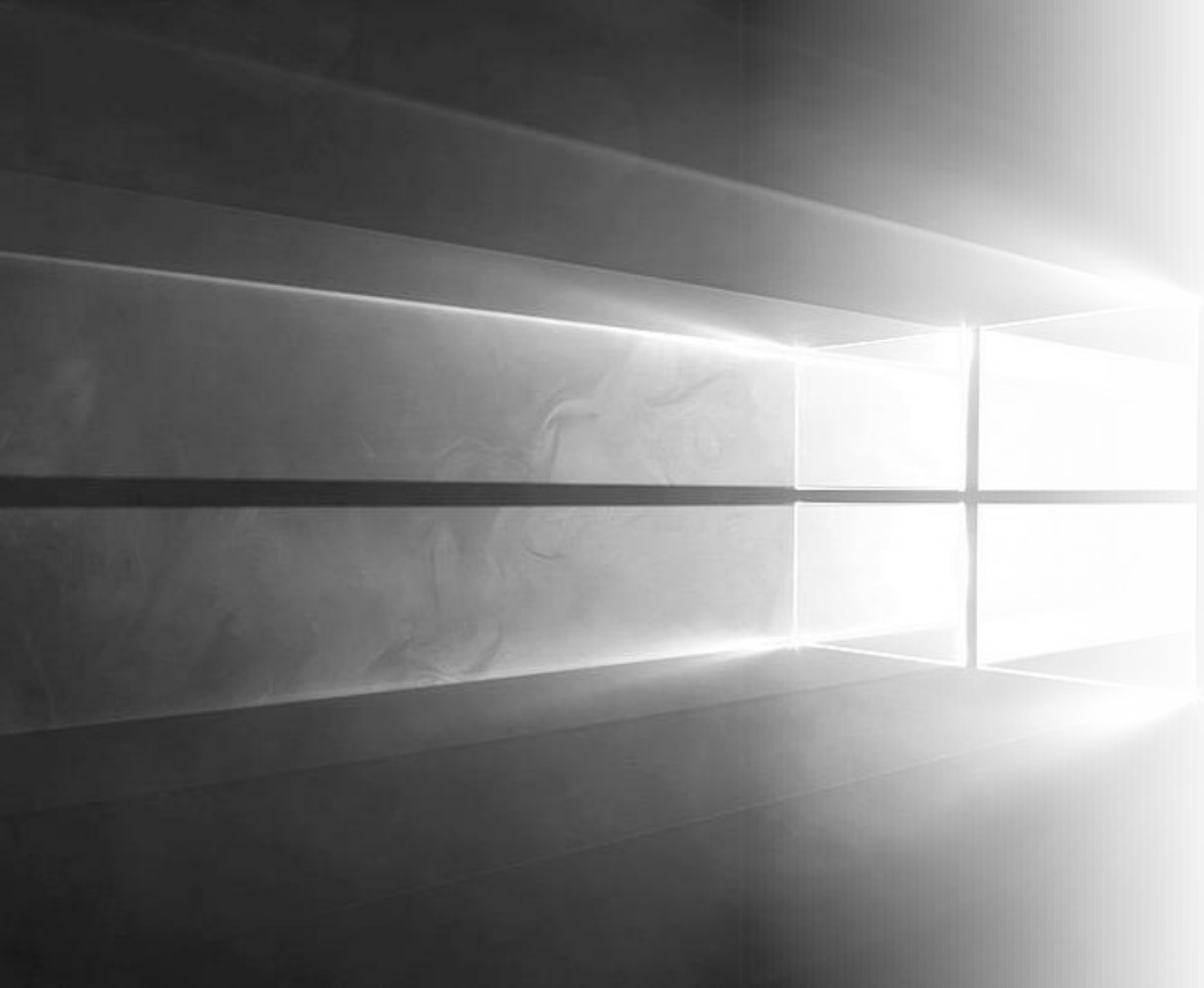


P5

The role of view and daylight on visual perception of people

Randy Bongers

Tutors:

Dr. Eleonora Brembilla

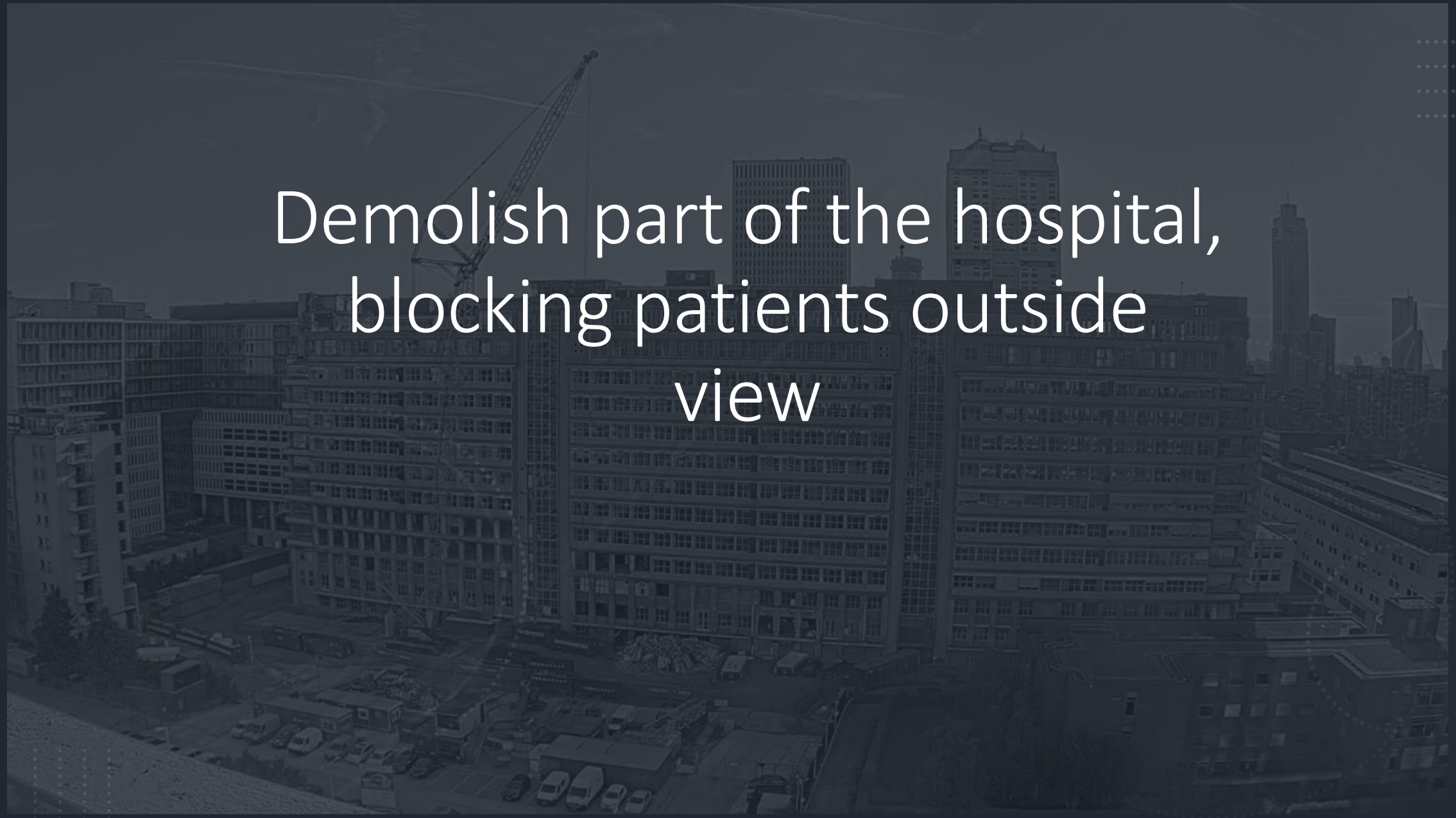
Dr. Clarine van Oel

The role of view in hospitals rehabilitation

- Green view project
- Greenery with daylight aspects
- Help in recovery and reduce hospital times

Erasmus Mc

- Biggest roof gardens in the Netherlands on 8 floor height.
- 3000m2



Demolish part of the hospital, blocking patients outside view

Research question

Which relevant factors related to the view to the outside and/or to daylight parameters influence the visual perception of people?

Sub questions:

- Is there a difference in pleasantness and or interest between rooms with different orientations?
- Do daylight parameters influence the pleasantness and or interest rating?
- Do view parameters influence the pleasantness and or interest rating?
- Is there an interaction between view and daylight parameters influencing the pleasantness and or interest ratings?

