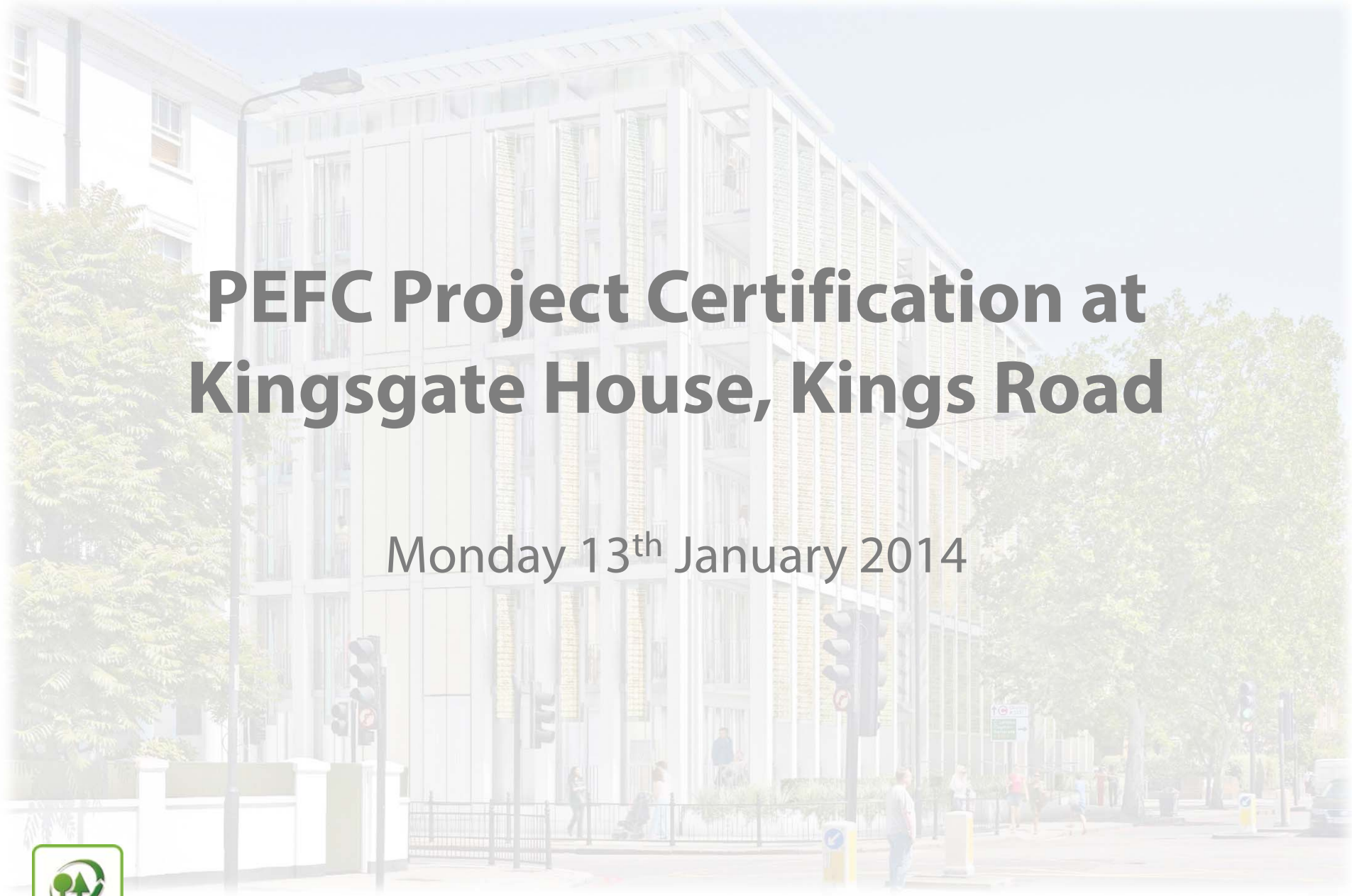


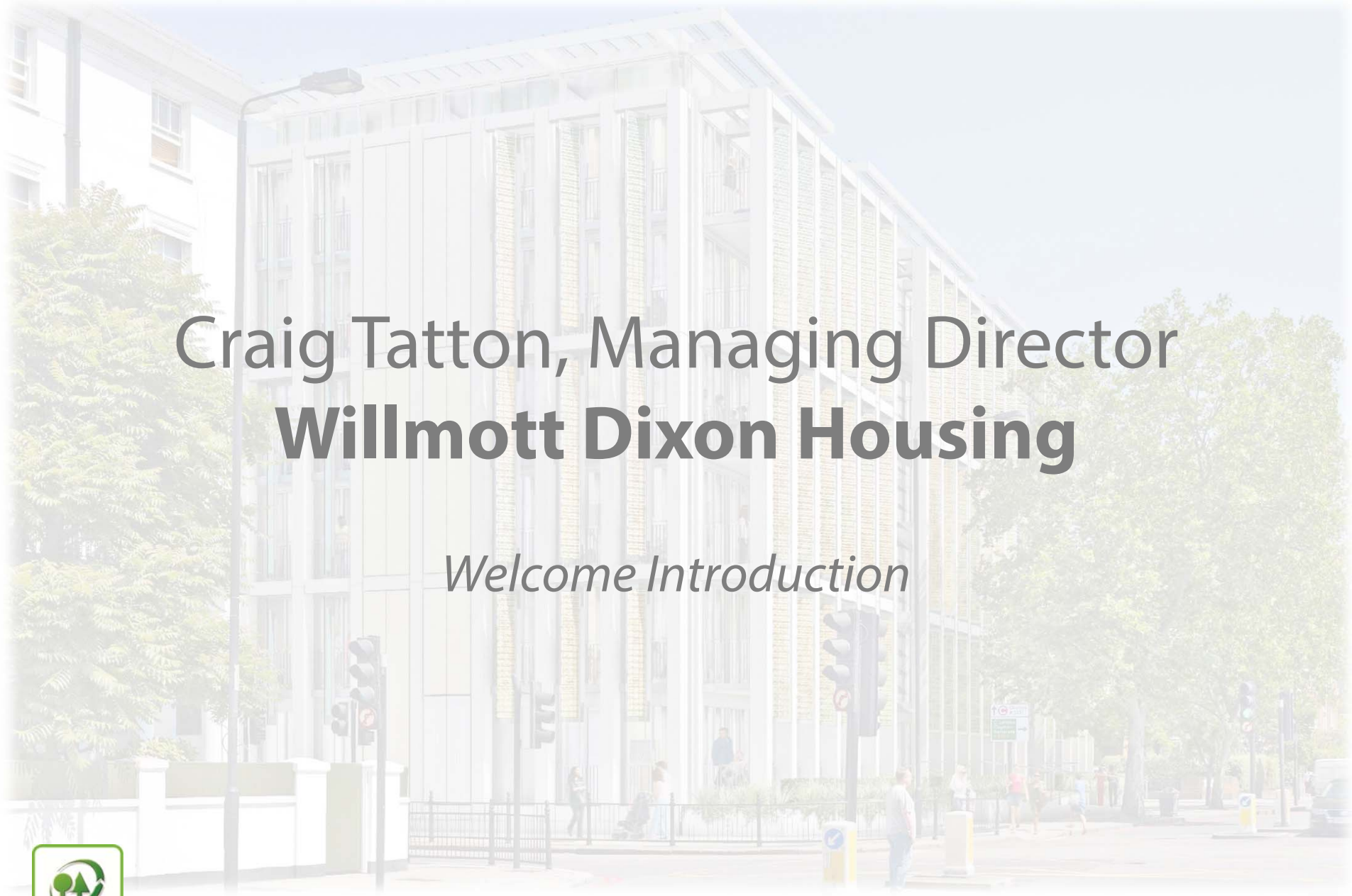
PEFC Project Certification at Kingsgate House, Kings Road

Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852



Craig Tatton, Managing Director
Willmott Dixon Housing

Welcome Introduction

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

Alun Watkins, National Secretary
PEFC UK Limited

The PEFC Project Certification Standard

Kingsgate House, Kings Road
Monday 13th January 2014

Progamme for the Endorsement of Forest Certification

Project Certification CPD January 2014

Alun Watkins

PEFC UK

National Secretary

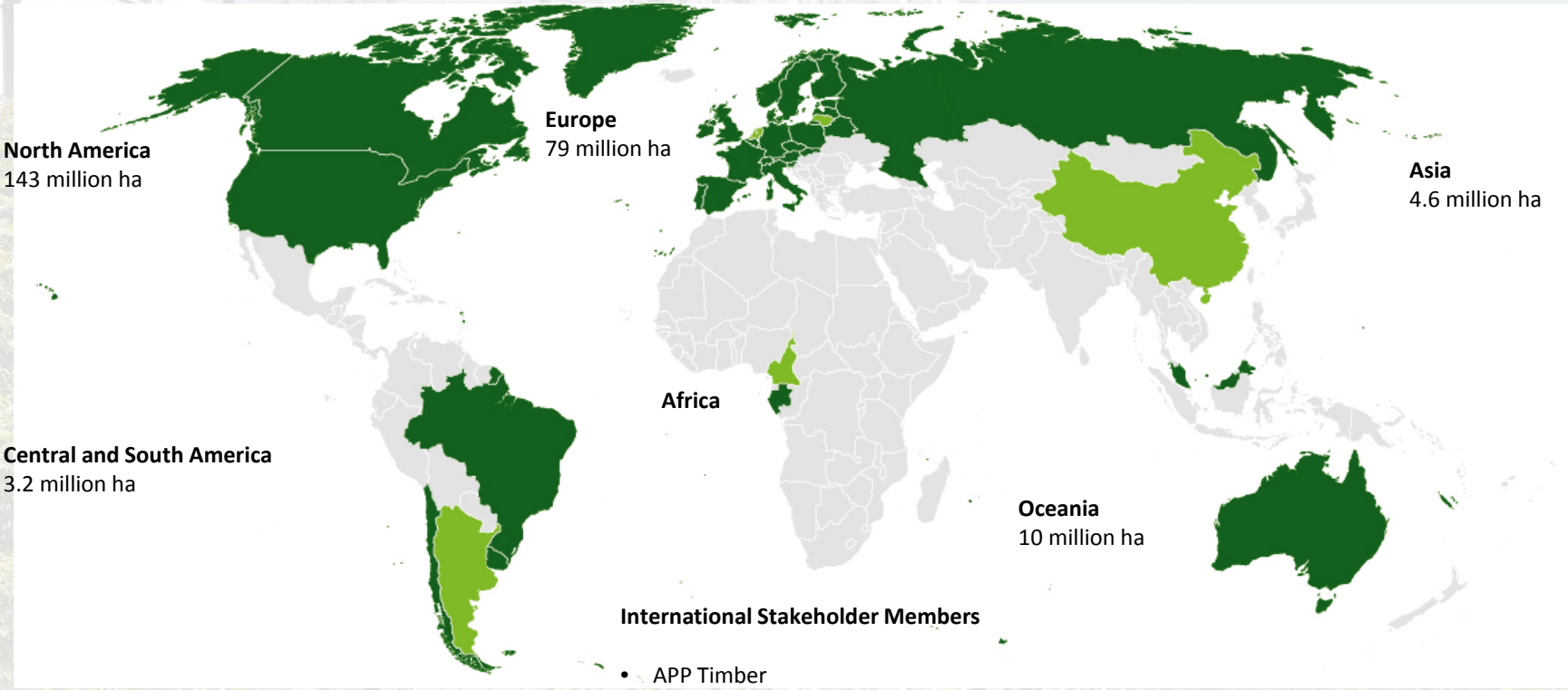
Kingsgate House, Kings Road

Monday 13th January 2014

About PEFC

- Global, not-for-profit, non-governmental organisation – established in 1999
- Alliance of national forest certification systems with global representation
- 251 million hectares are certified by PEFC-endorsed national schemes
- World's largest forest certification system and provider of sustainably managed wood-based products such as timber and paper

