SAP WorkSheet: New dwelling design sta	ige
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Southeast 0.9x	0.77	x	0.84	x	62.67	x	0.63	x	0.7	(=	32.18	(77)
Southeast 0.9x	0.77	x	2.4	x	62.67	x	0.63	1 x	0.7	=	183.88	(77)
Southeast 0.9x	0.77	x	1.4	x	62.67	x	0.63	x	0.7	=	53.63	(77)
Southeast 0.9x	0.77	x	5.58	x	62.67	x	0.63	x	0.7	=	106.88	(77)
Southeast 0.9x	0.77	x	2.16	х	62.67	x	0.63	x	0.7	=	124.12	(77)
Southeast 0.9x	0.77	x	3.96	x	62.67	x	0.63	x	0.7	=	75.85	(77)
Southeast 0.9x	0.77	x	2.16	x	62.67	x	0.63	x	0.7	=	41.37	(77)
Southeast 0.9x	0.54	x	9.28	x	62.67	x	0.63	x	0.7	=	124.65	(77)
Southeast 0.9x	0.77	x	3.96	×	85.75	x	0.63	x	0.7	=	207.56	(77)
Southeast 0.9x	0.77	x	0.84	x	85.75	x	0.63	x	0.7	=	44.03	(77)
Southeast 0.9x	0.77	x	2.4	×	85.75	x	0.63	x	0.7	=	251.59	(77)
Southeast 0.9x	0.77	x	1.4	x	85.75	x	0.63	x	0.7	=	73.38	(77)
Southeast 0.9x	0.77	x	5.58	x	85.75	x	0.63	x	0.7	(=)	146.24	(77)
Southeast 0.9x	0.77	x	2.16	х	85.75	x	0.63	x	0.7	=	169.82	(77)
Southeast 0.9x	0.77	x	3.96	×	85.75	x	0.63	x	0.7	=	103.78	(77)
Southeast 0.9x	0.77	x	2.16	x	85.75	x	0.63	x	0.7	=	56.61	(77)
Southeast 0.9x	0.54	x	9.28	x	85.75	x	0.63	x	0.7	=	170.56	(77)
Southeast 0.9x	0.77	x	3.96	x	106.25	x	0.63	x	0.7	=	257.18	(77)
Southeast 0.9x	0.77	x	0.84	x	106.25	X	0.63	x	0.7	(=)	54.55	(77)
Southeast 0.9x	0.77	x	2.4	x	106.25	X	0.63	x	0.7	=	311.73	(77)
Southeast 0.9x	0.77	x	1.4	x	106.25	X	0.63	x	0.7	=	90.92	(77)
Southeast 0.9x	0.77	x	5.58	x	106.25	x	0.63	x	0.7	=	181.19	(77)
Southeast 0.9x	0.77	x	2.16	x	106.25	x	0.63	x	0.7	=	210.42	(77)
Southeast 0.9x	0.77	x	3.96	x	106.25	x	0.63	x	0.7	=	128.59	(77)
Southeast 0.9x	0.77	x	2.16	x	106.25	x	0.63	x	0.7	=	70.14	(77)
Southeast 0.9x	0.54	×	9.28	x	106.25	x	0.63	x	0.7	=	211.33	(77)
Southeast 0.9x	0.77	x	3.96	x	119.01	x	0.63	x	0.7	=	288.06	(77)
Southeast 0.9x	0.77	x	0.84	x	119.01	x	0.63	x	0.7	=	61.1	(77)
Southeast 0.9x	0.77	×	2.4	×	119.01	x	0.63	×	0.7	17	349.16	(77)
Southeast 0.9x	0.77	x	1.4	х	119.01	x	0.63	x	0.7	=	101.84	(77)
Southeast 0.9x	0.77	x	5.58	×	119.01	x	0.63	×	0.7	=	202.95	(77)
Southeast 0.9x	0.77	x	2.16	x	119.01	x	0.63	x	0.7	(=)	235.69	(77)
Southeast 0.9x	0.77	x	3.96	x	119.01	x	0.63	×	0.7	=	144.03	(77)
Southeast 0.9x	0.77	x	2.16	x	119.01	x	0.63	x	0.7	=	78.56	(77)
Southeast 0.9x	0.54		9.28	X	119.01	x	0.63		0.7		236.71	(77)
Southeast 0.9x	0.77	×	3.96	x	118.15	×	0.63	×	0.7	-	285.98	(77)
Southeast 0.9x	0.77	x	0.84	x	118.15	x x	0.63	x x	0.7	-	60.66	(77)
Southeast 0.9x	0.77	x	2.4	x	118.15 118.15	x	0.63	Îx	0.7	-	346.64	(77)
Southeast 0.9x	0.77	x	5.58	x	118.15	x	0.63	x	0.7	-	201.48	(77)
Southeast 0.9x	0.77	Îx	2.16	x	118.15	x	0.63		0.7	1	201.48	(77)
	0.17	1	2.10	^	110.10		0.00	1 ^	0.7		200.00	0.0

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Southeast 0.9x	0.77	x	3.96] × [118.15) × [0.63] x [0.7] = [142.99	(77)
Southeast 0.9x	0.77	Ī×Ī	2.16	i × ľ	118.15	1 × 1	0.63	i × F	0.7	i <u>-</u> F	77.99	(77)
Southeast 0.9x	0.54	Ī×Ī	9.28	i × ľ	118.15	1 × 1	0.63	i x F	0.7	i - F	234.99	(77)
Southeast 0.9x	0.77	ī x [3.96	i _× ľ	113.91		0.63	i × F	0.7	1 - 1	275.71	(77)
Southeast 0.9x	0.77	1 × [0.84	i × ľ	113.91	1 × [0.63	i x F	0.7	i - F	58.48	(77)
Southeast 0.9x	0.77	1 × [2.4	i × ľ	113.91	1 × [0.63	i × F	0.7	ī = [334.2	(77)
Southeast 0.9x	0.77	x	1.4	i × ľ	113.91	ī × Г	0.63	Ī×Ē	0.7	1 = [97.47	(77)
Southeast 0.9x	0.77	×	5.58	Ī×Ī	113.91	1 × [0.63	I × [0.7	ī - [194.25	(77)
Southeast 0.9x	0.77	×	2.16] × [113.91	×	0.63] × [0.7	ī = [225.58	(77)
Southeast 0.9x	0.77	×	3.96] × [113.91	×	0.63	x	0.7] = [137.86	(77)
Southeast 0.9x	0.77	×	2.16] × [113.91	_ × [0.63] × [0.7] = [75.19	(77)
Southeast 0.9x	0.54	x	9.28] × [113.91	x	0.63	x	0.7] = [226.56	(77)
Southeast 0.9x	0.77	×	3.96] × [104.39	×	0.63) × [0.7] = [252.67	(77)
Southeast 0.9x	0.77	x	0.84	x	104.39	x	0.63	x	0.7	=	53.6	(77)
Southeast 0.9x	0.77	x	2.4] × [104.39	x	0.63) x [0.7	=	306.27	(77)
Southeast 0.9x	0.77	x	1.4	x	104.39	x	0.63	x	0.7	=	89.33	(77)
Southeast 0.9x	0.77	×	5.58	×	104.39	x	0.63	x	0.7	=	178.02	(77)
Southeast 0.9x	0.77	x	2.16] × [104.39	×	0.63	x	0.7	=	206.73	(77)
Southeast 0.9x	0.77	x	3.96	×	104.39	x	0.63	x	0.7	=	126.34	(77)
Southeast 0.9x	0.77	x	2.16	×	104.39	x	0.63	x	0.7	=	68.91	(77)
Southeast 0.9x	0.54	x	9.28	×	104.39	×	0.63	x	0.7	=	207.63	(77)
Southeast 0.9x	0.77	x	3.96] × [92.85	×	0.63	x	0.7	= [224.74	(77)
Southeast 0.9x	0.77	×	0.84	×	92.85	×	0.63	x	0.7		47.67	(77)
Southeast 0.9x	0.77	×	2.4	×	92.85	×	0.63	x	0.7] = [272.42	(77)
Southeast 0.9x	0.77	x	1.4	×	92.85	x	0.63	x	0.7	=	79.45	(77)
Southeast 0.9x	0.77	×	5.58	×	92.85	×	0.63	x	0.7	=	158.34	(77)
Southeast 0.9x	0.77	x	2.16	×	92.85	×	0.63	×	0.7	=	183.88	(77)
Southeast 0.9x	0.77	x	3.96	×	92.85	x	0.63	x	0.7	=	112.37	(77)
Southeast 0.9x	0.77	×	2.16	×	92.85	×	0.63	x	0.7	=	61.29	(77)
Southeast 0.9x	0.54	×	9.28	x	92.85	×	0.63	x	0.7		184.68	(77)
Southeast 0.9x	0.77	×	3.96	×	69.27	×	0.63	×	0.7	=	167.66	(77)
Southeast 0.9x	0.77	x	0.84	×	69.27	×	0.63	x	0.7	=	35.56	(77)
Southeast 0.9x	0.77	×	2.4	×	69.27	×	0.63	×	0.7	=	203.22	(77)
Southeast 0.9x	0.77	x	1.4	×	69.27	×	0.63	×	0.7	=	59.27	(77)
Southeast 0.9x	0.77	×	5.58	×	69.27	×	0.63	×	0.7		118.12	(77)
Southeast 0.9x	0.77	×	2.16	X	69.27	×	0.63	×	0.7	=	137.18	(77)
Southeast 0.9x	0.77	×	3.96		69.27	×	0.63	×	0.7	_ = _	83.83	(77)
Southeast 0.9x	0.77	×	2.16	×	69.27	×	0.63	×	0.7	=	45.73	(77)
Southeast 0.9x	0.54	×	9.28	×	69.27	×	0.63	×	0.7		137.77	(77)
Southeast 0.9x	0.77	×	3.96		44.07		0.63	×	0.7	╡╹┝	106.67	(77)
Southeast 0.9x	0.77	x	0.84	X	44.07	x	0.63	х	0.7	=	22.63	(77)

