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appendices

50 LUX

Car Parks
Main Entrances and exits
Store rooms
Outdoor platforms
Stables
Hotel bedrooms
Garages

100 LUX

Corridors and passageways
Stairs and escalators
Entrance gates
Changing rooms
Rest rooms
Raw material stores
Machine rooms
Loading bays
Foyers
Domestic living rooms

200 LUX

Lifts and lift lobbies
Waiting rooms
Medical stores
Machine assembly rooms
Finished goods stores
Vaults and strong-rooms
Print rooms
Shopping centre circulation areas
Airport lounges
Museum areas (general)
School assembly halls
Lecture theatres
Gymnasiums
Sports spectator areas

400 LUX

Enquiry desks and counters
Food preparation areas
Consulting and treatment rooms
General clerical offices
Library reading tables
Assembly hall platforms
Classroom white-boards
Laboratories
Hospital dispensing rooms
Workshop benches

600 LUX

Engine testing rooms
Cutting and assembly rooms
Inspection and product testing benches
Computer rooms
Drawing board task lighting
Food sales counters
Cashier counters
Supermarkets
School art rooms
Vision testing rooms
Sewing rooms

900 LUX

Electronics assembly areas
Instrumentation workbenches
Supermarket displays

1200+ LUX

Sorting and grading areas
Clothing inspection areas
Hand engraving workbenches
Jewellery workbenches
Boxing rings

Table 34 : Recommended minimum illuminance levels (source : Square One Research - Ecotect)

Single Leaf Construction	U	Y	Lag	Decr	Abs
1mm Framed Galvanised Iron	5.66	5.2	0	1	0.3
75mm Concrete Panel Precast	4.28	4.9	1.9	0.91	0.62
75mm Panel + 13mm Dense Plaster	3.88	4.78	2	0.89	0.62
75mm Panel + 10mm Gyprock	3.65	4.72	2	0.88	0.62
110mm Brick Single	3.3	4.2	3	0.87	0.7
110mm Brick + 13mm Dense Plaster	2.7	4.1	3	0.84	0.7
110mm Brick + 10mm Gyprock	2.6	4	3	0.83	0.7
150mm Aerated Concrete Block	1.28	2.28	7.1	0.54	0.6
150mm Aerated + 13mm Dense Plaster	1	2	7	0.51	0.6
150mm Aerated + 10mm Gyprock	0.95	2	7	0.5	0.6
150mm Concrete Dense Cast In-situ	3.48	5.2	4	0.7	0.6
150mm In-situ + 13mm Dense Plaster	3	5.05	4.1	0.68	0.6
150mm In-situ + 10mm Gyprock	2.96	5	4.1	0.67	0.6
200mm Concrete Blockwork	2.1	2.6	6.5	0.36	0.6
200mm Blockwork + 13mm Dense Plaster	1.8	2.48	6.8	0.35	0.6
200mm Blockwork + 10mm Gyprock	1.7	2.47	6.8	0.35	0.6
230mm Brick Header	2.3	4.7	6.1	0.54	0.7
220mm Brick + 13mm Dense Plaster	2.1	4.5	6.5	0.49	0.7
230mm Brick + 10mm Gyprock	1.9	4.5	6.5	0.47	0.7
250mm Concrete Dense Cast In-situ	2.84	5.2	5.8	0.52	0.65
250mm In-situ + 13mm Dense Plaster	2.66	5	6	0.5	0.65
Cavity Construction	U	Y	Lag	Decr	Abs
2 x 1mm Galv. Iron + 100mm Gap	2.86	2.34	0.3	1	0.3
2 x 1mm Galv. Iron + Gap + 50mm Insulation	0.63	0.9	0.7	0.99	0.3
270mm BkVeneer + 50mm Insulation	0.51	0.9	4.3	0.69	0.7
270mm BkVeneer + Foil + 50mm Insulation	0.34	0.9	4.3	0.69	0.7
270mm BkVeneer + Foil + 100mm Insulation	0.29	0.41	4.3	0.68	0.7
270mm Cavity Brick	1.88	4.4	7.7	0.44	0.7
270mm Cavity + 13mm Dense Plaster	1.72	4.22	7.8	0.41	0.7
270mm Cavity + 10mm Gyprock	1.58	4	7.8	0.4	0.7
270mm Cavity + 50mm Insul. + 10mm Gyprock	0.47	4.7	9.2	0.32	0.7

