Excellence In Design For Greater Efficiencies

IFC International Finance Corporation WORLD BANK GROUP

Creating Markets, Creating Opportunities

Project Details

Project Owner Name :		Project Address Line 1* :	
Project Name* :		Project Address Line 2 :	
Hotel Name* :		Project City* :	
Project Owner Email :		Project Province/State :	
Project Owner Phone :		Project Postal Code :	
Project Number :	Not Assigned	Project Country* :	
The Master Project Floor Area* :	m²	Project Type :	New Building
Project Stage* :			

Location Data

Country : South Africa

City : Bloemfontein

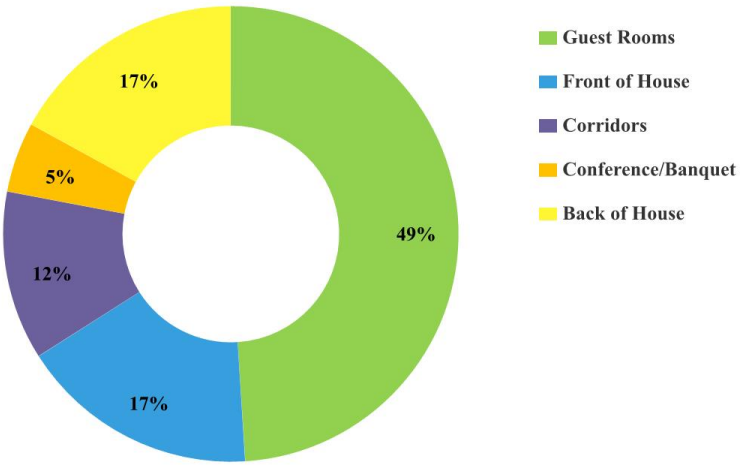
Basic Parameters

Star Rating of the Hotel :	4-Star	Yes	Irrigated Area	1,000 m²
Type of Hotel* :	Hotel	Yes	In-house Laundry	
Average Occupancy Rate* :	70%	Yes	Banquet/Conference Facility	
		No	Breakfast Area Only (No Restaurant)	
		No	Health Spa	
		Yes	Swimming Pool	

Building Data

Floors Above Ground :	8	no.
Floors Below Ground :	1	no.
Total Guest Rooms :	200	no.

	Default	*User Entry*	
Guest Rooms :	7,600		m²
Front of House :	2,679		m²
Corridors :	1,919		m²
Conference/Banquet :	779		m²
Back of House :	2,622		m²
Gross Internal Area :		15,599	m²



Building Systems

Does building design include an AC system? : Yes

Does building design include space heating system? : Yes

Key Assumptions for the Base Case

	Default	User Entry	
Fuel Used for Electric Generator :	Diesel	Diesel	
Fuel Used for Hot Water Generation :	Electricity	Electricity	
Fuel Used for Cooking :	Electricity	Electricity	
Fuel Used for Space Heating :	Electricity	Electricity	
% of Electricity Generation Using Diesel :	5%		% Ave. Yrly
Cost of Electricity :	2.1		ZAR/kWh
Cost of Diesel Fuel :	17.7		ZAR/L
Cost of Natural Gas :	8.2		ZAR/L
Cost of Water :	3.6		ZAR/kL
CO2 Emissions from Electricity Generation :	964.5		g/kWh
Window to Wall Ratio :	55%		%
Roof U - Value :	0.27		W/m² K
Wall U - Value :	0.53		W/m² K
Glass U - Value :	5.75		W/m² K
Glass SHGC :	0.80		Factor
Cooling System :	ASHRAE 90.1.2007	ASHRAE 90.1.2007	
AC System Efficiency :	2.66		COP
Heating System :	ASHRAE 90.1.2007	ASHRAE 90.1.2007	
Heating System Efficiency :	2.66		COP

Monthly Average Outdoor Temperature (deg.C)

