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Cairn Innovation & Digital Design Toolkit

An update on Cairn Homes' pioneering digital toolkit, demonstrating the practical impact of standardised digital processes across live project

Built For Good

Contents

1. Cairn Innovation Approach
2. What is happening currently?
3. Strategic Objectives of the Digital Design Toolkit
4. Design Toolkit - One Year on – Holybanks

Innovation – Core Identity & Strategy 2026

Core Identity

Innovation with purpose

Keeping innovation in focus throughout an active industry
Conversion to create tangible value

Innovation Strategy

Metrics

Develop, tangible metrics to prove results and tangible value created.

Delivering Results

c. 15%

faster construction times than industry average

20,000+

tonnes of carbon reduction

50+

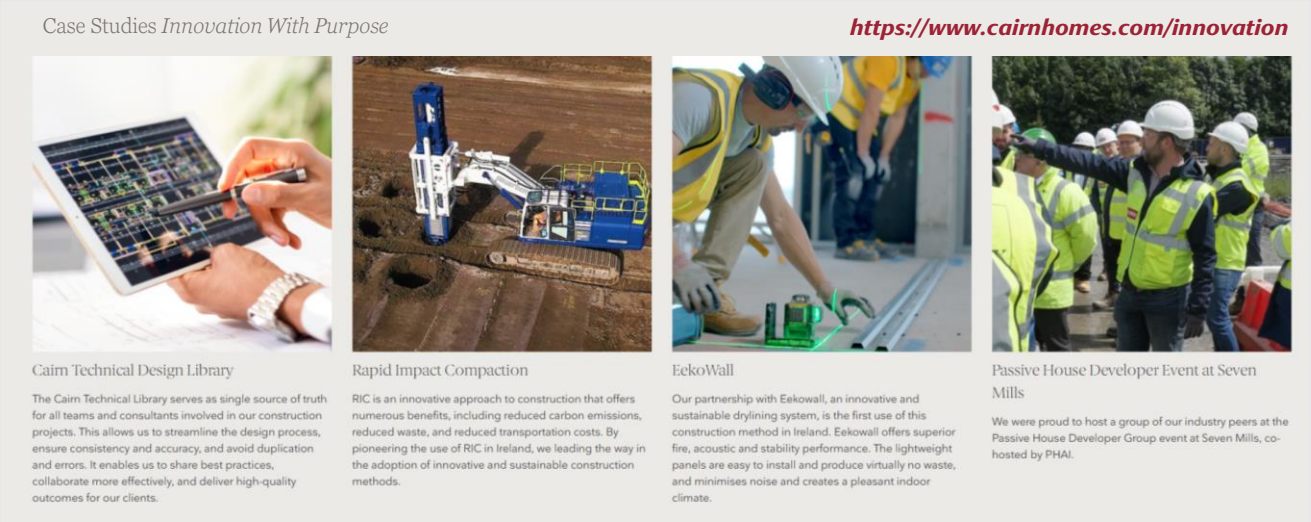
formally registered ideas in research

500+

supply chain, education and research partnerships

Storytelling & Case Studies

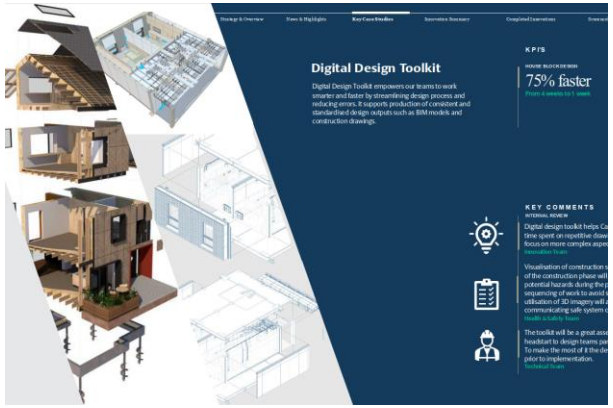
Consistent approach to how we explain what we are doing and where we are doing it.