Members; Endorsed Systems;



- Non-endorsed national member
- Endorsed national member

•ha – hectares

International Stakeholder Members

- APP Timber
- Building and Wood workers' International (BWI)
- Confederation of European Forest Owners (CEPF)
- Confederation of European Paper Industries (CEPI)
- Earth Focus Foundation
- European Network of Forest Entrepreneurs (ENFE)
- European Tissue Symposium (ETS)
- International Family Forestry Alliance (IFFA)
- Metsaliitto Group
- StoraEnso

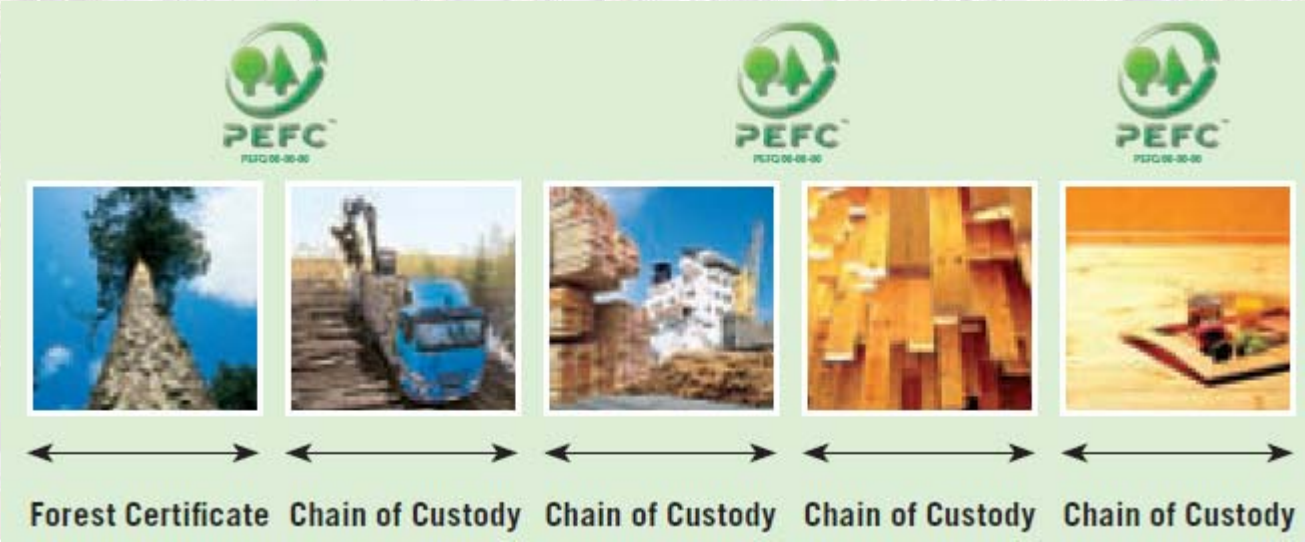
PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Chain of Custody Certification

- The timber supply requires a full chain of custody for all who take ownership. PEFC ST 2002:2013
- The Chain of Custody certificate guarantees that the certified products originates from sustainably managed forests



What is PEFC Project Certification?

Project Chain of Custody certification enables a claim to be made about the **PEFC certified material used within a defined Project.**

UK Government Procurement Policy (CPET)

- **Current policy**:

‘Legal & Sustainable’ or

FLEGT licensed or equivalent

or recycled timber

From 2015

‘Legal & Sustainable’ only

Increasing numbers of procurement policies specifiy certification schemes such as PEFC

- CPET
- ODA
- BREEAM
- Sustainable Homes Initiative
- UKCG
- Next Generation

- By procuring certified timber products you are also ensuring compliance with the EUTR.

- More info at www.pefc.co.uk
- Contact Alun Watkins awatkins@pefc.co.uk

Thank you!

Stephen Cherry, Partner

Horden Cherry Lee Architects

Kingsgate House – Project Overview

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

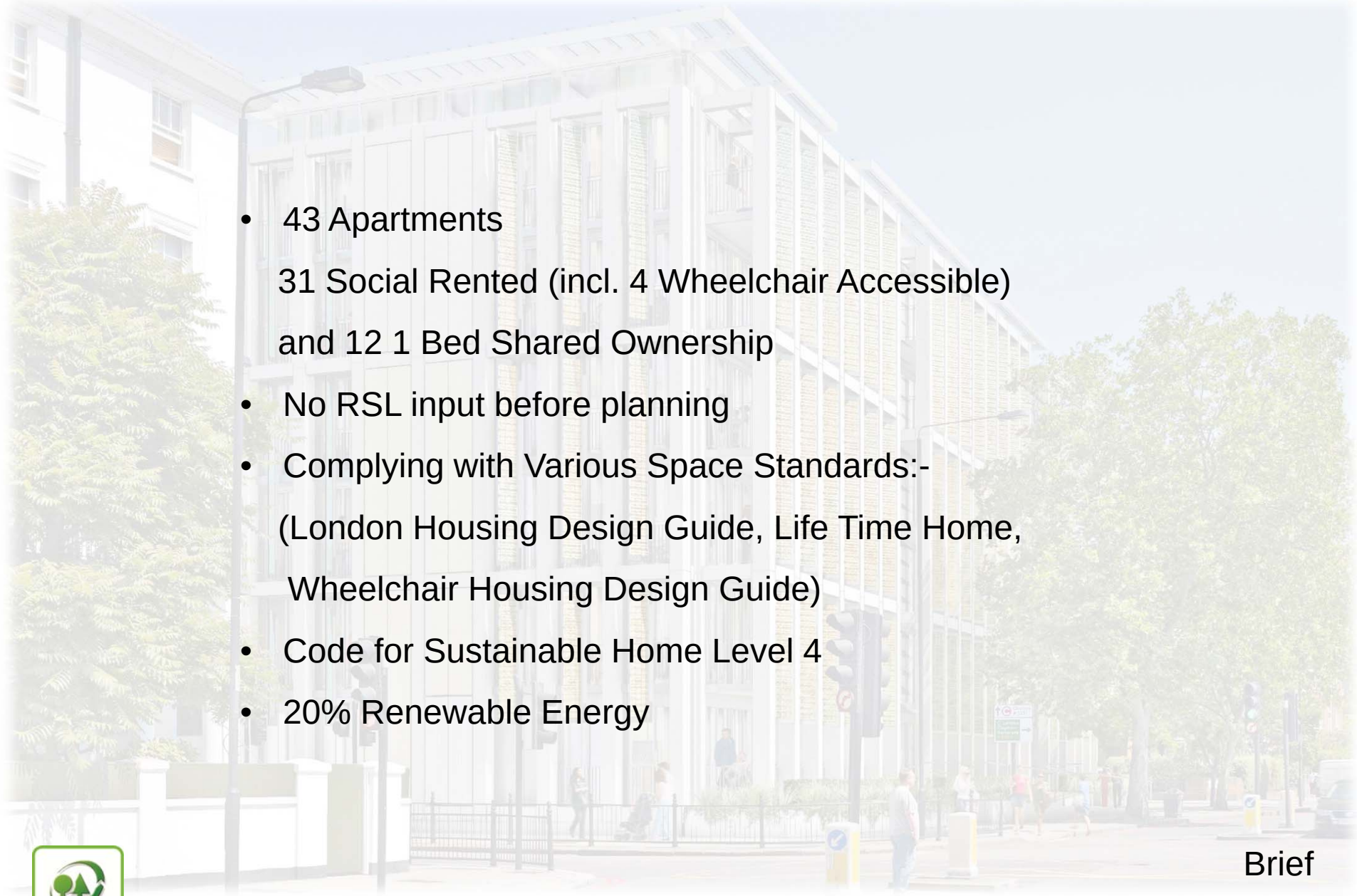
BM TRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

Existing Building

Kingsgate House, Kings Road
Monday 13th January 2014



- 43 Apartments

  31 Social Rented (incl. 4 Wheelchair Accessible)

  and 12 1 Bed Shared Ownership
- No RSL input before planning
- Complying with Various Space Standards:-

  (London Housing Design Guide, Life Time Home,

  Wheelchair Housing Design Guide)
- Code for Sustainable Home Level 4
- 20% Renewable Energy

Brief

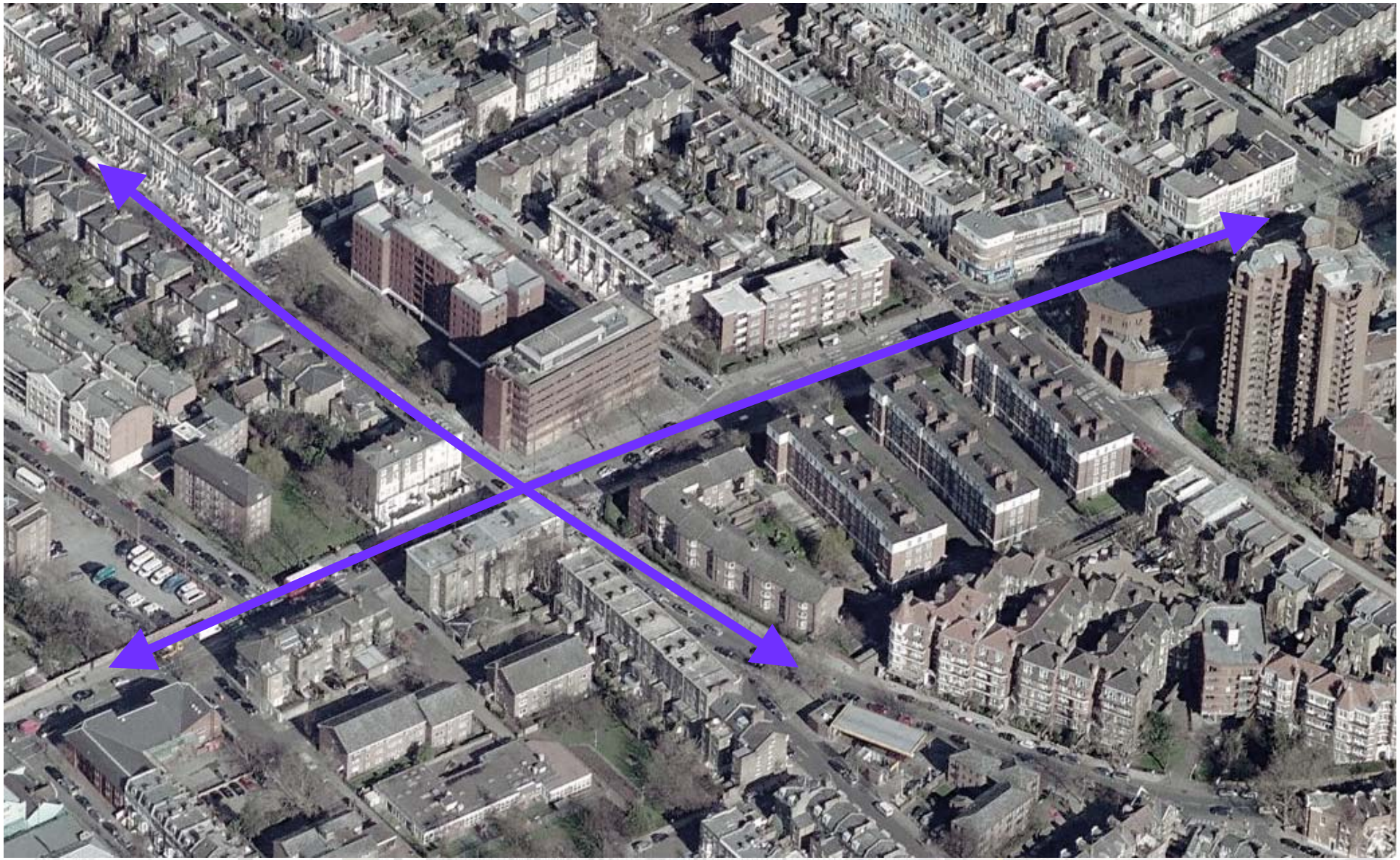
PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Site Context

