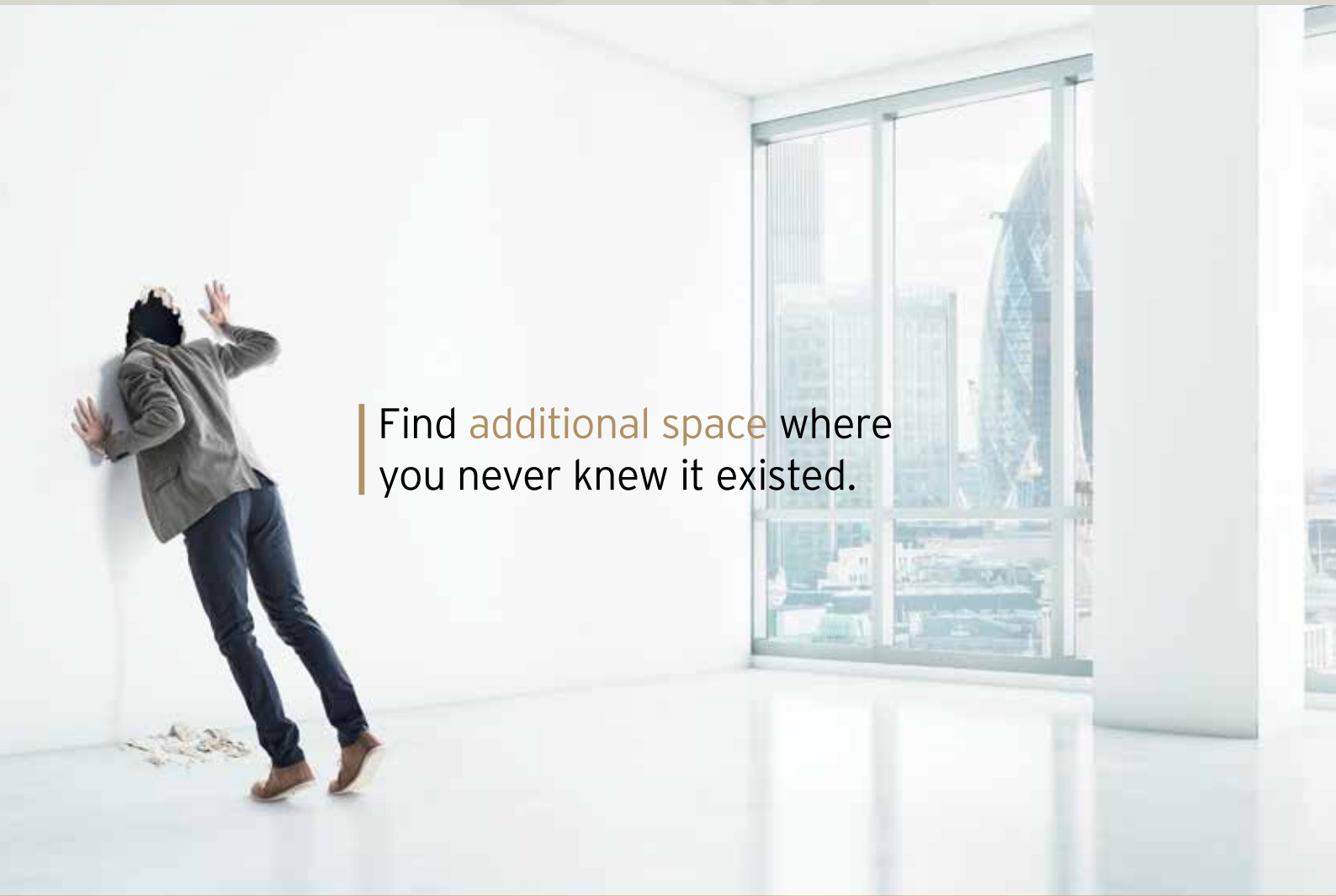




The Real Value of Space

IN COMMERCIAL REAL ESTATE - THE IMPACT OF DIFFERING INSULATION SPECIFICATIONS ON THE ROI ASSOCIATED WITH INTERNAL FLOOR AREA



Find **additional space** where you never knew it existed.

Contents

	Page
Introduction	4
Executive Summary	4
<hr/>	
Analysis	5
Background	5
Approach	5
<hr/>	
Findings	6
Cavity Wall Construction – Brick & Block	6
Timber Frame Wall Construction – Brick Outer Leaf	8
Rainscreen Ventilated Warm Wall Construction – Steel Frame	10
Rainscreen Ventilated Hybrid Wall Construction – Steel Frame	12
<hr/>	
Conclusion	14
<hr/>	
Case Studies	15
Glasgow, Retail Park	15
Edinburgh, Business Centre	16
Manchester, Office / Technology Park	17
Milton Keynes, Business Park / Office	18
Peterborough, Laboratory / Small Office	19
London, Office Tower	20
London, Office / Retail	21
Cardiff, Industrial / Office	22
Bristol, Office	23
Southampton, Business Park	24
<hr/>	
Appendix A	25
Database Buildings – Data Inputs & Model	25
<hr/>	
Appendix B	27
External Wall Construction Build-ups – Specification & Cost	27
<hr/>	

Introduction

Executive Summary

The usable space within a building is a fundamental metric in understanding the valuation, thus the investment potential, of real estate. Property with greater internal floor area commands a higher rental return in addition to a higher overall financial value and could, therefore, give rise to a greater Return on Investment (ROI).

The width of external walls incorporating *Kingspan Kooltherm*[®] wall insulation solutions is thinner than that incorporating comparative solutions – facilitating internal space gains without having to increase the overall designed footprint of a building.

With the aim of quantifying the financial benefits that result from insulating the external walls of new non-domestic buildings using *Kingspan Kooltherm*[®] wall insulation solutions, Kingspan Insulation commissioned Sweett Group to investigate the 'Real Value of Space in Commercial Real Estate'.

To this end, Sweett Group developed a research program to, firstly, analyse a database of 7,290 buildings generated from a model that considered a range of physical and financial building characteristics and, secondly, analyse ten real case study buildings in order to verify the calculation method used for the database buildings. Four types of external wall construction were examined. Two build-ups, differing by insulation specification, were compared for each scenario and the differential in both thickness and cost were taken into account in the analyses.

The findings show that, despite the requirement for a CapEx uplift ranging from £5.50 to £11.50 per square metre for the wall construction and 0.1% to 1.89% for the overall project development, the additional cost of specifying of *Kingspan Kooltherm*[®] wall insulation solutions, in lieu of the comparative solutions, can provide an overwhelming ROI*:

- **92% of the 7,290 database buildings analysed for each wall construction type showed a positive ROI;**
- **40% of the database buildings showed an ROI between 300% and 1,000%, whilst 18% showed an ROI greater than 1,000%;**
- **The ROI for the database buildings in locations with non-domestic yields of 5% and lower can exceed 2,500%; and**
- **all ten real case study buildings showed a positive ROI – up to 1,645%.**

“A lower thermal conductivity can result in thinner insulation. A thinner insulation can result in thinner external wall construction. A thinner external wall construction can result in greater internal floor area. A greater internal floor area can result in a greater Return on Investment (ROI)”.

*The overall return on the additional CapEx investment required for the use of *Kingspan Kooltherm*[®] wall insulation solutions versus comparative insulation solutions.

Analysis

Background

This study analyses the financial value of the additional internal floor area gained through the use of thinner wall insulation solutions in new non-domestic buildings, without compromising the overall designed footprint.

The analysis considers both a range of building characteristics (e.g. size and shape) and a range of commercial variables (e.g. geographical location, rental value and material cost), that are representative of modern day commercial building stock across Great Britain. These factors were used to create a model from which a database of 7,290 building instances was generated. The database buildings were subsequently analysed to identify the financial benefit (ROI) of the internal space gains obtained via the use of *Kingspan Kooltherm*[®] wall insulation solutions.

To establish the extent of this financial benefit on a given building, four types of external wall construction were examined. For each scenario, a comparison was made between two build-ups that differed by insulation specification. The construction width and cost for each build-up were used as direct inputs into the model. The subsequent outputs from the model were evaluated to determine the CapEx investment 'cost' of the additional space and, in terms of rental income and yield, the capitalised market 'value' of the additional space. The ROI was thus calculated by dividing the former by the latter.

To correlate the database findings with real buildings and real cost information, the same method of calculation as that used in the analysis of the database buildings was later applied to ten real case study buildings from Southampton to Glasgow.

Approach

To quantify the financial benefits associated with greater internal floor area, Sweett Group used an approach that comprised the following five stages.

Stage 1: Wall Build-up Selection

Four external wall constructions were identified as those typically used in new non-domestic buildings. For each construction, two build-ups were selected: one incorporating a *Kingspan Kooltherm*[®] wall insulation solution; and the other an appropriate comparative solution. Both build-ups were designed to achieve a U-value of 0.22 W/m²K.

Stage 2: Wall Build-up Cost Analysis

The cost breakdown and elemental rates for each build-up were ascertained. Prelims, contingency and professionals fees were excluded. The analysis of the cost differential between each build-up for each construction did, however, include a deep review of cost differences e.g. materials, labour, sundries.

Stage 3: Database Generation

A database of 7,290 building instances was generated using a model to create proxies for different types of non-domestic building in Great Britain. The main inputs used to run the model and generate the database comprised: external wall construction; building size and form; and building financials. Refer to Appendix A for further details of the data inputs and the model used to generate the database buildings.

Stage 4: Database Analysis

The database buildings were analysed using each external wall construction to determine the financial benefit resulting from the use of *Kingspan Kooltherm*[®] wall insulation solutions.

Stage 5: Approach Verification via Real Case Study Buildings

Ten real non-domestic building case studies, on which Sweett Group has provided cost consulting services in the last 24 months¹, were analysed to verify the approach. Refer to the 'Case Studies' section of this document for further details of each case study building, shown with one external wall construction incorporating a *Kingspan Kooltherm*[®] wall insulation solution.

¹ February 2013 to February 2015.

Findings

Cavity Wall Construction - Brick & Block

Width & Cost: Wall Build-ups

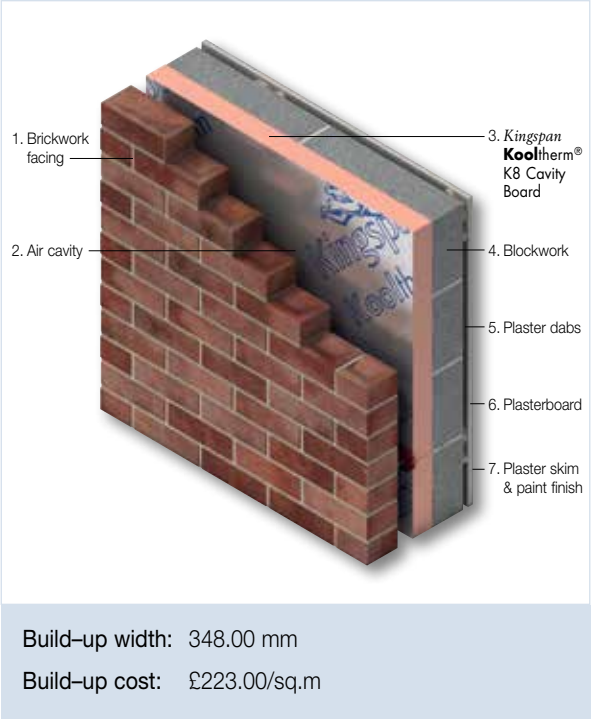


Figure 1: Build-up Incorporating Kingspan Kooltherm® K8 Cavity Board (Partially Filling 115 mm Cavity Width).

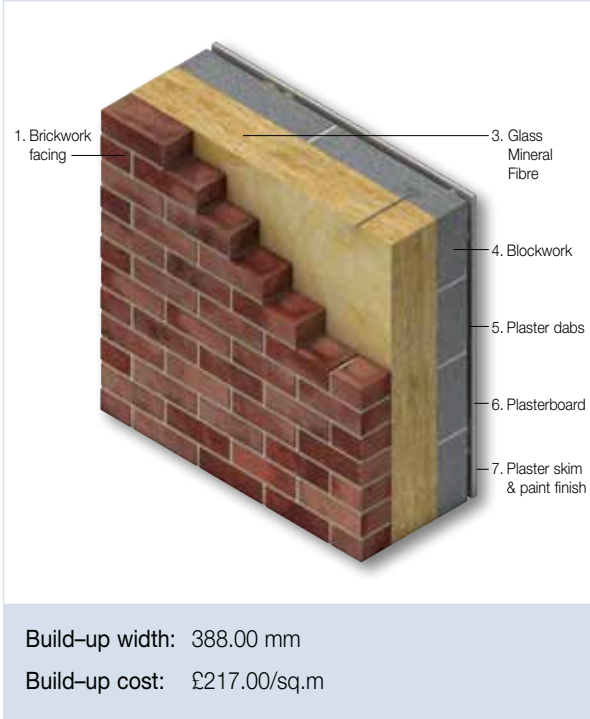


Figure 2: Build-up Incorporating Glass Mineral Fibre (Fully Filling 155 mm Cavity Width).

