Site Waste Reduction Protocol

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@zerowastescot **#circularconstruction**

Our Purpose is to lead Scotland to use products and resources responsibly and set an example for the world.

Our mission to accelerate and support Scotland's just transition to zero waste and a circular economy.

We do this through sharing our expertise and working on partnerships to support, influence policy and encourage national and local government, community leaders, businesses and the public to embrace circular living.

Our Construction Vision

All stakeholders in every construction project in Scotland collaborate to fully adopt a Circular Economy approach where all resources are valued and nothing is wasted for the whole life of a building, from concept to deconstruction.

Our Journey

ZERO WASTE SCOTLAND

Causes of construction (materials) waste

Client and Design Influence

- Ignoring buildability
- Materials of unsuitable dimensions (standard sizes)
- Client/designer change of mind
- Specification failing to match quality of building required
- Resistance to adopt alternative materials

Delivery of Products

- Over-ordering
- Method of packaging
- Method of transport
- Inadequate data re: time/method of delivery
- Inadequate details re: performance/ quality/site facilities

Site Management and Practices

- Poor management system: stock control/organisation/supervision
- Untidy construction sites
- Poor storage/handling e.g. breakage, damage, losses
- Excess materials at workplace/ over-sized foundations and other elements
- Undue cutting, fixing, application and residue waste
- Inadequate protection to finished work (other trades/vandalism)
- Learning curve/lack of training

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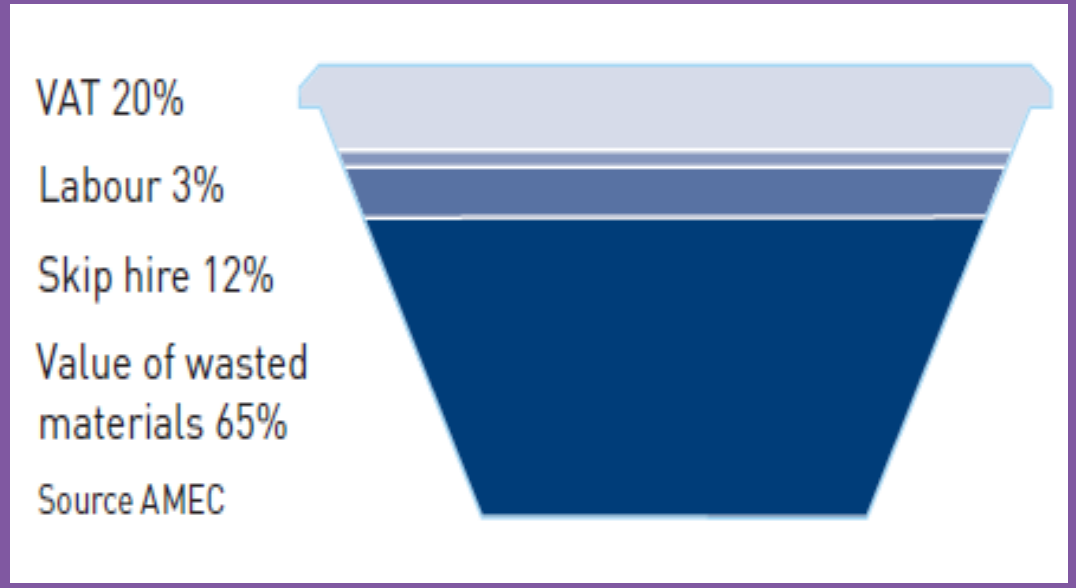
True cost of construction waste

The true cost of construction materials wastage, in terms of the typical contents of an 8 Yard Mixed Skip, is widely quoted to be in the region of:

£1,300 (2007)
£1,900 (2022)



2018: Desk Study: develop methodology
2019: Pilot Study: test methodology
2022: Case Studies
2023: Protocol launched

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Data collection

1	**SITE SET UP**	**Construction Waste Indicative Cost (CWIC) Calculator**	
2			
3	**Dates of sampling: from/to**	23/03/2022	24/03/22
4			
5	**Company name**	GCU	
6	**Your name**	B Hare	
7	**Site/location/reference**	Glasgow Campus	
8			
9	**Construction type**	Refurbishment/renovation	
10	**Project type**	Building: Commercial Offices	
11	**Project phase**	Mid: Mechanical, electrical plumbing (MEP)	
12	**Season**	Spring	
13	**Weather**	Light rain showers	
14			
15	**Distance to skip**		
16	Average distance (walking)	20	meters
17	Average distance (hoist/lift - vertical)	30	meters
18	Average distance (fork-lift/vehicle)	50	meters
19	Total average (auto)	100	
20	(or) Total average (manual)		meters
21			
22	Size of skip sampled	8	yards