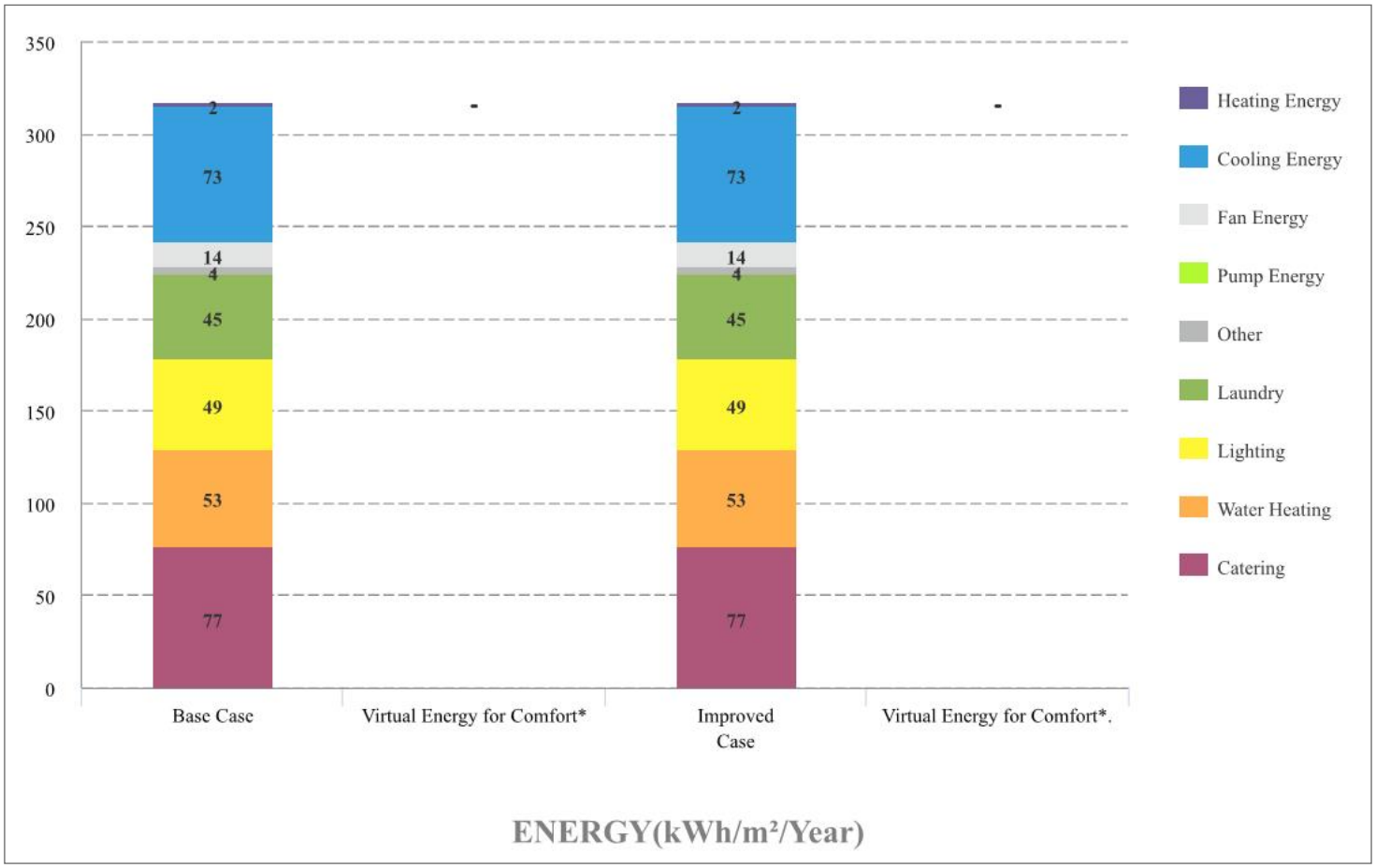
	Default	User Entry	
Jan :	23.9		
Feb :	22.2		
Mar :	20.0		
Apr :	16.1		
May :	12.2		
Jun :	8.3		
Jul :	8.3		
Aug :	11.1		
Sep :	15.0		
Oct :	18.3		
Nov :	20.0		
Dec :	22.2		
Latitude :	26.1		Deg
Average Annual Rainfall :	556.60		mm

