TEXT JEANNE TAN

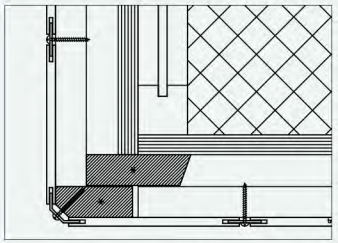
VELVE-LINDENHOF

ACTION PLAN PASSIVE HOUSE

HOW TO REALISE A LARGE-SCALE PASSIVE HOUSE DEVELOPMENT THAT IS QUICK TO BUILD, HAS LOW LIFE-CYCLE COSTS, MAXIMISES FLOOR AREA AND REDUCES EXPENSES.

"Through the use of Trespa® Meteon®, it's possible to complete a façade within a short period of time". *Marcel Besten*

THE AMBITIOUS NEW HOUSING DEVELOPMENT OF GROEN VELVE-LINDENHOF IN ENSCHEDE AIMS TO PROVIDE A SUPPORTIVE ENVIRONMENT FOR ITS RESIDENTS BOTH INSIDE AND OUTSIDE THE HOME. COMMISSIONED BY HOUSING CORPORATION DE WOONPLAATS, THIS IS THE LARGEST 'NEW BUILT' PASSIVE HOUSE PROJECT IN THE NETHERLANDS, MARKING A SIGNIFICANT RECOGNITION OF THE NEED FOR SUSTAINABLE CONSTRUCTION ON A LARGER SCALE. DESIGNED BY BELTMAN ARCHITECTEN, THE PROJECT DEMONSTRATES HOW ARCHITECTURE CAN CONTRIBUTE TO CREATING POSITIVE ENVIRONMENTS FOR ITS COMMUNITIES. ▸



Two examples of the façade construction from the inside to the outside.

Enschede, the Netherlands

About the Project

PRINCIPAL
DE WOONPLAATS
MAIN CONTRACTOR
DE GROOT VROOMSHOOP HOUTBOUW B.V. / TE PAS BOUW
INSTALLER
BIJLBOUW
BUILDING PHYSICS CONSULTANT
NIEMAN RAADGEVENDE INGENIEURS
ARCHITECT
BELTMAN ARCHITECTEN
YEAR
2012
MARKET SEGMENT
INDIVIDUAL HOUSING

PRODUCT
TRESPA® METEON® WOOD DECORS

5 PROJECT COLOURS

FINISH
SATIN

FIXING SYSTEM
TS 550

The neighbourhood of Velve Lindenhof is currently being renovated in a bid to improve the socio-economic circumstances of its residents and rejuvenate the physical surroundings. To achieve this, the residents, together with the municipality of Enschede and housing corporations, drafted the 'Actieplan Velve-Lindenhof'. The plan addresses the needs of the community through keeping operating costs low, new sustainable housing and providing a nurturing environment. A part of the redevelopment comprises 211 new low-cost houses, 82 of which will receive the Passief Bouwen certification. From the outset, the residents were active in all areas to help shape their new housing.

> "We want to make sure that the energy bills here remain affordable". *Marcel Besten*

BENEFITTING THE LONG AND SHORT TERM

A low cost of living remains a major consideration for these residents. Architecture can contribute to reducing that through addressing the building's life-cycle costs, of which long-term operating costs comprise a big chunk. According to De Woonplaats, energy efficient housing is the best way to minimise this expense, especially concerning winter heating. "In the coming years, energy prices are expected to increase," says Marcel Besten, project manager at De Woonplaats. "We want to make sure that the energy bills here remain affordable". Maintenance needs also add to rising household expenses. Therefore the choice was made to build the new houses according to Passive House principles which focus on minimising energy loss and reducing energy usage. A smart choice of materials for sustainability and durability completes the picture.

To minimise heat loss, these houses – there are six types – are equipped with a tight thermal envelope created by heavy insulation and good air tightness combined with triple glazing. Heating requirements are minimised through southern orientation to maximise passive solar gain, a heat recovery ventilation system and solar thermal collectors for hot water. For summer cooling, openings in the stairwell expel hot air. Residents are also provided with regular guidance about energy saving. This means the total EPC value (energy performance index) will not exceed 0.4 (standard is 0.6). This translates into a clear architectural strategy: open southern-facing façades with generous openings housing living functions and more closed northern-facing façades accommodating service functions. According to Beltman Architecten, the architecture here is utilised as a medium to express the message of passive building.

MINIMISING WEIGHT, MAXIMISING FLOOR AREA AND REDUCING TIME

To support the project's construction, environmental and economic aims; innovative construction methods were needed. Three main construction considerations were: minimising weight (reducing pressure on the foundations), minimising wall thickness (increasing floor area) and fast installation (reducing on-site construction time and effort). In this way, a lightweight prefabricated FSC timber frame system devised by De Groot Vroomshoop Houtbouw B.V. with a panel façade of Trespa® Meteon® provided the solution. "A Passive House requires optimal insulation and this increases the wall thickness," explains Harm Valk from Nieman Raadgevende Ingenieurs. "By using a sheeted façade, this delivers a saving of 8-10 cm in wall thickness in comparison with brick masonry". The prefabricated frame enables speedy construction as the whole structure is delivered ready-made to the site. "Therefore it's possible to build one house per day," says Besten. "Through the use of Trespa® Meteon®, it's possible to complete a façade within a short period of time and there is no wastage remaining because the panels are delivered ready-made on site". Known for its durability the material ticked all the right boxes regarding the façade's longevity, needing minimal replacement and maintenance during the building's life span. Valk adds another technical advantage: "From the standpoint of fire safety (fire spread) between the houses, Trespa® Meteon® is a good choice because it requires no additional treatments for fire-proofing".

> "This delivers a saving of 8-10 cm in wall thickness in comparison with brick masonry". *Harm Valk*

CREATING A NATURAL LOOK

The choice of Trespa® Meteon® supports the long-term vision of the project while creating a distinctive identity for the new neighbourhood. The three types of Trespa® Meteon® (NW02, NW03, NW08) cut precisely into vertical boards, are attached invisibly to create a flush façade – the screws are fastened in the connecting strips. Valk: "Through the tight measurements, a permanent detailing solution is possible which supports the low-maintenance character of the façade". Architecturally, the flexibility of the system enables application across the differing façades to create visual unity while offering variations in finish and colour. Besten explains: "The three different timber shades used in random sequence, in combination with the dark brickwork, create a visual variation. A natural 'green' atmosphere will result once new trees are planted in front of the houses". Koert Helman from Beltman Architecten echoes the same sentiment: "The neighbourhood has a very natural look and exudes a certain warmth". Feedback from the residents confirms they are very positive about their new homes: happy residents equal well-cared-for buildings delivering priceless benefits in the long run. ▪