Definition of health: Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

https://www.publichealth.com.ng/world-health-organizationwho-definition-of-health/who-definition-of-health-2/

https://doyouendo.com/being-a-patient-with-chronic-illness/

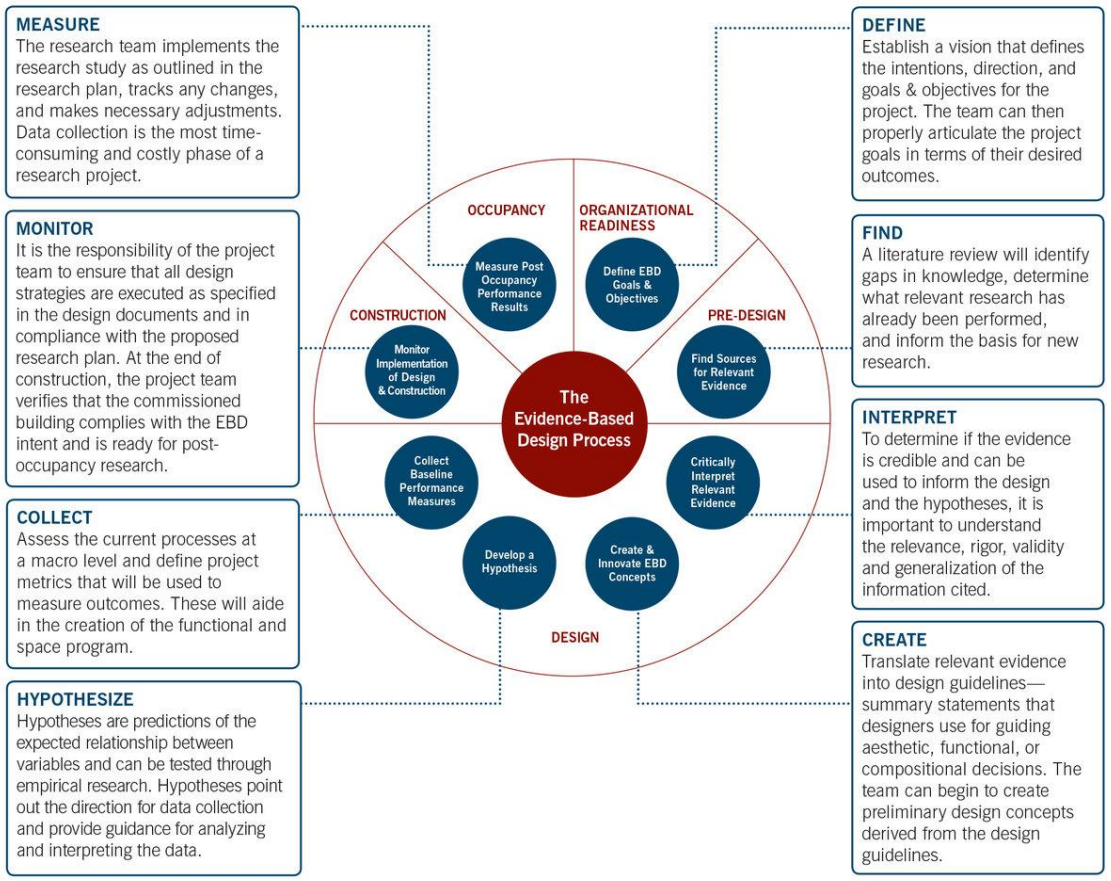
https://steemit.com/health/@jesusherrera/physical-mental-and-social-health

Hospital design

- Often program of requirement in hospital design is outdated.
- Discrepancy between healthcare experts (hospital staff) and the building design team.
- Hospital designs need to improve, parallel to the new acquired healthcare knowledge and patient demand.

Evidence based design

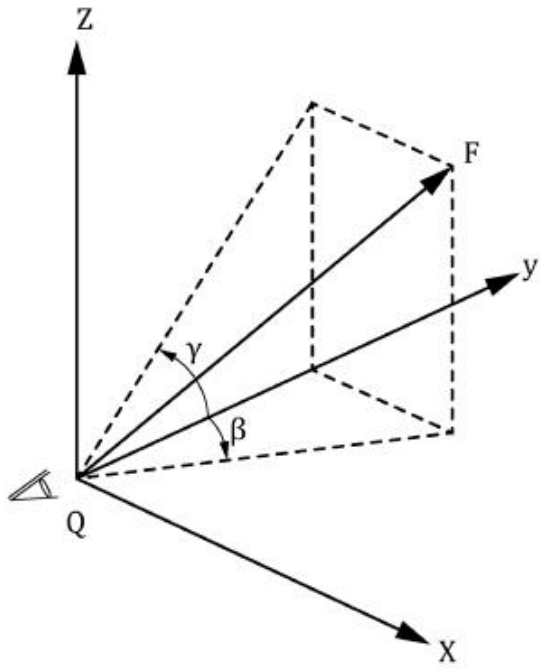
- One factor is isolated from the others and its effects on people's health and mental well-being is tested.
- The Center of Health Design divides EBD into 8 processes



evident based design, 8 design process steps. (Taylor, 2022

NEN-EN 17037

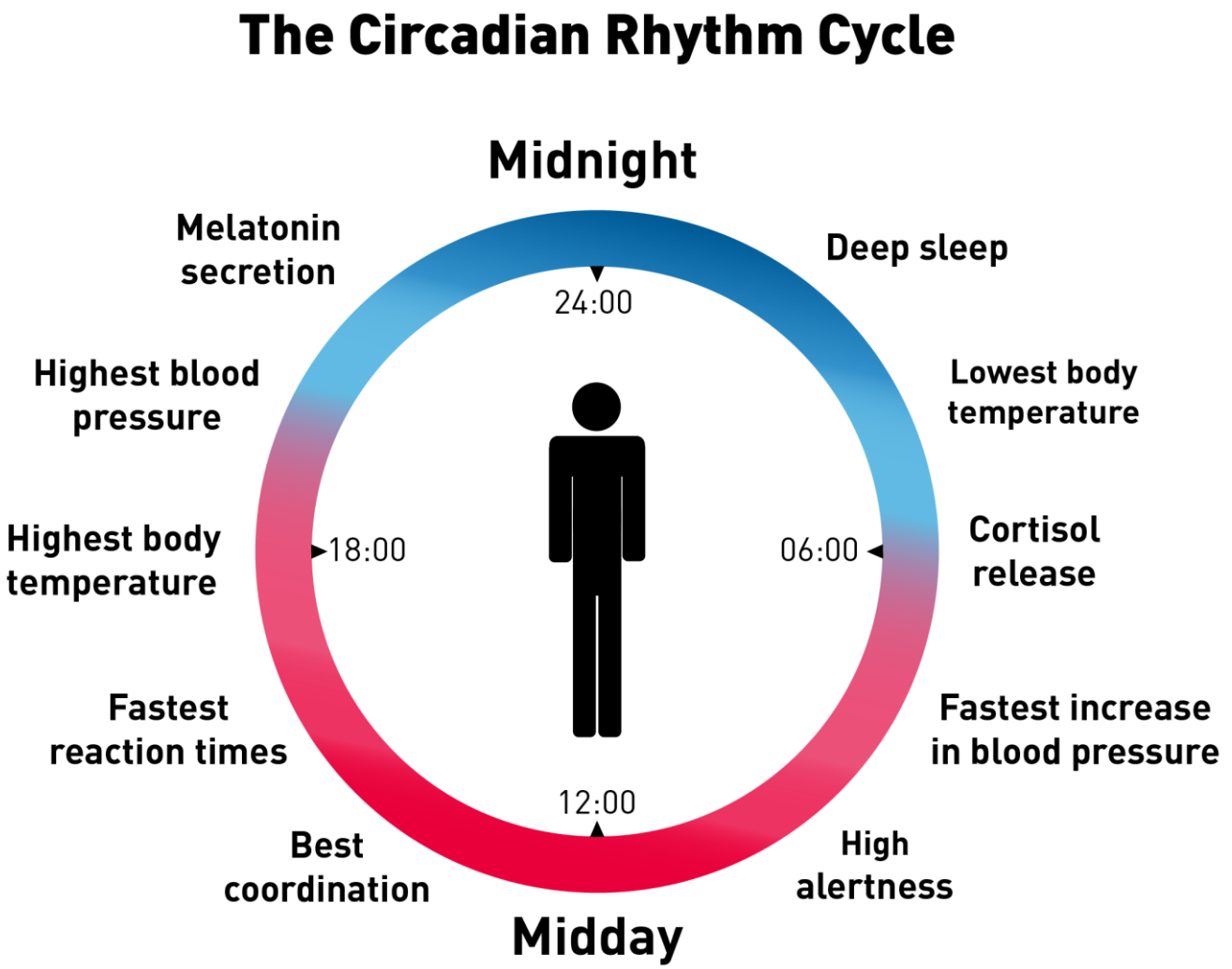
- Assessment view outwards
- Advanced verification method



	Parameter [a]		
Level of recommendation for view out	**Horizontal sight angle**	**Outside distance of the view**	**Number of layers to be seen from at least 75 % of utilized area:** **- sky** **- landscape (urban and/or nature)** **- ground**
Minimum	≥ 14°	≥ 6,0 m	At least landscape layer is included
Medium	≥ 28°	≥ 20,0 m	Landscape layer and one additional layer is included in the same view opening
High	≥ 54°	≥ 50,0 m	all layers are included in the same view opening

Daylight

- People prefer daylight over artificial light.
- Rooms which are lit by natural daylight help keeping the patients on their normal 24-hour sleep-wake cycle.
- Preventing the disruption of patient's circadian rhythm.
- A lot of processes in the human body which involve hormones are influenced strongly by the day and night cycle.
- The produced Cortisol and melatonin have influence on people health, their moods, well-being and performances.



https://atlasbiomed.com/blog/what-is-a-circadian-rhythm/

Window view

- The windows offer a gateway to the world outside, patients can mentally escape the busy or unpleasant room they are confined in.
- Give indication of time
- Information of the outside world
- This positive detracting stimulus can reduce pain perception, blood pressure, pulse frequency, muscle tension, negative emotions, anxiety and stress
- Connection to nature (biophilia), Biophilia makes psychological and physical rejuvenation possible and increases cognitive performances

https://www.dailymail.co.uk/health/article-11323139/Youre-likely-survive-hospital-window-nursing-station.html