RESULTS

Final Energy Use	413,171 kWh/Month	Operational CO2 Savings	0.00 tCO2/Year
Final Water Use	337 Lt./Guest/Night	Embodied Energy Savings	0.00 MJ/m²
Base Case Utility Cost	906,203.40 ZAR/Month	Incremental Cost	0.00 ZAR
Utility Costs Reduction	0.00 ZAR/Month	Payback in Years	N/A Yrs.
Energy Savings	0.00 MWh/Year	Water Savings	0.00 m³/Year
Embodied Energy in Material Savings	0.00 GJ	Project Floor Space	15599.00 m²

Energy Efficiency Measures 0.00%

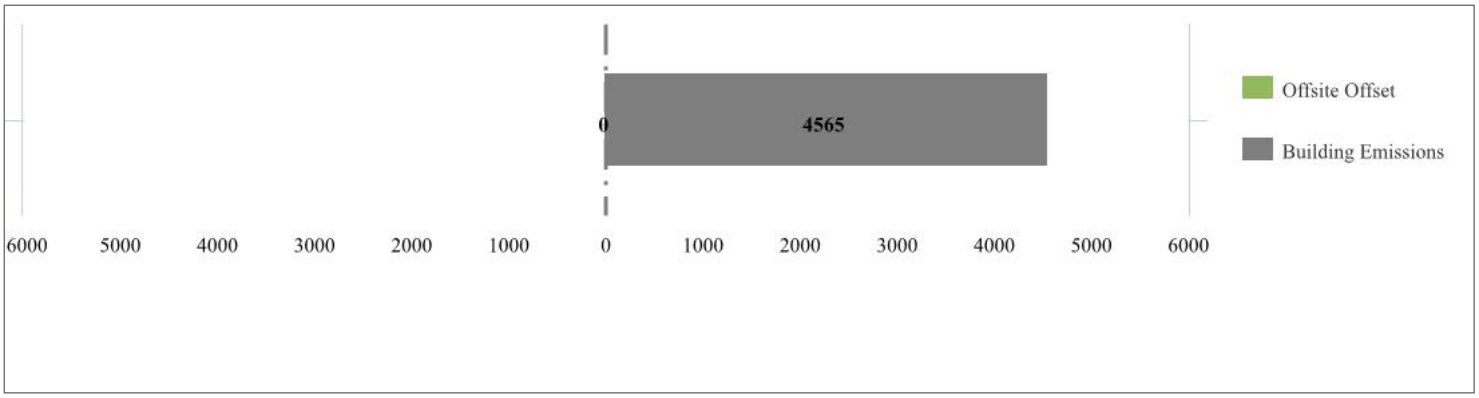
ENERGY SAVINGS



*Virtual energy is the amount of energy that will be required based on the assumption that the hotel will eventually install air conditioning or heating

