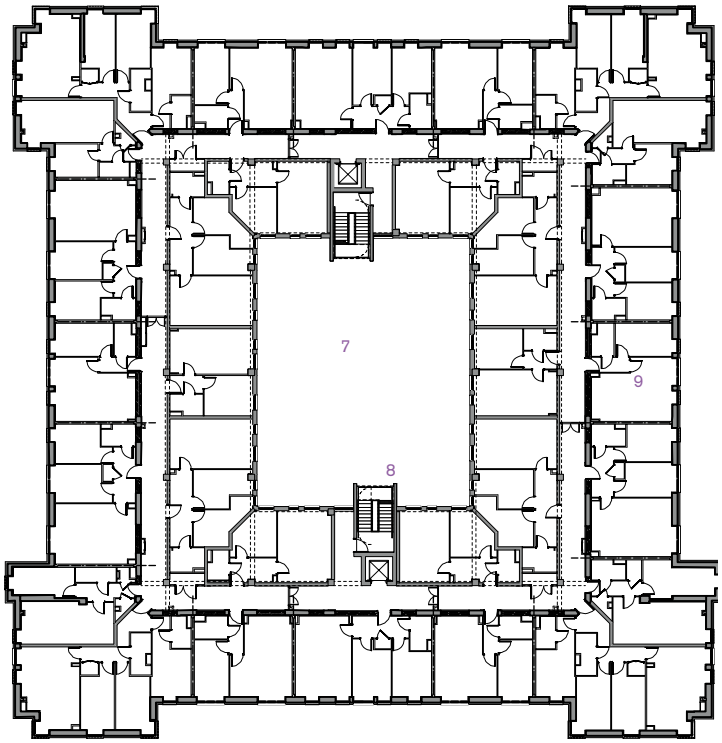
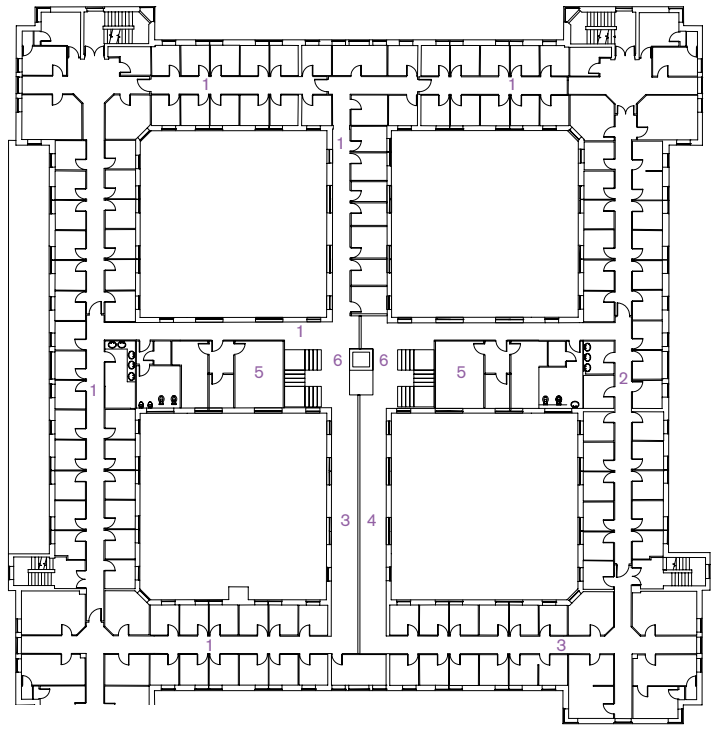
1. Male bedrooms
2. Female bedrooms
3. Male side
4. Female side
5. Staff
6. Main stair
7. Courtyard
8. Escape stair
9. New apartment



Site plan



New floor plan



Existing floor plan of workers' hostel

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Clockwise from top right Wind turbine and solar panels on roof; show flat; district hot-water tanks; courtyard

