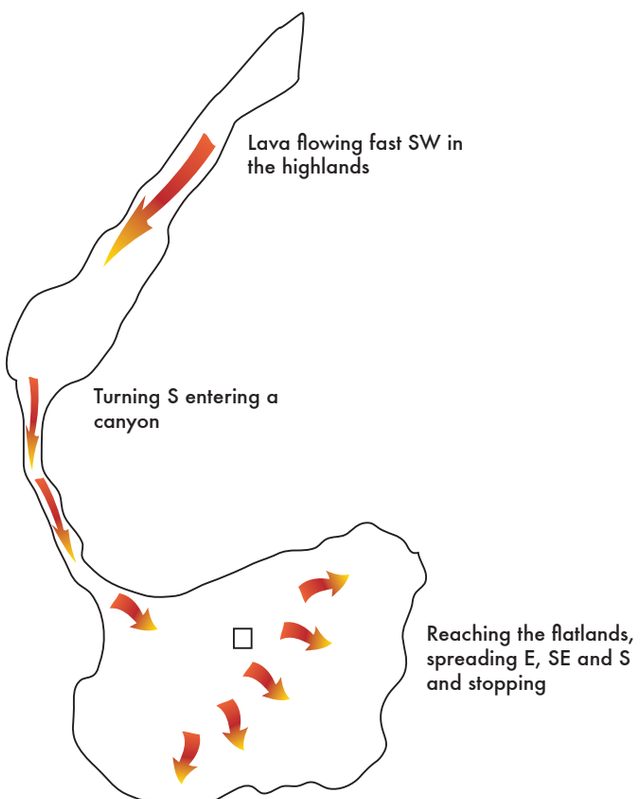

4 concept and building

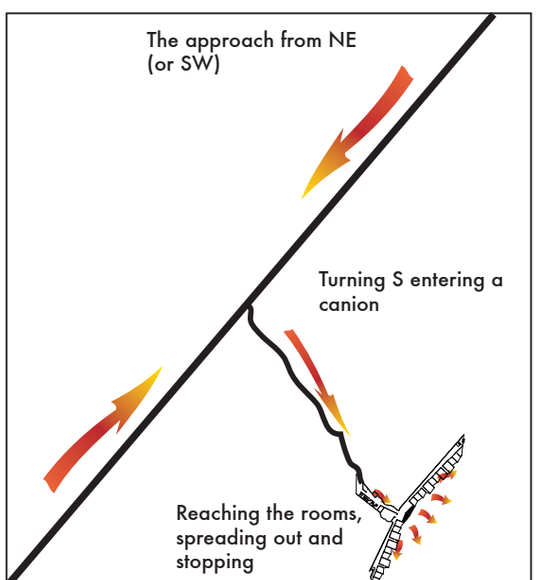

detailing

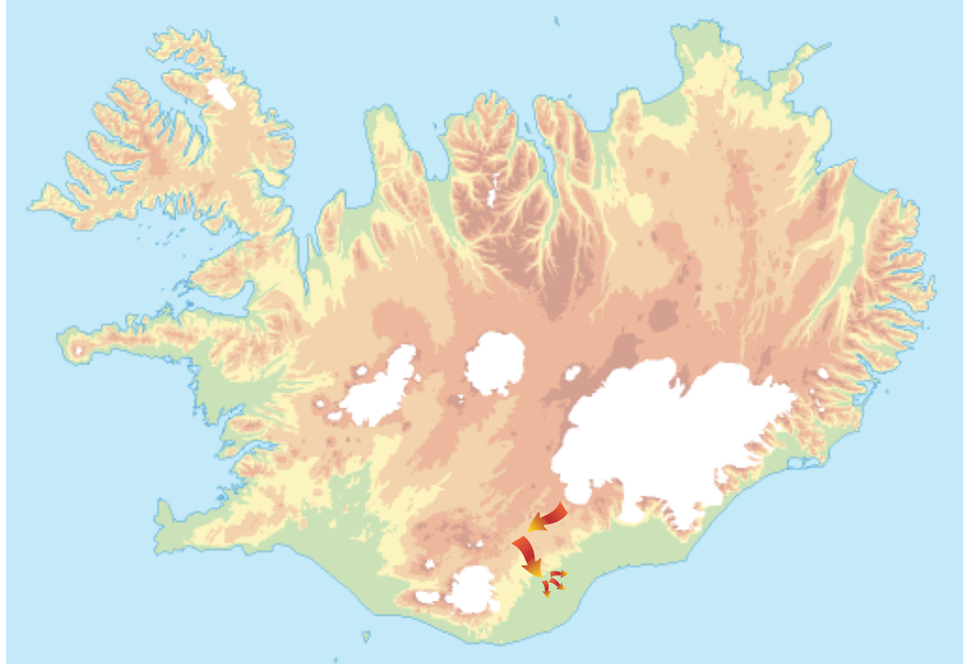
The flow of the lava

In 1783 the world witnessed a natural disaster. An eruption on a monumental scale started in the highlands of Iceland. The amount of lava flowing from the eruption was huge and shortly after the eruption started this enormus lava started its journey down to the flatlands 40 km away.

During the first km the direction of the flow was to the south-west from the eruption but soon it turned towards south. The ground became steeper and it started descending fast through a narrow passage or a canion. When it reached the open flat areas below it turned towards south-east and east, started spreading out and slowed down. There on the flat south coast of Iceland it finally stopped, cooled down and became solid.







The flow direction of Eldhraun lava

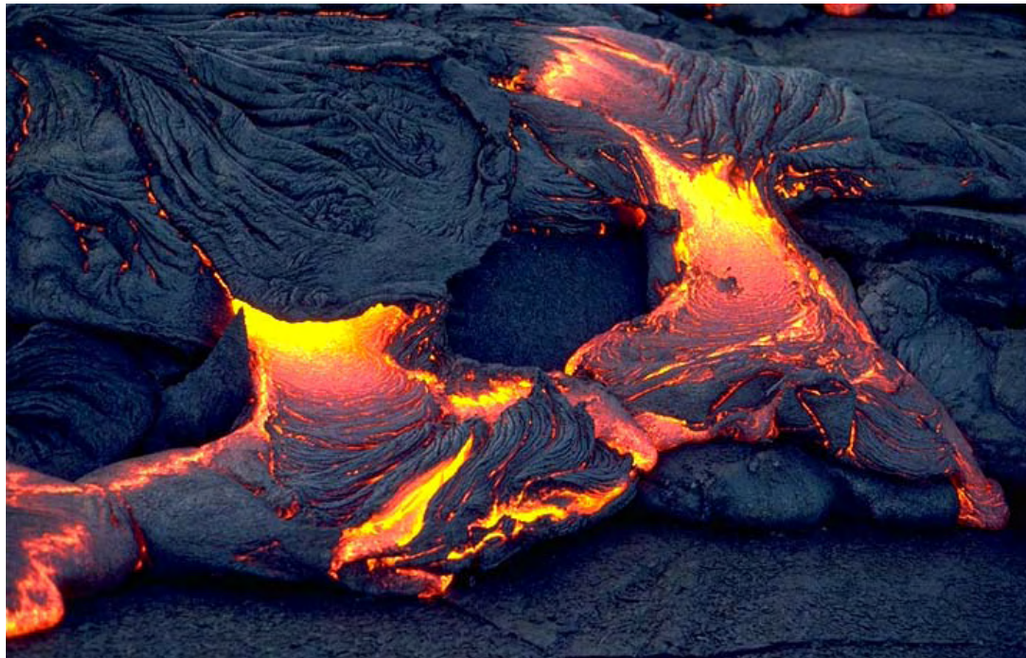
The flow through the hotel

The journey that the guests undertake when they approach and move through the lava hotel is similar to the journey of the lava. The approach from the Ringroad is to the north of the hotel. The guests approach the hotel by a small road that starts descending into the lava via a rift or a canyon. Surrounded by sheer rock walls and no view apart from directly into the sky, the guest travels this winding road, not knowing what is hidden around the next corner. Being in a car or bus the guests travel quite fast. Then suddenly this large, grey and smooth wall stands in front of the them. It appears to have no volume, only a thin sheet of heavy concrete. Slowly, on foot, the guests enter the building. Due to the main building´s curved form they turn to the southeast as they walk through the building. They pass the reception desk and continue their journey down a corridor that looks more like a canyon with a natural rock wall on one side and a smooth concrete wall on the other. They walk further until they start spreading out and entering the individual rooms. Here they finally stop. The view in front of them is breathtaking, overlooking the rugged and harsh lavafield, telling so many stories of strange, mystical and historical events. The journey of the lava has stopped but history continues its journey through time.

When lava is in it´s liquid and flowing form it acts like a river, finding its way around obstacles (photos: G. Bridde)

When lava is in its liquid state it acts like any other liquid material. Despite its extreme temperatures it flows down hills, flows over small obstacles but travels around larger ones. It looks for the easiest way to travel. When flowing liquid finds an obstacle that is too large to overflow, three things happen. The material starts piling up on the upwards side of the obstacle, it finds its way around the obstacle and it leaves a sheltered area on the downwards side of the obstacle.

This is what the wall elements in the lava hotel have done. When the flowing lava reached the wall it first tried to push it out of the way. The flowing lava piled up on the northern and western side of the wall before finally finding its way around the wall, thus creating a lower and sheltered area on the south-eastern side of the wall.



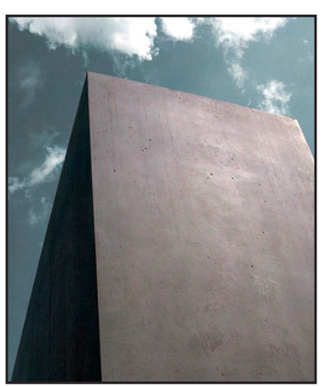
Materials

The number of different materials used in the buildings is kept to the minimum.
The main materials are:

- Concrete
- Glass
- Natural rock
- Wood / plaster

Most exterior- and loadbearing walls are made from concrete. Concrete, like lava, is basically solid rock that was in the beginning in a liquid state. The concrete is left uncovered in most areas. It is light grey and smooth creating a great contrast to the rugged, uneaven and dark lava surrounding the buildings.

Natural rock is used on the interior walls in some places. Partly in the form of lava bricks, used to bring the lava rock into the building to enhance the connection between the manmade and the natural but also as natural rock walls. Most of the floors are made from natural rock.


Flat, smooth and sharp concrete


Rugged, uneaven and dark lava


Lava bricks for interior walls


Untreated natural rock wall


Hard, smooth and reflecting glass


Soft, matte and spongy moss

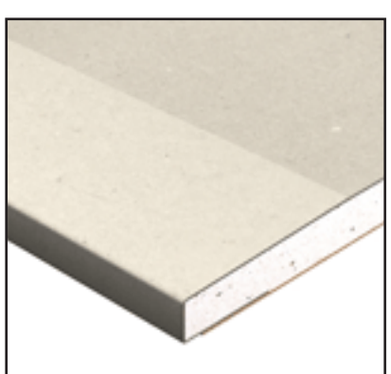
Glass plays a big part in the building for two main reasons.

