



Modern Methods of Construction (MMC)
Rapid Build Modular Homes Programme,
Presentation to Joint Committee on Housing,
Local Government & Heritage

OPW

2nd May 2023

Rapid Delivery Homes Milestones:



- **28th June 2022:** Memo for Government approved: Phase One 500 units
- **4th July 2022:** Procurement of Main Contractor
- **28th September 2022:** Procurement of Rapid Build manufacturers as Subcontractors to Main Contractor
- **7th November 2022:** Commencement of off-site factory production
Commencement of site works on first available sites
- **December 2022:** Programme expanded by Government: 200 additional rapid build homes
- **Late Jan 2023 onwards:** Deliveries of completed housing units & installation on site
- **May 2023 onwards:** Completions of sites for Phase One
- **June 2023 onwards:** Phased Handover of sites to DCEDIY with homes ready for occupation & management
- **August 2023 onwards:** Phase Two Completions: Dependant on availability and quality of sites on offer



Rapid Build Homes



URMH – Single Storey Design



Interior – Looking from kitchen to lounge area



Interior – Looking from lounge to kitchen area

Single Storey Unit – 3D Architectural Model

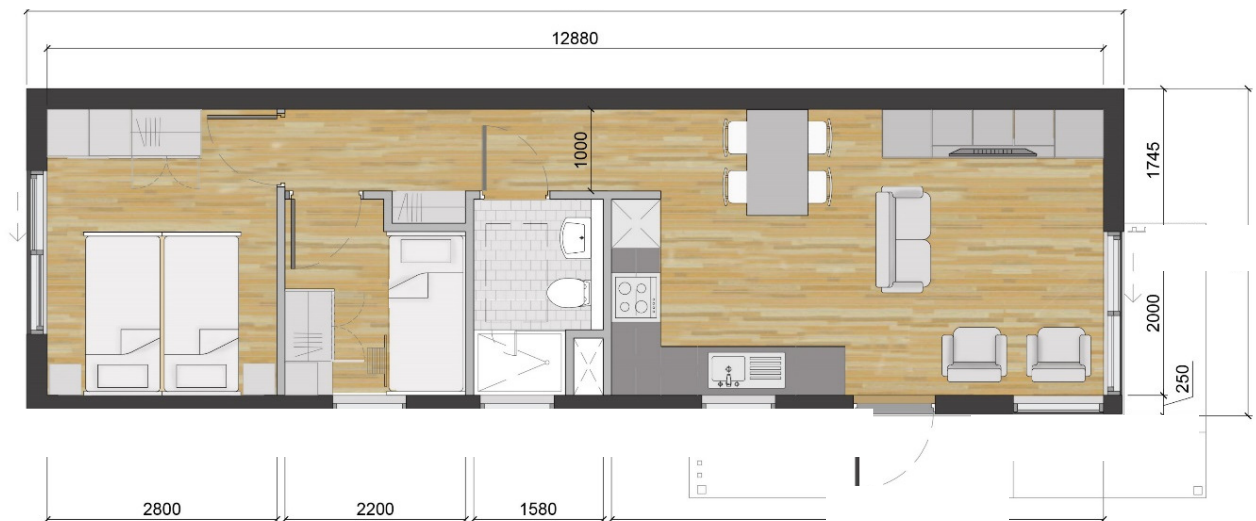




High-Quality Rapid Build Homes built Completely in a Factory Environment and Lifted onto Site.

A exemplar prototype;

- Centralised standard to which all manufactures will need to adhere. Gives level playing field for tendering.
- Fixed design to give certainty to manufactures and aid speed of deliver.
- Option to convert sofa into additional bed to sleep up to 6 people.