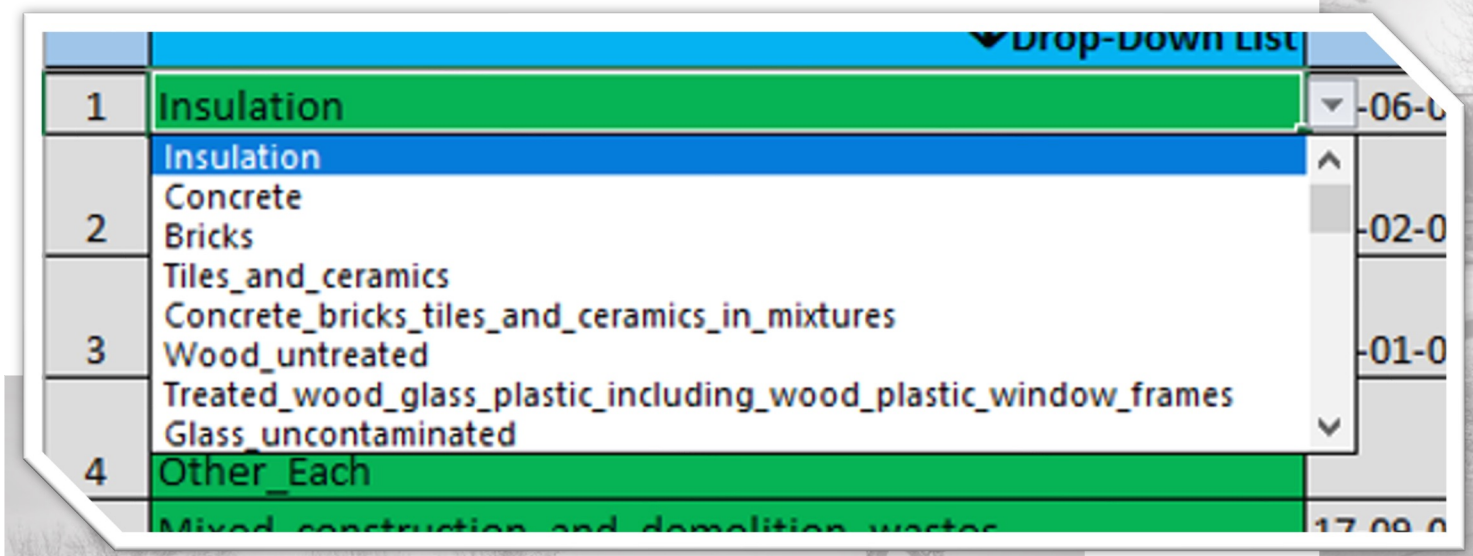
Green cells are for data entry

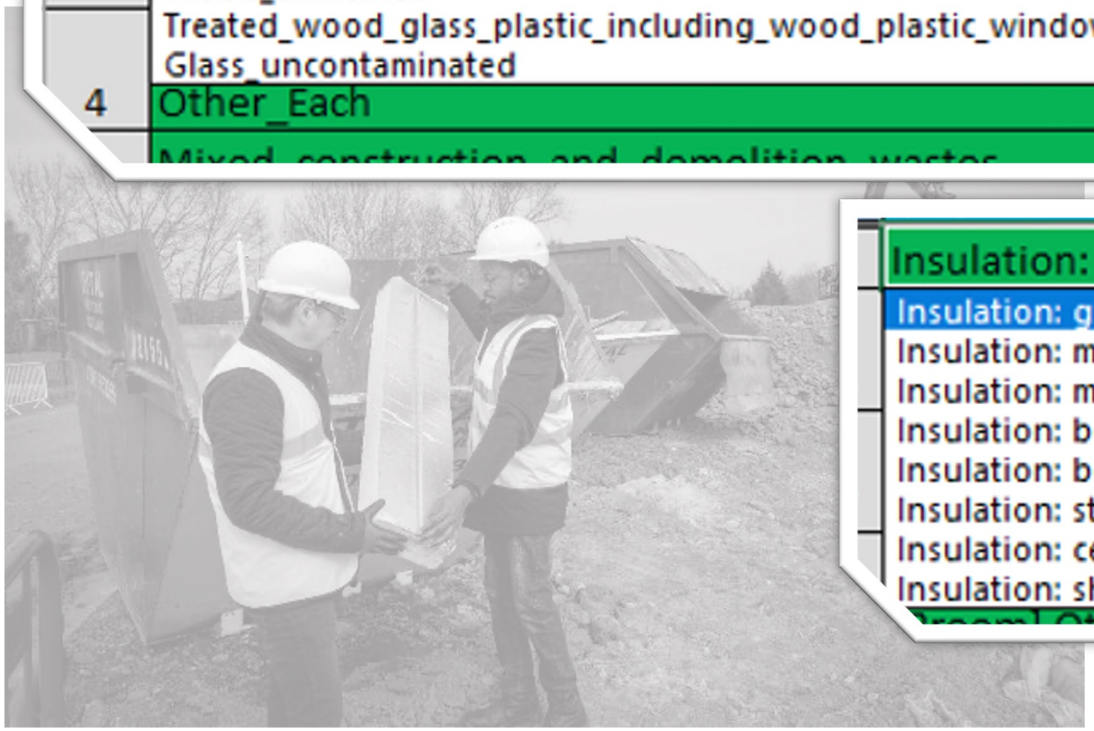
Dark green cells have drop-down lists ↓

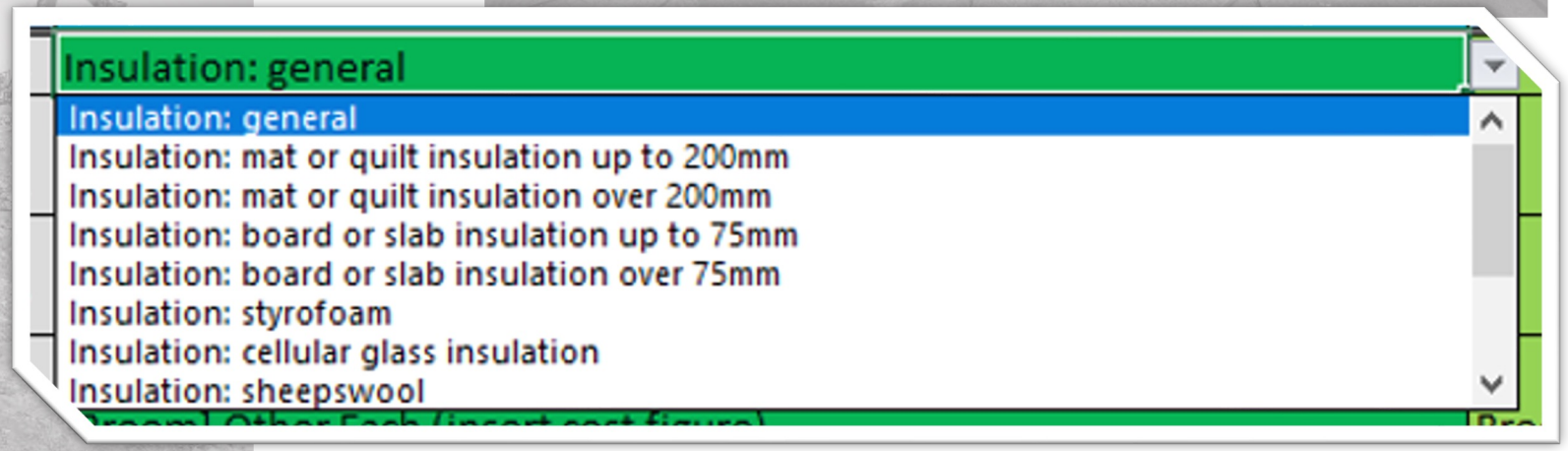
Tabs

Set up | Data input | Dashboard Costs | Dash Volume | Dash Weight | Dash Source | Dash Condition | Report | Lists | Costs | Calcs