Kingsgate House, Kings Road
Monday 13th January 2014

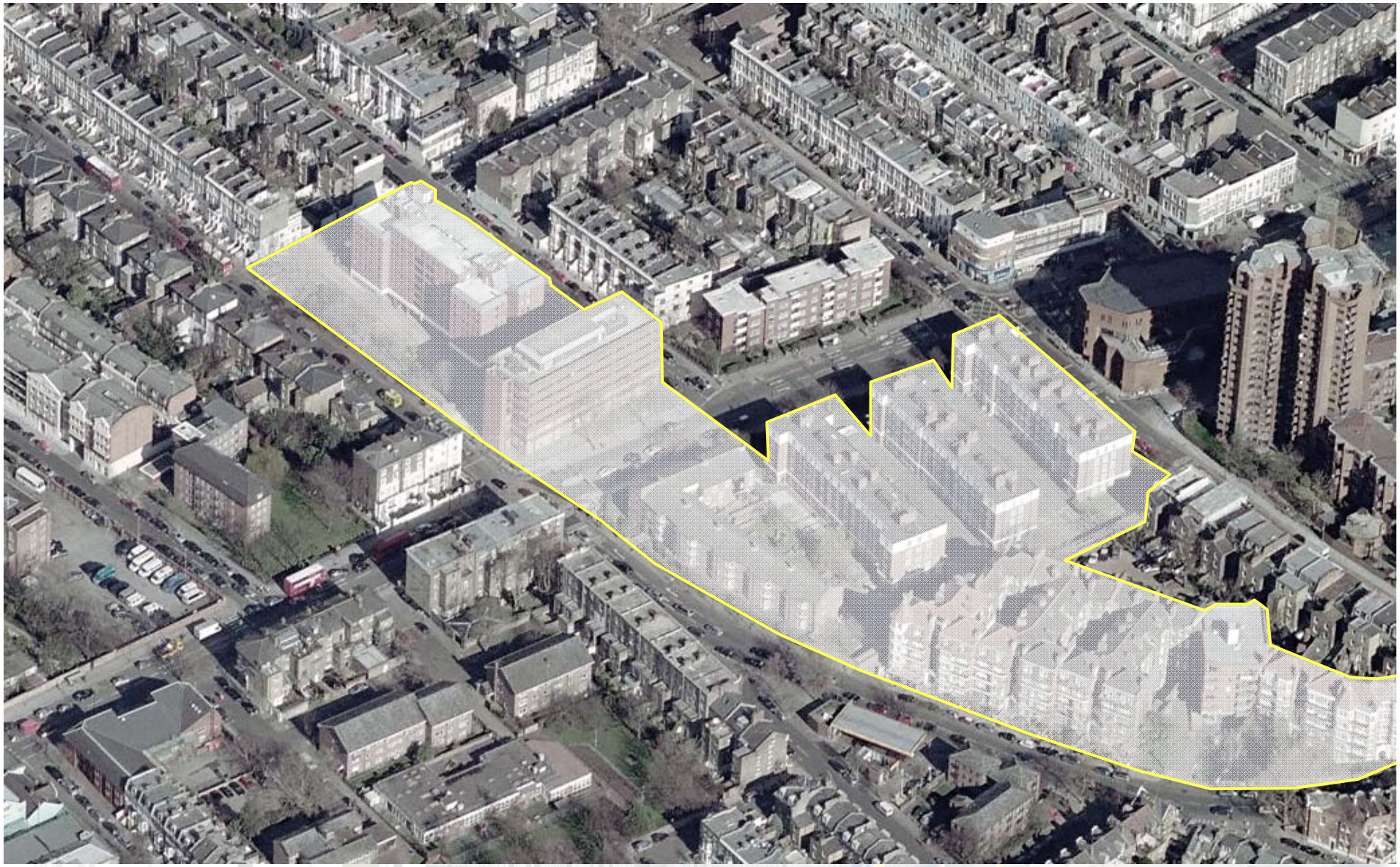


Challenges – Traffic Noise

Kingsgate House, Kings Road
Monday 13th January 2014

Challenges – Rights of Light

Kingsgate House, Kings Road
Monday 13th January 2014



Challenges – 'Nimby'

Kingsgate House, Kings Road
Monday 13th January 2014

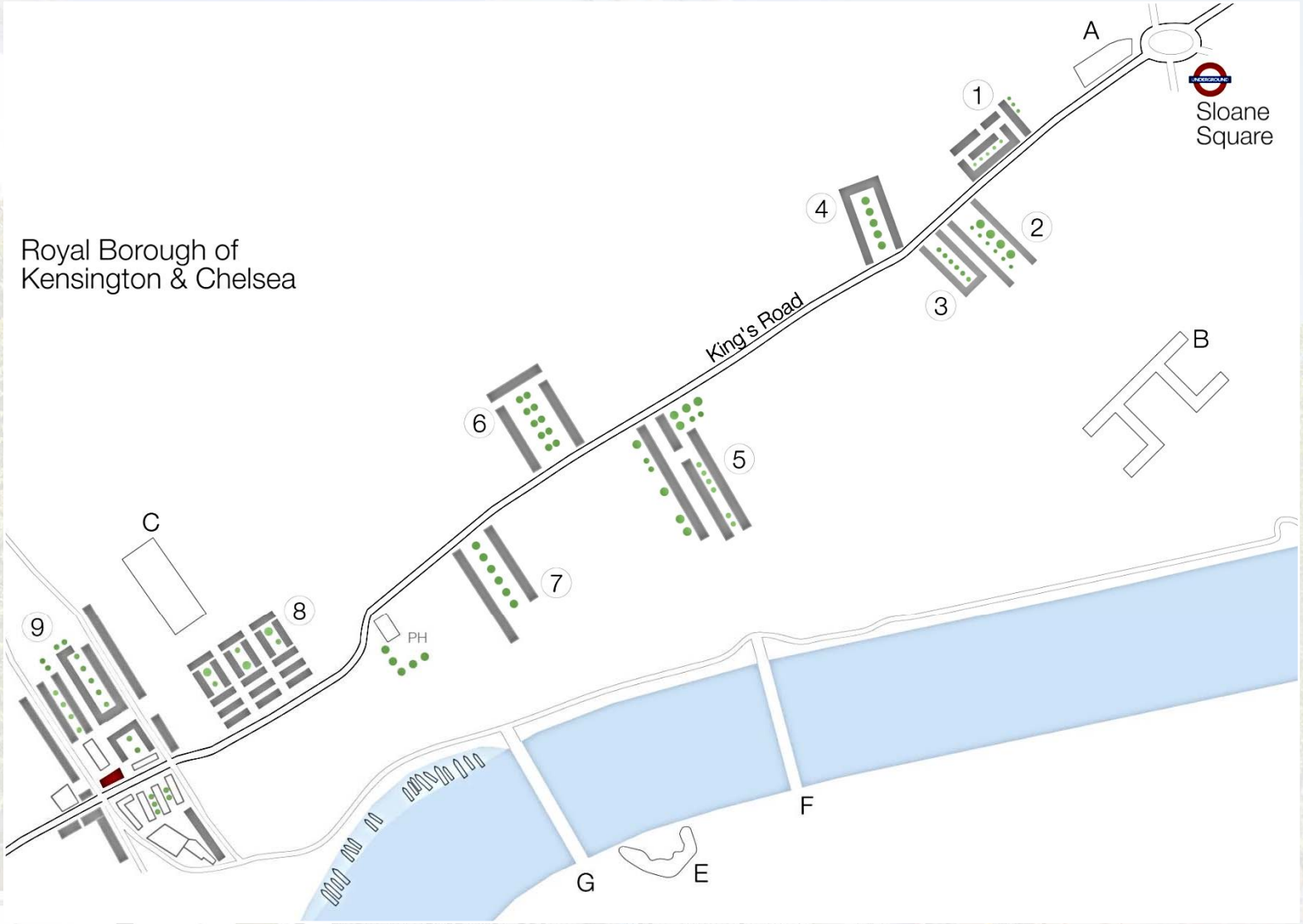
PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Challenges – Southerly Aspect

