bere:architects 73 Poets Road London N5 2SH tel +44 (0)20 7837 9333 fax +44 (0)20 7837 9444 web www.bere.co.uk

Appeal Statement

Project: **91 Dyne Road**
London
NW6 7DR

planning ref: 10/1221 approved and 10/2058 refused

date of application 10/2058: 02/08/2010

date of refusal of 10/2058: 24/09/2010

Home Owners: Debbie and Polo Tang
21 Melcombe Court
Dorset Square
London
NW1 6EP

Overview

Application 10/1221

Approved subject to conditions on 20/07/10, includes:

- Insulating the roof, which includes raising it by 140mm
- Insulating the roofs of the rear dormers
- Extending the side and rear eaves to 170mm
- The front garden landscaping with the car parking space
- The rear extension to 3m at lower ground floor and 1.177m at ground floor
- The green roofs to both the lower and ground floor extensions, including the extra height required for these
- The solar thermal panel for hot water
- The PV panels for electric
- Changing the paint work at the front of the house to white
- Reconditioning the existing windows and secondary glazing them where appropriate

Approval given for a Variation of Condition 2 to remove the upper extension and apply insulated render directly to the rear elevation in place of the extension, 07/01/11

Planning conditions discharged, 04/02/11

Application 10/2058

Refused 24/09/10, resulting in the following work which cannot be undertaken;

- The external insulation to the side of the house
- The external insulation to the rear first and second floors, including the insulation to the rear dormers

The currently refused 100mm of external insulation is part of a whole house energy improvement strategy which will see the energy required for heating the house reduce by 88% In carbon terms this represents in excess of 22 tons of carbon savings per year or a 76% reduction when comparing the property's carbon emissions before and after the retrofit.

Carbon emissions are the main cause of climate change (CLG, 2007), and have increased globally by 350% since 1960 (The World Bank CO^2 emissions, no date). A main source of carbon emissions is from housing, which was expected to account for 13% of all UK emissions in 2010 (CLG, 2008). Reducing this is a national priority, and the UK Government has now pledged that all new homes in the UK will be zero carbon by 2016 (CLG, 2006a) and stated that in seeking to reduce emissions the focus has to also be on increasing the energy efficiency of our existing housing stock which, will make the most impact and therefore should be prioritised (DECC, 2011).

Existing buildings are expected to form the majority of the UK's building stock for many years to come since approximately three-quarters of houses in 2050 are likely to have been built before 2010. Therefore, it is vital to focus on the energy efficiency of the existing stock as well as new buildings if we are to achieve the government's challenging emission reduction targets.

The only change application 10/2058 proposes to the approved scheme is the 100mm of external insulation. It is possible to accommodate the insulation within the approved eaves details so the only change is to the wall finish. The proposal is to insulate the house with 100mm of Phenolic insulation on the rear facade at first and second floor level. The rear dormers will have only 50mm of Phenolic insulation applied to their sides to appease the planning officer and minimise the change to the dormer proportions, even though this significantly affects the heat loss from them. The dormer roofs will be insulated to the already approved details (ref. 10/1221). The side of the house will be insulated with 100mm of Phenolic insulation starting 2m back from the front facade to reduce the visibility of the insulation from the street. The application also includes retrofitting the house with energy saving measures. On the internal front facade it is proposed to improve thermal performance by fitting less effective and higher risk and more costly internal insulation. The internal insulation will wrap around onto the internal side wall for the first 3m to create an overlap with the external insulation and reduce the thermal bridge.

The proposal has been designed to be respectful to the existing context of the house. The new external insulation will start 2m back from the front facade in order to minimise its visibility from the street, and in order to eliminate its visibility with regard to the general streetscape.

All of the approved changes to the roof eaves and the approved super low energy rear extension have been carefully designed to respect the original house while also providing dramatic energy improvements.

The energy demand of the house in its current state (before any of the approved proposals in application 10/1221) has been calculated using PHPP (Passivhaus Planning Package) which is an advanced and highly accurate energy measurement software for buildings. This has allowed us to determine how much heat energy the dwelling currently requires. The calculations show that at a constant temperature of 20 degrees, the existing house demands **357**kilowatt hours per square meter per year ($kWh/m^2/yr$). If the desired temperature was higher, the house would require more. For reference, in Europe $30kWh/m^2$/year is considered low energy and $15kWh/m^2$/year is the Passivhaus standard for new build properties, so