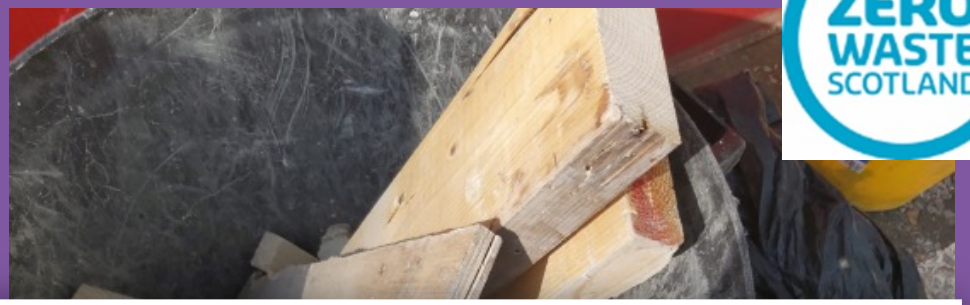
Drop-down lists





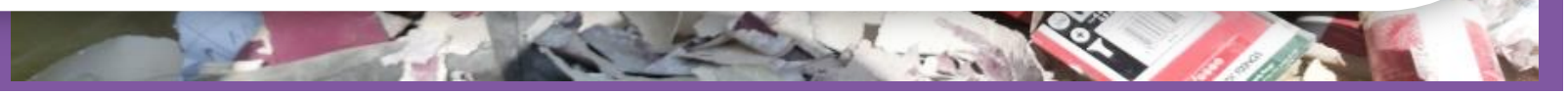


Data collection



Seq No.	Type of waste	Waste code (auto fill)	Description of waste	Notes on waste	Source of waste	No. of similar objects (enter 1 if only one)	Length (mm)	Width (mm)	Thickness (mm)	Total volume (auto fill). Aim for 5m3:	Condition	Waste material was installed then removed	New material needed to replace material
	↓Drop-Down List		↓Drop-Down List		↓Drop-Down List					1.055	↓Drop-Down List	↓List Yes/No	↓List Yes/No
1	Mixed_construction_and_demolition_wastes	09-04	Insulation	various sizes	Demolition and stripping out	250	300	150	40	0.450	Mostly recyclable	No	No
2	Wood_untreated	17-02-01	Wood - untreated: hardwood (volume)	various sizes	Cutting waste	140	150	150	30	0.095	Suitable for recycling	No	No
3	Packaging_Paper_and_Card	15-01-01	Packaging: Paper/Card	carboard boxes	Not recovered by supplier (packaging)	1	1000	650	250	0.163	Suitable for recycling	No	No
4	Mixed_metals	17-04-07	Mixed metals		Conversion waste (dimensions)	12	400	20	20	0.002	Suitable for recycling	No	No
5	Mixed_metals	17-04-07	Mixed metals	timber screws	Conversion waste (dimensions)	300	60	10	5	0.001	As good as new	No	No
6	Packaging_Paper_and_Card	15-01-01	Packaging: Paper/Card	screw boxes	Not recovered by supplier (packaging)	40	80	50	5	0.001	Suitable for recycling	No	No
7	Treated_wood_glass_plastic_including_wood_plastic_window_frames	17-02-04	Treated wood/glass/plastic: timber (lengths) - wall or partition members	saw dust	Cutting waste	50	100	100	100	0.050	Landfill	No	No
8	Mixed_construction_and_demolition_wastes	17-09-04	Mixed construction and demolition wastes	rubble	Demolition and stripping out	50	100	100	100	0.050	Landfill	No	No
9	Mixed_construction_and_demolition_wastes	17-09-04	Mixed construction and demolition wastes	wall paper	Demolition and stripping out	100	100	100	100	0.100	Landfill	No	No
10	Other_Each	0	Other [Zero Cost]	domestic waste (food packaging/ rapping)	Canteen and office waste	40	100	100	100	0.040	Landfill	No	No
11	Plastic_excluding_packaging_waste	17-02-03	Plastic - excludes packaging waste: plastic drain pipe	various lengths plastic pipes	Cutting waste	10	900	100	5	0.005	Mostly recyclable	No	No
12	Treated_wood_glass_plastic_including_wood_plastic_window_frames	17-02-04	Treated wood/glass/plastic: timber - plywood, marine quality		Cutting waste	5	600	400	5	0.006	Suitable for recycling	No	No

Set up | Data input | Dashboard Costs | Dash Volume | Dash Weight | Dash Source | Dash C ...



Data collection

No. of similar objects (enter 1 if only one)	Length (mm)	Width (mm)	Thickness (mm)	Total volume (auto fill). Aim for 5m3:	Condition	Waste material was installed then removed	New material needed to replace material wasted
				1.193	↓Drop-Down List	↓List Yes/No	↓List Yes/No
5	1200	400	200	0.480	Potentially reusable	No	No
10	2400	100	50	0.120	Potentially reusable	No	No
1	200	1200	120	0.029	Suitable for recycling	Yes	Yes
1	1200	20	20	0.000	Suitable for recycling	No	Yes
5	100	100	50	0.003	Landfill		
1	1000	600	400	0.240	Landfill		
50	50	300	10	0.008	Landfill		
7	600	300	150	0.189	Landfill		
1	500	500	500	0.125	Landfill		

