UNStudio
NMR FACILITY
UNIVERSITY UTRECHT, NETHERLANDS

1996-2000

Ben van Berkel with Harm Wassink, Walther Kloet and Marion Regitko, Jacco van Wengerden, Ludo Grooteman, Remco Bruggink, Laura Negrini, Paul Vriend, Mark Westerhuis, Jeroen Kreijnen, Henri Snel, Marc Prins, Aad Krom

Client: *University Utrecht*
Location: *Padualaan 8, De Uithof, Utrecht, Netherlands*
Building area: *2.050 m2*
Program: *laboratory with offices*
Constuctor: *ABT, Velp*
Contractor: *Nelissen van Egteren, Utrecht and Hoofddorp*
Surface: *10.000 m2*

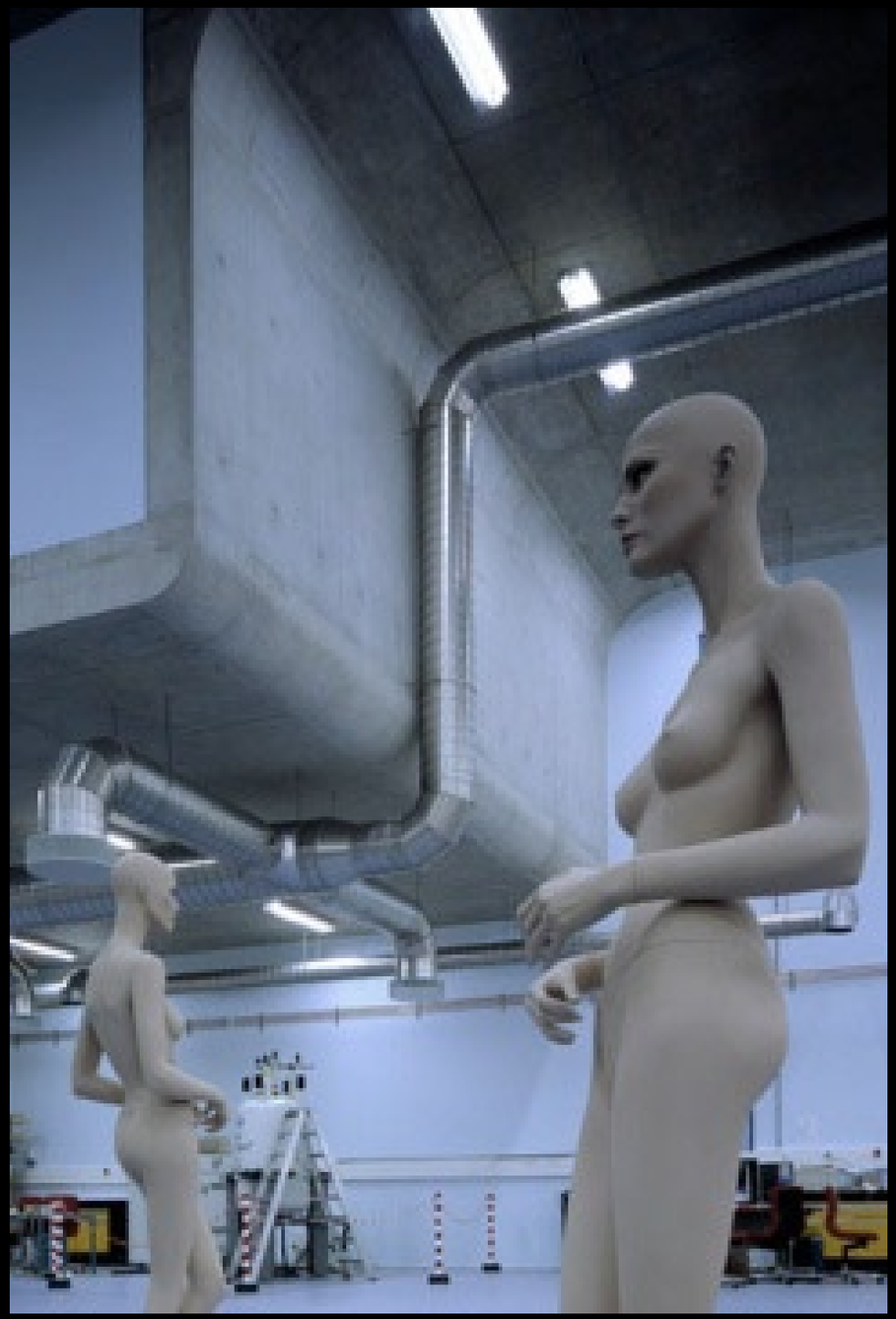
Antonis Antoniou

CONTEXT

1 - NMR Research Centre, UN Studio
2 - Dining halls, OMA
3 - "Minnaertgebouw, Neutelings Riedijk
4 - University of Economics & Management, Mecanoo
5 - Library, Wiel Arets

Located on the outskirts of Utrecht, the Uithof Campus was first developed in the '60s. In 1986, Rem Koolhaas's new master plan formed the basis for a number of new buildings.

