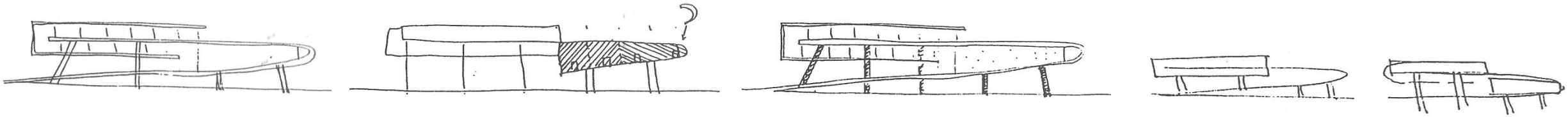
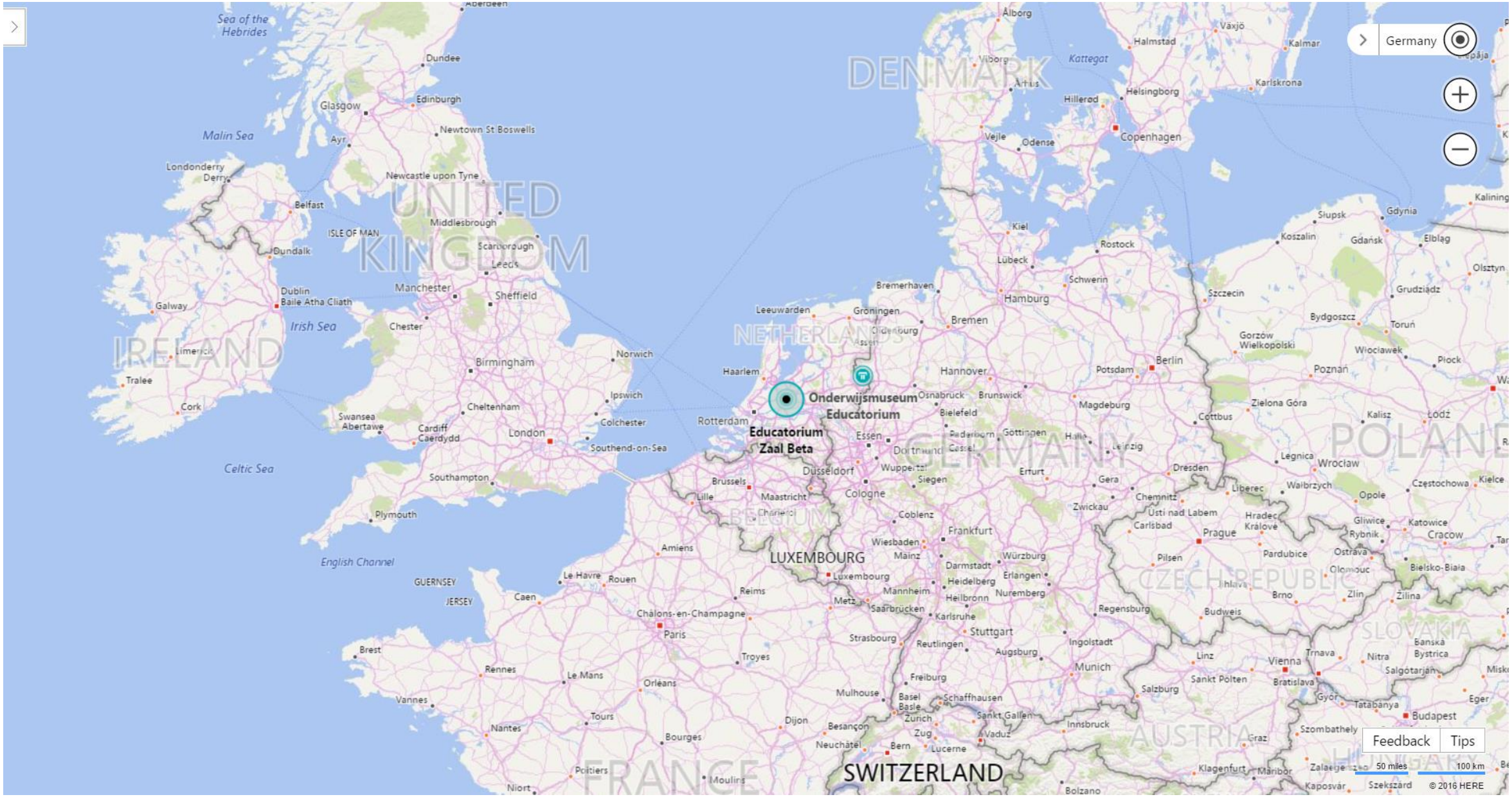


EDUCATORIUM

HILLARY BROWN, MEAGHAN GILLIAM, KELSIE KAATZ, DEBORAH MADERA, SHELLIE SAQIB


Germany
Onderwijsmuseum
Educatorium
Educatorium
Zaal Beta
Feedback
Tips
50 miles
100 km
© 2016 HERE

LOCATION


LOCATION
Utrecht, Netherlands
De Bilt
Huis ter Heide
Bosch en Duin
Utrecht
Zeist
Hoge Dennen
Kerckebosch
Bunnik

LOCATION

Building Name: Educatorium

Chief Architect: Rem Koolhaas

Client: University of Utrecht

Structural Engineer: BAM

Construction Contractor: BAM Bredero, A. de Jong air conditioning, Ergon Electric, GTI Rotterdam-Capelle, Lichtindustrie Wolter & Drost-Evli

Design : 1993 – 1995

Construction : 1995 – 1997

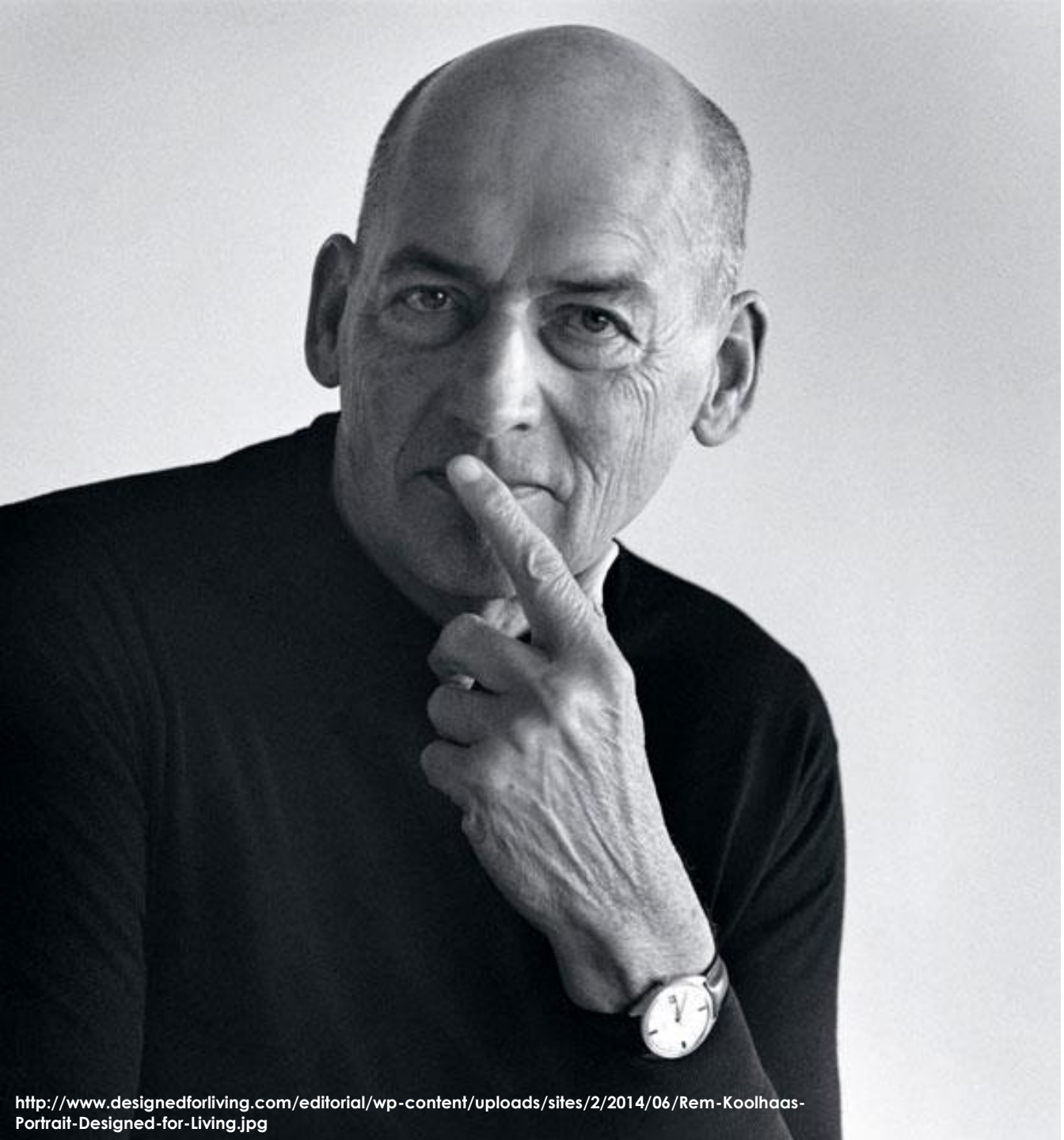
Floors: 6

Floor Area: 11,000m2 (118,403ft2)