Single Module:

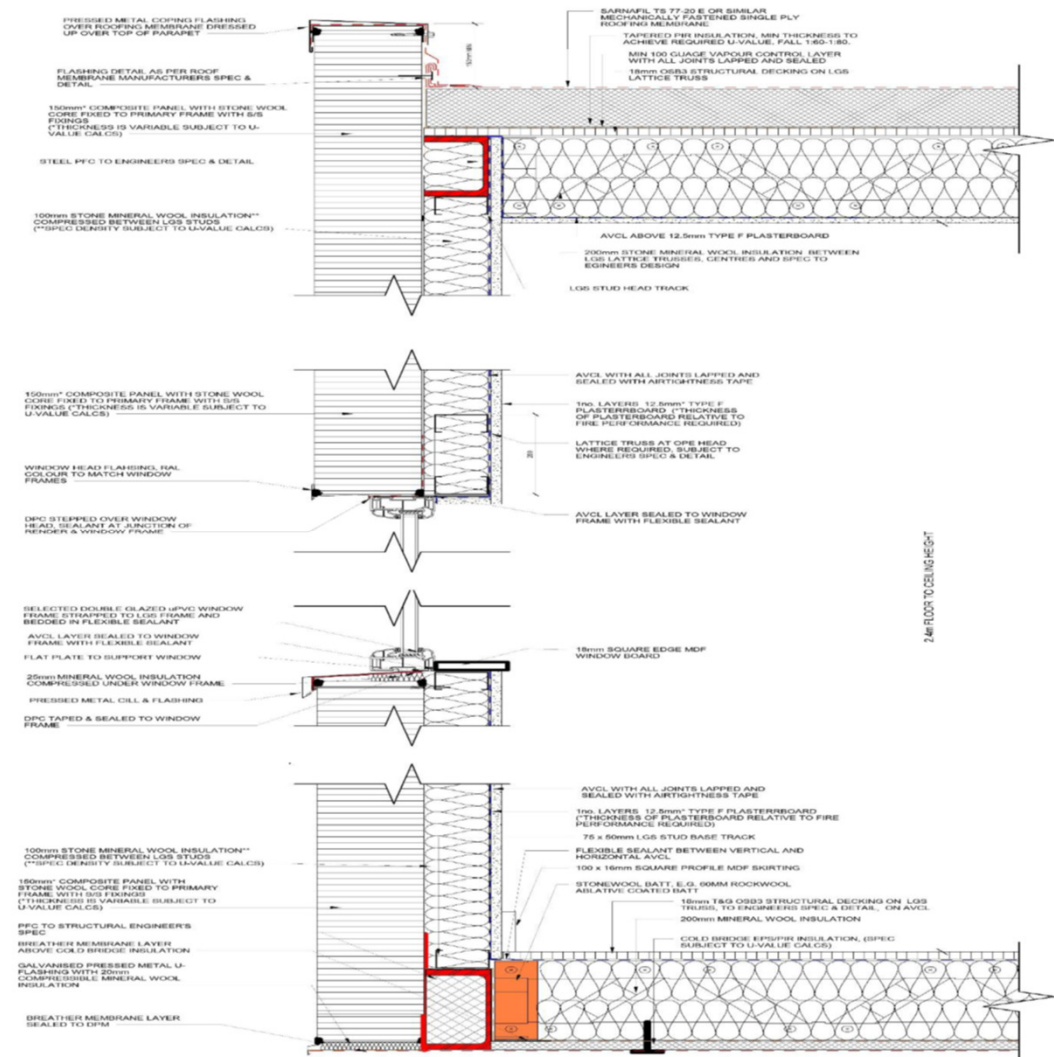
Purpose: Own door access, Independent living homes to accommodate family of 4 people (45m² / 484sqft)



Standards & Quality

General Description:

- 60 Year structural lifespan
- Standards – TGD Building Regulation compliance, allowing for future renewables.
- Insulated to A2 Standard
- Fully Wired and supplied with RECI certification
- Fully plumbed tested and certified
- Integrated electric hot water heater providing hot water supply to Kitchen and bathroom
- Thermostatically controlled Electric room heaters
- Fully finished internal walls, floors and ceilings
- Double glazed windows and doors.



