BUILDING LIFE CYCLE ASSESSMENT – CONCEPT DESIGN STAGE



UNITS 14-17 PLOT B, WINDRUSH

CANMOOR

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INTRODUCTION

Engineering Services Consultancy Ltd (ESC) has been appointed to carry out a building life cycle assessment (LCA) for Units 14-17 Plot B, Windrush. The main purpose of the building LCA is to achieve the BREEAM UK NC V6 Mat 01 credits at the concept design stage.

This report has been compiled at the concept stage (RIBA Stage 2), prior to the submission of the planning application.

The building LCA is to be reviewed and updated at technical design stage (RIBA Stage 4).

This report outlines the baseline building LCA for the:

- Superstructure
- Substructure
- Hard landscaping

An options appraisal has also been carried out for the:

- Superstructure
- Substructure
- Hard landscaping

This report makes recommendations following the concept design stage options appraisal which should be evaluated by the design team and incorporated into the design where feasible.

The options appraisal is to be reviewed and updated at technical design stage (RIBA Stage 4).

One Click LCA has been used as the recognised tool to demonstrate compliance.

The building LCA has been produced by Elspeth Wightman who has received training on the building LCA tool; has undertaken multiple different LCAs for paying customers in the last two years and is able to interpret construction documentation.



BREEAM NC V6 MAT 01 REQUIREMENTS

RIBA STAGE 2 CONCEPT DESIGN

Seven credits and three exemplary credits are available in this issue. Some credits require preceding criteria to be fulfilled first.

In order to have the opportunity to achieve all credits, a recognised LCA tool must be used.

UP TO FOUR CREDITS – SUPERSTRUCTURE

- 1) During the concept stage, demonstrate the environmental performance of the building as follows:
 - a. Carry out a building LCA on the superstructure of the building using an IMPACT compliant LCA tool.
 - b. Submit the Mat 01 results to the BRE at the end of the concept design stage (RIBA Stage 2) and before planning permission is applied for.

OPTIONS APPRAISAL DURING CONCEPT DESIGN

- 2) Item 1) must be achieved. During the concept design stage (RIBA Stage 2) identify opportunities for reducing environmental impacts as follows:
 - a. Carry out building LCA options of 2-4 significantly different superstructure design options using a recognised LCA tool. Each design option must fulfil the same functional requirements as the proposed superstructure.
 - b. Integrate the LCA options appraisal assessment within the wider design decision-making process and record this in an options appraisal summary document.
 - c. Record the differences between the design options, the option selected by the client and the reasons for selecting it and the reasons for not-selecting other options. Submit the Mat 01 results to the BRE at the end of the concept design stage (RIBA Stage 2) and before planning permission is applied for.

ONE CREDIT – SUBSTRUCTURE & HARD LANDSCAPING

- **3)** Items 1) and 2) must be achieved. During the concept design stage (RIBA Stage 2) identify opportunities for reducing environmental impacts as follows:
 - a. Carry out building LCA options of at least 6 significantly different substructure or hard landscaping design options using a recognised LCA tool. Each design option must fulfil the same functional requirements as the proposed superstructure.
 - b. Integrate the LCA options appraisal assessment within the wider design decision-making process and record this in an options appraisal summary document.
 - c. Record the differences between the design options, the option selected by the client and the reasons for selecting it and the reasons for not-selecting other options. Submit the Mat 01 results to the BRE at the end of the concept design stage (RIBA Stage 2) and before planning permission is applied for.



RIBA STAGE 4 TECHNICAL DESIGN

UP TO AN ADDITIONAL TWO CREDITS - SUPERSTRUCTURE

- **4)** During the technical design stage, demonstrate the environmental performance of the building as follows:
 - a. Carry out a building LCA on the superstructure of the building using an IMPACT compliant LCA tool.
 - b. Submit the Mat 01 results to the BRE at the end of the technical design stage (RIBA Stage 4).

OPTIONS APPRAISAL DURING TECHNICAL DESIGN

- 5) During the technical design stage (RIBA Stage 4) identify opportunities for reducing environmental impacts as follows:
 - a. Carry out building LCA options of 2-3 significantly different superstructure design options using a recognised LCA tool. Each design option must fulfil the same functional requirements as the proposed superstructure.
 - b. Integrate the LCA options appraisal assessment within the wider design decision-making process and update the options appraisal summary document.
 - c. Record the differences between the design options, the option selected by the client and the reasons for selecting it and the reasons for not-selecting other options. Submit the Mat 01 results to the BRE at the end of the technical design stage (RIBA Stage 4) and before planning permission is applied for.

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EXEMPLARY CRITERIA

EXEMPLARY CRITERIA – ONE CREDIT – CORE BUILDING SERVICES

- 6) Items 1) and 4) must be achieved. During the concept design stage (RIBA Stage 2) identify opportunities for reducing environmental impacts as follows:
 - a. Carry out building LCA options of at least 3 significantly different core building services design options using a recognised LCA tool. Each design option must fulfil the same functional requirements as the proposed superstructure.
 - b. Integrate the LCA options appraisal assessment within the wider design decision-making process and record this in an options appraisal summary document.
 - c. Record the differences between the design options, the option selected by the client and the reasons for selecting it and the reasons for not-selecting other options. Submit the Mat 01 results to the BRE at the end of the concept design stage (RIBA Stage 2) and before planning permission is applied for.

EXEMPLARY CRITERIA – ONE CREDIT – THIRD PARTY VERIFICATION

7) Items 1) to 3) must be achieved. A suitably qualified third party verifies the building LCA work and produces a report describing how they have checked that the building LCA work accurately represents the design under consideration during the concept stage (RIBA Stage 2) and the technical design stage (RIBA Stage 4).



LCA TOOL

One Click LCA is the tool being used to undertake the LCA to demonstrate compliance with the Mat 01 credits. The BRE has awarded One Click LCA with 100% quality score.

One Click LCA has also been verified by the BRE as IMPACT compliant.