Despite a CapEx uplift of £6.00 per square metre, the overall width of the build-up incorporating Kingspan Kooltherm® K8 Cavity Board is 40 mm thinner than that incorporating glass mineral fibre. Refer to Appendix B, Tables B-1 and B-2 for further details of the cost breakdown and elemental rates for each build-up.

ROI: Database Buildings

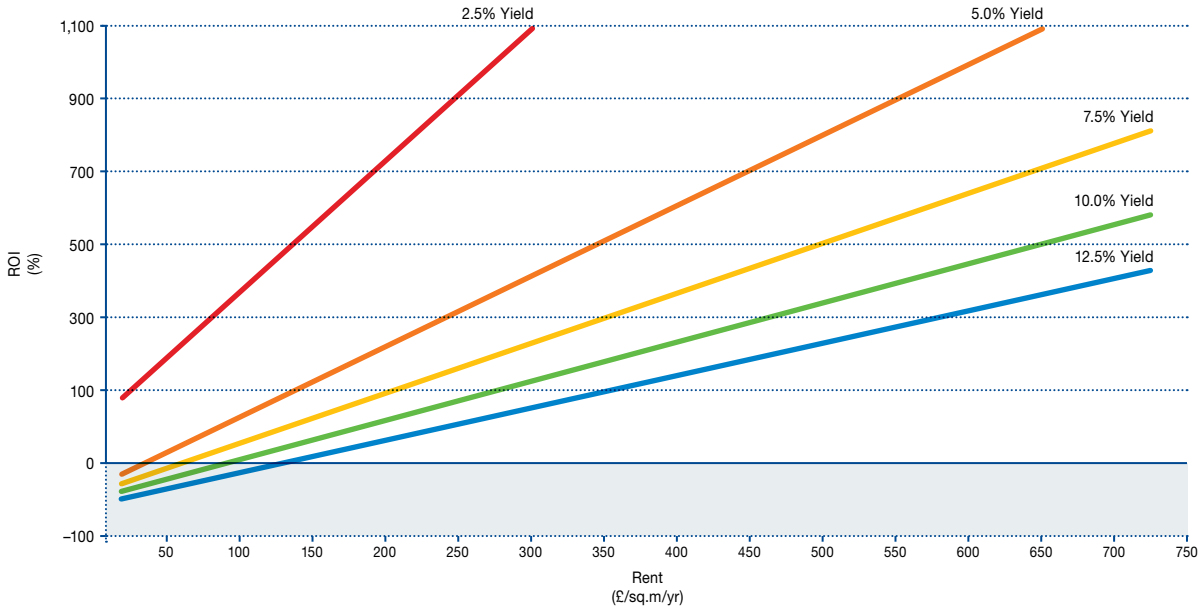


Figure 3: ROI for Database Buildings to which the *Kingspan Kooltherm*® K8 Cavity Board Build-up was Applied.

For all database buildings attracting annual rental incomes of £300/sq.m (£27.87/sq.ft) and above, across all yields, the additional CapEx investment in *Kingspan Kooltherm*® K8 Cavity Board provides an ROI of 100% or greater – the greatest of which being 1,100%, at both 2.5% and 5.0% yields, with a lettable floor area of £300/sq.m and £600/sq.m (£27.87/sq.ft and £55.74/sq.ft), respectively.

ROI: Case Study Buildings

Case Study		Rental Value per Annum		Size		Yield	ROI
Location	Building Type	(£/sq.m)	(£/sq.ft)	(sq.m)	(sq.ft)	(%)	(%)
Edinburgh	Business Centre	105.50	9.80	960	10,333	7.5	103
Manchester	Office / Technology Park	236.80	22.00	6,200	66,736	6.0	202
Milton Keynes	Business Park	154.10	14.32	10,300	110,868	5.5	181
Peterborough	Laboratory / Small Office	141.80	13.17	610	6,566	7.0	115
London	Office / Retail	683.50	63.50	6,800	73,195	3.5	1635
Cardiff	Industrial / Office	61.40	5.70	35,800	385,348	8.5	-37
Bristol	Office	288.50	26.80	29,600	318,611	6.5	343
Southampton	Business Park / Office	184.10	17.10	16,700	179,757	7.0	207

Table 1: ROI for Case Study Buildings to which the *Kingspan Kooltherm*® K8 Cavity Board Build-up was Applied.

For seven out of the eight real case study buildings to which the *Kingspan Kooltherm*® K8 Cavity Board build-up was applied, the ROI is positive – the greatest of which being 1,635% for a six storey office / retail building in London, at 3.5% yield, with 6,800 sq.m (73,195 sq.ft) lettable floor area.

Findings

Timber Frame Wall Construction - Brick Outer Leaf

Width & Cost: Wall Build-ups

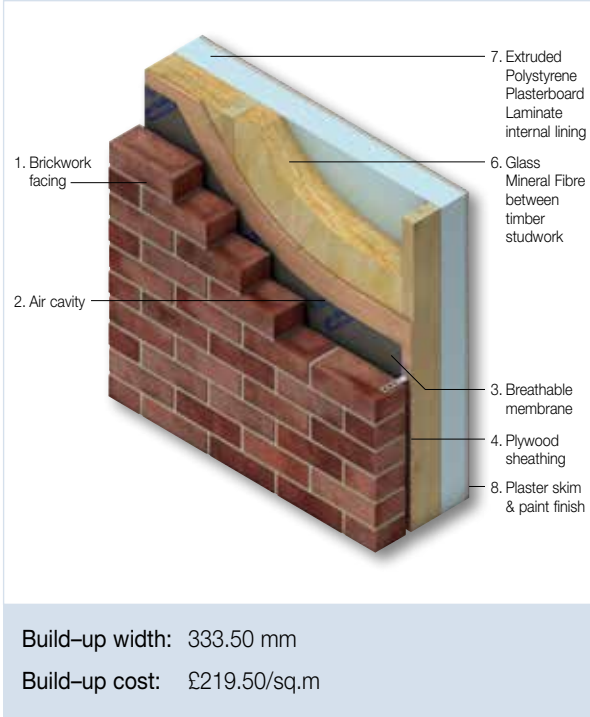
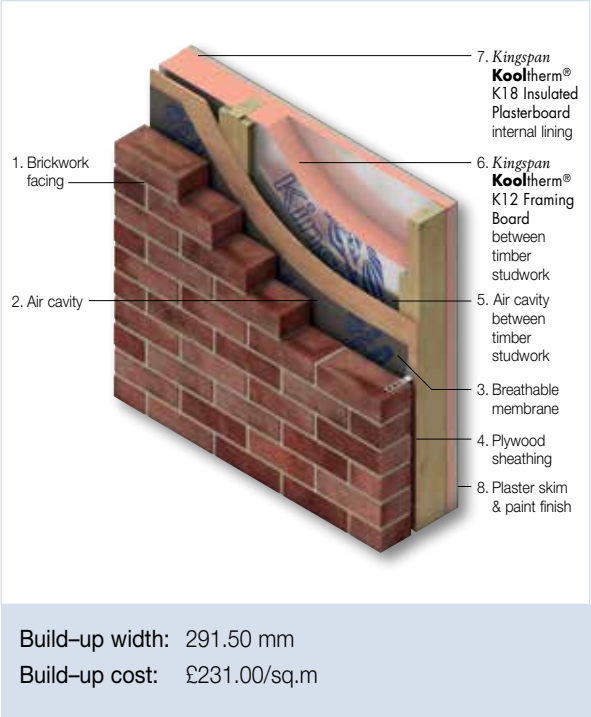


Figure 4: Build-up Incorporating Kingspan Kooltherm® K12 Framing Board & Kingspan Kooltherm® K18 Insulated Plasterboard.

Figure 5: Build-up Incorporating Glass Mineral Fibre & Extruded Polystyrene Plasterboard Laminate.

Despite a CapEx uplift of £11.50 per square metre, the overall width of the build-up incorporating Kingspan Kooltherm® K12 Framing Board and Kingspan Kooltherm® K18 Insulated Plasterboard is 42 mm thinner than that incorporating glass mineral fibre and extruded polystyrene plasterboard laminate. Refer to Appendix B, Tables B-3 and B-4 for further details of the cost breakdown and elemental rates for each build-up.

ROI: Database Buildings

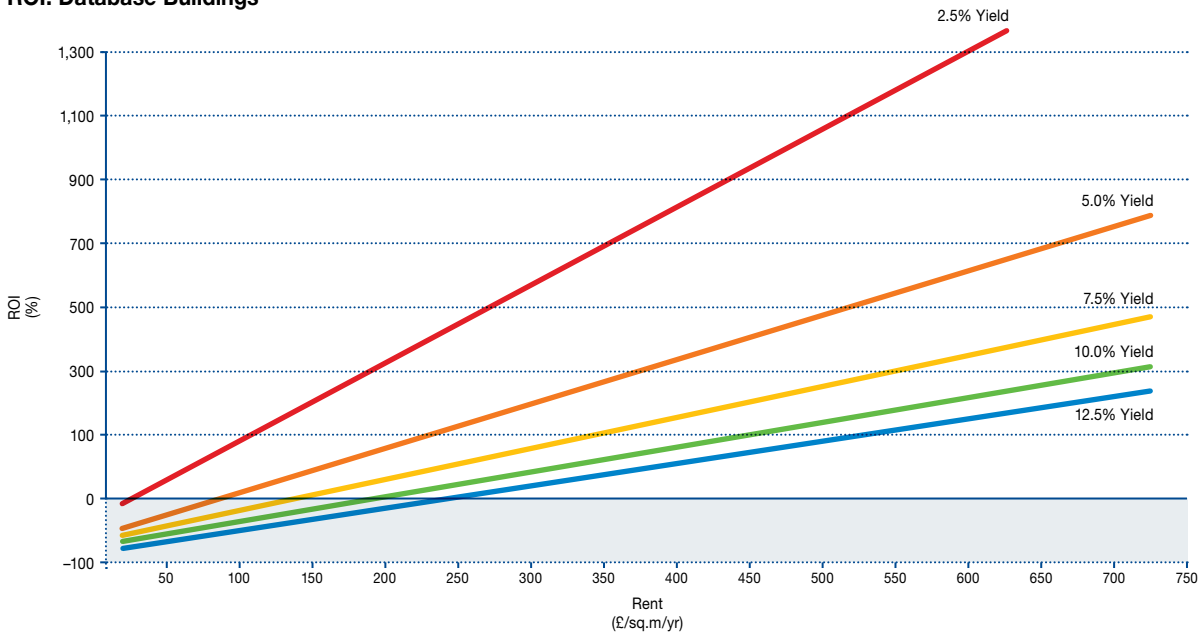


Figure 6: ROI for Database Buildings to which the *Kingspan Kooltherm® K12 Framing Board* & *Kingspan Kooltherm® K18 Insulated Plasterboard* Build-up was Applied.

For all database buildings attracting annual rental incomes of £425/sq.m (£39.48/sq.ft) and above, across all yields, the additional CapEx investment in *Kingspan Kooltherm® K12 Framing Board* and *Kingspan Kooltherm® K18 Insulated Plasterboard* provides an ROI of 100% or greater – the greatest of which being 1400%, at 2.5% yield, with a lettable floor area of £600/sq.m (£55.74/sq.ft).

ROI: Case Study Buildings

Case Study		Rental Value per Annum		Size		Yield	ROI
Location	Building Type	(£/sq.m)	(£/sq.ft)	(sq.m)	(sq.ft)	(%)	(%)
Edinburgh	Business Centre	105.50	9.80	960	10,333	7.5	23
Milton Keynes	Business Park	154.10	14.32	10,300	110,868	5.5	78
Peterborough	Laboratory / Small Office	141.80	13.17	610	6,566	7.0	38
Bristol	Office	288.50	26.80	29,600	318,611	6.5	190
Southampton	Business Park / Office	184.10	17.10	16,700	179,757	7.0	90

Table 2: ROI for Case Study Buildings to which the *Kingspan Kooltherm® K12 Framing Board* & *Kingspan Kooltherm® K18 Insulated Plasterboard* Build-up was Applied.