Roof Construction	U	Y	Lag	Decr	Abs
1mm Angled Metal Decking	7.14	7.1	0	1	0.5
1mm Metal + Attic + Gyprockk	2.54	2.6	0.3	1	0.5
1mm Metal + Attic + 50mm Insulation + Gyprockk	0.55	1	0.7	0.95	0.5
Gyprockk	0.44	0.88	0.9	0.9	0.5
10mm Angled Clay Tiles	3.1	3.1	0.2	1	0.6
10mm Tiles + Attic + Gyprockk	2.6	2.64	0.5	1	0.6
10mm Tiles + Foil + Attic + Gyprockk	1.82	2	0.5	0.95	0.6
10mm Tiles + Attic + 50mm Insulation + Gyprockk	0.61	1	1.5	0.91	0.6
Gyprockk	0.35	0.88	1.8	0.88	0.6
19mm Asphalt + 150mm Concrete Slab	2.8	5.9	8	0.4	0.9
25mm Pebbles + Asphalt + 150mm Slab	2.5	4.35	7	0.34	0.7
19mm Asphalt + 150mm Aerated Concrete Slab	0.88	2.3	7	0.58	0.9
25mm Pebbles + Asphalt + 150mm Aerated Slab	0.66	4.21	6.2	0.31	0.7

Floor Construction	U	Y	Lag	Decr	Abs
Suspended Timber Floor	2.16	2	0.7	0.99	--
Suspended Timber Floor + Carpet Thin	1.43	1.5	0.8	0.94	--
Suspended Timber Floor + Carpet Thick	1.24	1.3	0.8	0.93	--
100mm Concrete Slab Suspended	2.56	4.2	4	0.7	--
100mm Concrete Slab on Ground + 4 Exp. Edges	1.1	6	4	0.32	--
100mm Concrete Slab on Ground + 2 Exp. Edges	1.07	6	4	0.32	--
100mm Concrete Slab on Ground + Carpet Thin	0.92	6	4.2	0.31	--
100mm Concrete Slab on Ground + Carpet Thick	0.9	6	4.2	0.31	--
150mm CSOG + 4 Exp. Edges	0.88	6	4.6	0.3	--
150mm CSOG + 2 Exp. Edges	0.45	6	4.6	0.3	--
150mm CSOG + Carpet Thin	0.72	6	4.6	0.28	--
150mm CSOG + Carpet Thick	0.71	6	4.6	0.28	--
150mm CSOG + 25mm Insul. + 4 Exp. Edges	0.21	6	4.6	0.18	--
150mm CSOG + 25mm Insul. + 2 Exp. Edges	0.2	6	4.6	0.18	--

GARMENT DESCRIPTION

CLO - m²K/W

Underwear, pants	Pantyhose	0.02	0.003
	Panties	0.03	0.005
	Briefs	0.04	0.006
	Pants 1/2 long legs, wool	0.06	0.009
	Pants long legs	0.1	0.016
Underwear, shirts	Bra	0.01	0.002
	Shirt sleeveless	0.06	0.009
	T-shirt	0.09	0.014
	Shirt with long sleeves	0.12	0.019
	Half-slip, nylon	0.14	0.022
Shirts	Tube top	0.06	0.009
	Short sleeve	0.09	0.029
	Light blouse, long sleeves	0.15	0.023
	Light shirt, long sleeves	0.20	0.031
	Normal, long sleeves	0.25	0.039
	Flannel shirt, long sleeves	0.30	0.047
	Long sleeves, turtleneck blouse	0.34	0.053
Trousers	Shorts	0.06	0.009
	Walking shorts	0.11	0.017
	Light trousers	0.20	0.031
	Normal trousers	0.25	0.039
	Flannel trousers	0.28	0.043
Coveralls	Overalls	0.28	0.043
	Daily wear, belted	0.49	0.076
Highly-insulating coveralls	Work	0.50	0.078
	Multi-component, filling	1.03	0.160
Sweaters	Fibre-pelt	1.13	0.175
	Sleeveless vest	0.12	0.019
	Thin sweater	0.20	0.031
	Long sleeves, turtleneck (thin)	0.26	0.040
	Thick sweater	0.35	0.054
Sundries	Long sleeves, turtleneck (thick)	0.37	0.057
	Socks	0.02	0.003
	Shoes (thin soled)	0.02	0.003
	Slippers, quilted fleece	0.03	0.005
	Shoes (thick soled)	0.04	0.006
Skirts, dresses	Thick, ankle socks	0.05	0.008
	Boots 0.1 0.016 Gloves	0.05	0.008
	Thick, long socks	0.10	0.016
	Light skirt, 15 cm. above knee	0.01	0.016
	Light skirt, 15 cm. below knee	0.18	0.028
Sleepwear	Heavy skirt, knee-length	0.25	0.039
	Light dress, sleeveless	0.25	0.039
	Winter dress, long sleeves	0.40	0.062
	Undershorts	0.10	0.016
	Thin strap, short gown	0.15	0.023
Robes	Long sleeve, long gown	0.30	0.047
	Hospital gown	0.31	0.048
	Long sleeve, long pyjamas	0.50	0.078
	Body sleep with feet	0.72	0.112
	Long sleeve, wrap, short	0.41	0.064
	Long sleeve, wrap, long	0.53	0.082
	Wooden or metal	0.00	0.000
	Fabric-covered, cushioned, swivel	0.10	0.016
	Armchair	0.20	0.032



