This report provides an overview of the Whole Life Carbon Emissions (WLCA) that were produced in the fit out of The Typewriter Building. The report was completed retrospectively for the client to report on their scope 3 emissions for the scheme and provide insight into the impact of their fit out with TWO.

The report is constructed to accord with the methodological requirements and reporting of the RICS Professional Standard 2nd edition for Whole life carbon analysis, which is the methodology required to report against current industry benchmarks and targets.

The Typewriter Project

Whole Life Cycle Carbon Assessment – Post Construction

2nd October 2024

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Client: Worklife

Address: 140 Borough High Street, London

Contents

1 Scope of works

The project assessed is 2044sqm of commercial office space across 7 floors (LG – L5) of 140 Borough High Street, otherwise known as The Typewriter Building. The assessment does not include any of the furniture for version 1 of the report. A separate assessment can be done on the clients instruction to include these elements.

The assessment is only for the materials procured directly by WeAreTwo, and therefore does not include any of the CAT A elements within the building.

2 Method of data collection

As the assessment has been completed post project completion, we have used the following hierarchy to collate and corroborate information.

1. Material quantities provided by our subcontractors

We provided each subcontractor with a spreadsheet to list all materials and quantities that were procured under their control for the project. This included product name, materials, quantities, distance to manufacturer.

2. Information from drawings/cost plan

If there were measures that our subcontractors could not return information on in time, we have used the as built drawings to determine some quantities. These are then checked against the cost plan and standard waste % is included.