For all five real case study buildings to which the *Kingspan Kooltherm® K12 Framing Board* and *Kingspan Kooltherm® K18 Insulated Plasterboard* build-up was applied, the ROI is positive – the greatest of which being 190% for a six storey office building in Bristol, at 6.5% yield, with 29,600 sq.m (318,611 sq.ft) lettable floor area.

Findings

Rainscreen Ventilated Warm Wall Construction - Steel Frame

Width & Cost: Wall Build-ups

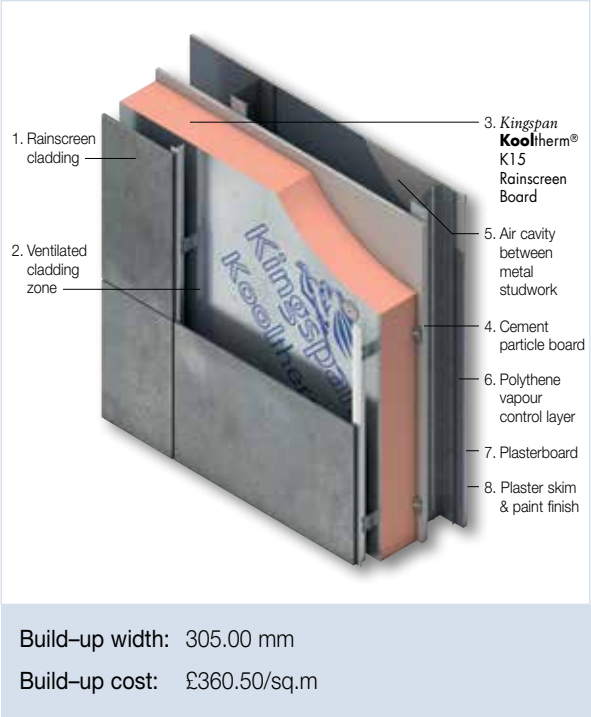


Figure 7: Build-up Incorporating Kingspan **Kooltherm**® K15 Rainscreen Board.

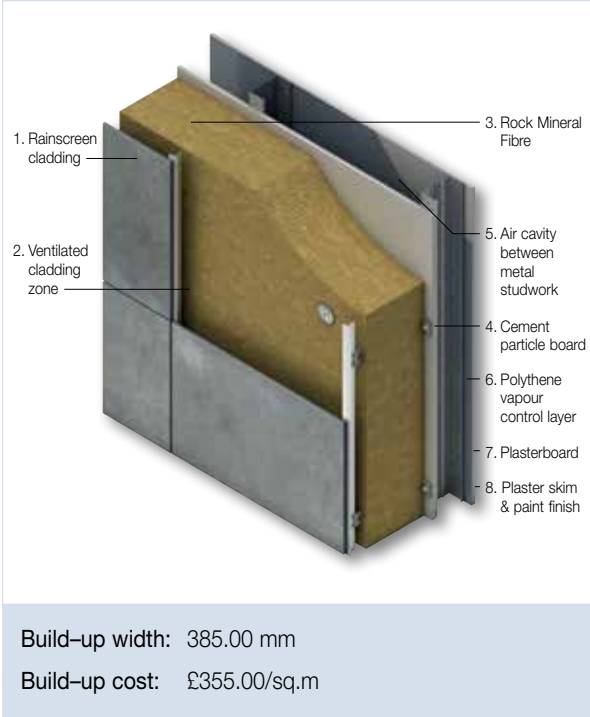


Figure 8: Build-up Incorporating Rock Mineral Fibre.

Despite the requirement for a CapEx uplift of £5.50 per square metre, the overall width of the wall build-up incorporating Kingspan **Kooltherm**® K15 Rainscreen Board is 80 mm thinner than that incorporating rock mineral fibre. Refer to Appendix B, Tables B-5 and B-6 for further details of the cost breakdown and elemental rates for each build-up.

ROI: Database Buildings

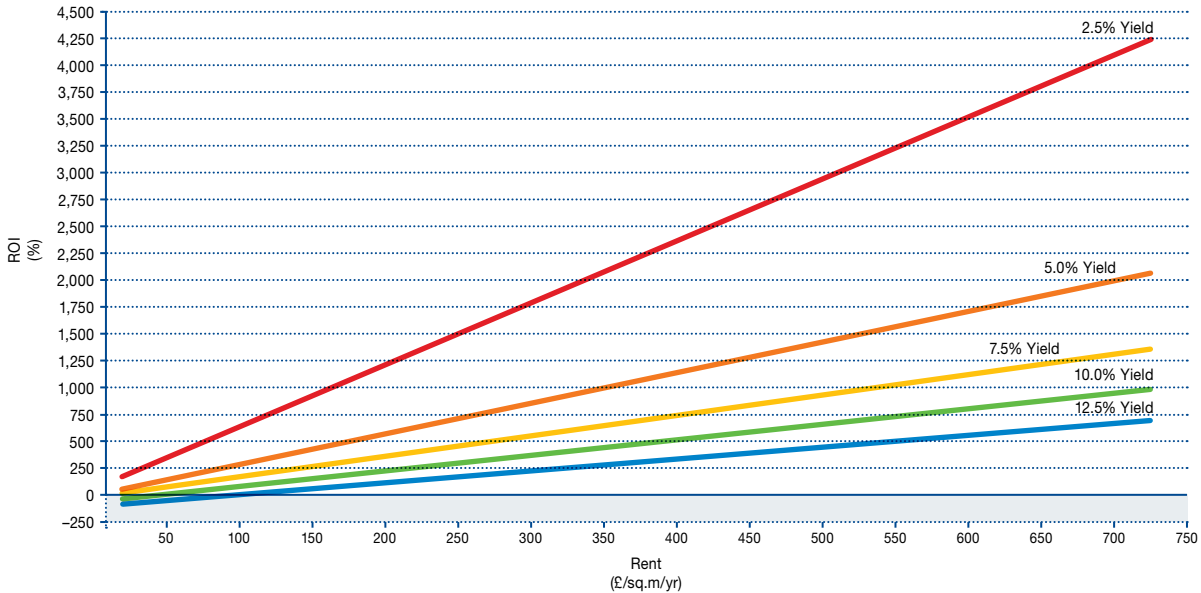


Figure 9: ROI for Database Buildings to which the *Kingspan Kooltherm*® K15 Rainscreen Board Build-up was Applied.

For all database buildings attracting annual rental incomes of £175/sq.m (£16.26/sq.ft) and above, across all yields, the additional CapEx investment in *Kingspan Kooltherm*® K15 Rainscreen Board provides an ROI of 100% or greater – the greatest of which being 4,250%, at 2.5% yield, with a lettable floor area of £725/sq.m (£67.35/sq.ft).

ROI: Case Study Buildings

Case Study		Rental Value per Annum		Size		Yield	ROI
Location	Building Type	(£/sq.m)	(£/sq.ft)	(sq.m)	(sq.ft)	(%)	(%)
Glasgow	Retail	159.30	14.80	5,550	59,740	9.0	282
Edinburgh	Business Centre	105.50	9.80	960	10,333	7.5	257
Manchester	Office / Technology Park	236.80	22.00	6,200	66,736	6.0	359
Milton Keynes	Business Park	154.10	14.32	10,300	110,868	5.5	353
Peterborough	Laboratory / Small Office	141.80	13.17	610	6,566	7.0	242
London	Office Tower	554.30	51.50	15,650	168,455	4.5	1324
Cardiff	Industrial / Office	61.40	5.70	35,800	385,348	8.5	32
Bristol	Office	288.50	26.80	29,600	318,611	6.5	578
Southampton	Business Park / Office	184.10	17.10	16,700	179,757	7.0	418

Table 3: ROI for Case Study Buildings to which the *Kingspan Kooltherm*® K15 Rainscreen Board Build-up was Applied.

For all nine real case study buildings to which the *Kingspan Kooltherm*® K15 Rainscreen Board build-up was applied, the ROI is positive – the greatest of which being 1,324% for a 14 storey office tower building in central London, at 4.5% yield, with a lettable floor area of 15,650 sq.m (168,455 sq.ft).

Findings

Rainscreen Ventilated Hybrid Wall Construction - Steel Frame

Width & Cost: Wall Build-ups

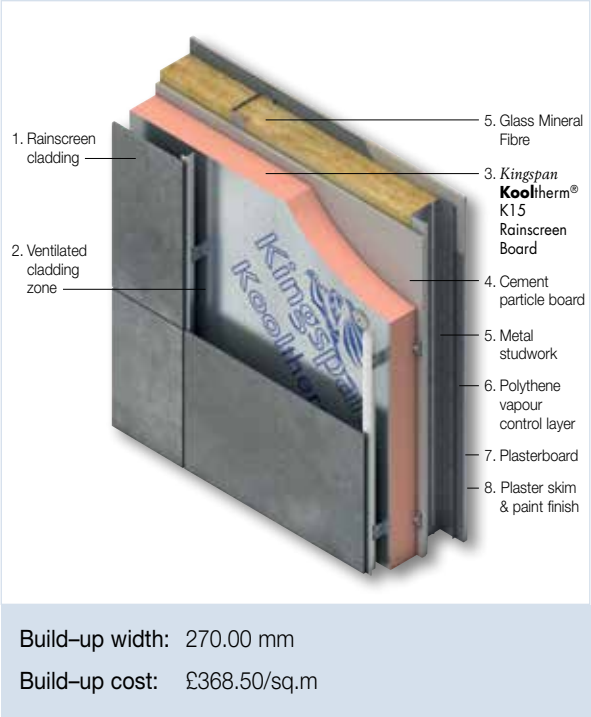


Figure 10: Build-up Incorporating Kingspan **Kooltherm**® K15 Rainscreen Board & Glass Mineral Fibre.

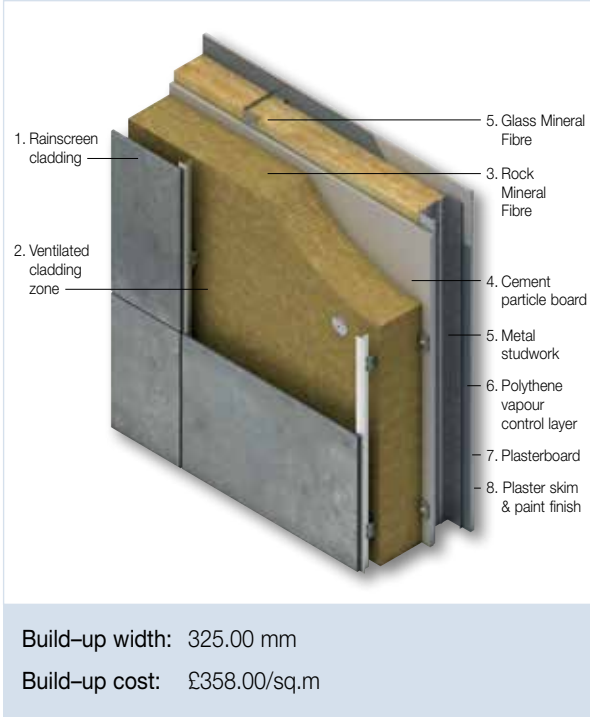


Figure 11: Build-up Incorporating Rock Mineral Fibre Slab & Glass Mineral Fibre.

Despite a CapEx uplift of £10.00 per square metre, the overall width of the build-up incorporating Kingspan **Kooltherm**® K15 Rainscreen Board and glass mineral fibre is 55 mm thinner than that incorporating rock mineral fibre slab and glass mineral fibre. Refer to Appendix B, Tables B-7 and B-8 for further details of the cost breakdown and elemental rates for each build-up.