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SAP WorkSheet: New	dwelling	design	stage
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Southeasto by 0.77 x 2.4 x 44.07 x 0.03 x 0.77 = 1129.3 077 Southeasto by 0.77 x 1.4 x 44.07 x 0.63 x 0.77 = 57.71 077 Southeasto by 0.77 x 2.16 x 44.07 x 0.63 x 0.77 = 53.34 077 Southeasto by 0.77 x 2.16 x 44.07 x 0.63 x 0.77 = 53.34 077 Southeasto by 0.77 x 2.48 x 31.49 x 0.63 x 0.77 = 0.76.57 0.77 Southeasto by 0.77 x 1.44 x 31.49 x 0.63 x 0.77 = 22.60 077 Southeasto by 0.77 x 1.44 x 31.49 x 0.63 x 0.77 = </th <th></th>													
Southeast 0 gl 0.77 x 558 x 44.07 x 0.63 x 0.77 = 75.15 (77) Southeast 0 gl 0.77 x 2.16 x 44.07 x 0.63 x 0.77 = 67.28 (77) Southeast 0 gl 0.77 x 2.56 x 44.07 x 0.63 x 0.77 = 25.34 (77) Southeast 0 gl 0.77 x 2.16 x 44.07 x 0.63 x 0.77 = 67.55 (77) Southeast 0 gl 0.77 x 0.84 x 11.48 x 0.63 x 0.77 = 62.63 (77) 55.63 x 13.44 x 0.63 x 0.77 = 62.63 (77) 55.63 x 13.44 x 0.63 x 0.77 = 62.63 (77) 50.01 63.03 x 0.77 = 62.63	Southeast 0.9x	0.77	x	2.4	x	44.07	x	0.63	x	0.7	=	129.3	(77)
Southeast 0.sk 0.77 × 2.16 × 44.07 × 0.63 × 0.77 = 67.28 (7) Southeast 0.sk 0.77 × 2.36 × 44.07 × 0.63 × 0.77 = 53.34 (7) Southeast 0.sk 0.77 × 2.26 × 44.07 × 0.63 × 0.77 = 76.21 (7) Southeast 0.sk 0.77 × 2.44 × 31.49 × 0.63 × 0.77 = 62.36 (7) Southeast 0.sk 0.77 × 1.44 × 1.44 × 0.63 × 0.77 = 62.36 (7) Southeast 0.sk 0.77 × 2.16 × 31.49 0.63 × 0.77 = 62.36 (7) Southeast 0.sk 0.77 × 1.216 × 31.49 0.63 × 0.77 = 62.35	Southeast 0.9x	0.77	x	1.4	x	44.07	x	0.63	x	0.7] = [37.71	(77)
Southeast 0.sx 0.77 x 2.96 x 44.07 x 0.63 x 0.77 = 53.34 (77) Southeast 0.sx 0.77 x 2.16 x 44.07 x 0.63 x 0.77 = 22.909 (77) Southeast 0.sx 0.77 x 3.96 x 31.49 x 0.63 x 0.77 = 16.17 (77) Southeast 0.sx 0.77 x 1.4 x 31.49 x 0.63 x 0.77 = 16.17 (77) Southeast 0.sx 0.77 x 1.4 x 31.49 x 0.63 x 0.77 = 22.36 (77) Southeast 0.sx 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 20.79 (77) Southeast 0.sx 0.77 x 1.216 x 31.49 x 0.63 x 0.77	Southeast 0.9x	0.77	x	5.58	x	44.07	x	0.63	x	0.7] = [75.15	(77)
Southeast 0.sk 0.77 × 2.16 × 44.07 × 0.63 × 0.77 = 29.06 (7) Southeast 0.sk 0.54 × 92.8 × 44.07 × 0.63 × 0.77 = 67.65 (7) Southeast 0.sk 0.77 × 0.84 × 31.49 × 0.63 × 0.77 = 162.17 (7) Southeast 0.sk 0.77 × 2.4 × 51.49 × 0.63 × 0.77 = 92.58 (7) Southeast 0.sk 0.77 × 1.4 × 31.49 × 0.63 × 0.77 = 62.38 (7) Southeast 0.sk 0.77 × 2.16 × 31.49 × 0.63 × 0.77 = 62.236 (7) Southeast 0.sk 0.77 × 1.54 × 1.44.75 0.63 × 0.77 =	Southeast 0.9x	0.77	x	2.16	x	44.07	x	0.63	x	0.7] = [87.28	(77)
Southeast 0 % 0.54 × 0.54 × 0.52 × 0.44 0.7 × 0.63 × 0.7 = 0.76 5.7 (7) Southeast 0 % 0.77 × 0.84 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.84 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.84 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.84 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.556 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.556 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.216 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.216 × 0.149 × 0.63 × 0.7 = 0.238 (7) Southeast 0 % 0.77 × 0.216 × 0.149 × 0.63 × 0.7 = 0.207 (7) Southeast 0 % 0.77 × 0.144 × 0.63 × 0.7 = 0.207 (7) Southeast 0 % 0.77 × 0.154 × 0.63 × 0.7 = 0.207 (7) Southeast 0 % 0.77 × 1.54 × 0.63 × 0.7 = 0.207 (7) Southeast 0 % 0.77 × 1.54 × 0.63 × 0.7 = 0.207 (7) Southeast 0 % 0.77 × 1.54 × 0.63 × 0.7 = 0.207 (7) Southeast 0 % 0.77 × 1.54 × 0.637 × 0.63 × 0.7 = 0.207 (7) Southeast 0 % 0.77 × 1.54 × 0.637 × 0.63 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.657 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.637 × 0.63 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.637 × 0.63 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.637 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.637 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.638 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.639 × 0.633 × 0.7 = 0.207 (7) South 0 % 0.77 × 1.54 × 0.639 × 0.633 × 0.7 = 0.207 (7) Southwest 0 % 0.77 × 1.54 × 0.637 × 0.633 × 0.7 = 0.207 (7) Southwest 0 % 0.77 × 1.54 × 0.637 × 0.633 × 0.7 = 0.207 (7) Southwest 0 % 0.77 × 1.54 × 0.637 × 0.633 × 0.7 = 0.207 (7) Southwest 0 % 0.77 × 0.31 × 0.375 × 0.3679 Southwest 0 % 0.77 × 0.31 × 0.375 × 0.3679 Southwest 0 % 0.77 × 0.316 × 0.267 Southwest 0 % 0.77 × 0.365 × 0.7 = 0.252 (7)	Southeast 0.9x	0.77	x	3.96	х	44.07	x	0.63	x	0.7] = [53.34	(77)
Southeast 0 sk 0.77 x 3.66 x 3.149 x 0.63 x 0.77 = 76.21 (77) Southeast 0 sk 0.77 x 2.4 x 31.49 x 0.63 x 0.77 = 16.17 (77) Southeast 0 sk 0.77 x 1.4 x 31.49 x 0.63 x 0.77 = 92.38 (77) Southeast 0 sk 0.77 x 1.4 x 31.49 x 0.63 x 0.77 = 62.36 (77) Southeast 0 sk 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 20.79 (77) Southeast 0 sk 0.77 x 1.54 x 1.657 x 0.63 x 0.77 = 20.79 (77) South 0 sk 0.77 x 1.54 x 76.57 x 0.63 x 0.77 <td< td=""><td>Southeast 0.9x</td><td>0.77</td><td>x</td><td>2.16</td><td>x</td><td>44.07</td><td>x</td><td>0.63</td><td>x</td><td>0.7</td><td>] = [</td><td>29.09</td><td>(77)</td></td<>	Southeast 0.9x	0.77	x	2.16	x	44.07	x	0.63	x	0.7] = [29.09	(77)
Southeast 0 x 0.77 x 0.84 x 31.49 x 0.63 x 0.7 = 16.17 (7) Southeast 0 x 0.77 x 2.4 x 31.49 x 0.63 x 0.7 = 22.84 (7) Southeast 0 x 0.77 x 5.56 x 31.49 x 0.63 x 0.7 = 28.94 (7) Southeast 0 x 0.77 x 2.16 x 31.49 x 0.63 x 0.7 = 52.38 (7) Southeast 0 x 0.77 x 2.16 x 31.49 x 0.63 x 0.7 = 52.38 (7) Southeast 0 x 0.77 x 2.16 x 31.49 x 0.63 x 0.7 = 20.79 (7) Southeast 0 x 0.77 x 2.16 x 31.49 x 0.63 x 0.7 = 20.79 (7) Southeast 0 x 0.77 x 1.54 x 46.75 x 0.63 x 0.7 = 22.79 (7) Southeast 0 x 0.77 x 1.54 x 46.75 x 0.63 x 0.7 = 44.01 (76) South 0 x 0.77 x 1.54 x 46.75 x 0.63 x 0.7 = 44.01 (76) South 0 x 0.77 x 1.54 x 110.23 x 0.63 x 0.7 = 100.77 (7) South 0 x 0.77 x 1.54 x 110.23 x 0.63 x 0.7 = 100.76 (7) South 0 x 0.77 x 1.54 x 110.23 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 110.23 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 110.23 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 110.23 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) South 0 x 0.77 x 1.54 x 100.80 x 0.63 x 0.7 = 100.67 (7) Southwest 0 x 0.77 x 1.54 x 36.79 N 0.63 x 0.7 = 100.67 (7) Southwest 0 x 0.77 x 1.54 x 36.79 N 0.63 x 0.7 = 100.67 (7) Southwest 0 x 0.77 x 1.54 x 36.79 N 0.63 x 0.7 = 100.67 (7) Southwest 0 x 0.77 x 1.54 x 36.79 N 0.63 x 0.7 = 100.67 (7) Southwest 0 x 0.77 x 1.54 x 36.79 N 0.63 x 0.7 = 100.67 (7) Southwest 0 x 0.77 x 1.54 x 36.79 N 0.63 x	Southeast 0.9x	0.54	x	9.28	x	44.07	x	0.63	x	0.7	=	87.65	(77)
Southeast 0 sk 0.77 x 2.4 x 31.49 x 0.63 x 0.77 = 92.35 (77) Southeast 0 sk 0.77 x 1.4 x 31.49 x 0.63 x 0.77 = 92.35 (77) Southeast 0 sk 0.77 x 2.558 x 31.49 x 0.63 x 0.77 = 92.35 (77) Southeast 0 sk 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 62.36 (77) Southeast 0 sk 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 62.65 (77) South 0 sk 0.77 x 1.54 x 46.75 x 0.63 x 0.77 = 44.01 (78) South 0 sk 0.77 x 1.54 x 110.45 0.63 x 0.77 =	Southeast 0.9x	0.77	x	3.96	x	31.49	x	0.63	x	0.7] = [76.21	(77)
Southeast 0.sk 0.77 x 1.4 x 31.49 x 0.63 x 0.77 = 26.94 (77) Southeast 0.sk 0.77 x 5.58 x 31.49 x 0.63 x 0.77 = 53.7 (77) Southeast 0.sk 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 62.36 (77) Southeast 0.sk 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 62.36 (77) South 0.sk 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 44.01 (78) South 0.sk 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 91.81 (78) South 0.sk 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = <td>Southeast 0.9x</td> <td>0.77</td> <td>x</td> <td>0.84</td> <td>×</td> <td>31.49</td> <td>x</td> <td>0.63</td> <td>x</td> <td>0.7</td> <td>] = [</td> <td>16.17</td> <td>(77)</td>	Southeast 0.9x	0.77	x	0.84	×	31.49	x	0.63	x	0.7] = [16.17	(77)
Southeast 0,sk 0.77 x 558 x 31.49 x 0.63 x 0.77 s 53.7 (77) Southeast 0,sk 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 62.36 (77) Southeast 0,sk 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 20.79 (77) Southeast 0,sk 0.54 x 9.28 x 31.49 x 0.63 x 0.77 = 62.63 (77) South 0,sk 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 44.01 (78) South 0,sk 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = 103.76 (78) South 0,sk 0.77 x 1.54 x 110.87 x 0.63 x 0.77 = </td <td>Southeast 0.9x</td> <td>0.77</td> <td>x</td> <td>2.4</td> <td>x</td> <td>31.49</td> <td>x</td> <td>0.63</td> <td>x</td> <td>0.7</td> <td>=</td> <td>92.38</td> <td>(77)</td>	Southeast 0.9x	0.77	x	2.4	x	31.49	x	0.63	x	0.7	=	92.38	(77)
Southeast 0.9x 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 62.36 (77) Southeast 0.9x 0.77 x 3.96 x 31.49 x 0.63 x 0.77 = 38.11 (77) Southeast 0.9x 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 20.79 (77) Southeast 0.9x 0.54 x 92.8 x 31.49 x 0.63 x 0.77 = 62.63 (77) South 0.9x 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 91.81 (78) South 0.9x 0.77 x 1.54 x 110.55 x 0.63 x 0.77 = 103.76 (78) South 0.9x 0.77 x 1.54 x 104.89 x 0.63 x 0.77 =	Southeast 0.9x	0.77	x	1.4	×	31.49	x	0.63	x	0.7] = [26.94	(77)
Southeast 0, x 0.77 x 3.96 x 31.49 x 0.63 x 0.77 = 38.11 (77) Southeast 0, x 0.54 x 9.28 x 31.49 x 0.63 x 0.77 = 62.63 (77) South 0, x 0.77 x 1.54 x 46.75 x 0.63 x 0.77 = 44.01 (78) South 0, x 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 44.01 (78) South 0, x 0.77 x 1.54 x 77.57 x 0.63 x 0.77 = 103.76 (78) South 0, x 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = 103.76 (78) South 0, x 0.77 x 1.54 x 110.87 0.63 x 0.77 = 104.06 (78) South 0, x 0.77 x 1.54 x 101.89	Southeast 0.9x	0.77	x	5.58	x	31.49	x	0.63	x	0.7] = [53.7	(77)
Southeasto.9x 0.77 x 2.16 x 31.49 x 0.63 x 0.77 = 20.79 (77) Southeasto.9x 0.54 x 9.28 x 31.49 x 0.63 x 0.77 = 62.63 (77) South 0.9x 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 44.01 (78) South 0.9x 0.77 x 1.54 x 97.53 x 0.63 x 0.77 = 91.81 (78) South 0.9x 0.77 x 1.54 x 110.55 x 0.63 x 0.77 = 104.06 (78) South 0.9x 0.77 x 1.54 x 104.87 0.63 x 0.77 = 98.74 (78) South 0.9x 0.77 x 1.54 x 104.89 x 0.63 <td>Southeast 0.9x</td> <td>0.77</td> <td>x</td> <td>2.16</td> <td>x</td> <td>31.49</td> <td>x</td> <td>0.63</td> <td>x</td> <td>0.7</td> <td>] = [</td> <td>62.36</td> <td>(77)</td>	Southeast 0.9x	0.77	x	2.16	x	31.49	x	0.63	x	0.7] = [62.36	(77)
Southeast 0.5x 0.54 x 9.28 x 31.49 x 0.63 x 0.77 = 62.63 (77) South 0.9x 0.77 x 1.54 x 46.75 x 0.63 x 0.77 = 44.01 (78) South 0.9x 0.77 x 1.54 x 97.53 x 0.63 x 0.77 = 91.81 (78) South 0.9x 0.77 x 1.54 x 97.53 x 0.63 x 0.77 = 103.76 (78) South 0.9x 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = 108.13 (78) South 0.9x 0.77 x 1.54 x 104.89 x 0.63 x 0.77 = 98.74 (78) South 0.9x 0.77 x 1.54 x 85.54	and the second sec	0.77	x	3.96	x	31.49	x	0.63	x	0.7] = [38.11	(77)
South 0.9x 0.77 x 1.54 x 46.75 x 0.63 x 0.77 = 44.01 (78) South 0.9x 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 72.07 (78) South 0.9x 0.77 x 1.54 x 97.53 x 0.63 x 0.77 = 91.81 (78) South 0.9x 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = 108.13 (78) South 0.9x 0.77 x 1.54 x 110.55 x 0.63 x 0.77 = 104.06 (78) South 0.9x 0.77 x 1.54 x 104.89 x 0.63 x 0.77 = 98.74 (78) South 0.9x 0.77 x 1.54 x 8		0.77	x	2.16	x	31.49	x	0.63	x	0.7] = [20.79	(77)
South 0.5x 0.77 x 1.54 x 76.57 x 0.63 x 0.77 = 72.07 78 South 0.5x 0.77 x 1.54 x 97.53 x 0.63 x 0.77 = 91.81 (78) South 0.5x 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = 91.81 (78) South 0.5x 0.77 x 1.54 x 110.55 x 0.63 x 0.77 = 104.06 (78) South 0.5x 0.77 x 1.54 x 108.01 x 0.63 x 0.77 = 101.67 (78) South 0.5x 0.77 x 1.54 x 108.01 x 0.63 x 0.7 = 98.74 (78) South 0.5x 0.77 x 1.54 x 82.	Southeast 0.9x	0.54	x	9.28	x	31.49	x	0.63	X	0.7] = [62.63	(77)
South 0.9x 0.77 x 1.54 x 97.53 x 0.63 x 0.77 = 91.81 (78) South 0.9x 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = 103.76 (78) South 0.9x 0.77 x 1.54 x 110.55 x 0.63 x 0.77 = 104.06 (78) South 0.9x 0.77 x 1.54 x 100.01 x 0.63 x 0.77 = 104.06 (78) South 0.9x 0.77 x 1.54 x 104.89 x 0.63 x 0.77 = 98.74 (78) South 0.9x 0.77 x 1.54 x 82.59 x 0.63 x 0.77 = 98.74 (78) South 0.9x 0.77 x 1.54 x <td< td=""><td>South 0.9x</td><td>0.77</td><td>x</td><td>1.54</td><td>x</td><td>46.75</td><td>x</td><td>0.63</td><td>x</td><td>0.7</td><td>] = [</td><td>44.01</td><td>(78)</td></td<>	South 0.9x	0.77	x	1.54	x	46.75	x	0.63	x	0.7] = [44.01	(78)
South 0.9x 0.77 x 1.54 x 110.23 x 0.63 x 0.77 = 103.76 (78) South 0.9x 0.77 x 1.54 x 114.87 x 0.63 x 0.77 = 103.76 (78) South 0.9x 0.77 x 1.54 x 110.55 x 0.63 x 0.77 = 104.06 (78) South 0.9x 0.77 x 1.54 x 106.01 x 0.63 x 0.77 = 101.67 (79) South 0.9x 0.77 x 1.54 x 101.89 x 0.63 x 0.77 = 99.74 (78) South 0.9x 0.77 x 1.54 x 82.59 x 0.63 x 0.77 = 97.74 (78) South 0.9x 0.77 x 1.54 x <	South 0.9x	0.77	x	1.54	x	76.57	x	0.63	x	0.7	=	72.07	(78)
South 0.9x 0.77 x 1.54 x 114.87 x 0.63 x 0.7 = 108.13 (78) South 0.9x 0.77 x 1.54 x 110.55 x 0.63 x 0.7 = 104.06 (78) South 0.9x 0.77 x 1.54 x 108.01 x 0.63 x 0.7 = 104.06 (78) South 0.9x 0.77 x 1.54 x 104.89 x 0.63 x 0.7 = 98.74 (78) South 0.9x 0.77 x 1.54 x 101.89 x 0.63 x 0.7 = 95.9 (78) South 0.9x 0.77 x 1.54 x 82.59 x 0.63 x 0.7 = 52.16 (78) South 0.9x 0.77 x 1.54 x 40.4<	South 0.9x	0.77	x	1.54	x	97.53	X	0.63	x	0.7	=	91.81	(78)
South $0.9x$ 0.77 x 1.54 x 110.55 x 0.63 x 0.77 $=$ 104.06 (78) South $0.9x$ 0.77 x 1.54 x 108.01 x 0.63 x 0.7 $=$ 101.67 (78) South $0.9x$ 0.77 x 1.54 x 104.09 x 0.63 x 0.7 $=$ 98.74 (78) South $0.9x$ 0.77 x 1.54 x 101.89 x 0.63 x 0.7 $=$ 98.74 (78) South $0.9x$ 0.77 x 1.54 x 101.89 x 0.63 x 0.7 $=$ 95.9 (78) South $0.9x$ 0.77 x 1.54 x 82.59 x 0.63 x 0.7 $=$ 77.74 (78) South $0.9x$ 0.77 x 1.54 x 82.59 x 0.63 x 0.7 $=$ 52.16 (78) South $0.9x$ 0.77 x 1.54 x 55.42 x 0.63 x 0.7 $=$ 52.16 (78) Southwesto $9x$ 0.77 x 1.26 x 36.79 0.63 x 0.7 $=$ 40.48 (79) Southwesto $9x$ 0.77 x 3.75 36.79 0.63 x 0.7 $=$ 42.17 (79) Southwesto </td <td>South 0.9x</td> <td>0.77</td> <td>x</td> <td>1.54</td> <td>x</td> <td>110.23</td> <td>x</td> <td>0.63</td> <td>x</td> <td>0.7</td> <td>=</td> <td>103.76</td> <td>(78)</td>	South 0.9x	0.77	x	1.54	x	110.23	x	0.63	x	0.7	=	103.76	(78)
South 0.9x 0.77 x 1.54 x 108.01 x 0.63 x 0.77 = 101.67 (78) South 0.9x 0.77 x 1.54 x 104.89 x 0.63 x 0.77 = 98.74 (78) South 0.9x 0.77 x 1.54 x 101.89 x 0.63 x 0.77 = 98.74 (78) South 0.9x 0.77 x 1.54 x 101.89 x 0.63 x 0.77 = 95.9 (78) South 0.9x 0.77 x 1.54 x 62.59 x 0.63 x 0.7 = 52.16 (78) South 0.9x 0.77 x 1.54 x 40.4 x 0.63 x 0.7 = 52.16 (78) South 0.9x 0.77 x 1.54 x 40.4 x 0.63 x 0.7 = 102.91 (79) Southw	South 0.9x	0.77	x	1.54	x	114.87	×	0.63	x	0.7	=	108.13	(78)
South 0.9x 0.77 x 1.54 x 104.89 x 0.63 x 0.7 = 98.74 (78) South 0.9x 0.77 x 1.54 x 101.89 x 0.63 x 0.7 = 98.74 (78) South 0.9x 0.77 x 1.54 x 101.89 x 0.63 x 0.7 = 98.74 (78) South 0.9x 0.77 x 1.54 x 82.59 x 0.63 x 0.7 = 95.9 (78) South 0.9x 0.77 x 1.54 x 55.42 x 0.63 x 0.7 = 52.16 (78) South 0.9x 0.77 x 1.54 x 40.4 x 0.63 x 0.7 = 38.03 (78) Southwesto.9x 0.77 x 1.56 x 36.79 0.63 x 0.7 = 17.54 (79) Southwesto.9x 0.77	South 0.9x	0.77	x	1.54	x	110.55	x	0.63	x	0.7] = [104.06	(78)
South 0.9x 0.77 x 1.54 x 101.89 x 0.63 x 0.7 = 95.9 (78) South 0.9x 0.77 x 1.54 x 82.59 x 0.63 x 0.7 = 97.74 (78) South 0.9x 0.77 x 1.54 x 55.42 x 0.63 x 0.7 = 77.74 (78) South 0.9x 0.77 x 1.54 x 55.42 x 0.63 x 0.7 = 52.16 (78) South 0.9x 0.77 x 1.54 x 40.4 x 0.63 x 0.7 = 52.16 (78) Southwesto.9x 0.54 x 13.05 x 36.79 0.63 x 0.7 = 102.91 (79) Southwesto.9x 0.77 x 1.56 x 36.79 0.63 x 0.7 = 42.17 (79) 0.63 x 0.7 = 42.17	South 0.9x	0.77	x	1.54	x	108.01	x	0.63	x	0.7] ∈ [101.67	(78)
South $0.9x$ 0.77 x 1.54 x 82.59 x 0.63 x 0.7 $=$ 77.74 (78) South $0.9x$ 0.77 x 1.54 x 55.42 x 0.63 x 0.7 $=$ 52.16 (78) South $0.9x$ 0.77 x 1.54 x 40.4 x 0.63 x 0.7 $=$ 52.16 (78) South $0.9x$ 0.77 x 1.54 x 40.4 x 0.63 x 0.7 $=$ 52.16 (78) Southwesto.9x 0.54 x 13.05 x 36.79 0.63 x 0.7 $=$ 102.91 (79) Southwesto.9x 0.77 x 1.26 x 36.79 0.63 x 0.7 $=$ 40.48 (79) Southwesto.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 $=$ 42.17 (79) Southwesto.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 $=$ 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 $=$ 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 $=$ 42.17 (79) Southwesto.9x 0.54 x 13.05 x 62.67 0.63 <td>South 0.9x</td> <td>0.77</td> <td>x</td> <td>1.54</td> <td>x</td> <td>104.89</td> <td>x</td> <td>0.63</td> <td>x</td> <td>0.7</td> <td>] = [</td> <td>98.74</td> <td>(78)</td>	South 0.9x	0.77	x	1.54	x	104.89	x	0.63	x	0.7] = [98.74	(78)
South $0.9x$ 0.77 x 1.54 x 55.42 x 0.63 x 0.7 = 52.16 (78) South $0.9x$ 0.77 x 1.54 x 40.4 x 0.63 x 0.7 = 38.03 (78) Southwesto.9x 0.54 x 13.05 x 36.79 0.63 x 0.7 = 102.91 (79) Southwesto.9x 0.77 x 1.2 x 36.79 0.63 x 0.7 = 102.91 (79) Southwesto.9x 0.77 x 1.56 x 36.79 0.63 x 0.7 = 17.54 (79) Southwesto.9x 0.77 x 1.56 x 36.79 0.63 x 0.7 = 17.54 (79) Southwesto.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 = 42.17 (79) Southwesto.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 = 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 17.43 (79) Southwesto.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 = 17.529 (79) Southwesto.9x 0.77 x	South 0.9x	0.77	x	1.54	x	101.89	x	0.63	x	0.7	=	95.9	(78)
South0.9x0.77x1.54x40.4x0.63x0.7=38.03(78)Southwesto.9x0.54x13.05x36.790.63x0.7=102.91(79)Southwesto.9x0.77x1.2x36.790.63x0.7=102.91(79)Southwesto.9x0.77x1.2x36.790.63x0.7=40.48(79)Southwesto.9x0.77x1.56x36.790.63x0.7=17.54(79)Southwesto.9x0.77x0.91x36.790.63x0.7=30.7(79)Southwesto.9x0.77x3.75x36.790.63x0.7=42.17(79)Southwesto.9x0.54x2.21x36.790.63x0.7=42.17(79)Southwesto.9x0.54x2.21x36.790.63x0.7=17.43(79)Southwesto.9x0.54x3.4x36.790.63x0.7=17.52(79)Southwesto.9x0.54x13.05x62.670.63x0.7=175.29(79)Southwesto.9x0.77x1.56x62.670.63x0.7=68.95(79)Southwesto.9x0.77x0.91	South 0.9x	0.77	×	1.54	x	82.59	×	0.63	x	0.7	=	77.74	(78)
Southwesto.9x 0.54 x 13.05 x 36.79 0.63 x 0.7 $=$ 102.91 (79) Southwesto.9x 0.77 x 1.2 x 36.79 0.63 x 0.7 $=$ 40.48 (79) Southwesto.9x 0.77 x 1.2 x 36.79 0.63 x 0.7 $=$ 40.48 (79) Southwesto.9x 0.77 x 1.56 x 36.79 0.63 x 0.7 $=$ 17.54 (79) Southwesto.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 $=$ 30.7 (79) Southwesto.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 $=$ 42.17 (79) Southwesto.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 $=$ 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 $=$ 17.43 (79) Southwesto.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 $=$ 26.81 (79) Southwesto.9x 0.54 x 13.05 x 62.67 0.63 x 0.7 $=$ 29.88 (79) Southwesto.9x 0.77 x 1.2 x 62.67 0.63 x 0.7 $=$ 29.88 (79) Southwesto.9x 0.77 x 0.91	South 0.9x	0.77	x	1.54	X	55.42	×	0.63	X	0.7	=	52.16	(78)
Southwesto.9x 0.77 x 1.2 x 36.79 0.63 x 0.7 = 40.48 (79) Southwesto.9x 0.77 x 1.56 x 36.79 0.63 x 0.7 = 17.54 (79) Southwesto.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 = 17.54 (79) Southwesto.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 = 30.7 (79) Southwesto.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 = 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 17.43 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 17.43 (79) Southwesto.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 = 26.81 (79) Southwesto.9x 0.54 x 13.05 x 62.67 0.63 x 0.7 = 68.95 (79) Southwesto.9x 0.77 x 1.26 x 62.67 0.63 x 0.7 = 29.88 (79) Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwesto.9x 0.77 x 3.75 x 62.67	The second second	0.77	x	1.54	x	40.4	x	0.63	x	0.7	=	38.03	(78)
Southwesto.9x 0.77 x 1.56 x 36.79 0.63 x 0.7 = 17.54 (79) Southwesto.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 = 30.7 (79) Southwesto.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 = 30.7 (79) Southwesto.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 = 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 17.43 (79) Southwesto.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 = 26.81 (79) Southwesto.9x 0.54 x 13.05 x 62.67 0.63 x 0.7 = 17.529 (79) Southwesto.9x 0.77 x 1.2 x 62.67 0.63 x 0.7 = 68.95 (79) Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwesto.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 52.29 (79) Southwesto.9x 0.77 x 3.75 x 62.67		0.54	x	13.05	x	36.79		0.63	x	0.7	=	102.91	(79)
Southwest0.9x 0.77 x 0.91 x 36.79 0.63 x 0.7 = 30.7 (79) Southwest0.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 = 42.17 (79) Southwest0.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 42.17 (79) Southwest0.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 17.43 (79) Southwest0.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 = 26.81 (79) Southwest0.9x 0.54 x 13.05 x 62.67 0.63 x 0.7 = 175.29 (79) Southwest0.9x 0.77 x 1.2 x 62.67 0.63 x 0.7 = 68.95 (79) Southwest0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwest0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwest0.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 52.29 (79) Southwest0.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 52.29 (79)		0.77	x	1.2	х	36.79		0.63	X	0.7		40.48	(79)
Southwesto.9x 0.77 x 3.75 x 36.79 0.63 x 0.7 = 42.17 (79) Southwesto.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 17.43 (79) Southwesto.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 = 17.43 (79) Southwesto.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 = 26.81 (79) Southwesto.9x 0.54 x 13.05 x 62.67 0.63 x 0.7 = 175.29 (79) Southwesto.9x 0.77 x 1.2 x 62.67 0.63 x 0.7 = 68.95 (79) Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwesto.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 52.29 (79)	CALL IN MULTING CONTRACTOR	0.77	x	1.56	x	36.79		0.63	x	0.7	=	17.54	(79)
Southwest0.9x 0.54 x 2.21 x 36.79 0.63 x 0.7 = 17.43 (79) Southwest0.9x 0.54 x 3.4 x 36.79 0.63 x 0.7 = 26.81 (79) Southwest0.9x 0.54 x 13.05 x 62.67 0.63 x 0.7 = 175.29 (79) Southwest0.9x 0.77 x 1.2 x 62.67 0.63 x 0.7 = 68.95 (79) Southwest0.9x 0.77 x 1.56 x 62.67 0.63 x 0.7 = 29.88 (79) Southwest0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwest0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwest0.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 52.29 (79)		0.77	x	0.91	х	36.79	1	0.63	x	0.7	=	30.7	(79)
Southwest 0.54 \times 3.4 \times 36.79 0.63 \times 0.7 $=$ 26.81 (79) Southwest $0.9x$ 0.54 \times 13.05 \times 62.67 0.63 \times 0.7 $=$ 175.29 (79) Southwest $0.9x$ 0.77 \times 1.2 \times 62.67 0.63 \times 0.7 $=$ 68.95 (79) Southwest $0.9x$ 0.77 \times 1.56 \times 62.67 0.63 \times 0.7 $=$ 29.88 (79) Southwest 0.77 \times 0.91 \times 62.67 0.63 \times 0.7 $=$ 52.29 (79) Southwest 0.77 \times 3.75 \times 62.67 0.63 \times 0.7 $=$ 52.29 (79)		0.77	x	3.75	x	36.79		0.63	x	0.7	=	42.17	(79)
Southwesto.9x 0.54 x 13.05 x 62.67 0.63 x 0.7 = 175.29 (79) Southwesto.9x 0.77 x 1.2 x 62.67 0.63 x 0.7 = 68.95 (79) Southwesto.9x 0.77 x 1.56 x 62.67 0.63 x 0.7 = 29.88 (79) Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwesto.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 71.83 (79)	and the second second second second	0.54	x	2.21	х	36.79		0.63	x	0.7	=	17.43	(79)
Southwest 0.9x 0.77 x 1.2 x 62.67 0.63 x 0.7 = 68.95 (79) Southwest 0.9x 0.77 x 1.56 x 62.67 0.63 x 0.7 = 29.88 (79) Southwest 0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwest 0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwest 0.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 71.83 (79)	and subscreams used as A	0.54	x	3.4	x	36.79	1 1	0.63	x	0.7	<u> </u> = [26.81	(79)
Southwest0.9x 0.77 x 1.56 x 62.67 0.63 x 0.7 = 29.88 (79) Southwest0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 29.88 (79) Southwest0.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwest0.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 71.83 (79)		0.54		13.05	x	62.67	ļļ	0.63	x	0.7	4 1	175.29	
Southwesto.9x 0.77 x 0.91 x 62.67 0.63 x 0.7 = 52.29 (79) Southwesto.9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 52.29 (79)		0.77	1	1.2	4 🔅	62.67	ļļ	0.63		0.7	4 1	68.95	-
Southwesto_9x 0.77 x 3.75 x 62.67 0.63 x 0.7 = 71.83 (79)		0.77	x	1.56	x	62.67		0.63	x	0.7	ļ	29.88	=
		0.77	x	0.91	X	62.67		0.63	x	0.7	= L	52.29	=
Southwest0.9x 0.54 x 2.21 x 62.67 0.63 x 0.7 = 29.69 (79)		0.77		3.75	×	62.67	ļļ	0.63	x	0.7	4 1	71.83	
	Southwest0.9x	0.54	x	2.21	X	62.67	L I	0.63	x	0.7	=	29.69	(79)