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Data collection

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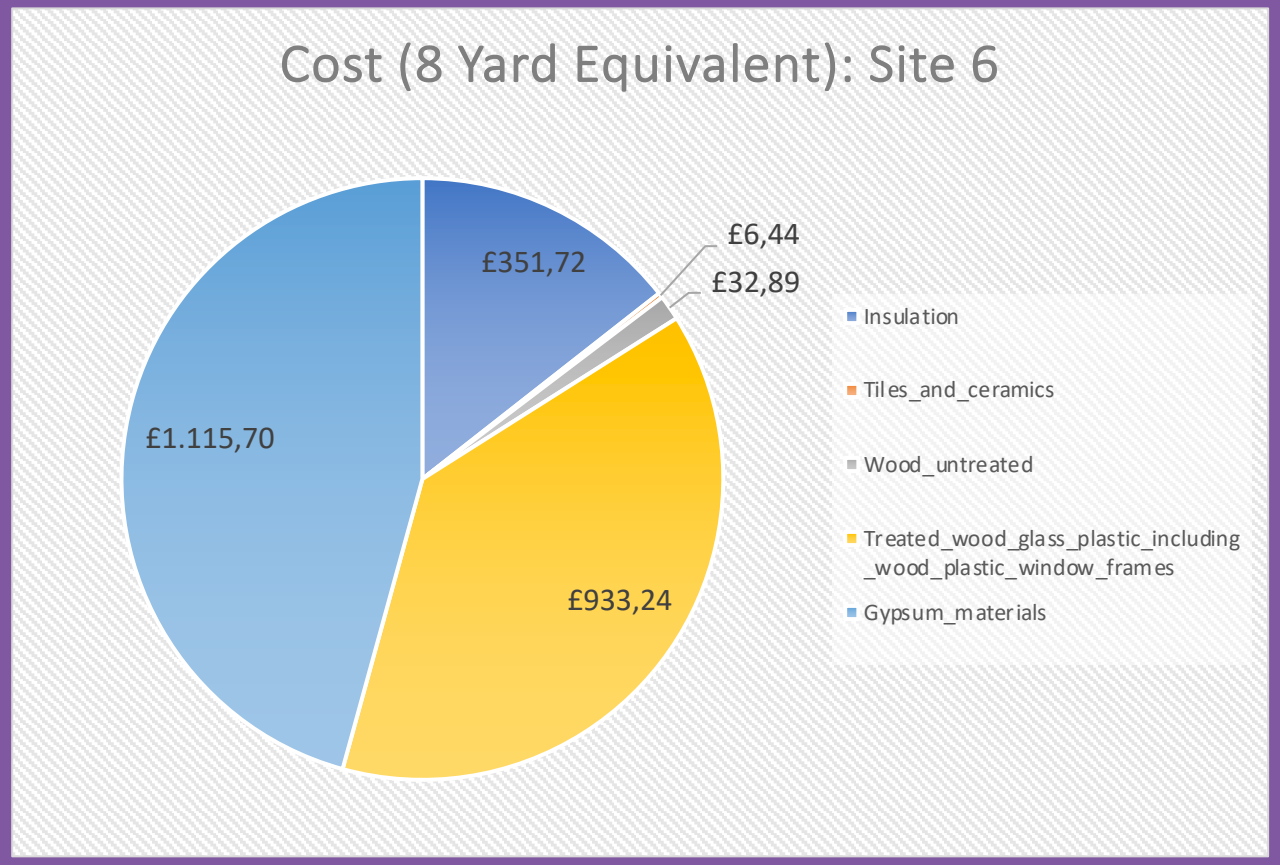
Example Analysis & Results (housebuilder)

Materials Breakdown	Cost
Insulation	£ 351.72
Tiles and ceramics	£ 6.44
Wood untreated	£ 32.89
Treated wood glass plastic including wood plastic window frames	£ 933.24
Gypsum materials	£ 1,115.70
Total Materials Costs	£ 2,439.98
Volume (m3) of sample:	5.15
Total Materials Costs	£ 2,439.98
Total Labour Costs	£ 384.00
Skip Hire Cost (mixed)	£ 475.56
Total (excl. VAT)	£ 3,299.54
VAT	£ 659.91
Grand Total	£ 3,959.45

Volume (m3) of sample:	5.154	Per m3	For skip (Yards): 40	Alt. Skip
Total Materials Costs	£2,439.98	£ 473.39	£ 12,199.91	£12,199.91
Total Labour Costs	£ 384.00	£ 74.50	£ 384.00	£ 384.00
Skip Hire Cost (mixed)	£ 475.56	£ 19.02	£ 475.56	£ -
Total (excl. VAT)	£3,299.54	£ 566.91	£ 13,059.47	£12,583.91
VAT	£ 659.91	£ 113.38	£ 2,611.89	£ 251.68
Grand Total	**£3,959.45**	**£ 680.29**	**£ 15,671.36**	**£12,835.59**

Materials Breakdown	Cost
Insulation	£ 351.72
Tiles_and_ceramics	£ 6.44
Wood_untreated	£ 32.89
Treated_wood_glass_plastic_including_wood_plastic_window_frames	£ 933.24
Gypsum_materials	£1,115.70

Example Analysis & Results (housebuilder)