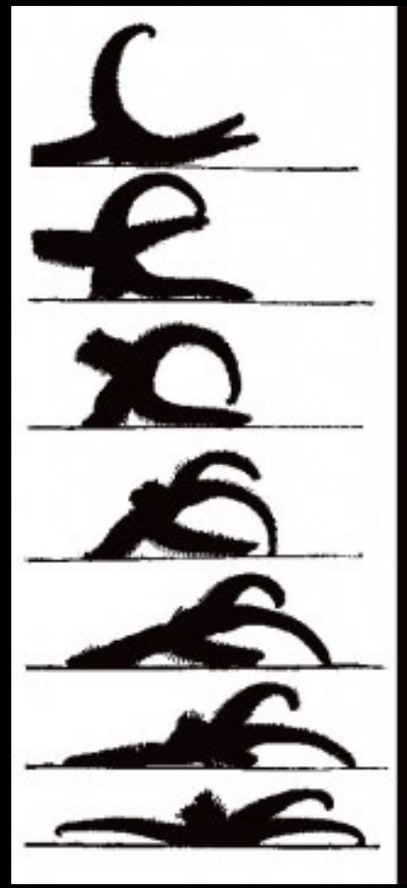
The ***Nuclear Magnetic Resonance Research Center*** by Ben van Berkel's Amsterdam-based UN Studio, is part of this complex. In this facility, the molecular structures of DNA can be investigated with the use of electromagnets. The findings of this research can also be used in the battle against the HIV virus. (1)



“The two-floor ***column-free*** laboratory houses eight spectrometers (high-frequency magnets). This influenced decisively the spatial layout of the building, because ***the radiate force fields these magnets produce may not be disturbed.*** The building consists of a ***single concrete surface***, which continues from floor plane into the wall and ceiling. The flipping-over surfaces are constructive and are thus not traversed by a secondary support structure of columns. Windows with integrated sun shading, a silk-screened dot pattern, are placed in office- and laboratory spaces, allowing daylight to enter. (2) ”

