PRIMROSE PARK

PASSIVHAUS SCHEME-ACHIEVING THE STANDARD

PRIMROSE PARK
Low energy, high comfort homes

WARM: Low Energy Building Practice

Plymouth Community Homes

mi-space
creating communities

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Introduction

Introduction

- Chris Herron – Operational Manager – Mi-space
- Headed up the Primrose Park Passivhaus Scheme
- 22 Years in the Industry
- Mi-space is a part of the Midas Group, one of the most respected privately owned construction companies in the UK
- Sally Godber – Director – Warm Partnership
- Headed up the Passivhaus Design for Primrose Park
- 19 Years in the Industry
- Primrose Park –Passivhaus Scheme & Achieving the Passivhaus Standard

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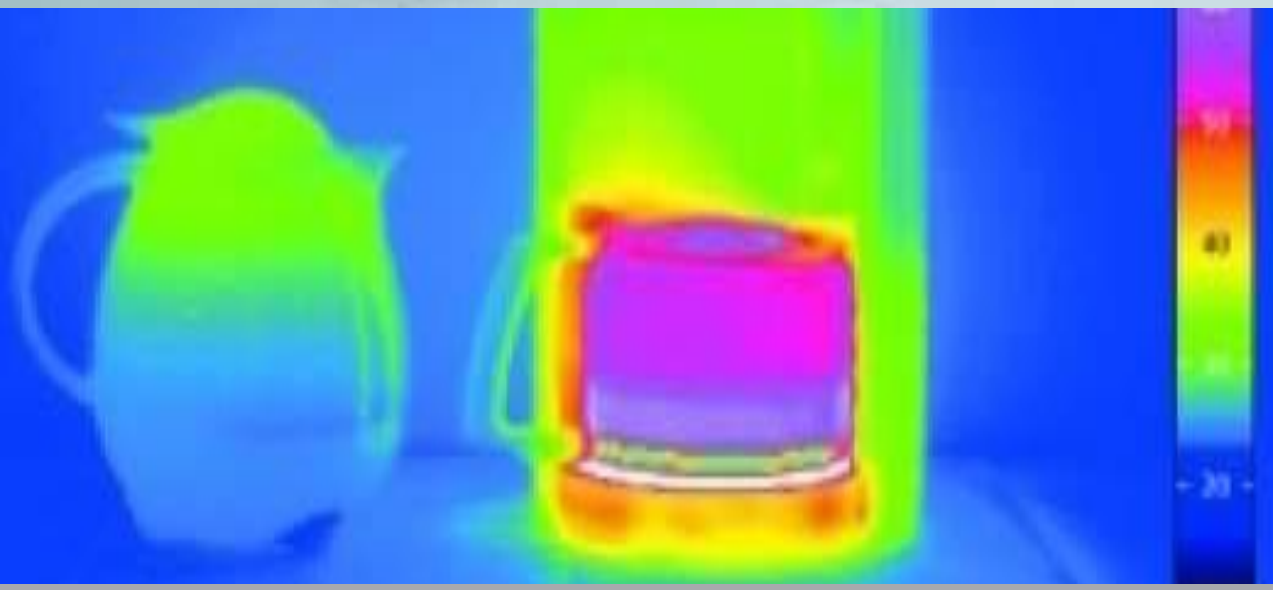
Passivhaus Principles



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What is Passivhaus?

- An approach for achieving low energy buildings which really works
  - A concept for highly insulated, air tight buildings with mechanical vent heat recovery ventilation
  - A tool to model building energy and give feedback to designers throughout the design process
  - An independent certification process to verify both the design and its implementation

A Comfort Standard

- No draughts
- No cold spots or areas
- Comfortable summers
- Constant supply of fresh filtered air
- Eliminate fuel poverty

All by simply improving the build quality

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The Scheme

Why Passivhaus?

- PCC Public Land Initiative - ‘Get Plymouth Building’
- Former Hillside & Woodland School
- Expensive – Site Abnormal Costs (Steep!) and Passivhaus costs
- Land Price – PCC sold the land for £1
- HCA – Increased Grant Rate (about £8k+)
- Buildings to perform 20% better than Building Regulations or use Renewables
- Project required adherence to Passivhaus Principles only!