Cost: 10,900,000 €

https://www.pinterest.com/pablo8095/educatorium-oma/

BUILDING INFO



http://www.designedforliving.com/editorial/wp-content/uploads/sites/2/2014/06/Rem-Koolhaas-Portrait-Designed-for-Living.jpg

Born: Rotterdam, Netherlands – November 17, 1944

Education: Architectural Association School of Architecture, Cornell University

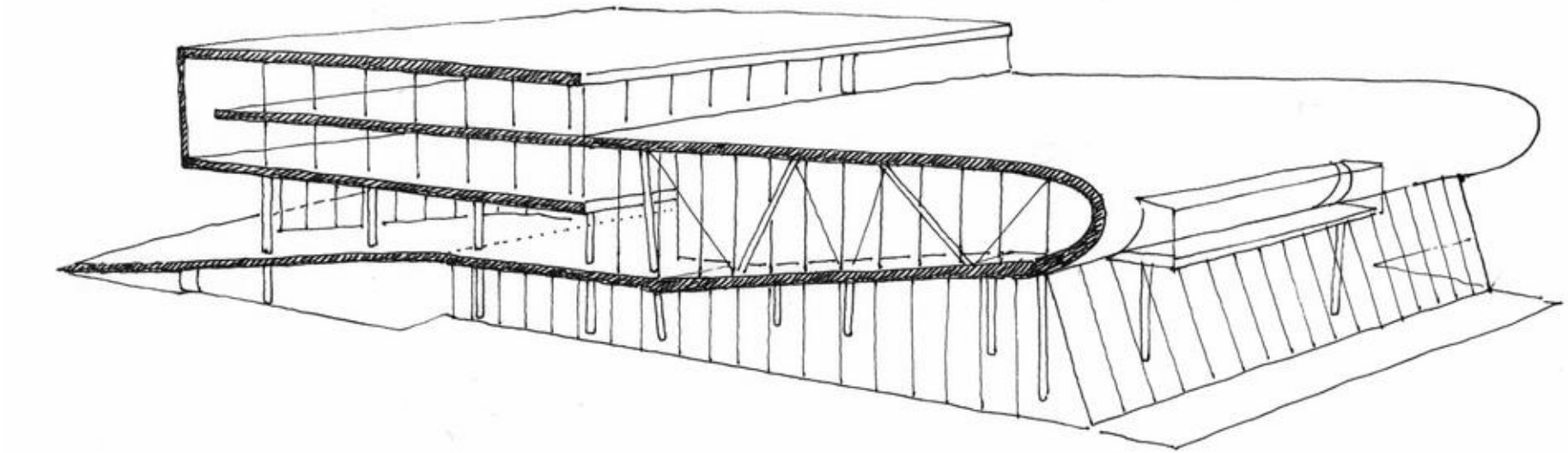
Public Recognition: *Delirious New York: A Retroactive Manifesto for Manhattan (1978)*

Practice: Office for Metropolitan Architecture, OMA

Awards: Pritzker Prize, 2000

Key Design Principle: "Interaction and inhabitation of people within a designed space."

ARCHITECT



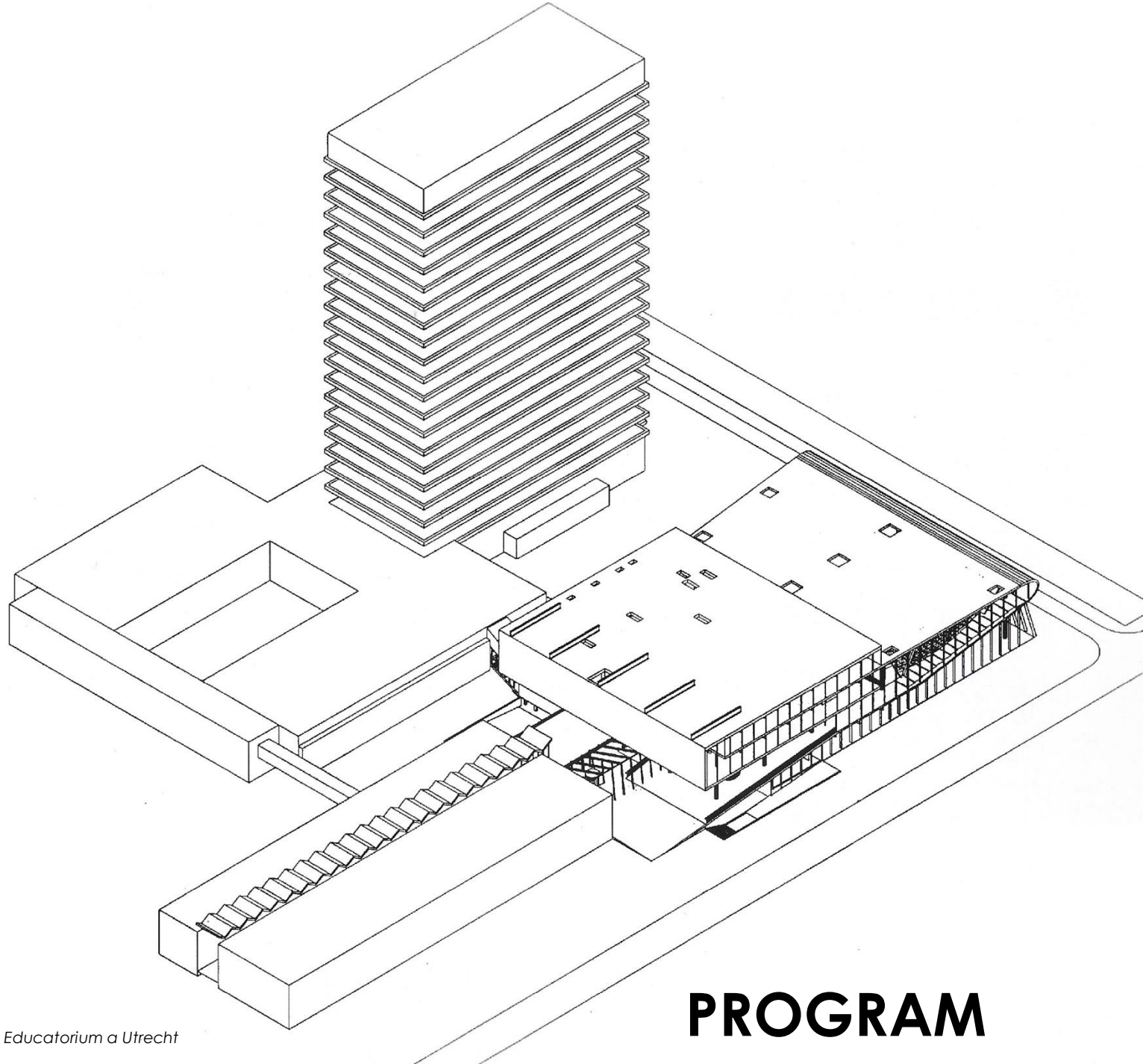
http://oma.eu/projects/educatorium

"The Educatorium is composed of two planes which fold to accommodate a range of distinct programs, including an outdoor plaza, two lecture halls, cafeteria and exam halls. Planes interlock to create a single trajectory in which the entire university experience - socialization, learning, examination - is encapsulated."