CONCEPT

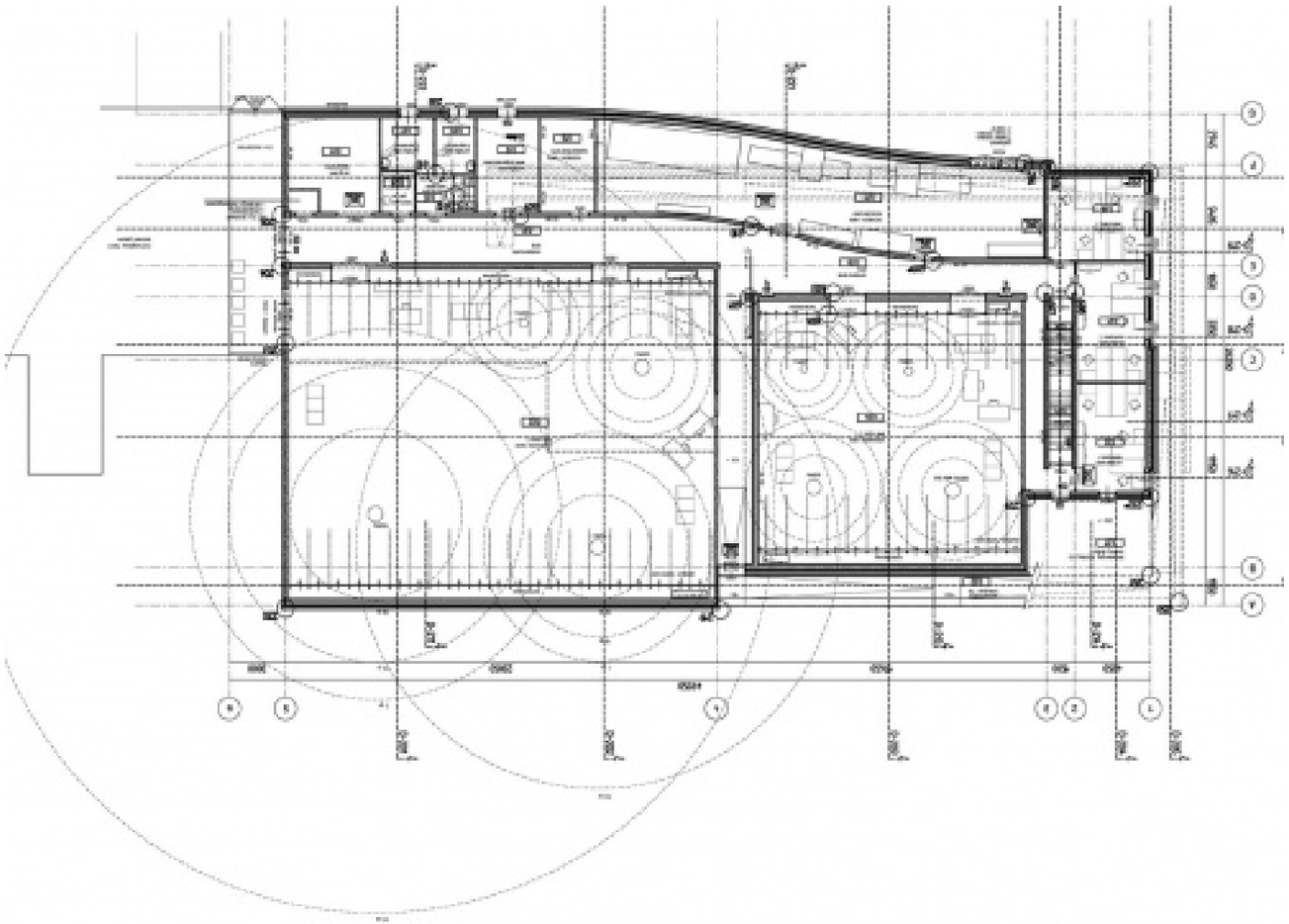
> “So the magnet itself was the starting point for a building based on ***two offset stacked volumes***, one for the technical equipment, the other for services. The rounded edges - a hallmark feature of UN Studio’s designs - are intended to suggest the molecule. The double metal skin is a wrap-around envelope that forms the structural facade, floor and roof. There are no pillars so the interiors are totally open and flexible. (3)”