- Its transparency; to view the outside from inside the building and at the same time letting light in.
- Its reflecting abilities; reflecting nature, allowing the building to merge with nature.

Glass is one of world´s hardest and most smooth materials. This is a great contrast to the moss that covers the lavafield and is reflected in the large glass windows. Moss is very soft and spongy material. The windows used in this project should have a high energy sufficiency and have a low U-value. (+/- 0,6 W/m2K.)

Wood / plaster is used to establish the room elements within the concrete room corridors. These walls are then treated with paint or natural rock to play with the inside/outside connection in the bulding.


Wooden frame construction and plaster for hotel rooms



Facades

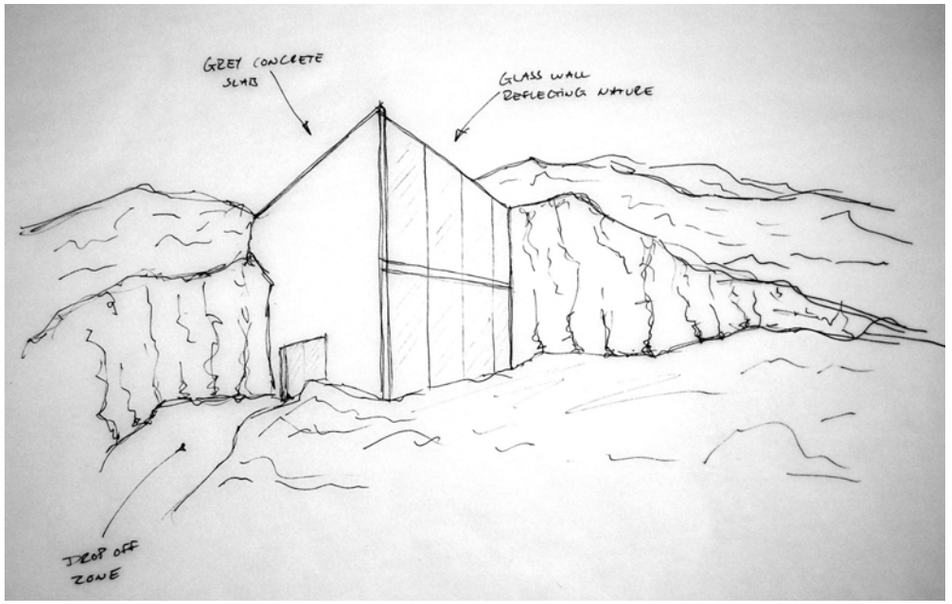
The building is divided into three parts:

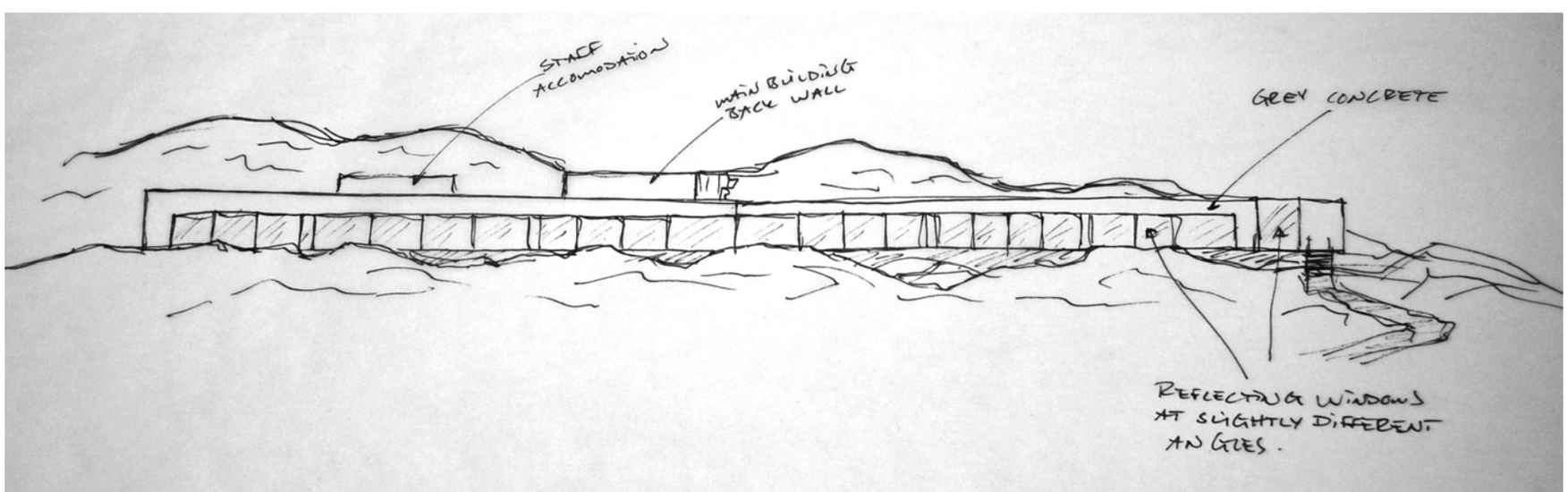
- The main building
- The north room corridor
- The south room corridor

The buildings are partly buried in the lavafield. The facades of the building parts that are visible are either the smooth grey and untreated concrete walls that are the icon for the hotel. Other visible facades are the large glass walls on the NW side of the main building or the continous window side of the rooms. In both cases the windows reflect the unspoiled nature and bring it into the building, almost merging these two different elements, the manmade and the natural. By doing this the building changes appearance along with the changing seasons.

The roofs of all building parts are slightly tilted. This means that under some circumstances the roofs can be visible. In order for them to blend into the landscape, lava gravel vill be placed on the roofs. In time moss will grow in the gravel merging the building even further with the surroundings.

Illustrations of the facades can be seen in chapter 6, Presentation.





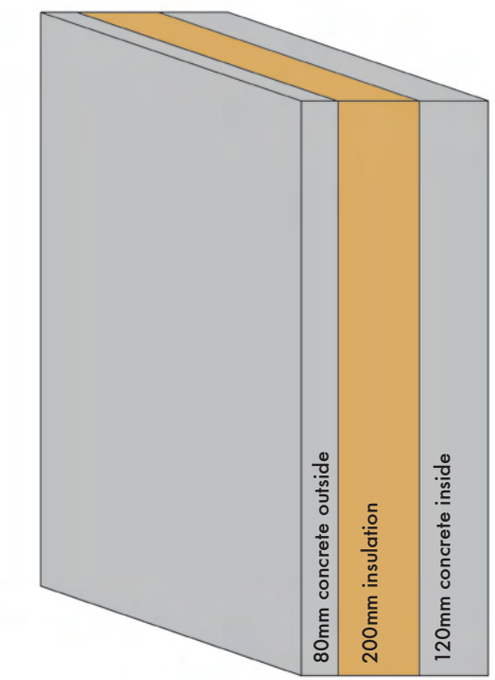
Construction

The lava hotel is mostly designed as a concrete building. In order to keep some focus on an enviromental approach, the use of local materials is important. Concrete is made in Iceland and therefore the use of steel or woodden construction is limited.

There is a very strong tradition for the use of concrete as a building material in Iceland. Due to its location on the North Atlantic ridge and frequent eartquakes, building regulations demand a large amount of steel reinforcement in all buildings. Taking into account the location of the lava hotel, in the middle of a lavafield that is only about 230 years old this is probably a good idea.

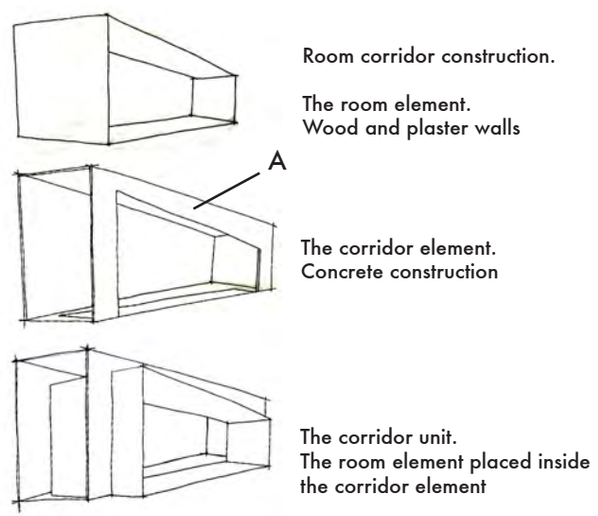
The main building is constructed out of two long walls stretching from SE to NW. The walls are 7m high on the SE end and 9m on the NW end. (see illustration on facing page) The building has two floors. The two walls are connected on the NW end with a wall completely made of glass. The SE end of the walls connect the main building to the room elements of the hotel. The exterior concrete walls are 400 mm thick, insulated and loadbearing. The roof of the building is made as a light construction and is connected to the inside of the concrete walls.

In order to avoid thermal bridges in the building envelope the loadbearing part of the wall is on the inside of the insulation. The thickness of the insulation is more than what the Icelandic building regulations demand (100-125 mm IBR 2003). This is done in order to limit the loss of heat through the walls and bring the building one small step closer to the Passive House concept. The natural rock walls that in some areas substitutes the concrete exterior walls are not insulated and that creates inevitable thermal bridges in some areas.



A 400mm thick loadbearing exterior wall:

The two corridors leading to the rooms are also made from concrete. They create two box like tubes leading to the NE and SW from the main building. The walls facing SE are partly open and the rooms are then built inside the concrete boxes as a light construction. This makes it possible to construct each room seperately and therefore gives the option of changing the rooms later if neccesary.



Room corridor construction.