The LCA has been carried out by Nick Gorrie, who has successfully completed One Click LCA's training on how to achieve building LCA and EPD credits for BREEAM UK NC V6.



Elspeth Wightman has received training on the building LCA tool; has undertaken multiple different LCAs for paying customers in the last two years and is able to interpret construction documentation.

The following documents have been used to build the LCA model in the OneClick LCA software:

- Various drawings from Hale Architecture
 - o 23052 PL-1003_00 Proposed Site Plan-A1
 - 23052 PL-1004_00 Proposed Hard and Soft Landscape-A1
 - o 23052 PL-1200_00 Units 14-17 Proposed Ground Floor GA Plan-A1
 - 23052 PL-1201_00 Units 14-17 Proposed First Floor Office GA Plan-A1
- Canmoor Developments Limited Cost Plan 240119 Budget Cost Estimate Nr 2 -Plot B, Windrush Estate, Witney
- Units 14-17 UKNC2018_Mat0102_ResultsSubmissionTool_V2.2
- BREEAM_UK_NC_2018_and_V6_Wat01_Calculator_v2.3



COMPARISONWITHTHEBREEAMLCABENCHMARK DURING CONCEPT DESIGN

SUBSTRUCTURE BASELINE – IMPACT COMPLIANT LCA TOOL

MAT01_CD_SUPERS_B

The One Click LCA for *BREEAM UK IMPACT*-compliant tool has been used to compare the building against the benchmark.

The superstructure base-build has been modelled within the software. The building material inputs for the superstructure using the IMPACT compliant tool can be seen in Appendix A.

RESULTS

The Mat 01 Results Submission Tool confirms that the building achieves **0.7 credits** for the superstructure comparison with the BREEAM benchmark.

Sup	Superstructure - Comparison with the BREEAM benchmark										
A con	pleted 'Mat01_CD_SuperS_B' dat	a file shall	be saved in t	the same folder as	this file.						
			I								
Desig	n option	Option data file link	m2 net internal area	BRE EN ecopoints/m2 net internal area (60 year study period)							
ID	Name			2.1 Frame	2.2 Upper floors	2.3 Roof	2.4 Stairs and ramps	2.5 External walls	2.6 Windows and external doors	2.7 Internal walls and partitions	Total
B1	Mat01_CD_SuperS_B	Link	5244	1.43	0.19	0.25	0.01	0.18	0.00	Not in scope	2.05
Result from tool (BRE EN ecopoints / m2 NIA): 2.05											
Bench	Benchmark value for this building type (BRE EN ecopoints / m2 NIA): 2.18										
Perce	Percentage better than benchmark: 5.9%										
Credi	Credits awarded: 0.80										



SUPERSTRUCTURE OPTION APPRAISAL DURING CONCEPT DESIGN

SUPERSTRUCTURE BASELINE – ONECLICK LCA TOOL

MAT01_CD_SUPERS_OPT1

In order to complete the *Mat 01 Results Submission Tool* Option 1 is equivalent to the Basebuild design, however this has been remodelled using the OneClick LCA database.

The superstructure base-build has been modelled within the software. The building material inputs for the superstructure using OneClick LCA can be seen in Appendix A.

SUPERSTRUCTURE DESIGN OPTION 1

MAT01_CD_SUPERS_OPT2

CHANGE

Ва	aseline	Alternative		
U	oper Floor	Upper Floor		
•	Structural steel profiles , generic, 20% recycled (columns and beams of for the upper floors only) Assumed 45 kg/m ² for upper floor GIA	 Structural steel profiles, generic recycled (columns and beams of upper floors only) Assumed 25kg for upper floor GIA 	c, 20% for the g/m²	
•	Galvanized profiled steel decking , for composite floor slabs/decks, 0.9 mm sheet thickness	 Hollow core concrete slabs - Assumed 250mm thick, C30/37, (recycled binders in cement)%	
•	Steel mesh reinforcement for concrete	• Flooring screed - 50mm thick, C	20/25,	
•	Concrete – C32/40, CEM I, 0% recycled binders, 150mm thick	 CEM I 0% Cement Replacement Assumed NO Raised access florence 	oor (as	
•	Raised access floor	screed detailing)	111111	

Material Option	Tonnes CO₂e	Difference (Tonnes CO₂e)	Lowest CO₂e
Baseline	1,442		×
Alternative	1,310	- 132	\checkmark



SUPERSTRUCTURE DESIGN OPTION 2

MAT01_CD_SUPERS_OPT3

CHANGE

Baseline		Alternative			
Up	oper Floor	Upper Floor			
•	Structural steel profiles , generic, 20% recycled (columns and beams of for the upper floors only) Assumed 45 kg/m ² for upper floor GIA	•	Glue laminated timber (Glulam) - Assumed 100 kg/m ² for upper floor GIA, NB: FSC certified timber, and a detailed disassembly plan made, to promote		
•	Galvanized profiled steel decking, for		reuse at end of building life		
	composite floor slabs/decks, 0.9 mm sheet thickness	•	200mm joists - Assumed 1.8m of joists per m ²		
•	Steel mesh reinforcement for concrete	•	22mm chipboard - Assumed 14.57		
•	Concrete – C32/40, CEM I, 0% recycled		kg/m²		
	binders, 150mm thick	•	Soffit lining/fire protection:		
•	Raised access floor	i) ii)	2 x Gypsum plasterboard, fire resistant, 12.5 mm 200mm of Rock wool/mineral wool insulation, Fire resistance class = A		
		•	No raised access floor needed		

Material Option	Tonnes CO₂e	Difference (Tonnes CO₂e)	Lowest CO₂e
Baseline	1,442		×
Alternative	1,266	- 176	\checkmark