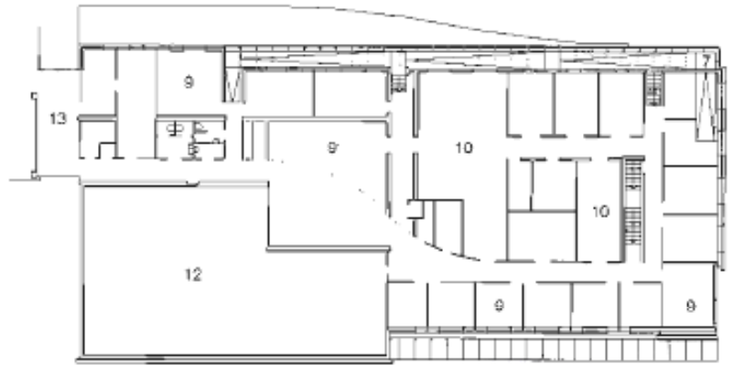


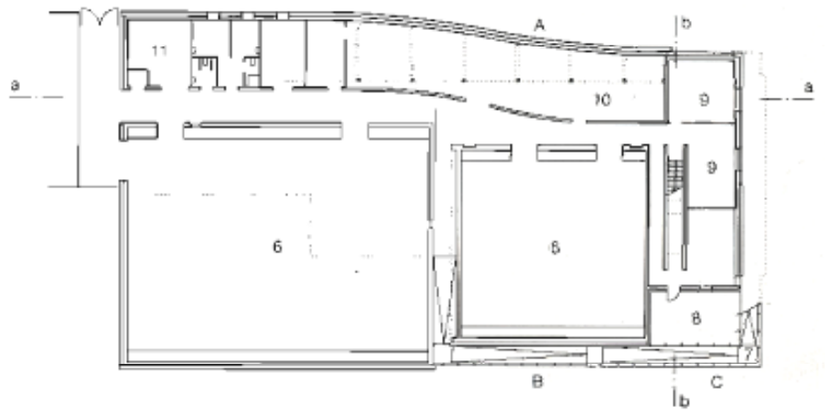
schematic iterations

digital model

PLANS



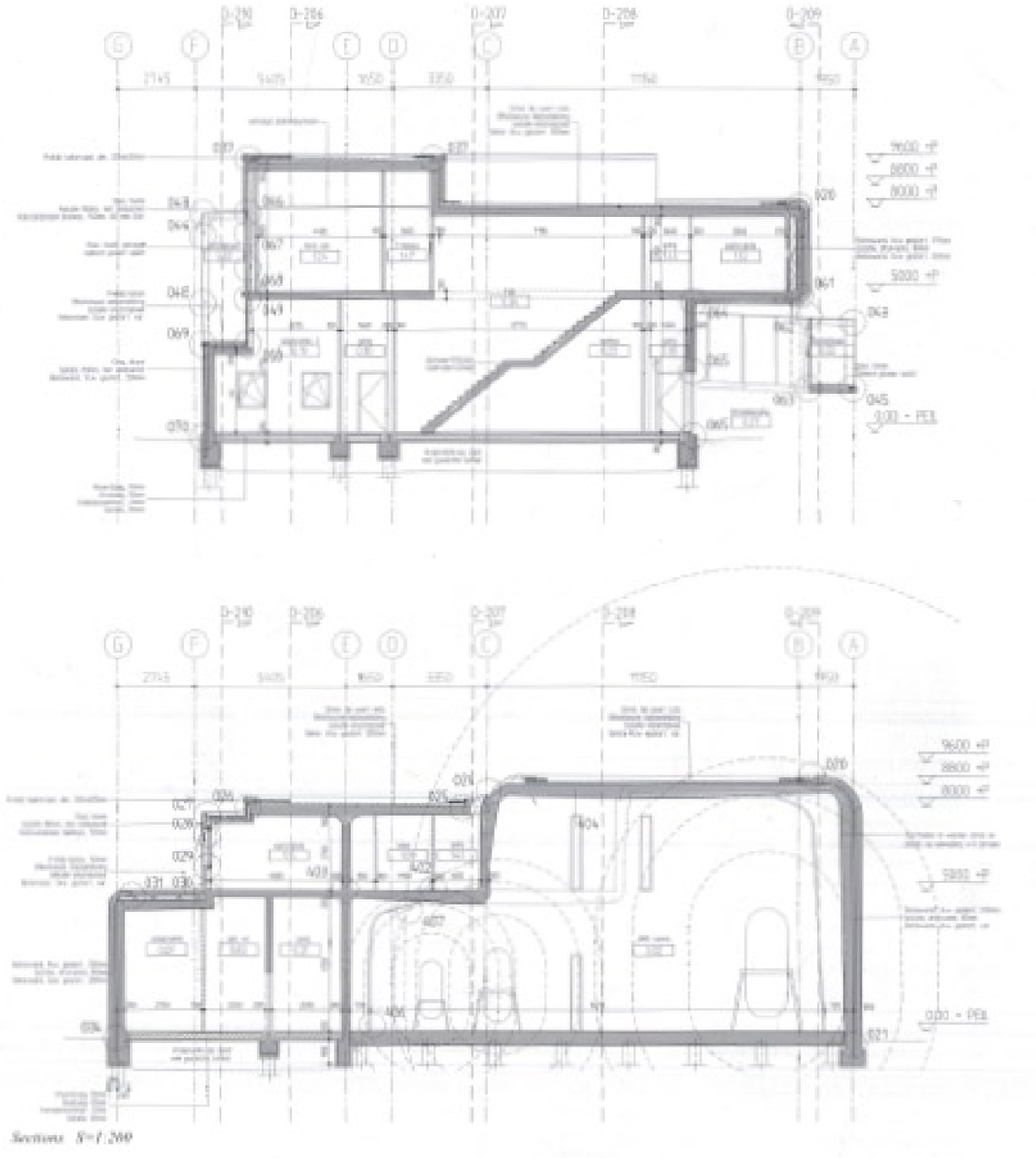




6 - Laboratory with electromagnet
7 - Ramp
8 - Outdoor area
9 - Office
10 - Operation room/Laboatory
11 - Staff room
12 - Void
13 - Link to existing building

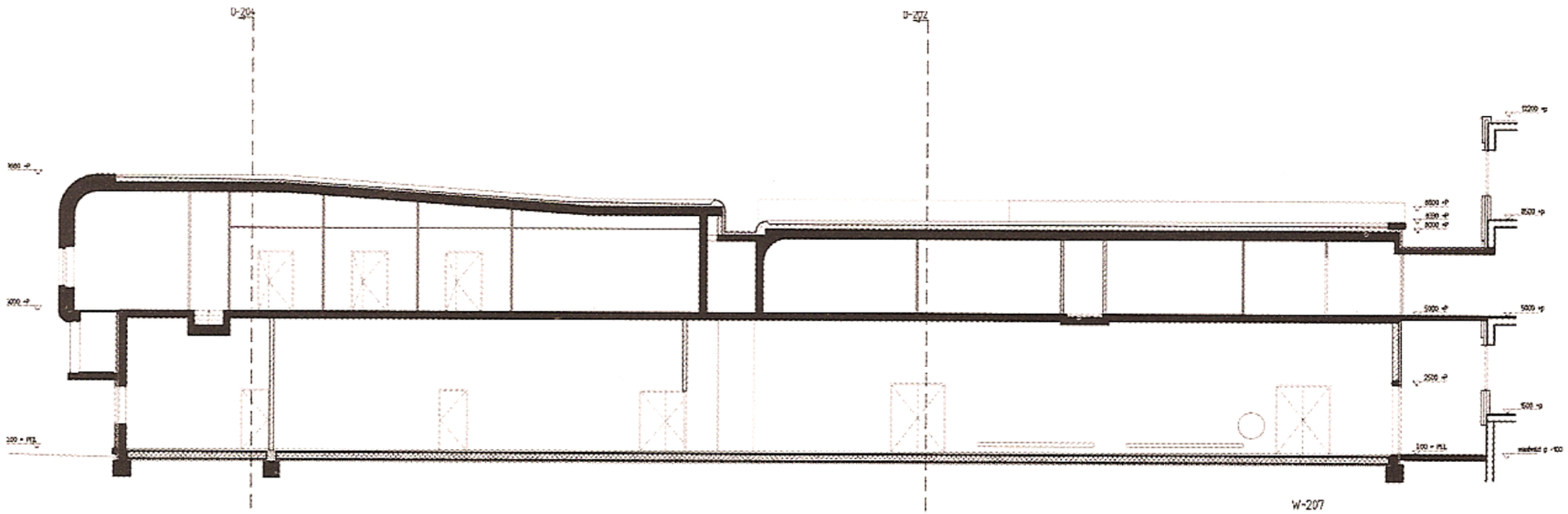
SECTIONS

“The organization of the building is in its surfaces. Inside, experiments are conducted with sensitive research equipment emitting Gauss radiation. ***The clouds of radiation are essentially untouchable space, around which the planes of floor, ceiling and wall surfaces are wrapped.*** These thin wrappers contain the construction, installations and routing system of the laboratory. Together they form a loosely knotted assembly of smooth planes that flip over from floor to wall to ceiling. (4) ”



SECTIONS

The concrete floor of the main laboratory room is separated from the construction to ensure a resonance-free environment.