Development of Technical details & standards by OPW

Off site construction 2D panelised / 3D volumetric



2D Volumetric - Key Factors:

- Slower delivery time than 3D Volumetric, quicker than traditional masonry method
- Scale required to give repetition.
- 'Flat-pack' panels lifted into position and bolted together.
- Full scaffolding required.
- All traditional trades on site.



3D Volumetric - Key Factors:

- Speed of delivery.
- Greater programming certainty
- Complete factory finished homes.
- Reduced site work, enabling works only.
- Improved Health & Safety
- High standard of quality Control
- Fully portable housing.
- Reduced wastage.



Site Development



URMH – Key Project Benefits

The benefits of such a scheme include but are not limited to:

- Speed of Delivery
- Greater programming certainty
- Turnkey approach for complete factory finished homes
- Reduced site work
- Improved H&S standards
- High standard of quality control
- Fully portable housing with 60 year lifespan
- Reduced waste



Exemplar Site Layout



- Variety of Layout
- Semi-detached homes
- Semi-private front curtilage & private rear gardens, sizes in accordance with Social Housing guidelines
- Density: In compliance with the 'Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas' for both urban sites (35-50 units/ha) and edge of urban sites (20-35 units/ha).
- Permanent infrastructure, streets, water, waste, roads, pedestrian routes, lighting, landscaping, public & private space.
- High quality landscaped amenity space
- High quality public Realm in accordance with the Design Manual for Roads & Street





Sustainability & Amenity

- Reuse of onsite excavation material
- Buffer mounding & Planting to maintain amenity of neighbours
- Similar to OPW approach taken of Forensic Science Ireland site.
- Biodiverse planting, no invasive species
- Avoiding landfill to reduce carbon footprint
- Insulated to A2 Standard