Strategic Clarity

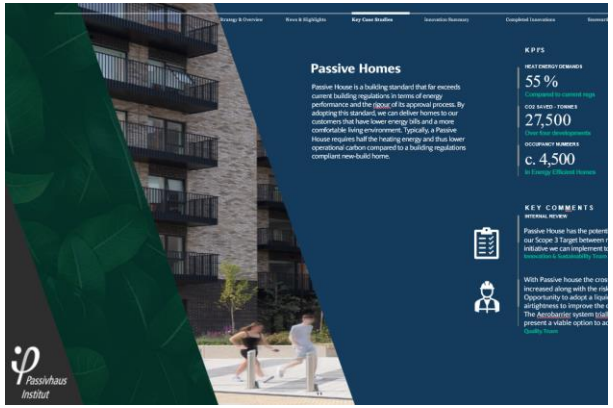
1

Digital Design Tool Kit



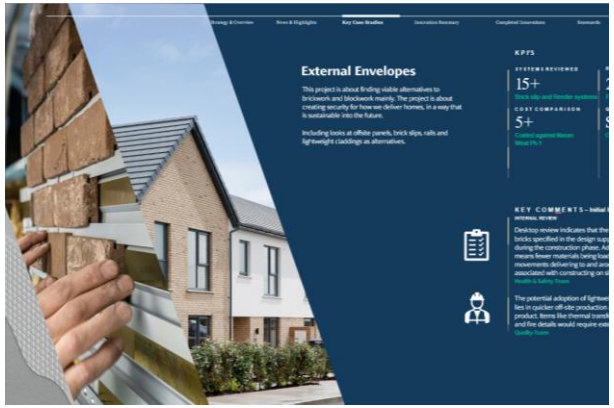
2

Sustainable Homes



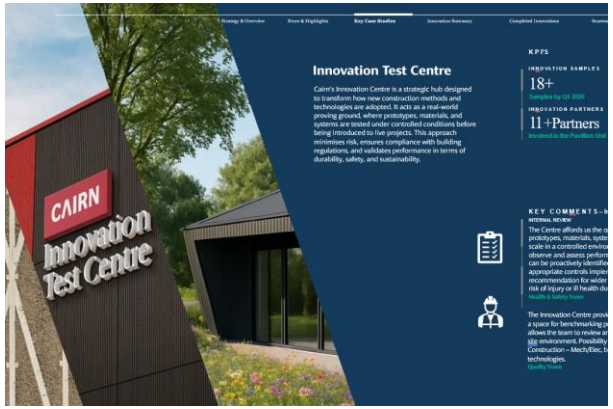
3

Securing Future Delivery



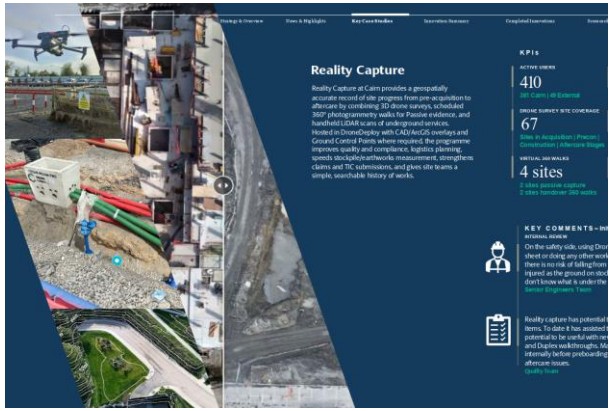
Innovation Report

Recording and discipling how innovation projects are managed



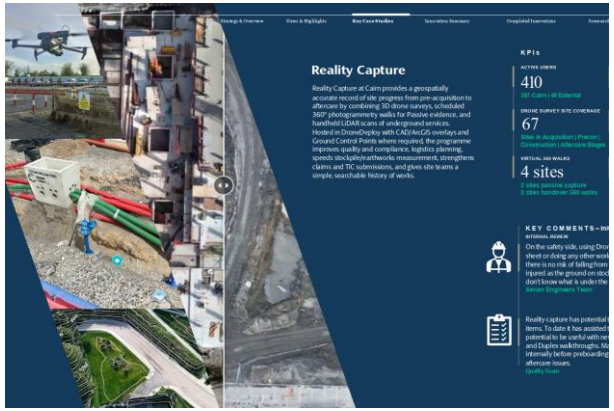
Innovation Centre

4



Digital Operations

5



Customer

6

Innovation Pillars

Focus on these core flagships will be the guide lights for all of our innovation

A Record of Partnership & Innovation Delivery

1

Intewall

2

Digital Design Tool Kit

3

Passive House at Scale

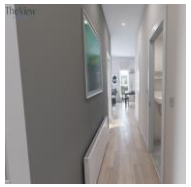
4

Cairn Technical Design Library

5

Bathroom Pods & Utility Pods

6



Digital Show Homes

7

Building with Wood

8

New Unit Typologies

9

Ai : Quality & Progress

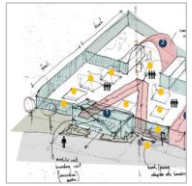
10

Kit of Parts : Balconies & Canopies

11

Reality Capture

12



Innovation Centre

We build things to use them !

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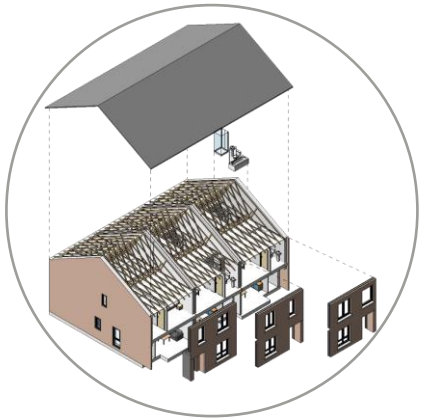
Cairn Innovation 2026 – What is Coming ?

Expanding Drone Capability
AI Recording Quality & Progress

Live Q1 2026

Cairn Innovation Centre
Opening

Live *Summer 2026*



Digital Design Toolkit
Live use on Projects

Phase1 Q3 2026

Product Development
Utility Pods & External Facades

Q1 – Q4 2026

We have some exciting things coming this year

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Why make a Digital Design Tool kit ?

Structured Data

We know that to take advantage of the next age of technology and AI, we need to first organise our data.
AI can't make sense of unstructured information. .

More Effective Ways of Working

A cloud-integrated data platform streamlines operations and enables secure, efficient information sharing and analysis across systems.

Downstream Capabilities

This new type of design information allows us to better structure for future needs and capabilities, Quantities and more.

Protects our product

Means our homes delivery how we want them to our specifications.
Protects our customers.

Sets us up for the future

Doing this now makes sure we are ready for the next 10 years of Cairn and what we want to do and achieve

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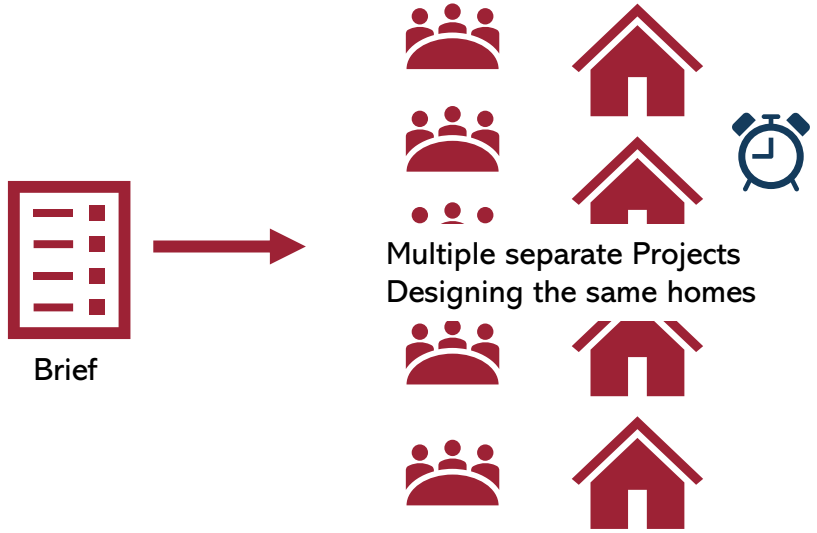
The Cairn Way
Digital Design Tool Kits – A new way to Design