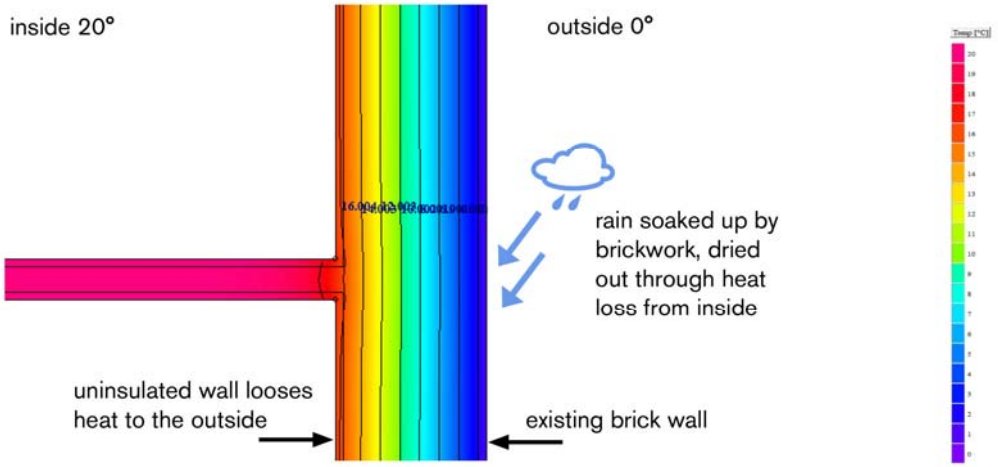
357kWh/m^2/year makes this a very high energy building typical of much of London's housing stock and this makes the retrofit project a very important exemplar project showing how we can make deep energy cuts on existing housing stock without affecting the streetscape.

As part of the energy improvements to the whole house it is proposed to fit internal insulation to the front facade and external insulation to the side and rear facades. Fitting internal insulation to all of the internal walls would not achieve the same energy savings and be prohibitively expensive. Now that the tender quotes have been returned for this project we can confirm that the cost of 100mm of Phenolic external insulation is £111/m^2 including all work to prepare and finish the walls. However, internal insulation causes other cost and the cost of the internal insulation is comprised of the following components: £180/m^2 to strip back the existing plaster and apply the insulation, £6/m for carefully taking down the ceiling cornices and wall skirting boards including refixing after the internal insulation has been applied, £27/m is required for the new skirting boards, £250/m for the new decorative plaster cornices. Finally 6/m^2 is required for the local removal of the floor boards around the external walls to allow the insulation to be installed. This takes the cost well over 2 x the cost of the external insulation and this does not include for the cost of the additional time on site for the installation of the internal insulation, expected to be a number of weeks. In addition the thermal performance of this internal insulation is 2x worse than the Phenolic insulation.

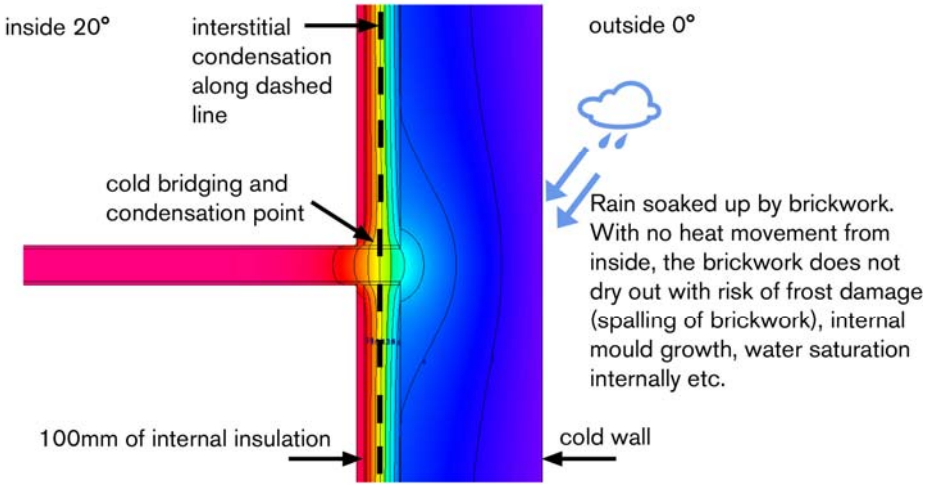
Summary of technical information provided with the planning application

The amount of internal insulation necessary for effective energy use reduction poses serious risks to the fabric of the house due to interstitial condensation. Reduced drying out of wet brickwork leads to a likelihood of frost damage due to the freezing of wet brickwork. So, internal insulation is not good in terms of building physics. With internal insulation you also have higher thermal bridges, loss of internal thermal mass and inevitably higher U-values and therefore lower energy savings. The wider the internal wall, the worse the thermal bridge will be where the internal partition wall meets the external wall. The thermal bridge (PSI value) for the internal insulation detail 2 shown overleaf is: 0.16W/mK. This is a significant thermal bridge. The dew point in this detail is on the inside of the external wall (around the 12degree line). This highlights the serious risks of condensation within internal insulation and can result in damage to timber floor joists with the risk of full structural failure in the future. With internal insulation you also lose the internal Victorian detailing of the house and this very disruptive and costly retrofit measure requires residents to move out of their homes for the duration of the work so cannot be considered as a viable option for retrofitting all of the UK's conservation area housing stock.