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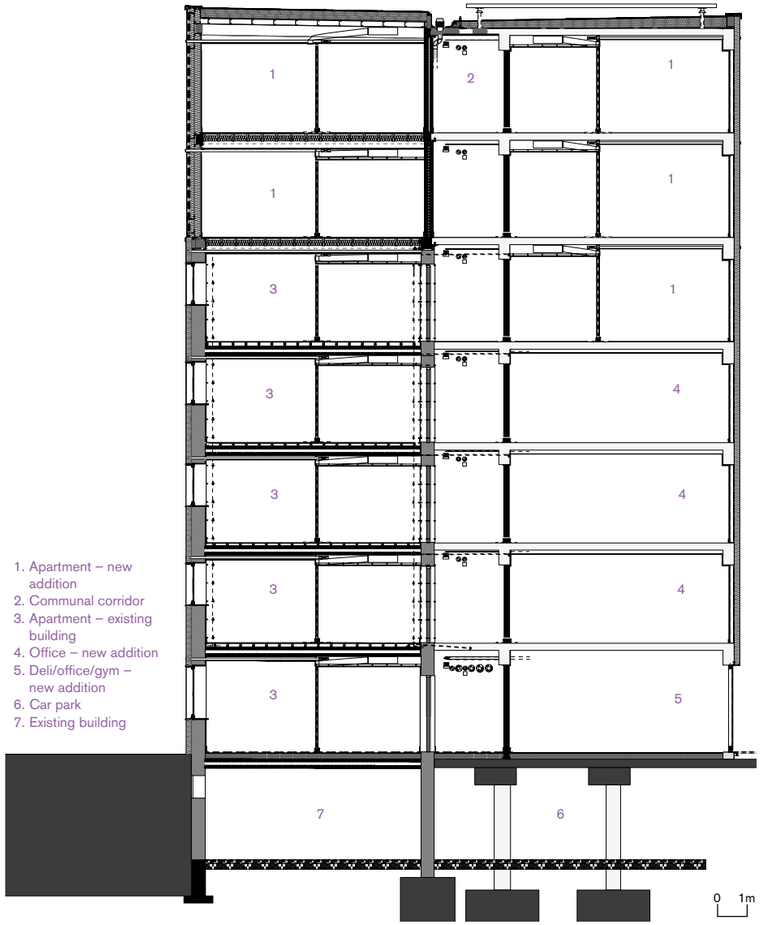
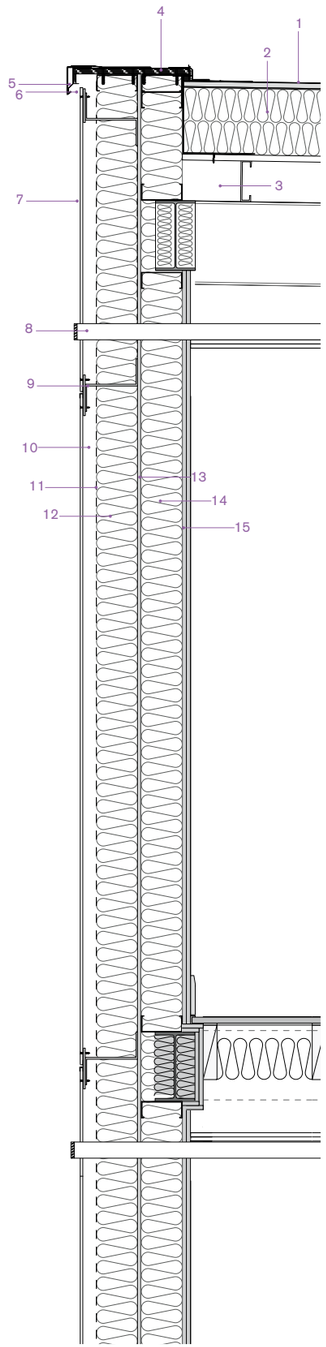


1. Apartment – new addition
2. Communal corridor
3. Apartment – existing building
4. Office – new addition
5. Deli/office/gym – new addition
6. Car park
7. Existing building