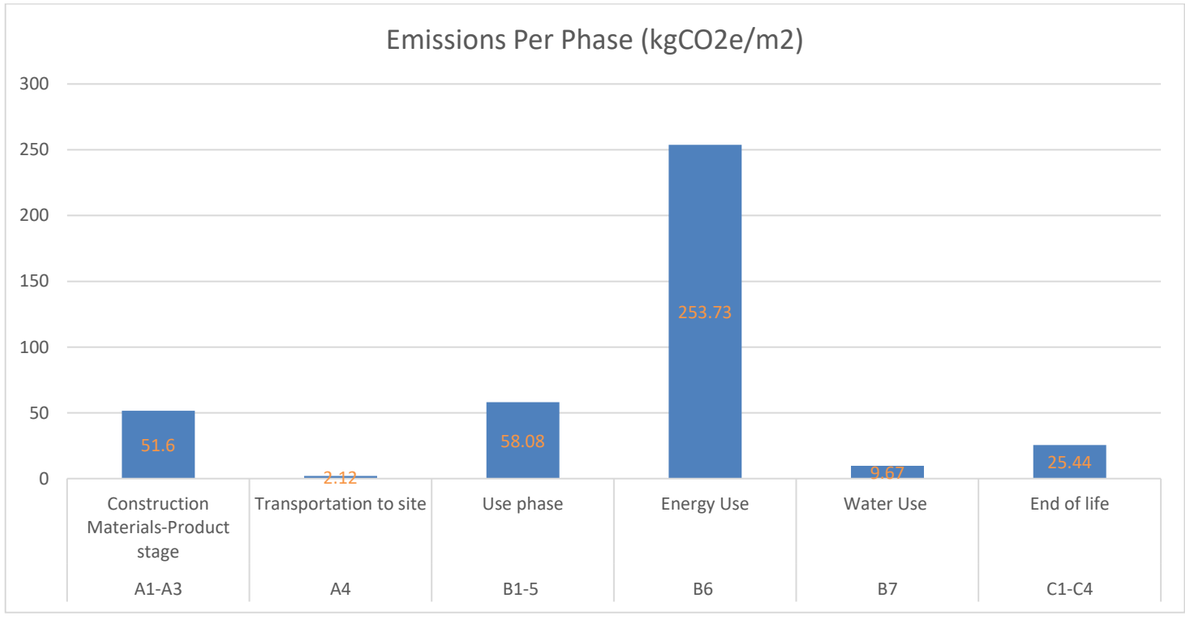
3 Results

For this assessment, we have omitted the onsite emissions (A5) as we did not collect the data whilst on site. Typically, this would only make up a small amount of the total figure (less than 1%). We have reported the whole life carbon over a 60-year period. It is worth noting that a typical fit out project is completed in a London office space every 5.1 years. The 60-year reporting period takes into account the replacements of materials after their designated lifespan comes to an end. In reality, after the referenced 5.1 years of a fit out, many materials despite their remaining warranty/usability, will be disposed of and new versions purchased. within the internal finishes will be removed much earlier than allowed for in this assessment (replacements are currently allowed for in the B4 phase).

Total Embodied Carbon (excluding energy and water) is **137.24kgCO2e/m2.**

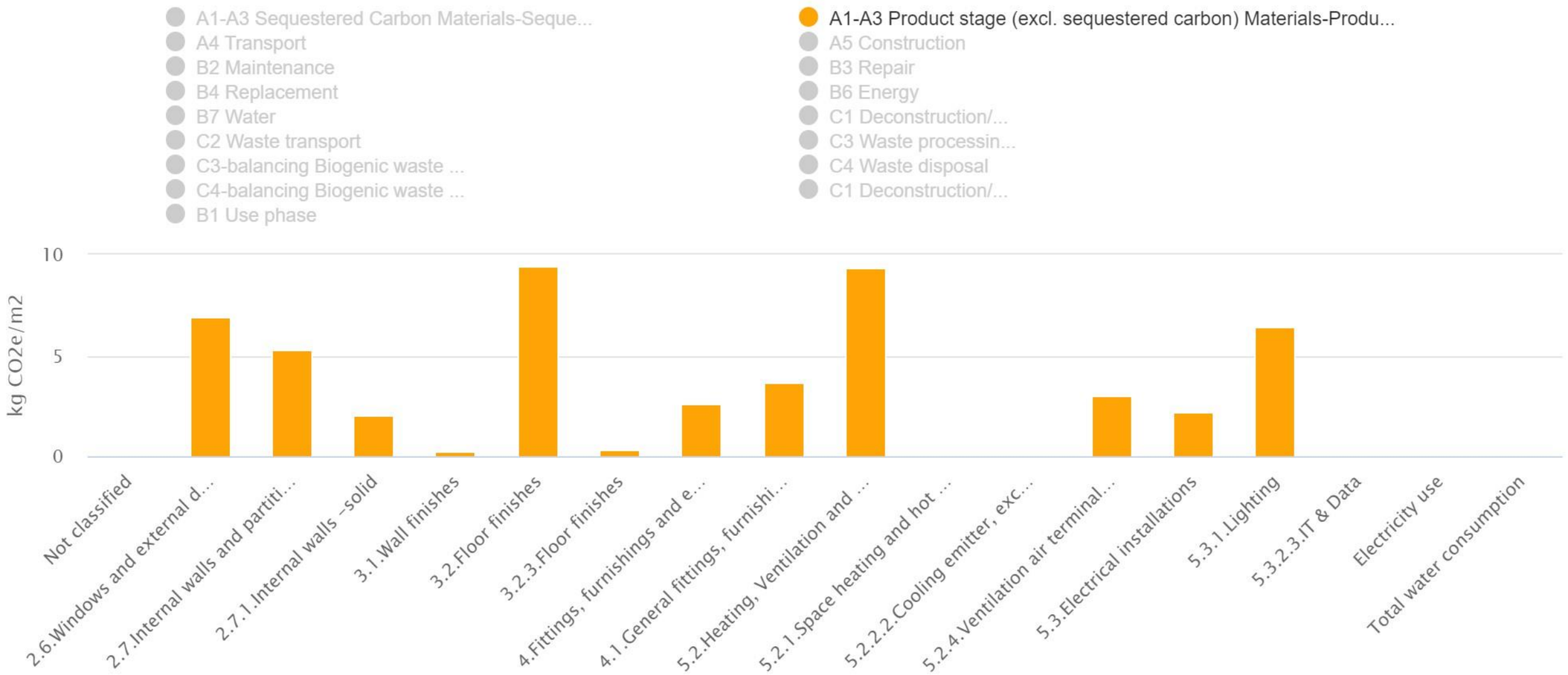
137.24kgCO2e/m2.