Old Way of Working



Completed Design

- Common Mistakes
- Slower
- Resource Heavy

Cairn Design Platform

Completed Design
With fewer errors and
more standardisation

- Common Standard
- Push Updates
- Confidence in Standard

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Standardisation Debate

Update on the .....
The Cairn Digital Design Tool Kit

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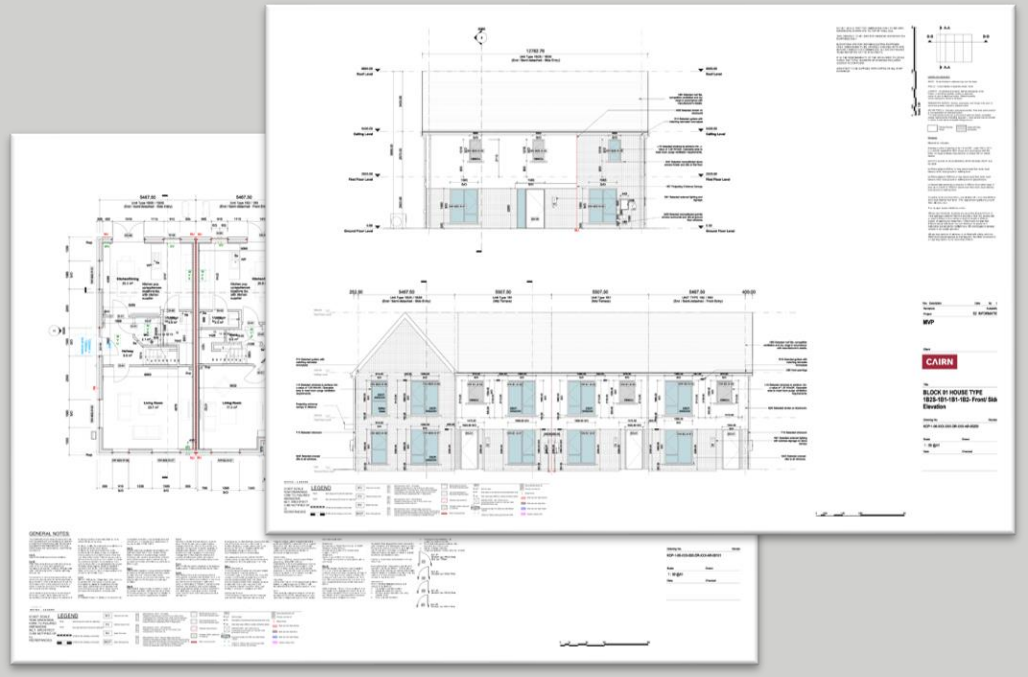
Digital Design Toolkit



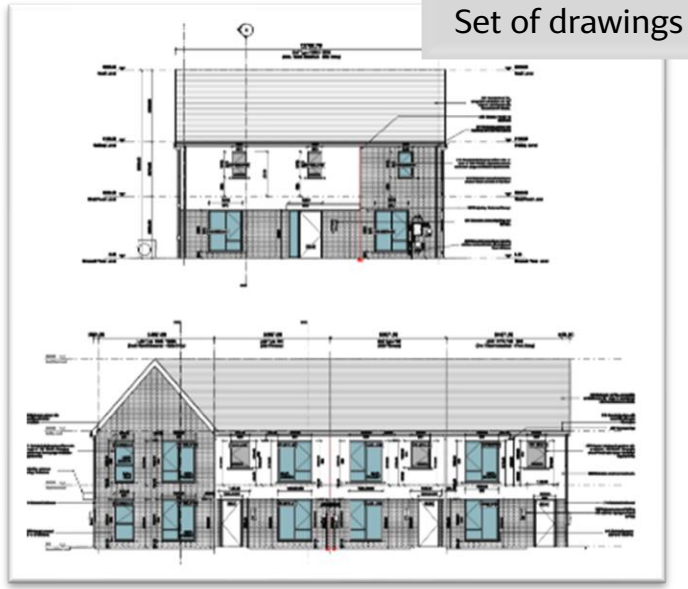
Digital Design Toolkit

What – Centrally governed **standard BIM models** and **Cairn-approved design drawings templates** based on Technical Design Library.

How does it help our projects?

- With **growing pipeline and limited resources**, the toolkit automates early design while maintaining standardisation,
- Provides **ready-to-use baseline** design for consultants,
- Frontloads **Cairn BIM Strategy**,
- Its' data-driven nature allows to integrate it with business systems and makes our design process **AI-ready**.

BIM model



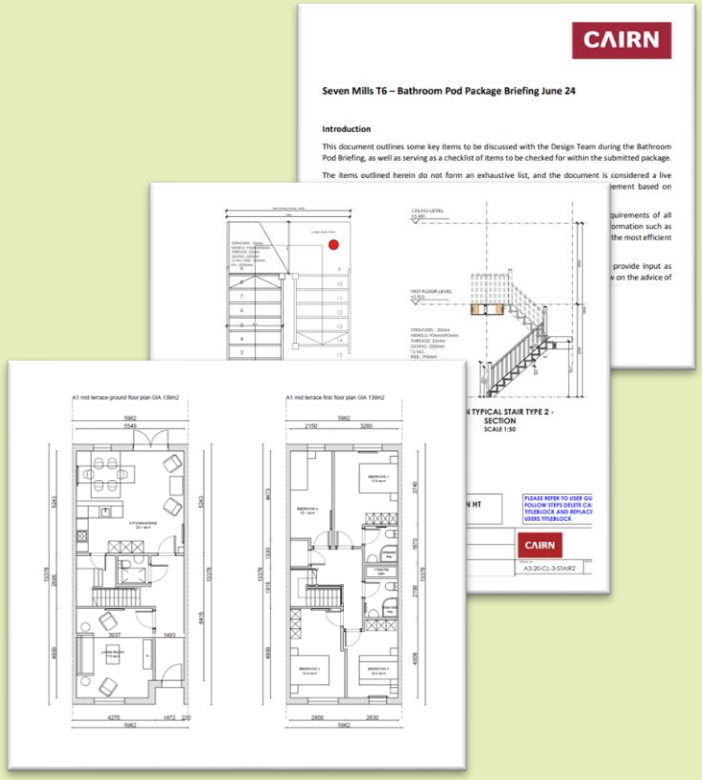
Set of drawings

Technical Design Library Evolution

Technical Design Library

Contains:
- Design Standards and Processes
- Technical Information
- House type & component drawings
- Details
- Best practices

SharePoint



Digital Design Toolkit

Contains:
- House type models
- Standard drawings
- 3D components
- Design automation software

AUTODESK Construction Cloud

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Last year we were here

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Project Pilot

Project

- Holybanks, Swords
- Mixed residential development:
  - 116 houses (107 standard, 9 non-standard)
  - 16 townhouses
  - 34 duplexes
  - 474 apartments

- Purpose:
  - Validate project integration
  - Understand efficiency
  - Identify improvements

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	CAIRN	HLM Architects	reddy a+u
Role	Client, Design Vision & Contractor	Passive Designer Design Toolkit Production	Principal Architect
Scope	• Issue design brief and communicate architectural and placemaking design vision for the project	• Produce design templates for standard houses using Digital Toolkit • Handover templates to Reddy A+U	• Validate design templates and take ownership • Integrate models/drawings into project deliverables • Update with project-level changes • Issue design outputs to Procore for approval

Lessons Learned

Strengths:

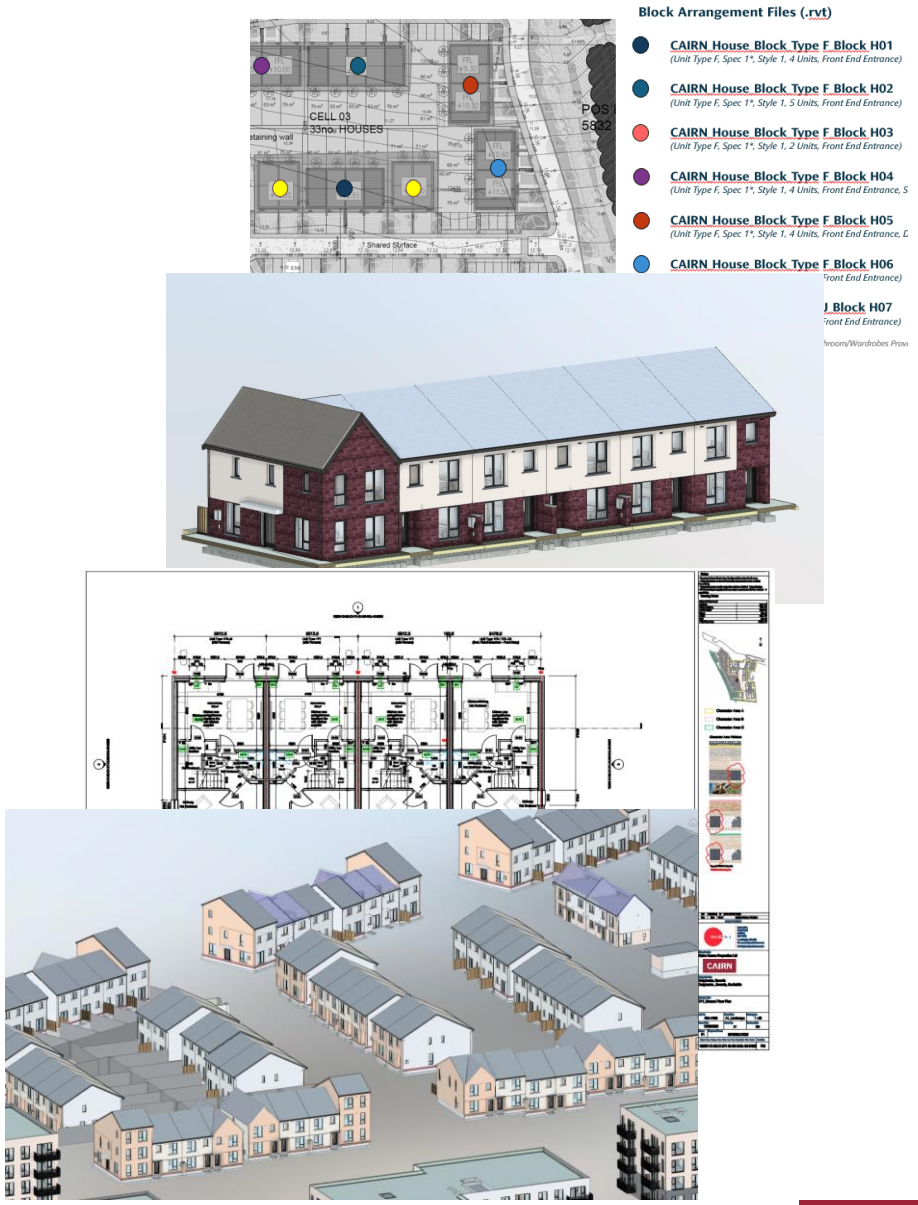
- **Accelerated design:** Toolkit templates provide ready-to-use fully dimensioned and annotated design drawings.
- **Validated process - Partnership model** emerged where Cairn supplies design template, and Architect takes ownership, manages and expands template with project-specific changes.
- **Change traceability:** issued design template can easily be compared to project design to identify uncontrolled changes.
- While designed for standardised houses, Toolkit was successfully **reused to produce design for non-standard houses** confirming value of standardised library even for non-standard design.

Challenges:

- **Window/door handing** in the schedules to be revised.

Recommendations:

- Allow **lead architect take full ownership** of the toolkit templates even when there are project changes required.
- **Provide guidance** on how to work with the toolkit → developed training plan and User Guide.
- More input required from Civils / Landscaping Teams to product site model



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Outputs

Standard & non-standard houses

Standard unit

Project-level variation
...
Manual adjustment

Non-standard unit

Standard block

Non-Standard block

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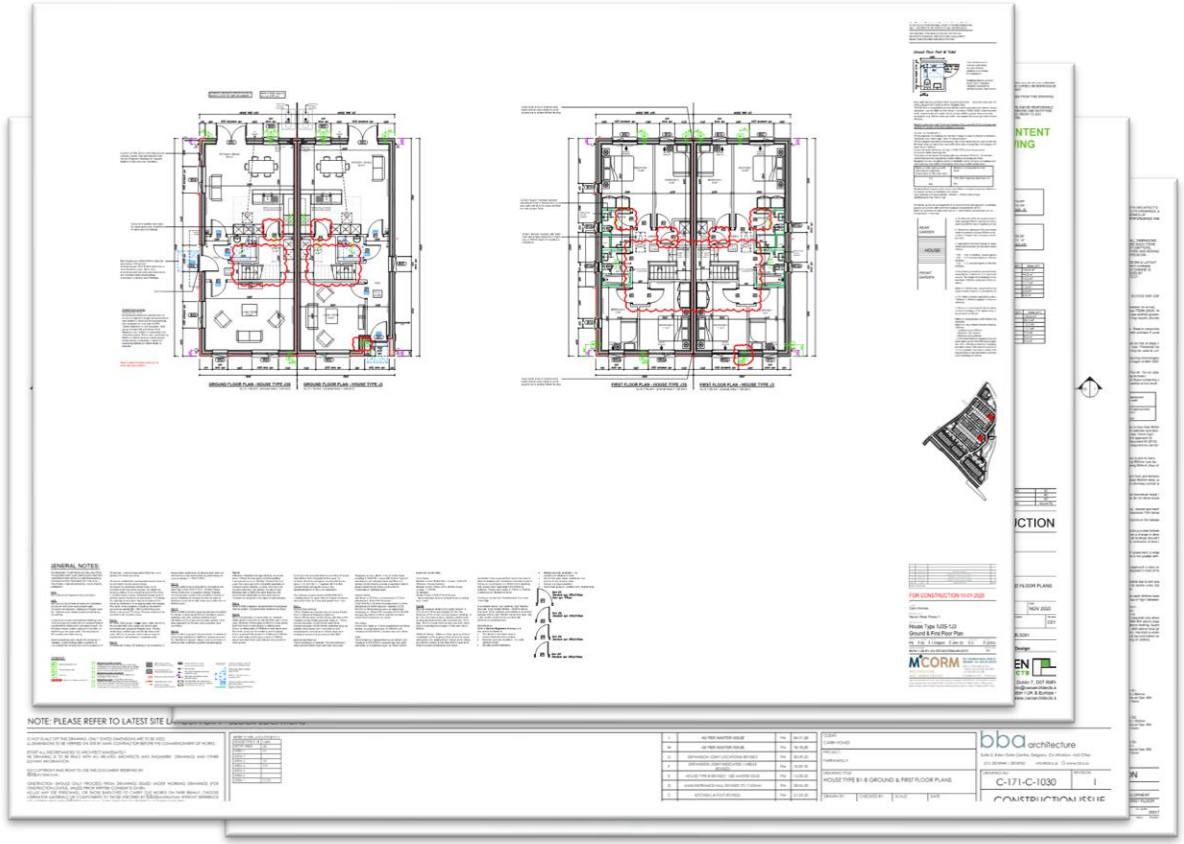
GROUND FLOOR PLAN - HOUSE TYPE J2B
GROUND FLOOR PLAN - HOUSE TYPE J2
FIRST FLOOR PLAN - HOUSE TYPE J2B
FIRST FLOOR PLAN - HOUSE TYPE J2
GENERAL NOTES:
FOR CONSTRUCTION 10-01-2020
House Type 1J2B-1J2
Ground & First Floor Plan
MCORM
NOTE: PLEASE REFER TO LATEST SITE
bba architecture
HOUSE TYPE B1-B GROUND & FIRST FLOOR PLANS
C-171-C-1030
1

