Project Fact Sheet

Scoil Naomh Uilig, Rickardstown, Newbridge, Co. Kildare

PROJECT: Scoil Naomh Uilig, Rickardstown, Newbridge, Co. Kildare

Projects	Scoil Naomh Uilig, Rickardstown, Newbridge, Co. Kildare
Value	€2.8 million
Client	Department of Education & Science
Stage	Complete
Completion Date	September 2011
Description	Design & build of new school extension & stand alone GP Hall including extensive external works.

FACTFILE

The design and build consortium planned a fast-track on-site construction duration of 26 weeks. This consisted of a two storey 12 classroom extension to the existing primary school and a standalone GP Hall. This was one of three school new-build contracts awarded to ABM by the Department of Education and Science under the Rapid Build Schools Programme.

PROJECT DETAILS

Schools in rapidly developing areas

In June 2009, the Department of Education and Science (DoES) advertised a Request for Proposals (RFP) from contractors to submit pre-qualification applications for inclusion on a tender shortlist for the Rapid Delivery Design & Build Schools and Framework 2009. In September 2009, the Department of Education and Science prioritised funding to facilitate the construction of schools in rapidly developing areas such as Rickardstown, Newbridge through a public rapid build schools tender. The programme was tendered on a design and build basis with contracts awarded to the successful candidates under the new GCCC. It was intended that the school extension & GP Hall would be operational by the start of the school term in September 2011. ABM's Design & Build proposals were successful and they were awarded the project in November 2010.

The project consisted of the construction of a 12 classroom Primary School Building extension to the existing school which includes 4 specialist rooms; as the school itself is categorised as a Special Needs school the requirements of the Department of Education & Skills, Technical Guidance Document No. 26 and Special Needs specification also applied to

the school extension. The project also entailed the construction of a standalone GP Hall and associated ancillary accommodation, associated site works and the provision of four new general ball courts and one new junior play court.and ancillary accommodation. External works included car parking (30 cars), access road and turning circle, 4 No. ball courts and general landscaping. The site is located a short distance from Newbridge town.