Visual perception parameters

View factors

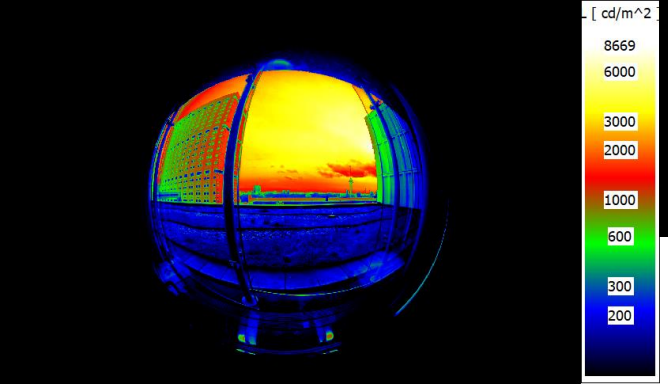
- Layers
- Building ratio
- Greenery ratio
- Street/water ratio
- Sky ratio
- Distance
- Far away elements
- Human activity

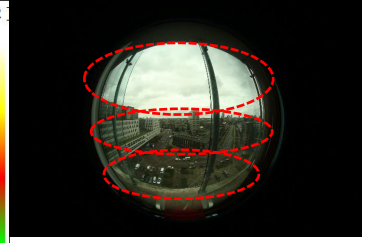
Daylight parameters

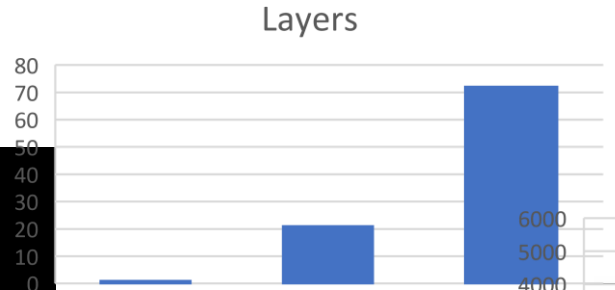
- Luminance
- Illuminance ratio

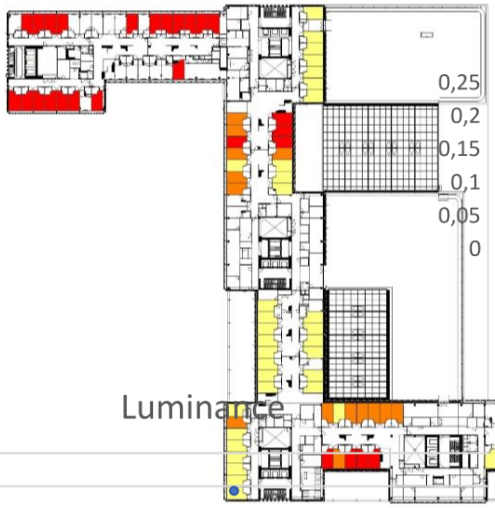
(vertical indoor illuminance / horizontal outdoor illuminance)

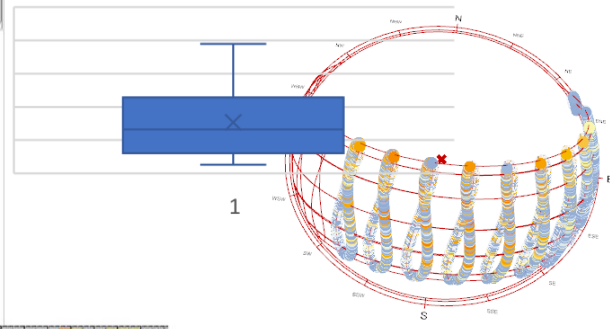
- Daylight factor
- Sunlight hours

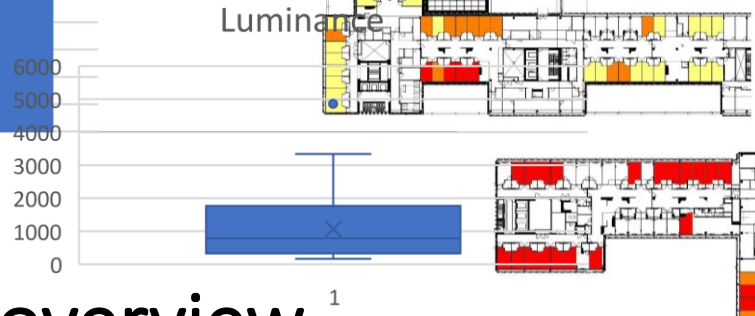






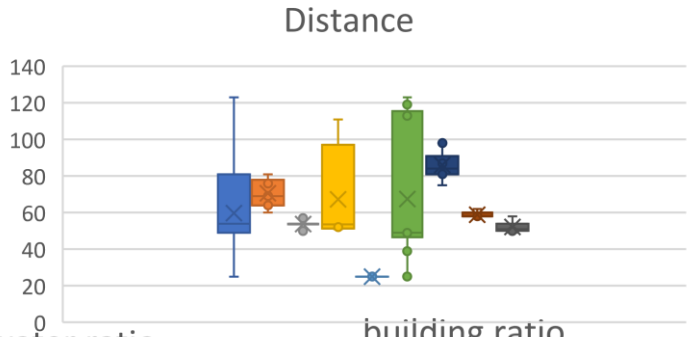


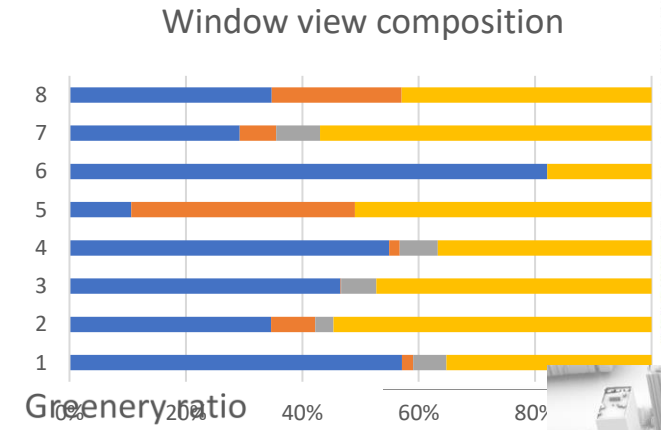


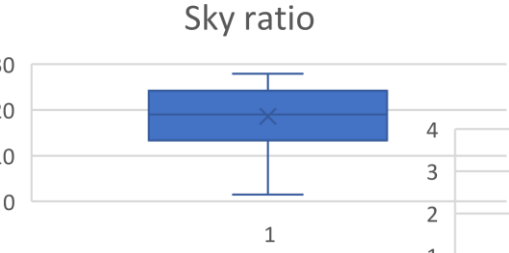


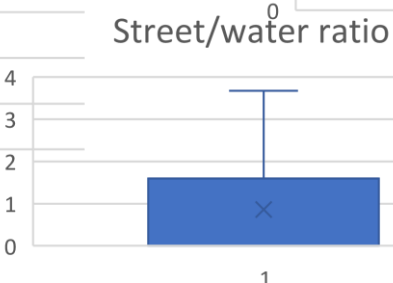
Direct Normal Radiation (Wh/m2)
city: AMSTERDAM
country: NLD
time-zone: 1.0
source: IWEC Data