SUPERSTRUCTURE DESIGN OPTION 3

MAT01_CD_SUPERS_OPT4

CHANGE

Ba	aseline	Alternative		
St	eel Frame	Tir	nber Frames	
٠	Structural steel profiles, generic, 20% recycled - Assumed 45 kg/m ² for ground floor GIA, Assumed 45 kg/m ² for upper floor GIA (accounted for below)	•	Glue laminated timber (Glulam) - Assumed 70 kg/m² for ground floor GIA, NB: FSC certified timber, and a detailed disassembly plan made, to promote reuse at end of building life	
Up	oper Floor	Up	per Floor	
•	Structural steel profiles , generic, 20% recycled (columns and beams of for the upper floors only) Assumed 45 kg/m ² for upper floor GIA	•	Glue laminated timber (Glulam) - Assumed 100 kg/m ² for upper floor GIA 200mm joists - Assumed 1.8m of joists per m ²	
•	Galvanized profiled steel decking , for composite floor slabs/decks, 0.9 mm sheet thickness	•	22mm chipboard - Assumed 14.57 kg/m ²	
•	Steel mesh reinforcement for concrete	•	Sofit lining/fire protection:	
•	Concrete – C32/40, CEM I, 0% recycled binders, 150mm thick	 i) 2 x Gypsum plasterboard, resistant, 12.5 mm ii) 200mm of Rock wool/mine 	2 x Gypsum plasterboard, fire resistant, 12.5 mm 200mm of Rock wool/mineral wool	
•	aised access floor		insulation, Fire resistance class = A	
		٠	No raised access floor needed	

Material Option	Tonnes CO₂e	Difference (Tonnes CO₂e)	Lowest CO₂e
Baseline	1,442		×
Alternative	707	- 735	\checkmark



SUBSTRUCTURE OPTION APPRAISAL DURING CONCEPT DESIGN

SUBSTRUCTURE BASELINE

MAT01_CD_SUBS_HL_OPT1

The substructure base-build has been modelled within the software. The building material inputs can be seen in Appendix A.

SUBSTRUCTURE DESIGN OPTION 2

MAT01_CD_SUBS_HL_OPT3

CHANGE

Baseline	Alternative		
 Lowest Floor Construction Concrete - Assumptions: C32/40, CEM I, 0% recycled binders 	 Concrete - Assumptions: C32/40, CEM I, 0% recycled binders, 15% thinner ground floor slab 		

Material Option	Tonnes CO₂e	Difference (Tonnes CO₂e)	Lowest CO₂e
Baseline	389		×
Alternative	344	-45	\checkmark



SUBSTRUCTURE DESIGN OPTION 2

MAT01_CD_SUBS_HL_OPT4

CHANGE

Baseline			Alternative		
Standard Foundations			Standard Foundations		
٠	Concrete - Assumptions: C32/40, CEM I, 0% recycled binders	•	Concrete - Reduced Foundations Size Due to Structural Timber Lighter Loads		
٠	Steel reinforcement		(circa 20% saving)		
		•	Steel reinforcement		

Material Option	Tonnes CO₂e	Difference (Tonnes CO ₂ e)	Lowest CO ₂ e
Baseline	389		×
Alternative	373	- 16	\checkmark



HARD LANDSCAPING OPTION APPRAISAL DURING CONCEPT DESIGN

HARD LANDSCAPING BASELINE

MAT01_CD_SUBS_HL_OPT2

The hard landscaping base-build has been modelled within the software. The building material inputs can be seen in Appendix A.

HARD LANDSCAPING DESIGN OPTION 1

MAT01_CD_SUBS_HL_OPT5

CHANGE

Bas	seline	Alte	ernative
Tar	mac	Pav	ing
550)mm build up of:	550	mm build up of:
•	350mm crushed aggregate sub-base	Blo	ck Paver
•	70mm AC 32	•	350mm crushed aggregate sub-base
•	60mm AC20 and	•	60mm AC 20
٠	40mm surface course	•	50mm sand bedding
		٠	80mm block paver

Material Option	Tonnes CO₂e	Difference (Tonnes CO₂e)	Lowest CO₂e
Baseline	282		×
Alternative	268	-14	\checkmark



HARD LANDSCAPING DESIGN OPTION 2

MAT01_CD_SUBS_HL_OPT6

CHANGE

Baseline	Alternative
Tarmac	Paving
550mm build up of:	550mm build up of:
 350mm crushed aggregate sub-base 	Block Paver
• 70mm AC 32	 330mm crushed aggregate sub-base
60mm AC20 and	• 60mm AC20
40mm surface course	 50mm sand bedding
	 100mm open grid paver (with 40% openness)

Material Option	Tonnes CO₂e	Difference (Tonnes CO₂e)	Lowest CO ₂ e
Baseline	282		×
Alternative	270	-12	\checkmark



BREEAM NC V6 MAT 01 CREDITS

The Mat 01 Results Submission Tool has been completed and confirms that a total of **4 credits** can be awarded at the **concept design stage**, as follows:

- BREEAM benchmark comparison = 0.7 credits
- Superstructure options appraisal = 2.67 credits
- Substructure and hard landscaping options appraisal = 1 credit

In addition to this it is expected that the following will also be undertaken:

- Third party verification of the LCA model & report at concept stage = 1 exemplary credit
- Alignment of the LCA and the LCC at concept stage = 1 exemplary credit

Therefore, a total of 4 credits have been achieved and it is anticipated that a further 2 exemplary credits will also be achievable.

		CO₂e Tonnes	CO₂e per m²/yr	Difference Tonnes	Difference %	Result
	Baseline	1442	4.58	-	-	-
Superatructure	Design Option 1	1310	4.16	-132.00	-9.15	\checkmark
Superstructure	Design Option 2	1266	4.02	-176.00	-12.21	\checkmark
	Design Option 3	707	2.25	-735.00	-50.97	\checkmark
	Baseline	389	1.24	-	-	-
Substructure	Design Option 1	344	1.09	-45.00	-11.57	\checkmark
	Design Option 2	373	1.19	-16.00	-4.11	\checkmark
Llord	Baseline	282	0.9	-	-	-
	Design Option 1	268	0.85	-14.00	-4.96	\checkmark
Landscaping	Design Option 2	270	0.86	-12.00	-4.26	\checkmark