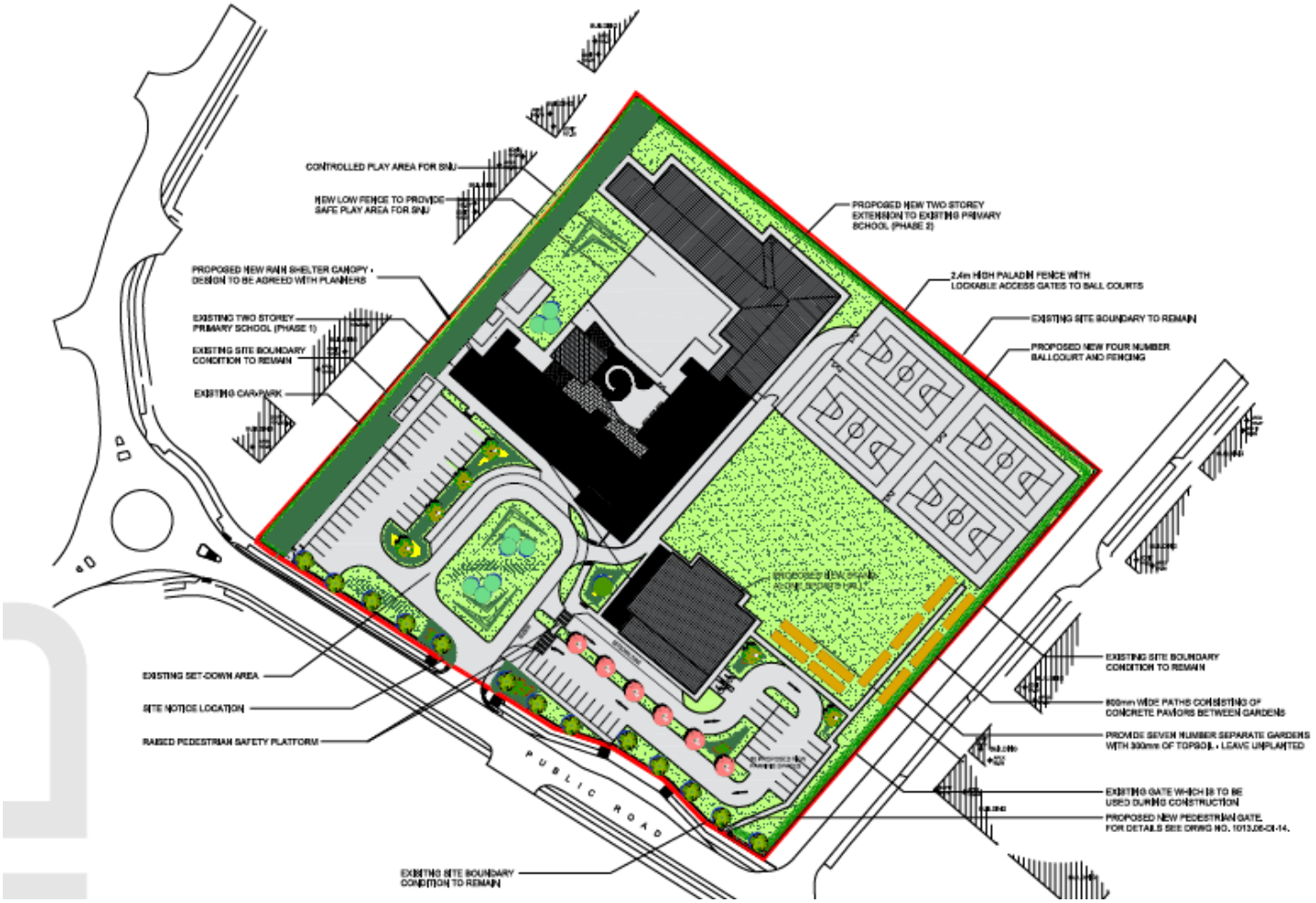

Image 1 – Site plan of Scoil Naomh Uilig, Rickardstown

In order to achieve completion by September 2011 (construction beginning in March 2011), ABM Design and Build procured a system build solution which enabled 'fast-track' construction. The school extension was constructed with a high emphasis on build quality, durability and programme. In order to achieve this ABM Design and Build procured Kingspan using their Kingspan Metro Building System (KMBS) which provided a complete building structure and shell solution, with the structural frame fully integrated for building physics and service requirements. Kingspan Century has an international reputation for excellence in the building industry and is acknowledged as one of Ireland's biggest and best companies. Their vast resources and expertise in construction have convinced ABM to propose this excellent system for a number of the schools projects. The structural frame comprises Kingspan Profiles & Sections cold rolled, light gauge, galvanised steel

sections and components to create transportable panels. These panels are made under Modern Methods of Construction (MMC) conditions off site and then transported for installation on site. In addition to the light gauge steel components, ancillary non-standard elements and transfer structures – such as hot rolled steel sections – are incorporated to augment KMBS structural solutions. Vertical gravity loads from roofs and floors span onto load-bearing panel walls and down to the supporting foundation or podium. Stability is achieved through diaphragmatic action of the floor slab / decked floor cassette, transferring lateral loads to flat strap diagonal braces on the wall panels. These are supplemented by stiff plate action of the boarding and galvanised steel plate may also be fixed to the panels if required for additional stability.
The skeletal structure can be seen below in image 2.