human comfort factors - clothing level

Table 37 : Typical CLO values for garments (www.squ1.org)

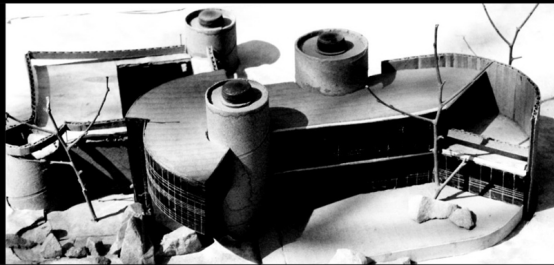
Figure 111 : Barbie & Ken's Malibu Vacation fashions

acknowledgement

My sincere thanks to Mr. Daniel De Beer for making time available to talk to me about his building.

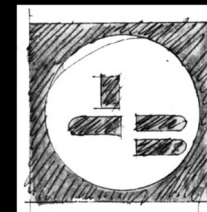
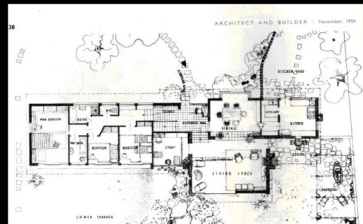
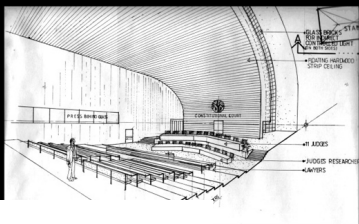
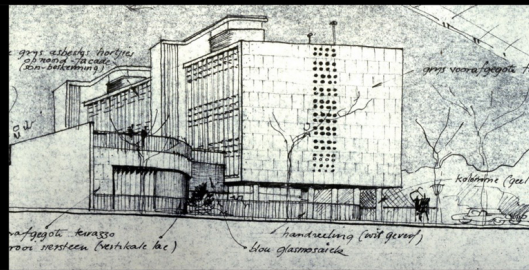
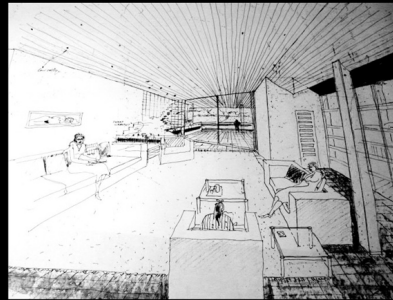
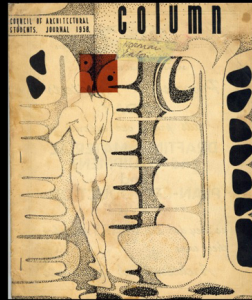
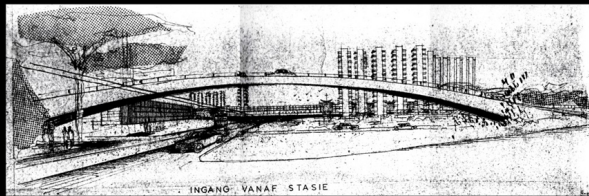
I regret not having the opportunity to visit again to discuss the result of this study ...and to somehow repay him for the insight that he offered me.

His passing is a loss to both his family and the profession...



as ek die begeerte mog waag,sou ek dit graag so wou he, dat die engel wat my kom haal huistoe, my daar bring met die verslag : "ek het hom by sy werk gekry"

cj langenhoven



danie de beer

07/12/1927-16/10/2008