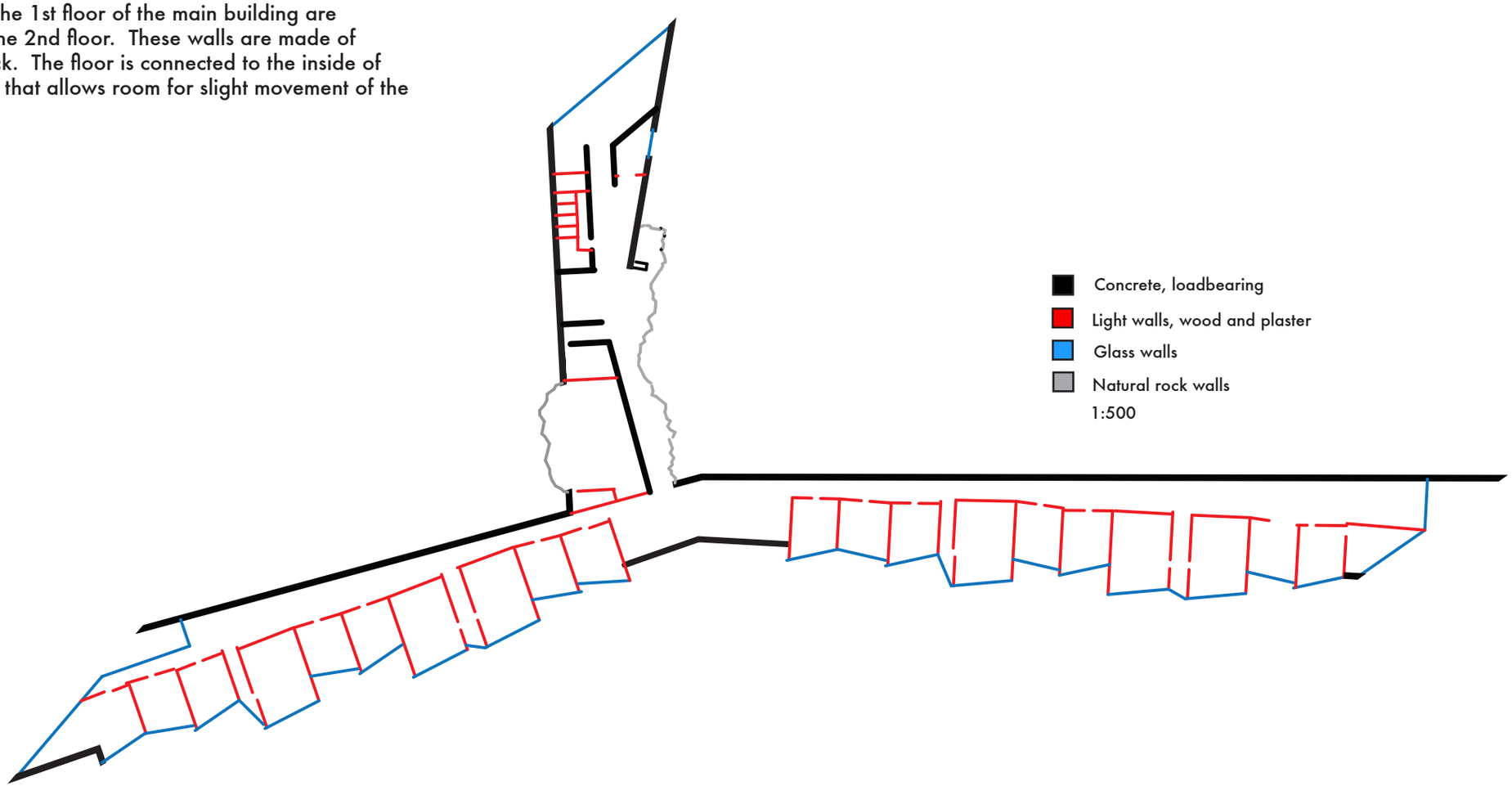
The room element.
Wood and plaster walls

The corridor element.
Concrete construction

The corridor unit.
The room element placed inside the corridor element

The walls seperating the rooms are 250 mm thick, allowing space for thermal and sound insulation, electrical cables and piping. This also creates room for steel columns within the walls to support the weight of the long concrete wall above the rooms. (marked A on sketch on facing page)

Some of the interior walls on the 1st floor of the main building are loadbearing and supporting the 2nd floor. These walls are made of concrete and are 200 mm thick. The floor is connected to the inside of the exterior walls in a manner that allows room for slight movement of the concrete floor.



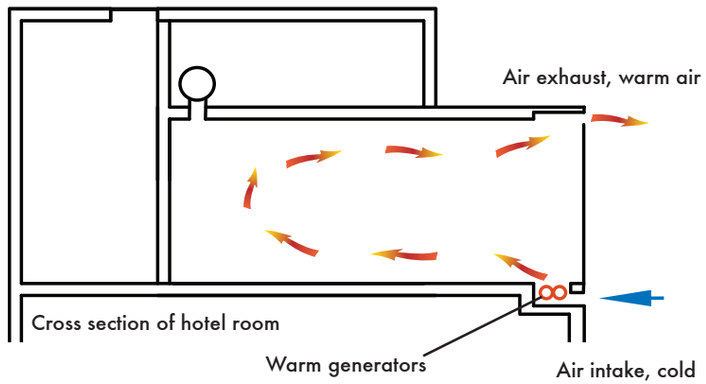
Ventilation strategies

The climate in Iceland is very inconstant. The difference from one day to another can be extreme, not to mention the difference from one season to another. This makes it difficult to utilize the passive principles for light, heating, cooling or ventilation. Iceland has a big advantage over most other countries in the world in the form of inexpencive electricity from clean energy sources and vast supplies of hot water. These things make up for the lack of implemented passive principles.

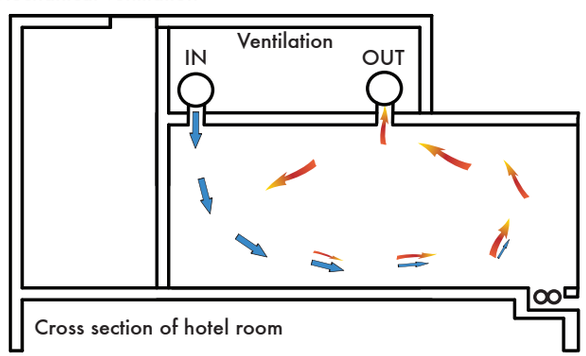
The depth of the rooms in the hotel ranges from 6,2 to 9,2 m from the window to the back wall. The ceiling hight in all rooms is 3,5 m. These dimensions allow for cross ventilation within the rooms since the room depth vs room height ratio is under 5:1. In this project windows on the back walls are not possible. Therefore single sided natural ventilation is used in the rooms during the warmer parts of the year (see illustration above). This is possible when the room depth vs room hight is less than 2,5:1
The cold air is taken in through a vent in the floor. If passes a generator that is heated with warm water before entering the room. The warm air passes through the room, rises and exits through a vent in the ceiling. On warm days it is possible to open larger windows on the top for a larger airchange.

The hotel will have a hibryd ventilation system with a heat recovery system (see illustration below). This is neccessary during the cold winter months and even on cold summer days. When the outside air entering the rooms is too cold a mechanical ventilation system is used. The mechanism for the system is in a highly sound insulated chamber above the room at the end of one corridor with the air intake and exhaust are on top of the roof. The ventilation shafts are placed on top of the rooms and the air intake in the rooms is at the back of the rooms. Preheated air is pumped into the room. The air then circulates through the room and is finally extracted and used in the heat recovery system.

Single sided ventilation



Mechanical ventilation



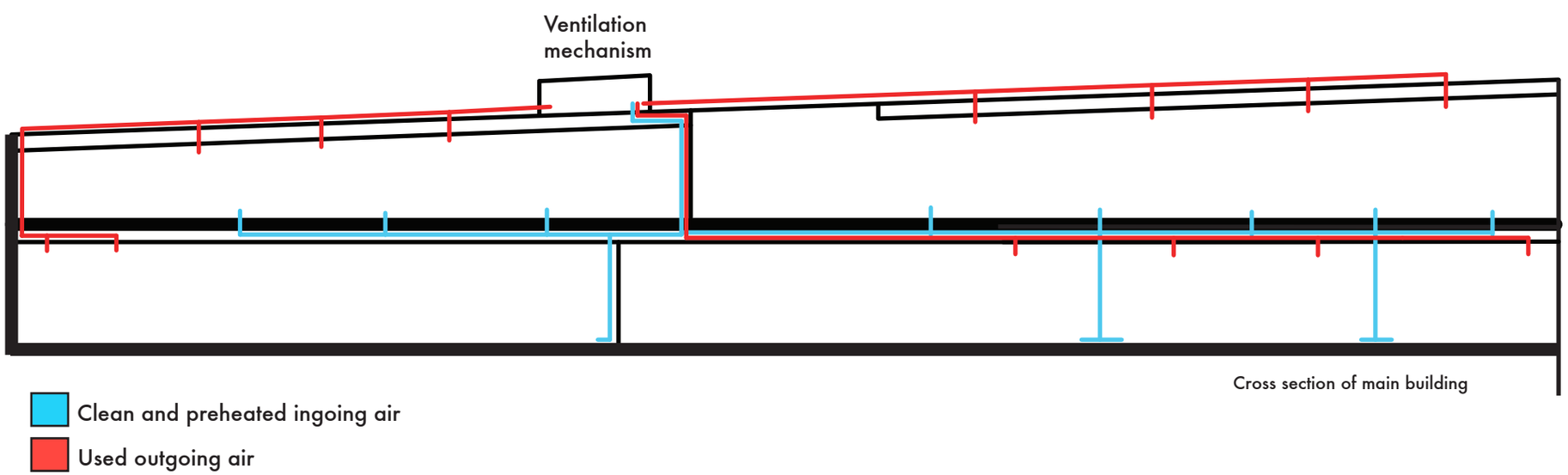
In the main building the ventilation mechanism is placed on the roof above the kitchen in an enclosure covered with natural lava rock. The ventilation pipes are hidden under false ceilings and light walls in the building. The ventilation in the larger rooms, dining and lobby, is mostly mechanical with the option of opening windows for a quick and large airchange when the weather permits.

The air is pumped into the rooms close to the floors. It circulates through the room, warms up and is then extracted in the ceiling. It is then used in the heat recovery system to preheat the incoming air. The air intake for the ventilation system is on top of the building. This ensures that the air used in the system is always fresh and clean.

The demanded air change ratio depends greatly upon the activity in the rooms. In this project calculations on the ventilation are not made. Following is a list of rooms in the hotel and the demanded airchange pr/h:

Entrance / reception	4
Bar / lounge	20-30
Dining room	12-15
Kitchen	15-60
Sitting area	6-12
Conference room	12-15
Office	3-4
Dwellings	2-4

(numbers from: www.engineeringtoolbox.com)

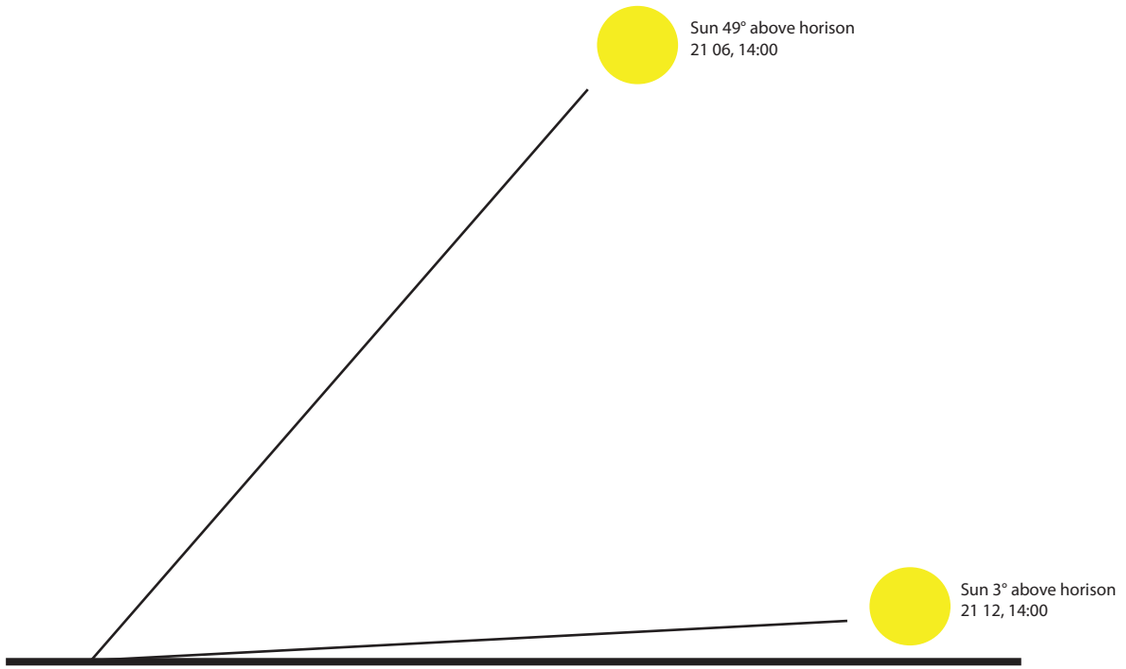


Using the daylight

Iceland is located in the northern hemisphere, close to the Arctic Circle. The GPS position of Eldhraun lava is 63.42.000 - 18.12.000. The amount of daylight this part of the world recieves varies greatly, depending on the time of year. During the high summer season the sun more or less stays in the sky for about 4 weeks. The opposite happens during the darkest winter months when the sun only stays in the sky for a few hours each day. During cloudy days this time of the year it does not get fully bright at all.