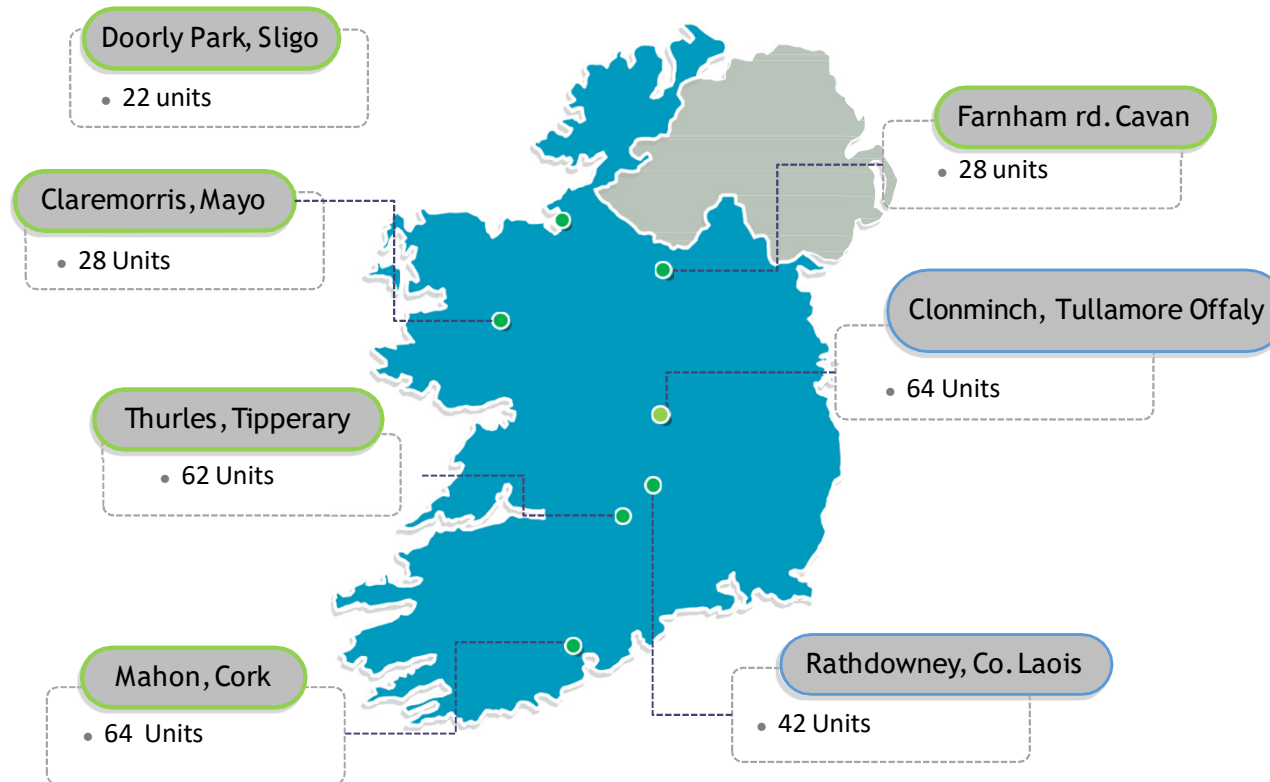




Site Progress

Current Sites

(Phase 1 & Partial Phase 2)



*Site feasibility is currently being assessed, some sites may not be viable
EXTRA SITES.

Ballinure, Mahon, Cork City

- 64 no. modular homes.

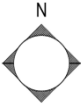


Farnham Road, Cavan

- 28 no. modular homes. (Larger sites improved economics)



Gortataggart, Thurles, Co. Tipperary.



- 62 no. modular homes.



Claremorris, Co. Mayo



- 28 no. modular homes.



Doorly Park, Sligo



- 22 no. modular homes.



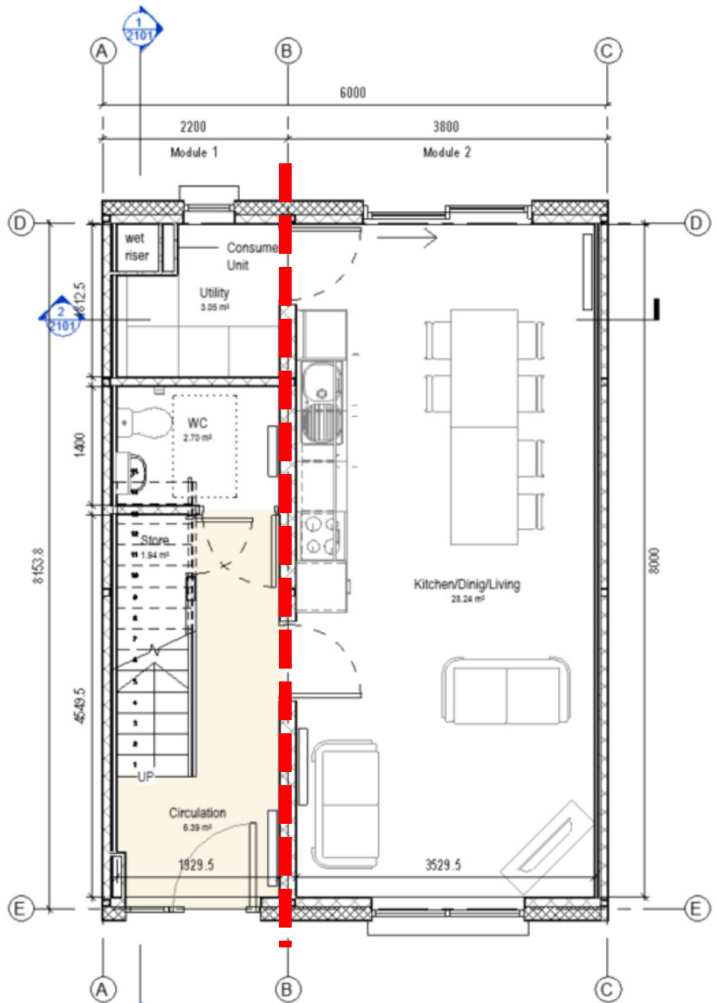


Multi Storey Units Options



URMH – Draft Two-Storey Modular house

- 3 Bed Layout
- Modules – 4 per dwelling (integrated roof on top 2 modules)
- Roofscape – low pitch due to height restrictions (4.5m max height – for transport purposes)