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APPENDIX A

Main	ESS0416 Plot B	l Windruch I li	nite 14-17 CA	> Mat01	CD Supers	く Ont1 >	I CA for BREEAM UK :	> Innut data	 Building 	matorials
-	200041011012			· mator_	OD_Oupere	_ opti -	LOAIDI DILLLAIII OIL	mput uutu	. Dununig	materials

Building materiale Energy	consumption annual	Water consumption annual	Construction site operation	ons Emi	ssions and removale	Ruilding a	irea
						Duliding a	
Material	Count	try Data source	Туре Ц	pstream	CO2e Unit	Stan	dard
Clear Filter:	▼ Filter:	Filter:	Filter: F	ilter: 🔻	Filter:	Filte	er: 🔻
Fill in the material consumptions by amounts (incl. losses). Materials can be	material type. You ma added in any section	y fill in all materials lumped togeth Material selection help.	ner, or on separate rows for e	xample by ty	pe of structure. Unles	ss instructed other	wise, use gross
Completeness (%) an	d plausibility o	hecker (-)					
1. Foundations and subs	structure - out of	i scope - Add to scope					
2. Vertical structures and	d facade 🔺 85	0 Tonnes CO ₂ e - 59 %					
External walls and facade	are answers 👻 🛨 (Create a group 🛛 🕂 Move mate	rials 🗿 Add to compare				
Start typing or click the arro							
Resource ≑	Quantity 🌲	CO2e	≑ Comment ≑		RICS category ⑦	Transpor	t, kilometers ⑦ ≑
Sandwich panel with glasswool insul ?	1439	m2 🗸 80t - 6%	External wall - Built up		2.5.1.External enclo	osing 80	Trailer combination, 40
Sandwich panel with stone wool i ? 🕻	2268	m2 🗸 116t - 8%	External wall - Compos	ite 🖉 🗎	2.5.1.External enclo	osing 80	Trailer combination, 40
Columns and load-bearing vertical s	tructures <mark>≓ Comp</mark> a	are answers – Create a gro	১up 🕂 Move materials এঁ	Add to co	mpare		
Start typing or click the arro							
Resource ≑	Quantity ≑	▲ CO ₂ e ≑	Comment ≑	F	RICS category ⑦	Transport, kilom	neters (?) ≑ Ser
Structural steel profiles, generic, ?	206100 k	g 🗸 526t - 36%	Steel frame - hot rolled	2 2	.1. Frame	110 Trailer	combination, 40 As t
Structural hollow steel sections (H ?	45800 k	g 🗸 128t - 9%	Steel frame - cold rtolled	2	.1.1.Steel frames	110 Trailer	combination, 40 As t
Internal walls and non-bearing struct	tures <mark>≓ Compare</mark> a	nswers → Create a group	🕂 Move materials 🗿 Ad	ld to compa	re		
Stort typing or click the orre							
Start typing of click the allo							
3. Horizontal structures:	beams, floors	and roofs 🌰 529 Toni	nes CO ₂ e - 37 %				
3. Horizontal structures: Floor slabs, ceilings, roofing decks,	beams, floors	s and roofs 🌰 529 Toni Compare answers 👻 🖬 Creat	nes CO ₂ e - 37 % te a group	rials ରିହି Ado	d to compare		
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro	beams, floors	s and roofs 🌰 529 Toni Compare answers 👻 🖬 Creat	nes CO₂e - 37 % te a group	rials <u>ର</u> ିଜ Ade	t to compare		
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro	beams, floors beams and roof Quantity ≑	s and roofs ▲ 529 Toni Compare answers - Creat	nes CO₂e - 37 % te a group	rials ରୁଦ୍ଧି Ade	t to compare RICS category	r ⑦ Transpo	rt, kilometers ⑦ ≑
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro Resource \$ Structural steel profiles, generic, ?	beams, floors	s and roofs 529 Toni Compare answers - Creat	nes CO₂e - 37 % te a group	rials 쇼 Add	d to compare RICS category = 2.2.Upper floor	7 ⑦ Transpo 110	rt, kilometers ⑦ ≑ Trailer combination, 40
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro Resource \$ Structural steel profiles, generic, ? Profiled steel decking for compo ? (A)	beams, floors beams and roof Quantity 29880 664	s and roofs 529 Toni Compare answers - Creat kg - 76t - 1 m2 - 22t -	nes CO ₂ e - 37 % te a group	rials 한 Add ural Steel deck	RICS category 2.2.Upper floor 2.2.1.Floors	7 ⑦ Transpor 110 110	rt, kilometers ⑦ ≑ Trailer combination, 40 Trailer combination, 40
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro Resource \$ Structural steel profiles, generic, ? Profiled steel decking for compo ? () Reinforcement steel mesh (rebar), 1 ?	beams, floors beams and roof Quantity € 29880 664 2005.28	s and roofs 529 Ton Compare answers - Creat kg - 76t - 1 m2 - 22t - kg - 1.5t -	nes CO₂e - 37 % te a group	rials 쇼 Add ural Steel deck	RICS category 2.2.Upper floor 2.2.1.Floors 2.2.1.Floors	r ⑦ Transpoi 110 110 110	rt, kilometers ⑦ ≑ Trailer combination, 40 Trailer combination, 40 Trailer combination, 40
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro Resource \$ Structural steel profiles, generic, ? Profiled steel decking for compo ? () Reinforcement steel mesh (rebar), 1 ? Ready-mix concrete, normal strength ?	beams, floors beams and roof Quantity 29880 664 2005.28 99.6	s and roofs ▲ 529 Ton Compare answers - Creat kg - 76t - 1 m2 - 22t - kg - 1.5t - m3 - 32t - 2	nes CO ₂ e - 37 % te a group	rials of Add ural Steel deck orcement	RICS category 2.2.Upper floor 2.2.1.Floors 2.2.1.Floors 2.2.Upper floor	7 ⑦ Transpor 110 110 110 60	rt, kilometers ⑦ ≎ Trailer combination, 40 Trailer combination, 40 Trailer combination, 40 Concrete mixer truck
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro Resource \$ Structural steel profiles, generic, ? Profiled steel decking for compo ? () Reinforcement steel mesh (rebar), 1 ? Ready-mix concrete, normal strength ? Raised access floor pedestals, for ?	beams and roof Quantity 29880 664 2005.28 99.6 1381.12	s and roofs ▲ 529 Ton Compare answers → ■ Creat kg → 76t - 1 m2 → 22t - kg → 1.5t - m3 → 32t - 3 kg → 5.3t -	nes CO₂e - 37 % te a group	rials 🕸 Add ural Steel deck procement rete	RICS category 2.2.Upper floor 2.2.1.Floors 2.2.1.Floors 2.2.Upper floor 2.2.Upper floor 3.2.2.Raised ac	r ⑦ Transpor 110 110 110 60 xcess 110	rt, kilometers ② ≎ Trailer combination, 40 Trailer combination, 40 Trailer combination, 40 Concrete mixer truck Trailer combination, 40
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro Resource \$ Structural steel profiles, generic, ? Profiled steel decking for compo ? () Reinforcement steel mesh (rebar), 1 ? Ready-mix concrete, normal strength ? Raised access floor pedestals, for ? Raised access flooring panels, chip ?	beams, floors beams and roof Quantity 29880 664 2005.28 99.6 1381.12 664	s and roofs ▲ 529 Ton Compare answers - Creat Compare answers - Creat Creat M2 - 22t - kg - 1.5t - m3 - 32t - 3 kg - 5.3t - m2 - 81t - 0	nes CO2e - 37 % te a group	rials 🕸 Add ural Steel deck orcement rete r feet	Hocompare RICS category 2.2.Upper floor 2.2.1.Floors 2.2.Upper floor 2.2.Upper floor 3.2.2.Raised act 3.2.2.Raised act	7 ⑦ Transpoi 110 110 110 60 xxess 110 xxess 110	rt, kilometers ⑦ \$ Trailer combination, 40 Trailer combination, 40 Trailer combination, 40 Concrete mixer truck Trailer combination, 40 Trailer combination, 40
3. Horizontal structures: Floor slabs, ceilings, roofing decks, Start typing or click the arro Resource \$ Structural steel profiles, generic, ? Profiled steel decking for compo ? () Reinforcement steel mesh (rebar), 1 ? Ready-mix concrete, normal strength ? Raised access floor pedestals, for ? Raised access flooring panels, chip ? Sandwich panel with glasswool insul ?	beams and roof Cuantity 29880 664 2005.28 99.6 1381.12 664 4855	S and roofs ▲ 529 Ton Compare answers → C Creat Kg → 76t - 1 m2 → 22t - Kg → 1.5t - m3 → 32t - 2 Kg → 5.3t - m2 → 81t - 0 m2 → 268t -	nes CO₂e - 37 % te a group	rials 🕸 Add	RICS category 2.2.Upper floor 2.2.1.Floors 2.2.1.Floors 2.2.Upper floor 2.2.2.Raised ac 3.2.2.Raised ac 2.3.Roofs	r ⑦ Transpor 110 110 110 60 ccess 110 ccess 110 80	rt, kilometers ⑦ Trailer combination, 40 Trailer combination, 40 Trailer combination, 40 Concrete mixer truck Trailer combination, 40 Trailer combination, 40 Trailer combination, 40