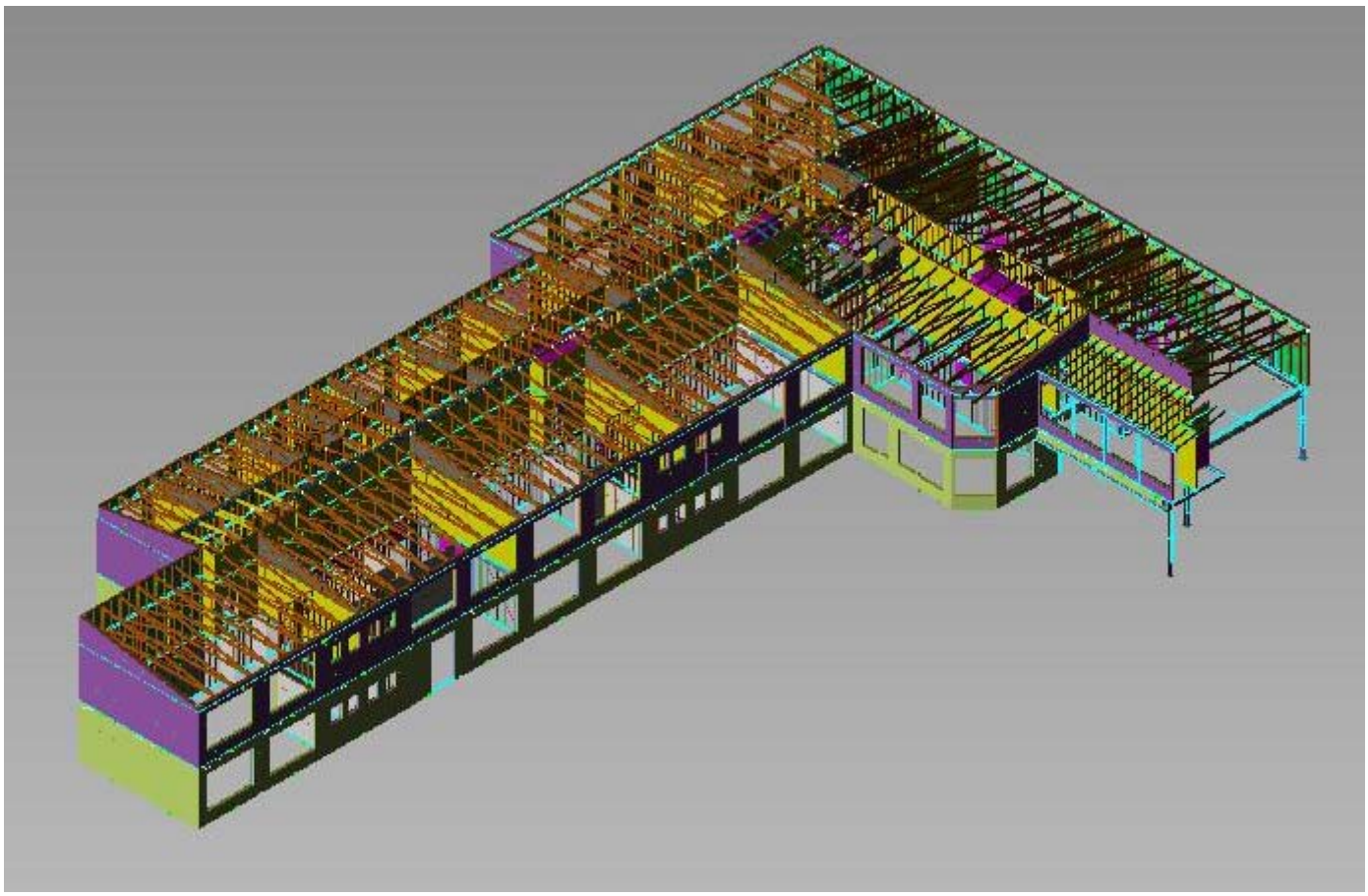

Image 2 – Kingspan Century KMBS Isometric of Scoil Naomh Uilig

The stand alone GP Hall was constructed using a structural steel and in-situ concrete system consisting of precision engineered in-situ curved concrete barge beams.

The ground works commenced on both school extension & GP Hall simultaneously with the off-site fabrication of the steel frame system (for school extension KMBS and structural steel for GP Hall). After week four, the ground works and off-site fabrication period was complete. The steel frame system which is highly efficient in terms of transport utilisation was delivered to site from Co. Monaghan and craned into position just after installation of the precast concrete stairs. The entire KMBS was erected in four weeks. The roof envelope on the school extension was installed in four weeks and consisted of a pre-fabricated Kingspan 120mm RW system. The GP Hall roof consisted of a Euroclad Elite curved built up roof system. The windows were also installed simultaneously allowing the building to be ‘watertight’ which in turn made way for the

internal finishes to begin at week 8 on the school extension. Wherever possible, off-site fabrication of the internal components were used such as pre-hung door sets, internal wall partitions, kitchens, cubicles, and heating pipe work runs.

Externally, both school extension & GP Hall façades comprised of block work & Parex Monorex monocouche colour through Render system. This system has been certified by NSAI Agrément (Irish Agrément Board). This block and render installation was not on the programme critical path as the KMBS did not depend on the external leaf structurally. All civil works were carried out in accordance with The National Roads Authorities guidelines and parameters.