Building Purpose: Counteract the impersonal university campus designed in the sixties

Design Intention: "Constant redefinition of what it means to learn in a social environment."

Program: Cafeteria, two auditoriums, three examination rooms, other rooms for study and research

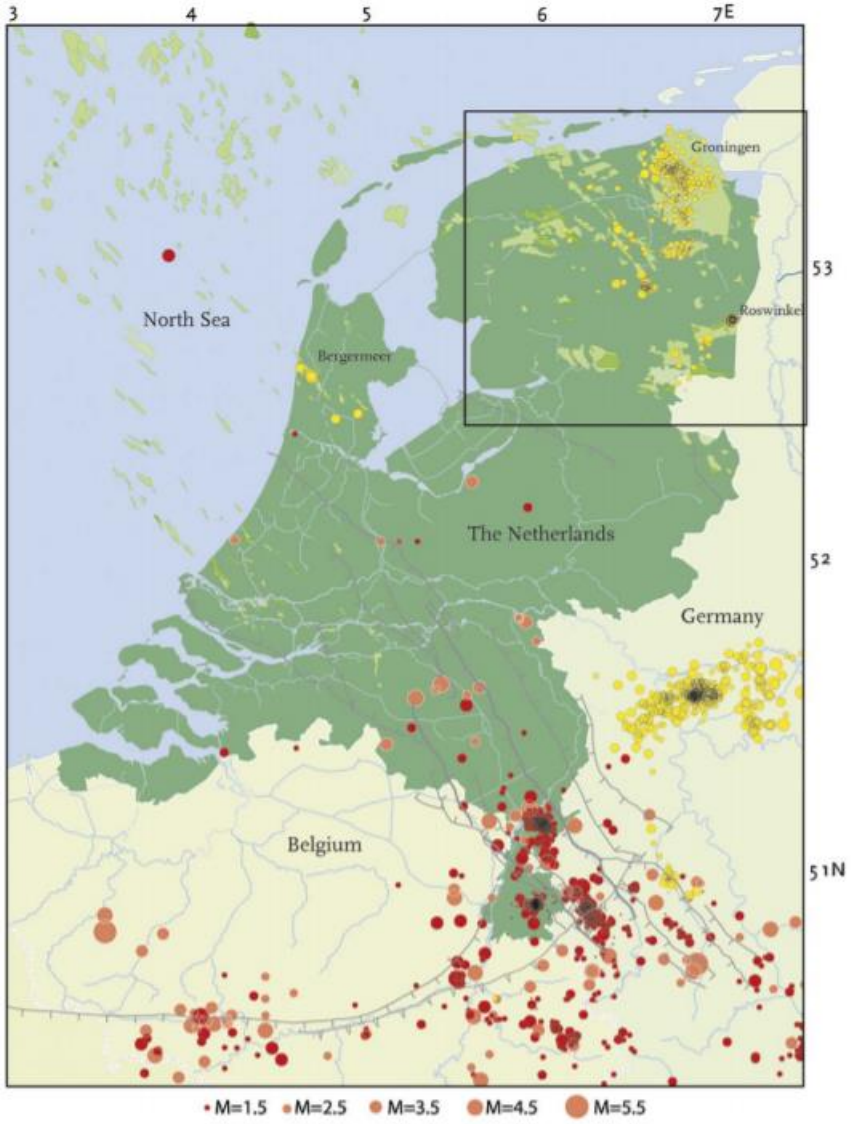


Educatorium a Utrecht

PROGRAM

Seismic Causes: Dutch oil and gas fields induce seismic actions by gas extraction for much of the Netherlands

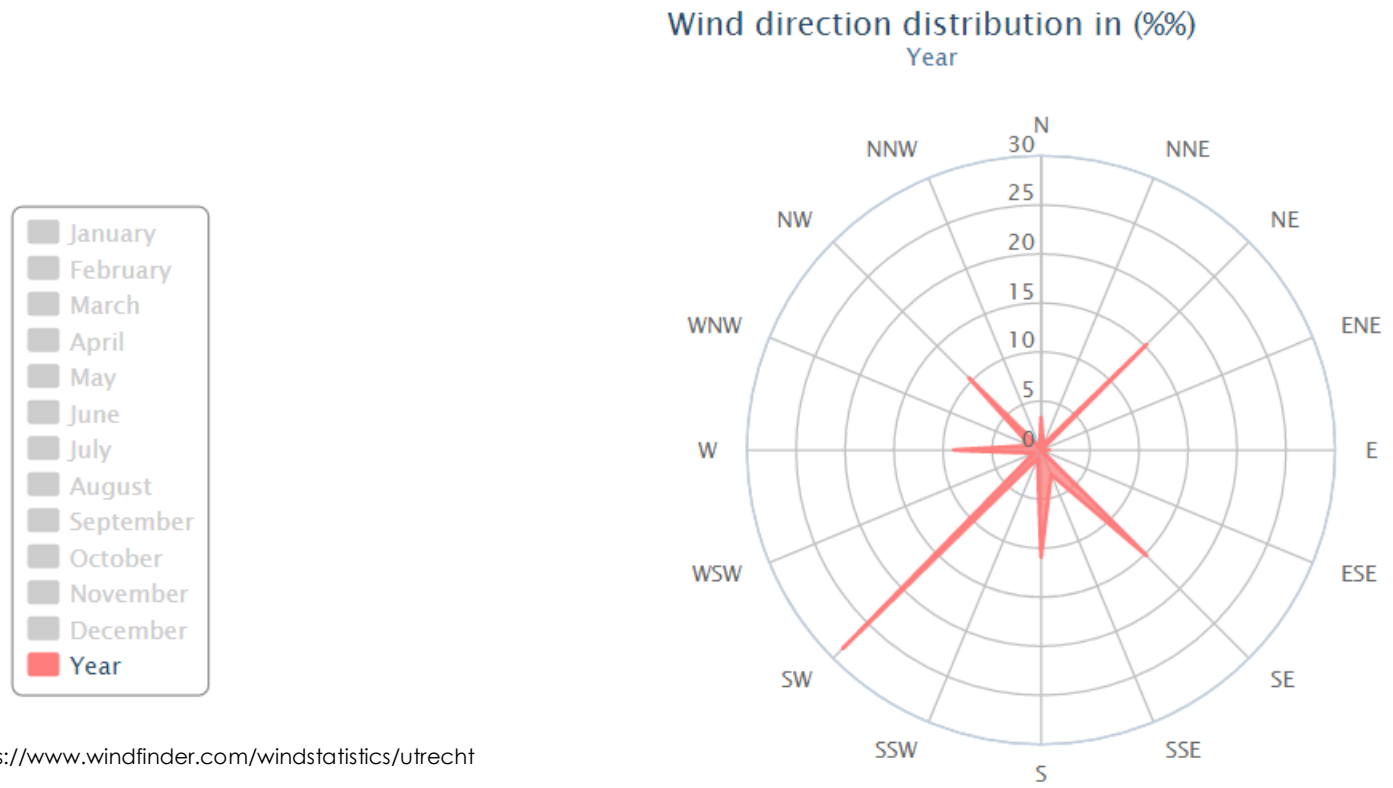
Utrecht: Centrally located in the Netherlands – surrounded by natural tectonic earthquakes and fault lines



http://ac.els-cdn.com/S0013795206001803/1-s2.0-S0013795206001803-main.pdf?_tid=4d0a28da-b5da-11e6-baf8-00000aacb35f&acdnat=1480386168_8e1ef43a5b441f8b1f5fd5255682158e

SEISMIC ANALYSIS

Month of year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
	01	02	03	04	05	06	07	08	09	10	11	12	1-12
Dominant wind direction													
Wind probability >= 4 Beaufort (%)	19	24	14	12	11	8	9	6	5	9	14	25	**13**
Average Wind speed (mph)	8	9	7	7	7	6	6	5	5	5	6	9	**6**
Average air temp. (°F)	41	42	46	55	62	68	73	71	66	57	50	46	**55**



https://www.windfinder.com/windstatistics/utrecht

WIND ANALYSIS

Soil Classification:

River clay, sedimented by and along the Rhine river

Table 1. The homogeneous areas in the various provinces 'translated' to a national-scale classification, and the number of samples taken.