The Site

- 72 dwellings
- 100% affordable
- 49 Affordable Rent
- 23 Shared Ownership
- 16 Life Time Homes
- Mix of 6, 1 bed apartments & 66 2 & 3 bed houses
- Procured through 2 Stage Tender

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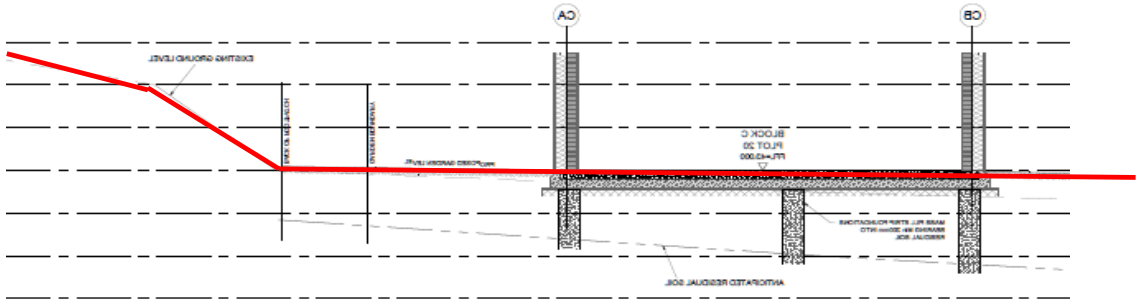
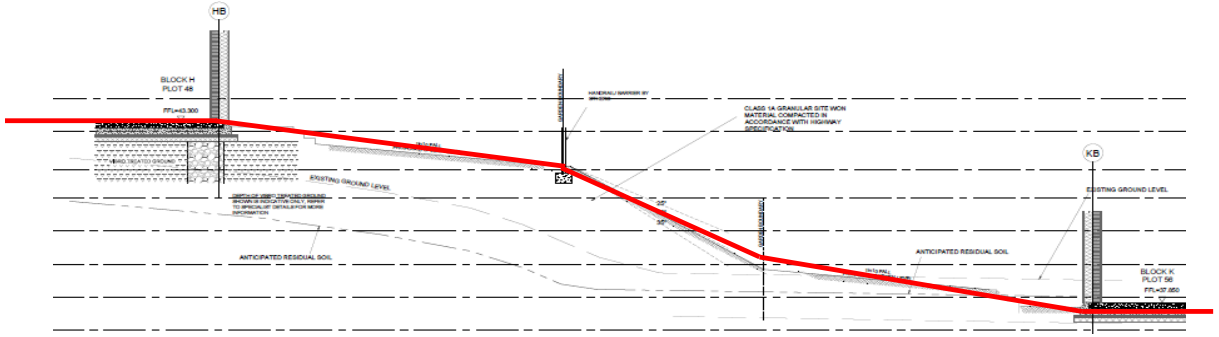
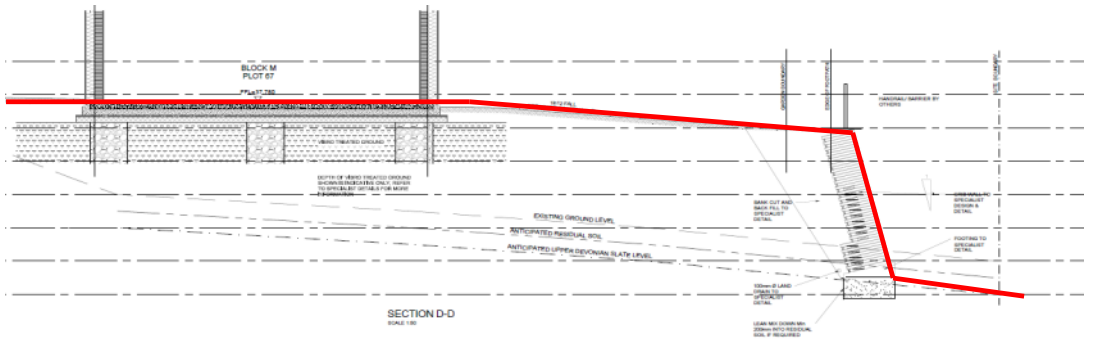
The Site





- Level difference through the site
- 13.500m from top to bottom
- Crib lock retaining walls
- Engineered banks