Kingsgate House, Kings Road
Monday 13th January 2014



Urban Context

Kingsgate House, Kings Road
Monday 13th January 2014





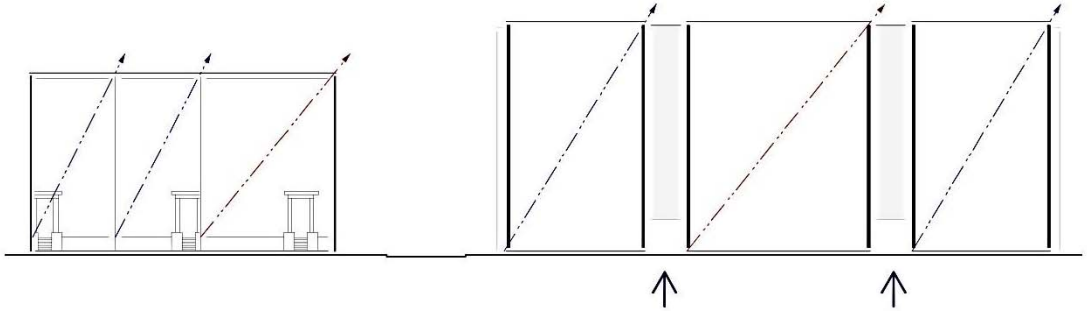

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

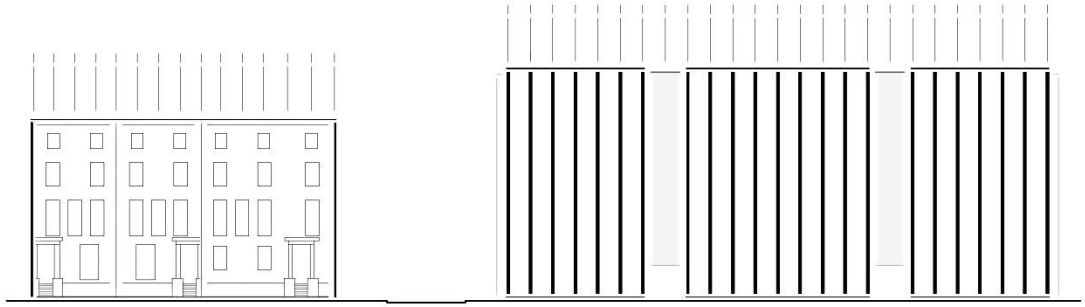
WILLMOTT DIXON
SINCE 1852

Urban Context

Kingsgate House, Kings Road
Monday 13th January 2014



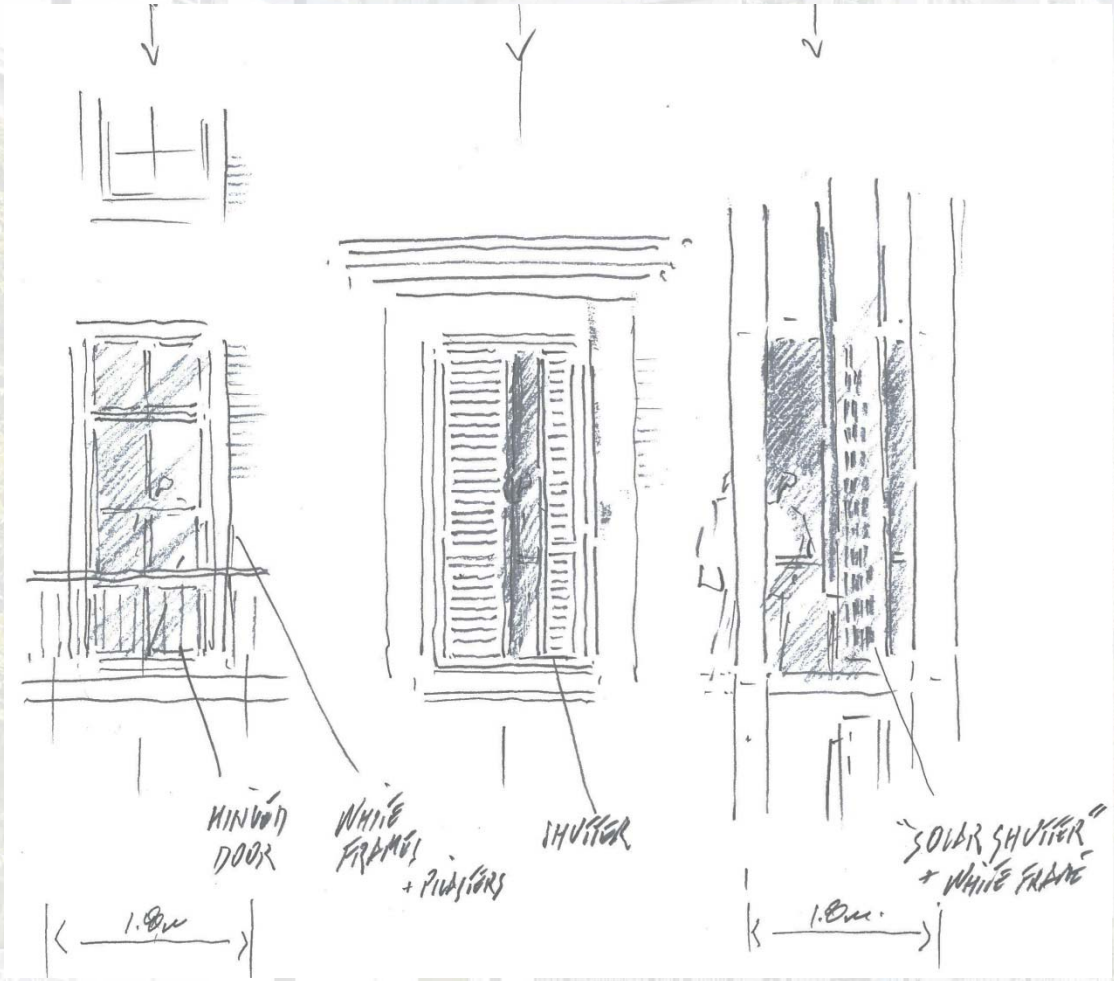
Proportion



Vertical Rhythm

Proportion and Rhythm

Kingsgate House, Kings Road
Monday 13th January 2014



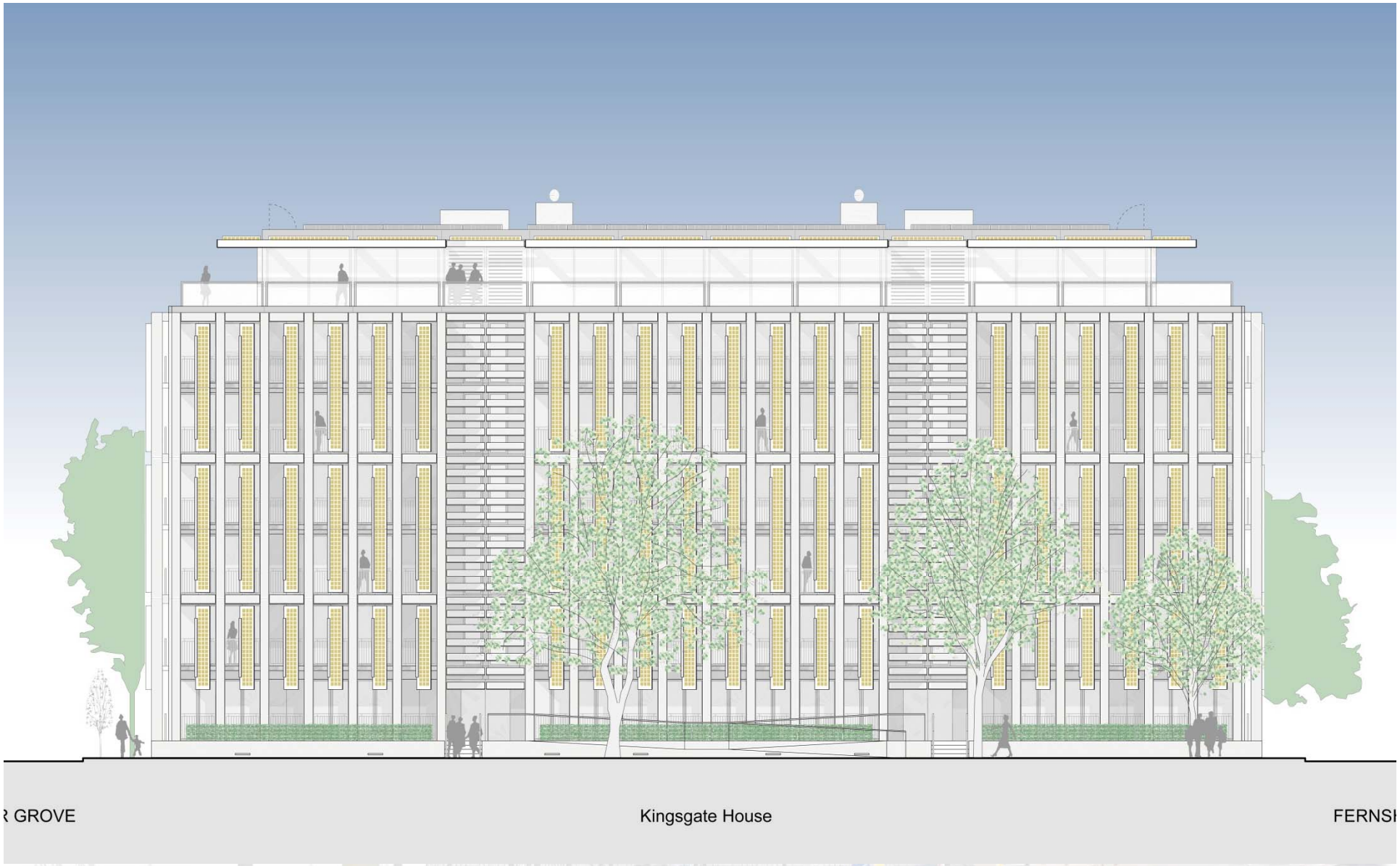
Solar Shutters

Kingsgate House, Kings Road
Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852



Architectural Design

Kingsgate House, Kings Road
Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

View from South

Kingsgate House, Kings Road
Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

View from West

Kingsgate House, Kings Road
Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

View from East

Kingsgate House, Kings Road
Monday 13th January 2014

Space Planning and Amenity Space

Kingsgate House, Kings Road
Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

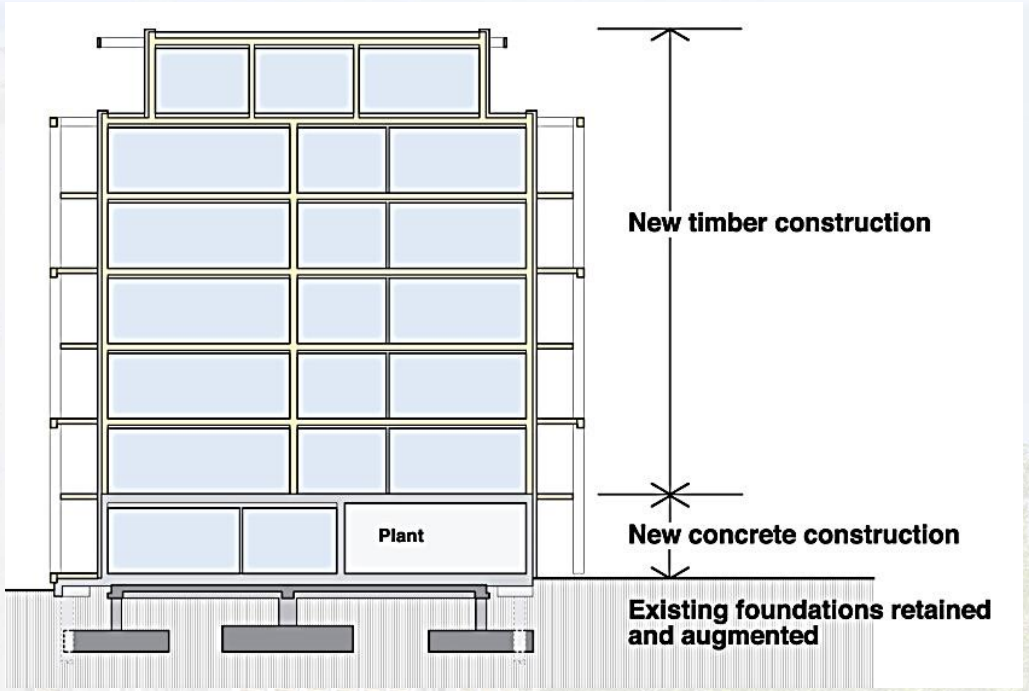
BM TRADA

WILLMOTT DIXON
SINCE 1852

- Benefit of Re-using Foundations
  - Saves excavation
  - Saves substructure cost
  - Saves Noise, Trucks & Mud

- Benefit of CLT Construction
  - Light Weight Structure
  - Embodied Carbon & Energy
  - Less Vehicles, Waste & Noise
  - Simpler & Faster Site Construction
  - Airtight Envelope
  - Thinner Transfer Slabs
  - Easy to Fix Sundry Items

Challenge was to convince Local Authority/HSE about Fire Protection



PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

- Sustainable Cladding Material
  - Trespa is 70% Wood based Fibre
  - Trespa certified by PEFC and FSC
  - Minimal Maintenance
- Acoustic Performance
  - 43 dB reduction
- U-Value (W/m2/°K)
  - Roof 0.10
  - Wall 0.18
  - Floor 0.15
  - Glazing 1.30
- Airtightness
  - 3m3/hr/m2 @ 50Pa test pressure

PEFC™ OR FSC™ CERTIFICATIONS AVAILABLE

The entire Trespa® Meteon® product range–in all types, sizes, thicknesses, finishes and colours–is available with PEFC™ or FSC™ certification upon request, in restricted quantities and jurisdictions. Ask Trespa's Customer Service Desk for PEFC™ or FSC™ certified products.