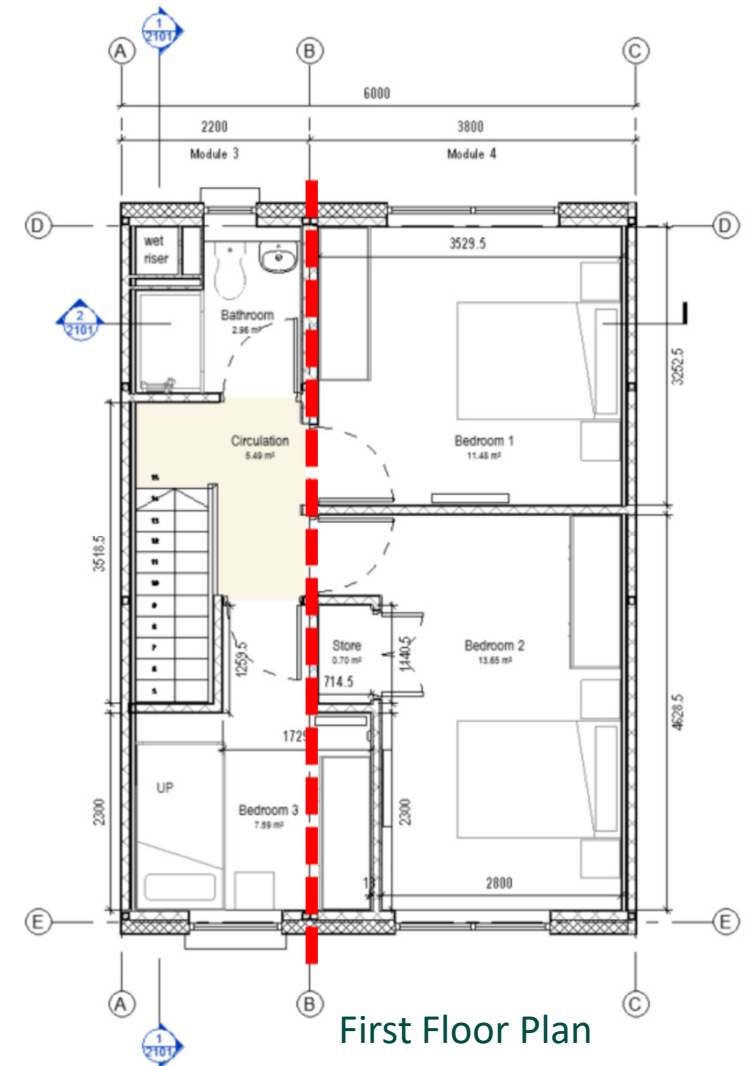


Ground Floor Plan

Key Dimensions (Internal)