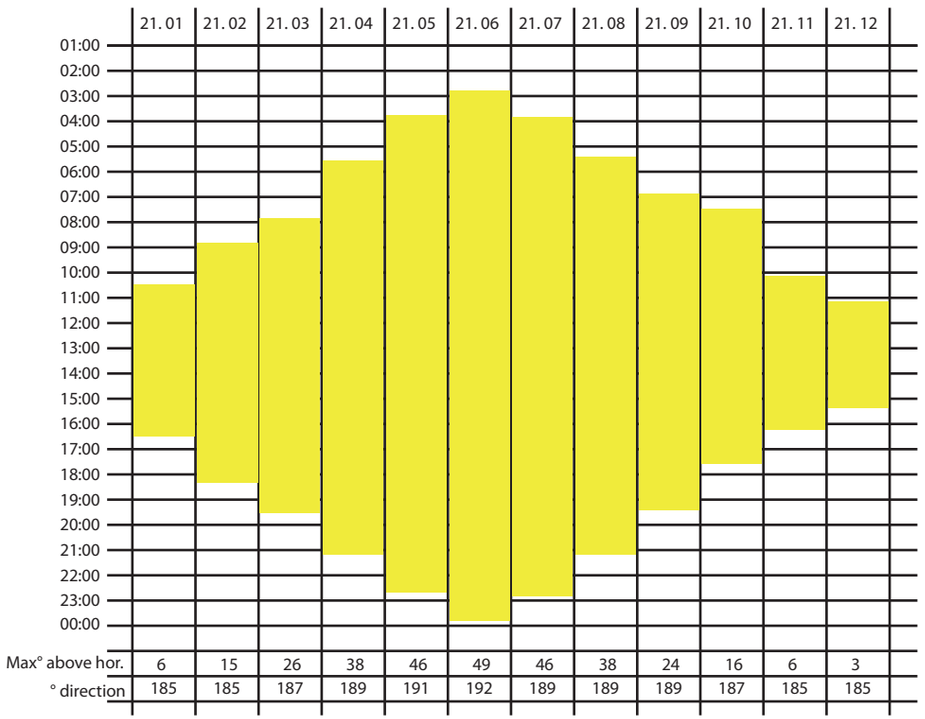
When designing a building with the use of daylight as one of the design criterias in this part of the world one has to be practical and a bit creative. It is important to look at daylight from the practical point of view, the amount of light inside the building and the energy saved by limiting the need for electrical lights and heating. However, it is also important to exploit the aesthetical aspect of the light and make use of its ability to enhance the desired feelings. In both cases the orientation of the building is very important.

In this project words such as mood, feeling and experience are used. The aim is to create a building, a hotel, that allows its guests to experience the lava. The lavafield changes when the weather and seasons change and creates different moods and expressions.



The shadow of a man 21. December, 14:00

The shadow of a man 21. June, 14:00



In June there are almost 24 hrs. of daylight
In December there are 4 hrs. of daylight

The lava hotel is a building in the middle of this mysterious area with stories of outlaws, trolls, elves and even ghosts around every rock. Therefore it is very important to bring these feelings, different moods and experiences into the building. This can be done by combining the use of form, material and light. Light becomes a large factor in the design, both practically and aesthetically.

In addition to large windows in some parts of the building that let vast amounts of daylight in, a number of different types and shapes of skylight windows are tried, to create the desired atmosphere. The shape and positioning of the windows and the constantly moving and changing light outside creates a living and ever changing feeling in the light inside the hotel. The mood of the area is therefore brought into the building creating a strong connection between the inside and the outside.

It is obvious that due to the lack of daylight during some part of the year and overabundance of daylight in other parts of the year that the building will not be lit up solely by daylight. It should also be mentioned that Iceland has vast amounts of low priced electricity from clean sources. Nonetheless, an attempt to reach the desired illumination factors (lx) with daylight will be made while still keeping the focus on the aesthetical part. In order to do this as accurately as possible the RELUX light simulator program is implemented into the process. Tests are made and depending on the output of the program, changes are made in the design of the individual building parts. This procedure is repeated until the optimal goal is reached.

The parts of the building where the interplay between daylight and feeling is most present are:

- The individual rooms
- The corridors leading to the rooms
- The entrance area

These are the parts of the building that RELUX tests are made on.

Relux light simulation tests

The desired illuminance factor (lx) in rooms or spaces depends greatly on their purpose and the activities that take place in them. Following is a list of the rooms and areas tested in this project along with the desided lx factor:

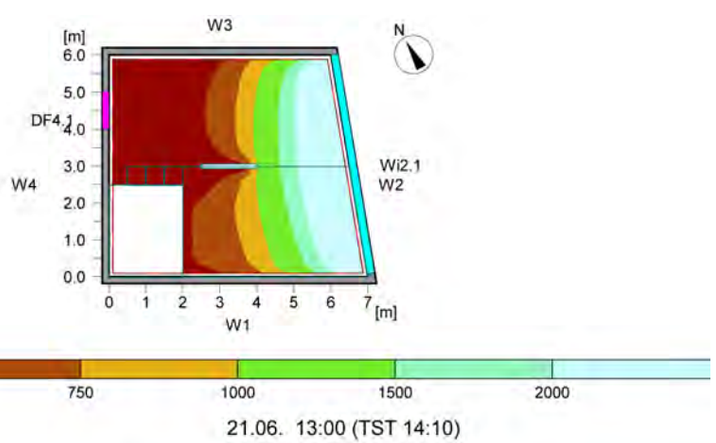
Hotel rooms	100-300 lx
Corridors	30-50 lx
Lobbies	30-50 lx

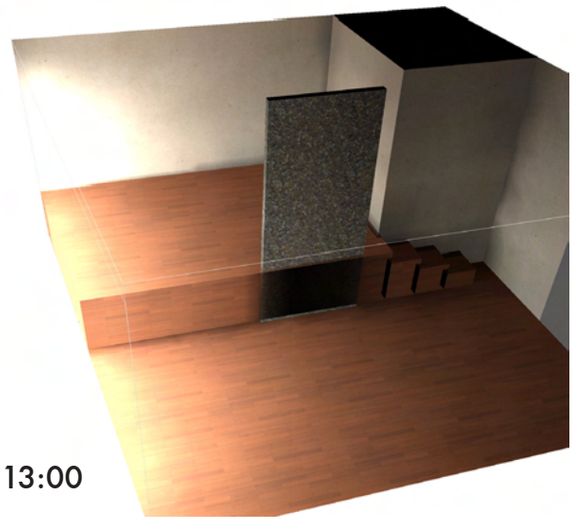
(values from DS 700;DIN 5035)

The tests measure the ambient lighting supplied by daylight. Additional tasklights as well as electrical lights during nighttime will be needed.

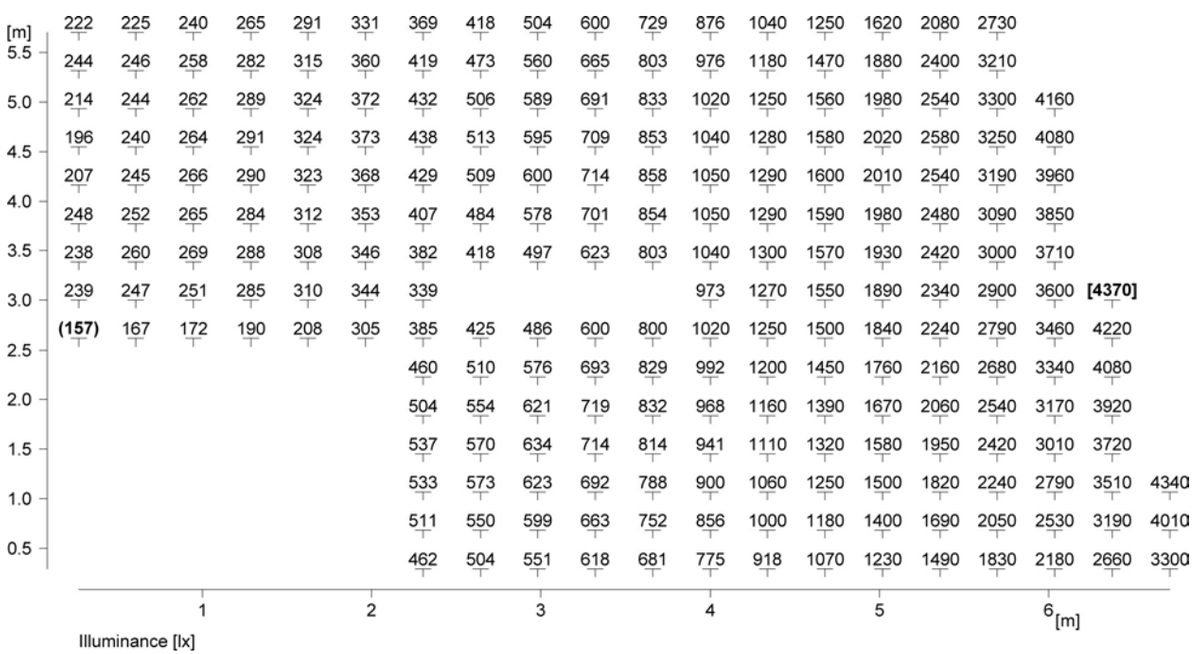
The rooms.

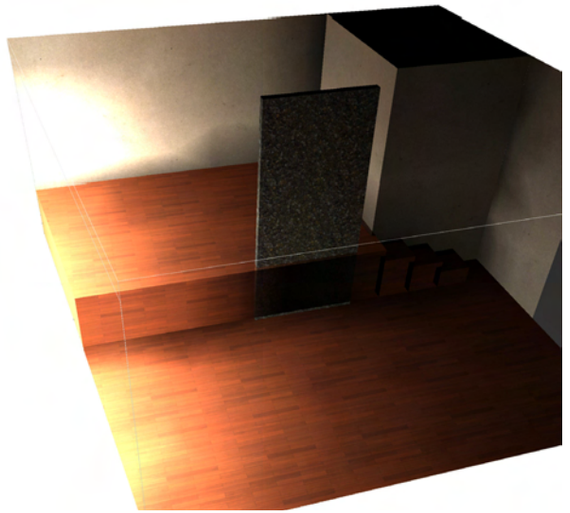
The design of the rooms only allows for a window on one side of the room. They are facing the rising sun in the east for the guests to enjoy the morning sun in the rooms but also to prevent the rooms from being overheated at night when the guests got to bed. This however limits the amount of light travelling all the way to the back of the room. As seen in the first Relux tests on the rooms the required lx factor is reached during the summer but the test made on 21. November gives a bad result.