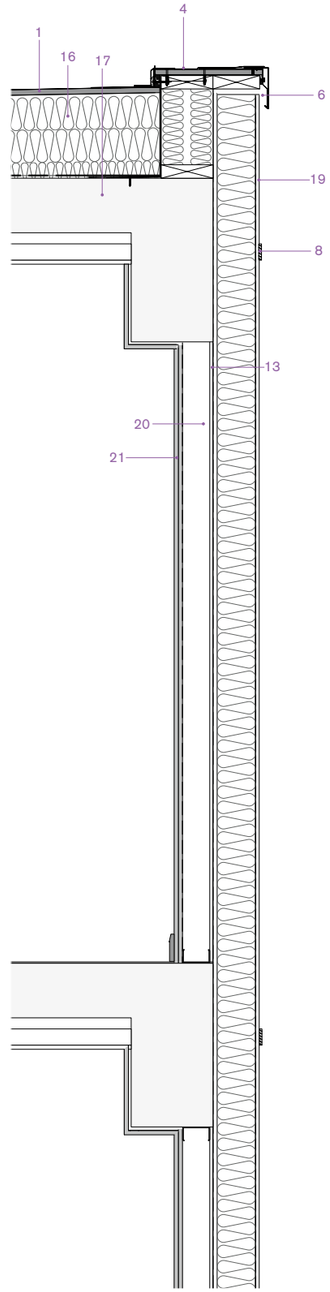
Section

Details

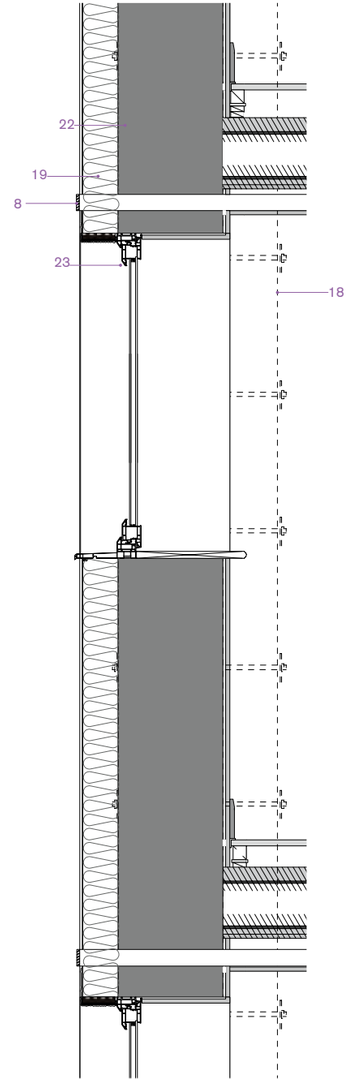
1. Sarnafil G410-12EL membrane
2. Kingspan Insulation Thermaroof TR27 on proprietary vapour barrier
3. Pressed metal purlins at 600mm c/c
4. PPC pressed metal capping detail
5. Drip detail
6. Continuous ventilation gap with insect mesh
7. 8mm RockPanel Boards
8. Ventilation extract
9. Proprietary steel support bracket system fixed back to SFS system
10. 50mm ventilation gap
11. Weatherproof membrane bonded to insulation face
12. 150mm Kooltherm k15 fixed to CP board
13. 15mm cement particle board
14. 150mm Kooltherm k12 between SFS support systems and 152 x 152 support columns
15. Vapour control layer and two layers of 15mm soundblock plasterboard
16. Kingspan Insulation Thermataper TT47 on proprietary vapour barriers
17. Reinforced concrete frame
18. Progressive collapse steelwork
19. WBS External Wall Insulation Render System with 130mm Kingspan K5 and vapour control layer
20. SFS support system
21. Two layers of 15mm soundbloc plasterboard
22. c.380mm existing solid brick wall
23. New high-performance window to achieve 1.32 U-value



Detail A



Detail B



Detail C

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Below View of the development looking west over Leeds