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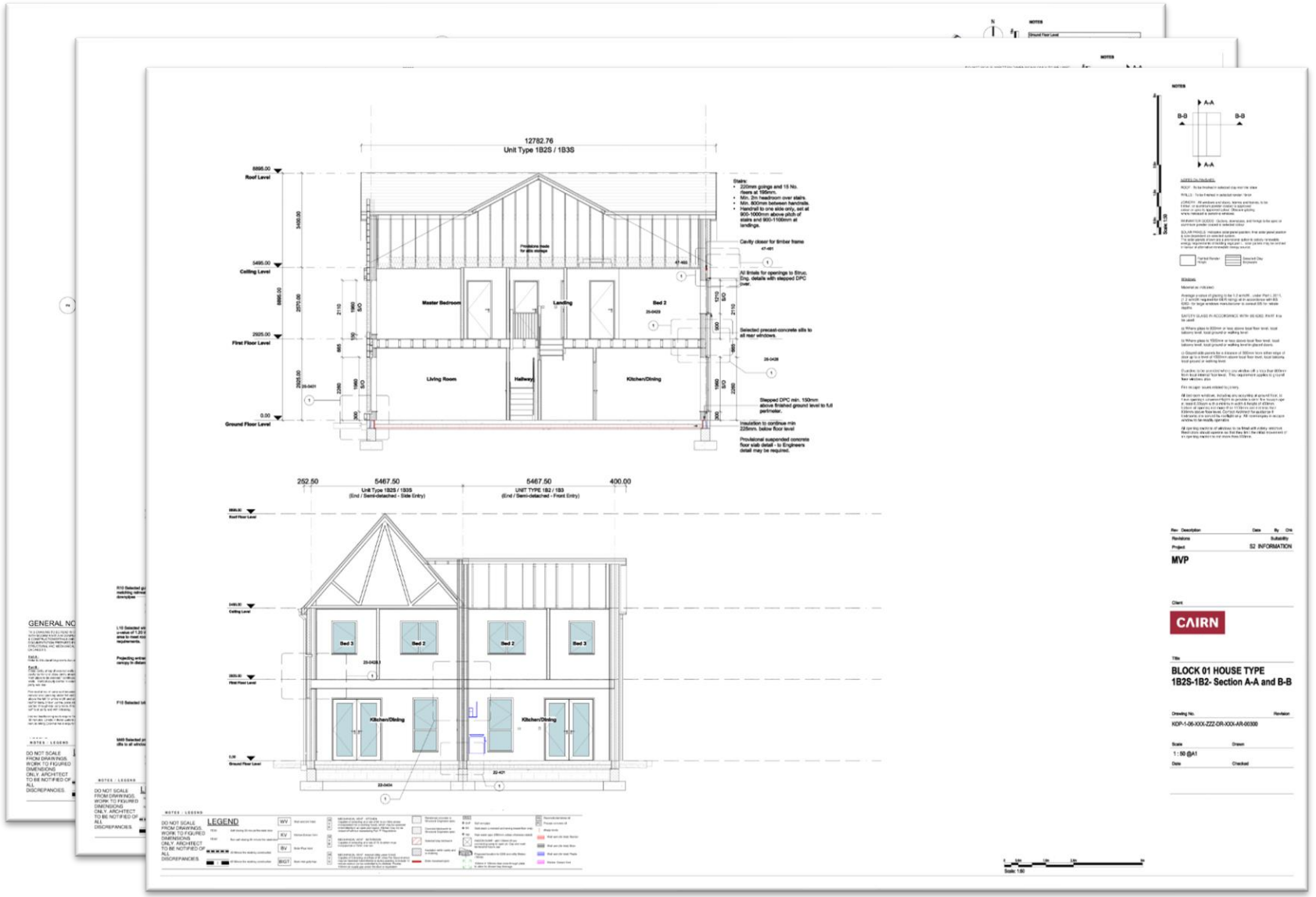
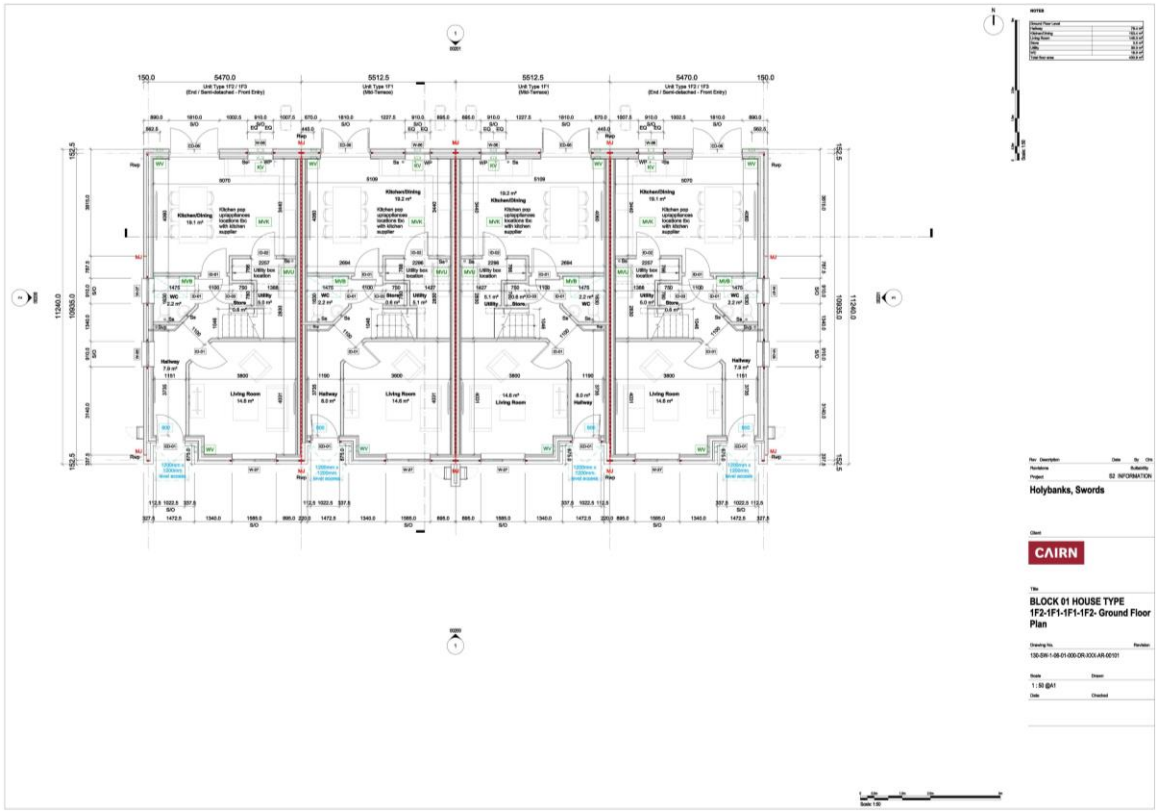

