

RIAI

EUSEW Energy day

Case studies in Retrofit and Circularity

Climate Challenge



Sustainability Policy

RIAI strategy 2023-2027

RIAI 2030 Climate Challenge

RIAI 2030 Climate Challenge target metrics for: Domestic Buildings



Sustainable Outcome metrics	Current Benchmarks (Part L 2019)	2025 Targets	2030 targets
Operational Energy kWh/m ² /y	90kwh/m ²	60kWh/m²	35kWh/m²
Embodied Carbon kgCO ₂ e/m ²	1200 kgCO ₂ e/m ²	<800kgCO ₂ e/m ²	<625kgCO ₂ e/m ² <small>(A1-A5 < 400 kgCO₂e/m²)</small> Higher target < 450 kgCO₂e/m² <small>(A1 -A5 < 300 kgCO₂e/m²)</small>
Potable Water	None required. DEAP credit where < 125 l/p/day	< 95 l/p/day	< 75 l/p/day

Typologies:

Domestic, Non-Domestic, Schools

Targets:

1. *Operational Energy*
2. *Embodied Carbon*
3. *Water*
4. *Health + Wellbeing*

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The Willows, Dublin

Case study 1 [Domestic]

The Willows

1970s detached house

Conventional construction – cavity masonry walls, timber floors, flat roof

Context

EnerPHit standard

Added value





Fabric First approach

Circularity

Design for Performance

Regeneration





Acknowledgements

Client: *Private*

Architects: *Peter Nickels Architects*

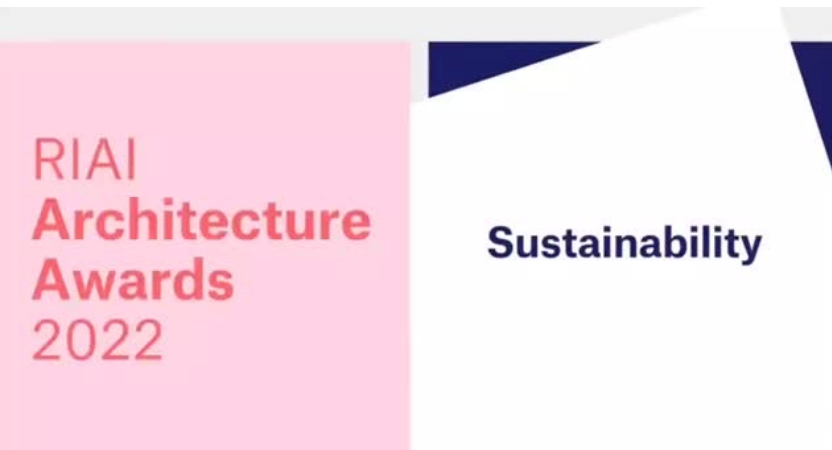
Thermal/Moisture Expert: *Earth Cycle Technologies*

Structural Engineers: *Niamh O Reilly Structural Engineering*

Main Contractor: *Leopardstown Construction*

Outcomes

- Increase in floor area from 179m² to 273m²
- Gas supply eliminated = all electric
- BER [EPC] D2 upgrade to A3 (54.16 kWh/m²/yr)
- EnerPHit standard
 - Space heating demand of 24.6 kWh/m²/yr
 - Primary Energy demand 94 kWh/m²/yr (PHPP)
 - Airtightness 0.98 (m³/hr)/m²
- Actual Energy Consumption **33.76** kWh/m²/yr
- 50% reduction on utility bills to €1,294/yr
- Embodied Carbon 282 kgCO₂e/m²
- Awards