ROI: Database Buildings

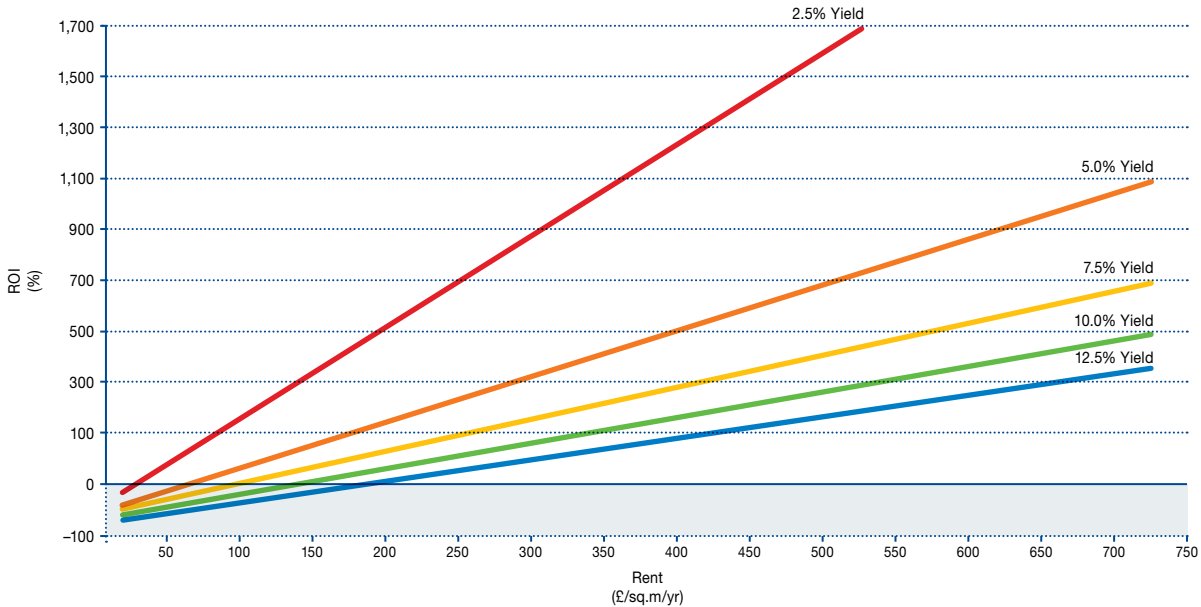


Figure 12: ROI for Database Buildings to which the *Kingspan Kooltherm*® K15 Rainscreen Board & Glass Mineral Fibre Build-up was Applied.

For all database buildings attracting annual rental incomes of £325/sq.m (£30.19/sq.ft) and above, across all yields, the additional CapEx investment in *Kingspan Kooltherm*® K15 Rainscreen Board and glass mineral fibre provides an ROI of 100% or greater – the greatest of which being 1,700%, at 2.5% yield, with a lettable floor area of £525/sq.m (£48.77/sq.ft).

ROI: Case Study Buildings

Case Study		Rental Value per Annum		Size		Yield	ROI
Location	Building Type	(£/sq.m)	(£/sq.ft)	(sq.m)	(sq.ft)	(%)	(%)
Glasgow	Retail	159.30	14.80	5,550	59,740	9.0	53
Edinburgh	Business Centre	105.50	9.80	960	10,333	7.5	74
Manchester	Office / Technology Park	236.80	22.00	6,200	66,736	6.0	166
Milton Keynes	Business Park	154.10	14.32	10,300	110,868	5.5	145
Peterborough	Laboratory / Small Office	141.80	13.17	610	6,566	7.0	88
London	Office Tower	554.30	51.50	15,650	168,455	4.5	791
Cardiff	Industrial / Office	61.40	5.70	35,800	385,348	8.5	-47
Bristol	Office	288.50	26.80	29,600	318,611	6.5	290
Southampton	Business Park / Office	184.10	17.10	16,700	179,757	7.0	165

Table 4: ROI for Case Study Buildings to which the *Kingspan Kooltherm*® K15 Rainscreen Board & Glass Mineral Fibre Build-up was Applied.

For eight out of the nine real case study buildings to which the *Kingspan Kooltherm*® K15 Rainscreen Board and glass mineral fibre build-up was applied, the ROI is positive – the greatest of which being 791% for a 14 storey office tower building central London, at 4.5% yield, with a lettable floor area of 15,650 sq.m (168,455 sq.ft).

Conclusion

It is clear from Sweett Group's findings that *Kingspan Kooltherm*[®] wall insulation solutions should be considered the insulation of choice, for new non-domestic buildings, where ROI is a consideration for property developers, owners and investors.

On the whole, the capitalised market 'value' of the additional space, resulting from the specification of *Kingspan Kooltherm*[®] wall insulation solutions, is far greater than the CapEx 'cost' of the additional space.

Out of the 7,290 database buildings that were analysed for each wall construction, 92% showed a positive ROI, irrespective of any CapEx uplift. With 51% of the buildings showing an ROI between 200% and 1,000%, and with 18% of the buildings showing an ROI greater than 1,000%, it is evident that any CapEx uplift is insignificant in the majority of development scenarios.

The rapid offsetting of the CapEx 'cost' of the additional space by the market 'value' of that additional space, is further underpinned by the findings for the real case study buildings. For instance, the office / retail building located in the heart of London with a 3.5% yield and an annual rental income of £683.50/sq.m (£63.50/sq.ft), showed an ROI of 1,645%.

As policy and legislation continue to target those activities that consume vast amounts of energy and contribute most to CO₂ emissions, buildings in particular are being subjected to increasingly stringent energy performance standards, which may include onerous requirements for the building envelope. This can lead to a subsequent increase in the wall insulation thickness required to achieve the specified thermal performance, and therefore a corresponding decrease in marketable internal floor area.

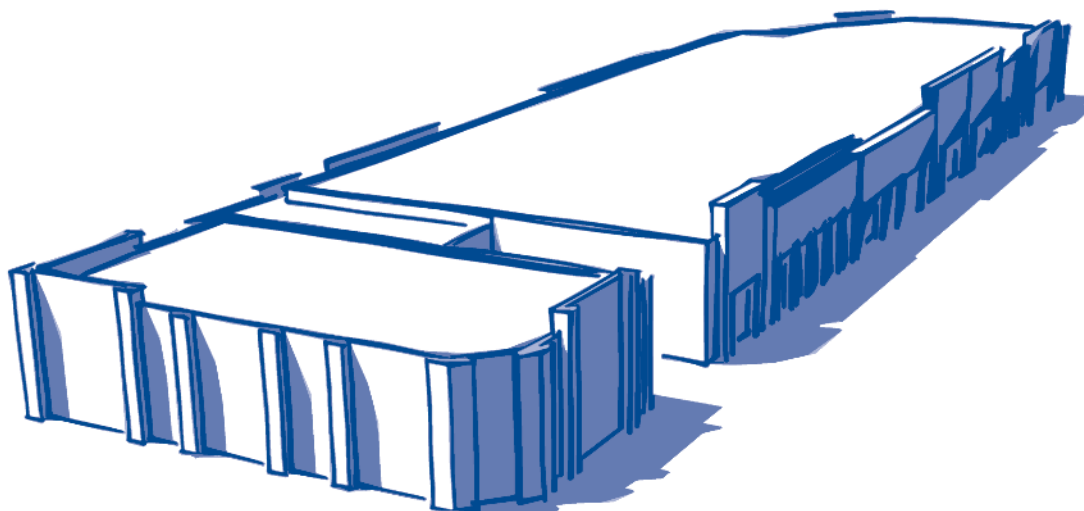
Poorer performing insulation materials (i.e. those with a higher thermal conductivity), can exacerbate the nuisance of ever-diminishing indoor space, particularly in buildings limited by a fixed footprint. Over time, this can erode the financial value, thus investment potential, of a building.

Premium performing insulation materials (i.e. those with a lower thermal conductivity), on the other hand, can provide some relief, since a lower thermal conductivity can result in thinner insulation. A thinner insulation can result in thinner external wall construction. A thinner external wall construction can result in greater internal floor area. A greater internal floor area can result in a greater ROI.

***"Kingspan Kooltherm*[®] wall insulation solutions should be considered the insulation of choice, for new non-domestic buildings, where ROI is a consideration for property developers, owners and investors".**

Case Studies

Glasgow, Retail Park



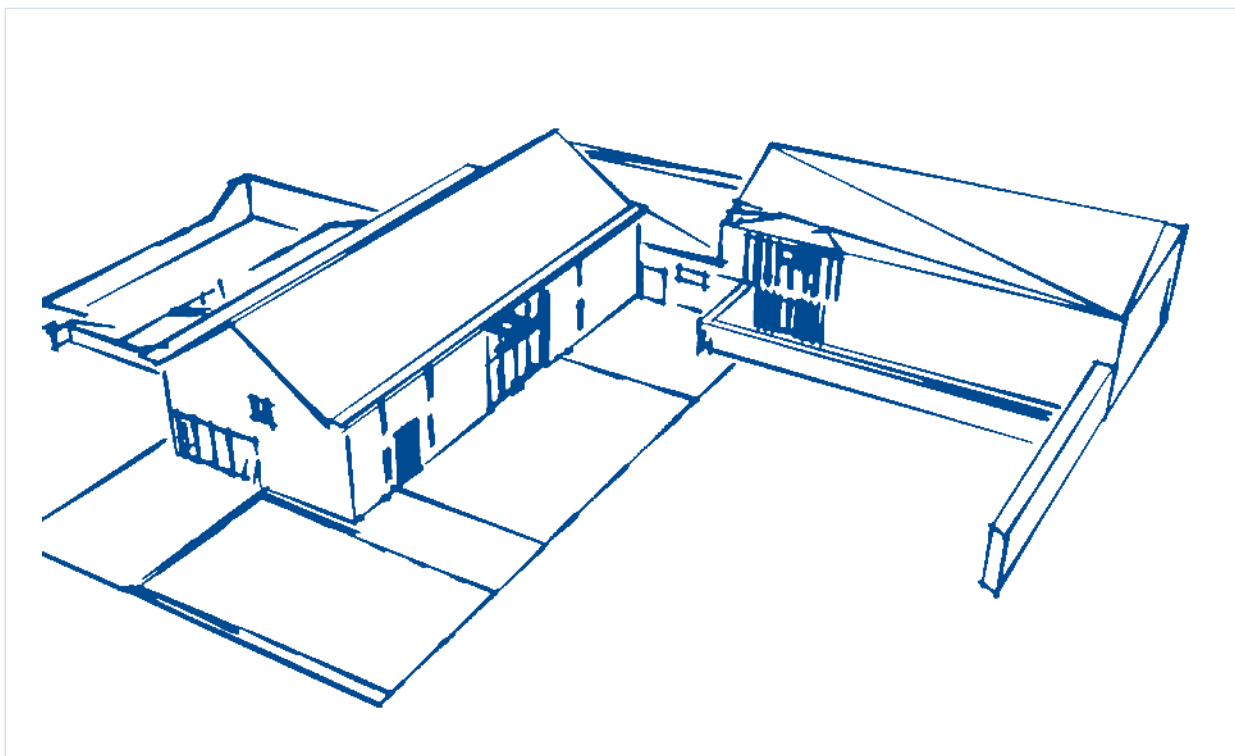
A typical new build retail park centre located on the outskirts of a major city. The development comprises a single building split into five separate retail spaces that could be let individually. Each unit is fit-out to shell only. The development is on an existing site. It includes the demolition of existing buildings and re-landscaping. The re-routing of services however, is not required.

Description	Value
External wall construction type	Rainscreen ventilated warm wall – steel frame
Wall build-up	<i>Kingspan Kooltherm</i> ® K15 Rainscreen Board
Development cost	£5.1 million
Lettable floor area	5,550 sq.m (59,740 sq.ft)
Projected annual rental value	£159.30/sq.m (£14.80/sq.ft)
External wall area	1,850 sq.m
Floor area to wall area ratio	3.0
Additional floor area	29.60 sq.m (318.61 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board	£13,453.00
Additional cost offset for as % of total development cost	0.26%
Additional annual rental income	£4,715.00
Current market yield for development	@9.0%
Capitalised value of space	£51,449.00
Return on additional CapEx	282%

Table 5: Details of the Glasgow, Retail Park Case Study Building with a Rainscreen Ventilating Warm Wall Construction Incorporating *Kingspan Kooltherm*® K15 Rainscreen Board.