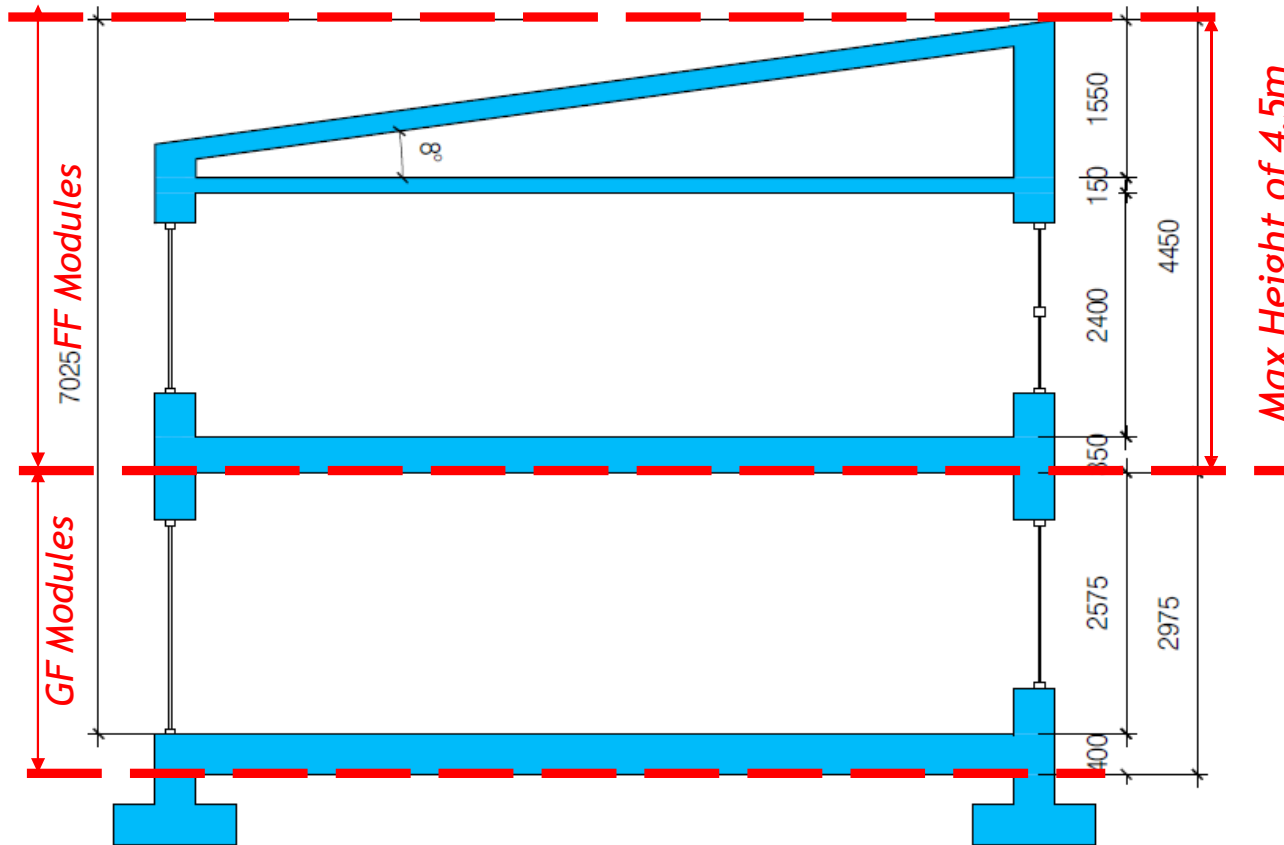
- Plot width – 6.5m
- Plot Depth – 7.8m
- GIA – 98m²

*Red line indicates join line between modules



First Floor Plan

URMH – Draft Two-Storey house – MonoPitch



Section – Key Considerations

- Ceiling Heights – 2575mm & 2400mm
- Floor Cassettes – 350mm (TBC)
- Ceiling Cassette – 150mm (TBC)
- Max Module height – 4.5m
- 4 modules required

URMH – Draft Two-Storey house – Materiality – Monopitch



Walls

- Brick Slips & Render

Windows & Doors

- Timber/ Alu Clad double glazed units.

Roof

- Standing Seam Roof System.