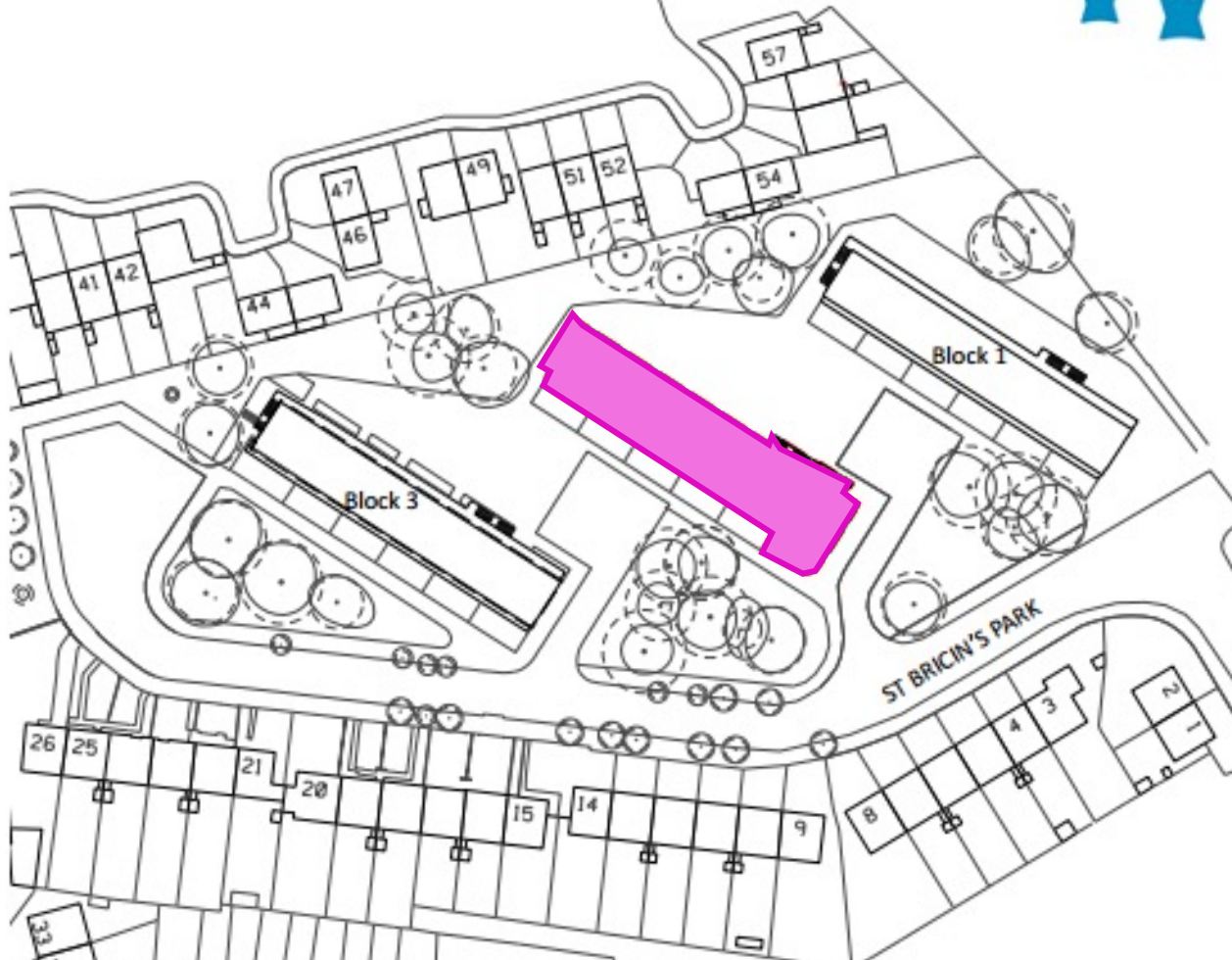
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St.Bricin's Park, Arbour Hill

Case study 2 [Senior Citizen Housing]