4564.78 tCO2/Year

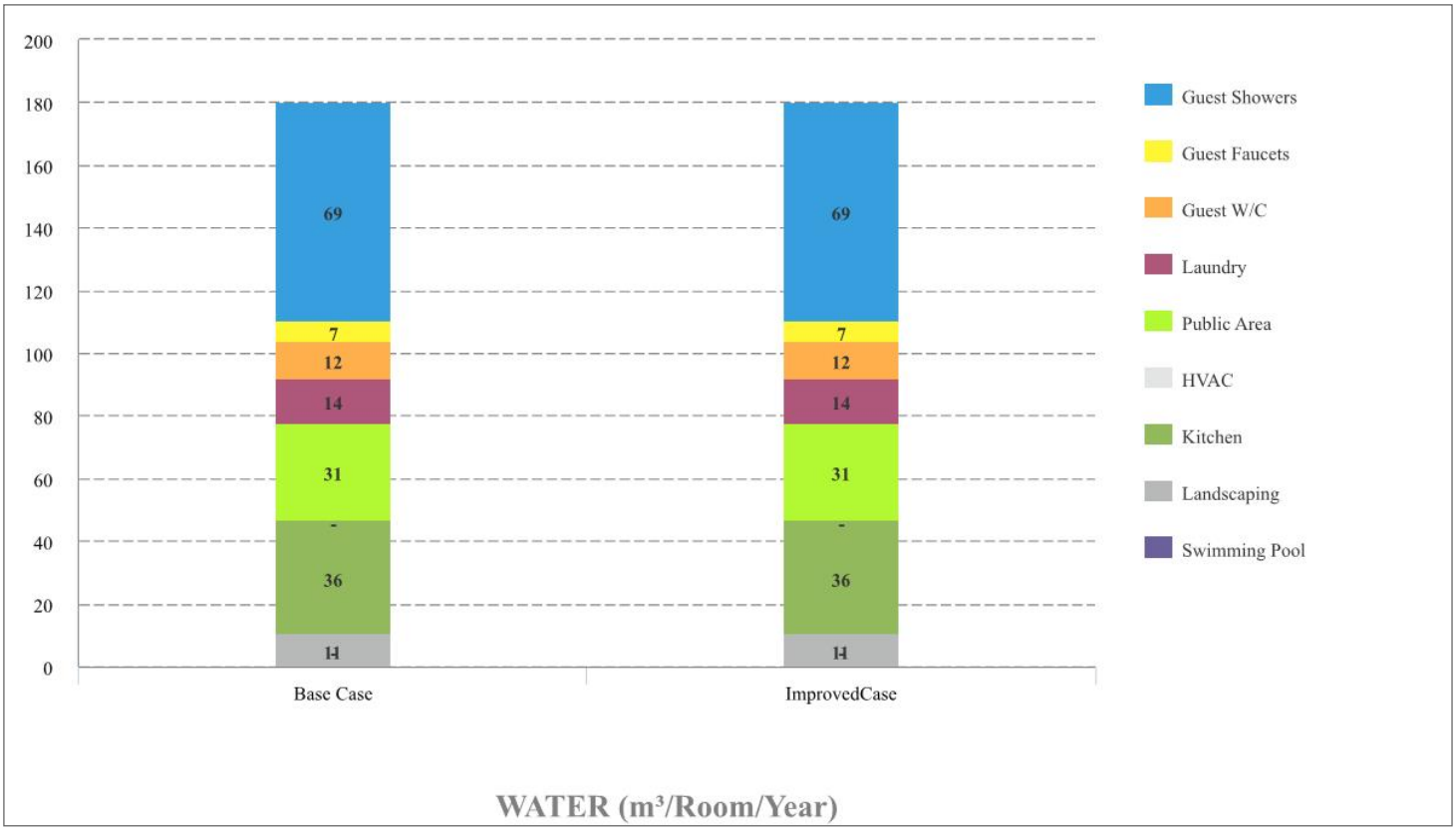
CARBON SAVINGS



No	HTE01	Reduced Window to Wall Ratio - WWR of 40%	WWR %	
No	HTE02	External Shading Devices - Annual Average Shading Factor (AASF) of 0.61	AASF	
No	HTE03	Insulation of Roof - U Value of 0.18	W/m² K	
No	HTE04	Insulation of External Walls - U Value of 0.27	W/m² K	
No	HTE05	Low-E Coated Glass - U Value of 3 W/m2 K and SHGC of 0.45	W/m² K	
			SHGC	
No	HTE06	Higher Thermal Performance Glass - U-Value of 1.98 W/m2 K and SHGC of 0.28	W/m² K	
			SHGC	
No	HTE07	Natural Ventilation - Corridors		
No	HTE08	Natural Ventilation - Guest Rooms with Auto Controls		
No	HTE09	Variable Refrigerant Flow (VRF) Cooling System - COP of 3.5	COP	
No	HTE10	Air Conditioning with Air Cooled Screw Chiller - COP of 3.2	COP	
No	HTE11	Air Conditioning with Water Cooled Chiller - COP of 5.39	COP	
No	HTE12	Ground Source Heat Pump - COP of 5.2	COP	
No	HTE13	Absorption Chiller Powered by Waste Heat - COP of 0.7	COP	
No	HTE14	Recovery of Waste Heat from the Generator for Space Heating		
No	HTE15	Variable Speed Drives on the Fans of Cooling Towers		
No	HTE16	Variable Speed Drives Pumps		
No	HTE17	Sensible Heat Recovery from Exhaust Air - Efficiency of 60%	% Eff.	