This is broken down into the below groups.



From this, the A1-A3 (construction materials) can also be broken down into the below material groups.

Global warming potential - Non-Decarbonised scenario (GWP-total-Non-Decarbonised Scenario) grouped by Building element breakdown



This shows that the most contributing materials for the project were the floor finishes, the M&E, and the windows and external doors (this is the internal glazed partitioning and doors but it classifies glass as windows.

See below top 10 contributing products.

Rank	Product name	Carbon Impact (A1-A3)
1	Aluminium framed glazed doors	14 tonnes
2	Low voltage copper cables	13 tonnes
3	Pendant light fittings	10 tonnes
4	Vinyl Floor tiles	9.9 tonnes
5	Aluminium framed single glazed partitioning	8.7 tonnes
6	Attenuators	5.5 tonnes
7	Cable Tray	5.4 tonnes
8	Plywood	5.1 tonnes
9	Modular carpet tiles	4.2 tonnes
10	Whiteboards	3.6 tonnes

Please note again that this does not include for the furniture, which is an optional reporting metric within the standard. If this is of interest, we can produce the carbon figure in a separate report and update the figures to suit.

So what do the figures mean relative to other projects?

In July 2024, the pilot study for the UK Net Zero Carbon Building Standard for CAT B fit outs was announced. The figure they came to was 190kgCO2e/m2NIA (this does include furniture).

Therefore, achieving a fit out with an embodied carbon figure of 137.24kg is a great indication that the design would be inline with the standard and therefore, if submitted and meets the operational efficiency requirements not reported within this report, could claim to be Net Zero Carbon Aligned.

As the standard develops, the carbon figure required to meet this standard reduce. Therefore a building considered Net Zero aligned currently, requires each fit out to meet the updated standards.

More information can be shared on this if interested but the key takeaway is that the Worklife fit out of the Lower ground floor up to Level 5 at The Typewriter would be compliant with this standard.

Any questions please get in touch.

4 Appendices

4.1 Appendix 1 – List of Project Stages with Definitions

This report follows the guidance outlined in the GLA Whole Life-Cycle Carbon Assessments guidance document.

Whole life-cycle carbon emissions are the total greenhouse gas emissions arising a development over its lifetime, from the emissions associated with raw material extraction, the manufacture and transport of building materials, to installation/construction, operation, maintenance and eventual material disposal.

The assessment follows the guidance for whole life carbon assessments outlined in EN 15978:2011. Calculations were undertaken using One Click LCA's 'GLA' Tool. The purpose of this assessment is to assess the whole life cycle carbon emissions for the complete development and to quantify increase/decrease in life cycle carbon emissions when compared to stage 4 WLCA figures. The object of the assessment is the building and site.

The scope of this Life cycle assessment includes the product, construction, use and end of life stages. The stages are outlined in Table 3.2, with an indication of what stage sections have been included within the scope of this report.

Stage	Product			Construction		Use							End of Life				
	A					B							C				D
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw Material	Transport	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Demolition	Transport	Waste Processing	Disposal	Benefits and Loads Beyond the System Boundary
Included in LCA?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 3.2 – Stages of the LCA

4.1.1 Product (A1 – A3)

The product stage covers the cradle to gate processes for the materials required for the building.

4.1.1.1 Raw Material, Transport & Manufacturing (A1, A2 & A3)

For each building element, the most relevant Environmental Product Declaration (EPD) was identified for each included building element. Where product specific EPDs were not available, the closest matching EPD has been used.