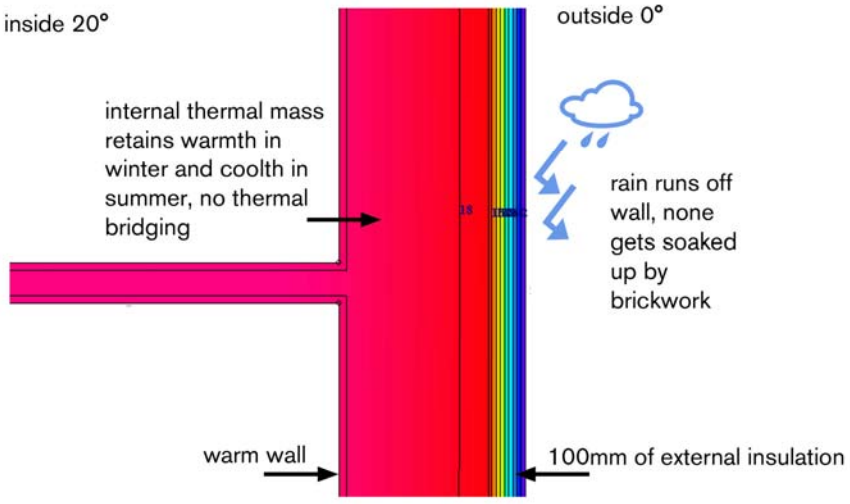
By contrast external insulation is non disruptive for residents, keeps the existing brickwork warm, free of damage and accessible for easy maintenance. The thermal bridge (psi) value for the detail 3 overleaf is 0 W/mK this means there is no thermal bridge and no risk of condensation or damage of the wall fabric. The thermal mass of the brick walls can also be utilised as it is on the inside of the house.



Detail 1 – Existing wall at Dyne Road



Detail 2 - Internal Insulation at Dyne Road



Detail 3 - External Insulation at Dyne Road

The general air tightness of the building will be greatly improved by the external insulation, and it is furthermore proposed to replace the lower ground floor with an insulated concrete slab. All existing windows will where possible be improved by adding secondary glazing and new windows will be fitted with triple glazed timber units. Finally we also propose fitting a low energy heat recovery ventilation unit to take advantage of saving from the draft fee improvements. The result of all of the above is that the head demand will reduce to **43**kilowatt hours per square meter per year (kWh/m^2/yr). By excluding the external wall insulation the heat demand will increase by $2^1/_2$ times to around 106 kilowatt hours per square meter per year (kWh/m^2/yr) and we will not be able to achieve a draft free envelope (the air changes per hour will be around 5, compared to the 1 air change which would be achievable with external insulation).

Government Policy

PPS1 stipulates that planning should facilitate and promote sustainable and inclusive patterns of urban and rural development by ensuring high quality development through good and inclusive design and the efficient use of resources. Although visual appearance and the architecture of individual buildings are clearly factors in securing high quality design, inclusive design also respects and considers the direct and indirect impact on the natural environment. This point is reiterated within the supplement to PPS1 which states that:

"Where there is any difference in emphasis on climate change between the policies in this PPS and others in the national series this is intentional and this PPS takes precedence."

Furthermore the PPS states that an applicant for planning permission to develop a proposal that will contribute to the delivery of the Key Planning Objectives set out in PPS1 should expect expeditious and sympathetic handling of the planning application.

References

CLG (2006a). *Building a Greener Future: Towards Zero Carbon Development.* Available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/153125.pdf (Accessed: 13 January 2011).

CLG (2007). *Building a Greener Future: Policy Statement.* Available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/building-greener.pdf (Accessed: 13 January 2011).

CLG (2008). *Housing and planning: The crucial role of the new local performance framework.* Available at: http://www.communities.gov.uk/documents/localgovernment/pdf/741935.pdf (Accessed: 13 January 2011).

DECC (2011). The Carbon Plan. Available at: http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/carbon_plan/carbon_plan.aspx (Accessed 15 April 2011)

PPS 1. Planning Policy Statement 1: Delivering Sustainable Development. Available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/planningpolicystatement1.pdf (Accessed 05 May 2010)

The World Bank CO2 emissions. (no date). *CO2 emissions (kT).* Available at: http://data.worldbank.org/indicator/EN.ATM.CO2E.KT (Accessed: 19 November 2010).