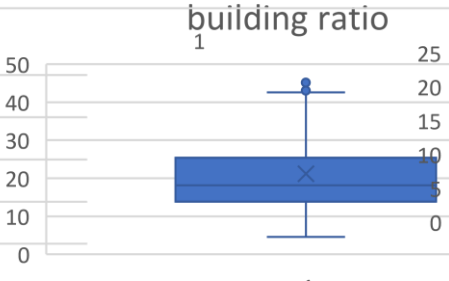
Data analyzes overview

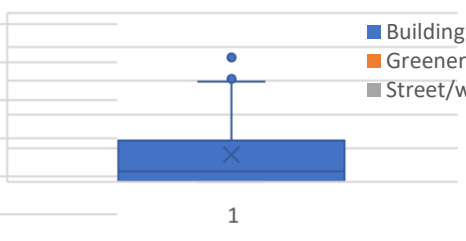


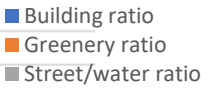


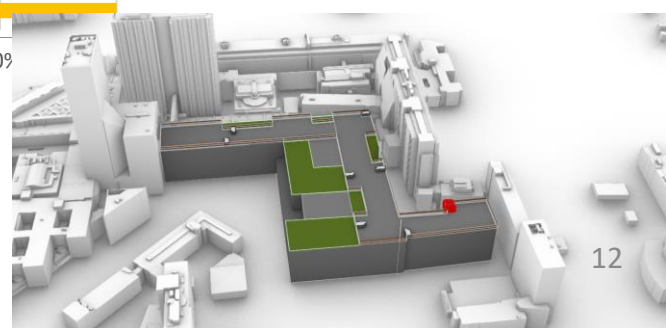








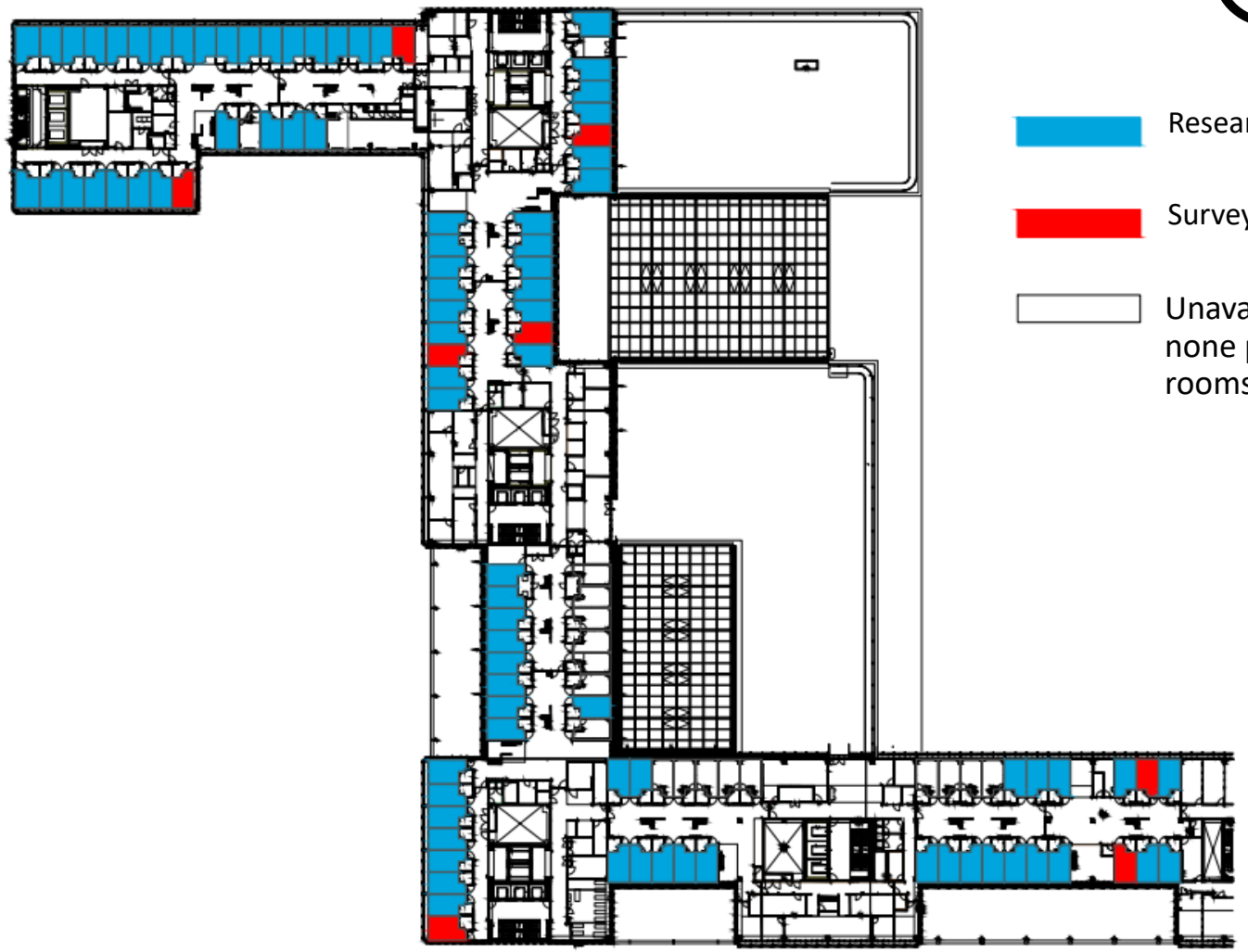




Top view Erasmus mc and surrounding area

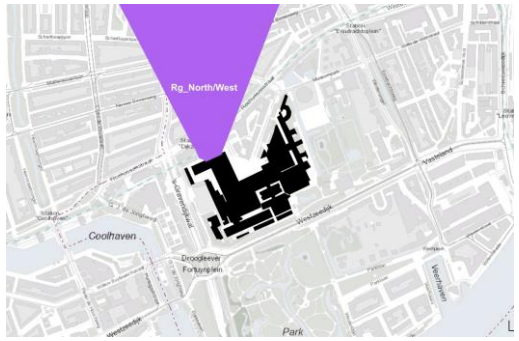
Evaluated hospital rooms

- 83 rooms on 8 floor
- Rooms used in survey are red
- 8 different view directions

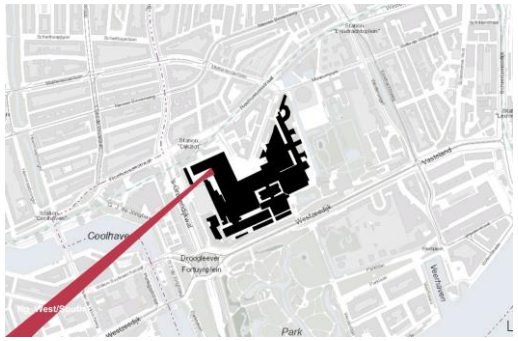


View directions

View directions

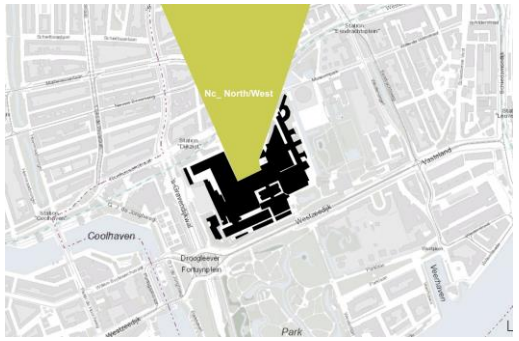


Rg north

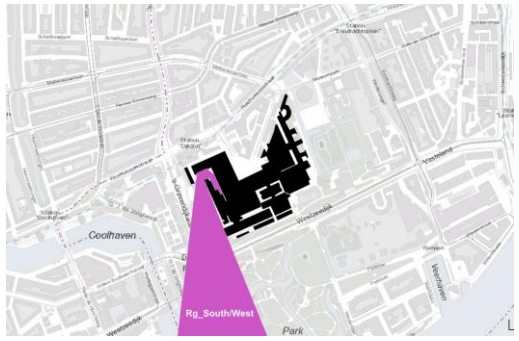


Ng west

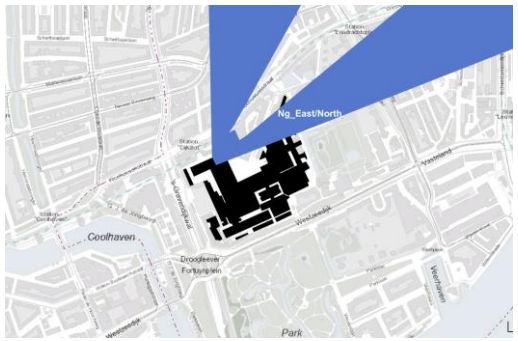
Ne west



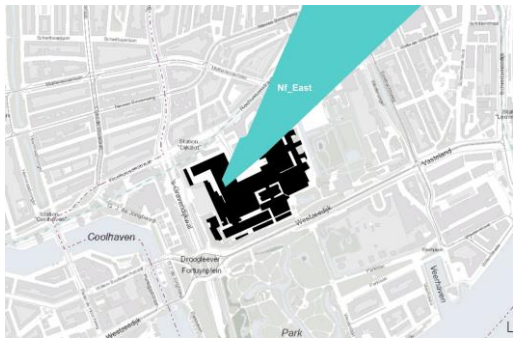
Nc north



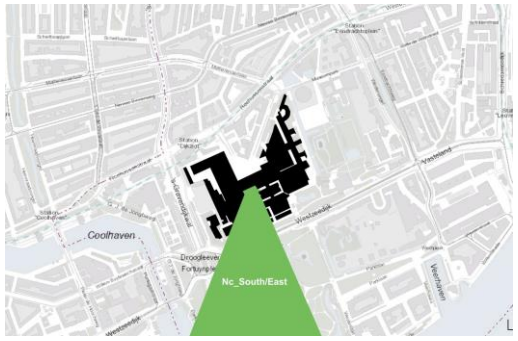
Rg south



Ng east



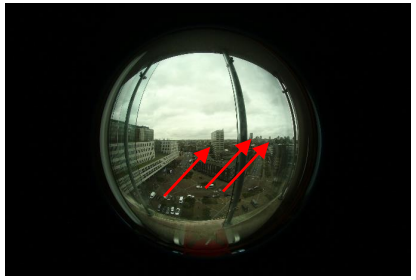
Nf east



Nc south

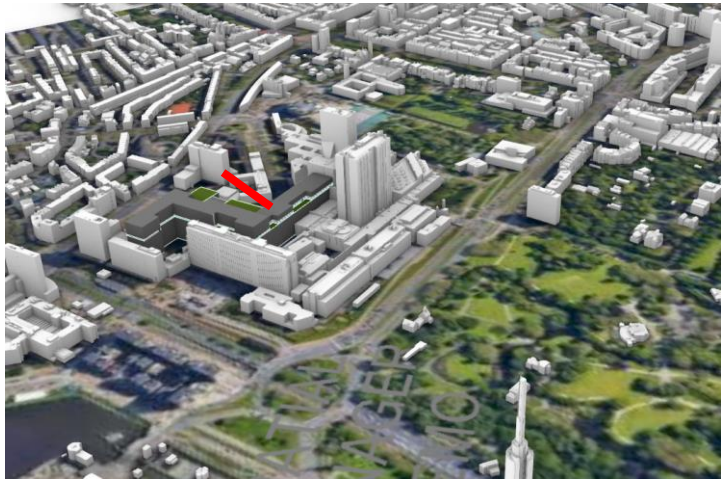
View factors

Layers (sky, landscape and ground)