4.1.2 Construction (A4 – A5)

The construction stage covers the impact of the process of transport and constructing the development.

4.1.2.1 Transport (A4)

The transport stage covers the transport of all materials and products required, from the manufacturing plant through to the site.

Transport figures have been calculated based on distances sourced from delivery notes for each material included within the LCA. All transport calculations exclude return trips.

4.1.2.2 Construction (A5)

The construction stage covers energy and water use during the process of construction, as well as any ancillary materials and waste products generated by the construction process. These have been omitted from the report due to information not collated on site.

4.1.3 Use (B1 – B7)

The use phase covers the use of the building to meet the specified functional and technical performance over its reference study period, from the completion of construction until deconstruction/demolition at the end of its life.

4.1.3.1 Use (B1)

This covers any emissions to the environment during the normal use of the building, such as refrigerant leakage or the release of substances from the building façade, coated surfaces or floor finishes.

4.1.3.2 Maintenance & Repair (B2 & B3)

Maintenance covers activities carried out to maintain the functional performance of the building, such as floor cleaning. These have been estimated based on GLA guidance.

Repair covers works carried out to repair building components, to allow it to maintain its functional performance, such as replacement of broken components. Certain materials have been identified with a percentage repair rate per year estimated, as per Table 3.3 below.

Building Element	Estimated Repair (%/Year)
Internal Finishes	1%
Plasterboard	1%
Services	1%
Glazing	1%
Doors	1%

Table 3.2 – Estimated Repair Rate per Year

4.1.3.3 Replacement & Refurbishment (B4 & B5)

This section covers the replacement of damaged components which cannot be repaired or have come to the end of their manufacturer's specified life.

These have been included within the scope of the assessment and are calculated based on default service life based on each materials product category or manufacturers defined service life.

4.1.3.4 Operational Energy Use (B6)

This section covers energy used in the normal operation of the building, such as energy for heating, cooling, ventilation, lighting hot water and pumps and fans, as well as unregulated energy use by the occupants.

Full energy calculations have been carried out and the operational energy use figures utilised within this LCA are representative of the results of that assessment, as shown in the provisional TM54 analysis within the energy strategy.

4.1.3.5 Operational Water use

Operation water use covers all water used for the normal operation of the building.

It has been included within the scope of the report and has been calculated based on the maximum occupancy of the development, based on 105/l/day for the maximum number of occupants for the development.

4.1.4 End of Life (C1-C4)

This section covers the decommissioning of the development once it has no further use at the end of its reference study period.

4.1.4.1 Demolition, Transport, Waste Processing & Disposal (C1, C2, C3 & C4)

This section covers the demolition of the building at the end of its life, the transport of demolition waste to end of life disposal sites, the sorting, collection and processing of different waste routes at a waste processing facility and the management and treatment at a disposal facility.

C1 demolition emissions have been estimated for the proposed development at the end of its life, based on GIA.

C2, C3 and C4 have been included within the scope of the report and are based on the material inputs into the development, please refer to the GLA Life Cycle Analysis Spreadsheet for assumed EOL action for each material.

4.1.5 Benefits and Loads Beyond the System Boundary (D)

This section covers any benefits or burdens accruing from the repurposing of elements discarded from the development, or any energy recovered from them beyond the project's life cycle. This has been included within the scope of the report and is based on the material inputs into the development. This has been included within the scope of the report and is based on the material inputs into the development, please refer to the GLA Life Cycle Analysis Spreadsheet for assumed EOL action for each material. Recycling potential is only reported for materials with shares of primary manufacturing, i.e. if a product is made of recycled material, it no longer has recycling potential. 5% of losses are assumed for recycling (the remaining 95% are recycled).