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Southwest0.9x	0.54	x	3.4	x	62.67	0.63	x	0.7	(=)	45.67	(79)
Southwesto.9x	0.54	x	13.05	x	85.75	0.63	x	0.7	=	239.85	(79)
Southwesto.9x	0.77	x	1.2	x	85.75	0.63	x	0.7	=	94.35	(79)
Southwest0.9x	0.77	x	1.56	x	85.75	0.63	x	0.7	=	40.88	(79)
Southwest0.9x	0.77	x	0.91	x	85.75	0.63	x	0.7	-	71.55	(79)
Southwesto.9x	0.77	x	3.75	x	85.75	0.63	x	0.7	=	98.28	(79)
Southwest0.9x	0.54	x	2.21	x	85.75	0.63	x	0.7	=	40.62	(79)
Southwesto.9x	0.54	×	3.4	x	85.75	0.63	x	0.7	=	62.49	(79)
Southwest0.9x	0.54	x	13.05	×	106.25	0.63	x	0.7	=	297.18	(79)
Southwesto.9x	0.77	x	1.2	x	106.25	0.63	x	0.7	=	116.9	(79)
Southwesto.9x	0.77	x	1.56	×	106.25	0.63	x	0.7	=	50.66	(79)
Southwesto.9x	0.77	x	0.91	x	106.25	0.63	x	0.7	=	88.65	(79)
Southwesto.9x	0.77	x	3.75	x	106.25	0.63	x	0.7	=	121.77	(79)
Southwest0.9x	0.54	x	2.21	x	106.25	0.63	x	0.7	=	50.33	(79)
Southwest0.9x	0.54	x	3.4	x	106.25	0.63	x	0.7	=	77.43	(79)
Southwesto.9x	0.54	x	13.05	x	119.01	0.63	x	0.7	=	332.87	(79)
Southwesto.9x	0.77	x	1.2	x	119.01	0.63	x	0.7	=	130.94	(79)
Southwest0.9x	0.77	x	1.56	x	119.01	0.63	x	0.7	=	56.74	(79)
Southwest0.9x	0.77	X	0.91	x	119.01	0.63	x	0.7	=	99.29	(79)
Southwest0.9x	0.77	x	3.75	x	119.01	0.63	x	0.7	=	136.39	(79)
Southwest0.9x	0.54	x	2.21	x	119.01	0.63	x	0.7	=	56.37	(79)
Southwesto.9x	0.54	x	3.4	x	119.01	0.63	x	0.7	=	86.72	(79)
Southwest0.9x	0.54	x	13.05	x	118.15	0.63	x	0.7	=	330.46	(79)
Southwest0.9x	0.77	x	1.2	x	118.15	0.63	x	0.7	=	129.99	(79)
Southwesto.9x	0.77	x	1.56	x	118.15	0.63	x	0.7	=	56.33	(79)
Southwest0.9x	0.77	x	0.91	x	118.15	0.63	x	0.7	=	98.58	(79)
Southwest0.9x	0.77	x	3.75	x	118.15	0.63	x	0.7	=	135.41	(79)
Southwest0.9x	0.54	x	2.21	x	118.15	0.63	x	0.7	=	55.96	(79)
Southwest0.9x	0.54	x	3.4	x	118.15	0.63	x	0.7	=	86.1	(79)
Southwesto_9x	0.54	x	13.05	х	113.91	0.63	X	0.7	=	318.6	(79)
Southwest0.9x	0.77	x	1.2	x	113.91	0.63	x	0.7	=	125.32	(79)
Southwest0.9x	0.77	x	1.56	x	113.91	0.63	x	0.7	=	54.31	(79)
Southwest0.9x	0.77	x	0.91	x	113.91	0.63	x	0.7	=	95.04	(79)
Southwest0.9x	0.77	x	3.75	x	113.91	0.63	x	0.7	=	130.55	(79)
Southwesto 9x	0.54	x	2.21	×	113.91	0.63	x	0.7	-	53.95	(79)
Southwesto.9x	0.54	x	3.4	x	113.91	0.63	x	0.7	=	83.01	(79)
Southwest0.9x	0.54	x	13.05	×	104.39	0.63	x	0.7	=	291.98	(79)
Southwesto.9x	0.77	x	1.2	x	104.39	0.63	x	0.7	:=:	114.85	(79)
Southwest _{0.9x}	0.77	x	1.56	х	104.39	0.63	x	0.7	=	49.77	(79)
Southwesto.9x	0.77	x	0.91	×	104.39	0.63	x	0.7	=	87.1	(79)
Southwesto.9x	0.77	x	3.75	X	104.39	0.63	x	0.7	(E (119.64	(79)

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Southwest0.9x	0.54	x	2.21	x	104.39	1 1	0.63	x	0.7	-	49.45	(79)
Southwest0.9x	0.54	T x T	3.4	i x i	104.39	i i	0.63	1 × F	0.7	i - F	76.07	(79)
Southwest0.9x	0.54	T × T	13.05	i x i	92.85	i i	0.63	ī x Ē	0.7	i - F	259.7	(79)
Southwest0.9x	0.77		1.2	i x i	92.85	i i	0.63	ī × Ē	0.7	i - F	102.16	(79)
Southwest0.9x	0.77	T x T	1.56	ī x ī	92.85	i i	0.63	Ī×Ē	0.7	i - F	44.27	(79)
Southwesto_9x	0.77	ī × Ē	0.91	i × i	92.85	i i	0.63	ī×Ē	0.7	i - L	77.47	(79)
Southwest0.9x	0.77	X	3.75	ī × ī	92.85	i i	0.63	Ī×Ī	0.7	i = [106.41	(79)
Southwesto.9x	0.54	1 × [2.21	i × i	92.85	1 1	0.63	Ī×Ī	0.7	T = T	43.98	(79)
Southwest0.9x	0.54	x	3.4	ī × Ī	92.85	īi	0.63	Ī×Ē	0.7	-	67.66	(79)
Southwesto.9x	0.54	x	13.05	x	69.27	1	0.63	x	0.7	= [193.74	(79)
Southwesto.9x	0.77	×	1.2	×	69.27	1	0.63	×	0.7] = [76.21	(79)
Southwest0.9x	0.77	x	1.56	x	69.27] [0.63	x	0.7] = [33.02	(79)
Southwest0.9x	0.77	x	0.91	x	69.27] [0.63	x	0.7	=	57.79	(79)
Southwest0.9x	0.77	x	3.75	x	69.27		0.63	×	0.7	=	79.38	(79)
Southwest0.9x	0.54	x	2.21	×	69.27] [0.63	x	0.7] = [32.81	(79)
Southwesto.9x	0.54	x	3.4	x	69.27] [0.63	x	0.7	=	50.48	(79)
Southwesto.9x	0.54	x	13.05	×	44.07] [0.63	x	0.7	-	123.26	(79)
Southwest0.9x	0.77	x	1.2	x	44.07] [0.63	x	0.7	=	48.49	(79)
Southwesto.9x	0.77	x	1.56	x	44.07]	0.63	x	0.7	(=)	21.01	(79)
Southwest0.9x	0.77	x	0.91	x	44.07] [0.63	x	0.7	=	36.77	(79)
Southwest0.9x	0.77	x	3.75	x	44.07		0.63	x	0.7	(=)	50.51	(79)
Southwesto.9x	0.54	x	2.21	x	44.07] [0.63	x	0.7	=	20.87	(79)
Southwesto.9x	0.54	x	3.4	x	44.07		0.63	x	0.7	=	32.11	(79)
Southwest0.9x	0.54	x	13.05	x	31.49] [0.63	x	0.7] = [88.07	(79)
Southwesto.9x	0.77	x	1.2	x	31.49		0.63	x	0.7	=	34.64	(79)
Southwesto.9x	0.77	×	1.56	x	31.49		0.63	x	0.7	=	15.01	(79)
Southwest0.9x	0.77	x	0.91	x	31.49		0.63	×	0.7	=	26.27	(79)
Southwesto_9x	0.77	x	3.75	x	31.49		0.63	x	0.7	=	36.09	(79)
Southwest0.9x	0.54	×	2.21	×	31.49		0.63	×	0.7	=	14.91	(79)
Southwest0.9x	0.54	x	3.4	х	31.49		0.63	X	0.7	=	22.95	(79)
Northwest 0.9x	0.77	×	12.18	×	11.28	×	0.63	x	0.7	=	42	(81)
Northwest 0.9x	0.77	x	20.01	х	11.28	x	0.63	х	0.7	(=)	69	(81)
Northwest 0.9x	0.54	x	3.77	x	11.28	x	0.63	x	0.7	(=)	27.35	(81)
Northwest 0.9x	0.54	x	3.48	х	11.28	X	0.63	x	0.7	=	8.42	(81)
Northwest 0.9x	0.77	x	2.16	×	11.28	x	0.63	x	0.7	=	7.45	(81)
Northwest 0.9x	0.77	x	2.4	x	11.28	×	0.63	x	0.7	(=)	24.83	(81)
Northwest 0.9x	0.77	×	3.6	×	11.28	x	0.63	×	0.7	=	12.41	(81)
Northwest 0.9x	0.77	x	2.86	×	11.28	x	0.63	x	0.7	=	9.86	(81)
Northwest 0.9x	0.77	x	0.5	×	11.28	X	0.63	x	0.7	=	1.72	(81)
Northwest 0.9x	0.77	x	0.7	×	11.28	x	0.63	_ × [0.7	_ = [2.41	(81)
Northwest 0.9x	0.77	x	2.52	x	11.28	x	0.63	x	0.7	=	8.69	(81)

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Northwest 0.9x	0.77	x	1.44] × [11.28	×	0.63	×	0.7		9.93	(81)
Northwest 0.9x	0.77	x	12.18	Ī×Ī	22.97	x	0.63	Ī×Ī	0.7	ī <u>-</u> [85.49	(81)
Northwest 0.9x	0.77	1 × 1	20.01	Í × ľ	22.97	ī x Г	0.63	Ī×Ī	0.7	i - F	140.45	(81)
Northwest 0.9x	0.54	x	3.77	Ī×Ī	22.97	x	0.63	X	0.7	ī - [55.67	(81)
Northwest 0.9x	0.54	x	3.48] × [22.97	x	0.63] × [0.7] = [17.13	(81)
Northwest 0.9x	0.77	x	2.16] × [22.97	×	0.63] × [0.7] = [15.16	(81)
Northwest 0.9x	0.77	x	2.4] × [22.97	×	0.63] × [0.7	=	50.54	(81)
Northwest 0.9x	0.77	x	3.6] × [22.97	×	0.63] × [0.7] = [25.27	(81)
Northwest 0.9x	0.77	x	2.86] × [22.97	×	0.63) × [0.7] = [20.07	(81)
Northwest 0.9x	0.77	x	0.5) × [22.97	x	0.63	x	0.7] = [3.51	(81)
Northwest 0.9x	0.77	x	0.7] × [22.97	×	0.63] × [0.7] = [4.91	(81)
Northwest 0.9x	0.77	x	2.52	x	22.97	x	0.63	x	0.7	=	17.69	(81)
Northwest 0.9x	0.77	x	1.44) × [22.97	×	0.63) × [0.7	=	20.21	(81)
Northwest 0.9x	0.77	x	12.18	x	41.38	x	0.63	x	0.7] = [154.03	(81)
Northwest 0.9x	0.77	x	20.01] × [41.38	x	0.63) × [0.7] = [253.04	(81)
Northwest 0.9x	0.54	x	3.77	×	41.38	x	0.63	x (0.7] = [100.3	(81)
Northwest 0.9x	0.54	x	3.48	×	41.38	x	0.63	×	0.7	=	30.86	(81)
Northwest 0.9x	0.77	x	2.16	×	41.38	×	0.63	x	0.7	=	27.32	(81)
Northwest 0.9x	0.77	X	2.4	×	41.38	X	0.63	x	0.7	=	91.05	(81)
Northwest 0.9x	0.77	x	3.6	×	41.38	×	0.63	×	0.7	=	45.53	(81)
Northwest 0.9x	0.77	x	2.86	×	41.38	×	0.63	x	0.7	=	36.17	(81)
Northwest 0.9x	0.77	x	0.5	×	41.38	×	0.63	×	0.7	=	6.32	(81)
Northwest 0.9x	0.77	x	0.7	×	41.38	x	0.63	×	0.7	=	8.85	(81)
Northwest 0.9x	0.77	x	2.52	×	41.38	×	0.63	×	0.7	=	31.87	(81)
Northwest 0.9x	0.77	x	1.44	×	41.38	x	0.63	×	0.7	=	36.42	(81)
Northwest 0.9x	0.77	x	12.18	×	67.96	×	0.63	×	0.7		252.96	(81)
Northwest 0.9x	0.77	x	20.01	×	67.96	×	0.63	×	0.7	=	415.57	(81)
Northwest 0.9x	0.54	x	3.77	×	67.96	×	0.63		0.7	╡╹┝	164.73	(81)
Northwest 0.9x	0.54	x	3.48	×	67.96	×	0.63	×	0.7	╡╹┝	50.69	(81)
Northwest 0.9x	0.77	x	2.16	×	67.96	×	0.63	x	0.7	╡╹┝	44.86	(81)
Northwest 0.9x	0.77	×	2.4	I × L	67.96	╡ [×] ┝	0.63	Į×Ļ	0.7	╡╹┝	149.53	(81)
Northwest 0.9x	0.77	x	3.6	X	67.96	×	0.63	X	0.7	╡╹┝	74.77	(81)
Northwest 0.9x	0.77	x	2.86		67.96		0.63		0.7		59.4	(81)
and and the second of the	0.77	х	0.5	Į×Ļ	67.96		0.63	╡ [×] ┝	0.7	╡╹┝	10.38	(81)
Northwest 0.9x	0.77	x	0.7		67.96		0.63		0.7	╡╴┝	14.54	(81)
Northwest 0.9x	0.77	×	2.52		67.96		0.63		0.7		52.34	(81)
Northwest 0.9x	0.77	X	1.44		67.96		0.63		0.7	╡┋┝	59.81	(81)
Northwest 0.9x	0.77	×	12.18		91.35	╡┈┝	0.63		0.7	╡╴┝	340.02	(81)
Northwest 0.9x	0.77	×	20.01		91.35		0.63		0.7	╡┋┝	558.61	(81)
Northwest 0.9x	0.54	×	3.77		91.35		0.63		0.7	╡┋┝	221.43	(81)
Horumest 0.9X	0.54	х	3.48	X	91.35	x	0.63	X	0.7	=	68.13	(81)

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Northwest 0.9x	0.77	x	2.16] × [91.35] × [0.63	×	0.7] ∈ [60.3	(81)
Northwest 0.9x	0.77	x	2.4	i x i	91.35	Ī × Ē	0.63	Ī×Ī	0.7	ī <u>-</u> [201	(81)
Northwest 0.9x	0.77	x	3.6	i x i	91.35	ī × Ē	0.63	Ī×Ī	0.7	i - F	100.5	(81)
Northwest 0.9x	0.77	x	2.86	İ x İ	91.35	ī × ī	0.63	Ī×Ī	0.7	ī = [79.84	(81)
Northwest 0.9x	0.77	x	0.5	İ x İ	91.35	T x T	0.63	Ī×Ī	0.7	ī - Ē	13.96	(81)
Northwest 0.9x	0.77	x	0.7	İ x İ	91.35] × [0.63	Ī×Ī	0.7	ī - [19.54	(81)
Northwest 0.9x	0.77	x	2.52	i x i	91.35	Ī × Ī	0.63	Ī×Ī	0.7	1 = [70.35	(81)
Northwest 0.9x	0.77	x	1.44	İ×İ	91.35	1 × [0.63	Ī × Ī	0.7	ī - Ē	80.4	(81)
Northwest 0.9x	0.77	x	12.18) × [97.38	×	0.63] × [0.7	=	362.5	(81)
Northwest 0.9x	0.77	x	20.01	x	97.38	x	0.63	x	0.7] = [595.54	(81)
Northwest 0.9x	0.54	x	3.77) × [97.38	×	0.63) × [0.7] = [236.06	(81)
Northwest 0.9x	0.54	x	3.48) × [97.38	x	0.63) × [0.7] = [72.63	(81)
Northwest 0.9x	0.77	x	2.16) × [97.38	× [0.63) × [0.7] = [64.29	(81)
Northwest 0.9x	0.77	x	2.4	x	97.38	x	0.63	x	0.7	=	214.29	(81)
Northwest 0.9x	0.77	x	3.6) × [97.38	x	0.63	x	0.7	=	107.14	(81)
Northwest 0.9x	0.77	x	2.86	x	97.38	x	0.63	x	0.7	=	85.12	(81)
Northwest 0.9x	0.77	x	0.5	×	97.38	x	0.63	x	0.7	=	14.88	(81)
Northwest 0.9x	0.77	x	0.7	x	97.38	×	0.63	x	0.7	=	20.83	(81)
Northwest 0.9x	0.77	x	2.52	x	97.38	x	0.63	x	0.7	=	75	(81)
Northwest 0.9x	0.77	x	1.44	x	97.38	x	0.63	x	0.7	=	85.71	(81)
Northwest 0.9x	0.77	x	12.18	x	91.1	×	0.63	x	0.7	=	339.11	(81)
Northwest 0.9x	0.77	x	20.01	x	91.1	×	0.63	x	0.7] = [557.11	(81)
Northwest 0.9x	0.54	x	3.77	x	91.1	x	0.63	×	0.7		220.83	(81)
Northwest 0.9x	0.54	x	3.48	x	91.1	x	0.63	×	0.7] = [67.95	(81)
Northwest 0.9x	0.77	x	2.16	x	91.1	x	0.63	×	0.7	=	60.14	(81)
Northwest 0.9x	0.77	x	2.4	x	91.1	×	0.63	×	0.7	=	200.46	(81)
Northwest 0.9x	0.77	x	3.6	x	91.1	×	0.63	×	0.7	=	100.23	(81)
Northwest 0.9x	0.77	x	2.86	x	91.1	x	0.63	x	0.7	=	79.63	(81)
Northwest 0.9x	0.77	x	0.5	×	91.1	×	0.63	x	0.7	=	13.92	(81)
Northwest 0.9x	0.77	x	0.7	х	91.1	x	0.63	x	0.7	_ = _	19.49	(81)
Northwest 0.9x	0.77	x	2.52	×	91.1	×	0.63	×	0.7	=	70.16	(81)
Northwest 0.9x	0.77	x	1.44	х	91.1	x	0.63	x	0.7	=	80.18	(81)
Northwest 0.9x	0.77	x	12.18	×	72.63	×	0.63	×	0.7	=	270.34	(81)
Northwest 0.9x	0.77	x	20.01	x	72.63	x	0.63	×	0.7	=	444.14	(81)
Northwest 0.9x	0.54	x	3.77	×	72.63	×	0.63	×	0.7		176.05	(81)
Northwest 0.9x	0.54	x	3.48	x	72.63	×	0.63	×	0.7	=	54.17	(81)
Northwest 0.9x	0.77	x	2.16	×	72.63	×	0.63	×	0.7	=	47.94	(81)
Northwest 0.9x	0.77	x	2.4	x	72.63	×	0.63	×	0.7		159.81	(81)
Northwest 0.9x	0.77	x	3.6	x	72.63	×	0.63	×	0.7	=	79.9	(81)
Northwest 0.9x	0.77	x	2.86	×	72.63	×	0.63	×	0.7	╡╹┝	63.48	(81)
Northwest 0.9x	0.77	x	0.5	x	72.63	x	0.63	x	0.7	(=)	11.1	(81)