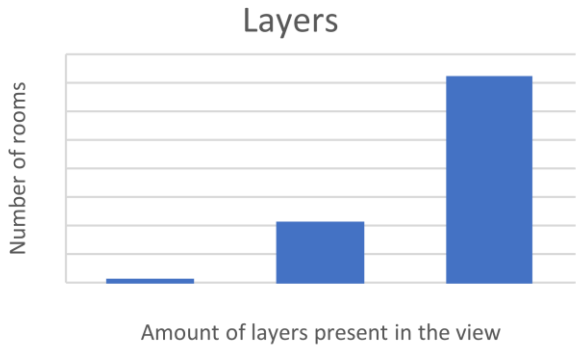


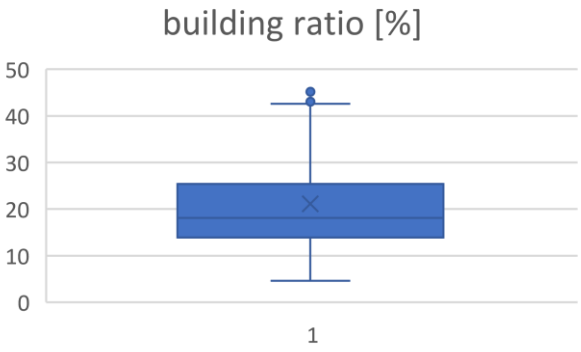
Ratio's:

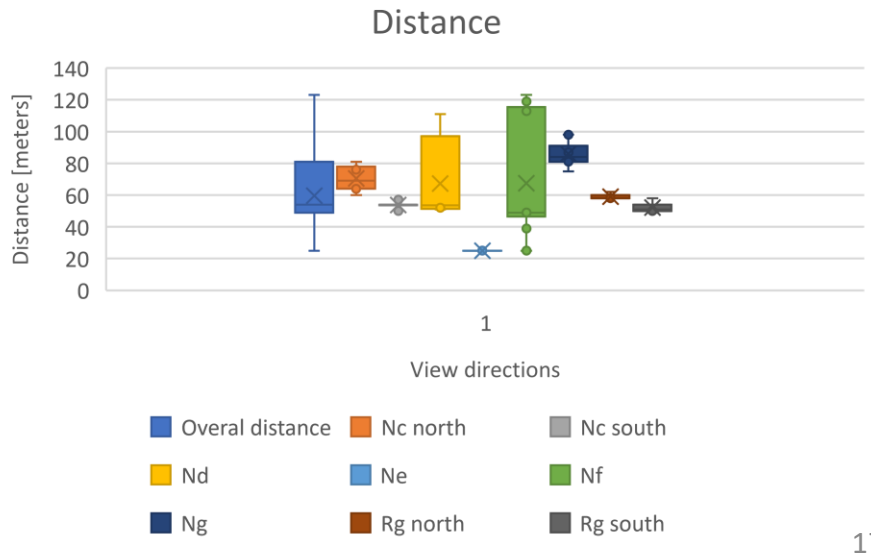
- Building ratio
- Sky ratio
- Greenery ratio
- Street/water ratio



Distance

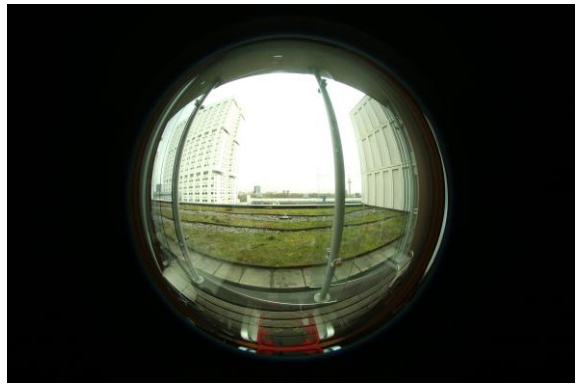




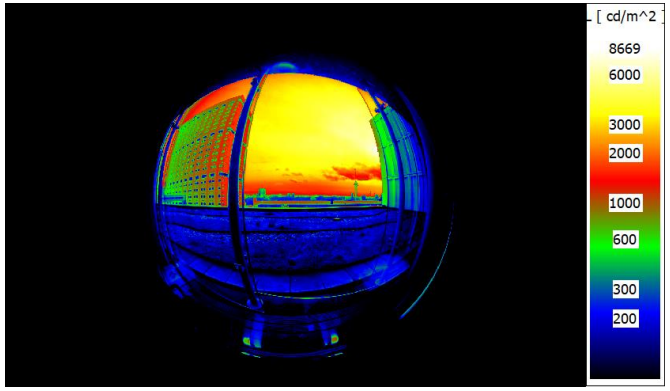


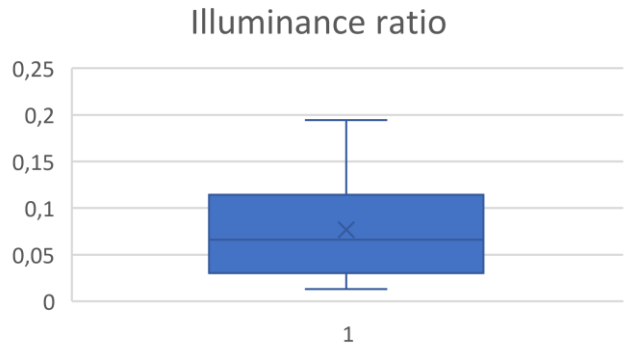
Daylight parameters

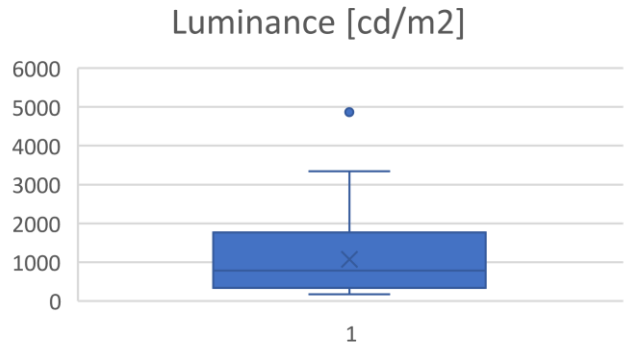
Illuminance ratio



Average luminance

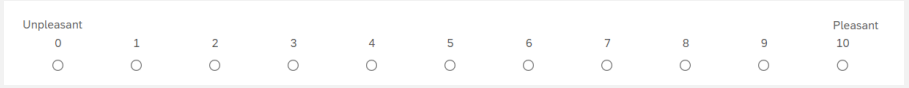




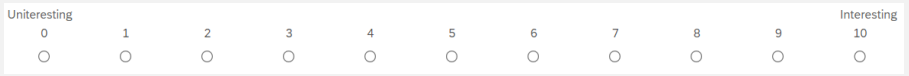


Survey

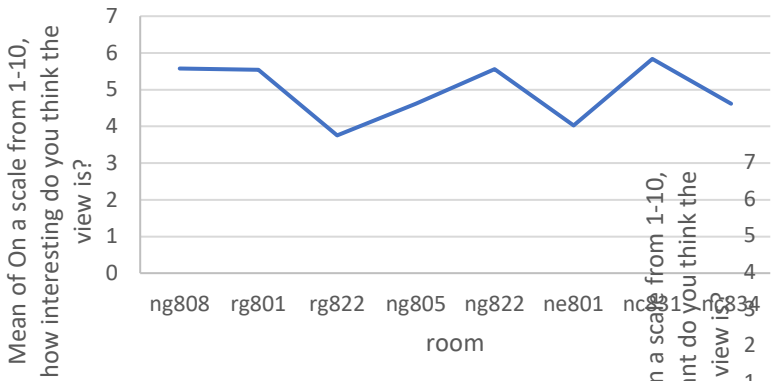
- Rating on pleasantness

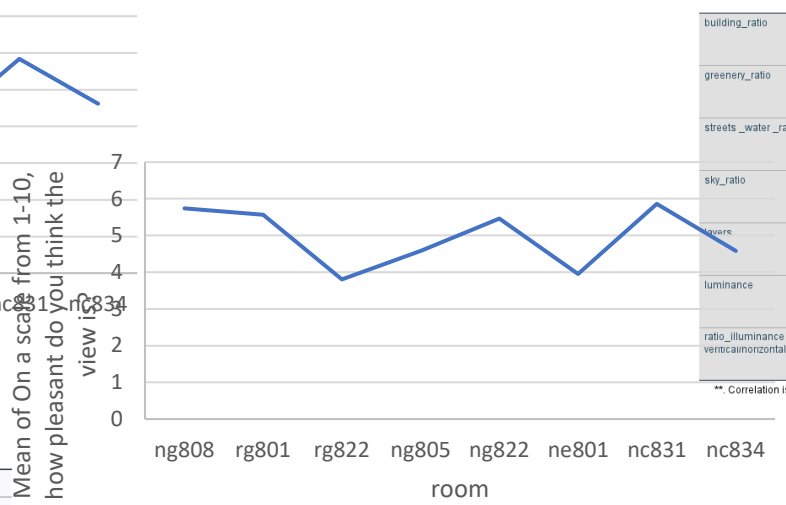


- Rating on interest



- Pleasantness and interest are considered to be fundamental dimensions in evaluating aesthetics