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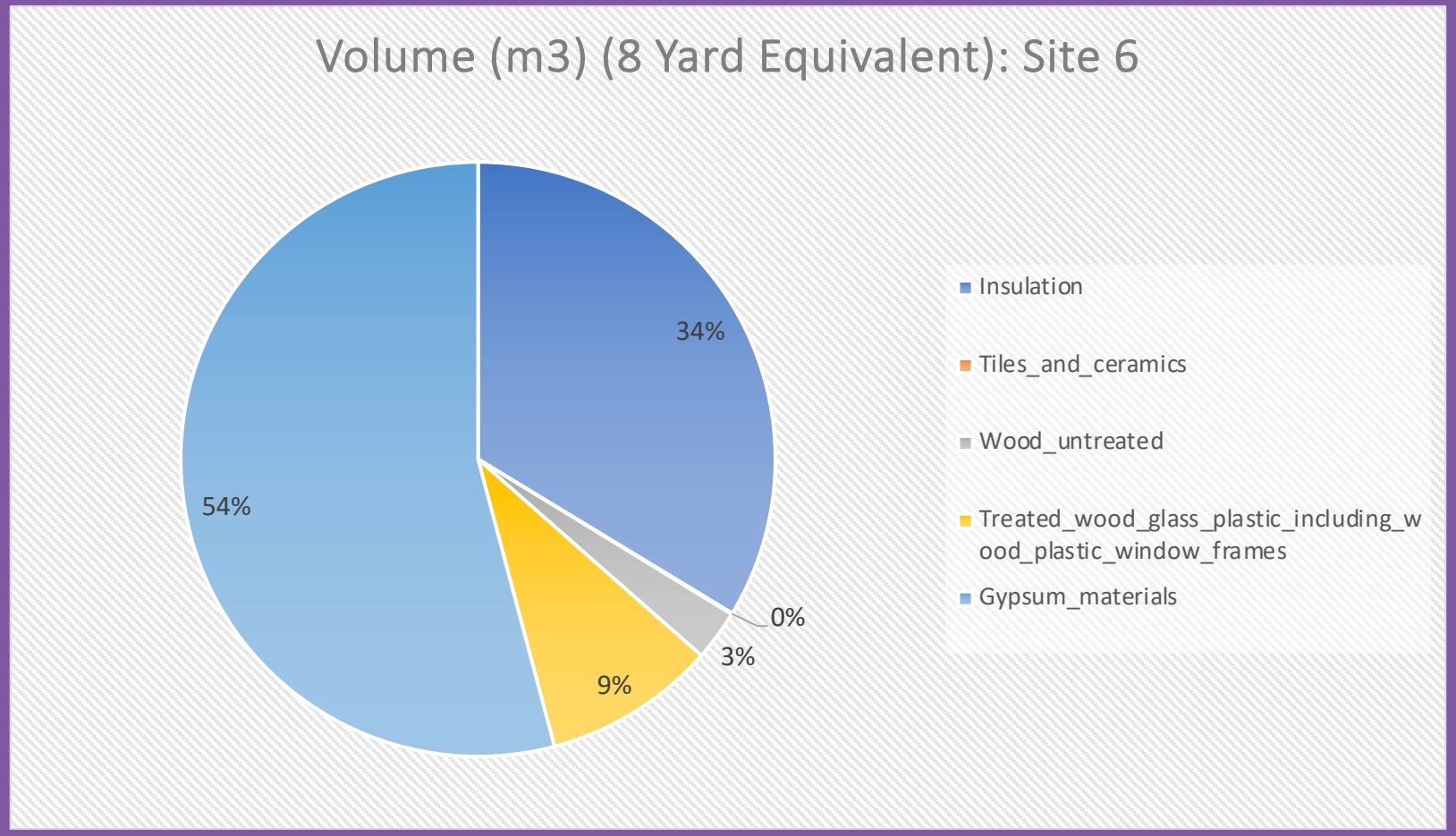
Example Analysis & Results (housebuilder)



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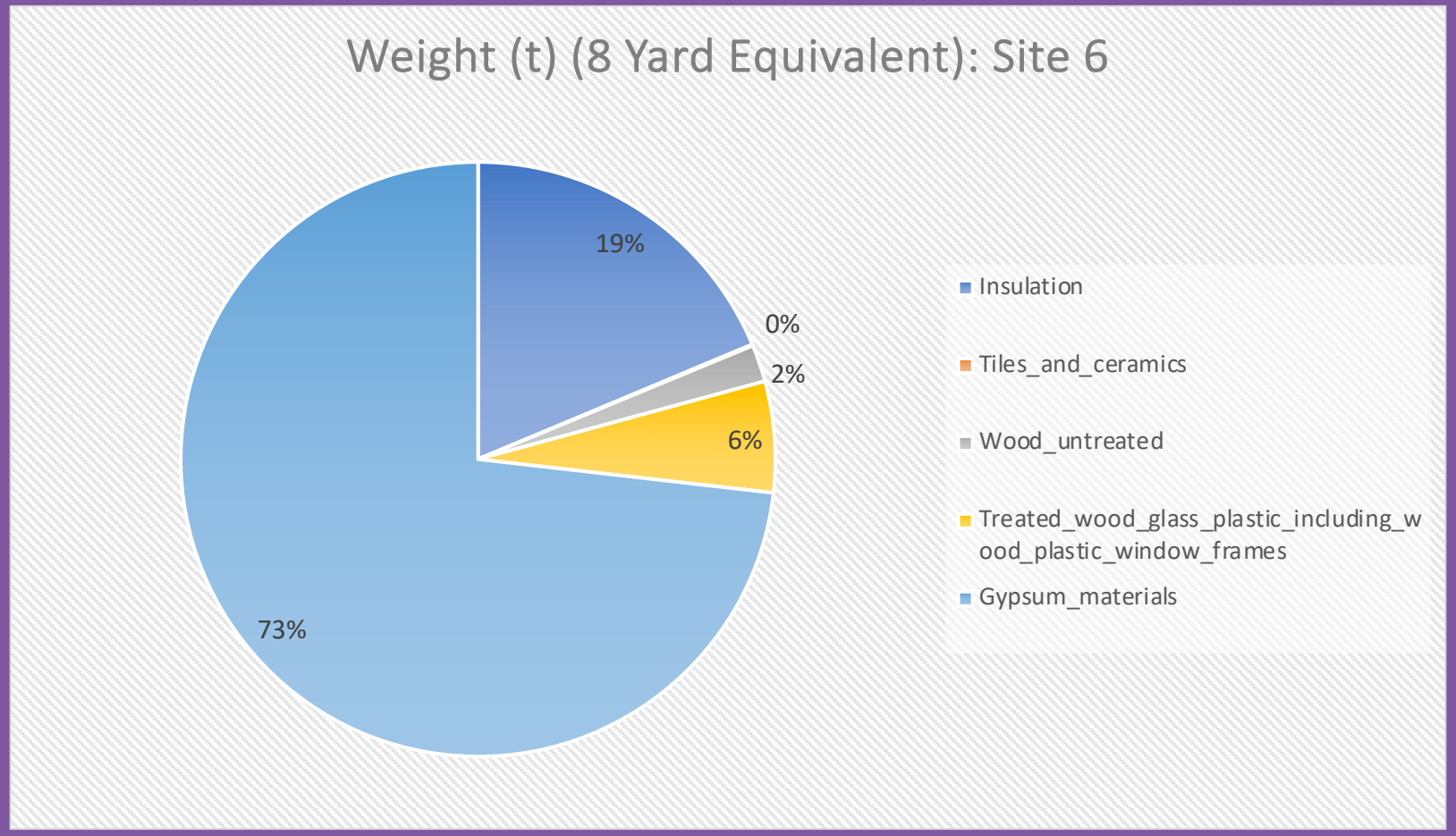
Example Analysis & Results (housebuilder)