21. June 13:00



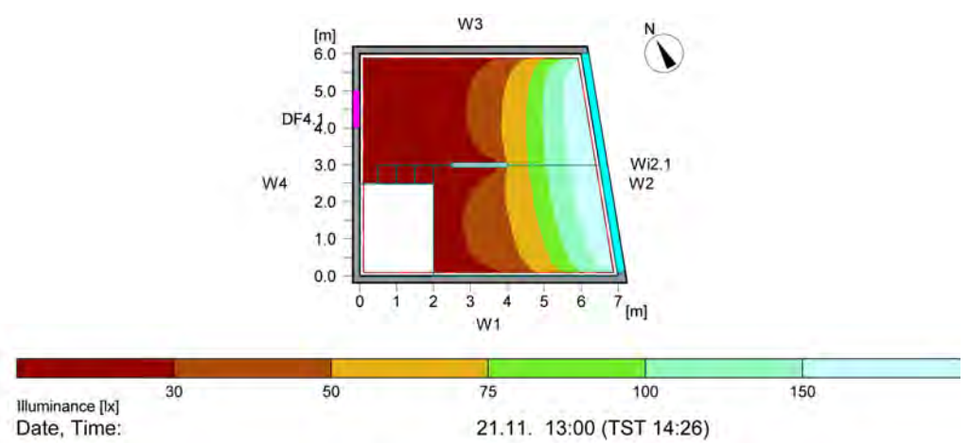


21. Nov. 13:00

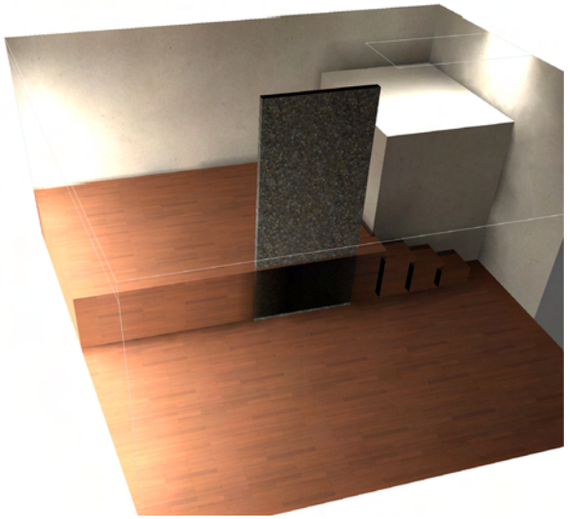
The desired lx factor in the room is 100-300. In November or during the winter months this number is very low. At 13:00 during the mid day the lx factor at the back of the room is only 10-15.

[m]	1	2	3	4	5	6 [m]
5.5	11	11	12	13	14	16	18	22	25	29	35	43	53	69	87	107	137	
	13	12	13	15	16	18	22	24	29	34	42	50	61	77	99	125	166	
5.0	11	13	14	15	17	19	22	26	31	36	43	53	65	82	104	133	172	217
4.5	10	12	14	15	17	19	22	27	31	37	44	54	67	83	105	135	170	213
4.0	11	13	14	15	17	19	22	26	31	37	45	55	67	83	105	133	166	207
	13	13	14	15	16	18	21	25	30	36	44	55	67	83	103	129	162	201
3.5	12	13	14	15	16	18	20	21	25	31	41	53	67	82	101	126	157	194
3.0	12	13	13	15	16	18	17					51	66	80	99	122	152	188	[229]
2.5	(7)	9	9	10	11	16	19	21	24	30	40	52	65	78	95	117	146	181	221
							21	25	29	36	43	51	62	75	92	113	140	174	213
2.0							22	27	32	37	43	50	60	73	87	108	133	165	205
1.5							24	28	32	36	42	48	58	69	83	101	127	157	194
1.0							23	28	31	35	40	46	55	65	78	95	117	146	183	227
							22	26	30	33	38	44	51	61	74	89	107	133	167	210
0.5							19	23	26	29	32	37	44	53	64	78	95	115	139	172

Illuminance [lx]



By adding a skylight window over the bathtub and opening the bathroom walls 100 cm down from the ceiling with windows, light can pass into the back of the room, raising the illuminance factor. Even though the difference is not significant the lx factor at the back of the room doubles in the test for 21. november.

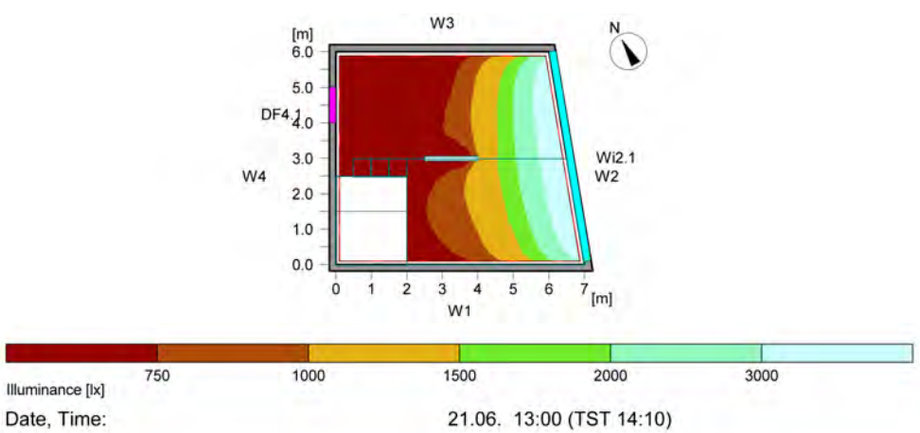


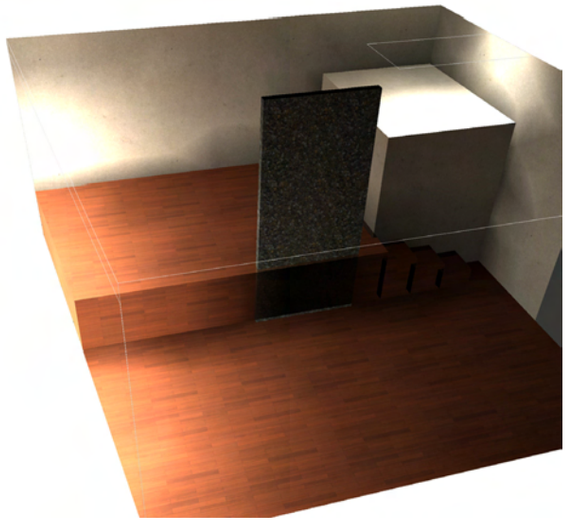
21. june 13:00

[m]																		
5.5	300	307	328	355	376	415	459	514	583	658	786	915	1070	1280	1640	2110	2740	
	343	355	373	402	433	466	515	572	642	734	860	1030	1230	1500	1910	2430	3220	
5.0	345	394	413	441	468	503	554	617	687	768	895	1060	1280	1600	2010	2560	3310	4170
4.5	371	432	459	488	514	550	596	644	715	804	920	1090	1320	1620	2040	2600	3280	4100
	449	514	535	563	580	599	638	680	737	816	934	1100	1320	1620	2030	2570	3210	3970
4.0	596	626	642	662	660	662	679	706	745	803	914	1100	1320	1620	2000	2490	3110	3860
3.5	641	695	700	714	712	705	699	642	605	672	822	1060	1310	1610	1960	2450	3040	3730
3.0	563	599	594	642	634	637	619					1040	1360	1610	1940	2380	2940	3630 **[4410]**
2.5	**(280)**	311	317	325	333	429	594	659	711	795	965	1140	1340	1580	1890	2300	2830	3490 4250
							607	719	810	889	1010	1130	1300	1520	1810	2210	2720	3370 4100
2.0							650	765	848	923	1000	1110	1260	1460	1740	2110	2570	3220 3940
1.5							666	771	845	904	971	1070	1210	1400	1660	1990	2470	3040 3750
1.0							652	739	807	868	941	1020	1150	1330	1550	1850	2280	2820 3530 4360
							617	687	757	815	883	968	1090	1240	1450	1720	2080	2580 3210 4020
0.5							546	615	676	737	793	869	988	1120	1270	1520	1860	2220 2690 3320
				1			2			3			4			5		6 [m]

Illuminance [lx]

Height of the reference plane		: 1.20 m
Average illuminance	Eav	: 1350 lx
Minimum illuminance	Emin	: 280 lx
Maximum illuminance	Emax	: 4410 lx





21. Nov. 13:00

[m]																		
5.5	15	15	16	17	18	20	22	25	28	31	38	45	55	70	89	108	137	
	18	18	19	21	22	24	27	29	33	38	45	52	63	78	100	126	168	
5.0	18	20	21	23	24	26	29	32	36	40	47	55	67	84	105	134	173	218
4.5	19	22	24	25	27	29	31	34	37	42	48	57	69	85	107	136	171	214
	24	26	28	29	30	31	33	35	39	43	49	57	69	85	106	134	167	208
4.0	31	32	34	34	35	34	36	36	38	41	47	57	69	84	105	130	163	202
3.5	32	36	37	37	37	37	36	32	31	34	42	54	69	84	102	127	159	196
3.0	29	31	32	33	33	33	32					54	71	84	102	124	154	189 [230]
	(14)	16	16	17	17	22	29	33	36	40	49	59	70	82	98	120	148	183 222
2.5							28	36	41	46	52	59	68	79	95	116	142	176 214
2.0							29	38	43	47	52	58	65	77	91	110	135	168 206
1.5							30	38	43	47	50	56	63	73	86	104	129	159 196
							29	37	41	44	48	53	60	69	81	98	119	148 185 228
1.0							26	33	38	41	45	50	55	65	76	91	110	134 168 211
0.5							22	28	32	35	38	42	48	57	67	79	97	116 140 173
		1		2		3		4		5		6 [m]						

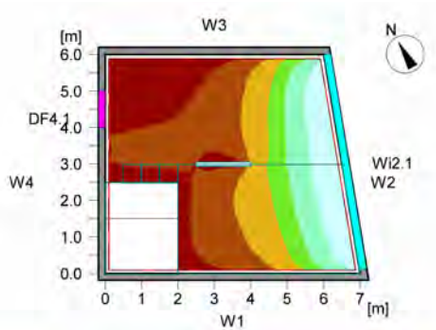
Illuminance [lx]

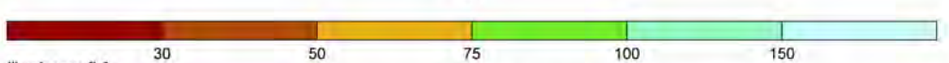
Height of the reference plane		: 1.20 m
Average illuminance	Eav	: 70 lx
Minimum illuminance	Emin	: 14 lx
Maximum illuminance	Emax	: 230 lx

Due to the few hours of daylight in December and how low in the sky the sun is, the Relux program refused to do any calculations on Desember. 21. November is used instead as the worst case senario.