PEFC Promoting Sustainable Forest Management www.pefc.org

FSC www.fsc.org FSC® C114684 The mark of responsible forestry

PEFC PEFC/01-00-01 Promoting Sustainable Forest Management www.pefc.org

BM TRADA

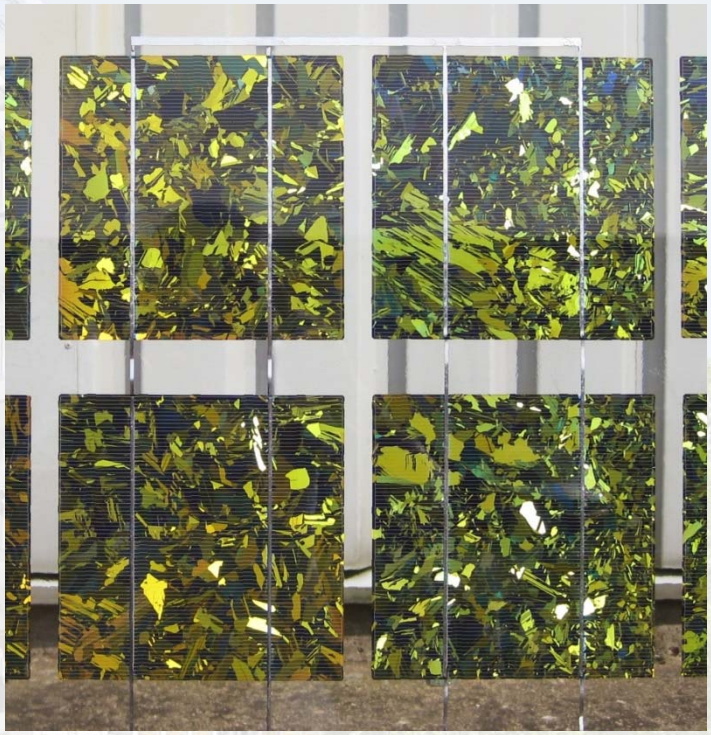
WILLMOTT DIXON SINCE 1852

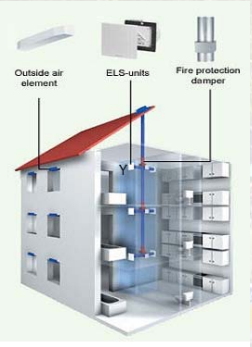
Holistic Sustainability Approach – Envelope

Kingsgate House, Kings Road
Monday 13th January 2014

- 44% reduction in CO_2 emissions over a base Part L equivalent building
- PV Cells generates 13,145 kWh of electricity per annum and save 8.2 tonnes of CO_2 per annum
- PV Cells and EAHP provides a 20% renewable contribution as required by the local authority
- Insulation and air tightness reduces Heating Energy by 70%
- Exhaust Air Heat Pump reduces Hot Water Energy by 70%

UKPN reduced Electricity Supply requiring limited need for Gas

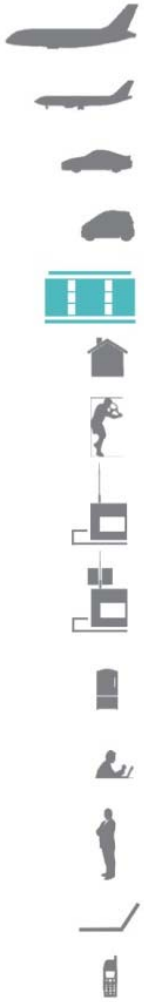




Holistic Sustainability Approach - Energy

Comparing energy uses:

Airbus A380	2'500'000 kwhrs/day
A321	46'560 kwhrs/day
Porsche	6'240 kwhrs/day
Smart	792 kwhrs/day
Kingsgate	250 kwhrs/ day
Four bed house	75 kwhrs/ day
Human being at full exercise	7.2 kwhrs/ day
Micro compact home	5.5 kwhrs/ day
Low-e m-ch	-14.5 kwhrs/ day [26 sqm solar cells]
Freezer	0.54 kwhrs/ day
Human being at a computer	3.6 kwhrs/ day
Human being at rest	1.9 kwhrs/ day
Laptop	0.21 kwhrs/ day
Mobile Phone	0.03 kwhrs/day



PEFC PEFC/01-00-01 Promoting Sustainable Forest Management www.pefc.org

BM TRADA

WILLMOTT DIXON SINCE 1852

Comparing Energy Uses

Kingsgate House, Kings Road
Monday 13th January 2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

Dr. Hugh Mansfield Williams, Technical Manager

BM TRADA

The Material – Cross Laminated Timber

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

BMTRADA

Wood from the trees

cover)

to process

Overcoming limitations

Timber was processed to provide flat contact surfaces

Framed and panelled structures were used for large flat areas

As tall as possible

As long as possible – mechanically laminated beams

Five storey block of flats – built around 1600 in Evolène, SW Switzerland

Model of Rhine bridge by Grubenmann brothers

Structural adhesives – new opportunities

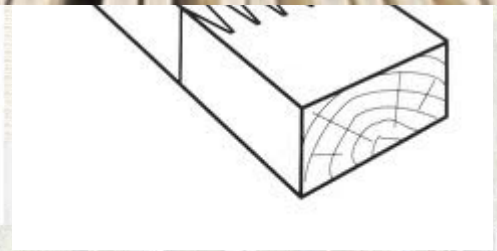
Gulam beams, straight and curved

Structur
OSB for

Cross la
load bea
roofs

Oldaport House is an eight-storey residential tower in Hackney, built entirely of CLT.

Wood for CLT



PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

And glue for CLT

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Made in the UK?

Napier University have studied the potential for manufacturing CLT from home-grown Sitka spruce (with funding from Forestry Commission Scotland, among others)

UK timber production is set to gradually increase over the next fifteen years, particularly in Scotland, up to 18 million m^3. There is enough timber available

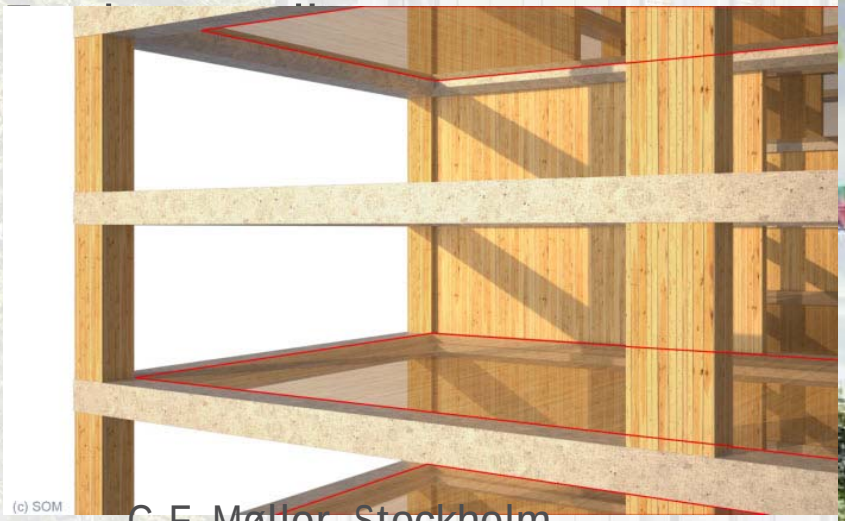
Sitka spruce is the main resource. Lab scale tests provided CLT material that is similar in performance to products from Central Europe

Commercial drying of Sitka spruce to 12% mc is poorly understood

A detailed business plan is required to create investor confidence

The sky's the limit?

The potential for CLT tall buildings has captured the imagination of architects



C.F. Møller, Stockholm
34 storeys, housing association
CLT structure with a concrete core

SOM
Timber tower researc
42 storeys, concrete

Kingsgate House, Kings Road
Monday 13th January 2014

Steve Cook, Principal Sustainable Development Manager

WD Rethinking

Kingsgate House – The Contractor's Perspective

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

Steve Cook, Principal Sustainable Development Manager

WD Rethinking

Kingsgate House – The Contractor's Perspective

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

Contents

Experience of CLT

CLT as a construction material

Benefits and performance

Embodied Carbon

Cross Laminated Timber Projects

1.	The Re-Thinking School	BRE Watford	2007
2.	St. Agnes Primary School	Manchester	2009
3.	Kendrick School	Reading	2009
4.	City Academy	Hackney	2010
5.	Bewbush Healthy Living Centre	Crawley	2010
6.	Waingels College	Wokingham	2011
7.	Bridport House	Hackney	2011
8.	Sheringham Junior School	Newham	2011
9.	Dersingham Primary School	Newham	2011
10.	Extension to St Agnes	Manchester	2013
11.	Kingsgate House	Chelsea & Kensington	2014
12.	Keynsham town hall	Keysham	2014