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Design

Design Principles

- Long Terraces - reduce the external envelope area for increased efficiency
- Windows with high value insulation and low values of cold bridging Triple glazed.
- Window detail that allows for good lighting, but recessed to limit summer solar gain. (long debate on this subject)
- Position of properties to maximise solar gain

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Design

- Elimination of cold bridging
- High levels of air tightness max 0.6acph
- Standardised design & construction to eliminate waste
- What heating is required comes from sources such as :
  - The Sun
  - The human occupants
  - Household Appliances
  - Other heating devices providing less than 10kW per square metre per annum

General Layout

- Break the monotony of the long terraces with colour to enable individual identities
- Simple palette of robust materials
- Simple construction method based on rectangular buildings that are easier to insulate and seal
- Sense of arrival – 3 storey bookend flats
- Sense of space
- Village square as a visual focus and meeting area

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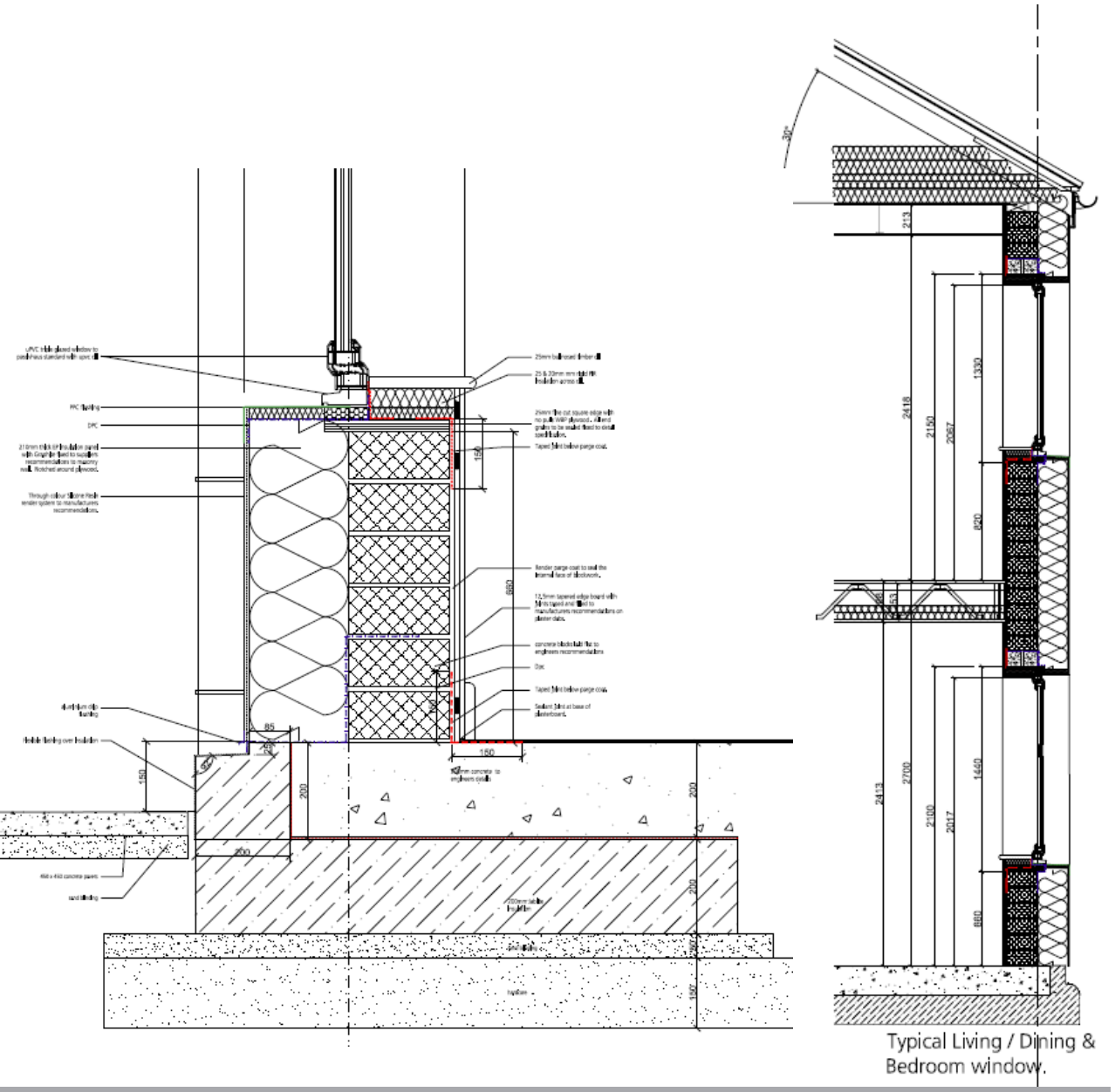
Construction and Commercial