4. Other structures and materials a 63 Tonnes CO2e - 4 %

Other structures and materials	npare answers 👻 🖬 Create a	i group 🕂 Move ma	aterials <u>ala</u> Add to coi	mpare				
Start typing or click the arro								
Resource ≑	Quantity ≑	▲ CO ₂ e ≑	Comment ≑		RICS category ⑦	Transpo	ort, kilometers 🤅	Sei
Precast concrete staircase, 2 fligh ?	84705.6 kg 🗸	16t - 1%	Precast Stair		2.4.Stairs and ramps	60	Trailer combination, 40	As
Windows and doors <mark> </mark>	ers 👻 🖪 Create a group 🔸	Dove materials 회	Add to compare					
Start typing or click the arro								
Resource ≑	Quantity ≑	▲ CO ₂ e ≑	Comment ≑		RICS category ③		Transport, kilometers (€ €
Aluminium frame window, double glaz ?	360 m2 🗸	47t - 3%	Window		2.6.Windows and e	xternal	130 Trailer combina	ation, 4
Finishes and coverings <mark> </mark>	nswers – E Create a group	Move materials	এঁ Add to compare					
+ Click to input data								
5. External areas and site e	elements - out of scope - /	Add to scope						

6. Building technology - out of scope - Add to scope

One Click LCA © copyright One Click LCA LTD | Version: 0.23.4, Database version: 7.6

Backend param handling took: 0.5s, GSP param handling took: 0.4s, Dom ready: 0.3s, Window loaded: 0.3s, Overall: 1.4s.

Main > ESS0416 Plot B Windrush Units 14-17 LCA > Mat01_CD_SubS_HL_Opt1 > LCA for BREEAM UK > Input data : Building materials