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Northwest 0.9x	0.77	x	0.7	x	72.63	x	0.63	x	0.7] = [15.54	(81)
Northwest 0.9x	0.77	x	2.52	x	72.63	x	0.63	x	0.7	i <u>-</u> F	55.93	(81)
Northwest 0.9x	0.77	×	1.44	x	72.63	x	0.63	x	0.7	i - F	63.92	(81)
Northwest 0.9x	0.77	x	12.18	x	50.42	x	0.63	x	0.7	i - F	187.68	(81)
Northwest 0.9x	0.77	x	20.01	x	50.42	x	0.63	x	0.7	1 - [308.34	(81)
Northwest 0.9x	0.54	x	3.77	x	50.42	x	0.63	x	0.7	i - F	122.22	(81)
Northwest 0.9x	0.54	x	3.48	x	50.42	x	0.63	x	0.7	1 = [37.61	(81)
Northwest 0.9x	0.77	x	2.16	x	50.42	×	0.63	x	0.7	1 = [33.28	(81)
Northwest 0.9x	0.77	x	2.4	x	50.42	×	0.63	x	0.7] = [110.95	(81)
Northwest 0.9x	0.77	x	3.6	x	50.42	x	0.63	x	0.7] = [55.47	(81)
Northwest 0.9x	0.77	x	2.86	x	50.42	x	0.63	x	0.7] = [44.07	(81)
Northwest 0.9x	0.77	x	0.5	x	50.42	x	0.63	x	0.7] = [7.7	(81)
Northwest 0.9x	0.77	x	0.7	x	50.42	x	0.63	x	0.7] = [10.79	(81)
Northwest 0.9x	0.77	x	2.52	x	50.42	x	0.63	x	0.7	=	38.83	(81)
Northwest 0.9x	0.77	x	1.44	x	50.42	x	0.63	x	0.7] = [44.38	(81)
Northwest 0.9x	0.77	x	12.18	x	28.07	x	0.63	(X)	0.7] = [104.48	(81)
Northwest 0.9x	0.77	x	20.01	x	28.07	x	0.63	x	0.7	=	171.64	(81)
Northwest 0.9x	0.54	x	3.77	x	28.07	x	0.63	x	0.7	=	68.04	(81)
Northwest 0.9x	0.54	x	3.48	x	28.07	×	0.63	x	0.7] = [20.93	(81)
Northwest 0.9x	0.77	x	2.16	x	28.07	×	0.63	x	0.7	=	18.53	(81)
Northwest 0.9x	0.77	x	2.4	x	28.07	×	0.63	x	0.7	=	61.76	(81)
Northwest 0.9x	0.77	x	3.6	x	28.07	×	0.63	x	0.7] = [30.88	(81)
Northwest 0.9x	0.77	x	2.86	x	28.07	x	0.63	x	0.7	=	24.53	(81)
Northwest 0.9x	0.77	x	0.5	x	28.07	x	0.63	x	0.7	=	4.29	(81)
Northwest 0.9x	0.77	x	0.7	x	28.07	x	0.63	x	0.7	=	6	(81)
Northwest 0.9x	0.77	x	2.52	x	28.07	×	0.63	x	0.7	=	21.62	(81)
Northwest 0.9x	0.77	x	1.44	x	28.07	×	0.63	x	0.7	=	24.7	(81)
Northwest 0.9x	0.77	x	12.18	x	14.2	x	0.63	x	0.7		52.85	(81)
Northwest 0.9x	0.77	x	20.01	x	14.2	×	0.63	x	0.7	=	86.82	(81)
Northwest 0.9x	0.54	x	3.77	x	14.2	x	0.63	x	0.7	=	34.41	(81)
Northwest 0.9x	0.54	x	3.48	×	14.2	×	0.63	x	0.7] = L	10.59	(81)
Northwest 0.9x	0.77	x	2.16	х	14.2	×	0.63	x	0.7		9.37	(81)
Northwest 0.9x	0.77	x	2.4	x	14.2	×	0.63	x	0.7] = [31.24	(81)
Northwest 0.9x	0.77	x	3.6	x	14.2	X	0.63	x	0.7		15.62	(81)
Northwest 0.9x	0.77	x	2.86	x	14.2	x	0.63	x	0.7	╡╹┝	12.41	(81)
Northwest 0.9x	0.77	x	0.5	x	14.2	x	0.63	x	0.7	=	2.17	(81)
Northwest 0.9x	0.77	x	0.7	×	14.2	X	0.63	x	0.7] = [3.04	(81)
Northwest 0.9x	0.77	x	2.52	x	14.2	X	0.63	x	0.7		10.93	(81)
Northwest 0.9x	0.77	x	1.44	X	14.2	X	0.63	x	0.7	╡╹┝	12.5	(81)
Northwest 0.9x	0.77	x	12.18	×	9.21	x	0.63	x	0.7	=	34.3	(81)
Northwest 0.9x	0.77	x	20.01	x	9.21	x	0.63	X	0.7	=	56.35	(81)

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SAP WorkSheet:	New dwelling	design stage
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Northwest 0.9x	0.54	x	3.77	x	9.21	x	0.63	x	0.7	=	22.34	(81)
Northwest 0.9x	0.54	x	3.48	x	9.21	x	0.63	1 x	0.7	=	6.87	(81)
Northwest 0.9x	0.77	x	2.16	x	9.21	x	0.63	x	0.7	=	6.08	(81)
Northwest 0.9x	0.77	x	2.4	x	9.21	x	0.63	x	0.7	=	20.28	(81)
Northwest 0.9x	0.77	x	3.6	x	9.21	x	0.63	x	0.7	=	10.14	(81)
Northwest 0.9x	0.77	x	2.86	x	9.21	x	0.63	x	0.7	=	8.05	(81)
Northwest 0.9x	0.77	x	0.5	x	9.21	x	0.63	x	0.7	=	1.41	(81)
Northwest 0.9x	0.77	x	0.7	x	9.21	x	0.63	x	0.7	=	1.97	(81)
Northwest 0.9x	0.77	x	2.52	x	9.21	x	0.63	x	0.7	=	7.1	(81)
Northwest 0.9x	0.77	x	1.44	x	9.21	x	0.63	x	0.7	=	8.11	(81)
Rooflights 0.9x	1	x	6.3	×	26	x	0.63	x	0.7	=	65.01	(82)
Rooflights 0.9x	1	x	12.26	x	26	x	0.63	x	0.7	=	126.52	(82)
Rooflights 0.9x	1	x	6.27	x	26	x	0.63	x	0.7	=	64.7	(82)
Rooflights 0.9x	1	x	7.84	x	26	x	0.63	x	0.7	=	80.9	(82)
Rooflights 0.9x	1	x	3.96	x	26	x	0.63	x	0.7	=	40.86	(82)
Rooflights 0.9x	1	x	0.64	x	39.98	x	0.63	x	0.7	=	10.15	(82)
Rooflights 0.9x	1	x	6.3	x	54	x	0.63	x	0.7	=	135.03	(82)
Rooflights 0.9x	1	x	12.26	x	54	x	0.63	x	0.7	=	262.76	(82)
Rooflights 0.9x	1	X	6.27	x	54	X	0.63	x	0.7	=	134.38	(82)
Rooflights 0.9x	1	x	7.84	x	54	x	0.63	x	0.7	=	168.03	(82)
Rooflights 0.9x	1	x	3.96	x	54	x	0.63	x	0.7	=	84.87	(82)
Rooflights 0.9x	1	x	0.64	x	73.48	×	0.63	x	0.7	=	18.67	(82)
Rooflights 0.9x	1	x	6.3	x	96	x	0.63	x	0.7	=	240.05	(82)
Rooflights 0.9x	1	x	12.26	x	96	x	0.63	x	0.7	=	467.14	(82)
Rooflights 0.9x	1	x	6.27	x	96	x	0.63	x	0.7	=	238.9	(82)
Rooflights 0.9x	1	x	7.84	x	96	x	0.63	x	0.7	=	298.72	(82)
Rooflights 0.9x	1	x	3.96	x	96	×	0.63	x	0.7	=	150.89	(82)
Rooflights 0.9x	1	x	0.64	x	112.11	x	0.63	x	0.7	=	28.48	(82)
Rooflights 0.9x	1	x	6.3	x	150	x	0.63	x	0.7	=	375.07	(82)
Rooflights 0.9x	1	x	12.26	х	150	x	0.63	x	0.7	=	729.9	(82)
Rooflights 0.9x	1	x	6.27	×	150	x	0.63	x	0.7	=	373.28	(82)
Rooflights 0.9x	1	x	7.84	х	150	x	0.63	x	0.7	=	466.75	(82)
Rooflights 0.9x	1	x	3.96	x	150	x	0.63	x	0.7	(=)	235.76	(82)
Rooflights 0.9x	1	x	0.64	x	153.81	X	0.63	x	0.7	=	39.07	(82)
Rooflights 0.9x	1	x	6.3	x	192	x	0.63	x	0.7	=	480.09	(82)
Rooflights 0.9x	1	x	12.26	x	192	x	0.63	x	0.7	=	934.27	(82)
Rooflights 0.9x	1	x	6.27	×	192	x	0.63	x	0.7	=	477.8	(82)
Rooflights 0.9x	1	x	7.84	x	192	x	0.63	x	0.7	=	597.45	(82)
Rooflights 0.9x	1	x	3.96	x	192	x	0.63	x	0.7	=	301.77	(82)
Rooflights 0.9x	1	x	0.64	x	182.63	x	0.63	x	0.7	=	46.39	(82)
Rooflights 0.9x	1	x	6.3	x	200	X	0.63	x	0.7	=	500.09	(82)

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Rooflights 0.9x	1	x	12.26	x	200	x	0.63	x	0.7] = [973.2	(82)
Rooflights 0.9x	1] x [6.27	×	200	x	0.63	x	0.7	i = F	497.71	(82)
Rooflights 0.9x	1	Ī×Ī	7.84	x	200	x	0.63	x	0.7	1 = 1	622.34	(82)
Rooflights 0.9x	1	1 x [3.96	x	200	x	0.63	x	0.7	1 = [314.34	(82)
Rooflights 0.9x	1	x	0.64	x	184.99	x	0.63] x	0.7	i - F	46.99	(82)
Rooflights 0.9x	1	1 x [6.3	1 × I	189	x	0.63	1 ×	0.7	i - F	472.59	(82)
Rooflights 0.9x	1	x	12.26	x	189	x	0.63	x	0.7	1 = [919.67	(82)
Rooflights 0.9x	1	x	6.27	×	189	x	0.63	x	0.7	ī - Ē	470.34	(82)
Rooflights 0.9x	1	x	7.84	1 × 1	189	x	0.63	x	0.7	ī = [588.11	(82)
Rooflights 0.9x	1	x	3.96	x	189	x	0.63	x	0.7] = [297.06	(82)
Rooflights 0.9x	1	×	0.64	×	176.88	x	0.63	x	0.7] = [44.93	(82)
Rooflights 0.9x	1	x	6.3	x	157	x	0.63	x	0.7] = [392.57	(82)
Rooflights 0.9x	1	x	12.26	x	157	x	0.63	x	0.7] = [763.96	(82)
Rooflights 0.9x	1	x	6.27	x	157	x	0.63	x	0.7	=	390.7	(82)
Rooflights 0.9x	1	x	7.84	×	157	x	0.63	x	0.7] = [488.54	(82)
Rooflights 0.9x	1	x	3.96	x	157	x	0.63	x	0.7] = [246.76	(82)
Rooflights 0.9x	1	x	0.64	x	155.4	x	0.63	x	0.7] = [39.47	(82)
Rooflights 0.9x	1	x	6.3	x	115	x	0.63	x	0.7] = [287.55	(82)
Rooflights 0.9x	1	x	12.26	x	115	X	0.63	x	0.7] = [559.59	(82)
Rooflights 0.9x	1	x	6.27	x	115	x	0.63	x	0.7] = [286.18	(82)
Rooflights 0.9x	1	x	7.84	x	115	x	0.63	x	0.7	=	357.85	(82)
Rooflights 0.9x	1	x	3.96	x	115	x	0.63	x	0.7] = [180.75	(82)
Rooflights 0.9x	1	x	0.64	x	126.86	x	0.63	x	0.7] = [32.22	(82)
Rooflights 0.9x	1	x	6.3	x	66	x	0.63	x	0.7] = [165.03	(82)
Rooflights 0.9x	1	x	12.26	x	66	x	0.63	x	0.7	=	321.16	(82)
Rooflights 0.9x	1	x	6.27	x	66	x	0.63	x	0.7	=	164.25	(82)
Rooflights 0.9x	1	x	7.84	x	66	×	0.63	x	0.7] = [205.37	(82)
Rooflights 0.9x	1	x	3.96	x	66	x	0.63	x	0.7] = [103.73	(82)
Rooflights 0.9x	1	×	0.64	×	84.6	x	0.63	x	0.7	=	21.49	(82)
Rooflights 0.9x	1	x	6.3	х	33	x	0.63	x	0.7] =	82.52	(82)
Rooflights 0.9x	1	x	12.26	x	33	x	0.63	x	0.7	=	160.58	(82)
Rooflights 0.9x	1	x	6.27	x	33	x	0.63	x	0.7	=	82.12	(82)
Rooflights 0.9x	1	x	7.84	x	33	x	0.63	x	0.7	:=)	102.69	(82)
Rooflights 0.9x	1	x	3.96	х	33	X	0.63	x	0.7	=	51.87	(82)
Rooflights 0.9x	1	x	0.64	x	48.93	x	0.63	x	0.7	=	12.43	(82)
Rooflights 0.9x	1	x	6.3	x	21	x	0.63	x	0.7	=	52.51	(82)
Rooflights 0.9x	1	x	12.26	×	21	x	0.63	×	0.7	=	102.19	(82)
Rooflights 0.9x	1	x	6.27	x	21	x	0.63	x	0.7] = [52.26	(82)
Rooflights 0.9x	1	x	7.84	x	21	X	0.63	x	0.7] =	65.35	(82)
Rooflights 0.9x	1	x	3.96	×	21	x	0.63	x	0.7] = [33.01	(82)
Rooflights 0.9x	1	x	0.64	х	33.5	x	0.63	x	0.7	=	8.51	(82)

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3)m= 1482	in watts, c	alculated	for eac	h month			(83)m = S	um(74)m .	(82)m				
	2.72 2746.05	4287.06	6108.89	7504.05	7723.21	7333.51	6262.49	4919.34	3183.2	1817.45	1241.32		(83
otal gains	- internal a	and solar	r (84)m =	= (73)m +	⊦ (83)m	, watts							
4)m= 3569	0.78 4820.39	6281.06	7975.72	9234.02	9336.4	8882.7	7829.96	6563.85	4955.17	3730.79	3268.05		(84
. Mean in	nternal tem	perature	(heating	season)								
emperati	ure during l	heating p	periods in	n the livir	ng area	from Tal	ole 9, Th	1 (°C)			ſ	21	(85
19939-00- 8 -0009-09-072	factor for g										<u>ا</u> ل	2004	(Gel)
Ja	1	Mar	Apr	Mav	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
6)m= 0.9		0.96	0.92	0.84	0.73	0.62	0.67	0.85	0.95	0.99	0.99		(86
	165.	N	10.12	02236-32363	12 (28.)/	18:517 11	and the second	198080					
	rnal tempe	1	<u> </u>	<u>`</u>				· · ·					107
7)m= 21	1 21	21	21	21	21	21	21	21	21	21	21		(87
emperati	ure during l	heating p	periods in	n rest of	dwelling	from Ta	ble 9, Ti	h2 (°C)			88		
8)m= 19.5	55 19.57	19.58	19.63	19.64	19.69	19.69	19.7	19.67	19.64	19.62	19.6		(88)
Itilisation	factor for g	ains for	rest of d	welling I	n2 m (se	e Table	9a)						
9)m= 0.9		0.95	0.9	0.8	0.65	0.49	0.55	0.8	0.94	0.98	0.99		(89
		120000			0.000			0.000					12
	rnal tempe		-		<u> </u>	-							
0)m= 19.5	55 19.57	19.58	19.63	19.64	19.69	19.69	19.7	19.67	19.64	19.62	19.6		(90
								1	fLA = Livin	g area + (4	4) =	0.06	(91
lean inte	rnal tempe	rature (fo	or the wh	ole dwel	llina) = f	LA × T1	+ (1 – fL	A) × T2					
2)m= 19.6		19.66	19.71	19.72	19.76	19.76	19.77	19.75	19.72	19.7	19.68		(92
Apply adi	ustment to t	the mean	n internal	tempera	ature fro	m Table	4e, whe	ere appro	opriate				
3)m= 19.6		19.66	19.71	19.72	19.76	19.76	19.77		19.72	19.7	19.68		(93
-							19.11	19.75	13.12	13./	19.00		(5.
Space	neating reg	uirement	1		10110	10.70	19.77	19.75	19.72	19.7	19.00		(55
	neating req			re obtain						0.00		ulate	(5.
Set Ti to th	neating req ne mean in ion factor f	ternal tei	mperatu							0.00		ulate	(5.
Set Ti to th	he mean in ion factor f	ternal tei	mperatu							0.00		ulate	(5.
Set Ti to th ne utilisat Ja	he mean in ion factor f in Feb	ternal ter or gains Mar	mperatui using Ta Apr	ible 9a	ed at st	ep 11 of	Table 9	o, so tha	t Ti,m=(76)m an	d re-calc	ulate	(5.
Set Ti to the utilisat Ja Utilisation	he mean in ion factor f in Feb factor for g	ternal ter or gains Mar	mperatui using Ta Apr	ible 9a	ed at st	ep 11 of	Table 9	o, so tha	t Ti,m=(76)m an	d re-calc	ulate	
Set Ti to the utilisat Ja Utilisation 4)m= 0.9	he mean in ion factor f in Feb factor for g	ternal ter or gains Mar gains, hm 0.96	mperatui using Ta Apr 1: 0.9	able 9a May 0.81	ed at sto Jun	ep 11 of Jul	Table 9l Aug	o, so tha Sep	t Ti,m=(Oct	76)m an Nov	d re-calc	ulate	
Set Ti to the utilisat Ja Utilisation 4)m= 0.9 Jseful gai	he mean in tion factor f n Feb factor for g 9 0.98 ns, hmGm	ternal ter or gains Mar gains, hm 0.96 , W = (9-	mperatui using Ta Apr 1: 0.9 4)m x (8-	able 9a May 0.81	ed at sto Jun	ep 11 of Jul	Table 9l Aug	o, so tha Sep	t Ti,m=(Oct	76)m an Nov	d re-calc	ulate	(94
Set Ti to th he utilisat Ja Utilisation 4)m= 0.9 Jseful gai 5)m= 3528	he mean in ion factor f in Feb factor for g 9 0.98 ns, hmGm 3.93 4714.12	ternal ter or gains Mar gains, hm 0.96 , W = (9- 6000.23	mperatu using Ta Apr 1: 0.9 4)m x (8- 7198.63	able 9a May 0.81 4)m 7449.29	ed at str Jun 0.66 6117.06	ep 11 of Jul 0.49	Table 9l Aug 0.56	o, so tha Sep 0.8	t Ti,m=(Oct 0.94	76)m an Nov 0.98	d re-calc Dec 0.99	ulate	(94
Set Ti to th he utilisat Ja Jtilisation 4)m= 0.9 Jseful gai 5)m= 3528	he mean in ion factor f n Feb factor for g 9 0.98 ns, hmGm 8.93 4714.12 verage exte	ternal ter or gains Mar gains, hm 0.96 , W = (9- 6000.23	mperatu using Ta Apr 1: 0.9 4)m x (8- 7198.63	able 9a May 0.81 4)m 7449.29	ed at str Jun 0.66 6117.06	ep 11 of Jul 0.49	Table 9l Aug 0.56	o, so tha Sep 0.8	t Ti,m=(Oct 0.94	76)m an Nov 0.98	d re-calc Dec 0.99	ulate	(94 (95
Set Ti to the he utilisat Ja Jtilisation 4)m= 0.9 Jseful gai 5)m= 3528 Monthly av 6)m= 4.3	he mean in ion factor f factor for g 9 0.98 ns, hmGm 0.93 4714.12 verage exte 3 4.9	ternal ter or gains Mar gains, hm 0.96 , W = (9- 6000.23 ernal ter 6.5	mperatur using Ta Apr 0.9 4)m x (8- 7198.63 nperature 8.9	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7	ed at sto Jun 0.66 6117.06 able 8 14.6	ep 11 of Jul 0.49 4388.63 16.6	Table 91 Aug 0.56 4395.69 16.4	o, so tha Sep 0.8 5254.09 14.1	t Ti,m=(Oct 0.94 4669.64	76)m an Nov 0.98 3663.03	d re-calc Dec 0.99 3237.66	ulate	(94 (95 (96
Set Ti to the he utilisati Ja Jtilisation 4)m= 0.9 Jseful gai 5)m= 3528 Monthly av 6)m= 4.3 Heat loss	he mean in ion factor f factor for <u>c</u> 9 0.98 ns, hmGm 3.93 4714.12 verage exte 3 4.9 rate for me	ternal ter or gains Mar jains, hm 0.96 , W = (9, 6000.23 ernal terr 6.5 an interr	mperatur using Ta Apr 1: 0.9 4)m x (8- 7198.63 nperature 8.9 nal tempe	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7 erature, 1	ed at sto Jun 0.66 6117.06 able 8 14.6 Lm , W =	ep 11 of Jul 0.49 4388.63 16.6 =[(39)m	Table 9l Aug 0.56 4395.69 16.4 × [(93)m	5, so tha Sep 0.8 5254.09 14.1 – (96)m	t Ti,m=(Oct 0.94 4669.64 10.6	76)m an Nov 0.98 3663.03 7.1	d re-calc Dec 0.99 3237.66 4.2	ulate	(94 (95
Set Ti to the utilisati Ja Jtilisation 4)m= 0.9 Jseful gai 5)m= 3528 Monthly av 6)m= 4.3 Heat loss 7)m= 28100	he mean in ion factor f factor for g 9 0.98 ns, hmGm 3.93 4714.12 verage exte 3 4.9 rate for me 5.07 26770.25	ternal ten or gains mains, hm 0.96 , W = (9. 6000.23 ernal tem 6.5 an intern 23661.2	mperatu using Ta Apr 1: 0.9 4)m x (8- 7198.63 perature 8.9 nal tempe 18572.22	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7 erature, I 13657.5	ed at sto Jun 0.66 6117.06 able 8 14.6 Lm , W = 8434.76	ep 11 of Jul 0.49 4388.63 16.6 =[(39)m 5167.38	Table 91 Aug 0.56 4395.69 16.4 x [(93)m 5464.33	0, so tha Sep 0.8 5254.09 14.1 – (96)m 9374.67	t Ti,m=(Oct 0.94 4669.64 10.6] 15531.16	76)m an Nov 0.98 3663.03 7.1 21841.19	d re-calc Dec 0.99 3237.66 4.2	ulate	(94 (95
Set Ti to the utilisat Jai Juliisation 4)me 0.9 Jseful gai 5)me 3528 Monthly av feat loss 7)me 28106 Space hee	he mean in ion factor f factor for g 9 0.98 ns, hmGm 3.93 4714.12 verage exte 3 4.9 rate for me 5.07 26770.25 ating requir	ternal ten or gains mains, hm 0.96 , W = (9- 6000.23 ernal tem 6.5 an intern 23661.2 ement fo	mperatu using Ta Apr 0.9 4)m x (8- 7198.63 aperature 8.9 nal tempe 18572.22 r each n	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7 erature, 1 13657.5 nonth, kV	ed at sto Jun 0.66 6117.06 able 8 14.6 Lm , W = 8434.76 Wh/mon	ep 11 of Jul 0.49 4388.63 16.6 =[(39)m 5167.38 th = 0.02	Table 91 Aug 0.56 4395.69 16.4 x [(93)m 5464.33 24 x [(97	o, so tha Sep 0.8 5254.09 14.1 – (96)m 9374.67)m – (95	t Ti,m=(Oct 0.94 4669.64 10.6] 15531.16)m] x (4	76)m an Nov 0.98 3663.03 7.1 21841.19 1)m	d re-calc Dec 0.99 3237.66 4.2 27323.53	ulate	(94 (95
Set Ti to the utilisat Jai Juliisation 4)m = 0.9 Jseful gai 5)m = 3528 Monthly av Heat loss 7)m = 28100 Space heat	he mean in ion factor f factor for g 9 0.98 ns, hmGm 3.93 4714.12 verage exte 3 4.9 rate for me 5.07 26770.25	ternal ten or gains mains, hm 0.96 , W = (9- 6000.23 ernal tem 6.5 an intern 23661.2 ement fo	mperatu using Ta Apr 0.9 4)m x (8- 7198.63 aperature 8.9 nal tempe 18572.22 r each n	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7 erature, I 13657.5	ed at sto Jun 0.66 6117.06 able 8 14.6 Lm , W = 8434.76	ep 11 of Jul 0.49 4388.63 16.6 =[(39)m 5167.38	Table 91 Aug 0.56 4395.69 16.4 x [(93)m 5464.33 24 x [(97 0	o, so tha Sep 0.8 5254.09 14.1 – (96)m 9374.67 0 m – (95	t Ti,m=(Oct 0.94 4669.64 10.6] 15531.16)m] x (4	76)m an Nov 0.98 3663.03 7.1 21841.19 1)m 13088.27	d re-calc Dec 0.99 3237.66 4.2 27323.53 17919.89	ulate 98143.9	(94 (95) (96) (97)
Set Ti to the utilisat Ja Ja Jtilisation (Juliisation (Juliisation) Jseful gai (Juliisation) Jseful gai (Juliisation) Jseful gai (Juliisation) (Juliisation) (Juliisation) Jseful gai (Juliisation) (J	he mean in ion factor f factor for g 9 0.98 ns, hmGm 3.93 4714.12 verage exte 3 4.9 rate for me 5.07 26770.25 ating requir	ternal ter or gains mar gains, hm 0.96 , W = (9- 6000.23 ernal terr 6.5 an interr 23661.2 ement fo	mperatui using Ta Apr 1: 0.9 4)m x (8- 7198.63 nperature 8.9 nal tempe 18572.22 or each n 8188.99	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7 erature, (13657.5 nonth, kV 4618.9	ed at sto Jun 0.66 6117.06 able 8 14.6 Lm , W = 8434.76 Wh/mon	ep 11 of Jul 0.49 4388.63 16.6 =[(39)m 5167.38 th = 0.02	Table 91 Aug 0.56 4395.69 16.4 x [(93)m 5464.33 24 x [(97 0	o, so tha Sep 0.8 5254.09 14.1 – (96)m 9374.67 0 m – (95	t Ti,m=(Oct 0.94 4669.64 10.6] 15531.16])m] x (4' 8080.97	76)m an Nov 0.98 3663.03 7.1 21841.19 1)m 13088.27	d re-calc Dec 0.99 3237.66 4.2 27323.53 17919.89	122/2014	(94) (96) (97) (97) (97) (97)
Set Ti to the utilisat Jai Utilisation ()m= 0.9 Jseful gai ()m= 3528 Monthly av ()m= 28100 Space hea ()m= 1828 ()m= 1828	he mean in ion factor f factor for g 9 0.98 ns, hmGm 3.93 4714.12 verage exte 3 4.9 rate for me 6.07 26770.25 ating requir 5.39 14821.72	ternal ter or gains mar yains, hm 0.96 , W = (9- 6000.23 ernal ter 6.5 an intern 23661.2 ement fo 13139.77 ement in	mperatu using Ta Apr 0.9 4)m x (8- 7198.63 nperature 8.9 nal tempe 18572.22 or each n 8188.99	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7 erature, (13657.5 nonth, kV 4618.9	ed at sto Jun 0.66 6117.06 able 8 14.6 Lm , W = 8434.76 Wh/mon	ep 11 of Jul 0.49 4388.63 16.6 =[(39)m 5167.38 th = 0.02	Table 91 Aug 0.56 4395.69 16.4 x [(93)m 5464.33 24 x [(97 0	o, so tha Sep 0.8 5254.09 14.1 – (96)m 9374.67 0 m – (95	t Ti,m=(Oct 0.94 4669.64 10.6] 15531.16])m] x (4' 8080.97	76)m an Nov 0.98 3663.03 7.1 21841.19 1)m 13088.27	d re-calc Dec 0.99 3237.66 4.2 27323.53 17919.89	98143.9	(94) (96) (97) (97) (97) (97)
Set Ti to the utilisat Ja Juilisation Jma Jseful gai Sime Jseful gai Sime Active Sime Active Space heat Space heat Space heat Space heat	he mean in ion factor f factor for <u>c</u> 9 0.98 ns, hmGm 3.93 4714.12 verage exte 3 4.9 rate for me 5.07 26770.25 ating requir 5.39 14821.72	ternal ter or gains mar gains, hm 0.96 , W = (9- 6000.23 ernal ter 6.5 an interr 23661.2 ement fo 13139.77 ement in quiremen	mperatu using Ta Apr 0.9 4)m x (8- 7198.63 nperature 8.9 nal temperature 18572.22 or each n 8188.99 kWWh/m ²	ble 9a May 0.81 4)m 7449.29 e from Ta 11.7 erature, 1 13657.5 nonth, kV 4618.9	ed at str Jun 0.66 6117.06 able 8 14.6 Lm , W = 8434.76 Wh/mont 0	ep 11 of Jul 0.49 4388.63 16.6 =[(39)m 5167.38 th = 0.02	Table 91 Aug 0.56 4395.69 16.4 x [(93)m 5464.33 24 x [(97 0	o, so tha Sep 0.8 5254.09 14.1 – (96)m 9374.67 0 m – (95	t Ti,m=(Oct 0.94 4669.64 10.6] 15531.16])m] x (4' 8080.97	76)m an Nov 0.98 3663.03 7.1 21841.19 1)m 13088.27	d re-calc Dec 0.99 3237.66 4.2 27323.53 17919.89	98143.9	(94 (95