Correlations

			layers
On a scale from 1-10, how interesting do you think the view is?	Pearson Correlation		.145**
	Sig. (2-tailed)		.008
	N		337
	Bootstrap[c]	Bias	-.002
		Std. Error	.057
		95% Confidence Interval Lower	.027
		Upper	.249
On a scale from 1-10, how pleasant do you think the view is?	Pearson Correlation		.157**
	Sig. (2-tailed)		.004
	N		
	Bootstrap[c]	Bias	
		Std. Error	
		95% Con	

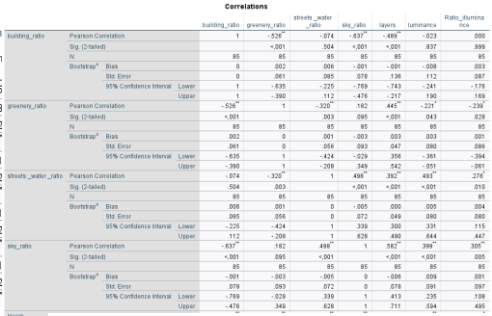
**. Correlation is significant at the 0.01 level (2-taile

c. Unless otherwise noted, bootstrap results are ba

Correlations

			building_ratio	greenery_ratio	streets _water _ratio	sky_ratio	layers	luminance	ratio_illuminance verticalhorizontal
building_ratio	Pearson Correlation		1	-.714**	-.008	-.871**	-.802**	-.061	.075
	Sig. (2-tailed)			<,001	.839	<,001	<,001	.140	.068
	N		592	592	592	592	592	592	592
greenery_ratio	Pearson Correlation		-.714**	1	-.593**	.397**	.283**	-.436**	-.495**
	Sig. (2-tailed)		<,001		<,001	<,001	<,001	<,001	<,001
	N		592	592	592	592	592	592	592
streets _water _ratio	Pearson Correlation		-.008	-.593**	1	.301**	.452**	.546**	.386**
	Sig. (2-tailed)		.839	<,001		<,001	<,001	<,001	<,001
	N		592	592	592	592	592	592	592
sky_ratio	Pearson Correlation		-.871**	.397**	.301**	1	.732**	.334**	.267**
	Sig. (2-tailed)		<,001	<,001	<,001		<,001	<,001	<,001
	N		592	592	592	592	592	592	592
layers	Pearson Correlation		-.802**	.283**	.452**	.732**	1	.422**	.186**
	Sig. (2-tailed)		<,(						
	N		5						
luminance	Pearson Correlation		-.(						
	Sig. (2-tailed)		.1						
	N		5						
ratio_illuminance verticalhorizontal	Pearson Correlation		.(						
	Sig. (2-tailed)		.(						
	N		5						

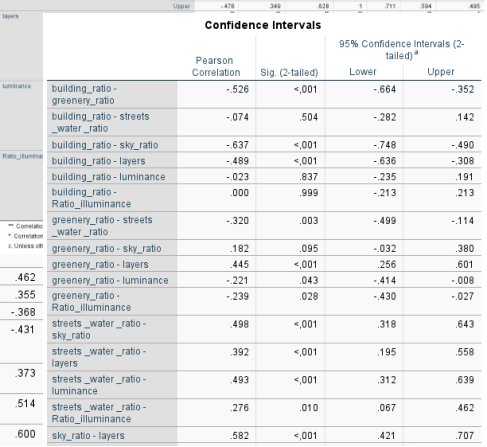
**. Correlation is significant at the 0.01 level (2-tailed).



Confidence Intervals

	Pearson Correlation	Sig. (2-tailed)	95% Confidence Interval[a] Lower	Up
building_ratio - greenery_ratio	-.714	<,001	-.751	
building_ratio - streets _water _ratio	-.008	.839	-.089	
building_ratio - sky_ratio	-.871	<,001	-.889	
building_ratio - layers	-.802	<,001	-.829	
building_ratio - luminance	-.061	.140	-.141	
building_ratio - ratio_illuminance verticalhorizontal	.075	.068	-.006	
greenery_ratio - streets _water _ratio	-.593	<,001	-.643	
greenery_ratio - sky_ratio	.397	<,001	.326	.462
greenery_ratio - layers	.283	<,001	.206	.355
greenery_ratio - luminance	-.436	<,001	-.498	-.368
greenery_ratio - ratio_illuminance verticalhorizontal	-.495	<,001	-.553	-.431
streets _water _ratio - sky_ratio	.301	<,001	.226	.373
streets _water _ratio - layers	.452	<,001	.385	.514
streets _water _ratio - luminance	.546	<,001	.486	.600
streets _water _ratio - ratio_illuminance verticalhorizontal	.386	<,001		
sky_ratio - layers	.732	<,001		
sky_ratio - luminance	.334	<,001		
sky_ratio - ratio_illuminance verticalhorizontal	.267	<,001		
layers - luminance	.422	<,001		
layers - ratio_illuminance verticalhorizontal	.186	<,001		
luminance - ratio_illuminance verticalhorizontal	.923	<,001		

a. Estimation is based on Fisher's r-to-z transformation with b



Confidence Intervals

	Pearson Correlation	Sig. (2-tailed)	95% Confidence Intervals (2-tailed)[a] Lower	Upper
building_ratio - greenery_ratio	-.526	<,001	-.664	-.352
building_ratio - streets _water _ratio	-.074	.504	-.282	.142
building_ratio - sky_ratio	-.637	<,001	-.748	-.490
building_ratio - layers	-.489	<,001	-.636	-.308
building_ratio - luminance	-.023	.837	-.235	.191
building_ratio - Ratio_illuminance	.000	.999	-.213	.213
greenery_ratio - streets _water _ratio	-.320	.003	-.499	-.114
greenery_ratio - sky_ratio	.182	.095	-.032	.380
greenery_ratio - layers	.445	<,001	.256	.601
greenery_ratio - luminance	-.221	.043	-.414	-.008
greenery_ratio - Ratio_illuminance	-.239	.028	-.430	-.027
streets _water _ratio - sky_ratio	.498	<,001	.318	.643
streets _water _ratio - layers	.392	<,001	.195	.558
streets _water _ratio - luminance	.493	<,001	.312	.639
streets _water _ratio - Ratio_illuminance	.276	.010	.067	.462
sky_ratio - layers	.582	<,001	.421	.707
				.564
				.486
				.527
				.434
				.756

Correlation analyses

Correlations

			building_ratio	greenery_ratio	streets _water _ratio	sky_ratio	luminance	ratio_illuminance verticalhorizontal
On a scale from 1-10, how interesting do you think the view is?	Pearson Correlation		-.171**	.116*	.055	.192**	.008	-.019
	Sig. (2-tailed)		.002	.034	.310	<,001	.883	.734
	N		337	337	337	337	337	337
	Bootstrap[c]	Bias	.002	-.003	.000	-.001	.001	.001
		Std. Error	.056	.054	.053	.053	.059	.056
		95% Confidence Interval Lower	-.278	.008	-.051	.083	-.111	-.129
		Upper	-.062	.218	.163	.293	.117	.086
On a scale from 1-10, how pleasant do you think the view is?	Pearson Correlation		-.170**	.102	.074	.194**	.030	-.003
	Sig. (2-tailed)		.002	.062	.176	<,001	.578	.957
	N		337	337	337	337	337	337
	Bootstrap[c]	Bias	.003	-.004	.002	-.001	.002	.002
		Std. Error	.055	.056	.054	.052	.058	.055
		95% Confidence Interval Lower	-.273	-.011	-.035	.086	-.093	-.113
		Upper	-.058	.208	.183	.293	.143	.103
layers	Pearson Correlation		-.800**	.286**	.445**	.731**	.416**	.178**
	Sig. (2-tailed)		<,001	<,001	<,001	<,001	<,001	.001
	N		337	337	337	337	337	337
	Bootstrap[c]	Bias	.001	.000	-.001	-.001	-.001	-.001
		Std. Error	.022	.022	.032	.026	.028	.021
		95% Confidence Interval Lower	-.838	.245	.380	.678	.360	.137
		Upper	-.751	.329	.508	.778	.469	.219

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

On a scale from 1-10, how pleasant do you think the view is?	Pearson Correlation							
	Sig. (2-tailed)							
	N							
	Bootstrap[c]	Bias						
		Std. Error						
		95% Confidence Interval Lower	-.273	-.011	.086	-.035	.118	-.093	-.113
		Upper	-.058	.208	.293	.183	.330	.143	.103
On a scale from 1-10, how interesting do you think the view is?	Pearson Correlation		-.171**	.116*	.192**	.055	.215**	.008	-.019
	Sig. (2-tailed)		.002	.034	<,001	.310	<,001	.883	.734
	N		337	337	337	337	337	337	337
	Bootstrap[c]	Bias	.002	-.003	-.001	.000	-.003	.001	.001
		Std. Error	.056	.054	.053	.053	.053	.059	.056
		95% Confidence Interval Lower	-.278	.008	.083	-.051	.105	-.111	-.129
		Upper	-.062	.218	.293	.163	.314	.117	.086