Building materials Energy const	mption, annual	Water co	onsumption, annual Co	nstruction site operations Er	nissions and removals	Building area	
Clear Material Filter:	▼	Country	Filter: • Data	a source Filter:	• Type Filte	er: • Upstream Filter: •	CO2
Fill in the material consumptions by material amounts (incl. losses). Materials can be added	ial type. You ma d in any sectior	ay fill in all ma n. <mark>Material sel</mark>	terials lumped together, or c ection help.	on separate rows for example by	type of structure. Unless	s instructed otherwise, use gross	
Completeness (%) and p	ausibility o	checker (-)				
1. Foundations and substru	cture 🌰 a	89 Tonnes C	:O ₂ e - 100 %				
Materials in the foundations will never be replace here, choose resource Excavation works.	d, no matter asse	essment period	length (except for RE2020 an	d FEC tools). For BREEAM UK Mat	1 IMPACT equivalent prov	vide the data for site excavation fuel us	9
Foundation, sub-surface, basement and n	etaining walls	≓ Compare	answers ▼ ■ Create a	group ⊕ Move materials <u>4</u>	Add to compare		
Start typing or click the arro							
Resource ≜	Quantity ≑		CO₂e ≑	Comment \$	RICS category ⑦	Transport, kilometers	Se
Ready-mix concrete, normal strength ?	202.5	m3 🗸	65t - 17%	Foundations - concrete	1.Substructure	60 Concrete mixer truck	P€
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ?	202.5 20250	m3 🗸	65t - 17% 11t - 3%	Foundations - concrete	1.Substructure 1.1.1.Standard	60Concrete mixer truck110Trailer combination, 40	P€ P€
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? Ready-mix concrete, normal strength ?	202.5 20250 916	m3 ∨ kg ∨ m3 ∨	65t - 17% 11t - 3% 295t - 76%	Foundations - concrete Foundations - Steel Ground Floor Slab -	1.Substructure 1.1.1.Standard 1.1.3.Lowest floor	60Concrete mixer truck110Trailer combination, 4060Concrete mixer truck	Pe Pe Pe
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ?	202.5 20250 916 32060	m3 🗸 kg 🗸 m3 🗸 kg 🗸	65t - 17% 11t - 3% 295t - 76% 17t - 4%	Foundations - concrete Foundations - Steel Ground Floor Slab - Ground Floor Slab - Steel	1.Substructure 1.1.1.Standard 1.1.3.Lowest floor 1.1.3.Lowest floor	60Concrete mixer truck110Trailer combination, 4060Concrete mixer truck110Trailer combination, 40	Ре Ре Ре
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? 2. Vertical structures and fa	202.5 20250 916 32060 cade - out of	m3 v kg v m3 v kg v	65t - 17% 11t - 3% 295t - 76% 17t - 4%	Foundations - concrete Foundations - Steel Ground Floor Slab - Ground Floor Slab - Steel	1.Substructure 1.1.1.Standard 1.1.3.Lowest floor 1.1.3.Lowest floor	 60 Concrete mixer truck 110 Trailer combination, 40 60 Concrete mixer truck 110 Trailer combination, 40 	Pe Pe Pe
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? 2. Vertical structures and fa 3. Horizontal structures: bea	202.5 20250 916 32060 cade - out of	m3 v kg v m3 v kg v	65t - 17% 11t - 3% 295t - 76% 17t - 4%	Foundations - concrete Foundations - Steel Ground Floor Slab - Ground Floor Slab - Steel	1.Substructure 1.1.1.Standard 1.1.3.Lowest floor 1.1.3.Lowest floor	60 Concrete mixer truck 110 Trailer combination, 40 60 Concrete mixer truck 110 Trailer combination, 40	Pe Pe Pe
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? 2. Vertical structures and fa 3. Horizontal structures: bea 4. Other structures and mat	202.5 20250 916 32060 Cade - out of ams, floors	m3 v kg v m3 v kg v	65t - 17% 11t - 3% 295t - 76% 17t - 4%	Foundations - concrete Foundations - Steel Ground Floor Slab - Ground Floor Slab - Steel	1.Substructure 1.1.1.Standard 1.1.3.Lowest floor 1.1.3.Lowest floor	60 Concrete mixer truck 110 Trailer combination, 40 60 Concrete mixer truck 110 Trailer combination, 40	Pe Pe Pe
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? 2. Vertical structures and fa 3. Horizontal structures: bea 4. Other structures and mat 5. External areas and site el	202.5 20250 916 32060 cade - out of ams, floors erials - out of	m3 v kg v m3 v kg v s cope - Add	65t - 17% 11t - 3% 295t - 76% 17t - 4%	Foundations - concrete Foundations - Steel Ground Floor Slab - Ground Floor Slab - Steel	1.Substructure 1.1.1.Standard 1.1.3.Lowest floor 1.1.3.Lowest floor	60 Concrete mixer truck 110 Trailer combination, 40 60 Concrete mixer truck 110 Trailer combination, 40	Ρε Ρε Ρε
Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? Ready-mix concrete, normal strength ? Reinforcement steel (rebar), generi ? 2. Vertical structures and fa 3. Horizontal structures: bea 4. Other structures and mat 5. External areas and site el Materials and constructions for external a	202.5 20250 916 32060 cade - out of ams, floors erials - out of ements reas ≓ Comp	m3 v kg v m3 v kg v f scope - Add s and roo	65t - 17% 11t - 3% 295t - 76% 17t - 4% I to scope OfS - out of scope - Add d to scope	Foundations - concrete Foundations - Steel Ground Floor Slab - Ground Floor Slab - Steel to scope ★ Move materials A Add to c	1.Substructure 1.1.1.Standard 1.1.3.Lowest floor 1.1.3.Lowest floor	60 Concrete mixer truck 110 Trailer combination, 40 60 Concrete mixer truck 110 Trailer combination, 40	Ρε Ρε Ρε