Images of School Extension:

Image 3 - North Elevation

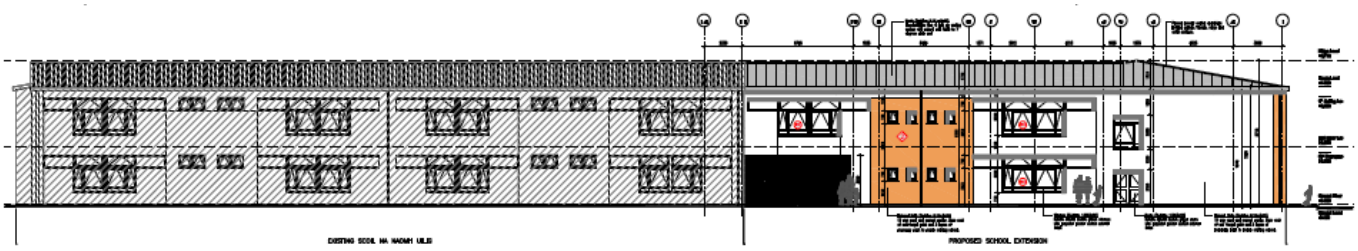

Image 4- South Elevation

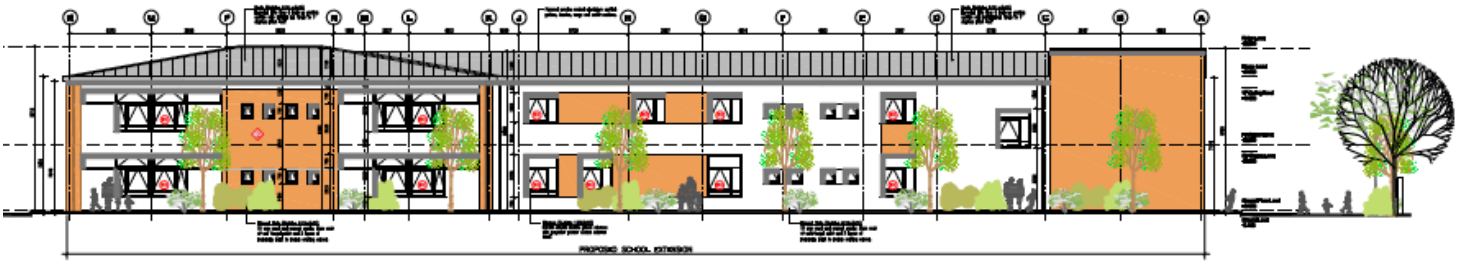

Image 5– East Elevation

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Images of GP Hall:

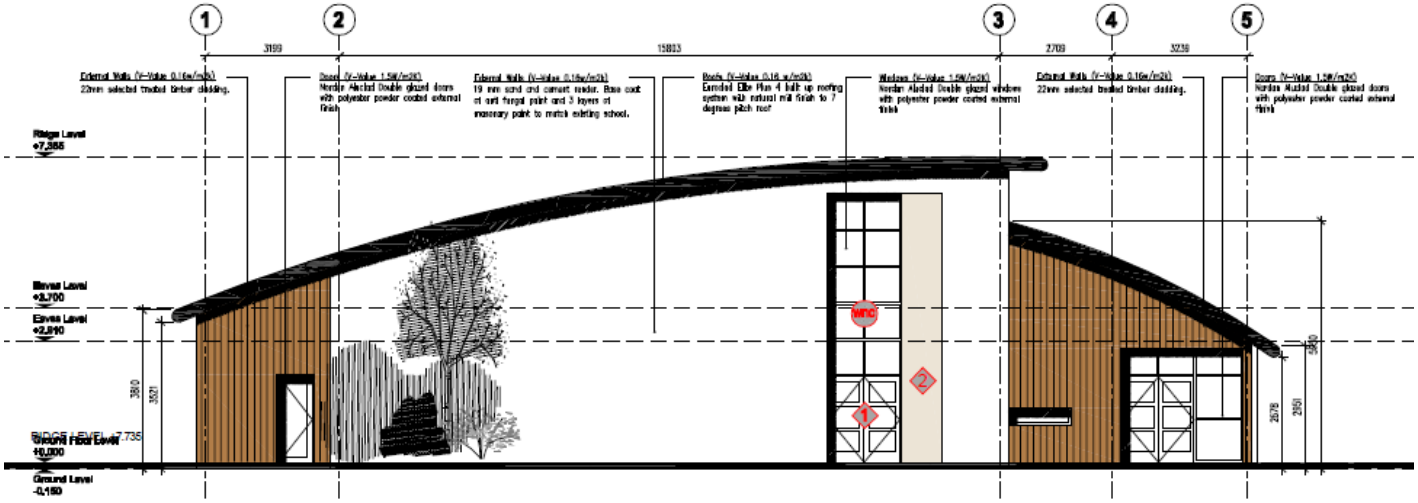

Image 6 - West Elevation

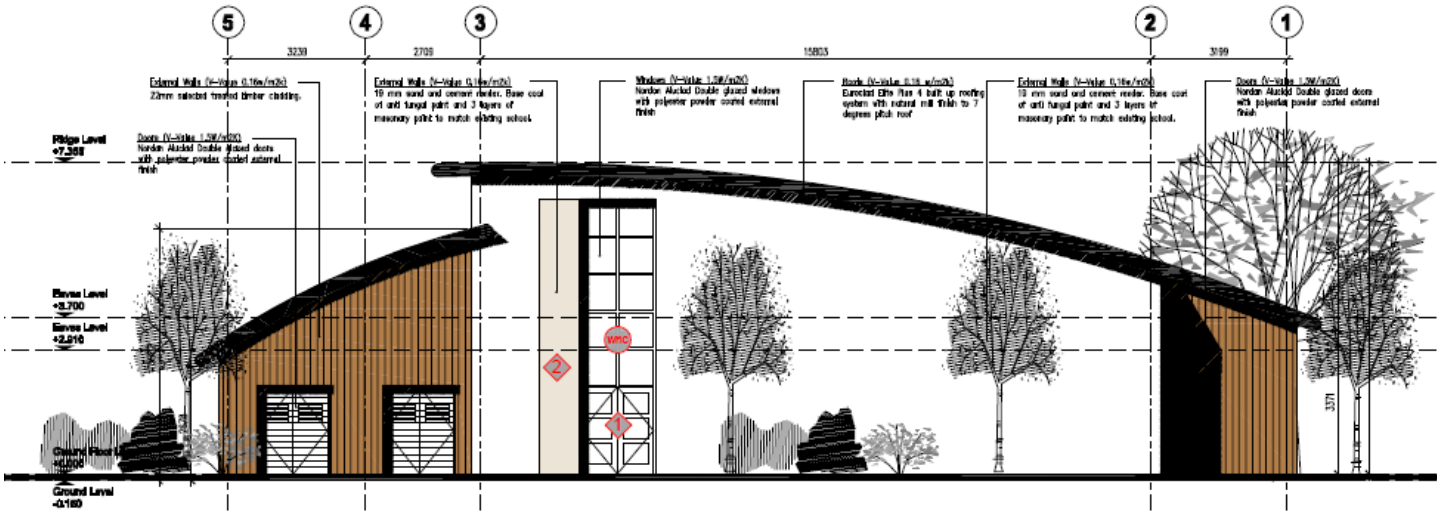

Image 7 - East Elevation

Sustainability

In accordance with the Department of Education and Science school specification, the buildings were constructed to facilitate a passive environment entailing light sensitive light fittings, excellent natural daylight, natural ventilation, air infiltration and water efficiency. The building elements were specified with a high emphasis on sustainability & efficiency. See below building elemental u-values which have been excelled with the construction of Naomh Scoil Uilig.