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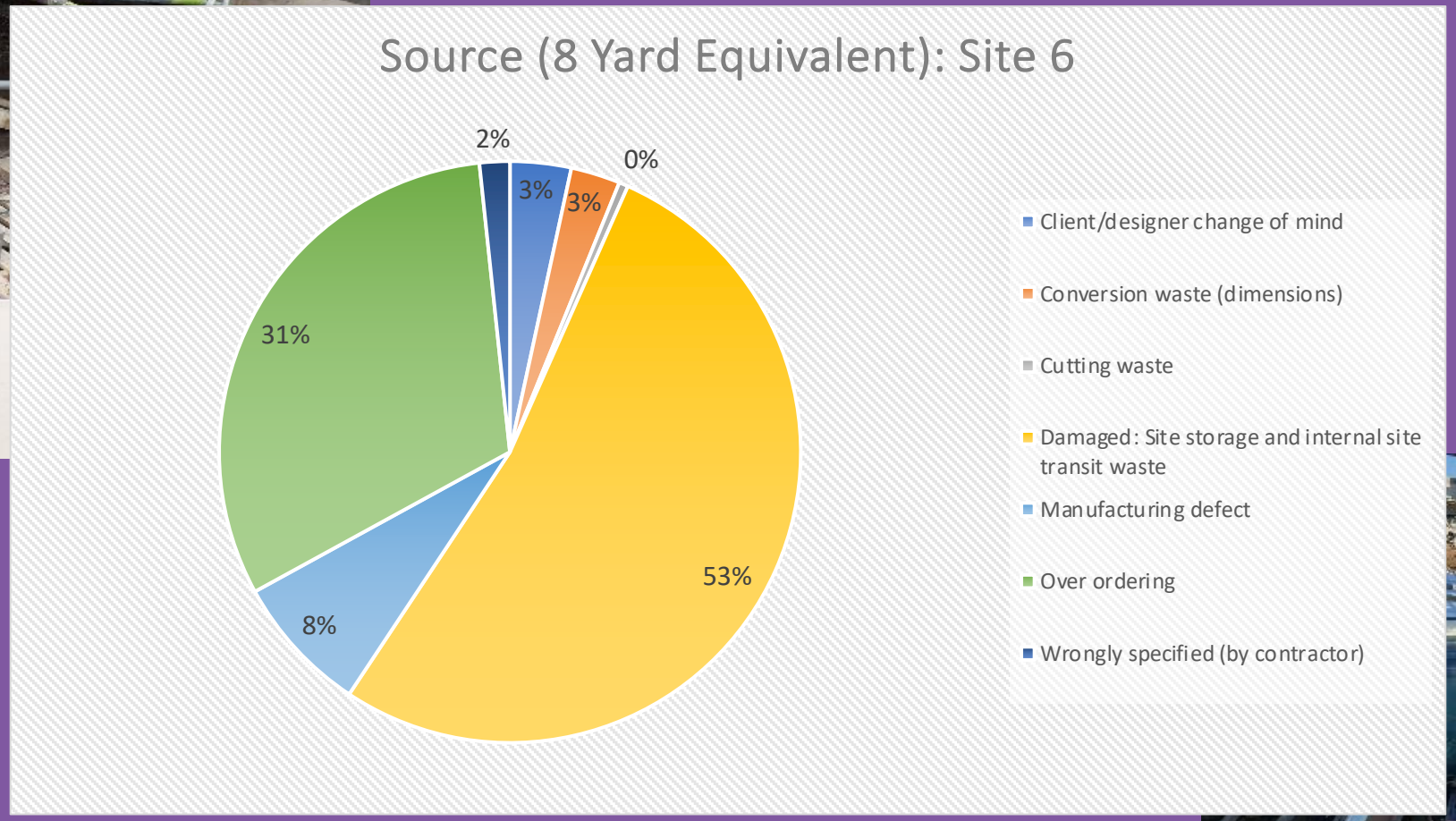
Example Analysis & Results (housebuilder)

Overordered insulation



Damaged glazing

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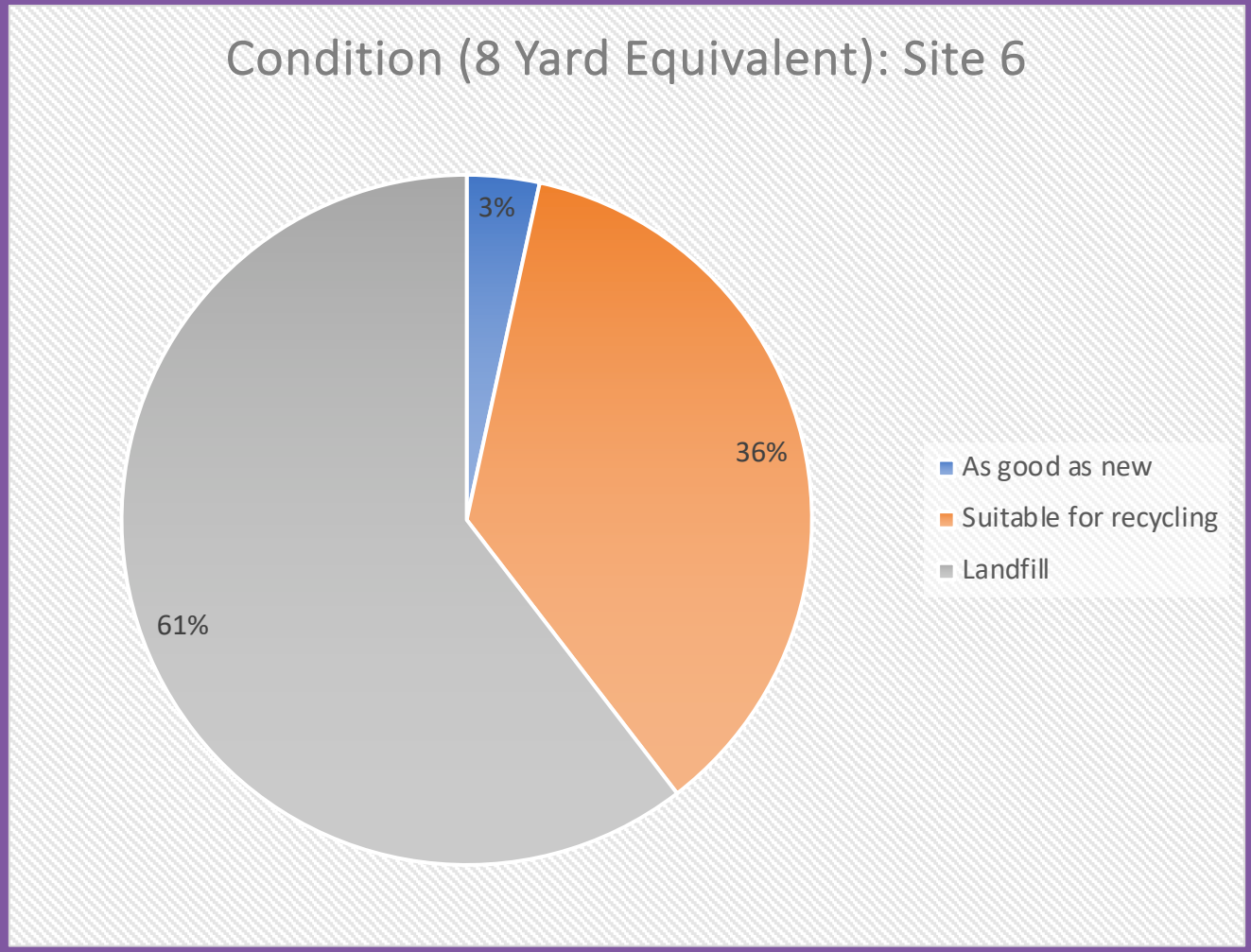
Example Analysis & Results (housebuilder)



