

		<h1 style="text-align: center;">CALCULATIONS</h1>		DOCUMENT No 7006-UA001881-UP21B-03				
OFFICE CARDIFF			PROJECT TITLE NW Bicester Eco Development					
SUBJECT Exemplar Site Sewage Generation Calculation					SHEET No 1 OF 2			
ISSUE	TOTAL SHEETS	AUTHOR	DATE	CHECKED BY	DATE	APPROVED BY	DATE	COMMENTS
1	2	DB	02/09/10	SD	02/09/10	SD	02/09/10	
2	2	DB	12/11/10	MP	12/11/10	SD	12/11/10	
3	2	DB	25/11/10	MP	25/11/10	SD	25/11/10	
4								
5								
SUPERSEDES DOC No								DATE

<p>DESIGN BASIS STATEMENT (Inc. sources of info/data, assumptions made, standards, etc.)</p> <p><i>Property information (use, size, etc.):</i></p> <p>Plot areas and land use split in accordance with data provided within the Exemplar Site masterplan non-residential buildings brief (4/11/2010) and Accommodation Schedule (29/10/1010).</p> <p><i>Water Demand:</i></p> <p>Conventional Development Rates: Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005)</p> <p>Sustainable Development Rates: Code For Sustainable Homes Technical Guide (May 2009 - Version 2) BREEAM Offices - Assessment Prediction Checklist</p>
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NW Bicester Eco Development
7006-UA001881-UP21B-03
Exemplar Site Sewage Generation Calculation

Land Use	Area (m2)	Number of Properties	Total Population	Water Consumption (l/person(m2)/day)	Rainwater Harvesting Contribution (l/person(m2)/day)	Average Discharge (l/day)	Average Discharge (l/s)	Peak Discharge (l/s)
Residential		400	1151	80	12.00	105,928.80	3.68	22.07
Social / Community	540	N/A	123	6.5	0.98	920.45	0.03	0.19
Commercial	3,610	N/A	820	6.5	0.98	6,153.41	0.21	1.28
Restaurant	300	N/A	68	162	24.30	12,702.27	0.44	2.65
Retail / Leisure	660	N/A	N/A	2.4	0.36	1,821.60	0.06	0.38
Education	1,110	N/A	139	48	7.20	7,658.00	0.27	1.60
						135,185.54	4.69	28.16
Development Total						135,186	5	28

Assumptions:

Factors

Peaking Factor	6	[Conversion from average discharge rate to peak discharge rate]
Infiltration	0%	
Rainwater Harvesting	15%	[Additional contribution to foul discharge rates]

Residential:

Baseline for Conventional Development	150 l/person/day	[Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005): General Housing = 600 l/property/day]
Sustainable Development	80 l/person/day	[Code for Sustainable Homes (Level 6)]
Residential split		
Affordable	123	
Private	270	
Residents per property		
Affordable	4.40	
Private	2.26	
Water consumption assumed to be over an	8 hour day	

Commercial (Offices / Hairdressers) and Social / Community:

Baseline for Conventional Development	33 l/person/day	[Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005): Offices = 750 l/100m2/day (population density as below)]
Sustainable Development	6.5 l/person/day	[BREEAM Offices 2005 (16-24 points): 1.5m3 per person per year (assume 230 working days per year)]
Staff density	4.4 m2/person	[The Workplace (Health, Safety & Welfare) Regulations 1992: Minimum working space = 11m3 (assume 2.5m high)]
Water consumption assumed to be over an	8 hour day	

Restaurant (Take-away / Pub):

Baseline for Conventional Development	270 l/person/day	[Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005): Restaurant = 270 l/seat/day (population density as below)]
Sustainable Development	162 l/person/day	[Assume 40% reduction from baseline]
Staff / customer density	4.4 m2/person	[Assumption - The Workplace (Health, Safety & Welfare) Regulations 1992: Minimum working space = 11m3 (assume 2.5m high)]
Water consumption assumed to be over an	8 hour day	

Retail / Leisure:

Baseline for Conventional Development	4 l/m2/day	[Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005): Shopping Centre = 400 l/100m2/day]
Sustainable Development	2.4 l/m2/day	[Assume 40% reduction from baseline]
Water consumption assumed to be over an	8 hour day	

Education:

Baseline for Conventional Development	80 l/person/day	[Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005): School]
Sustainable Development	48 l/person/day	[Assume 40% reduction from baseline]
Pupil density	8 m2/pupil	[Assumption]
Water consumption assumed to be over an	8 hour day	