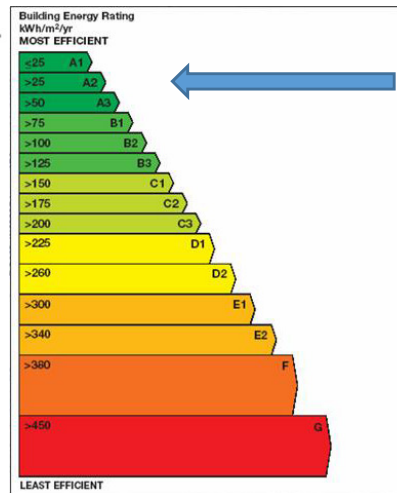
URMH – Draft Two-Storey house – Electrical Renewables

Calculation 3: Improved TB factor

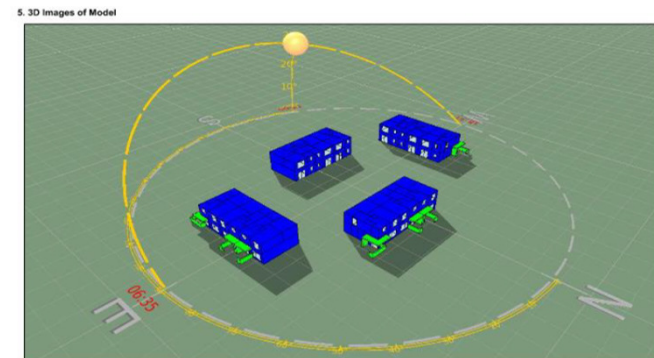
House	Thermal Bridging	BER	Energy Value	CO2 Emission	EPC	CPC	RER	PV required for A1		Part L compliant
	W/m2K		kWh/m2/yr	kgCO2/m2/yr	<0.3	<0.35	>0.2	No. Panels	kWh.yr	
EoT1	0.15 (default)	A2	44.19	8.69	0.268	0.257	0.514	3	900	Yes
	0.11	A2	41.97	8.25	0.255	0.245	0.513	3	800	Yes
	0.08 (ACDs)	A2	40.31	7.93	0.244	0.235	0.511	3	700	Yes
	0.035	A2	37.83	7.44	0.229	0.220	0.509	2	600	Yes
MT	0.15 (default)	A2	40.24	7.91	0.266	0.257	0.511	3	700	Yes
	0.11	A2	38.51	7.57	0.254	0.246	0.510	2	650	Yes
	0.08 (ACDs)	A2	37.22	7.32	0.246	0.238	0.508	2	550	Yes
	0.035	A2	35.31	6.94	0.233	0.225	0.506	2	500	Yes
EoT2	0.15 (default)	A2	43.98	8.65	0.267	0.256	0.514	3	850	Yes
	0.11	A2	41.81	8.22	0.254	0.244	0.513	3	750	Yes
	0.08 (ACDs)	A2	40.18	7.90	0.244	0.234	0.511	3	700	Yes
	0.035	A2	37.76	7.42	0.229	0.220	0.509	2	600	Yes

Notes: U-Values mentioned below are used for the calculations.