No	HTE18	High Efficiency Condensing Boiler for Space Heating - Efficiency of 90%	% Eff.	
No	HTE19	High Efficiency Boiler for Water Heating - Efficiency of 90%	% Eff.	
No	HTE20	Variable Speed Hoods with Automated Fan Controls		
No	HTE21	Preheat Water Using Waste Heat from the Generator		
No	HTE22	Heat Recovery from Grey Water - Efficiency of 30%	% Eff.	
No	HTE23	Heat Recovery from Laundry Waste Water - Efficiency of 30%	% Eff.	
No	HTE24	Heat Pump for Hot Water - COP of 3	COP	
No	HTE25	Energy-Saving Light Bulbs - Internal Spaces		
No	HTE26	Energy-Saving Light Bulbs - External Spaces		
No	HTE27	Energy-Saving Light Bulbs - Back-of-House		
No	HTE28	Lighting Controls for Corridors		
No	HTE29	Occupancy Sensors in Bathrooms		
No	HTE30	Solar Hot Water Collectors - 50% of Hot Water Demand	% Hot Water	
			Collector Area (m²)	0.0
No	HTE31	Solar Photovoltaics - 25% of Total Energy Demand	% of Annual Electricity Use	
			Capacity (kWp)	0.0
No	HTE32	Other Renewable Energy for Electricity Generation	Source type	Biomass
			% of Annual Electricity Use	
No	HTE33	Offsite Renewable Energy Procurement -Equal to 100% of total Operational CO2	% Annual Operational CO2	
			kWh/Year	-
No	HTE34	Carbon Offset-100% of Total CO2	% Annual Operational CO2	
			tCO2/Year	-