In the tests the room has two levels, the sleeping area being 90 cm higher than the sitting area. Hovewer this does not affect the results since the referance plane is 120 cm from the lower floor.

Here the difficult task of dealing with daylight in Iceland becomes obvious. The lx factor on the 21. of june is very high (280-4410) and could threaten to overheat the room. This can be solved with curtains. The lx factor on 21. November tells a completely different story. It reaches the desired factor in the front of the room but the back of the room is very low (14-230). It is obvious that electrical lighting will be needed during a large part of the year, even during daytime.





Date, Time: 21.11. 13:00 (TST 14:26)

The corridors

The corridors leading to the rooms extend in two directions from the SE end of the main building. These corridors are 65 and 75 m. long. Their length is determined by the fact that the rooms are all placed on the same side of the corridors. Hovewer compared to corridors in other hotels these corridors can by no means be called unusually long. In order to turn walking down these corridors into a pleasant experience a few things are implemented into the design. On of them is the use of light.

The corridors get wider and higher towards the ends. At each end there is a large window, letting in vast amounts of daylight. So when the guests are walking towards their rooms the amount of daylight increases the further they walk.

In two places in each corridor there are small side corridors with large windows at the ends. These windows open up towards daylight and break the corridors into sections.

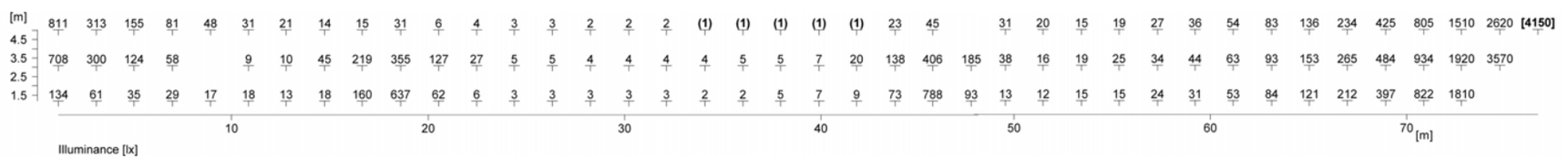
Relux tests on the corridors

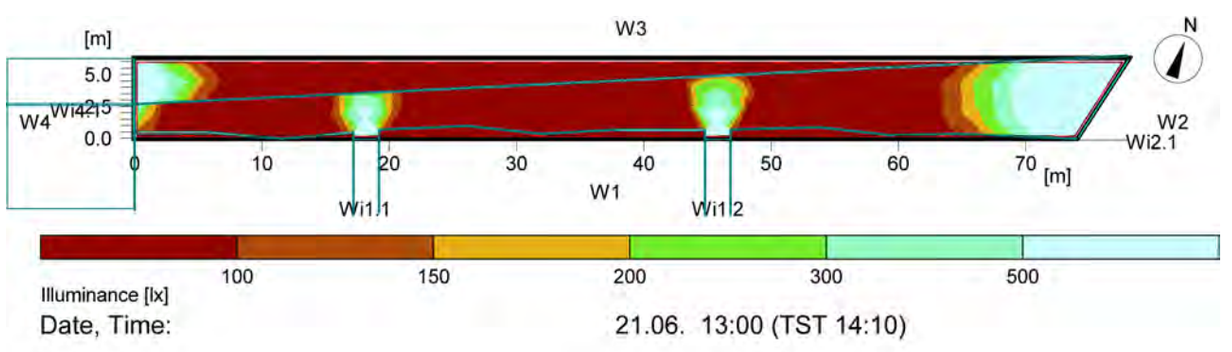
In spite of the size of the windows in the corridor their length and slim shape demand additional lighting. The fact that the amount of light varies as the guest walks down the corridor is considered a good thing and adds to the ever changing expression in the light.

However, as seen in the first Relux test on the facing page, only having the windows in the small corridor and the window at the end of the corridor is simply not letting in enough light to fulfill the lx requirements. Therefore additional intake of light is nescesary.

The requested lx faxtor in the corridor is 30-50. In this test the lower end of the scale reaches as far down as 2 even though the test is done on 21. June at 13:00.

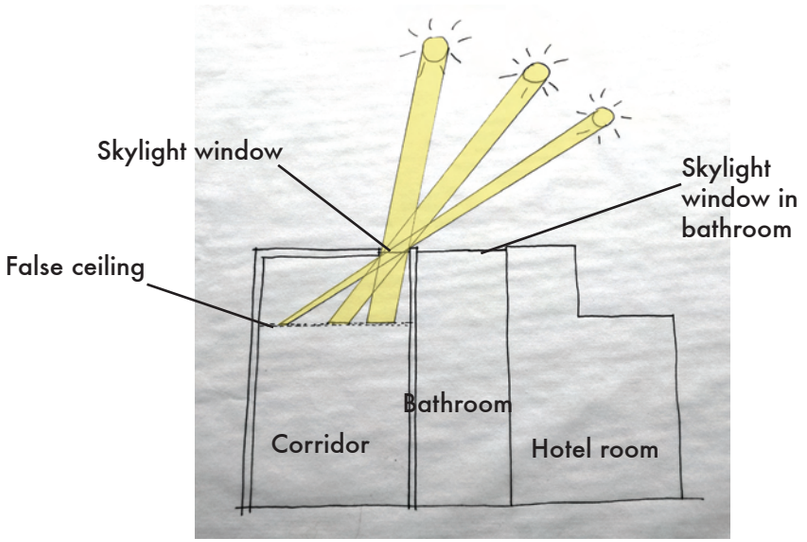
21.June 13:00

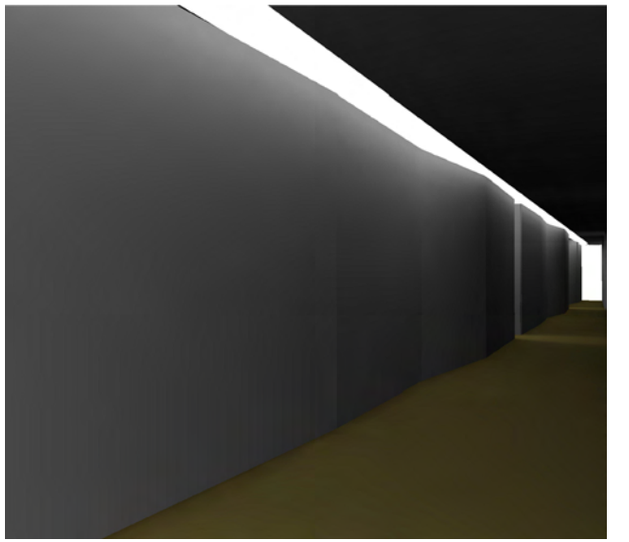




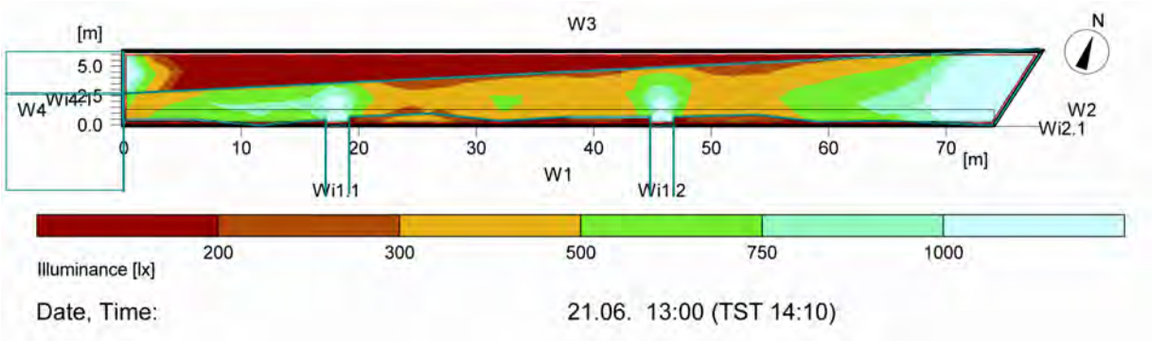
In this test skylight windows have been added to the corridors. (see illustration below) Below the window there is a false ceiling made from pourus and light distributing textile fabric. The light from the skylight window moves across the fabric as the sun moves over the sky, creating an interesting play in the lighting effect in the corridor. The different amount of daylight and its colour during the day creates a living experience in the light. The feeling of the outside is brought inside. To prevent overheating during the summer months when the sun is high in the sky, the skylight window can be closed partly or completely with a curtain.

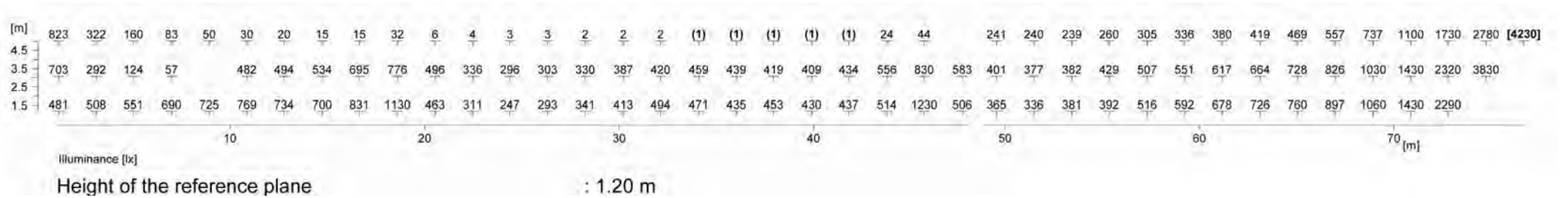
At night or during dark days the lack of light is compensated for with the help of electrical lights placed above the fabric.