Building Element	TGD Part L 2008 required u-value U value w/m²k	As built U value w/m²k	ABM Surpassed TGD Part L Requirements by U value w/m²k
Ground floor	0.25	0.12	0.13
Walls	0.27	0.16	0.11
Windows	2.2	1.5	0.7
Doors	2.2	1.5	0.7
Roof	0.2	0.16	0.04

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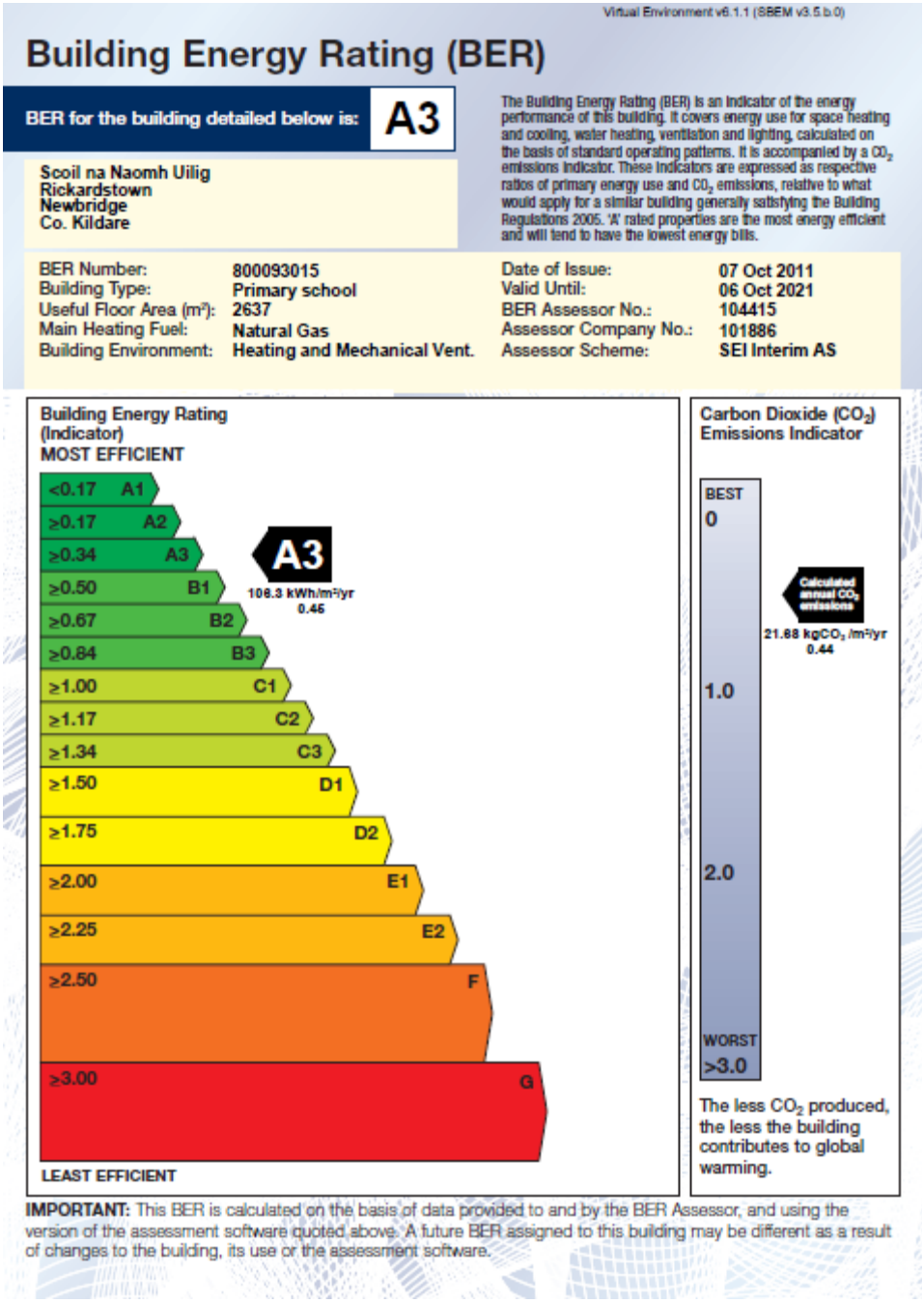
The requirements set out in the Department's TGD documents for air-tightness required an air loss of 5m3/h/m2 at a test pressure of 50Pa. The actual results from the test on the GP Hall were 4.92 m3.h-1.m-2 @ 50 Pa which surpassed TGD requirements. The actual results from the test on the school extension was 3.71 m3.h-1.m-2 @ 50 Pa which surpassed also TGD requirements. This resulted from the quality of installation and construction of all building elements. A Tyvek breather membrane was installed throughout to give the building excellent air-tightness. Energy conservation was conveyed through thermal performance & air tightness requirements which when constructed surpassed part L requirements. See below actual air tightness characteristics which has been extracted from air tightness certificate:



Virtual Environment v6.1.1 (SBEM v3.5.b.0)

Building Energy Rating (BER)

BER for the building detailed below is: A3

The Building Energy Rating (BER) is an indicator of the energy performance of this building. It covers energy use for space heating and cooling, water heating, ventilation and lighting, calculated on the basis of standard operating patterns. It is accompanied by a CO_2 emissions indicator. These indicators are expressed as respective ratios of primary energy use and CO_2 emissions, relative to what would apply for a similar building generally satisfying the Building Regulations 2005. 'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.

Scoil na Naomh Uilig
Rickardstown
Newbridge
Co. Kildare

BER Number:	800093015	Date of Issue:	07 Oct 2011
Building Type:	Primary school	Valid Until:	06 Oct 2021
Useful Floor Area (m^2):	2637	BER Assessor No.:	104415
Main Heating Fuel:	Natural Gas	Assessor Company No.:	101886
Building Environment:	Heating and Mechanical Vent.	Assessor Scheme:	SEI Interim AS

Building Energy Rating (Indicator)
MOST EFFICIENT

<0.17 A1
≥0.17 A2
≥0.34 A3
≥0.50 B1
≥0.67 B2
≥0.84 B3
≥1.00 C1
≥1.17 C2
≥1.34 C3
≥1.50 D1
≥1.75 D2
≥2.00 E1
≥2.25 E2
≥2.50 F
≥3.00 G

A3
106.3 kWh/m²/yr
0.45

LEAST EFFICIENT

Carbon Dioxide (CO_2) Emissions Indicator

BEST
0
1.0
2.0
WORST
>3.0

Calculated annual CO_2 emissions
21.88 kgCO_2 /m²/yr
0.44

The less CO_2 produced, the less the building contributes to global warming.

IMPORTANT: This BER is calculated on the basis of data provided to and by the BER Assessor, and using the version of the assessment software quoted above. A future BER assigned to this building may be different as a result of changes to the building, its use or the assessment software.

Air Permeability, AP_{50}:	**4.92 $m^3.h^{-1}.m^{-2}$ @ 50 Pa**
Effective Leakage Area:	0.40 m² @ 50 Pa
Correlation of results, r^2:	0.9962
Slope, n:	0.65
Air Flow Coefficient, C_{env}:	618.9 $m^3.h^{-1}.Pa^{-n}$
Intercept, C_L:	625.2 $m^3.h^{-1}.Pa^{-n}$

Air Permeability, AP_{50}:	**3.71 $m^3.h^{-1}.m^{-2}$ @ 50 Pa**
Effective Leakage Area:	0.61 m² @ 50 Pa
Correlation of results, r^2:	0.9984
Slope, n:	0.52
Air Flow Coefficient, C_{env}:	1,580.5 $m^3.h^{-1}.Pa^{-n}$
Intercept, C_L:	1,593.7 $m^3.h^{-1}.Pa^{-n}$

A building energy rating certificate and advisory report formed part of the original TGD documents. The BER is an indicator of energy performance covering energy use for space heating and cooling, water heating, ventilation and lighting, calculated on the basis of standard operating patterns. It is accompanied by a CO_2 emissions indicator. The Building energy rating survey was carried out in October 2011 which resulted in the building receiving a highly sustainable building energy rating band of A3. The estimated annual energy consumption is a highly efficient value of 106.3 kWh/m²/yr and the annual estimated CO2 consumption is estimated to be 21.68 kgCO2 /m²/yr.

Image 8 – BER Certificate for Scoil Naomh Uilig, Rickardstown

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Other sustainable technology incorporated into the design was a rainwater water harvesting system. Installed to collect rainwater at roof level, the water is then fed by gravity, through a dedicated system of underground medium density polyethylene (MDPE) pipe work to a leaf filter. Leaves and other debris are passed through the storm water system and the “filtered” rainwater is passed by gravity to an underground glass rainwater holding tank. This grey water is then re-used throughout the building.

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