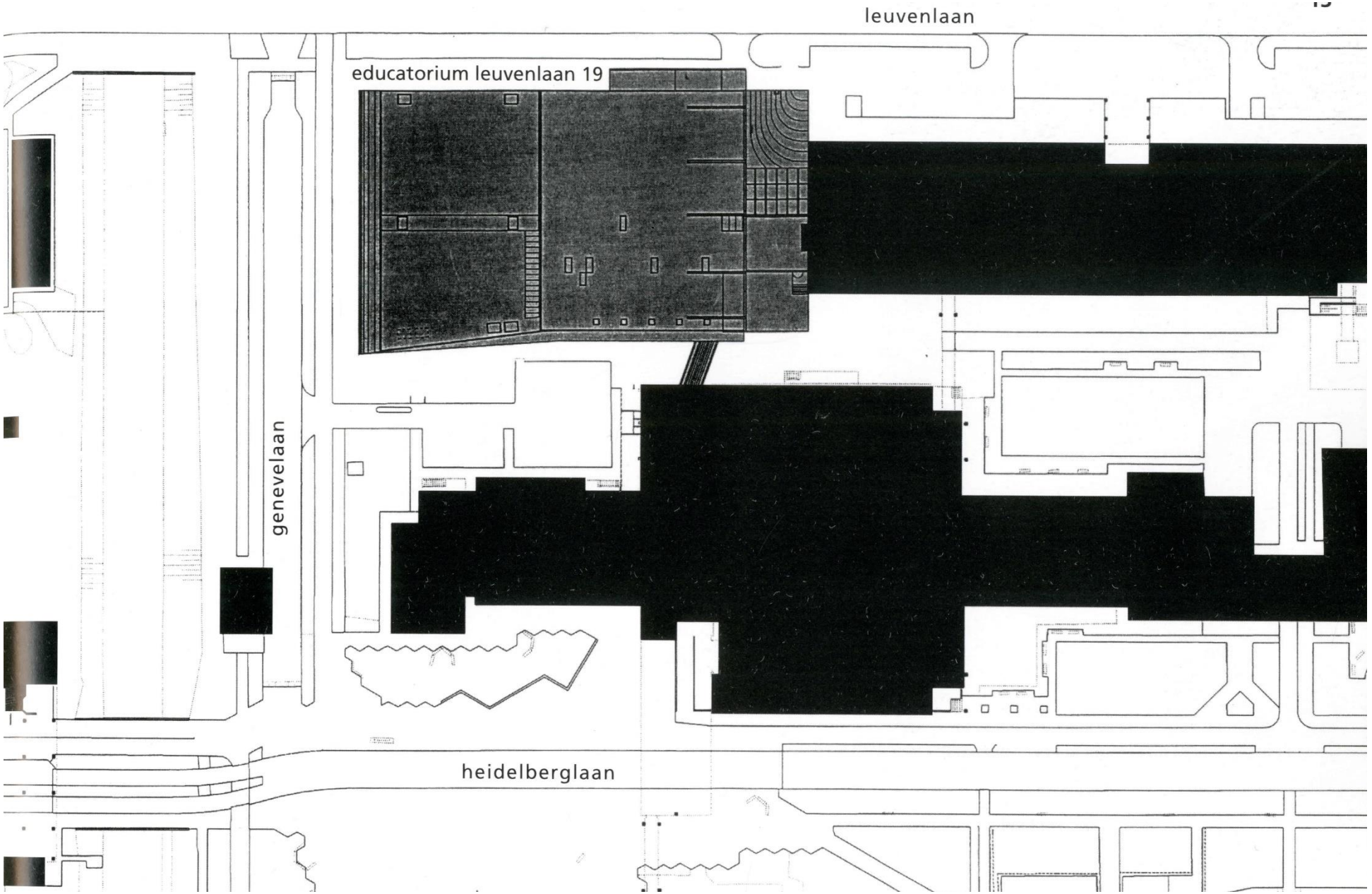
homogeneous area		number of samples per province[1]						
code	*description*	*Noord-Brabant* [a,b]	*Friesland* [a]	*Groningen* [a]	*Utrecht* [a,b]	*Drenthe* [c]	*Zuid-Holland* [b]	*Gelderland* [c]
AM	agriculture (extensive) on marine sediments (clay)	40		44			10	
AR	agriculture (extensive) on river sediments (clay)				6			20
AS	gricultural (extensive) on sandy soils			29		47	8	
AP	agricultural on peaty soils	31				16		
BS	bulbs on sandy soils						20	
FS	forest on sandy soil	98	39	6	7	21		30
FP	forest on peaty soil	6						
GR	grazing land/pastures on river sediments (clay)	23			12			
GP	grazing land/pastures on peaty soil		175		14	17	45	
GS	grazing land/pastures on sandy soil	46	99	12	8	49		50
GM	grazing land/pastures on marine sediments (clay)		145	28			10	
GRS	greenhouses (agricultural) on sandy soils						20	
GRM	greenhouses (agricultural) on marine sediments (clay)						5	
IS	intensive agriculture on sandy soil	197			9			50
IR	intensive agriculture on river sediments (clay)	15						
MS	moorland/heath on sandy soil	15				7		
MP	moorland/heath on peaty soil	11						
NS	nature on sandy soil			6			10	
NR	nature on river sediments (clay)		31					
NM	nature on marine sediments (clay)		8	12				
NP	nature on peaty soils			13		9	42	
OR	orchard (fruit) on river sediments (clay)				12			
	TOTAL	482	497	150	68	166	170	150

[1] The number of samples depends on the purpose of monitoring and is based here on the number of sample locations for heavy metals.
[a] Database used in the present contribution for analysis on heavy metals.
[b] Database used in the present contribution for analysis on nitrate and phosphate.
[c] Database not used in the present contribution.

http://www.fao.org/fileadmin/templates/soilbiodiversity/Downloadable_files/Buslink___Postma.pdf