St.Bricins Park



1960s original construction =
Concrete slab, concrete block walls and
tiled roof

Bedsit amalgamation programme

EnerPHit standard

SEAI Deep Retrofit Grant



Collaboration



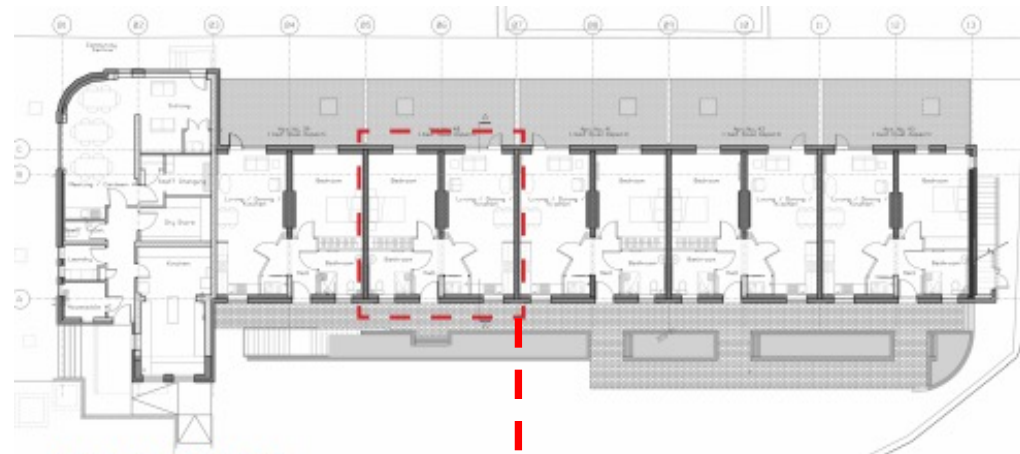
Design for Replacement



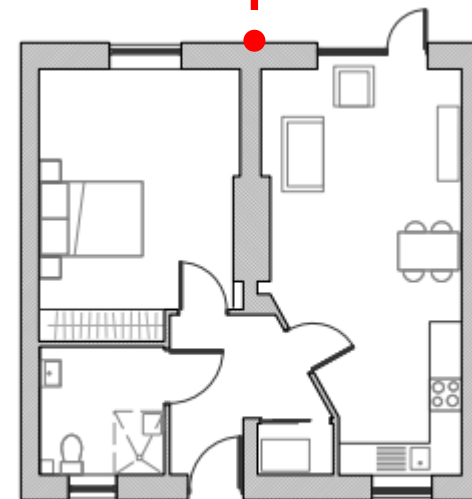
Upskilling



Future-proofing



Ground Floor Plan Block 2



1 Bed Apartment Unit Type
Scale: 1:100



Acknowledgements

Client: *Dublin City Council Housing and Community Services*

Project Manager: *City Architects, Dublin City Council*

Architects: *Low Energy Design*

Electrical Engineers: *DCC Electrical Engineering Services*

Mechanical Engineers: *Morely Walsh Mechanical Engineering*

Structural Engineers: *DCC Structural & Civil Engineers*

Quantity Surveyor: *DCC Quantity Surveyors*

Main Contractor: *Westside Civil Engineering*

Density

Site Area: 0.92HA

Housing Density: 38Units/HA

22 bedsits (approx. 26m²) amalgamated
to 11 one bed apartments (approx. 60 m²)

Outcomes

- Low maintenance
- Gas supply eliminated = all electric
- BER [EPC] E2 upgrade to A3 (63.8 kWh/m²/yr)
- 80% reduction in energy use
- Awards
- EnerPHit certification
 - Space heating demand of 22kWh/m²/yr
 - Primary Energy demand 127 kWh/m²/yr
 - Heat load 11W/m²
 - 0.55 ACH
 - €54/yr annual space heating costs (20



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The Rediscovery Centre, Ballymun

Case study 3 [Community]

Rediscovery Centre



1960s boiler house

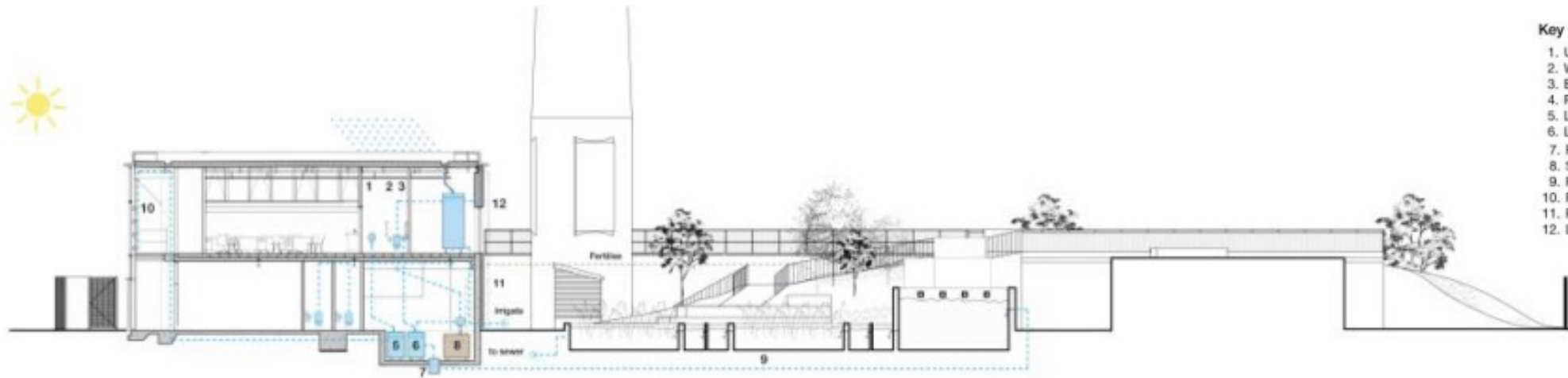
Conventional construction –masonry walls, steel frame, flat bitumin roof

National Centre of Excellence

Innovative reuse enterprises



“It’s a difficult thing when one has a desire to recycle and reuse, because you’re never entirely sure of what you can reuse and recycle, even up to the detailed design stage.”



- Key**
- 1. Urinal
 - 2. WC
 - 3. Basin
 - 4. Rainwater Storage Tank
 - 5. Liquid Foul Waste Dilution Tank
 - 6. Liquid Foul Waste Storage Tank
 - 7. Pump
 - 8. Solid Foul Waste Earthworm Composter for Fertilizer
 - 9. Reed Beds, 5 Step Filtration & Water Treatment Ponds
 - 10. Plants utilize liquid waste & provide fertilizer crop
 - 11. Rainwater Overflow Biodiversity Pond
 - 12. Living Green Wall Biodiversity Planting

Water Re-use & Treatment

Circularity

Education

Exemplar

Regenerative





Acknowledgements

Client: *The Rediscovery Centre/Dublin City Council*

Architects: *ABK Architects*

Consulting Engineers: *Homan & O'Brien Associates*

Structural Engineers: *Punch Consulting Engineers*

Quantity Surveyor: *AECOM*

Main Contractor: *Purcell*

Outcomes

- Demonstration and Education
- Circularity in practice
- Low embodied carbon
- BER [EPC] A2 (90.84 kWh/m²/yr)
- 80% energy generated on site
- Airtightness 2.16/m²/hr
- Building Control Amendment Regulations
- Awards



Rewarding excellence
in sustainable energy



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Thank you