Water Efficiency Measures 0.00%

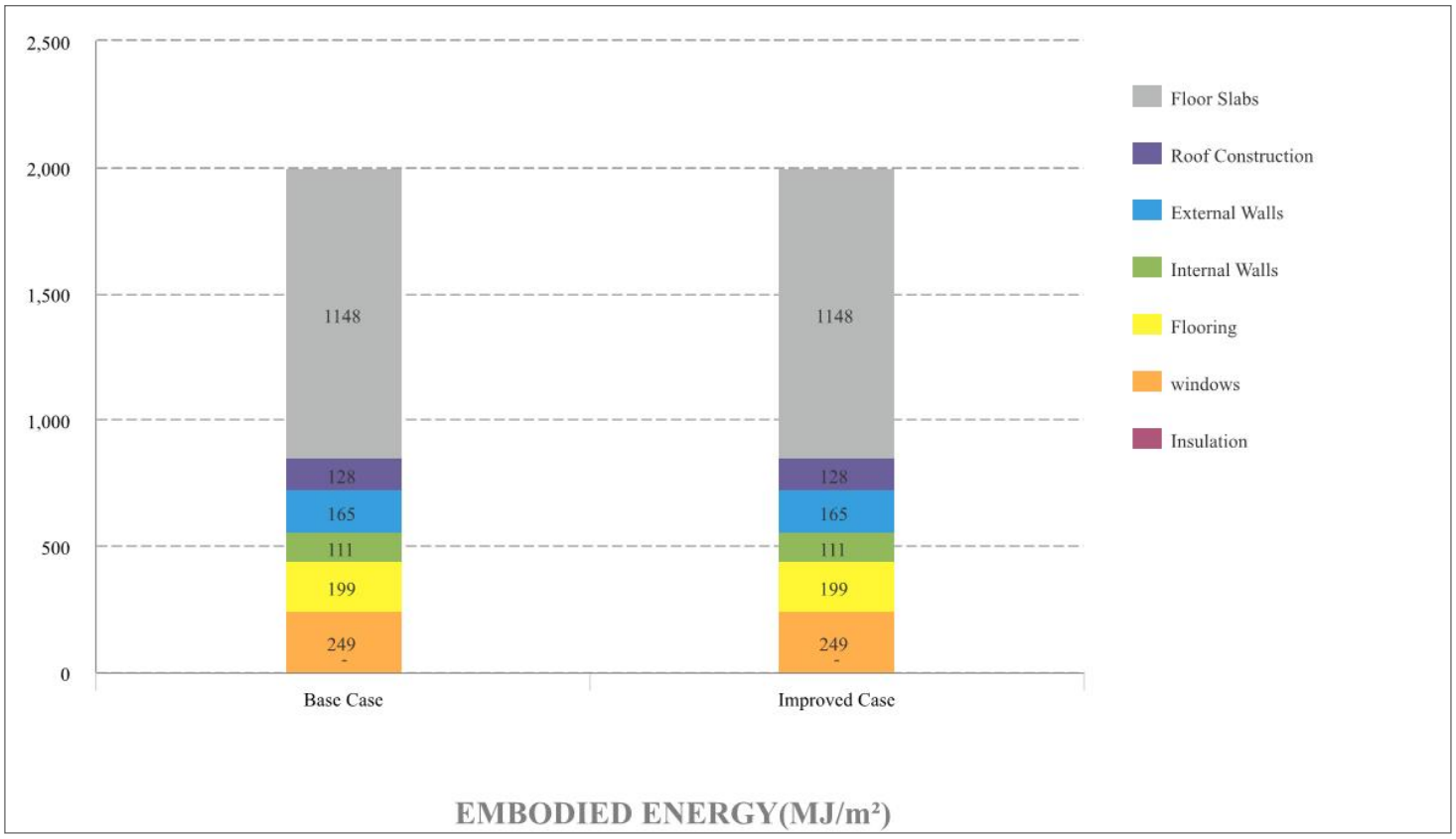
WATER SAVINGS



No	HTW01	Low-Flow Showerheads in Guest Rooms - 8 lt./min	Lt./min
No	HTW02	Low-Flow Faucets in Guest Rooms - 2 lt./min	Lt./min
No	HTW03	Dual Flush for Water Closets in Guest Rooms -6lt./1st flush and 3lt./2nd flush	1st - Lt./flush
	No	Single Flush/Flush Valve	2nd - Lt./flush
No	HTW04	Water-Efficient Front Loading Washing Machine - 6 lt./kg. of clothes	
No	HTW05	Water-Efficient Urinals in all Other Bathrooms - 2 lt./flush	Lt./flush
No	HTW06	Dual Flush for Water Closets in all Other Bathrooms -6lt./1st flush and 3lt./2nd flush	1st - Lt./flush
	No	Single Flush/Flush Valve	2nd - Lt./flush
No	HTW07	Aerators & Auto Shut-off Faucets in all Other Bathrooms -2 lt./min	Lt./min
No	HTW08	Water-Efficient Dishwashers - 5.3 lt./rack	
No	HTW09	Pre-rinse Valve for Rinsing Operation - 2.1 lt./min	
No	HTW10	Water-Efficient Kitchen Faucets - 12.7 lt./min	Lt./min
No	HTW11	Water-Efficient Landscaping - 4 lt./m²/day	Lts./m²/day
No	HTW12	Swimming Pool Cover	
No	HTW13	Condensate Water Recovery	
No	HTW14	Rainwater Harvesting System - 50% of Roof Area Used for Rainwater Collection	Roof Area Used (%)
No	HTW15	Grey Water Treatment and Recycling System	
No	HTW16	Black Water Treatment and Recycling System	

Materials Efficiency Measures 0.00%

EMBODIED ENERGY SAVINGS



				Proportion %	*Thickness*	*Steel Rebar*
HTM01	Floor Slabs					
	In-Situ Reinforced Concrete Slab		In-Situ Reinforced Concrete Slab		mm	kg/m²
	350 mm					
	Steel : 35 kg/m²					
HTM02	Roof Construction					
	In-Situ Reinforced Concrete Slab	Type 1	In-Situ Reinforced Concrete Slab	100 %	mm	kg/m²
	350 mm					
	Steel : 35 kg/m²					
HTM03	External Walls					
	Common Brick Wall with Internal & External Plaster	Type 1	Common Brick Wall with Internal & External Plaster	100 %	mm	
	200 mm					

				Proportion %	*Thickness*
HTM04	Internal Walls				
	Common Brick Wall with Plaster on Both Sides	Type 1	Common Brick Wall with Plaster on Both Sides	100 %	mm
	100 mm				
HTM05	Flooring				
	Ceramic Tile	Type 1	Ceramic Tile	100 %	
HTM06	Window Frames				
	Aluminium	Type 1	Aluminium	100 %	Single Glazing
	Single Glazing				