Case Studies

Edinburgh, Business Centre

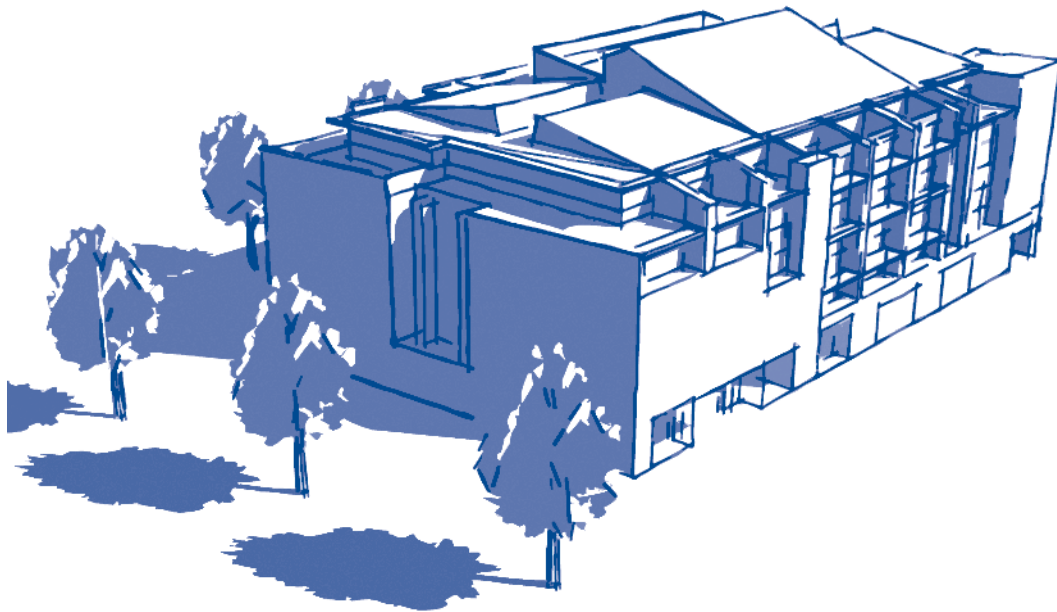


A low-rise new build business centre located in a regenerated rural area with close links to the local city centre. The development is on the site of some existing agricultural buildings. New services are required to be brought to the site. The internal space fit-out is to Cat-A specification.

Description	Value
External wall construction type	Cavity wall – brick & block
Wall build-up	<i>Kingspan Kooltherm</i> ® K8 Cavity Board
Development cost	£1.42 million
Lettable floor area	960 sq.m (10,333 sq.ft)
Projected annual rental value	£105.50/sq.m (£9.80/sq.ft)
External wall area	744 sq.m
Floor area to wall area ratio	1.29
Additional floor area	9.90 sq.m (106.56 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K8 Cavity Board	£6,742.00
Additional cost offset for as % of total development cost	0.47%
Additional annual rental income	£1,047.00
Current market yield for development	@7.5 %
Capitalised value of space	£13,703.00
Return on additional CapEx	103%

Table 6: Details of the Edinburgh, Business Centre Case Study Building with a Cavity Wall Construction Incorporating *Kingspan Kooltherm*® K8 Cavity Board.

Manchester, Office / Technology Park



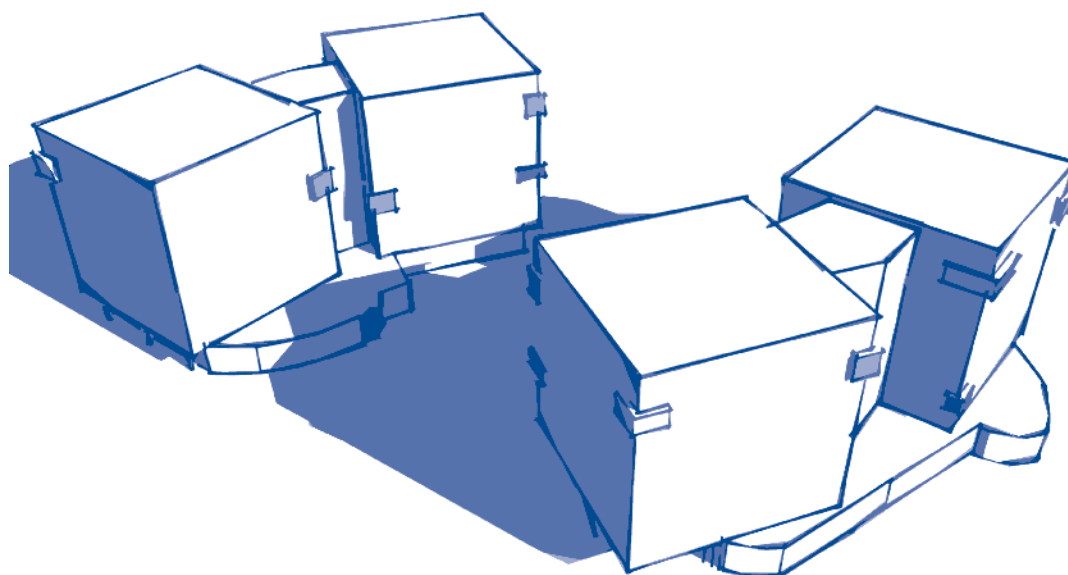
A low-rise new build office / technology block located in the city centre with few neighbouring buildings. The development is on a brownfield site with the demolition having already taken place. The development is split between 80% Cat-A specification office space and 20% shell only technical / laboratory space.

Description	Value
External wall construction type	Rainscreen ventilated hybrid wall – steel frame
Wall build-up	<i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with glass mineral fibre
Development cost	£9.5 million
Lettable floor area	6,200 sq.m / 66,736 sq.ft
Projected annual rental value	£236.80/sq.m (£22.00/sq.ft)
External wall area	3,225 sq.m
Floor area to wall area ratio	1.92
Additional floor area	39.40 sq.m (424.10 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with Glass Mineral Fibre	£57,404.00
Additional cost offset for as % of total development cost	0.60%
Additional annual rental income	£9,338.00
Current market yield for development	@6.0%
Capitalised value of space	£152,835.00
Return on additional CapEx	166%

Table 7: Details of the Manchester, Office / Technology Park Case Study Building with a Rainscreen Ventilated Hybrid Wall Construction Incorporating *Kingspan Kooltherm*® K15 Rainscreen Board & Glass Mineral Fibre.

Case Studies

Milton Keynes, Business Park / Office

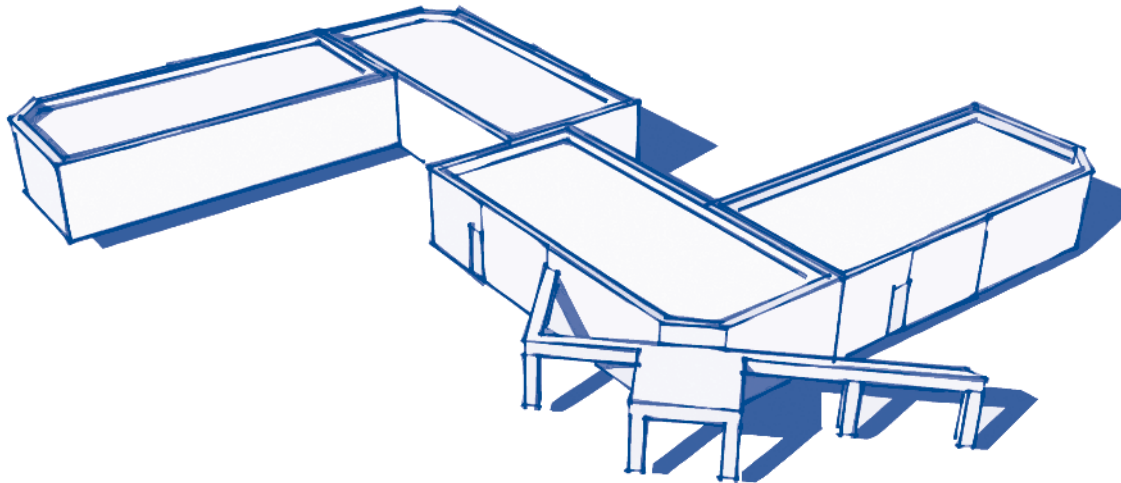


This case study encompasses two new build four storey office blocks located in an out of town business park in the Midlands. Two phases of the business park have already been completed and existing infrastructure is in place. Both blocks are fit-out to a Cat-A specification.

Description	Value
External wall construction type	Cavity wall – brick & block
Wall build-up	<i>Kingspan Kooltherm</i> ® K8 Cavity Board
Development cost	£15.3 million
Lettable floor area	10,300 sq.m (110,868 sq.ft)
Projected annual rental value	£154.10/sq.m (£14.32/sq.ft)
External wall area	4,985 sq.m
Floor area to wall area ratio	2.06
Additional floor area	52.50 sq.m (565.10 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K8 Cavity Board	£51,314.00
Additional cost offset for as % of total development cost	0.34%
Additional annual rental income	£8,087.00
Current market yield for development	@5.5 %
Capitalised value of space	£144,393.00
Return on additional CapEx	181%

Table 8: Details of the Milton Keynes, Business Park / Office Case Study with a Cavity Wall Construction Incorporating Insulated with *Kingspan Kooltherm*® K8 Cavity Board.

Peterborough, Laboratory / Small Office



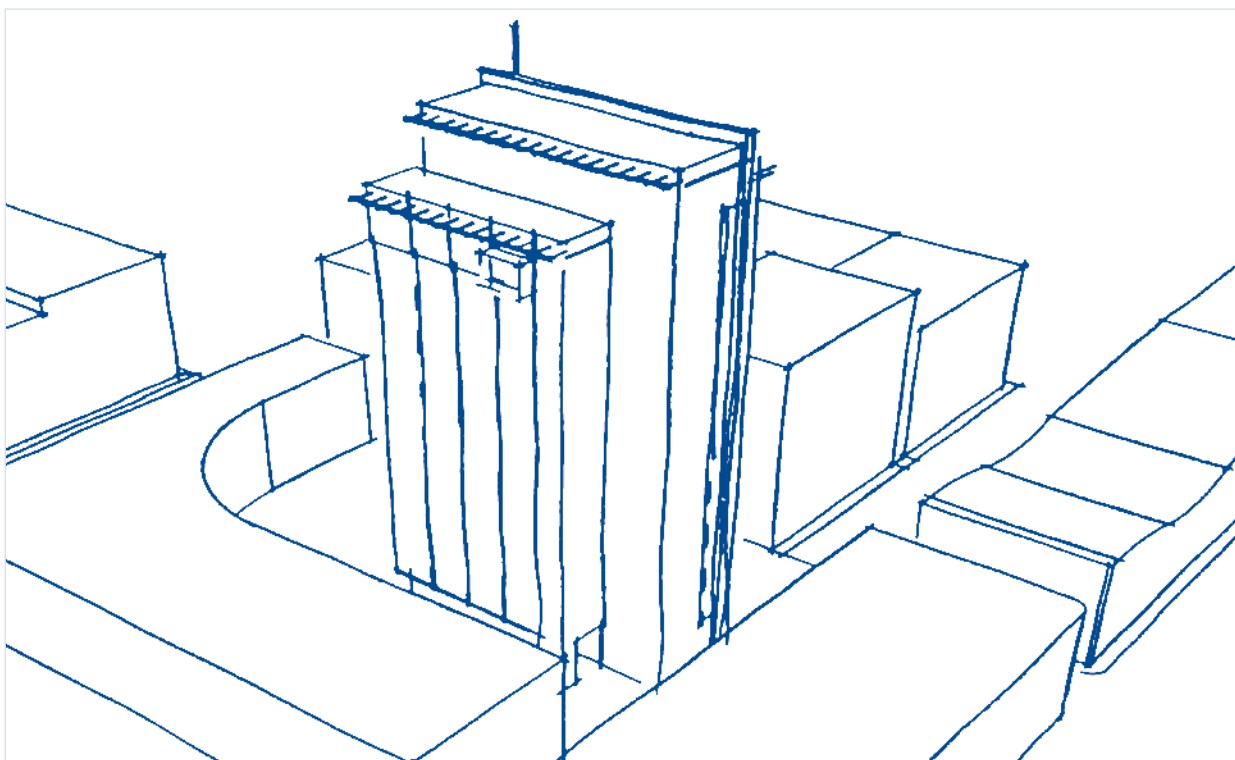
A small single storey new build office space and laboratory space development. The floor area is split into 75% office space and 25% laboratory space. The office space is fit-out to Cat-A specification and the laboratory space shell only. The development is part of an existing campus of office buildings located in a rural area with links to the local town. Services will need to be brought to the development as it will be built on virgin land.