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Re-Thinking School - BRE

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

St. Agnes Primary - Manchester

robinson architects

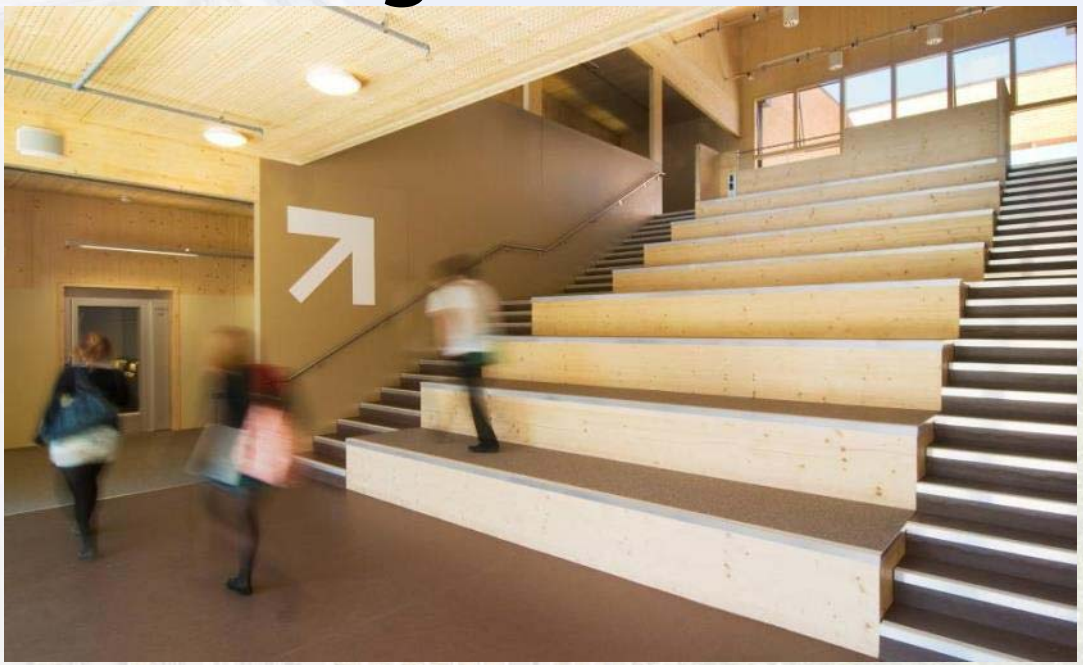
Waingels College - Wokingham

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Waingels College - Wokingham



Exposed Structural Timber

- Water tightness is key to avoid shrinkage movement and staining

- Extensive temporary measures may be required if timber is to remain visible on completion

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

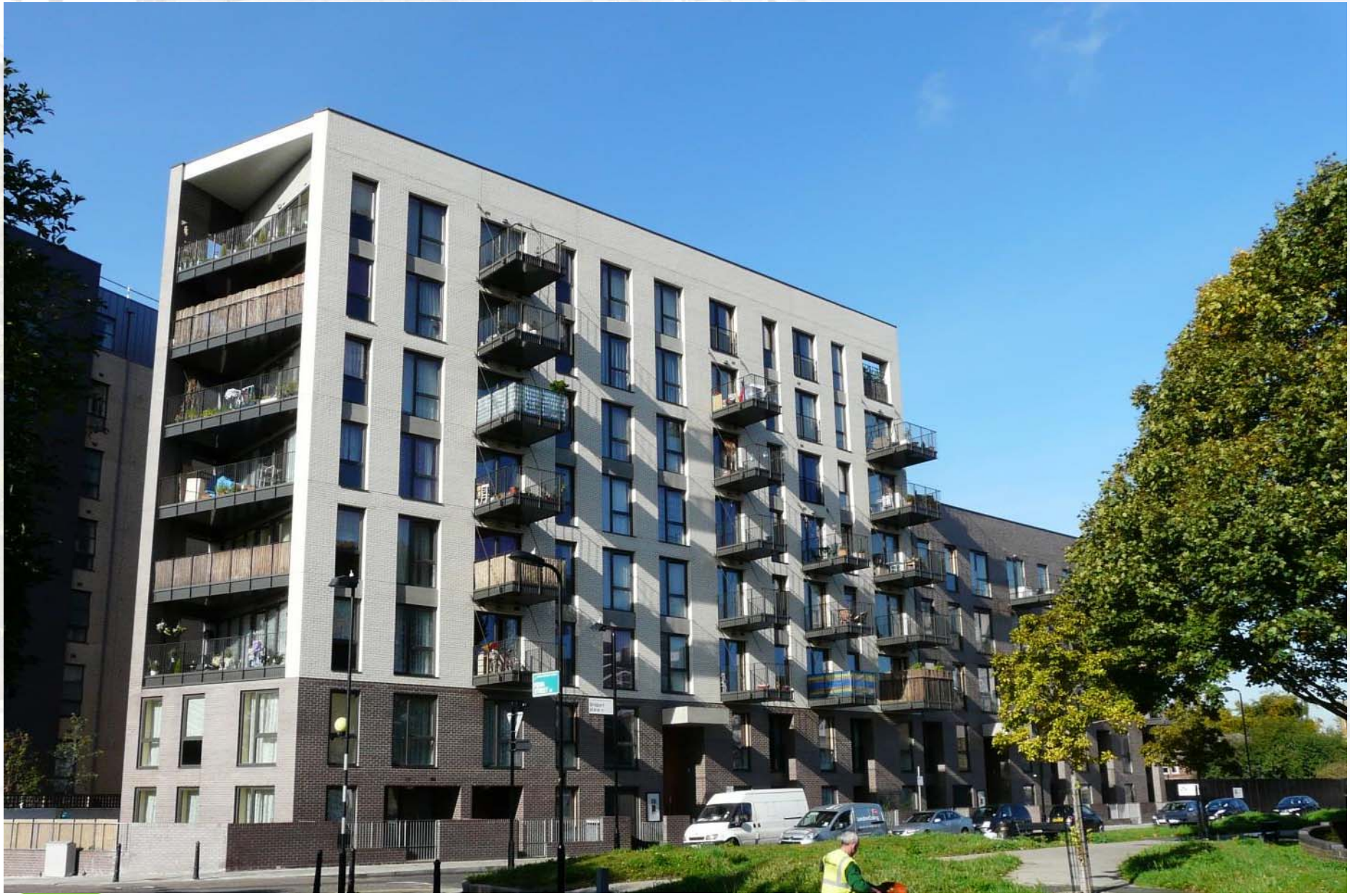
Keynsham Town Regeneration

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

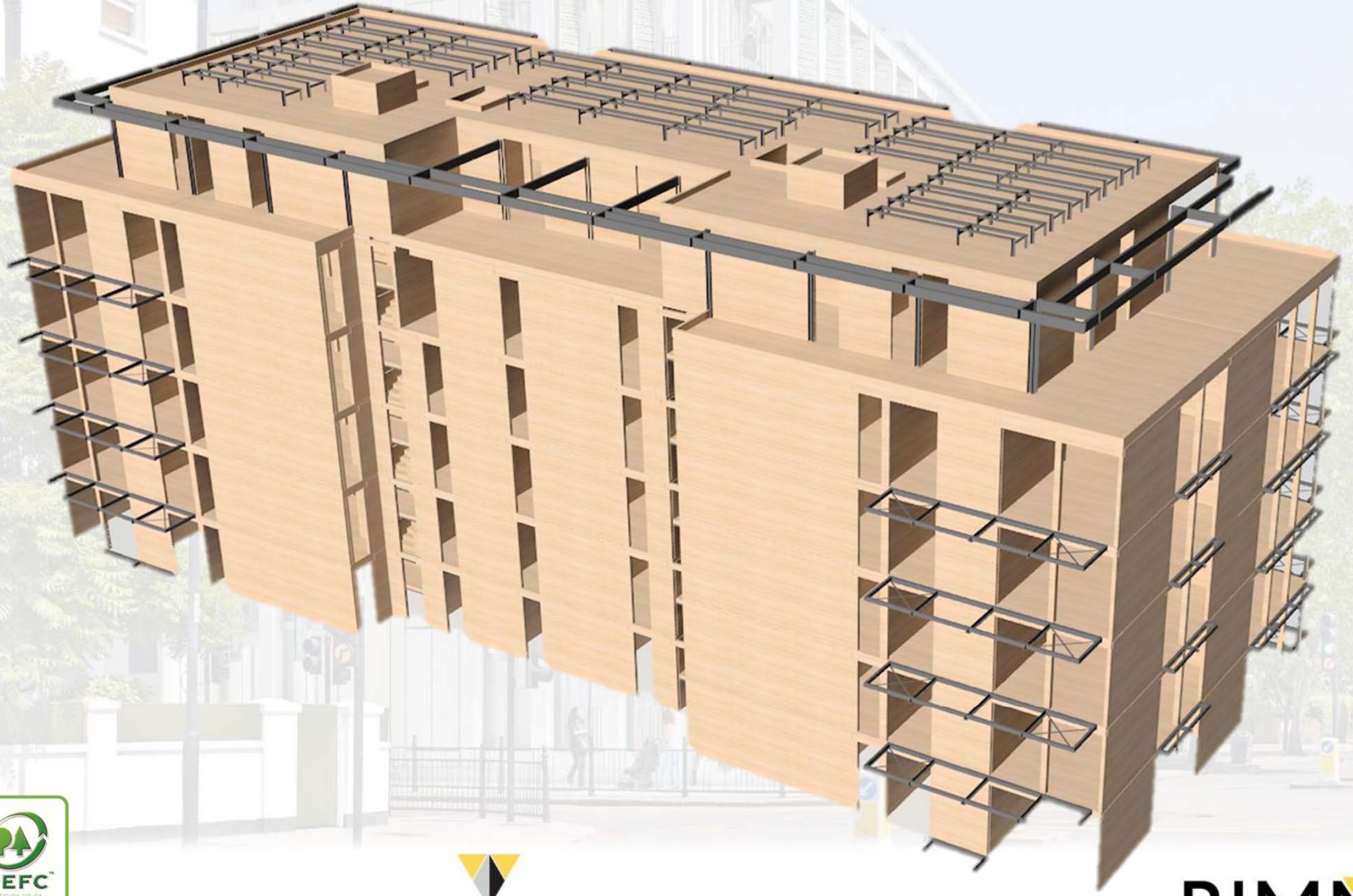
BMTRADA

WILLMOTT DIXON
SINCE 1852

Bridport House - Hackney



CLT as a Construction Material



PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

BIM
WILLMOTT DIXON


FRITZ MAYER
SCANIA
WILLMOTT DIXON
THINK SAFETY!
No smoking


FRITZ MAYER
FRITZ MAYER
FRITZ MAYER
SCANIA
53
WILLMOTT DIX


FRITZ MAYER
FRITZ MAYER
FRITZ MAYER
53
WILLMOTT DIXON
THINK SAFETY!