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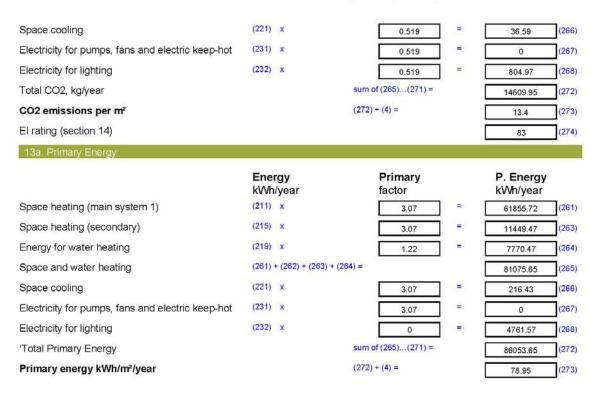
Heat	loss rate	e Lm (ca	lculated	using 28	5°C inter	nal temp	perature	and exte	ernal ten	nperatur	e from T	able 10)		
(100)m=	0	0	0	0	0	15356.71	12089.33	12318.06	0	0	0	0		(100)
Utilis	ation fac	tor for lo	oss hm						2					
(101)m=	0	0	0	0	0	0.55	0.61	0.56	0	0	0	0		(101)
Usef	ul loss, h	mLm (V	Vatts) = ((100)m x	(101)m									
(102)m=	0	0	0	0	0	8369.49	7433.63	6919.41	0	0	0	0		(102)
Gain	s (solar g	gains ca	lculated	for appli	cable w	eather re	egion, se	e Table	10)			10		
(103)m=	0	0	0	0	0	10271.01	9773.08	8604.26	0	0	0	0		(103)
						lwelling,	continua	ous (kW	h) = 0.0	24 x [(10	03) <i>m –</i> (102) m] x	(41)m	
			104)m <	· · ·		Contractor and	-		1942					
(104)m=	0	0	0	0	0	1369.1	1740.56	0	0	0	0	0	61.118 ST 61.6161	-
Casle	d fraction	-								I = Sum(=	3109.65	(104)
	d fraction	1000	able 10b						10=	cooled	area ÷ (•	4) =	0.39	(105)
(106)m=		0		0	0	0.25	0.25	0.25	0	0	0	0		
(100)				<u>.</u>					352	l = Sum(10	=	0	(106)
Space	coolina	requirer	ment for	month =	(104)m	× (105)	× (106)r	n	1014	Cum	10011	L	v	(1.00)
(107)m=		0	0	0	0	134.08	170.46	0	0	0	0	0		
									Tota	I = Sum(107)	=	304.55	(107)
Space	cooling	requirer	ment in k	⟨Wh/m²ʎ	/ear) ÷ (4) =		F	0.28	(108)
		- X				uctomo i	poludina	mioro (/ ()			0.20	(,
			115 - 1110	vidual fi	eauny s	ysterns i	ncluding	THICTO-C	aning)					
	e heatir ion of sp	-	t from s	econdar	v/supple	mentarv	system					Г	0.04	(201)
	199001279		at from m				00.0400.04040.076	(202) = 1 -	- (201) =			F	0.96	(202)
	a selô			10				(204) = (20		(203)1-		F	a secondaria	-
			ng from					(204) - (2)	v2)~[1-	(200)]-		Ļ	0.96	(204)
		<u>ii</u>	ace heat									Ļ	468.59	(206)
Effici	ency of s	seconda	ry/suppl	ementar	y heatin	g system	n, %						100	(208)
Cooli	ng Syste	em Ener	gy Efficie	ency Rat	tio								4.32	(209)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/ye	ear
Spac	e heatin	g require	ement (c	alculate	d above)								
	18285.39	14821.72	13139.77	8188.99	4618.9	0	0	0	0	8080.97	13088.27	17919.89		
(211)n	n = {[(98)m x (20	4)]}x1	00 ÷ (20)6)									(211)
	3753.9	-	2697.53			0	0	0	0	1658.98	2686.96	3678.86		
								Tota	I (kWh/yea	ar) =Sum(2	211),	=	20148.44	(211)
Spac	e heatin	a fuel (s	econdar	v) kWh/	month							L		
			00 ÷ (20											
(215)m=	694.84	563.23	499.31	311.18	175.52	0	0	0	0	307.08	497.35	680.96		
								Tota	I (kWh/yea	ar) =Sum(2	215),	-	3729.47	(215)
Water	heating	1												
		201 20 1	ter (calc	ulated a	bove)	23	o3			0.	0 1			
	390.84	346.81	369.69	338.99	337.69	309.63	304.88	324.19	320.38	351.14	361.76	384		
Efficie	ncy of w	ater hea	iter										65	(216)
(217)m=	65	65	65	65	65	65	65	65	65	65	65	65		(217)
Fuel fo	or water	heating,	kWh/ma	onth										
		-) ÷ (217)			r								
(219)m=	601.29	533.55	568.76	521.52	519.53	476.36	469.04	498.76	492.89	540.22	556.55	590.76		-
								Tota	I = Sum(2	19a) ₍₁₂ =			6369.24	(219)
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Space cooling fuel, kWh/month.

(221)m = (107)m÷ (209)										-	
(221)m= 0 0 0	0	0	31.04	39.46	0	0	0	0	0		-
55					Tota	I = Sum(2		565.4995		70.5	(221)
Annual totals Space heating fuel used, ma	in system	1					k	Wh/yea	ar	kWh/yea	ĥ
Space heating fuel used, sec										3729.47	-
	ondary										4
Water heating fuel used										6369.24	4
Space cooling fuel used										70.5	
Electricity for pumps, fans ar			ot				1000			-	-
Total electricity for the above	, kWh/yea	ar			sum	of (230a).	(230g) =			0	(231)
Electricity for lighting										1551	(232)
10a. Fuel costs - individual	heating sy	stems.									
			Fu kV	el Vh/year			Fuel F (Table			Fuel Cost £/year	
Space heating - main system	1 1		(21	1) x			13.	.19	x 0.01 =	2657.58	(240)
Space heating - main system	12		(21)	3) X				0	x 0.01 =	0	(241)
Space heating - secondary			(21	5) x			13.	.19	x 0.01 =	491.92	(242)
Water heating cost (other fue	el)		(21	9)			3.4	48	x 0.01 =	221.65	(247)
Space cooling			(22	1)			13.	.19	x 0.01 =	9.3	(248)
Pumps, fans and electric kee	p-hot		(23	1)			13.	.19	x 0.01 =	0	(249)
(if off-peak tariff, list each of Energy for lighting	(230a) to ((230g) s	eparately (23)		icable a	nd apply		ice acco	ording to x 0.01 =		(250)
Additional standing charges	(Table 12)									120	(251)
Appendix Q items: repeat line	00 (253) 2	nd (254		hoh							
Total energy cost	es (200) a			50)(254)	=					3705.02	(255)
11a. SAP rating - individual	heating s	ystems									
Energy cost deflator (Table 1	(2)									0.42	(256)
Energy cost factor (ECF)	_,	[(255) >	(256)] + [((4) + 45.0] =	=11					1.37	(257)
SAP rating (Section 12)										80.87	(258)
12a. CO2 emissions - Indiv	idual heat	ing syst	ems incli	uding mid	cro-CHF)					
				ergy Vh/year				sion fa 2/kWh	ctor	Emissions kg CO2/ye	-
Space heating (main system	1)		(21	1) x			0.5		=	10457.04	(261)
Space heating (secondary)	1		(21	5) x			0.5		=	1935.59	(263)
Water heating			(21	9) x			0.2	216	=	1375.76	(264)
Space and water heating			(26	1) + (262) +	+ (263) + (264) =				13768.39	(265)

Stroma FSAP 2012 Version: 1.0.3.11 (SAP 9.92) - http://www.stroma.com

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APPENDIX (E)

BRE DOMESTIC REFURBISHMENT PRE-ASSESSMENT



5 TEMPLEWOOD AVENUE HAMPSTEAD, LONDON, NW3

Report for Demostrating Compliance

BREEAM Domestic Refurbishment

"Very Good"

PRE-ASSESSMENT

DW/625: January 2017

AUTHOR: Dudley Walker ASSESSMENT ORGANISATION: ME7 Ltd Licensed BREEAM Assessor – DW35

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Energy Consultants

Please consider the environment before printing this document



5 TEMPLEWOOD AVENUE HAMPSTEAD, LONDON, NW3

Report for Demostrating Compliance

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Description

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Executive Summary & Proposals

BREEAM Domestic Refurbishment - Pre-Assessment Summary

Appendices

1.0 Calculation & Summary Sheet

Executive Summary

- Based on the evidence of this Assessment the proposed refurbishment to effect the 'deconversion' from the current three flats to two units of 50m² and 1087m² respectively can achieve "Very Good" status, based on the BREEAM Refurbishment Scheme Technical Manual SD5077 – 2014 – 2.0 Version.
- The proposals that have been considered satisfy all the mandatory minimum standards required and Illustrates how a score comfortably in excess of the threshold figure of 55% needed to achieve a "Very Good" rating under the BREEAM Scheme can be achieved.
- It is shown that satisfaction of all the minimum standards within the Energy, Water, Health/Wellbeing, Pollution and Materials Categories can achieve a level superior to "Very Good" and that the level attained in these sections relates to either an "Excellent" or "Outstanding" rating under the Scheme.
- This Pre-Assessment is based on early design information and is intended to provide guidance upon which the Design Team may rely in order to achieve Certification at Design and Post Construction Stage subject to verification by the BRE following accepted independent documentation, calculations and reports etc.
- From the following Assessment Report, it is illustrated that the proposed alterations at 5 Templewood Avenue has the potential to be an excellent example of sustainability in residential dwellings.

The Proposals

The existing property at 5 Templewood Avenue comprises a substantial 3 storey structure containing three separate flats. It is proposed to 'deconvert' the current arrangement of dwellings into two units of $50m^2$ and $1,087m^2$ respectively, as well as forming a basement to provide leisure facilities that will include a swimming pool, cinema, gym, study etc and plant room containing the services for the development.

The purpose of this report is to demonstrate the manner that compliance under the BREEAM Refurbishment Scheme [Technical Manual SD5077 – 2014 – 2.0 Version] can be achieved providing "Very Good" status in support of a Planning Application related to the proposals.

The BREEAM Scheme is divided into seven main elements;

- Management
- Health & Wellbeing
- Energy
- Water
- Materials
- Waste
- Pollution
- •

The following sections, overleaf, demonstrate in each Category how the proposals at Templewood Avenue can achieve a "Very Good" rating under the SD5077 – 2014 – 2.0 Version of the Scheme.

BREEAM Refurbishment : Domestic Buildings – Assessment Summary

Category 1: Management

Man 01: Home User Guide	Provision of a home user guide incorporating information relating to the site and its surroundings in accordance with the 'User Guide Contents List' of the BREEAM Scheme will achieve maximum credits
	3 Credits
Man 02: Responsible Construction Practices	Requires the Contractor engaged to carry out the construction work to register the site with the Considerate Constructors or equivalent scheme and achieve "Compliance" with the scheme as a minimum.
	1 Credit
Man 03: Construction Site Impacts	Requires the Contractor engaged to carry out the construction work to adopt 2 procedures that monitor, report and set targets in respect of Energy use, CO_2 production, Water consumption and responsibly sourced Timber in order to achieve Credit in this Category.
	1 Credit
Man 04: Security	Certified replacement external doors and accessible windows should be specified and/or adapted to meet minimum compliant security standards in order to satisfy first Credit requirements.
	Advisory Note: Secured by Design Certification from an approved Police DOCO will be needed to provide the 2 nd Credit that is available in this Category]
	1 Credit
Man 05: Ecological Features	From cursory inspection only the trees on the site present any ecological features which are shown to be retained as part of the scheme that would satisfy the requirement for the protection Credit in this Category. However, it is noted that some trees are located quite close to the extended subterranean structure of the proposals which may prevent their retention in practice and as no SQE has been consulted at this stage to provide any perspective on this matter no Credits have been allocated.
	0 Credits
Man 06: Project Management	Given the complexity of the proposals it will be of necessity that <i>Project Roles & Responsibilities</i> will need to be carefully addressed and <i>Handover & Aftercare</i> will similarly need careful attention.

2 Credits

Category 2: Health and Wellbeing

Hea 01: Daylighting	An Assessment will be required to substantiate Credit claims in this Category in due course, therefore, no assumptions are made now other than the probability that the proposals result, at least, in a neutral impact on the daylight levels in the dwellings.
	1 Credit
Hea 02: Sound Insulation	It is assumed that insulation values between the two dwellings can be improved by at least 3dB's compared to AD E of the Building Regulations which will need to be confirmed by Pre Completion testing by a UKAS approved testing body.
	3 Credits
Hea 03: Volatile Organic Compounds	It is assumed that in providing a healthy internal environment that fittings and finishes with low VOC's will be specified and used.
	1 Credit
Hea 04: Inclusive Design	It is unclear at this stage whether minimum accessibility compliant with Section 1 of Checklist A-8 of the BEEAM Technical Guide can be achieved, therefore, for the purposes of this assessment no Credits have been assumed.
	0 Credits
Hea 05: Ventilation	The project will be the subject of Building Regulations approval and will be required to satisfy AD F 2010 as a minimum related to background trickle ventilation but given the complexity of the services involved with the project it is assumed that ventilation to the dwellings will be provided that meets Section 5 of the B Regs Part F in full.
	[Advisory Note: Mandatory requirement that achieves BREEAM "Outstanding" status]
	2 Credits
Hea 06: Safety	The proposals include a compliant fire detection system being provided and that the system will to be wired in to the dwelling's main electricity supply.
	[Advisory Note: Mandatory requirement that achieves BREEAM 'Outstanding' status]

1 Credit

Category 3: Energy

Ene 01: Energy Efficiency Improvement	Preliminary Design Stage SAP Assessments that have considered the nature of the fabric, windows, insulation etc of the construction, pre & post refurbishment of the dwelling reveal that the Energy Efficiency rating can be improved by a minimum of 19.
	2 Credits
Ene 02: Post Refurbishment Energy Efficiency	Preliminary Design Stage SAP Assessments that have considered the nature of the fabric, windows, insulation etc of the proposed construction reveal that the energy efficiency rating post refurbishment can be improved to a minimum of 70.
	[Advisory Note: Mandatory requirement that achieves BREEAM 'Excellent' status]
	2.5 Credits
Ene 03: Primary Energy Demand	Preliminary Design Stage SAP Assessments that have considered the nature of the fabric, windows, insulation etc of the proposed construction and the heating regime reveal a primary energy demand of <320kWh/m2/year.
	2 Credits
Ene 04: Renewable Technologies	LZC Technologies will be installed as part of the energy solution that will comply with the London Plan and provide at least 20% of each dwellings Primary Energy Demand per annum.
	2 Credits
Ene 05: White Goods	A+ Fridge/Freezers and A rated Washing Machines and Dishwashers are to be supplied that are recognised by the Energy Saving Trust.
	2 Credits
Ene 06: Drying Space	External secure drying facilities comprising a min line length 4m+ for the 1 Bed Flat and min 6m+ for the main dwelling are to be provided that comply with the Scheme.
	1 Credit
Ene 07: Lighting	Low energy Space & Security fittings are to be provided throughout that also results in a max average of 9 watts/m2 across the total floor area of the dwelling.
	2 Credits
Ene 08: Energy Display Devices	Smart meters are to be installed registering the use of electricity and primary heating fuel allied to an EDD allowing monitoring of consumption
	2 Credits
	That is also capable of recording consumption data for the dwelling occupants.