6. Building technology - out of scope - Add to scope

Main > ES	S0416 Plot B Windru	sh Units 14-17 LCA	> Mat01 C	D SubS HL	Opt2 > LCA for BREEAM UK > In	out data : Building materials
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Building materials Energy	consumption, annual	Water consumption, a	annual Con	struction site operations	Emissions and removals	Building area
Material	Countr	ry Data s	source	Type Upstream	CO2e Unit	Standard
Clear Filter:	Filter:	▼ Filte	er: 🔻	Filter: Tilter: Tilter:	Filter: •	Filter:
Fill in the material consumptions by mounts (incl. losses). Materials can b	material type. You may e added in any section.	/ fill in all materials lumpe Material selection help.	d together, or on	separate rows for example b	y type of structure. Unless instr	ucted otherwise, use gross
Completeness (%) ar	nd plausibility c	hecker (-)				
I. Foundations and sub	structure					
Aterials in the foundations will never be r	eplaced, no matter asses	ssment period length (excep	ot for RE2020 and	FEC tools). For BREEAM UK M	at 1 IMPACT equivalent provide th	ne data for site excavation fuel use
oundation, sub-surface, basement	and retaining walls	≓ Compare answers √	🖬 Create a g	roup 🛛 💠 Move materials 🖉	ର୍ଣିଦ Add to compare	
Start typing or click the arro						
	d fo o o do					
2. vertical structures an	d Tacade - out of s	scope - Add to scope				
3. Horizontal structures:	beams, floors	and roofs - out of	f scope - Add to) scope		
4. Other structures and	materials - out of	f scope - Add to scope				
4. Other structures and	materials - out of	f scope - Add to scope				
4. Other structures and 5. External areas and sit	materials - out of	scope - Add to scope	0 %			
4. Other structures and 5. External areas and sit	materials - out of te elements ▲ rnal areas ≓ Compa	Scope - Add to scope 282 Tonnes CO ₂ e - 100 are answers → □ Crea	0 % ate a group ≮	🗘 Move materials এঁ০ Add to	o compare	
4. Other structures and 5. External areas and sit Materials and constructions for external Start typing or click the arro	materials - out of reelements ▲ rnal areas ≓ Compa	282 Tonnes CO₂e - 100 are answers → I Crea	0 % ate a group ←	🕈 Move materials এঁট্র Add to	o compare	
4. Other structures and 5. External areas and sit Materials and constructions for external Start typing or click the arro	materials - out of the elements ▲ rnal areas ⇄ Compa	Scope - Add to scope 282 Tonnes CO₂e - 100 are answers → □ Crea	0 % ate a group ↔	✿ Move materials 쇼쇼 Add to Comment 龠	o compare	Transport kilometers இ≜
4. Other structures and 5. External areas and sit Materials and constructions for external Start typing or click the arro Resource \$	materials - out of the elements ← rnal areas Imed Compa Quantity = 1089	282 Tonnes CO ₂ e - 100 are answers → Creation m2 → x 250 mm	0 % ate a group ← CO₂e ≑ 3t - 1%	<mark>ট Move materials</mark> এঁট Add to Comment ≑ Access road - Sub-base -	RICS category 8.2.1.Roads, paths and	Transport, kilometers ⑦ ≑ 60 Dumper truck, 19 to
4. Other structures and 5. External areas and sit Materials and constructions for external Start typing or click the arro Resource \$ Aggregate (crushed gravel), generic ?	materials - out of ree elements ▲ rnal areas	scope - Add to scope 282 Tonnes CO2e - 100 are answers - Creating m2 v x 250 mm m² 	0 % ate a group ← CO2e ≑ 3t - 1% 28t - 10%	Comment ≑ Access road - Sub-base - Access road - 90mm AC32	RICS category ③ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ⑦ ≑ 60 Dumper truck, 19 to Data by constituent
Other structures and Start typing or click the arro Start typing or click the arro Resource Aggregate (crushed gravel), generic M Asphalt concrete base course M Asphalt concrete base course	materials - out of the elements rnal areas Quantity ≑ 1089 1089 1089 1089	scope - Add to scope 282 Tonnes CO₂e - 100 are answers → Crea m2 → x 250 mm m ² m ²	0 % ate a group ← CO2e ≑ 3t - 1% 28t - 10% 19t - 7%	Move materials ₫ Add to Comment ≎ Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ⑦ ≑ 60 Dumper truck, 19 to Data by constituent Data by constituent
Other structures and S. External areas and sit Materials and constructions for exte Start typing or click the arro Resource Aggregate (crushed gravel), generic Aggregate (crushed gravel), generic Asphalt concrete base course Management of the structure of the structure base course Management of the structure base course Management of the structure base course Management of the structure base course	materials - out of ce elements arnal areas Quantity ‡ 1089 1089 1089 1089 1089 1089 1089	 scope - Add to scope 282 Tonnes CO₂e - 100 are answers → □ Creation m2 → x 250 mm m² m2 → x 40 mm 	0 % ate a group ← CO2e ≑ 3t - 1% 28t - 10% 19t - 7% 16t - 6%	Comment ≑ Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ③ ≑ 60 Dumper truck, 19 to Data by constituent Data by constituent 30 Dumper truck, 19 to
	materials - out of re elements materials - out of rnal areas Compa Cuantity ≎ 1089 1089 1089 1089 776	scope - Add to scope 282 Tonnes $CO_{2^{0}} - 10^{10}$ are answers \checkmark Creating m ² \checkmark x 250 mm m ² m ² \checkmark x 40 mm m ² \checkmark x 350 mm	0 % ate a group ← 3t - 1% 28t - 10% 19t - 7% 16t - 6% 3t - 1%	Move materials To Add to Comment Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation-	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ⑦ ≑ 60 Dumper truck, 19 to Data by constituent 30 Dumper truck, 19 to 60 Dumper truck, 19 to
	materials - out of re elements rnal areas Cuantity 1089 1089 1089 776 776 776 776	scope - Add to scope 282 Tonnes $CO_2e - 100$ are answers \checkmark Creating m ² \checkmark x 250 mm m ² m ² \checkmark x 40 mm m ² \checkmark x 350 mm m ²	0 % ate a group ← CO2e ≑ 3t - 1% 28t - 10% 19t - 7% 16t - 6% 3t - 1% 16t - 6%	Move materials A Add to Comment Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation- Car park circulation - 70mr	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ⑦ ≑ 60 Dumper truck, 19 to Data by constituent 30 Dumper truck, 19 to 60 Dumper truck, 19 to 60 Dumper truck, 19 to 60 Dumper truck, 19 to Data by constituent 10 30 Dumper truck, 19 to 60 Dumper truck, 19 to Data by constituent 10