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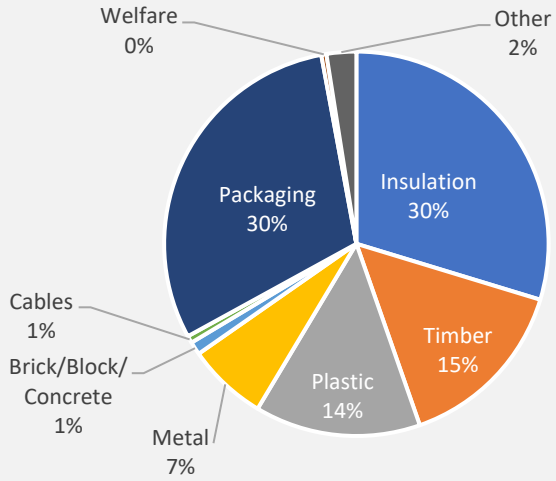
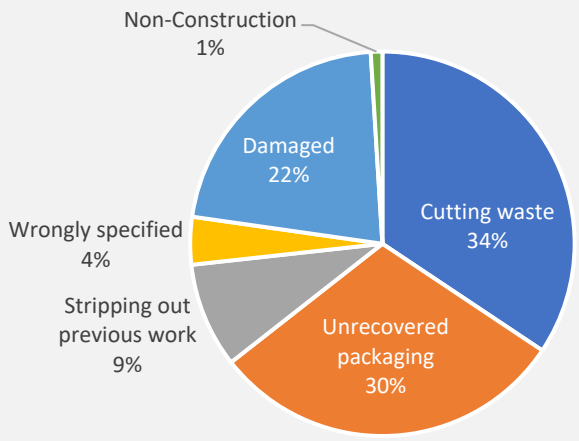
Site Waste Reduction Protocol

4.55 cubic meters of materials	£1,250.72
Labour	£11.08
Cost of damages and errors	£823.43
Equipment (telehandler fuel)*	£0.20
Skip Hire (8 yard mixed waste)*	£207.00
VAT (0% Labour & Building Materials; Other Costs* 20%)	£103.40
TOTAL	**£2,395.83**

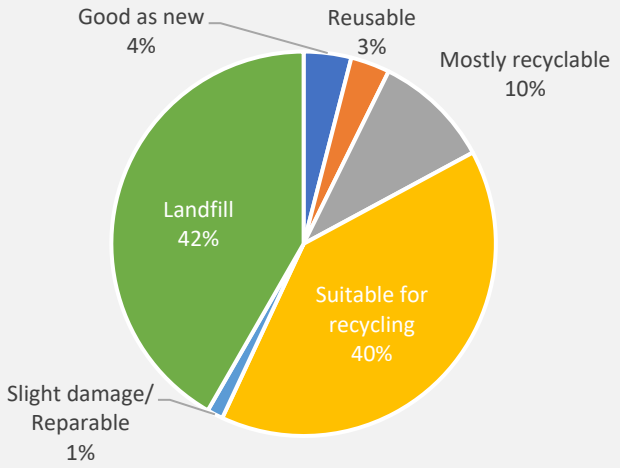
Waste by volume (%)