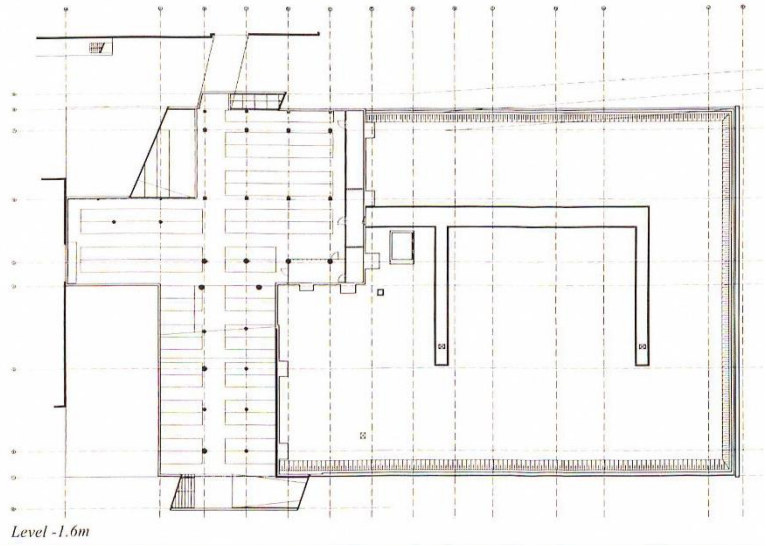
SOIL ANALYSIS

https://www.flickr.com/photos/kuk/5637802483

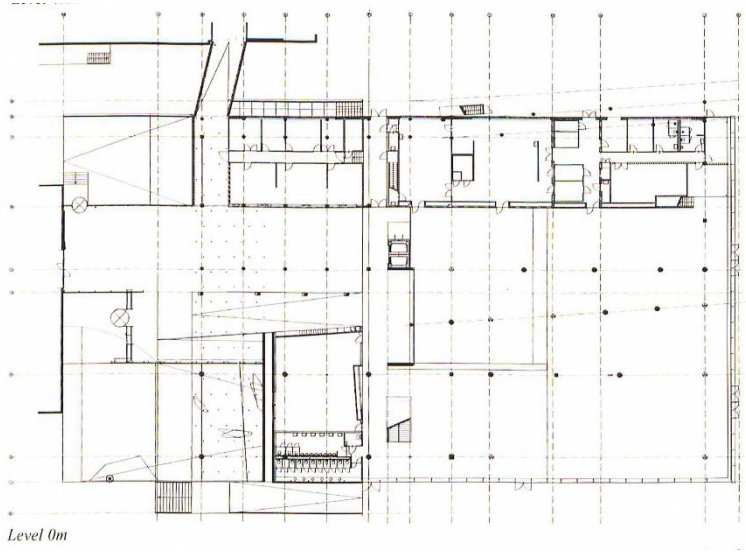


Educatorium a Utrecht

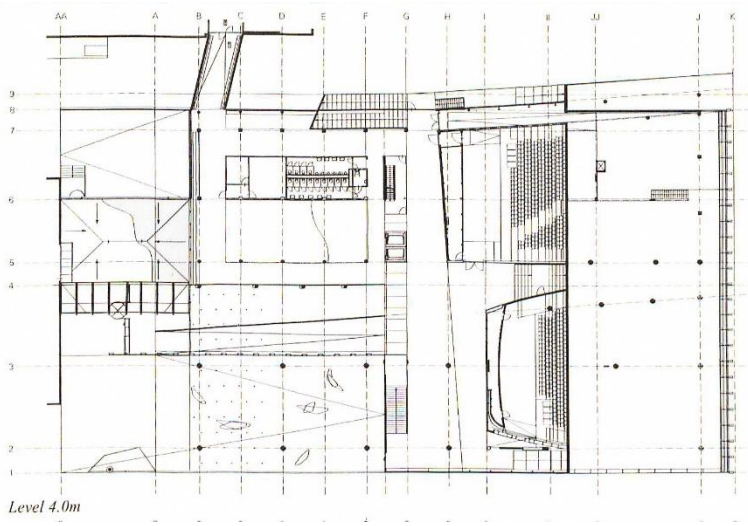
SITE PLAN



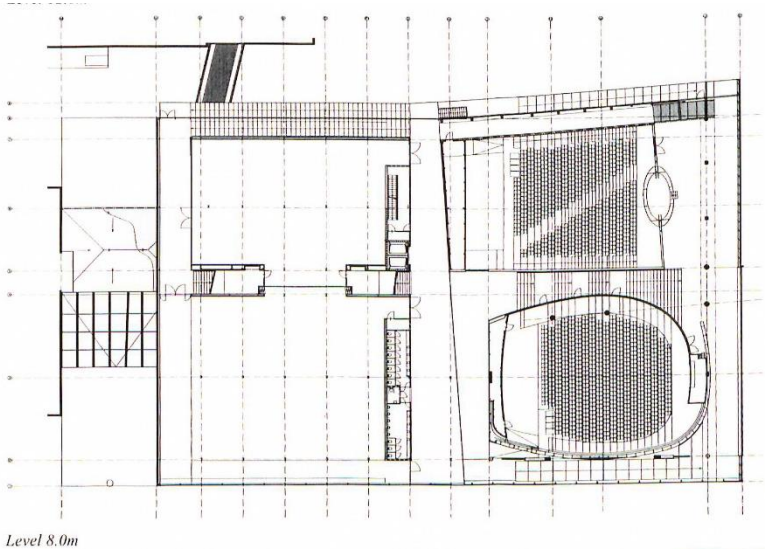
Level -1.6m



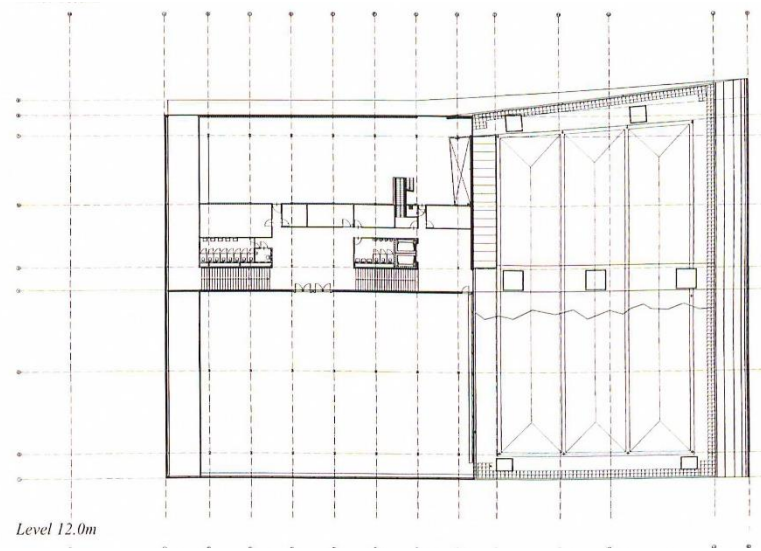
Level 0m



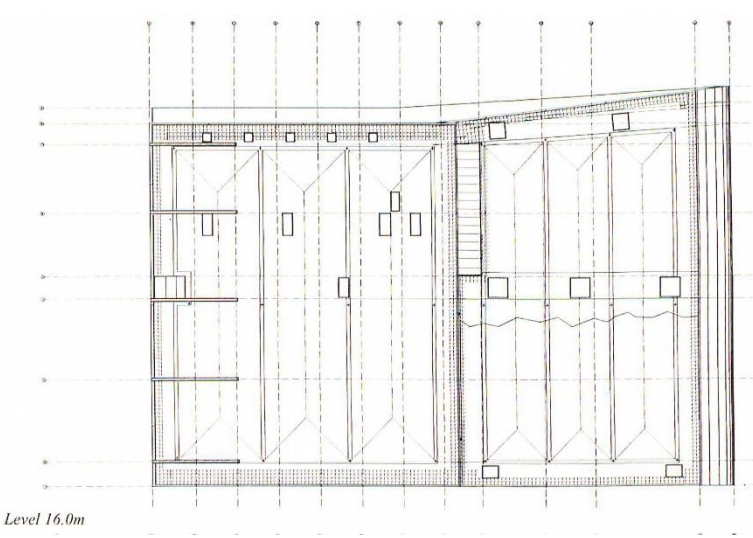
Level 4.0m



Level 8.0m