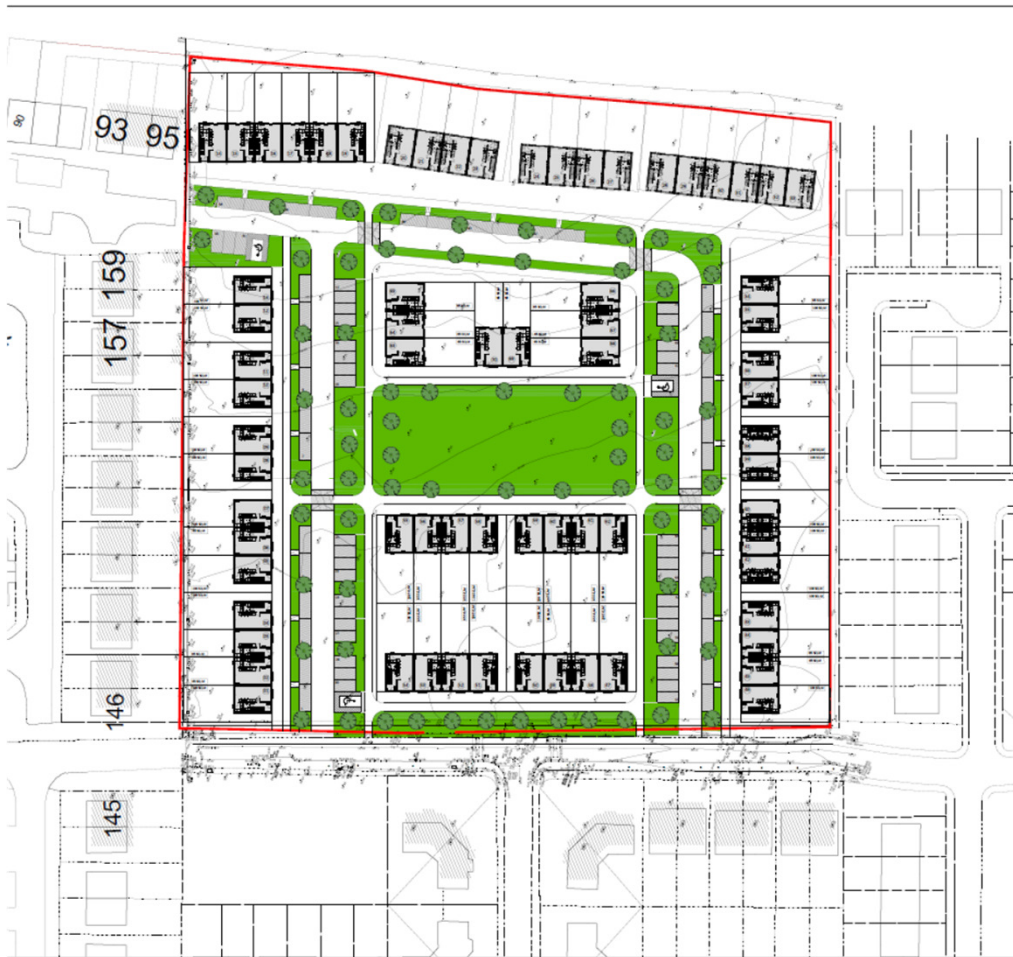
Building Fabric	U-Value
Roof	0.15 W/m2K
Walls	0.18 W/m2K
Floor	0.18 W/m2K
Windows & Doors	1.20 W/m2K
Air Permeability	3m ³ /(hr.m ²) @50pa (0.15 ac/h)



A2 Rating Achieved



URMH – Draft Two-Storey house – Typical Site Layout



Typical Site Layout

- 70 units - 14 no. semi-d units, 12 no. 3 unit terraces, 32 no. 4 unit terraces and 22 no. 6 unit terraces
- 74 car spaces (including 3 accessible)
- 2 main tree lined avenues
- 6m deep green to front of site creates set back from main road while still addressing the existing grain of the context.
- Consolidated central green area away from roads - Potential central amenity space.
- Density: 35 per hectare in compliance with the 'Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas' for both urban sites (35-50 units/ha) and edge of urban sites (20-35 units/ha).

Modular Manufacturers



 **CASTLE GROUP**



 **LMC**



 **VISIONBUILT**
BUILDING THE FUTURE. OFFSITE.



 **FRAMESPACE**



 **MHI** PRECISION ENGINEERED STRUCTURES



URMH MMC benefits:

- Design solution can adopt any structural system – light gauge steel / timber frame / mass timber
- Activated additional latent capacity within the construction industry.
- Development of embryonic Industry into a full production industry.
- High Quality Construction –consistency of approach
- Reduce waste in construction
- Reduced water & energy consumption
- Activates less skilled labour market
- Improved Health & Safety
- Increased sustainability
- Reduced time on site

Next steps:

- Embodied Carbon review - introduce more sustainable materials.
- Protocol and framework dissemination into the wider construction industry. Review and lessons learnt process.
- Collaborate with utility providers to simplify the established delivery procedures.