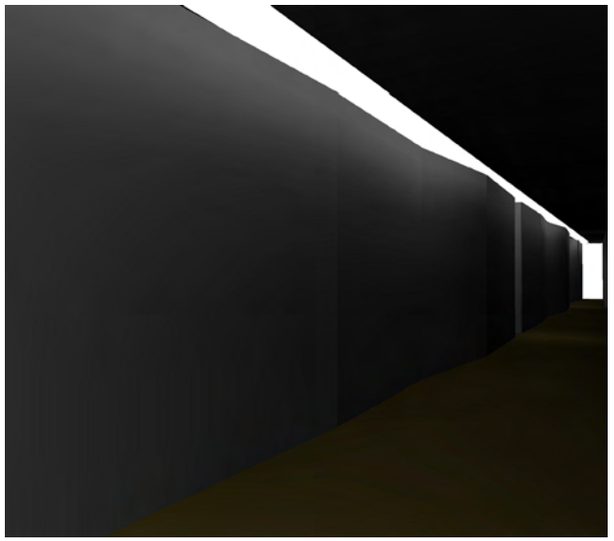




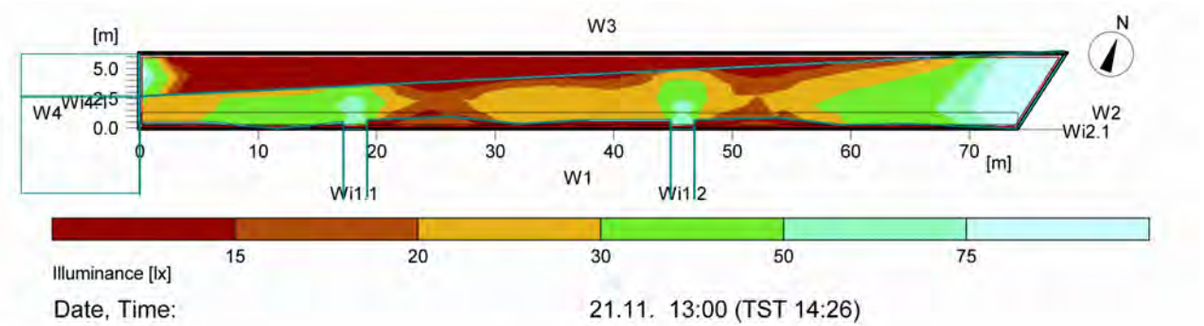
21.June 13:00

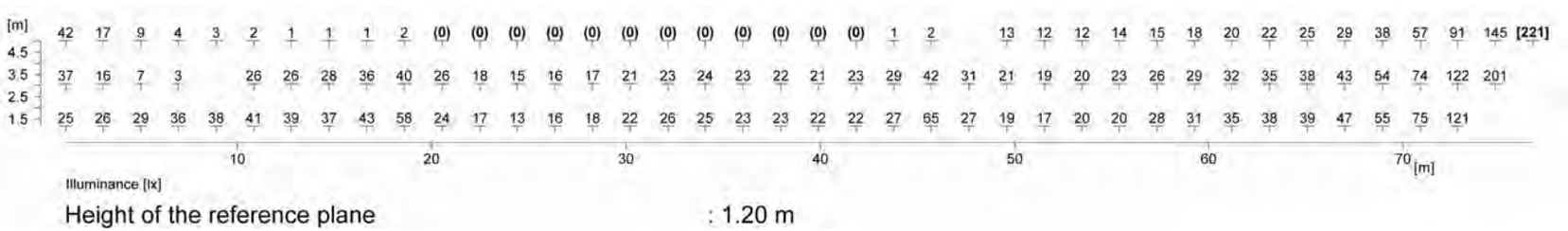






21.Nov. 13:00





By letting light into the corridor via the previously mentioned ways the desired lx factors of 30-50 are reached in most areas. As in the tests on the rooms the Relux program does not calculate the December month so 21. November is the darkest month in the test.

On the 21.June the lx factor is always a three digit number. The task during the light summer months will not be lack of daylight but preventing over heating.

On the 21.November the lx factor falls considerably, reaching as low as 13 in some sections. Over all the outcome is acceptable and by the additional electrical lighting this will not be a problem.

During the darkest months the sun stays in the sky only for a short while so electrical lighting will be needed during a large part of the day but by implementing these methods it is possible to make use of the daylight and still keep the desired feeling in the building.

The entrance / lobby

The entrance area / lobby is the first inside area the guests experience. The guests enter the hotel under the large and heavy concrete slab. Upon entering, the desired feeling is of a slight enclosure and the weight of the materials, without becoming claustrophobic. The ceiling hight is 3.5m and there is a good distance between the walls so the guest should not feel uncomfortable. But in order to create the right atmosphere the lighting in the room has to be right. The desired lx facor in lobbies and corridors is only 30-50 so there is not a demand for a strong light.

The first part of the room is rather dark. As the guest approaches the reception the ceiling opens up allowing daylight to flow into the room. The walls are partly natural rock and there is no view out except straight up.

This feeling of slight enclosure is achieved by allowing light to flow in from both ends of the room but the middle of the room is kept darker.

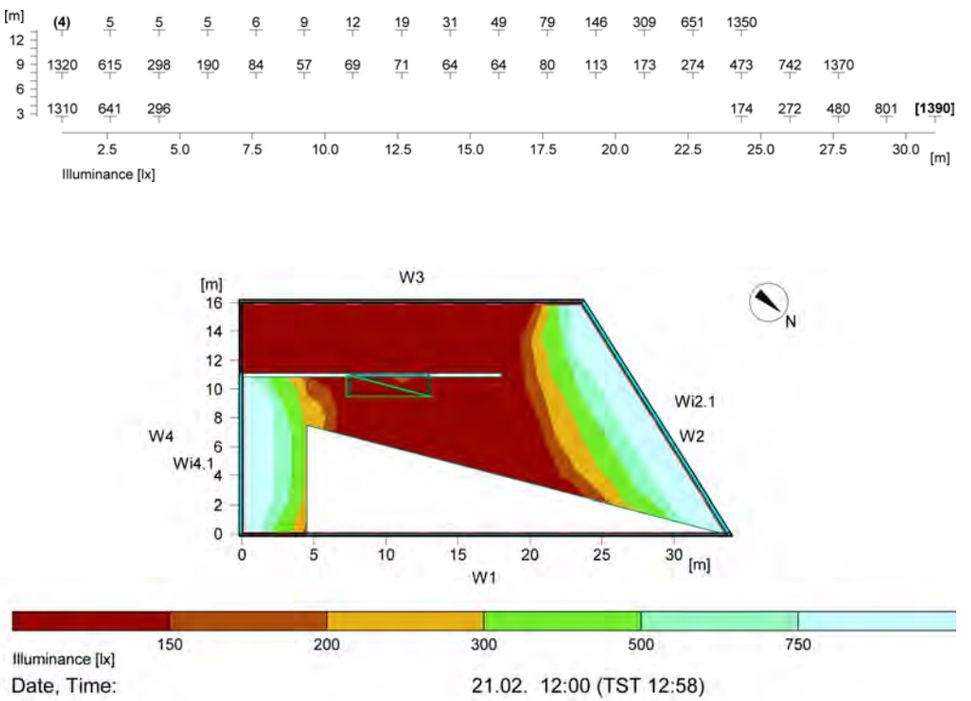
Relux tests on the entrance/lobby

In the first test the entrance area is open towards the lounge in the N end of the room. There is no wall dividing the room and no seperation between the entrance and the rest of the space. This allows the ligt coming from the window to the N to flow unobstructed into the room.

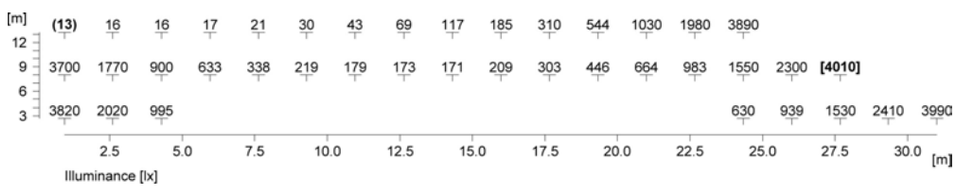
The amount of light is high. As seen in the tests taken on 21.Febuary, 21.June and 21.November the amount of daylight emmitted into the room varies a lot. In the June test it is high above the desired LX factor, with the lowest LX factor 171. Since this is a room that is supposed to give the guests the first impression of the hotel and the desired amount of light in the room is low this could have a bad effect.

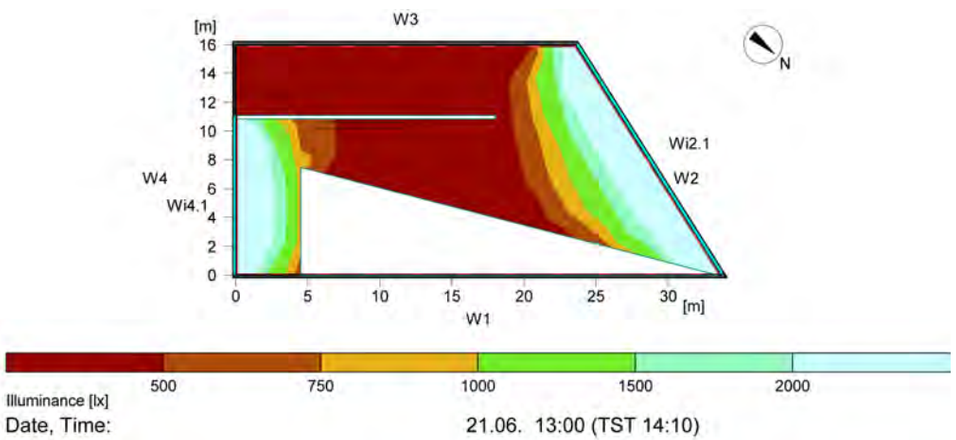
Placing a skylight window in the middle of the room close to the wall facing the entrance does not change the outcome of the tests but gives a nice effect to the room.