12782.76
Unit Type 1B2S / 1B3S
8895.00
Roof Level
5495.00
Ceiling Level
2925.00
First Floor Level
0.00
Ground Floor Level
Master Bedroom
Landing
Bed 2
Living Room
Hallway
Kitchen/Dining
Stairs:
220mm goings and 15 No. risers at 195mm.
Min. 2m headroom over stairs.
Min. 800mm between handrails.
Handrail to one side only, set at 900-1000mm above pitch of stairs and 900-1100mm at landings.
Cavity closer for timber frame
All lintels for openings to Struc. Eng. details with stepped DPC over.
Selected precast-concrete sills to all rear windows.
Stepped DPC min. 150mm above finished ground level to full perimeter.
Insulation to continue min 225mm. below floor level
Provisional suspended concrete floor slab detail - to Engineers detail may be required.
252.50
5467.50
Unit Type 1B2S / 1B3S
(End / Semi-detached - Side Entry)
5467.50
400.00
UNIT TYPE 1B2 / 1B3
(End / Semi-detached - Front Entry)
Bed 3
Bed 2
Bed 2
Bed 3
Kitchen/Dining
Kitchen/Dining
A-A
B-B
B-B
A-A
MVP
CAIRN
BLOCK 01 HOUSE TYPE
1B2S-1B2- Section A-A and B-B
KDP-1-06-XXX-ZZZ-DR-XXX-AR-00300
1 : 50 @A1
LEGEND