4.2 Appendix 2 - Full list of materials and quantities

Item	Contractor responsible	Product name	Predominant material (mild steel etc)	Material Quantity	Unit	Est transport distance to site (km)	EPD available?	Other details
1	Stansons	Stansons 4400 Curtain track	Aluminium	12	m	30	No	229g/m
2	Stansons	Stansons Curtains in Daydream Mellows	Fabric made from 100% recycled PET	60	m	30	No	
3	Andhouse	Plasterboard (12.5mm)	Gypsum/ recycled paper	650 nr 1.2 x 2.4m		70 miles		
4	Andhouse	Metal 70mm stud	Mild steel	320 nr 3m		70 miles		0.61kg/lm
5	Andhouse	Metal ceiling MF 6a, 5,7 & 17	Mild steel	60 nr 3.6m		70 miles		0.61kg/lm
6	Andhouse	25mm insualtion	Fibreglass	560	m2	70 miles		
7	Andhouse	Access panel	Mild steel	25	nr	30 miles		
8	Andhouse	Ply	Timber	30 nr 2.4 x 1.2m		70 miles		
9	Andhouse	mdf	Timber fibers	15 nr 2.4 x 1.2m		12 miles		
10	Andhouse	Aluminium door frames	Aluminium	56	nr	25 miles		
11	Andhouse	Aluminium glazing tracks	Aluminium	45 nr 3m		25 miles		
12	Andhouse	Glass	Glass	85 nr 0.9 x 2.2m (12mmt)		25 miles		
13	Andhouse	Timber doors and frames	Timber	5	nr	35 miles		
14	Andhouse	Lever handles	Steel	58	nr	38 miles		
15	Andhouse	Shelves	mdf	28	nr	60 miles		assumed 0.5m depth and 1m in length each
16	Andhouse	Easifill	Gypsum plaster	35	bags	70 miles		
17	Andhouse	Plasterboard Screws	Steel	8000	nr	70 miles		
18	Andhouse	Autex Acoustic panels	PET - Polyethylene Terephthalate	48 nr 2.4 x 1.2		155 miles		
19	Andhouse	Fire batt	Minerial fibre glass	30 nr 1.2 x 0.6		160 miles		
20	Andhouse	Fire mastic	Acrylic filler	60 nr 300ml	tubes	160 miles		
21	ECJ	Black MDF	mdf	84	kg			
22	ECJ	MDF Lamniated	MDF Lamniated	1271.23	kg			
23	ECJ	MFC	MFC	419.83	kg			
24	ECJ	MDF	MDF	3519.95	kg			
25	ECJ	Solid Surface	Solid Surface	889.1	kg			
26	ECJ	Howdens Panel		562.34	kg			
27	ECJ	MDF Veneered	MDF Veneered	8.87	kg			
28	ECJ	Plywood	Plywood	36.48	kg			
29	ECJ	Solid oak	Solid oak	42.29	kg			
30	GWC	Glass whiteboards		1500 x 900 (54)	nr			
31	Vision SS	CCTV Camera		22	nr	120 miles		