21.Feb. 12:00

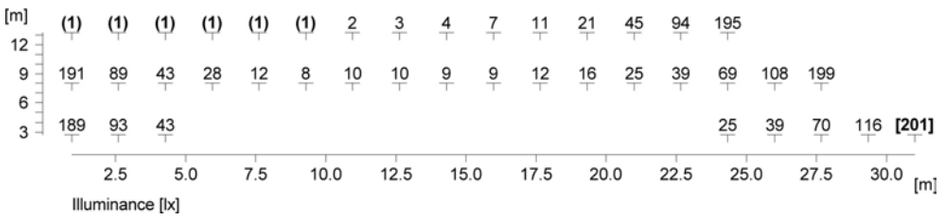


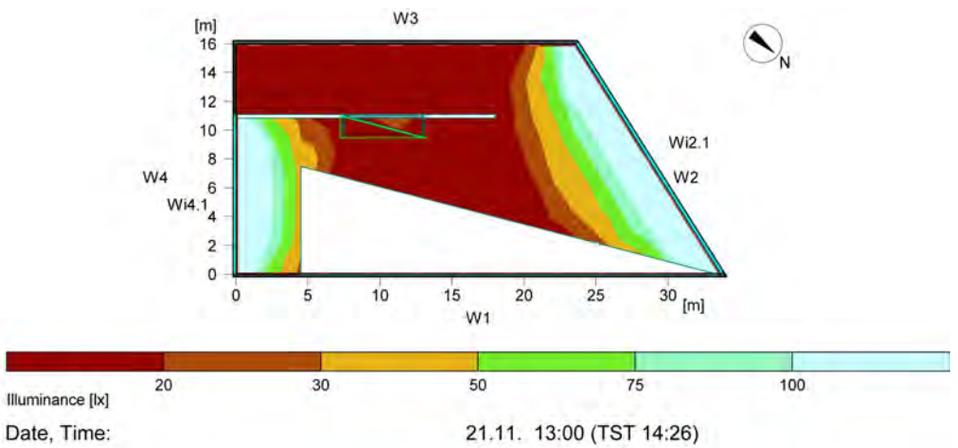
21.June 13:00





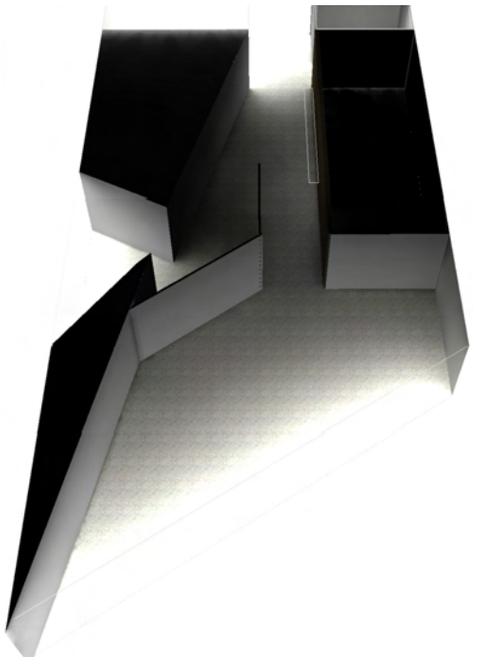
21.Nov. 13:00



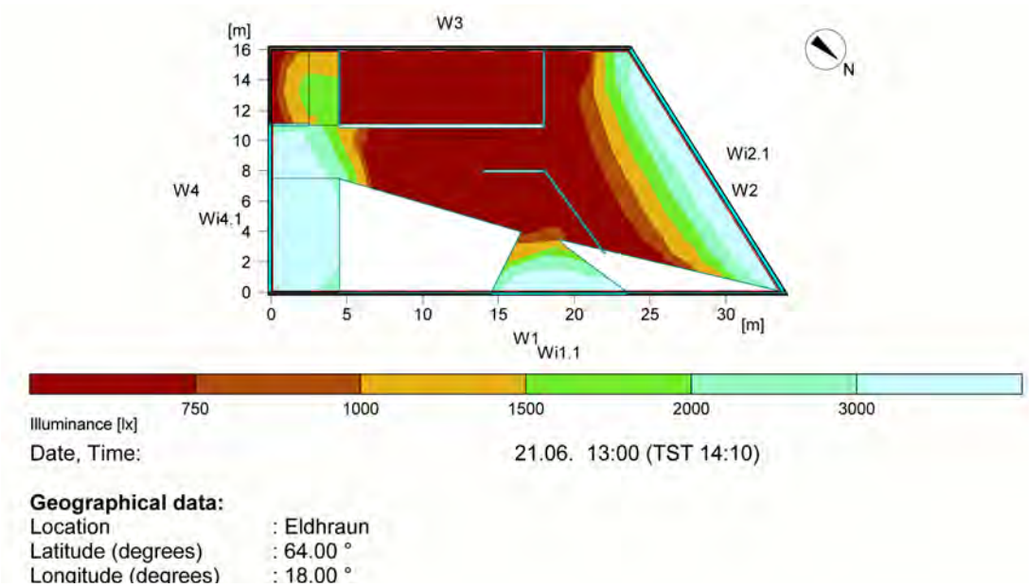


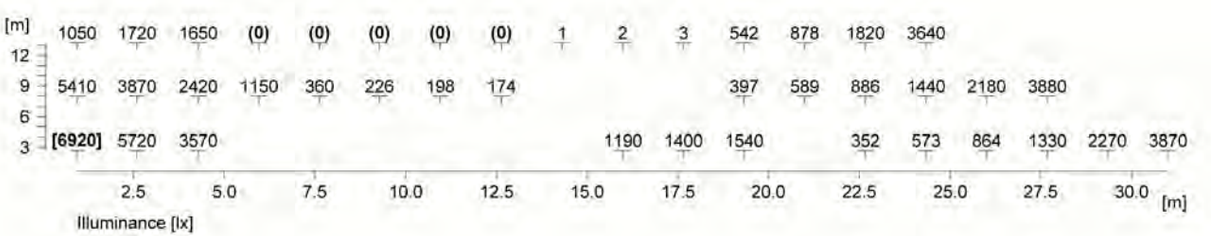
The window to the N of the entrance is covered by the walls surrounding the lounge / bar. There is also a small wind fang around the entrance. There is a short corridor that the light travels through from the window to the middle of the entrance room. There is also light coming from the area around the reception. The openings in the room are enough to supply the room with the desired amouth of daylight through most of the year. These walls dampen the light during the summer months creating a dark area around the point where the guest moves from the entrance area into the lobby. This dark area is not large but should create the desired contrast in the light within the room.

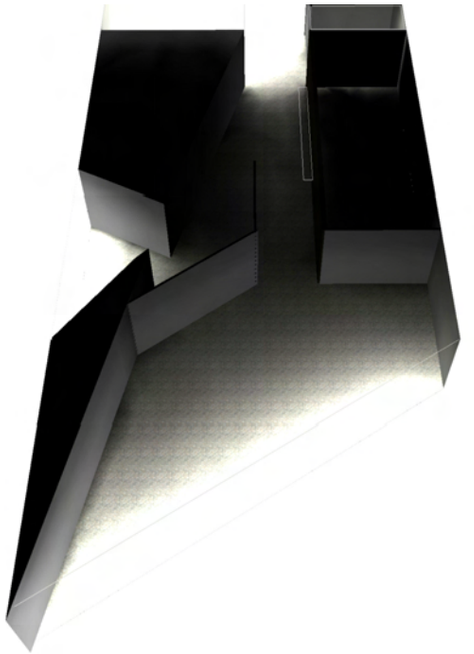
The highest number in the June test is over 6000 lx. This is where the sun shines directly down through the skylight window above the reception. This only happens during a very short period of time during the brightest part of the year and will be fixed with shading. There is a small skylight next to a wall opposite the entrance.



21.June 13:00







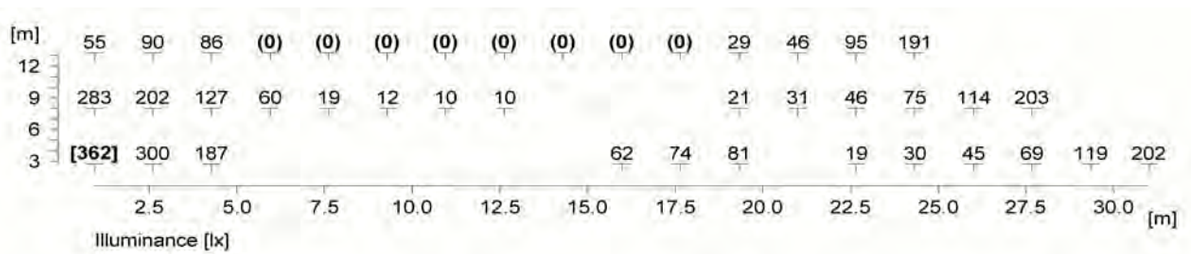
On 21.June, when the sun is high and the day is long the lx factor at 13:00 is high in some areas This may cause the need for curtains in order to prevent overheating the lounge and over the reception during some parts of the day in very sunny days in the summer. It will also be possible to open the doors in the lounge to let in the fresh and crisp air. At the same time the middle of the room is receiving little light.

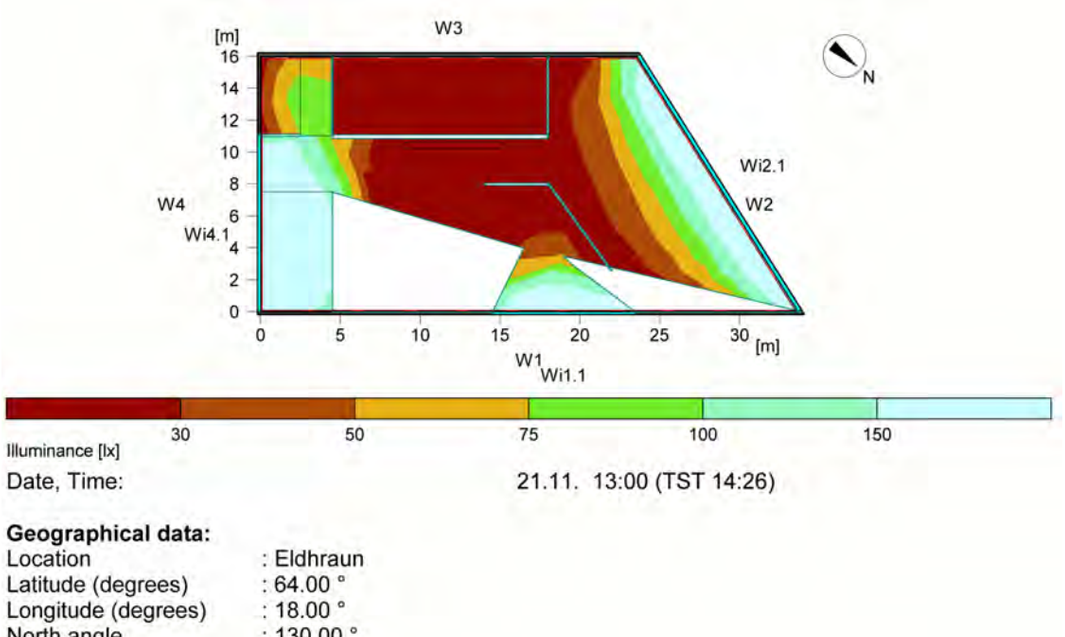
On 21.November, during some of the shortest days of the year the lx factor is still close to acceptable, ranging between 10 to 300. Additional electric lighting may be needed but during the daytime the amount of daylight should be enough to keep light inside the room.

To create the right feeling in the hotel it is very important not to use too much light except where that is the intention. That would minimize the desired contrast between the darkness and light and could destroy the feeling of mystery and the unknown.

This test gives an acceptable outcome and is the one used in the design.

21.Nov. 13:00





Geographical data:

Location	: Eldhraun
Latitude (degrees)	: 64.00 °
Longitude (degrees)	: 18.00 °
North angle	: 130.00 °

Conclusion

The design of the hotel is rather enclosed. There are large windows on some sides but due to the fact that the building is buried in the hill many of the facades are under the lava. This fits the overall feeling in the building and should be used in the design. The view is present in some areas while other parts of the building should give the feeling of enclosure. It is very important that this feeling does not turn into claustrphobia!

In order to bring the feel of daylight into the buildings the windows play a large role. The light in the sky is ever changing and that is to be used. The skylight windows in the bathrooms are clear. This is done to make it possible for the guests to see the sky from the bathtubs. The skylight in the corridors is hidden above the textile fabric that also distributes the light into the room.

It is clear that electrical lighting will be needed in the building during the darkest months and during nighttime most of the year. The desing of the electrical light has to work in the same way as the natural light, that is creating this feeling of natural appearance and a feeling of mystery. Simply placing lamps in the ceilings will not do.

The corridors and the 1st floor in the main building have false ceilings. This ceiling should be made from the same thin textile fabric everywhere. The electrical lights should then be placed above this fabric. By doing this the lamps are not visible but the light shines through the fabric. This will give the same open, overall expression on the 1st floor in general.

In the dining hall on the 2nd floor the ceiling is a light construction. Here the same false ceiling can be placed closer to the ceiling covering the lamps that can be integrated into the ceiling.

When the light from the lamps is on, the whole ceiling will be lit instead of individual lamps shining here and there. Like the ambient sun shining through the sky on a cloudy or misty day.

(Other Relux tests on CD)