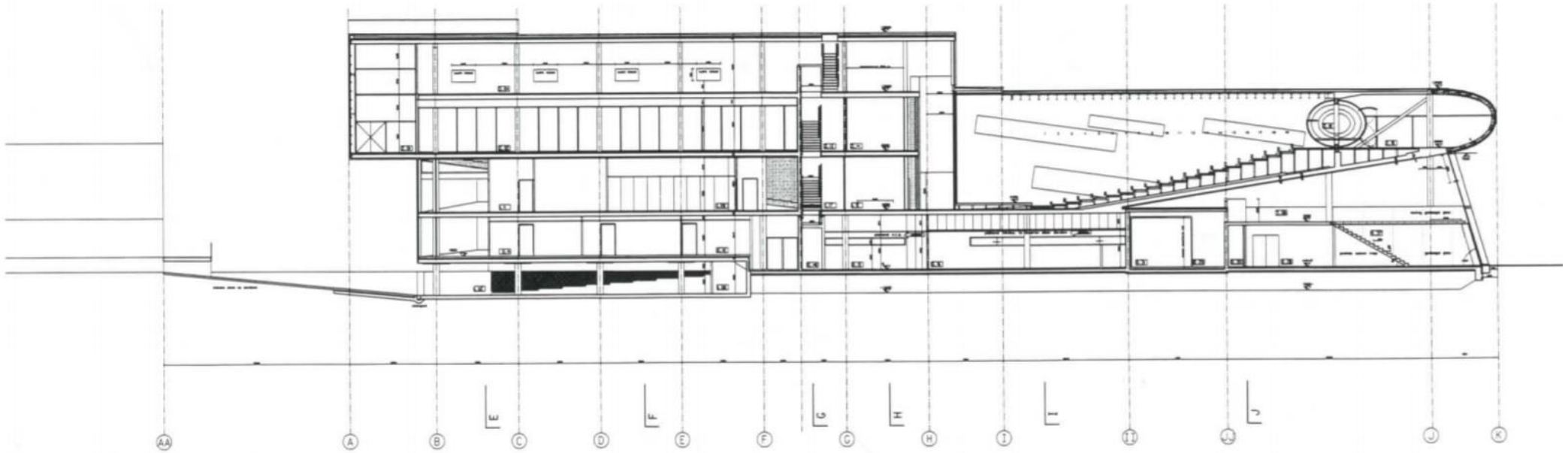


Level 12.0m

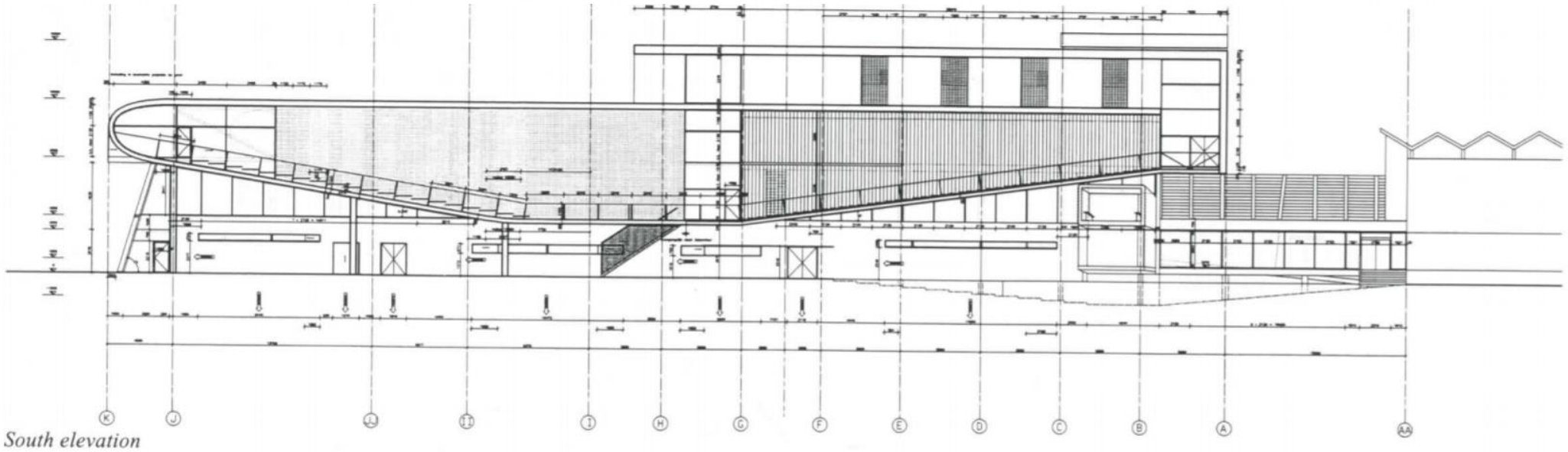


Level 16.0m

FLOOR PLANS



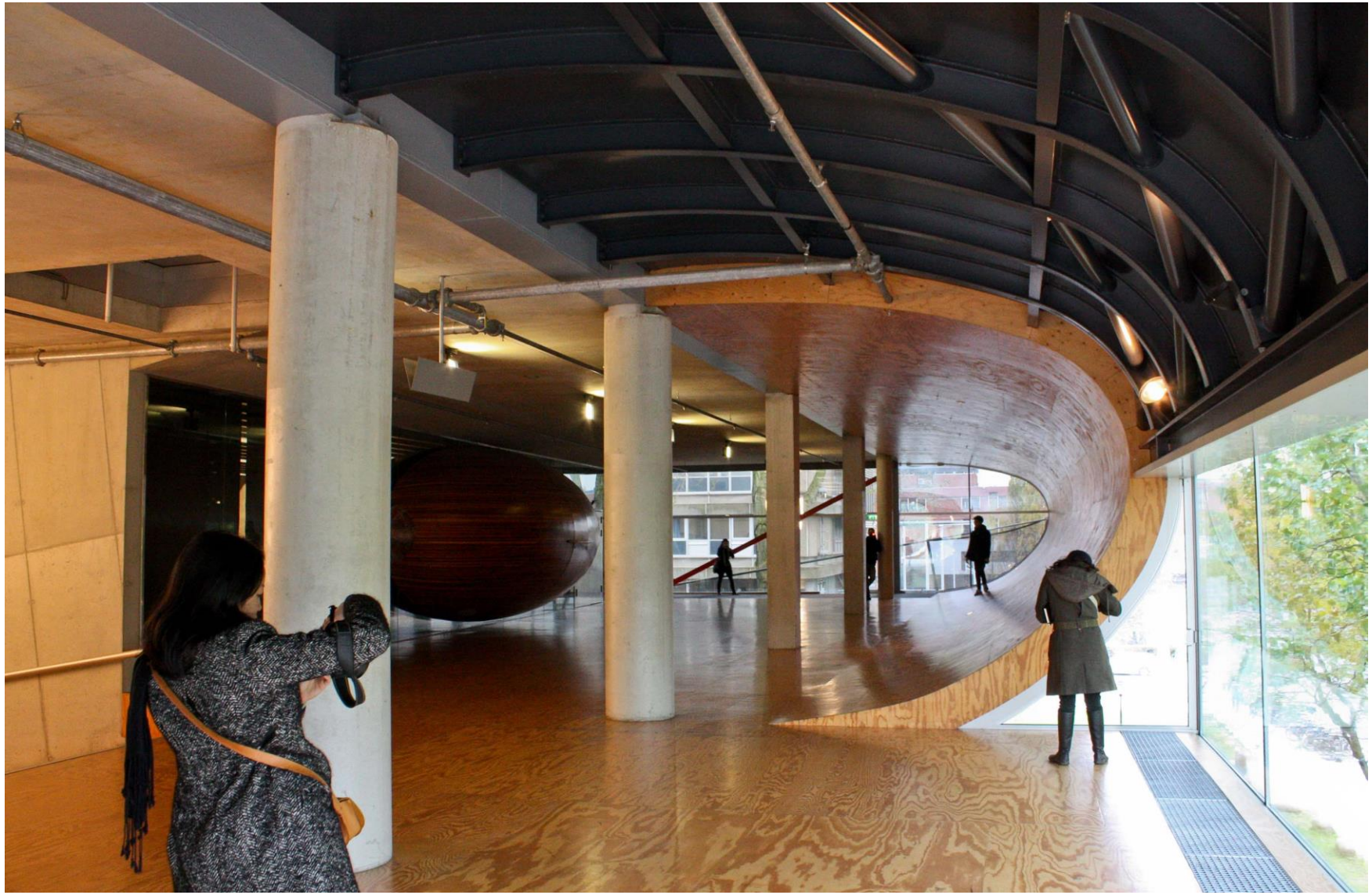
Section B-B



South elevation

GA Document 53

BUILDING SECTIONS



https://dinneratmidnight.wordpress.com/2010/11/15/travels-part-4-the-netherlands/

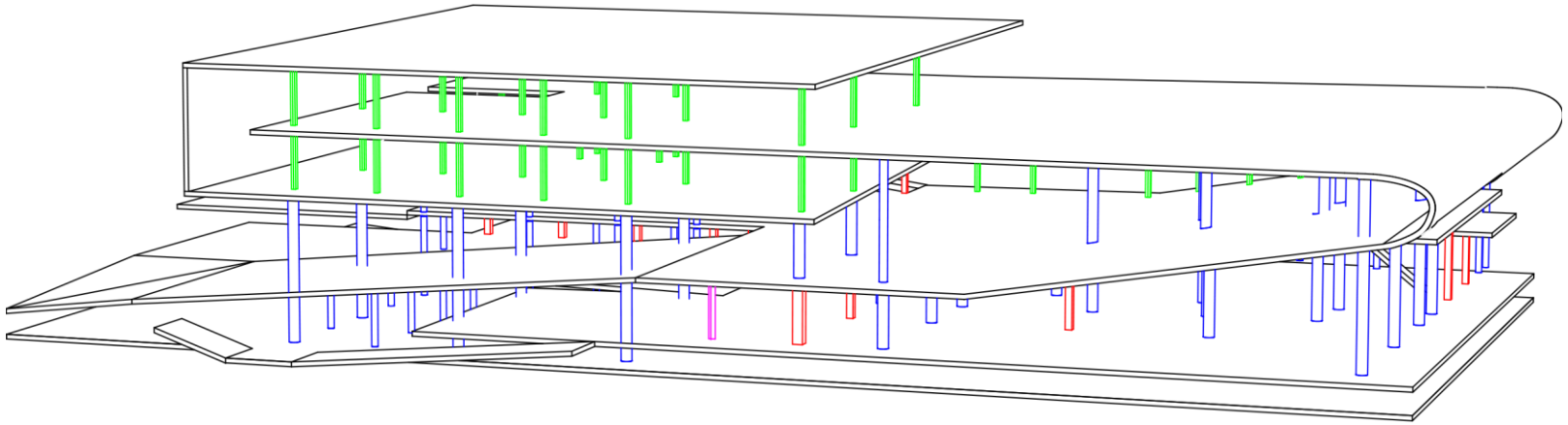
Variety of materials including, structural steel, wood, and concrete