FRITZ MAYER
FRITZ MAYER
FRITZ MAYER
SCANIA
53
WILLMOTT


SLABS
SSS
BANKSMAN


SURBAN
SSS
BANKSMAN


SSS
BANKSMAN


SSS
BANKSMAN


URBAN
SSS
BANKSMAN


SSS


SSS
BANKSMAN


URBAN
SSS
BANKSMAN

CLT as a Construction Material

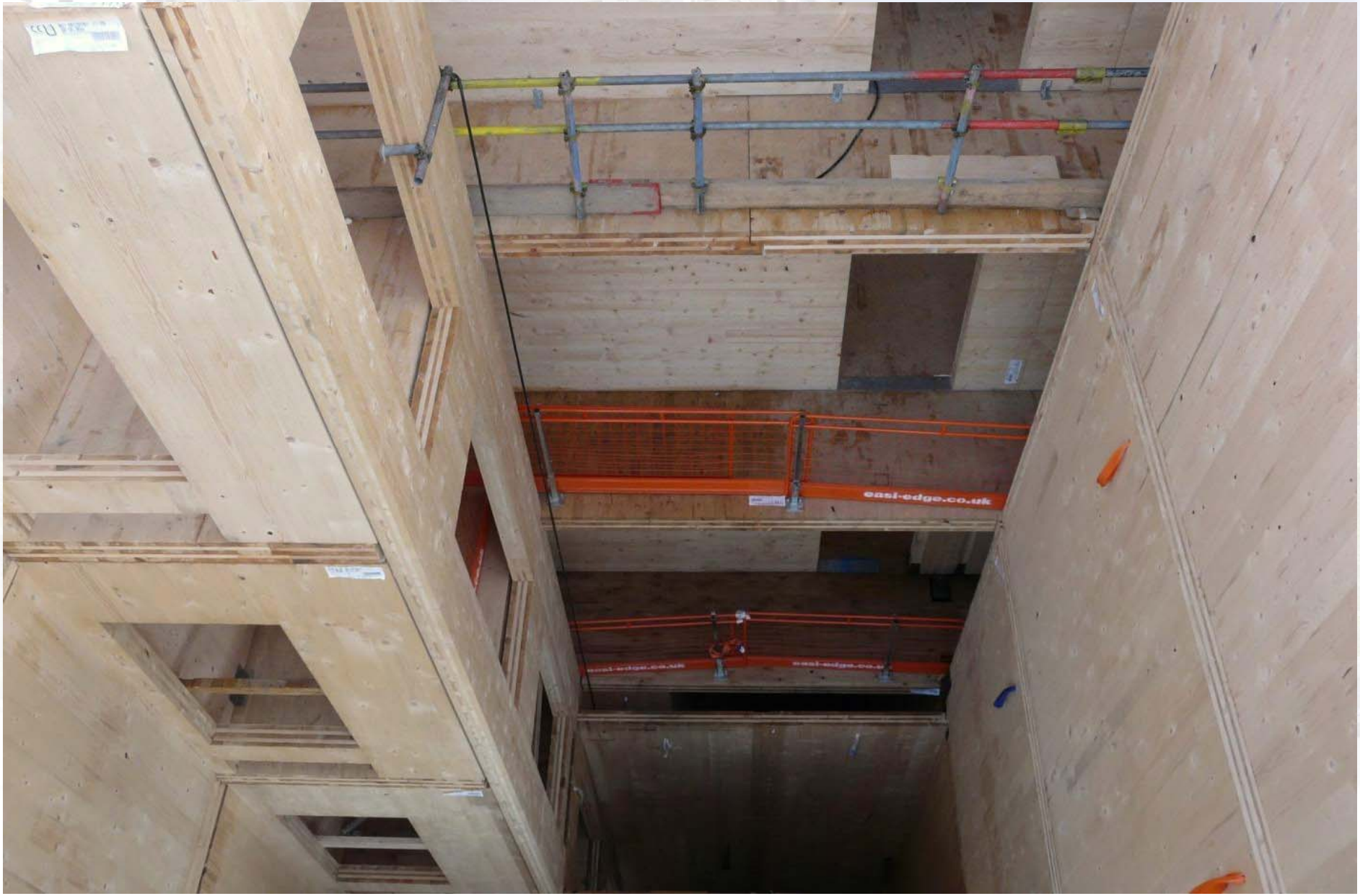
Quiet and Considerate

RC Frame	= 200 deliveries	(25 operatives)
CLT	= 23 deliveries	(7 operatives)

Clean and tidy with minimal waste

Fewer materials interfaces

Lift shafts



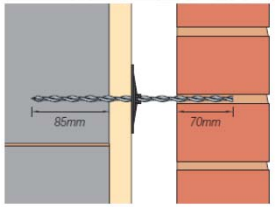
Staircases

Speed of following trades

External Walls - Brickwork

Staifix-Thor Helical TJ2
European Patent No. 1307303

NHBC



Embedment Depths

TJ2 Recommended Lengths

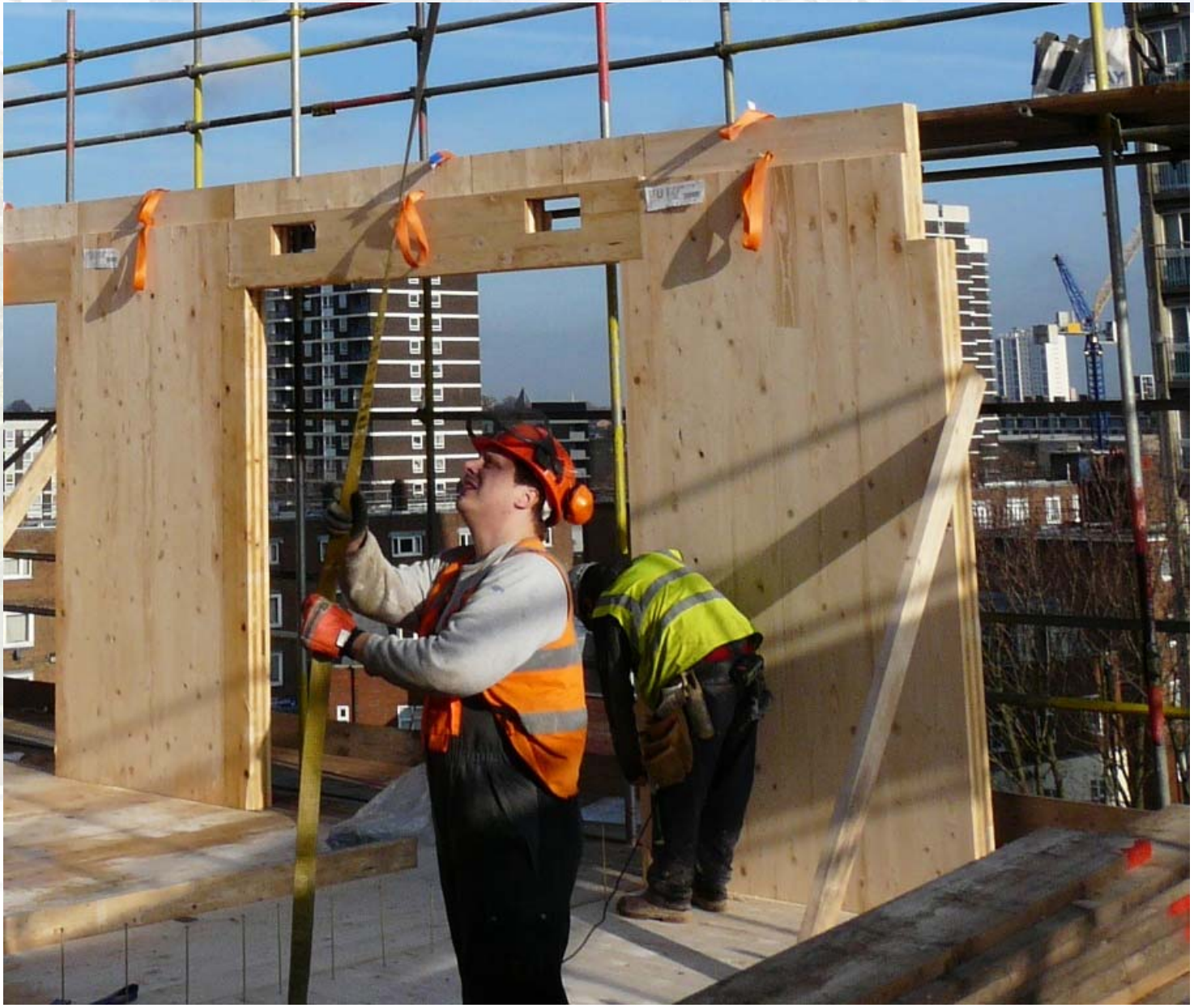
Cavity Width (mm)	Tie Length (mm)
50	*205*
75	*230*
100	*255*
125	280
150	305

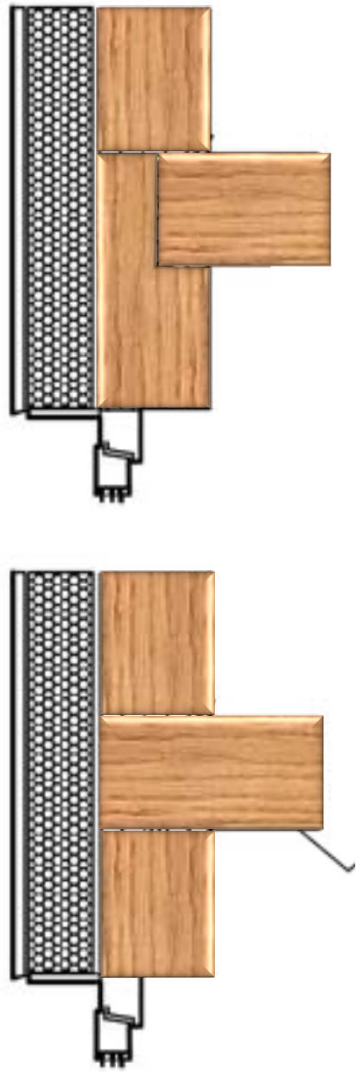
PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Floor Junctions And Movement





External Walls – Rain screen

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

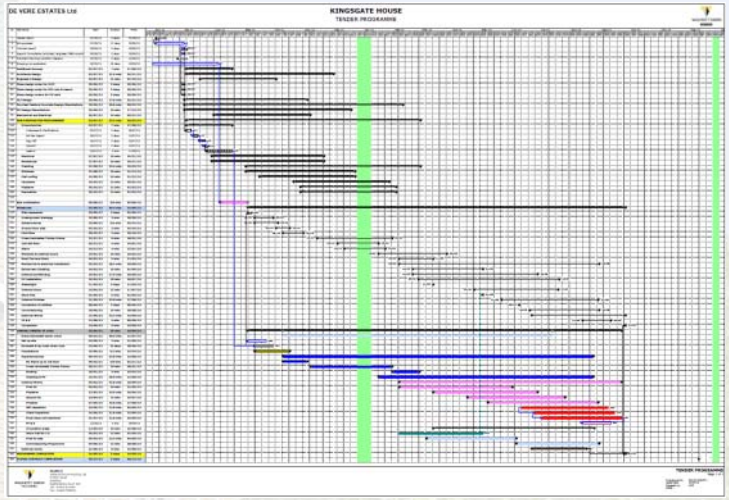
COST BENEFIT - Lightweight

- Lightweight = Cost reduction in Substructures
- High Strength = greater spans less loadbearing walls

COST BENEFIT - Programme Saving

CLT start - 20th February 2013

CLT complete - 16th May 2013



CLT Erection 12 weeks

comparison with

RC frame erection 15 weeks

Allowance for external walls and party walls + 2 more weeks.