1 Credit

Ene 09: Cycle Storage	Insufficient space for the storage of cycles for the main dwelling disallows Credit allocation in this Category at this stage.
	[Advisory Note: To achieve 1 Credit 3 spaces are required and 2 Credits requires 5 spaces]
	0 Credits
Ene 10: Home Office	A specific space with all necessary services that includes 2xdouble power sockets & telephone point is to be provided to allow the set up of a Home Office which will also include a window providing adequate ventilation and achieving an average daylight factor of 1.5%.

1 Credit

Category 4: Water

Wat 01: Internal Water Use The provision of Dual flush WC's, attention to bath size and restricted flow to showers, basins and kitchen taps will ensure that water consumption can be restricted to the maximum of 105litres /person/day required by LB Camden.

[Advisory Note: Mandatory requirement that achieves BREEAM 'Excellent' status]

2.5 Credits

Wat 02: External Water Use As part of the site drainage scheme a minimum 200 litre harvesting tank is proposed to collect rainwater for the purpose of external irrigation.

1 Credit

Wat 03: Water Meter It is part of the mechanical installation that a water meter will be included within the service proposals for the development that will allow dwelling occupants to readily monitor potable water consumption.

1 Credit

Category 5: Materials

Mat 01: Environmental
Impact of MaterialsBRE Green Guide ratings related to the roof, external walls, internal
walls, upper & ground floors and windows are conservatively
assessed as achieving a minimum 12 Credits of the 25 available.

12 Credits

Mat 02: Responsible
Sourcing of Materials6 of the 12 Credits available have been assumed at this Assessment
Stage related to responsible sourcing of basic &/or finishing materials.
It will be a matter of contractual responsibility that all new timber will
be sourced in accordance with the UK Government's Timber
Procurement Policy in that all new timber is to be purchased through
independent verifiable legal and sustainable sources or FLEGT
licensed or equivalent sources.

[Advisory Note: Mandatory requirement that achieves BREEAM 'Outstanding' status]

6 Credits

Mat 03: InsulationNo Credits have been assumed at this Assessment Stage related to
embodied environmental impact of any new insulation introduced into
the construction as the requirement for new insulation has not been
determined. However, in recognition of the Energy Efficiency Rating
Post Refurbishment discussed under Ene 02, Credits are achieved
under Responsible Sourcing by default.

4 Credits

Category 6: Waste

Was 01:Household Waste	Dedicated internal storage provided with minimum 30 litre capacity located in the kitchens together with external space provided for waste bins and Local Authority providing weekly collections for waste and recyclables will comply.
	1 Credit
	Provision of composting facility – kitchen & green waste – either through LA collection scheme and/or private facility
	1 Credit
Was 02: Site Waste Management	It is assumed that contractual arrangements will require a compliant Site Waste Management be in place that will include, at the least, Good Practice Waste Benchmarks.
	2 Credits
Category 7: Pollution	
Pol 01: Nox Emissions	It is assumed that primary space and hot water heating will be provided by a boiler superior to Class 5 providing dry NOx emissions \leq 40mg/kWh.
	3 Credit
Pol 02: Surface Water Run- Off	It is assumed that the surface water treatment for the site will provide, at the very least, a neutral impact on discharge from the site.
	1 Credit
Pol 03: Flooding	Consultation of the available Environmental Agency data indicates the site to be located in an area of low risk that, in due course, a suitably qualified professional will be required to substantiate within a compliant Flood Risk Analysis.
	[Advisory Note: Mandatory requirement that achieves BREEAM 'Outstanding' status]
	2 Credits

Appraisal:

Compilation of the above attributable Credits through the BREEAM Calculator Tool reveals an overall score for the proposals of 65.99% comfortably superceding the 55% threshold figure required to achieve a "Very Good" rating.

The BREEAM Calculation and Summary sheet is attached overleaf as an Appendix in confirmation of the rating achieved under the Domestic Refurbishment Scheme

Dudley Walker Licensed BREEAM Assessor – DW35 E: <u>dw@me7.eu</u>

APPENDIX

Assessment Calculation & Summary Sheet

Demonstrating BREEAM VERY GOOD Rating

BREEAM UK Domestic Refurbishment 2014 Pre-Assessment Estimator v0.1: Results Summary

Weighting

12%

17%

Section Score

8.73%

11.33%

BREEAM®UK

Building name		
Indicative Building Score	65.99%	
Indicative Building Rating	BREEAM Very Good	

Indicative Credits

Achieved

3

0

2

1

3

1

0

Credits

Available

3

2

1

2

1

2

2

4

1

7

Issue

Man 01

Man 02

Man 03

Man 04

Man 05

Man 06

Hea 01

Hea 02

Hea 03

Hea 04

I

Π

ī

Management

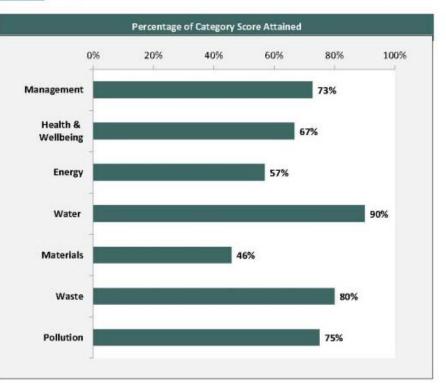
Health and

ARC-III-

This assessment and indicative BREEAM rating is not a formal certified BREEAM assessment or rating and must not be communicated as such. The score presented is indicative of a dwelling's potential performance and is based on a simplified pre-formal BREEAM assessment and unverified commitments given at an early stage in the design process.

	Minimum Standards						
	Pass	Good	Very Good	Excellent	Outstanding		
Ene 02	1	4	4	4	×		
Wat 01	1	1	~	1	×		
Hea 05	1	1	1	4	1		
Hea 06	1	1	1	1	1		
Pol 03	1	1	1	1	1		
Mat 02	4	1	1	1	1		

Wellbeing	Hea 04	2	0		
	Hea 05	2	2		
	Hea 06	1	1		
	Ene 01	6	2	_	
	Ene 02	4	2.5		
	Ene 03	7	2		
	Ene 04	2	2		
Energy	Ene 05	2	2	43%	24.47%
	Ene 06	1	1		
	Ene 07	2	2		
	Ene 08	2	2		
	Ene 09	2	0		
	Ene 10	1	1		
	Wat 01	3	2.5		9.90%
Water	Wat 02	1	1	11%	
AND DECK	Wat 03	1	1	27777	
	Mat 01	25	12		
Materials	Mat 02	15	6	8%	3.67%
materials	Mat 03	8	4	0.0	5.0774
	Was 01	2	2		
Waste	Was 02	3	2	3%	2.40%
		3	3		
	Pol 01	2			4 50%
Pollution	Pol 01 Pol 02	3	1	6%	4.50%
Pollution	Pol 01 Pol 02 Pol 02			6%	4.50%



fied pre-formal BREEAM assessment and unverified SS. Building Indicative building sco Indicative BREEAM agement Health & Wellbeing Energy INNOVATION	name ore (%) 65.99%	/ Good	Pass Good Very Good Ene 02 - - - Wat 01 - - - Hea 05 - - - Hea 06 - - - Pol 03 - - - Mat 02 - - - Indicative Section Score - -	*****
nents				
MANAGEMENT 01 Home Users Guide	Section Weighting: 12%		Indicative Section Score	: 8.73%
or for the oser's during of th		Min	imum Standards applicable:	27% No Indicative Cred 3
e a home Users Guide de provided to all dwellings, nents	covering an issues set out in the Use	ers Guide Contents II:	st, pree dealts may be awarded	
02 Responsible Construction Practices o. of BREEAM credits available 2 of BREEAM innovation credits 1		Available c		18%
sment Criteria e a compliant considerate construction scheme will	be used, credits are awarded deper	nding the score achie	ved as outlined below:	Indicative Cred
Large Scale - project with more than 5 units	One Cred	lit	Two Credits	
Considerate Constructors Scheme	Score of 25-34 with a score	of 5 in each section	Score of 35-39 with a score of 7 in each section	4
Alternative Compliant Scheme	Compliance	ce	Beyond Compliance	
Small Scale - project with 5 units or fewer	One Cred	it	Two Credits	-)
Considerate Constructors Scheme	Score of 25-34 with a score		Score of 35-39 with a score of 7 in each section	1
Alternative Compliant Scheme	Compliance	ce	Beyond Compliance]
Checklist A-3	50% of the option	nal items	80% of the optional items	
Exemplary Credit Considerate Constructors Scheme	Score of 40 or more with a section			Indicative Innova Credits Achieve Please Select
Alternative Compliant Scheme	Exemplary Level C			
Checklist A-3*	All Items (Optional &	Mandatory)	* Small Scale Project Only	
nents				
03 Construction Site Impacts o. of BREEAM credits available 1 of BREEAM innovation credits 0				09%
of BREEAM innovation credits 0 sment Criteria e evidence demonstrate that site impacts will be m	onitored, as detailed below:	New research	⇒	Indicative Cred
Large Scale	Where there is evidence to		or more of the sections in Checklist A-4	
Small Scale	Where there is evidence to		or more of the sections in Checklist A-5	
	Sections of Checklist	are comple	ited	1
Large Scale - Check	dist A-4		nall Scale - Checklist A-5	
Monitor, report and set targets for CO2 produc activities	ction of energy use arising from site		educing CO2 production from energy use ising from site activities	
Monitor, report and set targets for water cons	umption arising from site activities		- or reducing water use arising from site	1
A main contractor with an environ	mental materials policy	Main contracto	activities r environmental materials statement	-
A main contractor that operates an Enviro	2734 SK		er is reclaimed, re-used or responsibly	1
0007 6 33 34 1	ed or responsibly sourced		sourced	

BREEAM credits available 2 REEAM innovation credits 0	Available contribution to overall score: 2.18% Minimum Standards applicable: No
nt Criteria following requirements will be met:	
One Credit Secure windows and doors	External doors and accessible windows meet minimum standards and appropriately certified
Two Credits	Principles and guidance of Secured by Design Section 2 are complied with
Secured by design	A suitably qualified security consultant is consulted at the design stage and their recommendations are incorporated into the refurbishment
Protection and Enhancement of Ecological Features BREEAM credits available REEAM innovation credits 1	s Available contribution to overall score: 1.09% Minimum Standards applicable: No
nt Criteria following requirements will be met:	
One Credit	Site survey carried out to determine presence of ecological features
Protecting Ecological Features	Statutory Nature Conservation Organisation notified of protected species
	Features of ecological value protected during refurbishment works Indicative In
Exemplary Credit	A suitably qualified ecologist recommends features to enhance ecology of the site
Ecological enhancement	adopts all general ecological recommendations adopts 30% of additional recommendations
BREEAM credits available 2	Available contribution to overall score 2.18%
BREEAM credits available 2 REEAM innovation credits 2 It Criteria	Minimum Standards applicable No Indicative
roject Management BREEAM credits available 2 REEAM innovation credits 2 it Criteria following requirements will be met:	Minimum Standards applicable No Indicative
BREEAM credits available 2 LEEAM innovation credits 2 t Criteria	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making 2 Small Scale - the project manager assigns individual and shared responsibilities amongst 2
BREEAM credits available 2 REEAM innovation credits 2 t Criteria	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making 2 Small Scale - the project manager assigns individual and shared responsibilities amongst the project team including all trades on site 1 Large Scale - the project manager assigns individual and shared responsibilities across the 1
BREEAM oredits available 2 REEAM innovation credits 2 t Criteria following requirements will be met:	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making 2 Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site 2 Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification 1
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BREFAM credits available 2 LEAM innovation credits 2 t Criteria following requirements will be met: One Credit Project Roles and Responsibilities	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making 2 Small Scale - the project manager assigns individual and shared responsibilities amongst the project team individual and shared responsibilities across the following key design and refurbishment stages: I. Planning and Building control notification II. Design II. Refurbishment IV. Commissioning and handover V. Occupation Large Scale projects: more than five units and more than
BREFAM credits available 2 EEAM innovation credits 2 t Criteria following requirements will be met: One Credit Project Roles and Responsibilities	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making 2 Small Scale - the project manager assigns individual and shared responsibilities amongst the project team inducing all trades on site 2 Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: Planning and Building control notification Design Refurbishment V. Commissioning and handover V. Occupation an £100k Large Scale projects: more than five units and more than £100k
BREFAM credits available 2 LEAM innovation credits 2 t Criteria following requirements will be met: One Credit Project Roles and Responsibilities	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making 2 Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site 2 Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation Large Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to:
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BREFAM credits available 2 LEEAM innovation credits 2 Concerdits 2 following requirements will be met:	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Indicative Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site Indicative Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation Indicative team five units and more than £100k Handover meeting arranged 2 or more of the following committed to: - A site inspection within 3 months of occupation - Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation
BREFAM credits available 2 LEAM innovation credits 2 t Criteria following requirements will be met: One Credit Project Roles and Responsibilities mall Scale projects: five units or fewer and less the One Credit	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Image: Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site Image: Small Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: I. Planning and Building control notification II. Design III. Refurbishment IV. Commissioning and handover V. Occupation Large Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to: A site inspection within 3 months of occupation Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation Conget term after care e.g. a helpline, nominated individual or other appropriate system to support building users for at least the first 12 months of
BREFAM credits available 2 REFAM innovation credits 2 t Criteria following requirements will be met: One Credit Project Roles and Responsibilities mall Scale projects: five units or fewer and less the One Credit Handover and Aftercare	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making 2 Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site 2 Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Berging iii. Refurbishment iv. Commissioning and handover v. Occupation Aurge Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to: - A site inspection within 3 months of occupation - Conduct post occupancy interviews with building coupants or a survey via phone or posted information within 3 months of occupation - Longer term after care e.g. a helpline, nominated individual
RREFAM credits available 2 LEEAM innovation credits 2 Concerdits 2 following requirements will be met: 1 One Credit Project Roles and Responsibilities mall Scale projects: five units or fewer and less the One Credit Mandover and Aftercare	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Indicative Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site Indicative Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation an £100k Large Scale projects: more than five units and more than £100k
RREFAM credits available 2 LEEAM innovation credits 2 Concerdits 2 following requirements will be met: 1 One Credit Project Roles and Responsibilities mall Scale projects: five units or fewer and less the One Credit Mandover and Aftercare	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Indicative Small Scale - the project manager assigns individual and shared responsibilities amongst the project team individual and shared responsibilities across the following key design and refurbishment stages: Planning and Building control notification Design Refurbishment V. Commissioning and handover V. Occupation an £100k Large Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to:
BREFAM credits available 2 EEAM innovation credits 2 EEAM innovation credits 2 Cone Credit Cone Credit Project Roles and Responsibilities mall Scale projects: five units or fewer and less the One Credit Handover and Aftercare xemplary Credits	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Indicative Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site Indicative Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation Indicative in £100k Barge Scale projects: more than five units and more than £100k Earge Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to:
REEAM credits available 2 EEAM innovation credits 2 Credit 2 One Credit 2 Project Roles and Responsibilities 2 mall Scale projects: five units or fewer and less the 2 One Credit 3 Handover and Aftercare 3 templary Credits 3 One Exemplary Credit 3	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Indicative Small Scale - the project manager assigns individual and shared responsibilities amongst the project team induding all trades on site Indicative Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: I. Planning and Building control notification II. Design II. Refurbishment IV. Commissioning and handover V. Occupation an £100k Large Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to: A site inspection within 3 months of occupation Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation Longer term after care e.g. a helpline, nominated individual or other appropriate system to support building users for at least the first 12 months of occupation Where A BREEAM Accredited Professional has been appointed to oversee key stages within the project. OR O Where a BREEAM Domestic Refurbishment Assessor has been appointed at an early stage of the project, prior to the production of a refurbishment specification Where Thermographic surve
RREFAM credits available 2 CREAM credits available 2 CREAM credits 2 CREAM credits 2 CREAM credits 2 CREAM credit CREAM c	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Indicative Small Scale - the project manager assigns individual and shared responsibilities amongst the project team including all trades on site Image: Scale - the project manager assigns individual and shared responsibilities amongst the project team including all trades on site Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation an £100k Large Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to: - A site inspection within 3 months of occupation - Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation - Longer term after care e.g. a helpline, nominated individual or other appropriate system to support building users for at least the first 12 months of occupation Where A BREEAM Accredited Professional has been appointed to oversee key stages within the project OR Where a BREEAM Domestic Refurbishment Assessor has been appointed at an early stage of the project, prior to the production of a refurbishment specification Where Thermographic surveying and Airtightness testing have been carried out at both pre and post refurbishment stages
RREFAM credits available 2 CREAM innovation credits 2 CREAM innovation credits 2 CREAM credits 2 CREAM credit CREAM CRE	Minimum Standards applicable No Indicative Indicative Where all of the project team are involved in the project decision making Indicative Small Scale - the project manager assigns individual and shared responsibilities amongst the project team including all trades on site Image: Scale - the project manager assigns individual and shared responsibilities amongst the project team including all trades on site Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation an £100k Large Scale projects: more than five units and more than £100k Handover meeting arranged 2 or more of the following committed to: - A site inspection within 3 months of occupation - Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation - Longer term after care e.g. a helpline, nominated individual or other appropriate system to support building users for at least the first 12 months of occupation Where A BREEAM Accredited Professional has been appointed to oversee key stages within the project OR Where a BREEAM Domestic Refurbishment Assessor has been appointed at an early stage of the project, prior to the production of a refurbishment specification Where Thermographic surveying and Airtightness testing have been carried out at both pre and post refurbishment stages

1 Daylighting . of BREEAM credits available 2	Available contribution to overall score 2.83%
f BREEAM innovation credits 0	Minimum Standards applicable No Indicative Cre
Where the refurbishment results in a neutral in	npact on daylighting or where minimum daylighting standards are met, up to two 📫 1
credits may be awarded as follows: For Existing Dwellings and Change of Use Proj	ects
First Credit	The refurbishment results in a neutral impact on the dwellings daylighting levels in the
Maintaining Good Daylighting	kitchen, living room, dining room and study
Where the property is being extended	New spaces achieve minimum daylighting levels
First Credit	The extension does not significantly reduce daylighting levels in the kitchen, living room,
Maintaining Good Daylighting	dining room or study of neighbouring properties
For All Properties	The dealling address address on the basis of the first sector in the
Second Credit Minimum Daylighting	The dwelling achieves minimum daylighting levels in the kitchen, living room, dining room and study
	5. 5.
ents	
Sound Insulation	
of BREEAM credits available 4 f BREEAM innovation credits 0	Available contribution to overall score 5.67% Minimum Standards applicable No
nent Criteria	Indicative Cre
Properties where sound testing has been carri	
Up to Four Credits	Four credits awarded according to the improvement over building regulations. See table in
	additional information in Technical Manual
Properties where sound testing is not feasible	and not required by the appointed Building Control body Where existing separating walls and floors are designed to meet the requirements of
Two Credits	where existing separating walls and floors are designed to meet the requirements of Building Regulations with compliant construction details
	Where a Suitably Qualified Acoustician (SQA) provides recommendations for the
	specification of all existing separating walls and floors
	SQA confirms in their professional opinion that they have the potential to meet or exceed
Up to Four Credits	the sound insulation credit requirements
	Where these recommendations are implemented
	See table in additional information in Technical Manual
Historic Buildings	
	Where the dwelling is a Historic Building and sound testing results demonstrate existing separating walls and floor meet the Historic Building credit requirements
	soparan B wars and noor meet all matche Barain B arait redairements
	See table in additional information in Technical Manual
	Where sound testing is not feasible and not required by the appointed Building Control
Up to Four Credits	body meeting criteria 2 and 3 using Table 12
	Properties where sound testing has been carried out, credits awarded according to the improvement over building regulations. See table in additional information in Technical
	Manual
	Where the dwelling is a detached property
	Where the dwelling is a property with separating walls or floors only between non
	habitable rooms OR Testing not required by building control body
Detached Properties	
Four Credits Properties with separating walls or floors only	By Default y between non habitable rooms OR Testing not required by building control body
Four Credits	By Default
ents	
3 Volatile Organic Compounds of BREEAM credits available <u>1</u>	Available contribution to overall score 1.42%
f BREEAM innovation credits 0 nent Criteria	Minimum Standards applicable No Indicative Cre
	Cs with new products meeting the following requirements:
	Where all decorative paints and varnishes used in the refurbishment have met the requirement listed in table 5.4 in the Technical Manual
One Credit	Where at least five of the eight remaining product categories listed in table 5.4 have met the testing requirements and emission levels for Volatile Organic Compound (VOC)
Avoiding the use of VOCs	emissions against the relevant standards identified within table 5.4 in the Technical
	Manual
	Where five or less products are specified within the refurbishment, all must meet the requirements in order to achieve this credit.
	requirementent of der ce de libre billo di de la