MATERIALS

http://larryspeck.com/2010/05/17/educatorium-at-the-university-of-uithof/

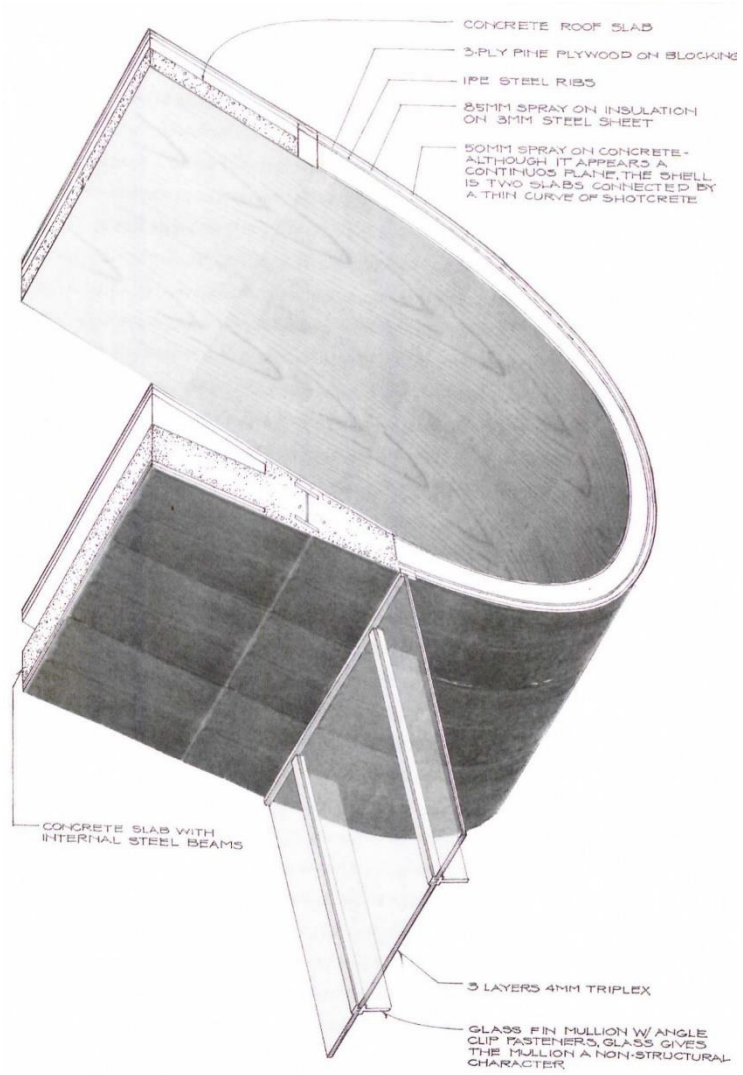
http://larryspeck.com/2010/05/17/educatorium-at-the-university-of-uithof/

http://larryspeck.com/2010/05/17/educatorium-at-the-university-of-uithof/



STRUCTURAL HIGHLIGHTS

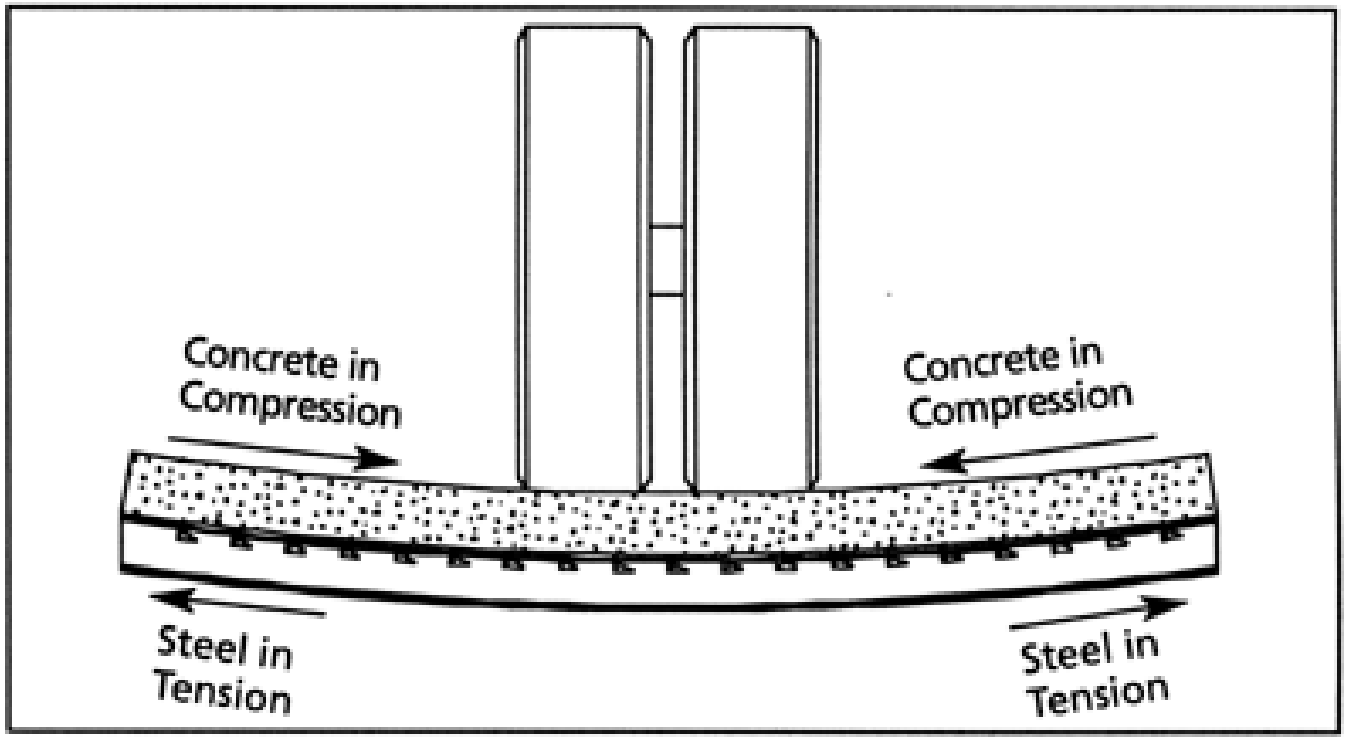
http://oma.eu/projects/educatorium



The “fold” in the concrete is actually constructed out of structural steel members covered in a concrete skin to continue the thin line of concrete

CONCRETE FOLD

https://www.flickr.com/photos/tags/educatorium/



http://www.exodermic.com/Design/HowItWorks.aspx

The larger auditorium has exposed rebar in the ceiling where the concrete in the slab is not necessary. In other words the area below the neutral axis is only reacting in tension therefore the concrete is not very useful, so concrete is removed below the axis revealing the rebar.

AUDITORIUM STRUCTURE

http://flickrhivemind.net/Tags/educatorium,university/Interesting

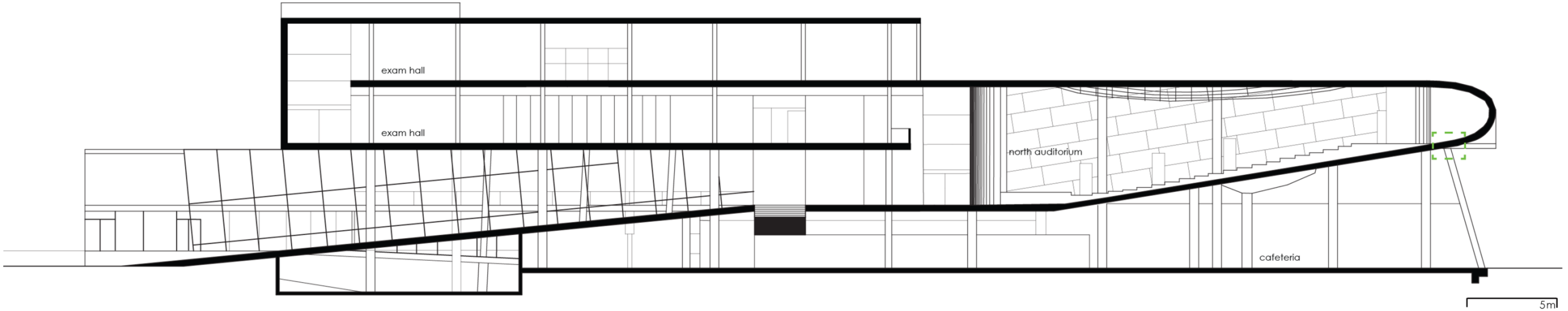
"The roof of the smaller of the two auditorium to the south of the building, spans between two large walls and is composed of many I-beams closely positioned. This creates a surface of steel."