Construction Techniques

During the 2nd Stage, various construction methodologies were design tested on the criteria of:

- Passivhaus Principles
  - Ease of achieving high insulation
  - Ease of achieving air tightness
- Cost
  - A key client driver was in achieving value for money
- Buildability
  - Ensuring our local supply chain could deliver the scheme
  - No complicated detailing



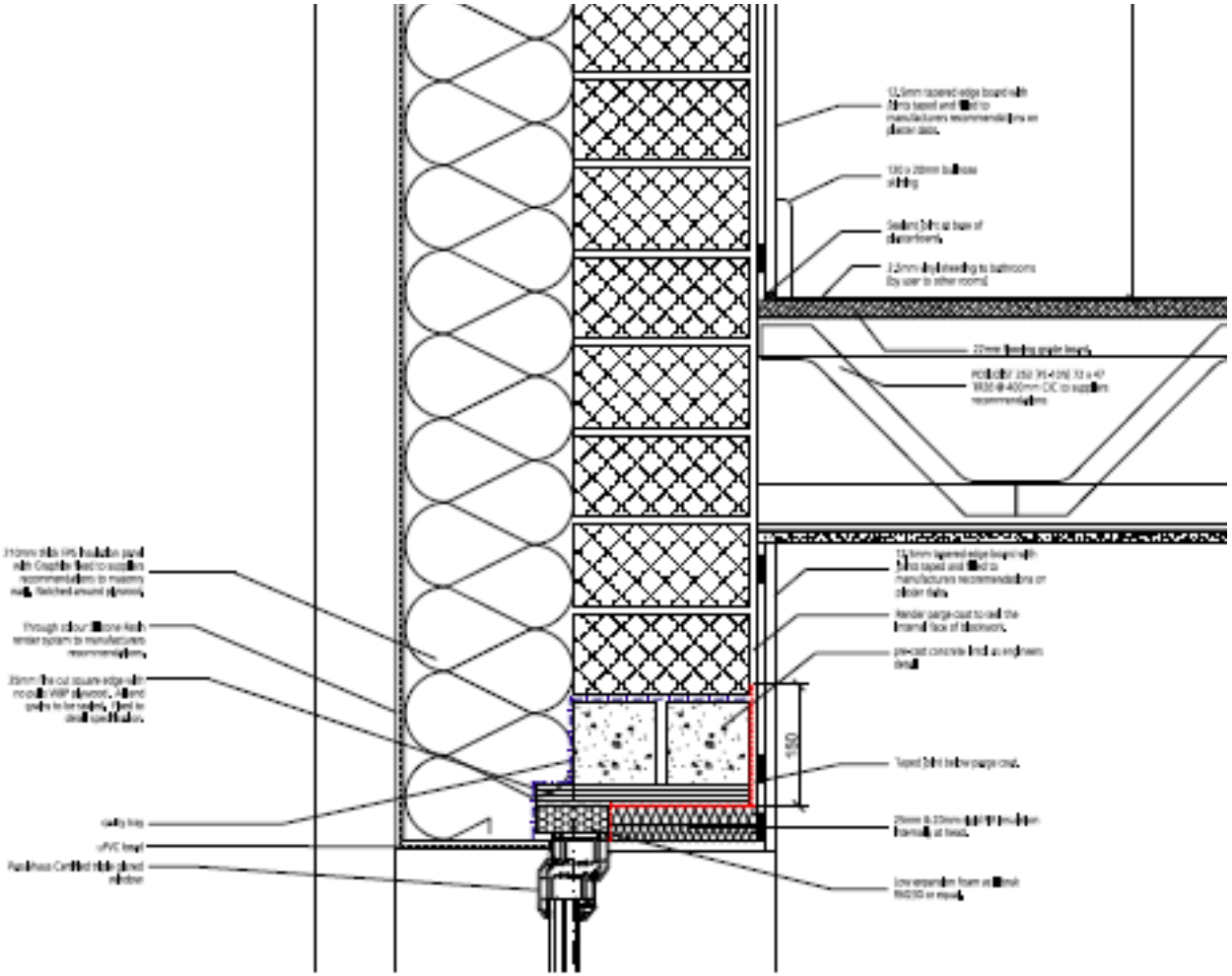
Typical Living / Dining & Bedroom window.