No. of BREE	EEAM credits available	2 1			ribution to overall score Im Standards applicable	2.83 No	1		
		ied out using Checkli	st A-8 of the Technical Manual to c	optimise the accessib	ility of the home as		Indicati	ve Credits 0	
ollows:			Check	list A-8 of the Techni	ical Manual				
_	One Credit		Section 1		Section 2				
-	Minimum Access	sibility	Completed with Evid	lence					
-	Two Credit Advanced Access		Completed with Evid	lence	Completed with Evide	ence			
Exer	mplary Performance		a stank ha maralifi and un and have a fish a s		labed a soliton a 1. Dan d			e Innovatio Achieved	
			suitably qualified member of the c s statement template with evidence					0	
	the	refurbishment	ALTER OF THE CONTRACT OF THE CONTRACT						
Comments									
Hea 05 Ven									
	EEAM credits available	2			ribution to overall score Im Standards applicable	2.83 Yes			
Assessment C Whe	Criteria ere the dwelling meets the fo	ollowingventilation r	equirements:				Indicati	ve Credits	
			A minimum level of backgroun	d ventilation is provid	ded (with trickle ventilato	rs or other			
			means of ventilation) for all h	nabitable rooms, kitcl	nens, utility rooms and ba	ithrooms			
			compliant with section 7, B	uilding Regulations A	pproved Document Part F	=, 2010			
	One Credit		Aminimum level of extract vent						
	Minimum Ventilation R		bath-rooms), compliant with se	ection 5, Building Reg 2010.	ulations Approved Docun	nentPartF			
			A minimum level of purge vent	X X X	all babitable or encourse du				
			compliant with section 7, B						
			It is an historic building and me		requirements in CN4 of th	e technical			
				manual					
1			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 -	Ventilation is provided for the dwelling that meets the requirements of Section 5 of				
						ction 5 of			
i i i i i i i i i i i i i i i i i i i	Two Credit Advanced Require		Bui	lding Regulations Par	t F in full				
Comments			Bui Where the building is a historic b	lding Regulations Par	t F in full ne requirements for Histo				
Hea OG Safe	Advanced Require	ement s	Bui Where the building is a historic b	lding Regulations Par building and meets th ance note 4 of the te	t F in full ne requirements for Histo		%		
Hea OG Safe No. of BR No. of BREE	Advanced Require ety IEEAM credits available EAM innovation credits		Bui Where the building is a historic b	Iding Regulations Par building and meets th ance note 4 of the te Available cont	t F in full ne requirements for Histo chnical manual	ric Buildings	5	ve Credits	
Hea D6 Safe No. of BR No. of BREE Assessment C	Advanced Require ety IEEAM credits available ECAM innovation credits	iments 1 0	Bui Where the building is a historic I in complic in complic	Iding Regulations Par building and meets th ance note 4 of the te Available cont <u>Minimu</u> ows:	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable	ric Buildings	5	ve Credits 1	
Hea D6 Safe No. of BR No. of BREE Assessment C	Advanced Require ety IEEAM credits available ECAM innovation credits	iments 1 0	Bui Where the building is a historic I in complia in complia in compliant in compliant in compliant in compliant fire detection	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable m Is provided	ric Buildings 1.42 Yes	5		
Hea OG Safe No. of BRE No. of BREE Assessment C Whe	Advanced Require	1 0 de (CO) detection an	Bui Where the building is a historic I in complic in complication a larm system is specified as follow Where a compliant fire detector Carbon Monoxide detector insta fuel	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable m Is provided	ric Buildings 1.42 Yes	5		
No. of BREE Assessment C Whe	Advanced Require	1 0 de (CO) detection an	Bui Where the building is a historic I in complic in complication a larm system is specified as follow Where a compliant fire detector Carbon Monoxide detector insta fuel	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste alled if dwelling is sup	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable im is provided plied with mains gas or of	ric Buildings 1.42 Yes	5		
Hea OG Safe No. of BRE No. of BREE Assessment C Whe	Advanced Require ety LEEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi one Credit e and Carbon Monoxide (CO)	1 0 de (CO) detection an	Bui Where the building is a historic I in complia d alarm system is specified as follo Where a compliant fire detectior Carbon Monoxide detector insta fuel	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste illed if dwelling is sup d alarm system if pro	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring*	1.42 Yes	5		
Hea DG Safe No. of BREE Assessment C Whe Fire	Advanced Require ety LEEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi one Credit e and Carbon Monoxide (CO)	1 0 de (CO) detection an ; Detection and Alarm	Bui Where the building is a historic I in complic in complication d alarm system is specified as folic Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste illed if dwelling is sup d alarm system if pro	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring*	1.42 Yes	5		
Hea DG Safe No. of BREE Assessment C Whe Fire	Advanced Require	1 0 de (CO) detection an ; Detection and Alarm	Bui Where the building is a historic I in complic in complication d alarm system is specified as folic Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste illed if dwelling is sup d alarm system if pro	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring*	1.42 Yes	5		
Hea DG Safe No. of BREE Assessment C Whe Fire	Advanced Require	1 0 de (CO) detection an ; Detection and Alarm	Bui Where the building is a historic I in complic in complication d alarm system is specified as folic Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste illed if dwelling is sup d alarm system if pro	t F in full he requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring*	1.42 Yes	5		
Hea DG Saffa No. of BRE Assessment C Who Fire * se Comments	Advanced Require ety tEFAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi one Credit and Carbon Monoxide (CO) Systems ee CN9 in Hea D6 for the defi ENERGY	1 0 de (CO) detection an Detection and Alarm nition of re-wiring	Bui Where the building is a historic I in complic in complication d alarm system is specified as folic Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste illed if dwelling is sup d alarm system if pro	t F in full er equirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* o re-wiring* is to take pla	1.42 Yes	s Indicati		
Hea 06 Safe No. of BR No. of BR Ssessment C Whe Fire * se Comments	Advanced Require ety EEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi ere af and Carbon Monoxide (CO) Systems ee CN9 in Hea 06 for the defi ENERGY provement in Energy Efficien	1 0 de (CO) detection an Detection and Alarm nition of re-wiring	Bui Where the building is a historic I in complia d alarm system is specified as follo Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an Battery operated fire detection a	Iding Regulations Par building and meets th ance note 4 of the te Available cont <u>Minimu</u> ows: n and fire alarm system illed if dwelling is sup d alarm system if pro and alarm system if n	t F in full er equirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* o re-wiring* is to take pla	ther fossil	s Indicati 24. 47%		
Hea DG Saffa No. of BR No. of Set Assessment C Whe Fire Fire Comments Ene 01 Imp No. of BR No. of BR	Advanced Require ety teEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi one Credit and Carbon Monoxide (CO) Systems se CN9 in Hea D6 for the defi ENERGY revement in Energy Efficien teEAM credits available EAM innovation credits	1 0 de (CO) detection an Detection and Alarm nition of re-wiring	Bui Where the building is a historic I in complia d alarm system is specified as follo Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an Battery operated fire detection a	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm system illed if dwelling is sup d alarm system if pro and alarm system if n Available cont	t F in full er requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* io re-wiring* is to take pla	ther fossil	s Indicati 24. 47%	1	
Hea 06 Safe No. of BRE Ssessment C Whe Fire * se Comments	Advanced Require ety (EEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi One Credit e and Carbon Monoxide (CO) Systems ee CN9 in Hea 06 for the defi ENERGY provement in Energy Efficien (EEAM innovation credits Criteria		Bui Where the building is a historic I in complia d alarm system is specified as folic Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an Battery operated fire detection a Section Weighting: 43%	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm system illed if dwelling is sup d alarm system if pro and alarm system if n Available cont Minimu s a result of refurbish	t F in full e requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* to re-wiring* is to take pla Indicative Sr ribution to overall score im Standards applicable	1.42 Yes ther fossil ice	s Indicati 24. 47%		
Hea 06 Safe No. of BRE Ssessment C Whe Fire * se Comments	Advanced Require ety (EEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi One Credit e and Carbon Monoxide (CO) Systems ee CN9 in Hea 06 for the defi ENERGY provement in Energy Efficien (EEAM innovation credits Criteria		Bui Where the building is a historic I in complia d alarm system is specified as folic Where a compliant fire detector Carbon Monoxide detector insta fuel Mains supplied fire detection an Battery operated fire detection a Battery operated fire detection a section Weighting: 43%	Iding Regulations Par building and meets the ance note 4 of the te Available cont Minimu ows: n and fire alarm system illed if dwelling is sup d alarm system if pro and alarm system if n and alarm system if n s a result of refurbish Credits 0.5	t F in full e requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* to re-wiring* is to take pla Indicative Sr ribution to overall score im Standards applicable	1.42 Yes ther fossil ice	s Indicati 24. 47%	1 ve Credits	
Hea 06 Safe No. of BRE Ssessment C Whe Fire * se Comments	Advanced Require ety (EEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi One Credit e and Carbon Monoxide (CO) Systems ee CN9 in Hea 06 for the defi ENERGY provement in Energy Efficien (EEAM innovation credits Criteria		Bui Where the building is a historic I in complia d alarm system is specified as folic Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an Battery operated fire detection a Battery operated fire detection a Section Weighting: 43% Section Weighting: 43%	Iding Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm system and alarm system if pro and alarm system if pro and alarm system if n Available cont Minimu s a result of refurbish Credits 0.5 1	t F in full e requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* to re-wiring* is to take pla Indicative Sr ribution to overall score im Standards applicable	1.42 Yes ther fossil ice	s Indicati 24. 47%	1 ve Credits	
Hea 06 Safe No. of BRE Ssessment C Whe Fire * se Comments	Advanced Require ety (EEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi One Credit e and Carbon Monoxide (CO) Systems ee CN9 in Hea 06 for the defi ENERGY provement in Energy Efficien (EEAM innovation credits Criteria		Bui Where the building is a historic I in complia in compliant d alarm system is specified as follo Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an Battery operated fire detection an Battery operated fire detection an Battery operated fire detection an Battery operated fire detection an Battery operated fire detection an Battery operated fire detection an Battery operated fire detection an Battery operated fire detection an Battery operated fire detection and Section Weighting: 43%	Available cont Minimu Available cont Minimu ows: n and fire alarm syste alled if dwelling is sup d alarm system if pro and alarm system if n Available cont Minimu s a result of refurbish Credits 0.5 1 1.5 2	t F in full e requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* to re-wiring* is to take pla Indicative Sr ribution to overall score im Standards applicable	1.42 Yes ther fossil ice	s Indicati 24. 47%	1 ve Credits	
Hea 06 Safe No. of BRE Ssessment C Whe Fire * se Comments	Advanced Require ety (EEAM credits available EAM innovation credits Criteria ere a fire and carbon monoxi One Credit e and Carbon Monoxide (CO) Systems ee CN9 in Hea 06 for the defi ENERGY provement in Energy Efficien (EEAM innovation credits Criteria		Bui Where the building is a historic I in complia d alarm system is specified as follor Where a compliant fire detection Carbon Monoxide detector insta fuel Mains supplied fire detection an Battery operated fire detection a Battery operated fire detection a section Weighting: 43% Section g Regulations Par building and meets th ance note 4 of the te Available cont Minimu ows: n and fire alarm syste alled if dwelling is sup d alarm system if pro and alarm system if n and alarm system if n s a result of refurbish Credits 0.5 1 1.5	t F in full e requirements for Histo chnical manual ribution to overall score im Standards applicable m is provided plied with mains gas or of ject involves re-wiring* to re-wiring* is to take pla Indicative Sr ribution to overall score im Standards applicable	1.42 Yes ther fossil ice ection Score 2 8.90	s Indicati 24. 47%	1 ve Credits		
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No. of BREEAM innovation credits Assessment Criteria	<u>4</u> 2	Mir	contribution to overall score nimum Standards applicable	5.93% Yes Indicative Credit
Where the following Energy Efficiency Rating	benchmarks will be met as a result of refurbish EER post refurbishment	nment: Credits	N #1	2.5
	≥50	0.5	Minimum requiremen 'Pass' level EER of 50	
	≥55	1	'Good' level EER of 58	3
	≥60 ≥65	1.5	'Very Good level' EER of	65
	≥70	2.5	'Excellent' level EER of	
	≥75	3		6.04
	≥80 ≥85	3.5	'Outstanding' level EER o	181
				Indicative Innovat
	Exemplary ≥90	Credits 1		
	≥50 ≥100	2	(r	
Comments				
Ene 03 Primary energy demand				
No. of BREEAM credits available	7		contribution to overall score	10.38%
No. of BREEAM innovation credits Assessment Criteria	0	Mir	nimum Standards applicable	No Indicative Credit
Where the following Primary Energy Demand	benchmarks will be met as a result of refurbis			
Pri	mary Energy Demand Post Refurbishment ≤ 400	Credits 0.5		2007
	≤ 400 ≤ 370	1	-	
	≤ 340	1.5		
	≤ 320 ≤ 300	2	 _	
	≤ 280	3		
	≤ 260 ≤ 240	3.5 4		
	≤ 220	4.5	-	
	≤ 200	5		
	≤ 180 ≤ 160	5.5		
	≤ <u>1</u> 40	6.5		
Comments	≤ 120	7		
		1911	nimum Standards applicable	No
Assessment Criteria Where the dwelling will meet the following %	contribution from renewables and primary en			No Indicative Credit
Where the dwelling will meet the following %	welling Type Primary Energy Demand	ergy demand targets Percentage fro 1 Credit	as a result of refurbishment m Renewables 2 Credits	Indicative Credit
Where the dwelling will meet the following %	ed	ergy demand targets : Percentage fro	as a result of refurbishment	Indicative Credit
Where the dwelling will meet the following % Detach Semi-D Bungal	welling Type Primary Energy Demand ed etached ow ≤ 250 kWh/m²/year	ergy demand targets a Percentage fro 1 Credit ≥10% ≥10% ≥10%	as a result of refurbishment Im Renewables 2 Oredits ≥20% ≥20% ≥20%	Indicative Credit
Where the dwelling will meet the following % Detach Semi-D	welling Type Primary Energy Demand ed ed etached ≤ 250 kWh/m²/year ow Ferrace	ergy demand targets a Percentage fro 1 Credit ≥10% ≥10%	as a result of refurbishment m Renewables 2 Oredits ≥20% ≥20%	Indicative Credit
Where the dwelling will meet the following % Detaah Semi-D Bungak End of Mid Ter Low Ris	welling Type Primary Energy Demand ed ed etached ≤ 250 kWh/m²/year ow errace rrace eFlat	ergy demand targets: Percentage fro 1 Credit ≥10% ≥10% ≥10% ≥10% ≥10%	as a result of refurbishment m Renewables 2 Oredits ≥ 20% ≥ 20% ≥ 20% ≥ 20% ≥ 20%	Indicative Credit
Where the dwelling will meet the following % Detach Semi-D Bungai End of Md Ter	welling Type Primary Energy Demand ed etached ow ≤ 250 kWh/m²/year Terrace race ve Flat ≤ 220 kWh/m²/year	ergy demand targets a Percentage fro ≥10% ≥10% ≥10% ≥10% ≥10%	as a result of refurbishment m Renewables ≥ 20% ≥ 20% ≥ 20% ≥ 20% ≥ 20%	Indicative Credit
Where the dwelling will meet the following % Detach Bungai End of Mid Ter Low Ris Mid Ris High Ri	welling Type Primary Energy Demand ed etached ow ≤ 250 kWh/m²/year Terrace race ve Flat ≤ 220 kWh/m²/year	ergy demand targets = Percentage fro ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10%	as a result of refurbishment m Renewables 2 Credits 220% 220% 220% 220% 220% 220% 220% 215%	Indicative Credit
Where the dwelling will meet the following % Detach Bungai End of Mid Ter Low Ris Mid Ris High Ri	welling Type Primary Energy Demand ed etached ow ≤ 250 kWh/m²/year Terrace race ve Flat ≤ 220 kWh/m²/year	ergy demand targets a Percentage fro 1 Credit ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10%	as a result of refurbishment m Renewables 2 Credits 220% 220% 220% 220% 220% 220% 220% 215%	Indicative Credit
Where the dwelling will meet the following % Detach Sermi-D Bungai End of Mid Ter Low Ris High Ris Comments	welling Type Primary Energy Demand ed ed etached ≤ 250 kWh/m²/year ow se Flat se Flat ≤ 220 kWh/m²/year	ergy demand targets : Percentage fro ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10%	as a result of refurbishment m Renewables 2 Credits 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 15%	2.97% No No Indicative Credit
Where the dwelling will meet the following % Detach Bungal End of Mud Tet Low Ris Mud	Primary Energy Demand ed etached ow retrace race e Flat e Flat se Flat ≤ 220 kWh/m²/year	Percentage fro 1 Credit ≥10%	as a result of refurbishment 2 Crolis 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 15% 2 15% 2 15% 2 15%	Lindicative Credit 2
Where the dwelling will meet the following % Detach Semi-D Bungal End of Comments The D5 Energy Labelled White Goods No. of BREEAM credits available No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where Energy Efficiency White goods are to b	Primary Energy Demand ed etached ow Terrace race be Flat be Flat se Flat se Flat se Flat se Flat se Flat	Percentage fro 1 Credit ≥10%	as a result of refurbishment Therewables 2 Credits 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 15%	Lindicative Credit 2
Where the dwelling will meet the following % Detach Bungal End of No. of BREEAM incover No.	welling Type Primary Energy Demand ed ed etached ≤ 250 kWh/m²/year ow ≤ 250 kWh/m²/year race ≤ 220 kWh/m²/year se Flat ≤ 220 kWh/m²/year se Flat ≤ 220 kWh/m²/year b eprovided as follows:	ergy demand targets a Percentage fro 1 Credit ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10%	as a result of refurbishment 2 Crolis 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 15% 2 15% 2 15% 2 15%	Indicative Credit 2
Where the dwelling will meet the following % Detach Semi-D Bungai End of Mid Tei Low Ris High Ris Comments Ene 05 Energy Labelled White Goods No. of BREEAM credits available No. of BREEAM credits available No. of BREEAM credits available No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where Energy Efficiency White goods are to b First Credit Appliance Fridges, Freezers and Fridge	Arr Rating under EV Primary Energy Demand ed ed etached ≤ 250 kWh/m²/year own ≤ 250 kWh/m²/year er Flat ≤ 220 kWh/m²/year e Flat ≤ 220 kWh/m²/year be provided as follows: Appliance pr 2 A+ Rating under EU Energy Scheme	ergy demand targets : Percentage fro ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ovided v Efficiency Labelling 9	as a result of refurbishment The second sec	Indicative Credit 2
Where the dwelling will meet the following % Detach Semi-D Bungal End of Low Ris Multiple Comments Ene 05 Energy Labelled White Goods No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where Energy Efficiency White goods are to b First Credit Appliance Fridges, Freezers and Fridge	welling Type Primary Energy Demand ed ed etached ≤ 250 kWh/m²/year race se Flat se Flat ≤ 220 kWh/m²/year se Flat ≤ 220 kWh/m²/year be provided as follows: Appliance pr are prevented as follows: A+ Rating under EU Energy	ergy demand targets : Percentage fro ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ovided Available e Mir ovided percentage from the form of the fo	as a result of refurbishment The Renewables 2 Credits 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 20% 2 15%	Indicative Credit 2
Where the dwelling will meet the following % Detach Serni-D Bungal End of Mid Tei Low Ris High Ri Comments Ene 05 Energy Labelled White Goods No. of BREEAM credits available No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where Energy Efficiency White goods are to b First Credit Appliance Fridges, Freezers and Fridge Second Credit	Appliance pr 2 0 2 0 2 0	ergy demand targets : Percentage fro ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ovided vided refriciency Labelling e ovided under EU Energy rg Scheme Energy Efficiency	as a result of refurbishment The second sec	Indicative Credit 2
Where the dwelling will meet the following % Detach Semi-D Bungal End of End of Comments Ene 05 Energy Labelled White Goods No. of BREEAM innovation credits Assessment Criteria Where Energy Efficiency White goods are to b First Credit Appliance Fridges, Freezers and Fridge Second Credit Appliance	Appliance pr 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 4+ Rating under EU Energy Schem Appliance pr Washing Machine A++ Efficiency Labellin Appliance scrifted with	ergy demand targets : Percentage fro ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ≥10% ovided Available (Mir ovided under EU Energy rg Scheme Energy Efficiency heme A Rating under EU	as a result of refurbishment m Renewables 2 Credits ≥ 20% ≥ 20% ≥ 20% ≥ 20% ≥ 20% ≥ 20% ≥ 20% ≥ 15% ≥ 15% ≥ 15% ≥ 15% EU Energy Efficiency Labelling S Information Leaflet provided dwellings	Indicative Credit 2