Drawings – Floor plans

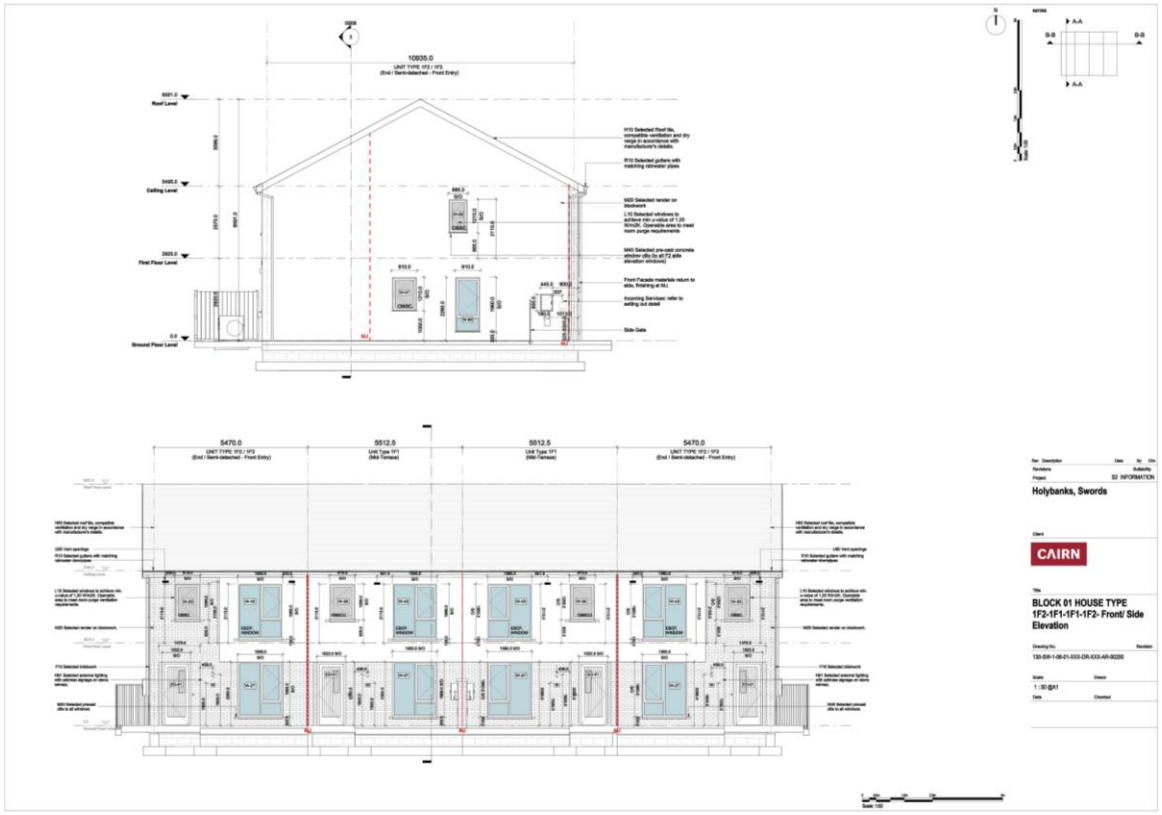
Toolkit Drawings



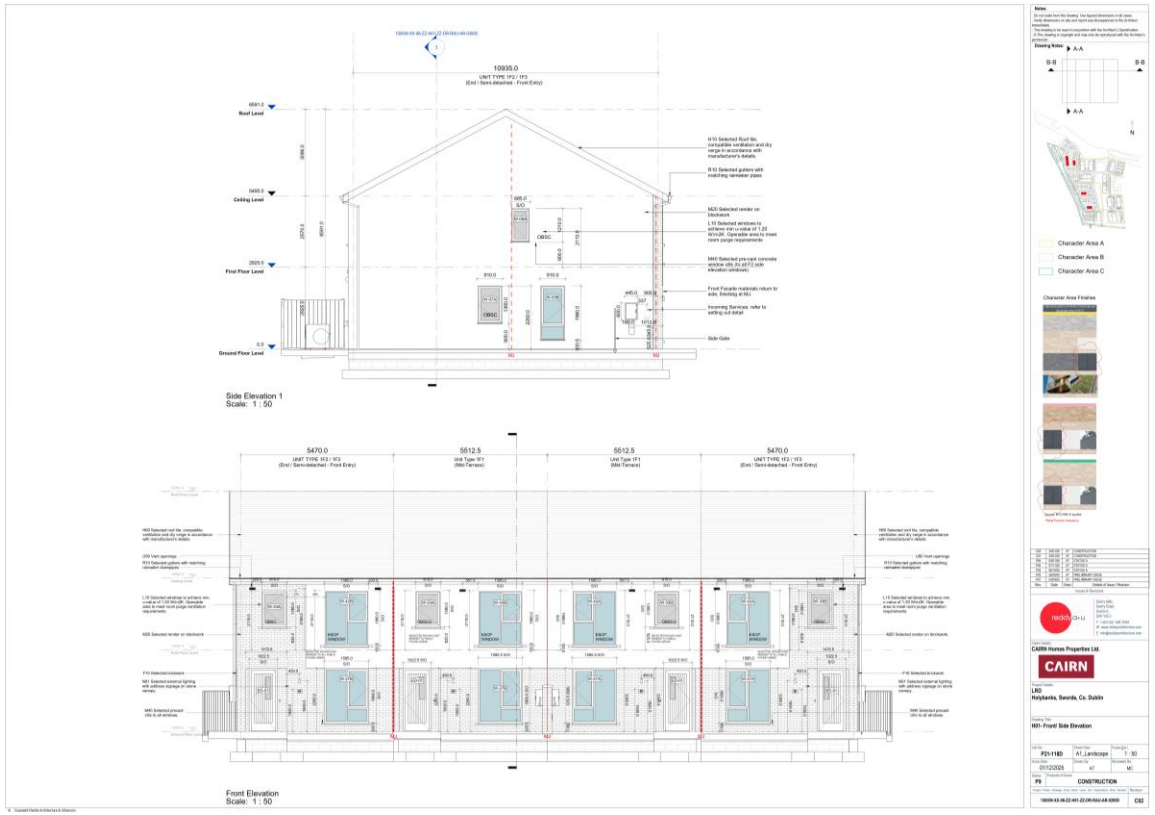
Holybanks Architectural Drawings

Drawings – Elevation

Toolkit Drawings



Holybanks Architectural Drawings



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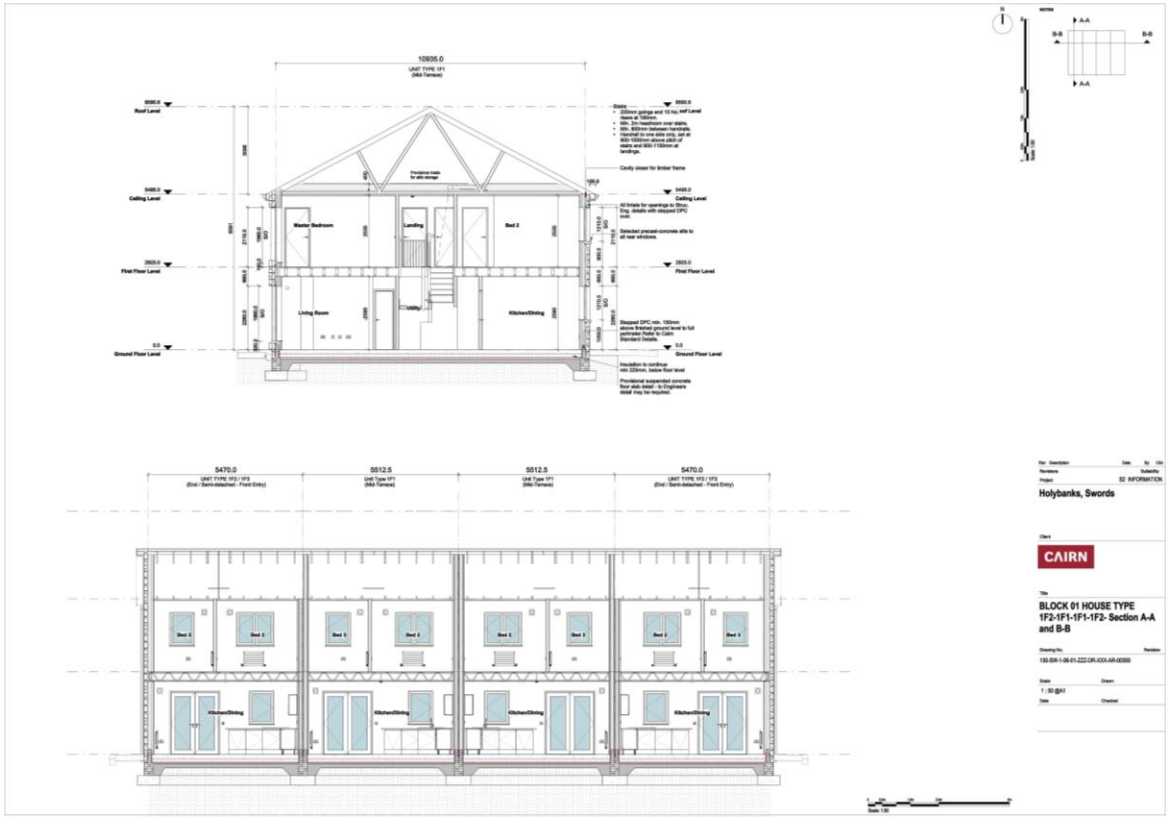
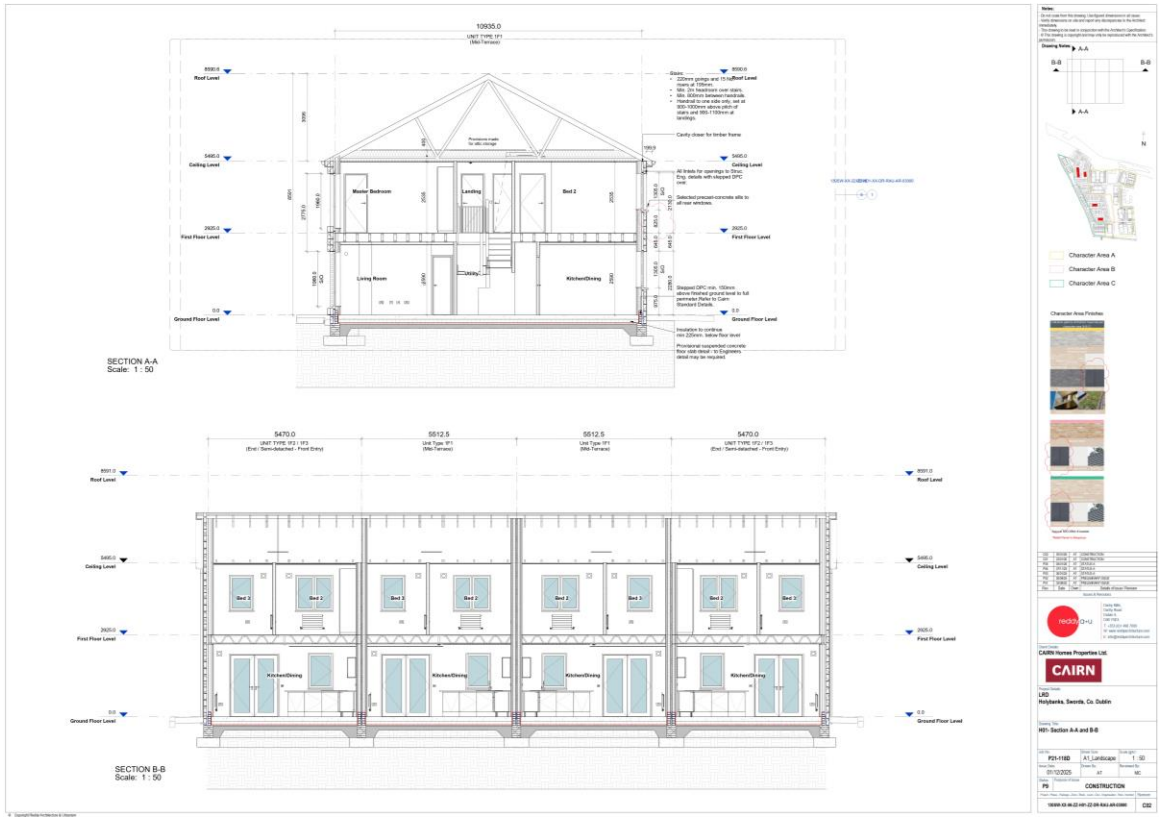
Drawings – Sections