Description	Value
External wall construction type	Timber frame wall construction – brick masonry outer leaf
Wall build-up	Kingspan Kooltherm® K12 Framing Board
Development cost	£1.875 million
Lettable floor area	610 sq.m (6,566 sq.ft)
Projected annual rental value	£141.80/sq.m (£13.17/sq.ft)
External wall area	500 sq.m
Floor area to wall area ratio	1.42
Additional floor area	6.00 sq.m (64.58 sq.ft)
Additional capex offset for Kingspan Kooltherm® K12 Framing Board	£8,666.00
Additional cost offset for as % of total development cost	0.46%
Additional annual rental income	£852.00
Current market yield for development	@7.0 %
Capitalised value of space	£11,947.00
Return on additional CapEx	38%

Table 9: Details of the Peterborough, Laboratory / Small Office Case Study with a Timber Frame Wall Construction Incorporating **Kingspan Kooltherm® K12 Framing Board**.

Case Studies

London, Office Tower

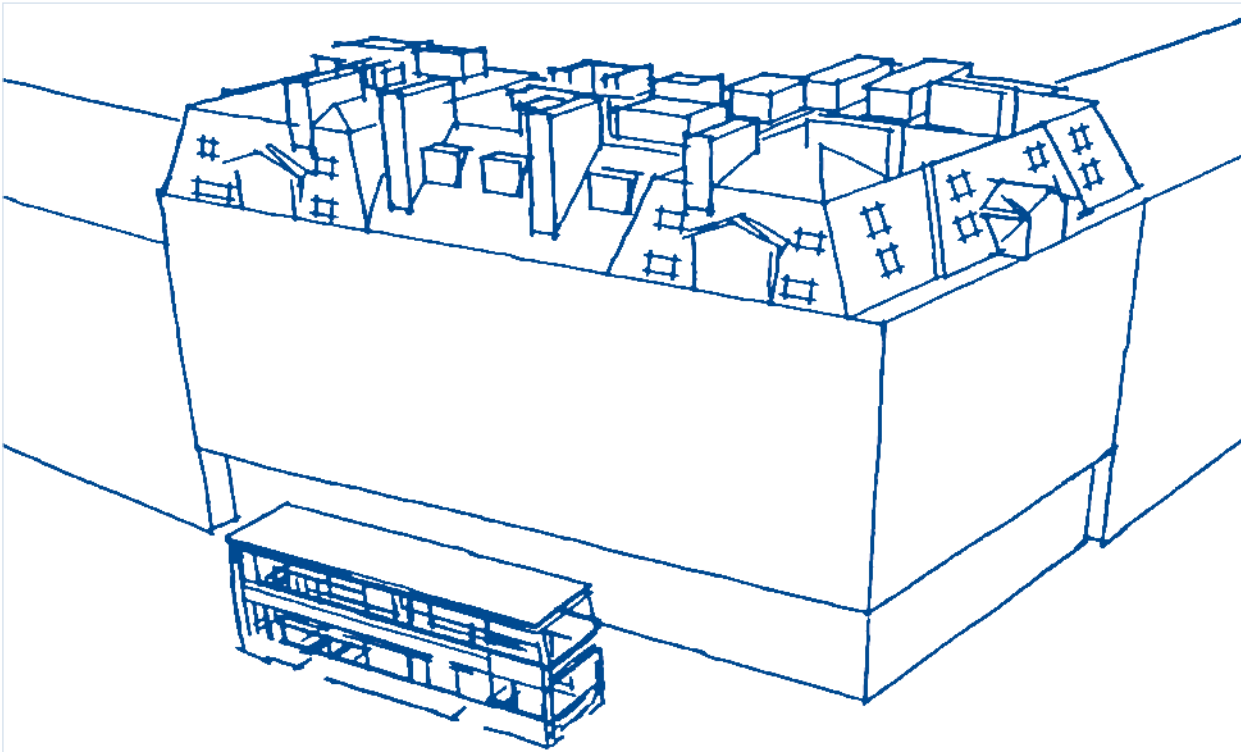


Located on an already demolished site, this new build development is located in the city centre inside of a densely built up area. The tower is 14 storeys high, including a double basement. The fit-out of the entire building will be to a Cat-A specification, modelled around a central core that runs throughout the tower.

Description	Value
External wall construction type	Rainscreen ventilated hybrid wall – steel frame
Wall build-up	<i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with glass mineral fibre
Development cost	£63.45 million
Lettable floor area	15,650 sq.m (168,455 sq.ft)
Projected annual rental value	£554.30/sq.m (£51.50/sq.ft)
External wall area	8,600 sq.m
Floor area to wall area ratio	1.81
Additional floor area	126.50 sq.m (1,361.63 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with Glass Mineral Fibre	£171,762.00
Additional cost offset for as % of total development cost	0.27%
Additional annual rental income	£70,119.00
Current market yield for development	@4.5%
Capitalised value of space	£1,530,151.00
Return on additional CapEx	791%

Table 10: Details of the London, Office Tower Case Study with a Rainscreen Ventilating Hybrid Wall Construction Incorporating *Kingspan Kooltherm*® K15 Rainscreen Board with Glass Mineral Fibre.

London, Office / Retail



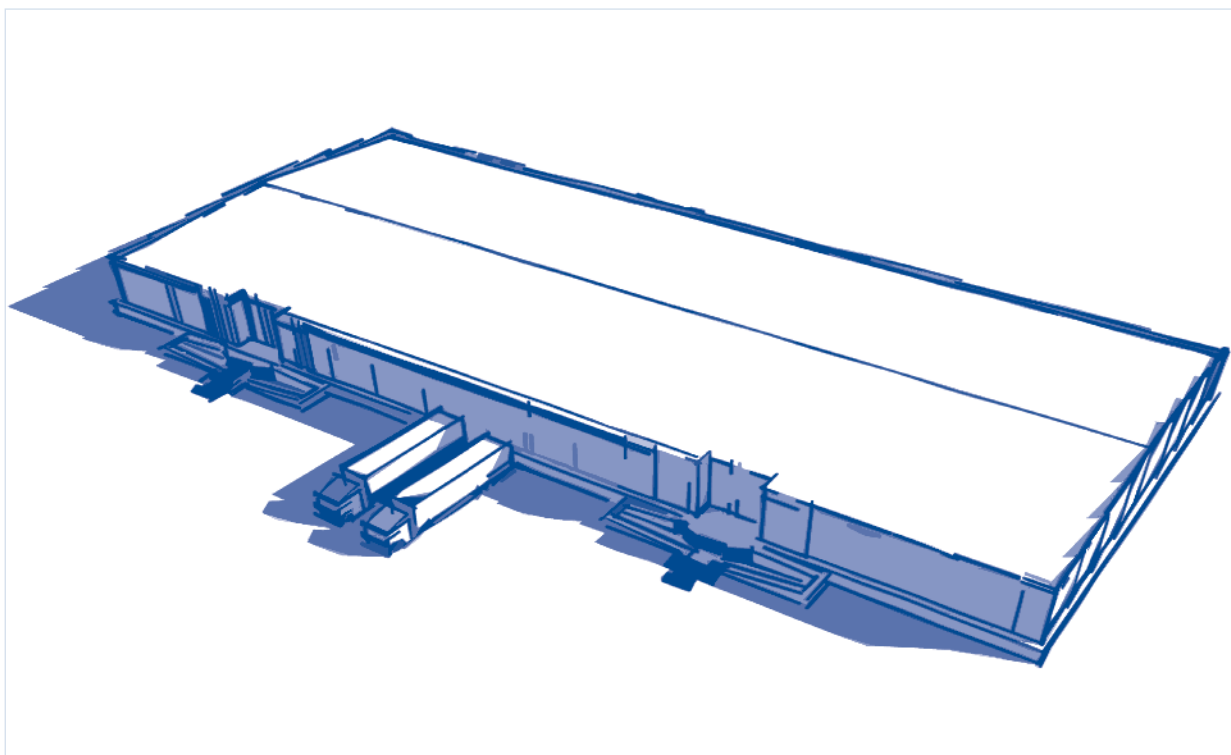
A typical city centre new build development on the site of a previous building which had a similar height and shape. The new build development is in keeping with the local vernacular. The ground floor is a shell only fit-out for retail let and the above five floors is fit-out to a Cat-A Office specification.

Description	Value
External wall construction type	Cavity wall – brick & block
Wall build-up	<i>Kingspan Kooltherm</i> ® K8 Cavity Board
Development cost	£15.476 million
Lettable floor area	6,800 sq.m (73,195 sq.ft)
Projected annual rental value	£683.50/sq.m (£63.50/sq.ft)
External wall area	2,250 sq.m
Floor area to wall area ratio	3.03
Additional floor area	26.00 sq.m (279.86 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K8 Cavity Board	£28,743.00
Additional cost offset for as % of total development cost	0.19%
Additional annual rental income	£17,771.00
Current market yield for development	@3.5%
Capitalised value of space	£498,603.00
Return on additional CapEx	1,635%

Table 11: Details of the London, Office / Retail Case Study with a Cavity Wall Construction Incorporating *Kingspan Kooltherm*® K8 Cavity Board.

Case Studies

Cardiff, Industrial / Office

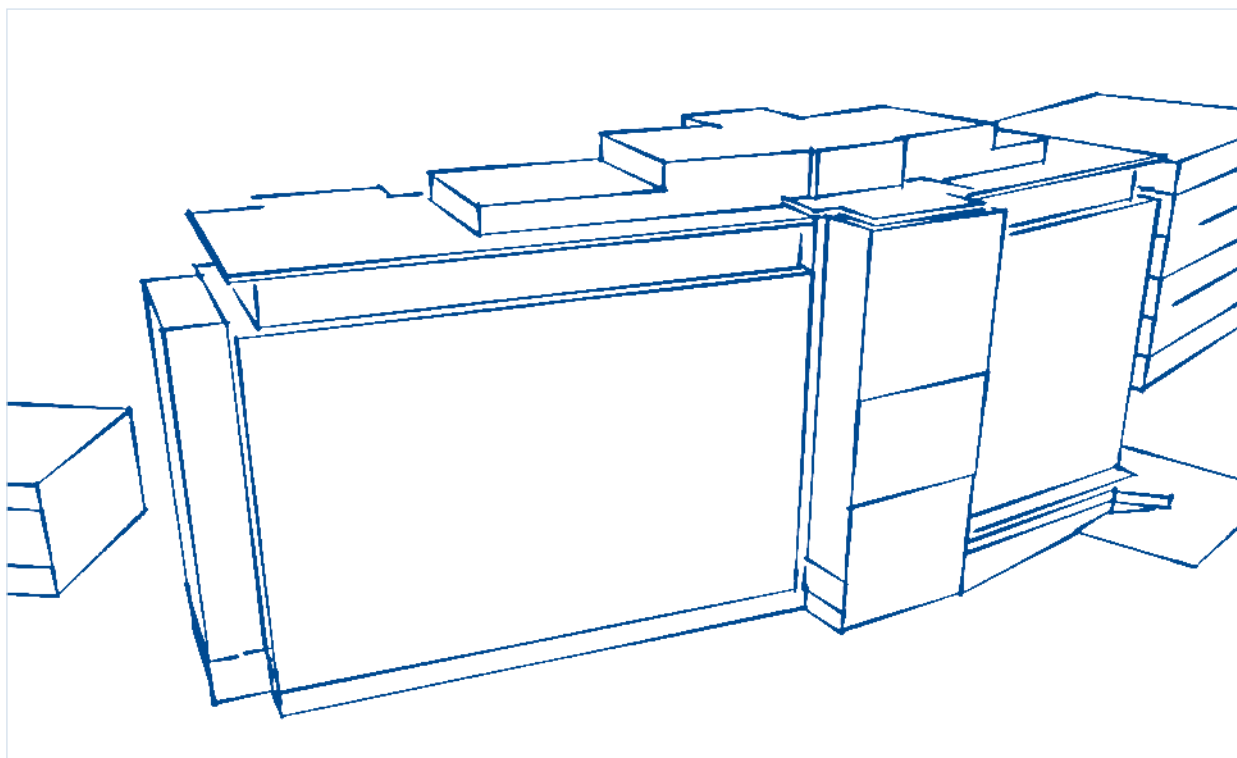


A large scale industrial / distribution unit located on the outskirts of a major city near a shipping port. The new build development comprises the demolition of existing site buildings, general site clearance and the development of a large industrial unit with car parking and access routes. The unit itself comprises 90% distribution unit and 10% office.