	materials - out of ree elements materials - out of rnal areas Comparing Quantity Comparing 1089 1089 1089 1089 1089 776 776 776	scope - Add to scope 282 Tonnes $CO_{2^{e}} - 100$ are answers - Creating the formula of the	0 % ate a group ← CO2e ← 3t - 1% 28t - 10% 19t - 7% 16t - 6% 3t - 1% 16t - 6% 13t - 5%	Move materials Add to Comment Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation- Car park circulation - 70mm Car Park - 60mm AC20	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ③ ≑ 60 Dumper truck, 19 to Data by constituent 30 30 Dumper truck, 19 to 60 Dumper truck, 19 to 30 Dumper truck, 19 to 60 Dumper truck, 19 to Data by constituent Data by constituent
Asphalt concrete base course	materials - out of the elements materials - out of the elements	Scope - Add to scope 282 Tonnes CO ₂ e - 100 are answers \checkmark Creating m ² \checkmark x 250 mm m ² m ² \checkmark x 40 mm m ² m ² \checkmark x 350 mm m ² m ² m ² \checkmark x 40 mm	0 % ate a group	Move materials ऒ Add to Comment € Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation- Car park circulation - 70mm Car Park - 60mm AC20 Car park bays - 40mm	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ⑦ ≑ 60 Dumper truck, 19 to Data by constituent 30 Dumper truck, 19 to 60 Dumper truck, 19 to 10 Dumper truck, 19 to 10 Data by constituent 10 Dumper truck, 19 to 10 Data by constituent 10 Data by constituent 10 Data by constituent 10 Dumper truck, 19 to
Other structures and S. External areas and sit Atterials and constructions for external Start typing or click the arro Start typing or click the arro Start typing or click the arro Asphalt concrete base course Asphalt concrete base	materials - out of ree elements malareas ≓ Compa Cuantity ≑ 1089 1089 1089 1089 776 776 776 776	scope - Add to scope 282 Tonnes $CO_2e - 100$ are answers \checkmark \square Creating m ² \checkmark x 250 mm m ² m ² \checkmark x 40 mm m ² m ² m ² \checkmark x 350 mm m ² m ² m ² \checkmark x 40 mm m ² m ² \checkmark x 200 mm	0 % ate a group CO2e CO2e	Move materials A Add to Comment Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation- Car park circulation - 70mr Car park - 60mm AC20 Car park bays - 40mm Service Yard - Concrete	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ③ ≑ 60 Dumper truck, 19 to Data by constituent
Other structures and Start typing or click the arro Asphalt concrete base course	materials - out of re elements urnal areas Countity ≑ 1089 1089 1089 1089 1089 776 7776 7776 7776 2434 17038	scope - Add to scope 282 Tonnes $CO_2e - 100$ are answers \checkmark Creating m ² \checkmark 250 mm m ² m ² \checkmark 40 mm m ² m ² \checkmark 350 mm m ² m ² \checkmark 40 mm m ² m ² \checkmark 40 mm m ² m ² \checkmark 40 mm	0 % ate a group ← CO2e ← 3t - 1% 28t - 10% 19t - 7% 16t - 6% 3t - 1% 16t - 6% 13t - 5% 11t - 4% 157t - 56% 9.2t - 3%	Move materials Add to Comment Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation- Car park circulation- Car park circulation - 70mm Car park - 60mm AC20 Car park bays - 40mm Service Yard - Concrete Service Yard - Steel	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ⑦ ÷ 60 Dumper truck, 19 to Data by constituent Data by constituent 30 Dumper truck, 19 to 60 Concrete mixer truck 110 Trailer combination,
 4. Other structures and 5. External areas and sit Materials and constructions for external areas and sit Materials and constructions for external areas and site Start typing or click the arro Resource \$ Aggregate (crushed gravel), generic ? Asphalt concrete base course Asphalt concrete base c	materials - out of ce elements urnal areas Cuantity ≑ 1089	scope - Add to scope 282 Tonnes $CO_2e - 100$ are answers \checkmark Creating m ² \times 250 mm m ² m ² \times 40 mm m ² m ² \times 350 mm m ² m ² \times 40 mm m ² m ² \times 200 mm kg \checkmark m ² \times 60 mm	0 % ate a group ← CO2e ← 3t - 1% 28t - 10% 19t - 7% 16t - 6% 3t - 1% 16t - 6% 13t - 5% 11t - 4% 157t - 56% 9.2t - 3% 5.3t - 2%	Move materials A Add to Comment Access road - Sub-base - Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation- Car park circulation - 70mr Car park circulation - 70mr Car park circulation - 70mr Car park circulation - 70mr Service Yard - 60mm AC20 Car park bays - 40mm Service Yard - Concrete Service Yard - Steel Footpaths - block paving	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers ③ ≑ 60 Dumper truck, 19 to Data by constituent 30 Dumper truck, 19 to 60 Concrete mixer truck 110 Trailer combination, 60 Trailer combination,
 4. Other structures and 5. External areas and sit Materials and constructions for external areas and sit Materials and constructions for external areas and site Start typing or click the arro Resource \$ Aggregate (crushed gravel), generic? Asphalt concrete base course? Concrete paving blocks, semi dry mi? Sand, compacted dry density, 1682 k 	materials - out of re elements arnal areas Quantity € 1089 1089 1089 1089 1089 776 776 776 2434 17038 420 420	scope - Add to scope 282 Tonnes $CO_2e - 100$ are answers \checkmark Creating m ² \times 250 mm m ² m ² \times 40 mm m ² m ² \times 350 mm m ² m ² \times 40 mm m ² m ² \times 300 mm m ² m ² \times 60 mm m ² \times 50 mm	0 % ate a group CO2e	Move materials Add to Comment Access road - Sub-base - Access road - Sub-base - Access road - 90mm AC32 Access road - 60mm AC20 Access road - 40mm Car park circulation- Car park circulation- Car park circulation - 70mm Car park - 60mm AC20 Car park bays - 40mm Service Yard - Concrete Service Yard - Steel Footpaths - block paving Footpaths - bedding sand	RICS category ⑦ 8.2.1.Roads, paths and 8.2.1.Roads, paths and	Transport, kilometers (2) \$ 60 Dumper truck, 19 to Data by constituent Data by constituent 30 Dumper truck, 19 to 60 Concrete mixer truck 110 Trailer combination, 60 Dumper truck, 19 to

6. Building technology - out of scope - Add to scope