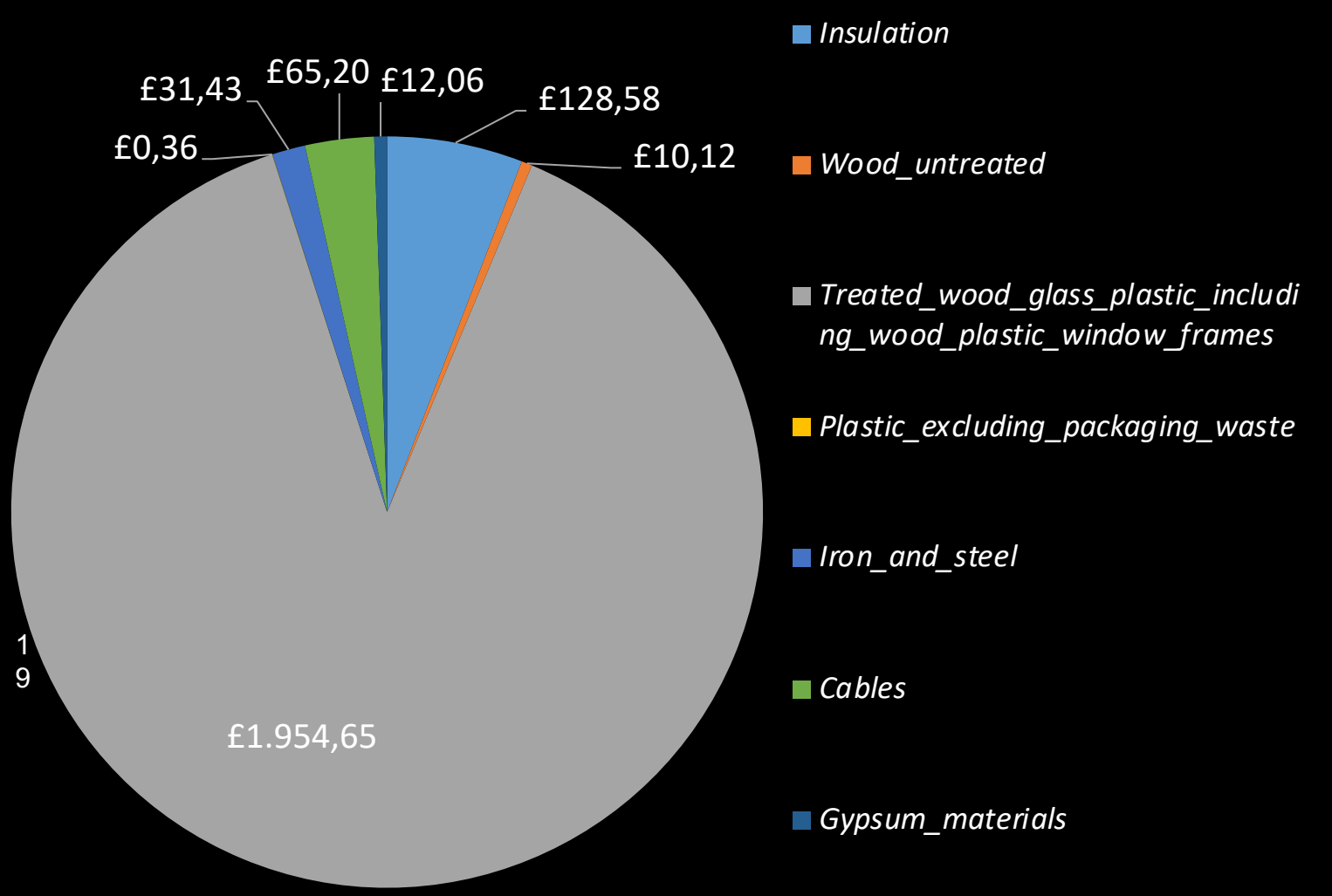
Waste by source (%)



Condition of waste (%)



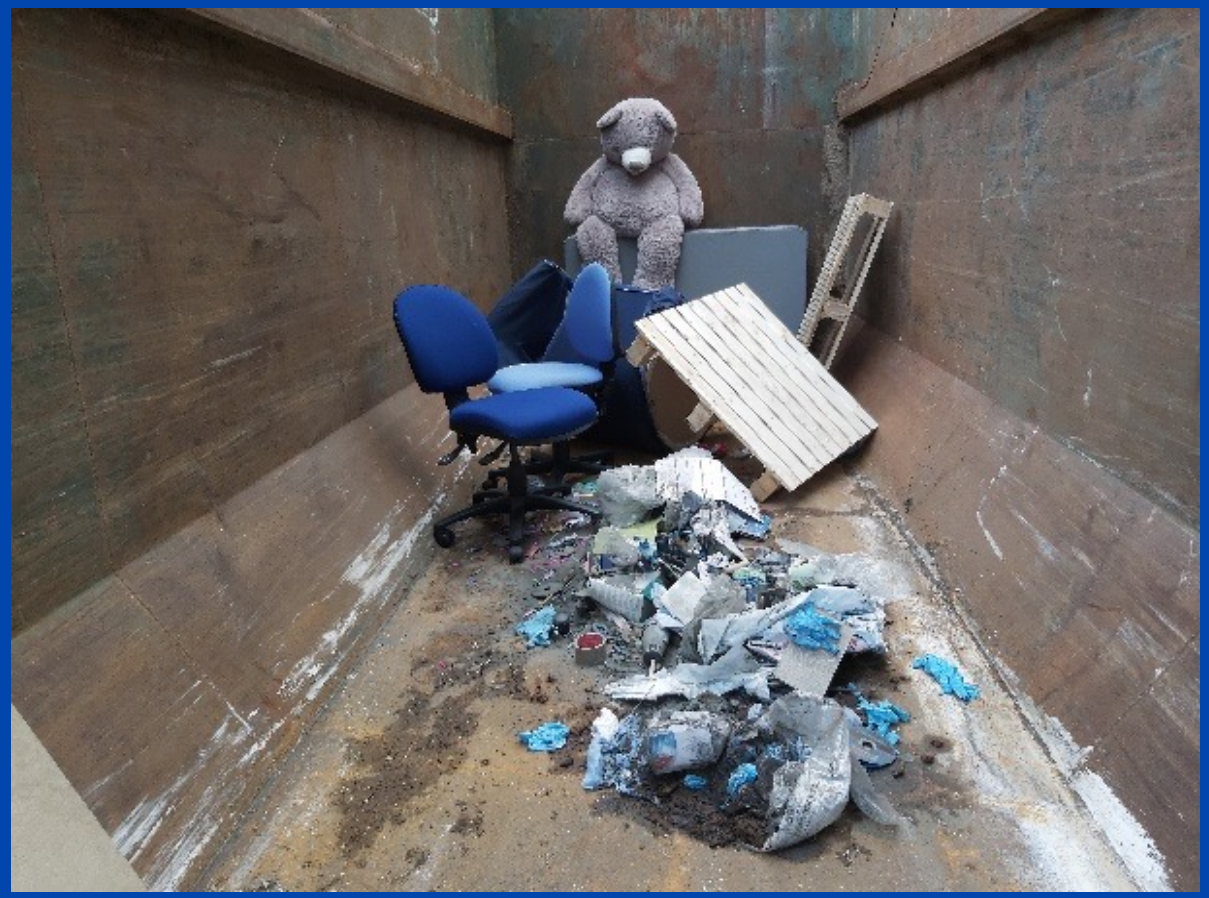
Cost (8 Yard Equivalent): Site 1 – Higher Education Build



- **1/3 of products discarded were in a usable condition**
- **80% of waste was from cutting standardised materials to fit**
- **The largest waste streams by volume products didn't drive the costs**

MULTIPLEX

Questions?



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