AUDITORIUM STRUCTURE

https://www.pinterest.com/pablo8095/educatorium-oma/

The cafeteria sits underneath the slope of the auditorium and there is a seemingly random arrangement of columns. The columns are sized larger to the south and smaller to the north. These columns create smaller intermediate spaces within the room.

CAFETERIA STRUCTURE

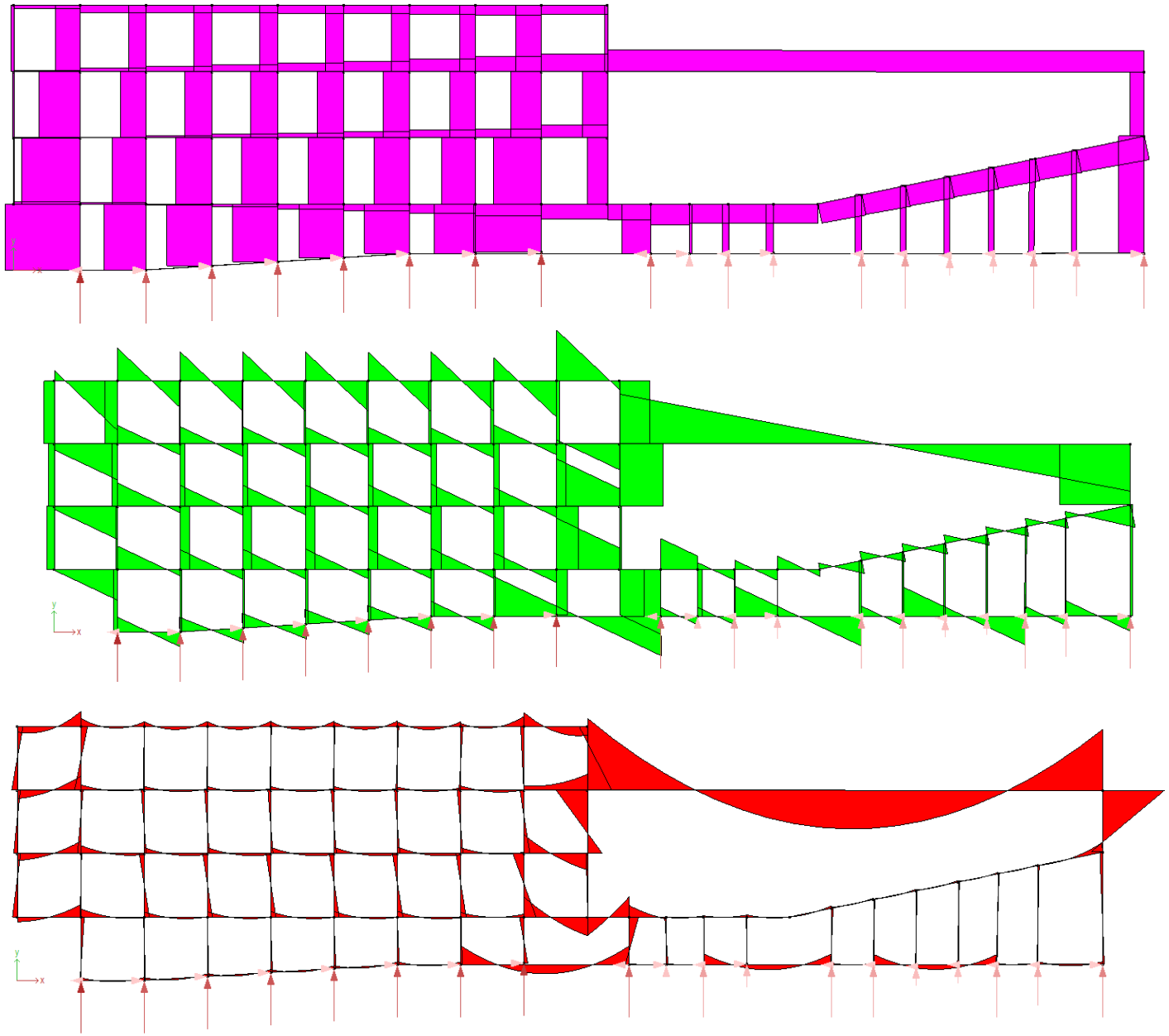


REDRAWN LONGITUDINAL SECTION

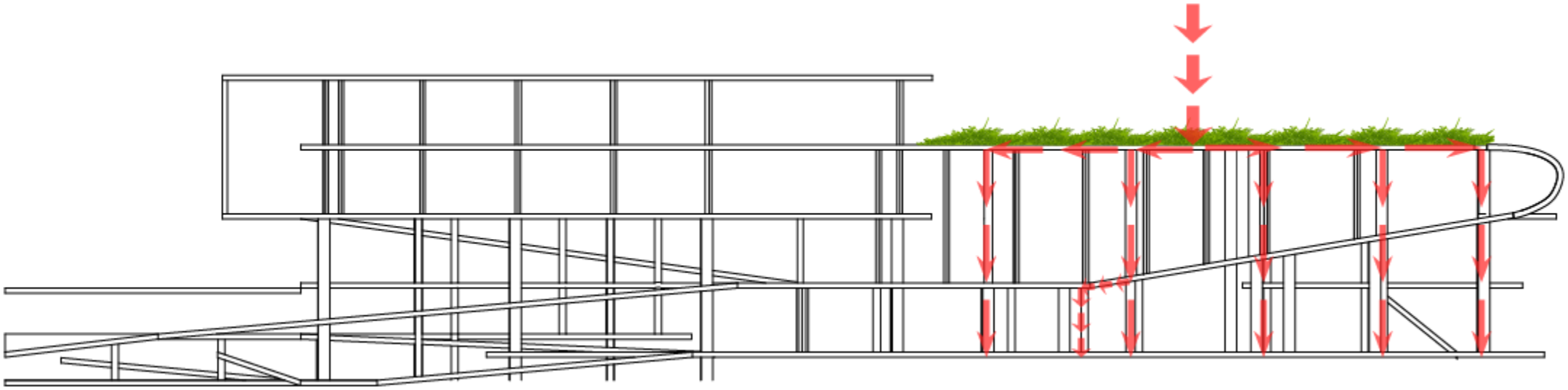
http://laith-nuqul.com/educatorium.html

The exam areas are cantilevered away from the building and held in place with large beams extending from the roof.

EXAM ROOM STRUCTURE



MULTIFRAME ANALYSIS



LOAD TRACING

Goals: Reduce energy consumption and emission of carbon dioxide, provide good indoor thermal and visual conditions

Design Execution: Glass insulators create greenhouse effect, passive ventilation using night cooling and heat capacity of the mass, roof gardens hold rainwater to reduce waste water loads

SUSTAINABILITY

WEBSITES:

https://www.windfinder.com/windstatistics/utrecht

https://scits.stanford.edu/sites/default/files/tle340606722e1.pdf

http://ac.els-cdn.com/S0013795206001803/1-s2.0-S0013795206001803-main.pdf?_tid=4d0a28da-b5da-11e6-baf8-00000aacb35f&acdnat=1480386168_8e1ef43a5b441f8b1f5fd5255682158e

http://www.fao.org/fileadmin/templates/soilbiodiversity/Downloadable_files/Buslink___Postma.pdf

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https://en.wikiarquitectura.com/index.php/Educatorium

http://www.archdaily.com/119580/ad-classics-educatorium-oma

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Koolhaas, Rem, and Alessandro Rocca. *Educatorium a Utrecht: Rem Koolhaas*. Firenze: Alinea, 1999. Print.

Futagawa, Yukio. *GA Document 53*. Tokyo, Japan: A.D.A. EDITA, 1997. Print.

Ford, Edward R. *The Architectural Detail*. New York: Princeton Architectural, 2011. Print..

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SOURCES

http://www.architravel.com/architravel_wp/wp-content/uploads/2015/11/Educatorium_main.jpg