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Correlations

			building_ratio	
ale from 1-10, how ng do you think the	Pearson Correlation		-.171**	
	Sig. (2-tailed)		.002	
	N		337	
	Bootstrap[c]	Bias	.002	
		Std. Error	.056	.054 .053 .053
		95% Confidence Interval Lower	-.278	.008 -.051 .083
		Upper	-.062	.218 .163 .293
ale from 1-10, how t do you think the	Pearson Correlation		-.170**	.102 .074 .194**
	Sig. (2-tailed)		.002	.062 .176 <,001
	N		337	337 337 337
	Bootstrap[c]	Bias	.003	-.004 .002 -.001
		Std. Error	.055	.056 .054 .052
		95% Confidence Interval Lower	-.273	-.011 -.035 .086
		Upper	-.058	.208 .183 .293
	Pearson Correlation		-.800**	.286** .445** .731**
	Sig. (2-tailed)		<,001	<,001 <,001 <,001
	N		337	337 337 337
	Bootstrap[c]	Bias	.001	.000 -.001 -.001
		Std. Error	.022	.022 .032 .026
		95% Confidence Interval Lower	-.838	.245 .380 .678
		Upper	-.751	.329 .508 .778

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Correlations

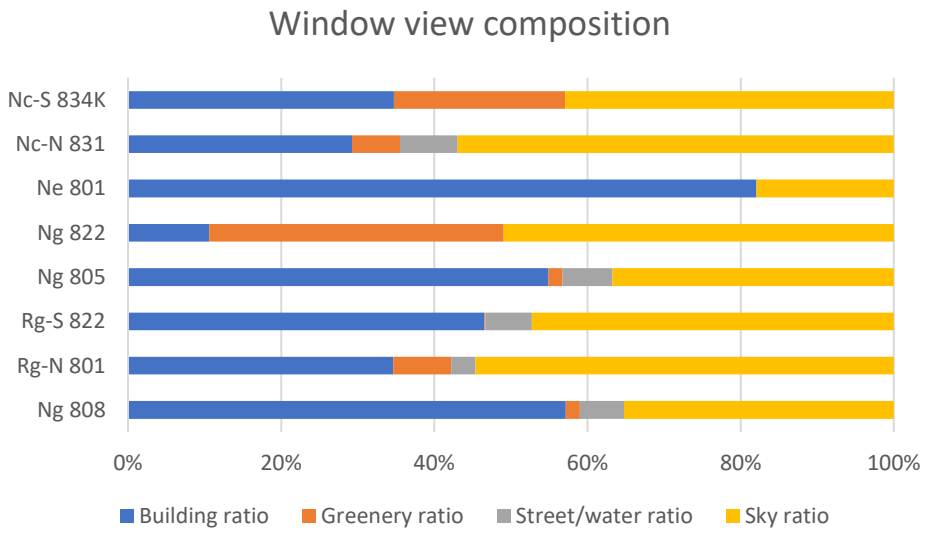
			luminance	ratio_illuminance verticalhorizontal
building_ratio	Pearson Correlation		-.061	.075
	Sig. (2-tailed)		.140	.068
	N		592	592
	Bootstrap[c]	Bias	.002	.002
		Std. Error	.040	.030
		95% Confidence Interval Lower	-.134	.016
		Upper	.024	.137
greenery_ratio	Pearson Correlation		-.436**	-.495**
	Sig. (2-tailed)		<,001	<,001
	N		592	592
	Bootstrap[c]	Bias	-.001	-.001
		Std. Error	.023	.018
		95% Confidence Interval Lower	-.481	-.533
		Upper	-.393	-.459
streets _water _ratio	Pearson Correlation		.546**	.386**
	Sig. (2-tailed)		<,001	<,001
	N		592	592
	Bootstrap[c]	Bias	.000	.001
		Std. Error	.024	.028
		95% Confidence Interval Lower	.498	.334
		Upper	.594	.444
sky_ratio	Pearson Correlation		.334**	.267**
	Sig. (2-tailed)		<,001	<,001
	N		592	592
	Bootstrap[c]	Bias	-.001	-.001
		Std. Error	.031	.029
		95% Confidence Interval Lower	.268	.208
		Upper	.392	.324

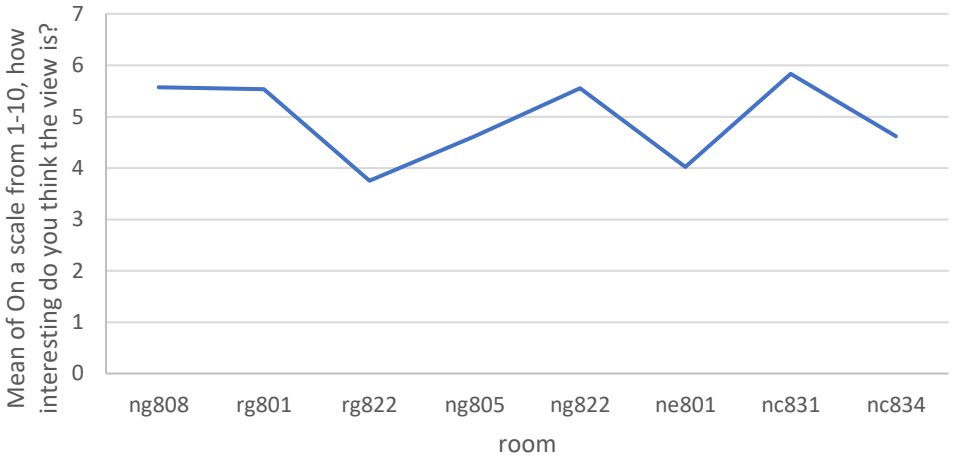
**. Correlation is significant at the 0.01 level (2-tailed).

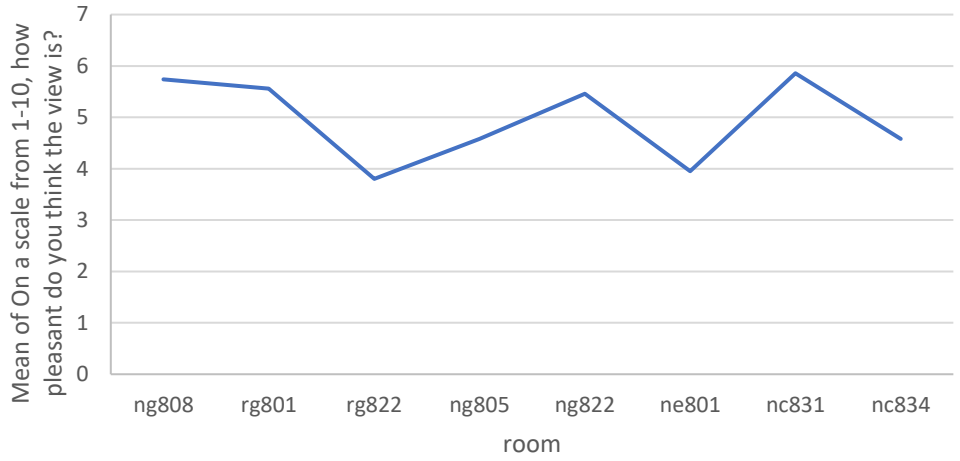
c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Visual perception rating

- Pleasantness and interest similar evaluations
- The rooms with a lot of building ratio and no greenery were rated the lowest.
- Rooms with the highest score were similar in building ratio, also greenery and street/water were present







Corresponding correlations and differences

- Building , sky and the green ratio have corresponding significant correlations .
- Daylight parameters have very low correlation
- For the layers, the view factors and daylight parameters had significant correlations.

Correlations

				building_ratio	greenery_ratio	streets _water _ratio	sky_ratio	luminance	ratio_illuminance veritical/horizontal
On a scale from 1-10, how interesting do you think the view is?	Pearson Correlation			-.171**	.116*	.055	.192**	.008	-.019
	Sig. (2-tailed)			.002	.034	.310	<,001	.883	.734
	N			337	337	337	337	337	337
	Bootstrap[c]	Bias		.002	-.003	.000	-.001	.001	.001
		Std. Error		.056	.054	.053	.053	.059	.056
		95% Confidence Interval	Lower	-.278	.008	-.051	.083	-.111	-.129
			Upper	-.062	.218	.163	.293	.117	.086
On a scale from 1-10, how pleasant do you think the view is?	Pearson Correlation			-.170**	.102	.074	.194**	.030	-.003
	Sig. (2-tailed)			.002	.062	.176	<,001	.578	.957
	N			337	337	337	337	337	337
	Bootstrap[c]	Bias		.003	-.004	.002	-.001	.002	.002
		Std. Error		.055	.056	.054	.052	.058	.055
		95% Confidence Interval	Lower	-.273	-.011	-.035	.086	-.093	-.113
			Upper	-.058	.208	.183	.293	.143	.103
layers	Pearson Correlation			-.800**	.286**	.445**	.731**	.416**	.178**
	Sig. (2-tailed)			<,001	<,001	<,001	<,001	<,001	.001
	N			337	337	337	337	337	337
	Bootstrap[c]	Bias		.001	.000	-.001	-.001	-.001	-.001
		Std. Error		.022	.022	.032	.026	.028	.021
		95% Confidence Interval	Lower	-.838	.245	.380	.678	.360	.137
			Upper	-.751	.329	.508	.778	.469	.219

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Correlation between view factors and daylight parameters

- Significant correlation between the view factors and the daylight parameters, except for the building ratio.