Ene 06 Drying Space						
No. of BREEAM credits available	1	1	Available cont	ribution to overall score	1.48%	
No. of BREEAM innovation credits				um Standards applicable	No	
Assessment Criteria						icative Credits
Where adequate, secure internal or e	xternal space with posts :	and footings or fixings is provi	ided with the following:			1
		1 Credit	and an entry of the second			
		Number of bedrooms	Drying line requi	red		
		1.2	4m+			
		3+	бm+			
Comments						
Ene 07 Lighting						
No. of BREEAM credits available	2		Available cont	ribution to overall score	2.97%	
No. of BREEAM innovation credits	0		Minim	um Standards applicable	No	
Assessment Criteria					Ind	icative Credits
Where energy efficient internal and e		d as follows:				2
	External Lighting • 1					
		ghting of more than 45 lumen	is per circuit watt and Ene	ergy Efficient		
	Security Lighting OR					
	Where Energy Efficient S	pace Lighting is provided ONL	Y			
	Internal Lighting - 1					
	Maximum average watta	age across the total floor area	of the dwelling of 9 watt	s/m2		
Comments						
Ene 08 Display Energy Devices						
No. of BREEAM credits available				ribution to overall score	2.97%	
No. of BREEAM innovation credits	1		Minim	um Standards applicable	No	
Assessment Criteria					Ind	icative Credits
Where consumption data is displayed	to occupants by a compl	ant energy display device				2
	Flectricity	ige data displayed		eating Fuel		
		- Alexandra and a service	Electricity	Other		
	Electricity usa	age data displayed	2 credits awarded	1 credit awarded		
	Primary Heating Fu	el usage data displayed	N/A	1 credit awarded		
	Electricity & Primary H	eating Fuel usage displayed	N/A	2 credits awarded		
	Exemplary Credits					
	On	e credit		credits are achieved		ative Innovation
		onsumption data		Energy Display Device is	Cre	edits Achieved
	ive coi dirig c	unsumption data	capable of recordin	ig consumption data		1
Comments						
Ene 09 Cycle Storage	-	7				
No. of BREEAM credits available				ribution to overall score	2.97%	
No. of BREEAM innovation credits	0		Minimi	um Standards applicable	No	
Assessment Criteria	iont quelo otorogo io provi	ded as fellouisi			Ind	icative Credits
Where individual or communal compl		One Credit	Two Credits			0
	Dwelling Size		1 CK2007 (MARK CK27201107			
	Studios/ 1 bedroom	1 per two dwellings	1 per dwelling			
	2-3 bedrooms	1 per dwelling	2 per dwelling			
	4 bedrooms	2 per dwelling	4 per dwelling			
Comments						
Ene 10 Home Office						
No. of BREEAM credits available				ribution to overall score	1.48%	
No. of BREEAM innovation credits	0		Minim	um Standards applicable	No	
Assessment Criteria						icative Credits
Where sufficient space and services w	vill be provided to allow o	ccupants to set up a home of	fice in a suitable room wit	th adequate ventilation		1
Comments				and the second sec		
comments						

	Section Weighting: 11	%	Indicative Section Sco	ore 9.90%
Wat 01 Internal Water Use				
No. of BREEAM credits available No. of BREEAM innovation credits		Available contribution Minimum Stand		6.60% Yes
Assessment Criteria				Indicative Credits
Where the dwellings water consump consumption standards:	tion meets the following consumption benchmark	s, or where terminal fittings meet the fo	llowing water	₹ 2.5
Calculated Water				
Consumption	Equivalent terminal fitting standards	Minimum Standard	Credits	
(litres/person/day)				
>150	Typical baseline performance	N/A	0	
	NAME OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION OF A	ana.		
from 140 to ≤ 150	All showers specified to 'Good' OR All taps and ' to 'Good' OR Kitchen fittings specified to 'Excell		0.5	
a	to Good Or Ritchernitungs speaned to Excel			
from 129 to < 140	All showers specified to 'Excellent' OR All show	vers BREEAM Very Good	1	
1101112510 (140	and bathroom taps to 'Good'	BREEAWIVERY GOOD	÷	
from 118 to < 129	All bathroom and WC room fittings specified to '0	Good'	1.5	
from 118 to < 129	OR All bathroom fittings specified to 'Exceller	N/A	1.5	
	All Bathroom and WC room fittings specified	to		-
NATION CONTRACTOR OF A STATE	'Excellent' OR All Bathroom fittings Specified	to		
from 107 to < 118	'Excellent' and WCroom fitting specified to 'Goo		2	
	All Bathroom fittings, kitchen and utility sittin specified to 'Good'	lêz		
	All kitchen, bathroom, utility room and WC roo	227		-
from 96 to < 107	fittings specified to 'Good' OR All bathrooms, kit		2.5	
	and utility rooms specified to 'Excellent'			
	All bathroom fittings specified to 'Excellent' and	1WC		
< 96	room, kitchen and utility room fittings specified	d to BREEAM Outstanding	3	
	'Good'			
NOTE: 'Good' fittings are ed for full details.	uivalent to good practice fittings with "Excellent"	fittings equivalent to best practice fittin	gs (see the technical man	ual Indicative Innovation
		If the water consumption is less	1 _	Credits Achieved
	Exemplary Credit	than 80l/person/day		
Comments				<i>n</i>
Wat 02 External Water Use				
No. of BREEAM credits available		Available contribution		2.20%
No. of BREEAM innovation credits Assessment Criteria	0	Minimum Stand	ards applicable	No Indicative Credits
Where the following requirements w				
	Requirements:		and the second second second second second second second second second second second second second second second	-
	been provided to dwe	nwater collection system for external/in Ilings	ternal irrigation use has	
	One Credit OR	in Eo.		
	Where dwellings have	no individual or communal garden spac		
Comments			e.	
			e.	
			e.	
Wat 03 Water Meter			e	
No. of BREEAM credits available		Available contribution	to overall score	2.20%
No. of BREEAM credits available No. of BREEAM innovation credits		Available contribution Minimum Stand	to overall score	No
No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria		Minimum Stand	to overall score ards applicable	
No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded	0	Minimum Stand	to overall score ards applicable	No Indicative Credits
No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded	0	Minimum Stand	to overall score ards applicable	No Indicative Credits
No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded	0	Minimum Stand	to overall score ards applicable	No Indicative Credits
No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded	0	Minimum Stand	to overall score ards applicable	No Indicative Credits
No. of BREEAM inrovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of N	0 or measuring usage of mains potable water meter Section Weighting: 8%	Minimum Stand	to overall score ards applicable redit may be	No Indicative Credits
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of M No. of BREEAM credits available	0 or measuring usage of mains potable water meter Section Weighting: 3% Anterials 25	Minimum Stand has been provided to dwelling(s), one o has been provided to dwelling(s), one of has been provided to dwe	to overall score ards applicable redtmay be Indicative Section Sco to overall score	No Indicative Credits
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of f No. of BREEAM innovation credits No. of BREEAM innovation credits	0 or measuring usage of mains potable water meter Section Weighting: 3% Actorials 25	Minimum Stand	to overall score ards applicable redtmay be Indicative Section Sco to overall score	No Indicative Credits
No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat D1 Environmental Impact of N No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with	0 or measuring usage of mains potable water meter Section Weighting: 3% Anterials 25	Minimum Stand	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable	No Indicative Credits
No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat D1 Environmental Impact of N No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, wilt cred ts available for each element:	0 or measuring usage of mains potable water meter Section Weighting: 8% Autorials 25 0 h credits calculated using the Mat 01 calculator to	Minimum Stand has been provided to dwelling(s), one of 6 Available contribution Minimum Stand ol. The table below shows the maximum	to overall score ards applicable redtmay be Indicative Section Sco to overall score ards applicable	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of N No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, wilt credits available for each element: Elem	0 or measuring usage of mains potable water meter Section Weighting: 3% Asterials 25 0 h credits calculated using the Mat 01 calculator to ents Green Guide Rat	Minimum Stand has been provided to dwelling(s), one of has been provided to dwelling(s), one of Minimum Stand hol. The table below shows the maximum ting credits available Thermal per	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable in number of formance credits available	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental impact of N No. of BREEAM credits available No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, wit cred ts available for each element.	0 or measuring usage of mains potable water meter Section Weighting: 8% Auterials 25 0 h credits calculated using the Mat 01 calculator to ents Green Guide Rat of i valls	Minimum Stand has been provided to dwelling(s), one of 6 Available contribution Minimum Stand ol. The table below shows the maximum	to overall score ards applicable red t may be Indicative Section Sco to overall score ards applicable	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat D1 Environmental Impact of N No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, wilt credits available for each element: Elem Baber Stremming Commentation (Criteria)	0 or measuring usage of mains potable water meter Section Weighting: % Atterials 25 0 h credits calculated using the Mat 01 calculator to ents of sit walls ing separating walls)	Minimum Stand has been provided to dwelling(s), one of Available contribution Minimum Stand for the table below shows the maximum Sting credits available Thermal per 5 5 5	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable in number of formance credits available 3 3.8	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental impact of M No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, wit Credits available for each element.	0 or measuring usage of mains potable water meter Section Weighting: 8% Asterials 25 0 h credits calculated using the Mat 01 calculator to ents of ing separating walls) ing separating walls	Minimum Stand has been provided to dwelling(s), one of has been provided to dwelling(s), one of Available contribution of Minimum Stand ol. The table below shows the maximum sing credits available 5 5	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable on number of formance credits available 3	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat D1 Environmental Impact of f No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with credits available for each element: Elem Ro Externi Internal walks (includ Upper and C	0 or measuring usage of mains potable water meter Section Weighting: 8% Aterials 25 0 h credits calculated using the Mat 01 calculator to ents of il walls ing separating walls) inound Floor lows seents all of the elements containing refurbished	Minimum Stand thas been provided to dwelling(s), one of the seen provided to dwelling(s), one of the second	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable on number of formance credits available 3 3.8 - 1.2 2 2 m Gude Rating of A+(6)	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments Mat D1 Environmental Impact of M No. of BREEAM credits available No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with credits available for each element: Elem Ro Elem Internal walls (includ Upper and C The full 25 credits repp G GR	O Section Weighting: 3% Asterials C O Asterials C O Asterials C	Minimum Stand has been provided to dwelling(s), one of Available contribution Minimum Stand ol. The table below shows the maximum Sting credits available Thermal per 5 5 5 or existing materials that meet the Gree 7 refurbished elements Poir 5	to overall score ards applicable redt may be Indicative Section Sco and applicable on number of formance credits available 3.8 - 1.2 2	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of f No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with credits available for each element: Elem Ro Externin Internal Walls (includ Upper and G Upper and G G R A+ A+	0 Section Weighting: 3% Aterials 25 0 Aterials 25 0 Aterials Control of the elements containing refurbished ating Points for existing / (6) (5)	Minimum Stand thas been provided to dwelling(s), one of the seen provided to dwelling(s), one of the second	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable on number of formance credits available 3 3.8 - 1.2 2 2 m Gude Rating of A+(6)	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat D1 Environmental Impact of N No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with cred ts available for each element: Elem Ro Elem Internal walls (includ Upper and C C The full 25 credits repp G GR Assessment Criteria Internal walls (includ Upper and C Assessment Assessment Assessment Assessment Assessment Criteria Assessment Criteria Bartinovation credits available Ro Bartinovation credits available Assessment Criteria Assessment Criteria		Minimum Stand has been provided to dwelling(s), one of Available contribution Minimum Stand ol. The table below shows the maximum Sting credits available Thermal per 5 5 5 5 5 6 7 refurbished elements 7 5 4.6 4.2 3.8	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable on number of formance credits available 3 3.8 - 1.2 2 2 m Gude Rating of A+(6)	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of f No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with credits available for each element: Elem Ro Externin Internal walks (includ Upper and C Winn The full 25 credits rep G G R A+ A+ A+ A+ A+ A+ A+	0 Section Weighting: 3% Aterials 25 0 Aterials Control of the elements containing refurbished ating Points for existing / (6) (5) (2) (2) (5) (2) (5) (5) (2) (5) (5) (5) (5) (5) (5) (5) (5) (5) (5	Minimum Stand thas been provided to dwelling(s), one of the seen provided to dwelling(s), one of the second	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable on number of formance credits availabl 3 3.8 - 1.2 2 2 2 1.9 4 5 or new elements	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat D1 Environmental Impact of N No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with cred ts available for each element: Elem Ro Elem Internal walls (includ Upper and C C The full 25 credits repp G GR Assessment Criteria Internal walls (includ Upper and C Assessment Assessment Assessment Assessment Assessment Criteria Assessment Criteria Bartinovation credits available Ro Bartinovation credits available Assessment Criteria Assessment Criteria		Minimum Stand has been provided to dwelling(s), one of Available contribution Minimum Stand ol. The table below shows the maximum Sting credits available Thermal per 5 5 5 5 5 6 7 refurbished elements 7 5 4.6 4.2 3.8	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable on number of formance credits available 3 3.8 - 1.2 2 2 m Gude Rating of A+(6)	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of f No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with credits available for each element: Elem Ro Externin Internal walls (includ Upper and C Winn The full 25 credits rep G G R A+ A+ A+ A+ A+ A+ A+ A+ A+ A+ A+ A+ A+		Minimum Stand thas been provided to dwelling(s), one of thas been provided to dwelling(s), one of the spectrum	to overall score ards applicable redit may be indicative Section Sco to overall score ards applicable on number of formance credits available 3.8 1.2 2 2 1.2 2 3.8 1.2 2 1	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments MATERIALS Mat 01 Environmental Impact of N No. of BREEAM credits available No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, with credits available for each element: Elem Rea Elem Commental Walls (includ Upper and Comments reprint The full 25 credits reprint G R Assession Assession Assession The full 25 credits reprint Assession Assession Assession Assession Assession Assession Commentation Assession Commentation		Minimum Stand thas been provided to dwelling(s), one of the speen provid	to overall score ards applicable redit may be Indicative Section Score ards applicable on unmber of formance credits available 3 3.6 1.2 2 in Guide Rating of A+(6) its for new elements 3 2 2	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments Material innovation credits Assessment criteria Up to 25 credits can be awarded, wit cred ts available for each element.		Minimum Stand thas been provided to dwelling(s), one of the seen provided to dwelling(s), one of the second	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable a number of formance credits available 3 3.8 - 1.2 2 n Guide Rating of A+ (6) ts for new elements 3 3 2.2 1 0.5 0,25 0	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12
No. of BREEAM innovation credits No. of BREEAM innovation credits Assessment Criteria Where an appropriate water meter f awarded Comments Mat D1 Environmental Impact of M No. of BREEAM innovation credits Assessment Criteria Up to 25 credits can be awarded, wit cred ts available for each element: Elem Ro Base available for each element: Elem Ro Comments Base available for each element: Elem Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro		Minimum Stand thas been provided to dwelling(s), one of thas been provided to dwelling(s), one of the spectrum	to overall score ards applicable redit may be Indicative Section Sco to overall score ards applicable a number of formance credits available 3 3.8 - 1.2 2 n Guide Rating of A+ (6) ts for new elements 3 3 2.2 1 0.5 0,25 0	No Indicative Credits 1 are 3.67% 4.16% No Indicative Credits 12

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	Roof External walls	0.11 0.15	
	Internal walls (including separating walls) Upper and Ground Floor Windows	0.15	
	Windows	1.4	
Comments			

at 02 Responsible Sourcing of M No. of BREEAM credits available		-	Available contribution to	overall score	2.50%	-
Io. of BREEAM innovation credits			Minimum Standar		Yes	ndicative Credits
			of new materials for an element are i		⇒∟	6 6
irced. The credits achieved are de irced as detailed below:	pendent on % of point a	achieved which is based upon th	e responsible sourcing tier level of ea	ach material	85°	
a ce u as uetalle d below?		Sustainable Procument Plan (3				r used in the pro
	The principal contracto sustainable procureme		ect in accordance with a documented			ordance with the mber Procurem
		principal contractor is a Small C	ompany (up to 3 BREEAM credits)			mber Procurem /es
		Checklist A-9 is filled in with su	pporting evidence			
Table 1	BRE	EAM credits	% of available points achieved	l l		
		12 10	≥54% ≥45%			
	1	8	≥45%			
		6	≥ 27%			
	2	4	≥18% ≥9%			
nments						
at 03 Insulation No. of BREEAM credits available	8		Available contribution to	overall score	1.33%	
lo. of BREEAM innovation credits			Minimum Standar		No	adioatius C. In
essment Criteria ere any new insulation specified f	or use within externel	alls ground floor, reaf and huilt	dings services meet the following req	uiremente		ndicative Credit: 4
or clamy new insuration specified (Requirements	and, ground noor, roor and built	an Palaci Arcea meet rije ronowing led	yan errierite.		
		Where the Insulation Ind	ex for new insulation used in the buil	ldings is >?		
	4 Credits			0		
		Where Green Guide rati	ings are determined using the Green specification tool	Guide to		
	Requirements		op concernent cool			
	4 Credits		nermal insulation used in the building	g elements is		
nments			responsibly sourced.			
	-11					
WASTE		Section Weighting: 3%		Indicative Section	in Score 2.40%	
	2	-	Available contribution to	overall score	1.20%	
No. of BREEAM credits available lo. of BREEAM innovation credits			Available contribution to Minimum Standard		1.20% No	
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	The percentage of non-hazardous construction waste and demolition waste
	generated by the project has been diverted from landfill and meets or exceeds the refurbishment & demolition waste diversion benchmarks
ojects over £300k	
First Credit Management Plan	Where a compliant Level 2; Site Waste Management Plan (SWMP) is in place
	First credit achieved
	Non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the resource efficiency benchmark
Second Credit Good Practice Waste Benchmarks	Amount of waste generated against £100,000 of project value is recorded in the SWMP \ensuremath{SWMP}
	Pre-refurbishment audit of the existing building is completed
	If demolition is included as part of the refurbishment programme, then the audit should also cover demolition materials
	Where the first two credits have been achieved achieved
Third Credit Best Practice Waste Benchmarks	Where Non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the refurbishment & demolition waste diversion benchmarks
Exemplary Credit	Where non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the <i>exemplary level resource efficiency</i> <i>benchmark</i>
	Where Non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the exemplary level diversion benchmarks

NOx Emissions of BREEAM credits available	3	Available contribution to overall scorel 2.25%
BREEAM innovation credits	0	Minimum Standards applicable No
nent Criteria are awarded on the basis of NOx er	nissions arising f	rom the operation of space heating and hot water systems for each refurbished minimum 3
; as follows:		Dry NOx Emissions
		One Credit ≤100 mg/kWh (NOx dass 4 boiler)
		Two Credits ≤70 mg/kWh (N0x class 5 boiler)
nts		Three Credits ≤40 mg/kWh
Surface Water Runoff of BREEAM credits available	3	Available contribution to overall score 2.25%
BREEAM innovation credits	1	Minimum Standards applicable No
nent Criteria mpacts of the refurbishment on su	face water runc	off are neutralised or where runoff is reduced as a result of refurbishment, up to
edits can be awarded as follows:	irements	
Kequ	irements	New hard standing areas must be permeable
One Credit		If building on to previously permeable area additional run-off must be managed on site
Neutral Impact on Surf	ace Water	Calculations should be carried out by an appropriately qualified professional
Requ	irements	carcaladorio sinotid de carried ode by an appropriately quanted professional
		Where the criteria needed for One Credit has been achieved Where all run off from the reaf for rainfall donthe up to 5 mm, have been managed on site
OR Second Crea	lits	Where all run-off from the roof for rainfall depths up to 5 mm, have been managed on site using source control methods
Reducing Run-Off From	Site: Basic	Include runoff from all existing and new parts of the roof.
		An appropriately qualified professional should be used to design an appropriate drainage strategy for the site
Requ	irements	Norma Writer and the
		Where run-off as a result of the refurbishment is managed on site using source control
		An appropriately qualified professional should be used to design an appropriate drainage
		strategy for the site.
OR Three Cred	its	The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event has
Reducing Run-Off From Si	te: Advanced	been reduced by 75% from the existing site.
		The total volume of run-off discharged into the watercourses and sewers as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration has been reduced by 75%.
		An allowance for climate change must be included for all of the above calculations, in accordance with current best practice (PPS25, 2010).
Requ	irements	
		Where all run-off from the developed site is managed on site using source Indicative Inno
		control The peak rate of run-off as a result of the refurbishment for the 1 in 1 year 0
		event is reduced to zero.
		The peak rate of run-off as a result of the refurbishment for the 1 in 100 year
Exemplary Cre	dit	event is reduced to zero.
		There is no volume of run-off discharged into the watercourses and sewers
		as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration.
		An allowance for climate change must be included for all of the above
		calculations, in accordance with current best practice (PPS25, 2010).
nts		
Flooding		
of BREEAM credits available BREEAM innovation credits	2	Available contribution to overall score 1.50% Minimum Standards applicable Yes
nent Criteria		here in a medium to high flood risk zone and a flood resilience/resistance strategy
ne dwelling is located in a low flood n implemented, up to two credits c		
Minimum Stand	ards	A minimum of two credits must be achieved for this issue at the Excellent and Outstanding
		levels
Option 1 · Low Flood Risk		Where a Flood Risk Assessment (FRA) has been carried out and the assessed dwellings are
Two Credits		defined as having a low annual probability of flooding.
Option 2 · Medium / High Flood	Risk	Notes a folgen a constant the consultation of the 2016 2010 Constant 2016 2010 Constant 2016
		Where a Flood Risk Assessment (FRA) has been carried out and the assessed dwellings are
		defined as having a medium or high annual probability of flooding.
		Two credits are awarded where as a result of the dwellings floor level or measures to keep
Two Credits		water away the dwelling is defined as achieving avoidance from flooding by following Checklist A-10; Decision Strategy Flow Chart.
		Where avoidance is not possible, two credits are achieved where a full flood
		resilience/resistance strategy is implemented for the dwellings in accordance with
		resilience/resistance strategy is implemented for the dwellings in accordance with recommendations made by a Suitably Qualified BuildingProfessional