Toolkit Drawings



Holybanks Architectural Drawings



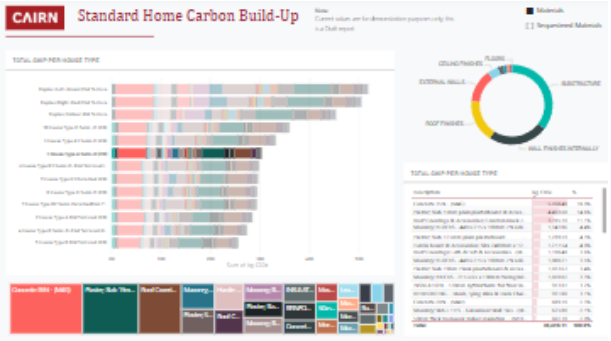
Site model

Toolkit Benchmark Site Model

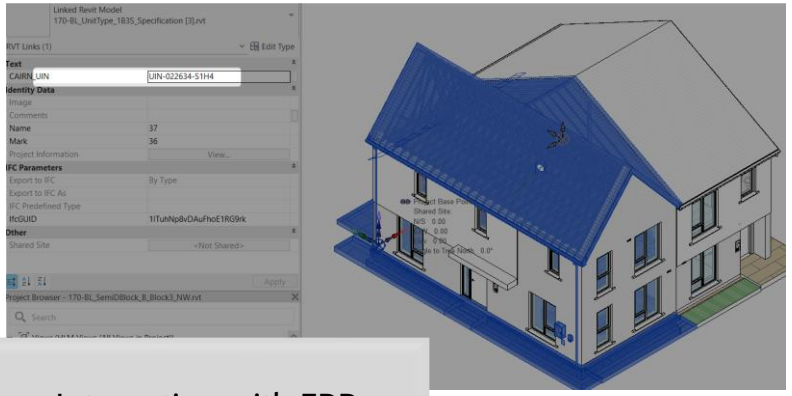
Holybanks Site Model

Rendered show court and virtual development

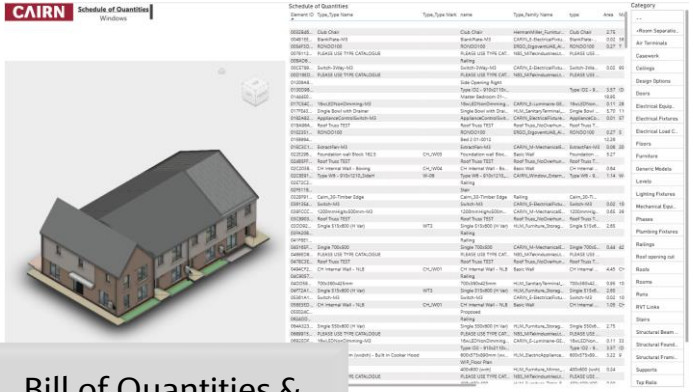
Site federated model with landscaping & civils



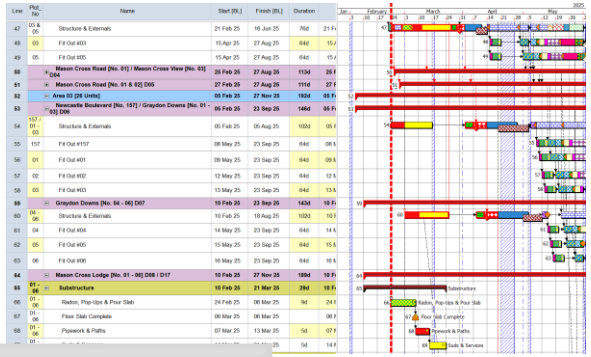
Sustainability & Circularity



Integration with ERP



Bill of Quantities & Cost Planning



Construction Planning

Key takeaways

Standardisation is the foundation to using MMC at scale.

Successful innovation is achieved through transparency and collaboration with trusted partners and business functions.

Digital infrastructure is key to unlocking the next stages of innovation in construction industry.

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Thank You

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