Construction Techniques

Simplicity

We came to understand the necessity to keep everything simple. Various solutions for the construction methodology were tested. The final solution was a block laid flat with an internal parge coat and an external insulated render system.

Other systems considered included off site SIP, Composite Panels and timber frames, however for us, these all brought complexity and the associated increased risk.



Construction Techniques

In addition to the principle of simplicity we also understood the real need to be fully designed before starting work on site.

So to summarise:

- Keep it simple
- Design it fully
- Build it right
- Record, Record, Record

Collaboration

- Project Team was involved throughout the whole process – NO LOSS OF KNOWLEDGE
- Challenged design from the outset
- Early procurement of supply chain
- This allowed the key supply chain members to influence the design
- Carried out weekly squad checks on drawings with both design team & supply chain
- Close monitoring of Programme through the adoption of the Collaborative Planning/Last Planner techniques
- One Team ethos, Client/Design Team/Contractor & Supply chain working towards a common goal

Commercial

When considering Passivhaus you will need to think about the investment costs, however keeping the principle of simplicity in mind the extra over costs need not be extreme. At this scheme our assessment is an extra over cost of £7k per dwelling. Excluding site abnormals.

We believe that a cost increase could be offset against renewable energy solutions. The key is to keep to the simplicity theme. The more complex the building the more the cost will increase.

Commercial

- Time, Cost & Quality all linked
- Weekly reviews of Risk Register/KPI's & costs
- Payment linked to quality sign off
- Robust Quality Assurance Procedure in place
- Identification of tasks & associated payment for the task agreed with the supply chain at tender stage
- Holding people to account & do not accept incomplete or substandard work

To Certify, or Not to Certify

Passivhaus Principles?

Or

Passivhaus Certified?

We have been asked this question several times and having now had the benefit of delivering some units I would state that the single largest benefit Passivhaus Certification brings is the robust validation process you go through. It holds the whole team to a standard that you cannot escape.

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Research – Passivhaus Performance

Primrose Park Monitoring

Post occupancy monitoring of Primrose Park

- Direct comparison of Passivhaus against a similar sized Building Regulations compliant scheme developed by PCH, both completed in 2018
- In-depth monitoring of 20 houses from each site including:
  - Internal conditions logged (temperature and humidity hourly)
  - Regular questionnaires
  - Energy readings
- Mixture of rented and shared ownership homes
- The monitoring will run for 2 years & will be complete summer 2020

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Residents

Preparing for Occupation

- Joint training sessions with Maintenance & Development teams by WARM & Mi-space
- Scheme briefing sessions – Lettings Team/ Housing Officers
- Handy Guide to Passivhaus – DVD/ YouTube
- Additional support at sign-up
- Post occupancy visits and monitoring – WARM
- Offering servicing to Shared Owners (MVHR)

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Summary

Summary

- The brief and contract was to achieve Passivhaus Principles. We achieved 100% certification without incurring additional cost, taking longer or affecting overall quality. The scheme is still the largest affordable fully certified Passivhaus development in the South West.

- Simplicity – This might seem insignificant, but right from the beginning we recognized that to achieve the best results we needed to keep it simple & using this simple thought process at every step of the way ensured we had:
  - An affordable product
  - An easily buildable product
  - Simple procurement – Price quoted price paid.
  - Quality built in through predetermined check points.

Summary

- Incredibly comfortable
- PROVEN low energy buildings
- Happy occupants
- Small, simple building services
- Low maintenance (& understandable)
- Predictable, low running costs
- Low rent arrears & turnover of tenants
- Long lasting: focus on fabric means little to replace

THANKS FOR YOUR TIME

Any Questions?

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