Correlations

				luminance	ratio_illuminance veritical/horizontal
building_ratio	Pearson Correlation			-.061	.075
	Sig. (2-tailed)			.140	.068
	N			592	592
	Bootstrap[c]	Bias		.002	.002
		Std. Error		.040	.030
		95% Confidence Interval	Lower	-.134	.016
			Upper	.024	.137
greenery_ratio	Pearson Correlation			-.436**	-.495**
	Sig. (2-tailed)			<,001	<,001
	N			592	592
	Bootstrap[c]	Bias		-.001	-.001
		Std. Error		.023	.018
		95% Confidence Interval	Lower	-.481	-.533
			Upper	-.393	-.459
streets _water _ratio	Pearson Correlation			.546**	.386**
	Sig. (2-tailed)			<,001	<,001
	N			592	592
	Bootstrap[c]	Bias		.000	.001
		Std. Error		.024	.028
		95% Confidence Interval	Lower	.498	.334
			Upper	.594	.444
sky_ratio	Pearson Correlation			.334**	.267**
	Sig. (2-tailed)			<,001	<,001
	N			592	592
	Bootstrap[c]	Bias		-.001	-.001
		Std. Error		.031	.029
		95% Confidence Interval	Lower	.268	.208
			Upper	.392	.324

**. Correlation is significant at the 0.01 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Confidence intervals comparison

- The confidence intervals of survey rooms are in range of the floor 8 rooms data set

Confidence interval: survey rooms data set

Confidence Intervals

	Pearson Correlation	Sig. (2-tailed)	95% Confidence Intervals (2-tailed)[a] Lower	Upper
building_ratio - greenery_ratio	-.714	<,001	-.751	-.672
building_ratio - streets _water _ratio	-.008	.839	-.089	.072
building_ratio - sky_ratio	-.871	<,001	-.889	-.849
building_ratio - layers	-.802	<,001	-.829	-.771
building_ratio - luminance	-.061	.140	-.141	.020
building_ratio - ratio_illuminance veritical/horizontal	.075	.068	-.006	.155
greenery_ratio - streets _water _ratio	-.593	<,001	-.643	-.538
greenery_ratio - sky_ratio	.397	<,001	.326	.462
greenery_ratio - layers	.283	<,001	.206	.355
greenery_ratio - luminance	-.436	<,001	-.498	-.368
greenery_ratio - ratio_illuminance veritical/horizontal	-.495	<,001	-.553	-.431
streets _water _ratio - sky_ratio	.301	<,001	.226	.373
streets _water _ratio - layers	.452	<,001	.385	.514
streets _water _ratio - luminance	.546	<,001	.486	.600
streets _water _ratio - ratio_illuminance veritical/horizontal	.386	<,001	.315	.452
sky_ratio - layers	.732	<,001	.692	.767
sky_ratio - luminance	.334	<,001	.261	.404
sky_ratio - ratio_illuminance veritical/horizontal	.267	<,001	.190	.340
layers - luminance	.422	<,001	.353	.485
layers - ratio_illuminance veritical/horizontal	.186	<,001	.107	.263
luminance - ratio_illuminance veritical/horizontal	.923	<,001	.910	.934

a. Estimation is based on Fisher's r-to-z transformation with bias adjustment.

Confidence interval: floor 8 rooms data set

Confidence Intervals

	Pearson Correlation	Sig. (2-tailed)	95% Confidence Intervals (2-tailed)[a] Lower	Upper
building_ratio - greenery_ratio	-.526	<,001	-.664	-.352
building_ratio - streets _water _ratio	-.074	.504	-.282	.142
building_ratio - sky_ratio	-.637	<,001	-.748	-.490
building_ratio - layers	-.489	<,001	-.636	-.308
building_ratio - luminance	-.023	.837	-.235	.191
building_ratio - Ratio_illuminance	.000	.999	-.213	.213
greenery_ratio - streets _water _ratio	-.320	.003	-.499	-.114
greenery_ratio - sky_ratio	.182	.095	-.032	.380
greenery_ratio - layers	.445	<,001	.256	.601
greenery_ratio - luminance	-.221	.043	-.414	-.008
greenery_ratio - Ratio_illuminance	-.239	.028	-.430	-.027
streets _water _ratio - sky_ratio	.498	<,001	.318	.643
streets _water _ratio - layers	.392	<,001	.195	.558
streets _water _ratio - luminance	.493	<,001	.312	.639
streets _water _ratio - Ratio_illuminance	.276	.010	.067	.462
sky_ratio - layers	.582	<,001	.421	.707
sky_ratio - luminance	.399	<,001	.203	.564
sky_ratio - Ratio_illuminance	.305	.005	.098	.486
layers - luminance	.354	<,001	.152	.527
layers - Ratio_illuminance	.243	.025	.032	.434
luminance - Ratio_illuminance	.647	<,001	.503	.756

a. Estimation is based on Fisher's r-to-z transformation.

Correlation visual perception and layers

- Significant correlation between visual perception and layers

Correlations

				layers
On a scale from 1-10, how interesting do you think the view is?	Pearson Correlation			.145**
	Sig. (2-tailed)			.008
	N			337
	Bootstrap[c]	Bias		-.002
		Std. Error		.057
		95% Confidence Interval	Lower	.027
			Upper	.249
On a scale from 1-10, how pleasant do you think the view is?	Pearson Correlation			.157**
	Sig. (2-tailed)			.004
	N			337
	Bootstrap[c]	Bias		-.003
		Std. Error		.055
		95% Confidence Interval	Lower	.042
			Upper	.256

**. Correlation is significant at the 0.01 level (2-tailed).

c. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

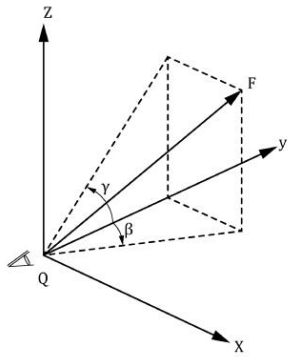
Nen-EN 17037 (current)

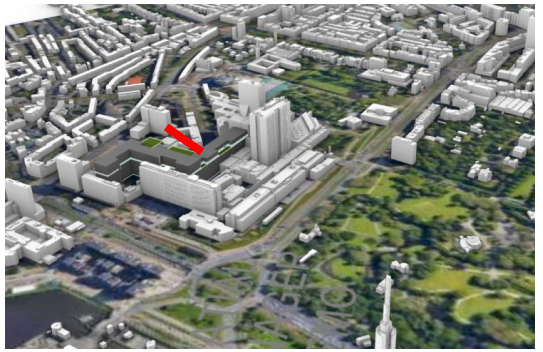
- Researched behind the NEN-EN

Hellinga, H., & Hordijk, T. (2014). The D&V analysis method: A method for the analysis of daylight access and view quality. *Building and en Environment*, 101-114.

Nen-EN 17037 (current)

- Lowest value determine level of recommendation
- Area does not have any influence
- One shoe fits all, the influence of building functions are not represented in the matrix

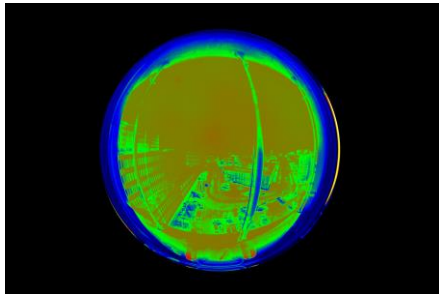




	Parameter [a]		
Level of recommendation for view out	**Horizontal sight angle**	**Outside distance of the view**	**Number of layers to be seen from at least 75 % of utilized area:** **- sky** **- landscape (urban and/or nature)** **- ground**
Minimum	≥ 14°	≥ 6,0 m	At least landscape layer is included
Medium	≥ 28°	≥ 20,0 m	Landscape layer and one additional layer is included in the same view opening
High	≥ 54°	≥ 50,0 m	all layers are included in the same view opening

Nen-EN 17037 (proposed)

- Layers are indeed important for the participants perception.
- However, the division could be revisited, the presents of greenery have influence.
- The view elements are influencing each other and participants perception.
- Also, daylight parameters have influence on the view factors, the connection is not included in the current NEN



	Horizontal sight angle	Distance	Building ratio	Sky ratio	Greenery ratio	Street/water ratio
Percentage based value						
Day light parameter Impact factor						
Location factor impact factor						
Score						
Overall score						

Implemented into the hospital design

Readjusting	Readjusting hospital plans: view outward should match the illness severity of the department
Improve	Improve the view outwards, by implementing Green pathways around hospital, green parks
Incorporating	Incorporating :Green renovation in existing hospitals, for example Roof gardens, vertical gardens

Thank you for listening

Questions ?

Effect size of significant correlations

Range effect size	Effect size category
0.00 < 0.20	Weak
0.20 < 0.40	Moderate
0.40 < 0.60	Relative strong
0.60 < 0.80	Strong
0.80 < 1.00	Very strong

Incorporating more green

https://slate.com/human-interest/2013/09/patrick-blanc-s-newest-vertical-garden-greening-urban-walls-around-the-world.html

https://www.udesign.es/best-biggest-vertical-gardens-world/