32	Vision SS	Access Doors		19	nr	120 miles			
33	Vision SS	Lift access control		2	nr	120 miles			
34	Vision SS	Data Cable		300	m	90 miles			
35	Vision SS	Data Cable		300	m	90 miles			
36	Vision SS	Data Cable		300	m	90 miles			
37	Cost plan	Composture Carpet ties	carpet	80	m2			Items taken from cost plan as no response from contractor	
38	Cost plan	Heuga 727 carpet tiles	carpet	4	m2				
39	Cost plan	Allura Flex Vinyl planks	vinyl	102	m2				Allura Flex required 6mm ply then looselay
40	Cost plan	interlocking comms room tiles	vinyl	12	m2				
41	Cost plan	Composture Carpet ties	carpet	6	m2				
42	Cost plan	Heuga 727 carpet tiles	carpet	5	m2				
43	Cost plan	Allura Flex Vinyl planks	vinyl	204	m2				Allura Flex required 6mm ply then looselay
44	Cost plan	Amtico Civtorian Vinyl	vinyl	21	m2				
45	Cost plan	IVC Rudiments Carpet Tiles	carpet	233	m2				
46	Cost plan	Heuga 727 carpet tiles	carpet	5	m2				
47	Cost plan	IVC Roots vinyl to tea point	vinyl	25	m2				
48	Cost plan	Allura Flex Vinyl planks	vinyl	85	m2				Allura Flex required 6mm ply then looselay
49	Cost plan	IVC Rudiments Carpet Tiles	carpet	244	m2				
50	Cost plan	Heuga 727 carpet tiles	carpet	6	m2				
51	Cost plan	interlocking comms room tiles	vinyl	7	m2				
52	Cost plan	IVC Roots vinyl to tea point	vinyl	25	m2				IVC Roots was 6mm ply and then adhesive used
53	Cost plan	Allura Flex Vinyl planks	vinyl	73	m2				Allura Flex required 6mm ply then looselay
54	Cost plan	IVC Rudiments Carpet Tiles	carpet	249	m2				
55	Cost plan	Heuga 727 carpet tiles	carpet	5	m2				
56	Cost plan	IVC Roots vinyl to tea point	vinyl	25	m2				
57	Cost plan	Allura Flex Vinyl planks	vinyl	76	m2				Allura Flex required 6mm ply then looselay
58	Cost plan	Composture Carpet ties	carpet	20	m2				
59	Cost plan	Composture Carpet ties	carpet	22	m2				
60	Cost plan	Forbo Allura Flex	vinyl	296	m2				Allura Flex required 6mm ply then looselay
61	Cost plan	interlocking comms room tiles	vinyl	4	m2				
62	Cost plan	Composture Carpet ties	carpet	9	m2				
63	Cost plan	Forbo Allura Flex	vinyl	149	m2				
64	Cost plan	Creative Spark Carpet Tiles	carpet	8	m2				
67	Reflooring	Styccobond F41	liquid	7	TUB	40			
68	Reflooring	Styccobond F46	liquid	4	TUB	40			
69	Reflooring	Ardex feather finish	powerder	7	BAG	40			
70	Reflooring	Ardex Ardurapid A45	powerder	8	BAG	40			

71	Reflooring	Stopgapp 1200	liquid +powerder	45	UNIT	40		
72	Reflooring	styccobond F77	liquid	1	TUB	40		
73	Reflooring	P141	liquid	1	TUB	40		
74	Reflooring	P131	liquid	7	TUB	40		
75	APD	Gland Kit	Brass	97	units	19.3		
76	APD	Mineral Insulated Cables (singles L + N + E)	Copper	3000	lm	19.3		
77	APD	Twin Socket	Metal Clad	68	units	19.3		
78	APD	Conduit	Galvanised Steel	120	units	19.3		
79	APD	Mineral Insulated Cables (SWA)	Copper	1000M	units	19.3		
80	APD	Electrical Meter Boxes	UPVC	1	units	19.3		
81	APD	Dado Trunking	UPVC	30L	units	19.3		
82	APD	Conduit Channel	UPVC	10L	units	19.3		
83	APD	Circuit Breaker Variable		83	units	19.3		
84	APD	Twin Socket USB A + C	Stainless Steel & Nylon	30	units	19.3		
85	APD	Floor box	Galvanised Steel	1	unit	19.3		
87	Creatif Wall	Moveable wall		12	m2			
89	Cost plan	transfer fans		3	units			
90	Cost plan	air conditioning		5.6	kW			
91	Cost plan	Plenum box		4	units			
92	Cost plan	CTA		53	units			
93	Cost plan	FCU to L2		1	units			
94	Cost plan	PIR		118	units			
95	Cost plan	Fire exit signs		14	units			
96	Cost plan	Containment for data		285	lm			
97	Cost plan	Lighting - downlights		149	units			
98	Cost plan	LED downlights for zoom rooms		11	units			
99	Cost plan	Pendant lights		54	units			

100	Cost plan	comms racks		4	units			