Description	Value
External wall construction type	Rainscreen ventilated warm wall – steel frame
Wall build-up	<i>Kingspan Kooltherm</i> ® K15 Rainscreen Board
Development cost	£18.01 million
Lettable floor area	35,800 sq.m (385,348 sq.ft)
Projected annual rental value	£61.40/sq.m (£5.70/sq.ft)
External wall area	5,940 sq.m
Floor area to wall area ratio	6.03
Additional floor area	79.20 sq.m (852.50 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board	£42,530.00
Additional cost offset for as % of total development cost	0.24%
Additional annual rental income	£4,863.00
Current market yield for development	@8.5%
Capitalised value of space	£56,181.00
Return on additional CapEx	32%

Table 12: Details of the Cardiff, Industrial / Office Case Study with a Ventilated Warm Wall Construction Incorporating *Kingspan Kooltherm*® K15 Rainscreen Board.

Bristol, Office



A typical new build office development in a prime location of the city. The development comprises the demolition of the existing and the construction of the new six storey building with basement car parking. It is fit-out to a Cat-A specification.

Description	Value
External wall construction type	Rainscreen ventilated hybrid wall – steel frame
Wall build-up	<i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with glass mineral fibre
Development cost	£30.085 million
Lettable floor area	29,600 sq.m (31,8611 sq.ft)
Projected annual rental value	£288.50/sq.m (£2,680/sq.ft)
External wall area	7,560 sq.m
Floor area to wall area ratio	3.91
Additional floor area	118.80 sq.m (1,278.75 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with Glass Mineral Fibre	£132,775.00
Additional cost offset for as % of total development cost	0.44%
Additional annual rental income	£34,274.00
Current market yield for development	@6.5 %
Capitalised value of space	£517,798.00
Return on additional CapEx	290%

Table 13: Details of the Bristol, Office Case Study with a Rainscreen Ventilated Hybrid Wall Construction Incorporating *Kingspan Kooltherm*® K15 Rainscreen Board with Glass Mineral Fibre.

Case Studies

Southampton, Business Park



This case study comprises the development of a new build business park on the edge of the city with direct links to the city and its shipping areas. It is situated on a brownfield site. In total there are six office buildings on the site: five buildings with two storeys and one with three storeys. All are Cat-A office specification fit-out.

Description	Value
External wall construction type	Rainscreen ventilated hybrid wall – steel frame
Wall build-up	<i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with glass mineral fibre
Development cost	£18.985 million
Lettable floor area	16,700 sq.m (179,757 sq.ft)
Projected annual rental value	£184.10/sq.m (£17.10/sq.ft)
External wall area	8,600 sq.m
Floor area to wall area ratio	1.95
Additional floor area	135.10 sq.m (1,454.20 sq.ft)
Additional capex offset for <i>Kingspan Kooltherm</i> ® K15 Rainscreen Board with Glass Mineral Fibre	£131,578.00
Additional cost offset for as % of total development cost	0.69%
Additional annual rental income	£24,878.00
Current market yield for development	@7.0 %
Capitalised value of space	£349,008.00
Return on additional CapEx	165%

Table 14: Details of the Southampton, Business Park Case Study with a Rainscreen Ventilated Hybrid Wall Construction Incorporating *Kingspan Kooltherm*® K15 Rainscreen Board with Glass Mineral Fibre.

Appendix A

Database Buildings - Data Inputs & Model

Data Inputs

The data inputs that have been used to run the model and generate the 7,290 database buildings have each been researched and decided on by the relevant building professionals at Sweett Group including: Chartered Surveyors; Chartered Engineers; Asset Management and Capital Allowance specialists; and Corporate Real Estate Advisors.

Description	Value	
External Wall Construction Build-up Width & Cost		
Cavity wall – brick & block	<i>Kingspan Kooltherm®</i> K8 Cavity Board	348.0 mm £223.00/sq.m
	Glass mineral fibre	388.0 mm £217.00/sq.m
Timber frame – brick outer leaf	<i>Kingspan Kooltherm®</i> K12 Cavity Board & <i>Kingspan Kooltherm®</i> K18 Insulated Plasterboard	291.5 mm £231.00/sq.m
	Glass mineral fibre & XPS plasterboard laminate	333.5 mm £219.50/sq.m
Rainscreen ventilated warm wall – steel frame	<i>Kingspan Kooltherm®</i> K15 Rainscreen Board	308.0 mm £360.50/sq.m
	Rock mineral fibre	388.0 mm £355.00/sq.m
Raincreen ventilated hybrid wall – steel frame	<i>Kingspan Kooltherm®</i> K15 Rainscreen Board & glass mineral fibre	273.0 mm £368.50/sq.m
	Rock mineral fibre & glass mineral fibre	328.0 mm £358.50/sq.m
Building Size & Form		
Lettable floor area	1,000–30,000 sq.m (10,763.9–430,556.0 sq.ft) in increments of 5,000 sq.m; and 30,000–50,000 sq.m (322,917.0–538,195.0 sq.ft) increments of 10,000 sq.m.	
Floor area to wall area ratio	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0	
Floor to floor height	4.0 m	
Perimeter length	Calculated from 4.0 m floor to floor height & then adjusted	
Building Financials		
Annual rental value	£50.00–£750.00/sq.m (£4.65–£69.68/sq.ft) in increments of £50.00/sq.m	
General build development rate*	£1,807.69/sq.m	
Fit-out rate**	£290.63/sq.m	
Capitalisation rate***	@2.5%, @5.0%, @7.5%, @10.0%, @12.5%	
Standard fees	Agency	1.00%
	Legal	0.75%
	Miscellaneous	0.05%
Professional fees & provisional sums	5%	
Cost contingency	10%	
Preliminaries	10%	
<p>* Based upon a national average from current Sweett Group estimations, using a Cat A Office block as a basis. ** Based upon a national average & assuming that, as a baseline, the development cost and quality is representative of a Cat-A fit-out. *** The capitalisation calculator in the model is used to define the value of space for each database building. The calculator is an implicit model developed by the Royal Institute of Chartered Surveyors (RICS) and uses an 'all-risks yield' as a valuation model. The capitalisation of the value of space is not the gross cost. It takes into account agency and legal fees. This is set at an industry standard of 1.8% of the gross cost.</p>		

Table A-1: Data Inputs Used To Run the Model & Generate the Database Buildings.

Appendix A

Model

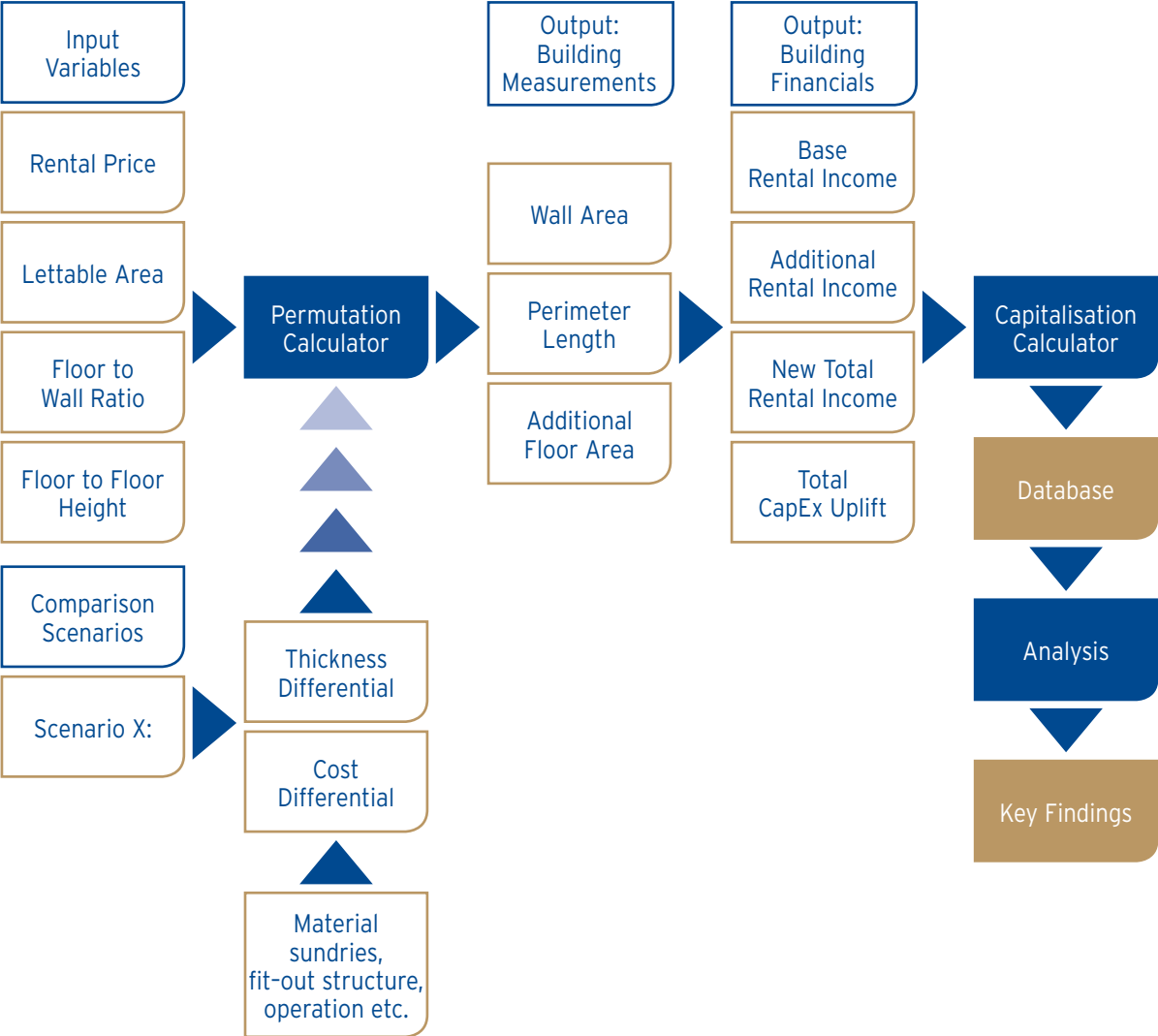


Figure A-1: Model used to Generate the Database Buildings.

Appendix B

External Wall Construction Build-ups - Specification & Cost

Wall Construction Build-up Specifications

The external wall constructions and corresponding build-up specifications used in the analysis are defined by Kingspan Insulation Ltd. The calculated U-value for all build-ups shown is 0.22 W/m².K. U-values are calculated using the methods detailed in:

- BS EN ISO 6946: 2007 (Building components & building elements. Thermal resistance & thermal transmittance. Calculation method);
- BS EN ISO 13370: 2007 (Thermal performance of buildings. Heat transfer via the ground. Calculation methods); and
- using the conventions set out in BR 443 (Conventions for U-value calculations).

For the purpose of these calculations, the standard of workmanship is assumed good therefore the correction factor for air gaps is ignored.

Build-up Cost Breakdown & Elemental Rates

Cost data for the components comprising the build-ups has been researched and determined by the relevant building professionals at Sweett Group, namely Quantity Surveyors.

Prelims, contingency and professional fees are not included for in the total cost shown for the full wall build-ups, neither is an allowance for a damp proof membrane (where applicable).

Appendix B

Cavity Wall Construction – Brick & Block

Layer	Build-up Component	Kingspan Kooltherm ® K8 Cavity Board*			Glass Mineral Fibre**		
		Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)	Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)
–	Outside surface resistance	–	–	0.040	–	–	0.040
1	Brickwork facing	102.5	0.770	1.330	102.5	0.770	1.330
2	Air cavity	50.0	–	0.644	–	–	–
3	Insulant	65.0	0.020	3.250	155.0	0.037	4.189
4	Blockwork 1400 kg/m ³	100.0	0.510	0.196	100.0	0.510	0.196
5	Plaster dabs cavity fill 20%	15.0	–	0.180	15.0	–	0.180
6	Plasterboard	12.5	0.190	0.066	12.5	0.190	0.066
7	Plaster skim	3.0	0.180	0.017	3.0	0.180	0.017
–	Inside surface Resistance	–	–	0.130	–	–	0.130
1–7	Full wall build-up	348.0	–	–	388.00	–	–

* Assuming a stainless steel flexible tie (thermal conductivity 'λ-value' 17.00 W/m·K) with 2.5 ties per sq.m and a cross-sectional area of 12.50 sq.mm.
 ** Assuming a stainless steel flexible tie (λ-value 17.00 W/m·K) with 3.0 ties per sq.m and a cross-sectional area of 60.80 sq.mm.

Table B-1: Cavity Wall Construction Build-up Specification.