Therefore a 5 week programme reduction

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

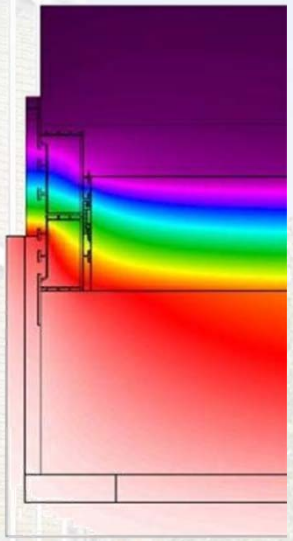
COST BENEFIT – Better U Values, reduced thermal bridges

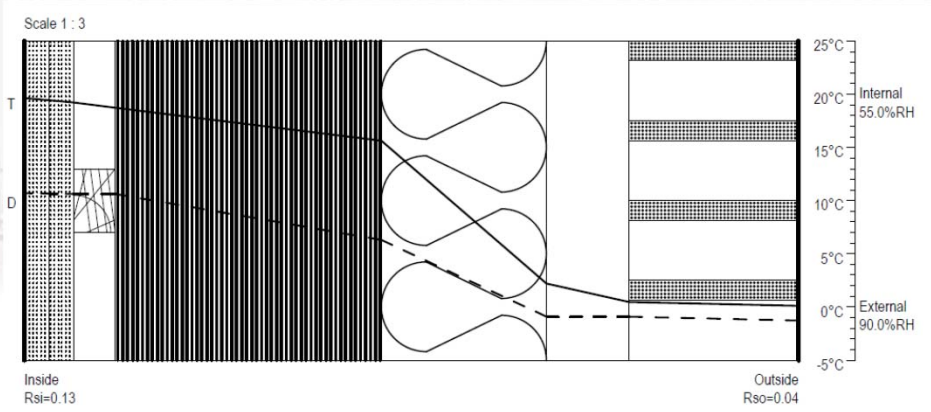
Kingspan Insulation Ltd

Client : Karakusevic Carson
Contract : Bridport House, 41 Flats
Structure element : Wall
Description : Warm wall insulating sheathing
File reference : HE924351.FCF

Calculated 'U' value = 0.13W/m²K (Calculated to the Proportional Area Method)

Element Description	Element Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)	Mean T (K)	Delta T (K)
Outside surface resistance	-	-	0.040	-	-	282.18	0.06
BRICKWORK FACING	102.5	0.770	0.133	42.00	4.31	282.31	0.20
UNV. A/SPACE;	50.0	-	0.644	-	0.00	282.88	0.95
KOOLTHERM K12 - FIXED BACK TO TIMBER PANEL	100.0	0.020	5.000	-	100.00	287.05	7.39
CROSS LAMINATED TIMBER PANEL	161.0	0.140	1.150	520.00	83.72	291.60	1.70
TIMBER BATTEN CAVITY; U/V. 11.4% wall timber - 47mm batten @ 600mm ctrs + 47mm noggins @ 1200mm ctrs (25.0mm)	25.0	-	0.184	-	0.00	292.59	0.27
PLASTERBOARD	15.0	0.190	0.079	50.00	0.75	292.78	0.12
PLASTERBOARD	15.0	0.190	0.079	50.00	0.75	292.90	0.12
Inside surface resistance	-	-	0.130	-	-	293.05	0.19



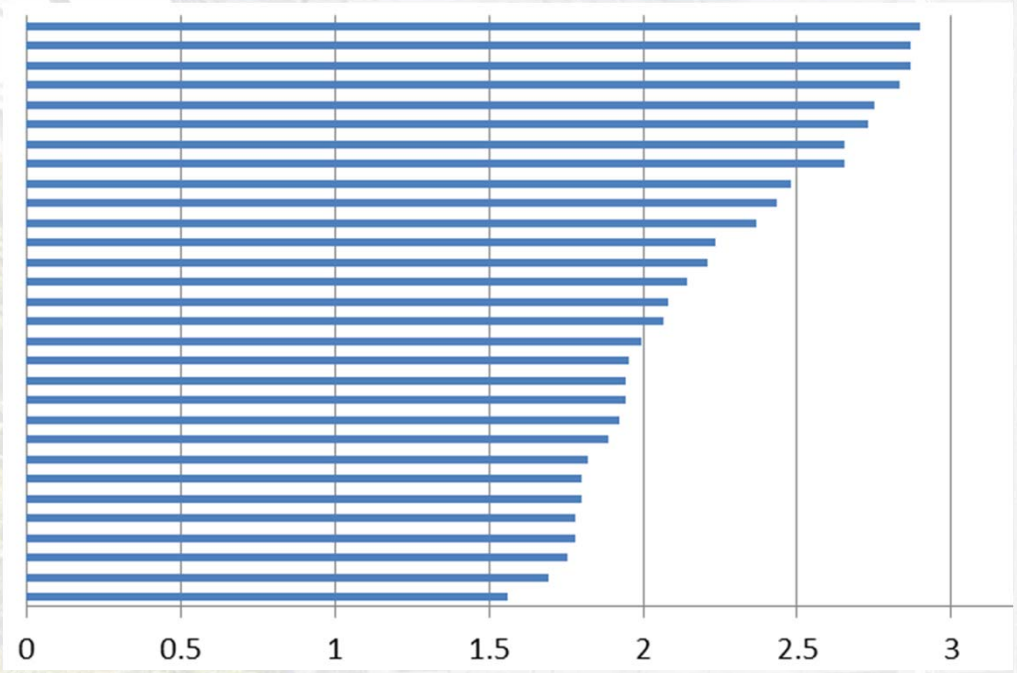


PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

COST BENEFIT – Inherently Airtight



Target design air permeability of 3m³

Achieved results at 1.5m³

Average result 2.2m³

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

COST BENEFIT – Acoustics

Summary Table of Results:

	Floor		Wall
	Air Bourne (Dntw+ctr)	Impact (Lntw)	Air Bourne (Dntw+ctr)
	Require more than **≥45dB**	Require less than **≤62dB**	Require more than **≥45dB**
No of Tests	12.0	12.0	10.0
Average Test Result (dB)	56.3	44.3	54.9
Target Test Result (ADE 2003) (dB)	45.0	62.0	45.0
Ave. Improvement over B. Regs (dB)	11.3	17.8	9.9
CFSH Target Ave. ≥3dB	Yes	Yes	Yes
CFSH Target Ave. ≥5dB	Yes	Yes	Yes
CFSH Target Ave. ≥8dB	Yes	Yes	Yes
Best Single Result	65	40	60
Worst Single Result	52	49	52
Range Between Best and Worst	13	9	8

All test results at least 7dB better than building regulations with the best result 22dB better

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Embodied Carbon

Carbon Storage

- Total Timber in CLT frame is 1091.7m^3
- Sequestered carbon (@750kg/CO_2/m^3) = 819t
- Equivalent to 20 years of operational carbon

Carbon Saved

Similar savings likely through avoiding traditional forms of construction and reuse of existing

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Hierarchy of decision making

Programme Drivers

Embodied Carbon

Economic viability

Responsibly Sourced

Aesthetics

Height

FORM OF CONSTRUCTION

Renewable

Form & Function

Life Cycle Analysis

Availability of supply

Logistics

Ground Conditions

Local Spend

Whole Life Costing

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Looking Ahead

Lower costs

33%

reduction in the initial cost of construction and the whole life cost of built assets

Faster delivery

50%

reduction in the overall time, from inception to completion, for newbuild and refurbished assets

Lower emissions

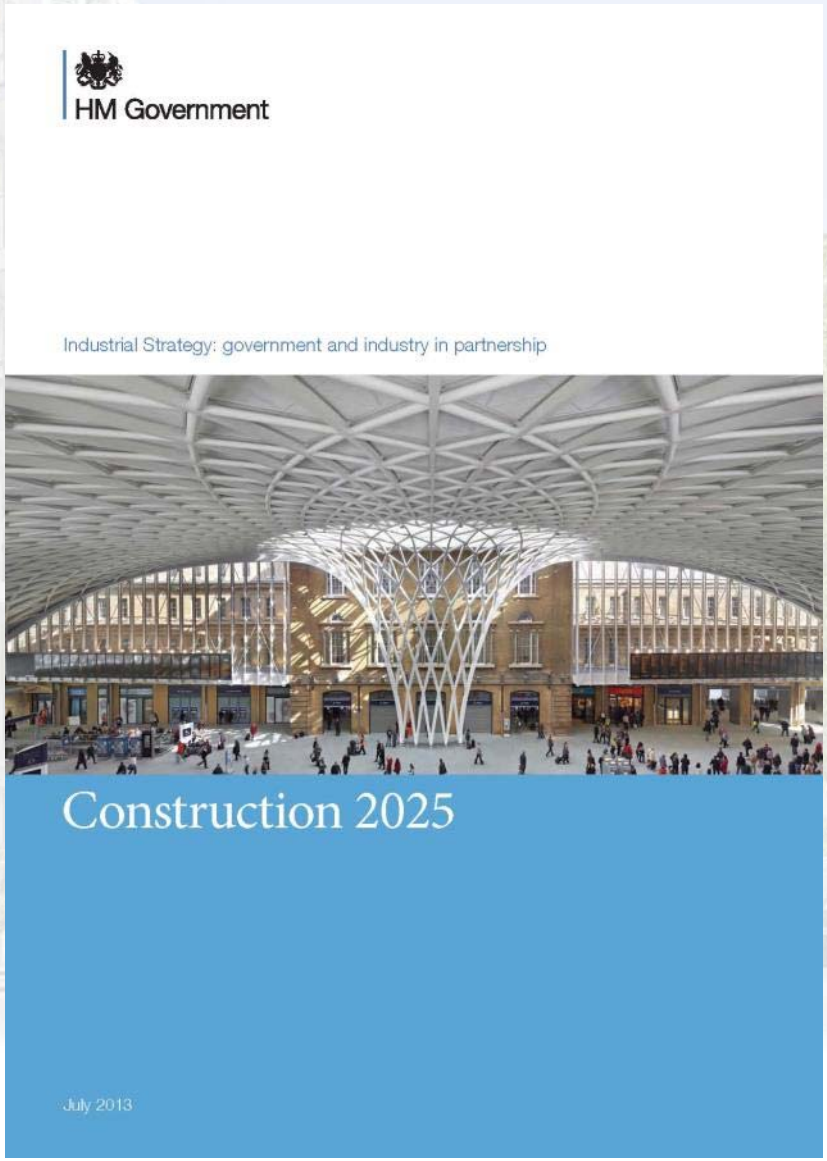
50%

reduction in greenhouse gas emissions in the built environment

Improvement in exports

50%

reduction in the trade gap between total exports and total imports for construction products and materials



PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Many Thanks

steve.cook@willmottdixon.co.uk

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BM TRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

Alun Watkins, National Secretary

PEFC UK Limited

Alasdair McGregor, Business Development Executive

BM TRADA

Short Film and Presentation

PEFC
PEFC/01-00-01
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014

Thank you for joining us, further questions can be taken by any of our speakers afterwards in the forum

CPD Certificates will be emailed to all delegates following this event

CPD CERTIFIED
The CPD Certification Service

PEFC
Promoting Sustainable Forest Management
www.pefc.org

BMTRADA

WILLMOTT DIXON
SINCE 1852

Kingsgate House, Kings Road
Monday 13th January 2014