Layer	Description	Wall Build-up Cost (£/sq.m)	
		Kingspan Kooltherm ® K8 Cavity Board	Glass Mineral Fibre
1	Brickwork facing	102.00	102.00
2a	Stainless steel wall ties	3.00	4.00
2b	Cavity closers**	5.00	5.50
2c	Cavity trays**	2.00	3.00
2d	Lintols**	10.00	11.00
3	Insulant	13.00	3.50
4	Blockwork	53.00	53.00
5–6	Plasterboard on dabs	23.00	23.00
7a	Plaster skim coat	7.00	7.00
7b	Paint finish	5.00	5.00
1–7b	Full wall build-up	223.00	217.00

* Assuming £800 per 1,000 units.
 ** Assumed allowance.

Table B-2: Cavity Wall Construction Build-up Cost Breakdown & Elemental Rates.

Timber Frame Wall Construction – Brick Outer Leaf

Layer	Build-up Component	Kingspan Kooltherm ® K12 Framing Board & Kingspan Kooltherm ® K18 Insulated Plasterboard			Glass Mineral Fibre & XPS Plasterboard Laminate		
		Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)	Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)
–	Outside surface resistance	–	–	0.040	–	–	0.040
1	Brickwork facing	102.5	0.770	1.330	102.5	0.770	1.330
2	Air cavity	50.0	–	0.184	50.0	–	0.184
3	Breathable membrane	0.5	–	0.006	0.5	–	0.006
4	Plywood sheathing	9.0	0.140	0.064	9.0	0.140	0.064
5	Air cavity between timber studwork	19.0	–	0.617	–	–	–
6	Insulant between timber studwork*	70.0	0.020	3.500	89.00	0.040	2.225
7	Insulant & plasterboard internal lining	37.5*	–	1.256	79.5**	–	2.166
8	Plaster skim	3.0	0.180	0.017	3.0	0.180	0.017
–	Inside surface Resistance	–	–	0.130	–	–	0.130
1–8	Full wall build-up	291.5	–	–	333.5	–	–

* 12.5 mm of which is plasterboard (λ -value 0.19 W/m·K) with remaining 25 mm insulation (thermal conductivity 0.021 W/m·K).
** 9.5 mm of which is plasterboard (λ -value 0.19 W/m·K) with remaining 70 mm insulation (thermal conductivity 0.033 W/m·K).
NB These calculations assume a 15% bridging factor for the 89 mm timber studwork (λ -value 0.12 W/m·K, whilst ignoring the effect of fixings for the insulated plasterboard as the insulation layer penetrated is not the main insulation layer.

Table B-3: Timber Frame Wall Construction Build-up Specification.

Layer	Description	Wall Build-up Cost (£/sq.m)	
		Kingspan Kooltherm ® K12 Framing Board	Glass Mineral Fibre
1	Brickwork facing*	102.00	102.00
2a	Stainless steel wall ties**	2.50	2.50
2b	Cavity closers***	4.50	4.50
2c	Cavity trays***	2.50	2.50
2d	Lintols***	9.50	9.50
3	Kingspan nilvent ® Breathable Membrane	5.00	5.00
4	Plywood sheathing	5.00	5.00
5	Timber studwork	43.00	43.00
6	Insulant between timber studwork	16.00	3.50
7	Insulant & plasterboard internal lining	22.50	23.50
8a	Vapour control layer	6.50	6.50
8b	Plaster skim coat	7.00	7.00
8c	Paint finish	5.00	5.00
1–8c	Full wall build-up	231.00	219.50

* Assuming £800 per 1,000 units.
** Assuming 2.5 ties per sq.m.
*** Assumed allowance.

Table B-4: Timber Frame Wall Construction Build-up Cost Breakdown & Elemental Rates.

Appendix B

Rainscreen Ventilated Warm Wall Construction – Steel Frame

Layer	Build-up Component	Kingspan Kooltherm ® K15 Rainscreen Board			Rock Mineral Fibre		
		Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)	Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)
–	Outside surface resistance	–	–	0.316	–	–	0.141
1	Rainscreen cladding	10.0	0.000	0.000	10.0	0.000	0.000
2	Ventilated cladding zone	50.0	–	0.000	50.0	–	0.000
3	Insulant	120.0	0.020	6.000	200.0	0.035	5.714
4	Cement particle board	12.0	0.230	0.052	12.0	0.230	0.052
5	Air cavity between metal studwork	100.00	–	0.194	100.00	–	0.194
6	Polythene vapour control layer	0.5	–	0.001	0.5	–	0.001
7	Plasterboard	12.5	0.190	0.066	12.5	0.190	0.066
8	Plaster skim	3.0	0.180	0.017	3.0	0.180	0.017
–	Inside surface Resistance	–	–	0.130	–	–	0.130
1–8	Full wall build-up	308.0	–	–	388.0	–	–

NB These calculations assume: a 3% bridging factor for the 1.2 mm steel studwork installed at 600 mm centres horizontally and 1,200 mm vertically; a carbon steel fastener (λ-value 50.00 W/m·K) with 3.13 fasteners per sq.m and a cross-sectional area of 16.98 sq.mm; and that cladding brackets are installed at 600 mm centres horizontally and vertically.

Table B-5: Rainscreen Ventilated Warm Wall Construction Build-up Specification.

Layer	Description	Wall Build-up Cost (£/sq.m)	
		Kingspan Kooltherm ® K15 Rainscreen Board	Glass Mineral Fibre
1–2	Rainscreen cladding on brackets	250.00	250.00
3	Insulant	26.00	20.50
4	Cement particle board	10.00	10.00
5	Metal studwork	43.00	43.00
6	Polythene vapour control layer	6.50	6.50
7	Plasterboard	13.00	13.00
8a	Plaster skim coat	7.00	7.00
8b	Paint finish	5.00	5.00
1–8b	Full wall build-up	360.50	355.00

Table B-6: Timber Frame Wall Construction Build-up Cost Breakdown & Elemental Rates.

Rainscreen Ventilated Hybrid Wall Construction – Steel Frame

Layer	Build-up Component	Kingspan Kooltherm ® K15 Rainscreen Board			Rock Mineral Fibre		
		Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)	Thickness (mm)	Thermal Conductivity (W/m·K)	Thermal Resistance (m ² ·K/W)
–	Outside surface resistance	–	–	0.316	–	–	0.141
1	Rainscreen cladding	10.0	0.000	0.000	10.0	0.000	0.000
2	Ventilated cladding zone	50.0	–	0.000	50.0	–	0.000
3	Insulant	85.0	0.020	4.250	140.0	0.035	4.000
4	Cement particle board	12.0	0.230	0.052	12.0	0.230	0.052
5	Insulant between metal studwork	100.00	0.038	2.632	100.00	0.038	2.632
6	Polythene vapour control layer	0.5	–	0.001	0.5	–	0.001
7	Plasterboard	12.5	0.190	0.066	12.5	0.190	0.066
8	Plaster skim	3.0	0.180	0.017	3.0	0.180	0.017
–	Inside surface Resistance	–	–	0.130	–	–	0.130
1–8	Full wall build-up	273.0	–	–	328.0	–	–

NB These calculations assume: a 3% bridging factor for the 1.2 mm steel studwork at 600 mm centres horizontally and 1,200 mm vertically; a carbon steel fastener (λ-value 50.00 W/m·K) with 3.13 fasteners per sq.m and a cross-sectional area of 16.98 sq.mm; and that cladding brackets are installed at 600 mm centres horizontally and vertically.

Table B-7: Rainscreen Ventilated Hybrid Wall Construction Build-up Specification.

Layer	Description	Wall Build-up Cost (£/sq.m)	
		Kingspan Kooltherm ® K15 Rainscreen Board & Glass Mineral Fibre	Rock Mineral Fibre & Glass Mineral Fibre
1–2	Rainscreen cladding on brackets	250.00	250.00
3	Insulant	24.00	14.00
4	Cement particle board	10.00	10.00
5a	Glass Mineral Fibre	10.00	10.00
5b	Metal studwork	43.00	43.00
6	Polythene vapour control layer	6.50	6.50
7a	Plasterboard	13.00	13.00
8a	Plaster skim coat	7.00	7.00
8b	Paint finish	5.00	5.00
1–8b	Full wall build-up	368.50	358.50

Table B-8: Rainscreen Ventilated Hybrid Wall Construction Build-up Cost Breakdown & Elemental Rates.

Contact Details

Customer Service

For quotations, order placement and details of despatches please contact the Kingspan Insulation Customer Service Department on the numbers below:

UK Tel: +44 (0) 1544 388 601
Fax: +44 (0) 1544 388 888
email: customerservice@kingspaninsulation.co.uk

Ireland Tel: +353 (0) 42 979 5000
Fax: +353 (0) 42 975 4299
email: info@kingspaninsulation.ie

Literature & Samples

Kingspan Insulation produces a comprehensive range of technical literature for specifiers, contractors, stockists and end users. The literature contains clear 'user friendly' advice on typical design; design considerations; thermal properties; sitework and product data.

Available as a complete Design Manual or as individual product brochures, Kingspan Insulation technical literature is an essential specification tool. For copies please contact the Kingspan Insulation Marketing Department, or visit the Kingspan Insulation website, using the details below:

UK Tel: +44 (0) 1544 387 384
Fax: +44 (0) 1544 387 484
email: literature@kingspaninsulation.co.uk
www.kingspaninsulation.co.uk/literature

Ireland Tel: +353 (0) 42 979 5000
Fax: +353 (0) 42 975 4299
email: info@kingspaninsulation.ie
www.kingspaninsulation.ie/literature

Tapered Roofing

For technical guidance, quotations, order placement and details of despatches please contact the Kingspan Insulation Tapered Roofing Department on the numbers below:

UK Tel: +44 (0) 1544 387 383
Fax: +44 (0) 1544 387 483
email: tapered@kingspaninsulation.co.uk

Ireland Tel: +353 (0) 42 975 4297
Fax: +353 (0) 42 975 4296
email: tapered@kingspaninsulation.ie

Technical Advice / Design

Kingspan Insulation supports all of its products with a comprehensive Technical Advisory Service for specifiers, stockists and contractors.

This includes a computer-aided service designed to give fast, accurate technical advice. Simply phone the Kingspan Insulation Technical Service Department with your project specification. Calculations can be carried out to provide U-values, condensation / dew point risk, required insulation thicknesses etc... Thereafter any number of permutations can be provided to help you achieve your desired targets.

The Kingspan Insulation Technical Service Department can also give general application advice and advice on design detailing and fixing etc... Site surveys are also undertaken as appropriate.

The Kingspan Insulation British Technical Service Department operates under a management system certified to the BBA Scheme for Assessing the Competency of Persons to Undertake U-value and Condensation Risk Calculations.



Please contact the Kingspan Insulation Technical Service Department on the numbers below:

UK Tel: +44 (0) 1544 387 382
Fax: +44 (0) 1544 387 482
email: technical@kingspaninsulation.co.uk

Ireland Tel: +353 (0) 42 975 4297
Fax: +353 (0) 42 975 4296
email: technical@kingspaninsulation.ie

General Enquiries

For all other enquiries contact Kingspan Insulation on the numbers below:

UK Tel: +44 (0) 1544 388 601
Fax: +44 (0) 1544 388 888
email: info@kingspaninsulation.co.uk

Ireland Tel: +353 (0) 42 979 5000
Fax: +353 (0) 42 975 4299
email: info@kingspaninsulation.ie

Kingspan Insulation Ltd. reserves the right to amend product specifications without prior notice. Product thicknesses shown in this document should not be taken as being available ex-stock and reference should be made to the current Kingspan Insulation price-list or advice sought from Kingspan Insulation's Customer Service Department (see above left). The information, technical details and fixing instructions etc. included in this literature are given in good faith and apply to uses described. Recommendations for use should be verified for suitability and compliance with actual requirements, specifications and any applicable laws and regulations. For other applications or conditions of use, Kingspan Insulation offers a Technical Advisory Service (see above), the advice of which should be sought for uses of Kingspan Insulation products that are not specifically described herein. Please check that your copy of this literature is current by contacting the Kingspan Insulation Marketing Department (see left).

Kingspan Insulation Ltd is a member of:
The National Insulation Association (NIA)



Kingspan Insulation Ltd
Pembridge, Leominster, Herefordshire HR6 9LA, UK
Castleblayney, County Monaghan, Ireland

www.kingspaninsulation.co.uk www.kingspaninsulation.ie