MAGNETS & STRUCTURING PRINCIPLES

"The magnets all have specific behavior and requirements, creating magnetic fields of differing sizes and sensitivity. These affect the performance of other equipment present within a variable radius of the magnets. The sensitivity to movement, types of structure, installation and climate of the magnetic fields depends upon the differing frequencies of the magnets. Basically ***these force fields should not be disturbed***. As a result, the radiating powers of the magnets constitute the virtual core of the project, and modify the organization of the building. They provide permutations for the structure and surface of the building, the materials that can be used, the disposition of the program and the equipment, and the possible routing systems. A second important structuring principle is the column-free spatial organization, which enables efficient use of the small centre. The combination of these two central principles results in a multi-directional surface condition in which the walls flip over and meet each other to generate a situation in which all ends meet. (5)"

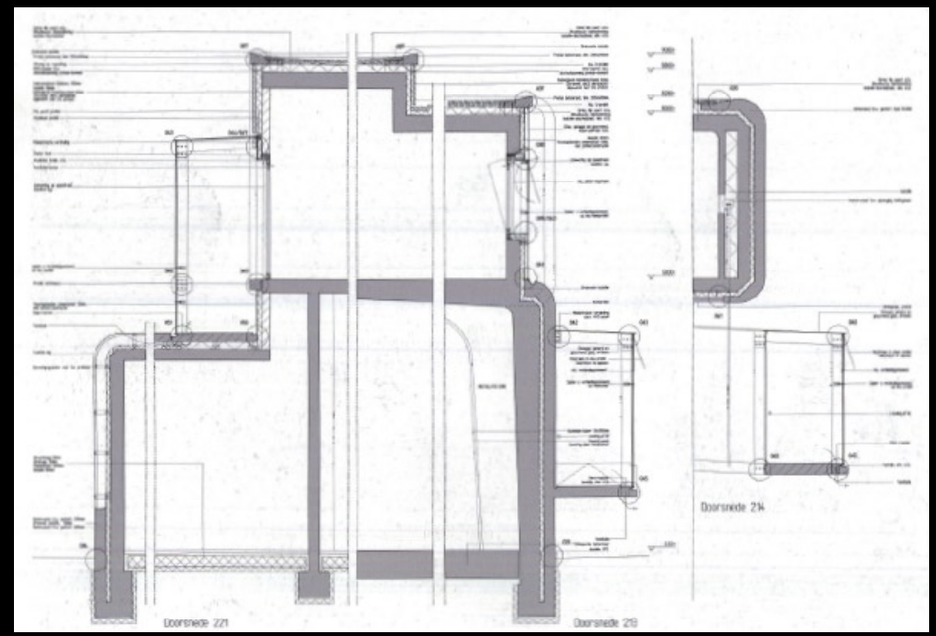
Laboratory

STRUCTURE & DETAILS

The eight electromagnets have a field strength of up to 500,000 times that of the gravitational force of the earth. ***Reinforced concrete casing*** is used as a continuous surface wrapped around the two windowless laboratories to block anything that could affect the magnetic field. As the exposed concrete structure weaves through, it creates other ancillary spaces to accommodate program, travelling from floor to wall, wall to roof, roof to facade and back again.

"The ramp drawn round the building is similar in nature, forming a spatially defining link between the different levels. There is ***no lift*** in the building, since this would have interfered with the sensitive magnetic fields of the centre's trial facilities.

Wherever possible, areas of glazing - covered with a screening grid of dots - were installed between the concrete elements. The end faces of the concrete strip reveal the thickness of the material and make its special features legible. (6)"



FOOTNOTES

(1) “Laboratory Building in Utrecht.” Detail, v.43, n.4, p.353, Apr. 2003
(2) “UNStudio” http://www.unstudio.com/projects/year/2000-1996/1/107
(3) “Laboratorio NMR.” ABITARE N.459, p.156, Mar. 2006
(4) “UN Studio: NMR facilities, Utrecht, the Netherlands.” GA DOCUMENT, n.67, p.28, Oct. 21
(5) GA DOCUMENT, p.28
(6) Detail, p.353

SOURCES/BIBLIOGRAPHY

ABITARE *"Laboratorio NMR." n.459, p.156, Mar. 2006*

DETAIL *"Laboratory Building in Utrecht." v.43, n.4, p.352-355, Apr. 2003*

GA DOCUMENT *"UN Studio: NMR facilities, Utrecht, the Netherlands." n.67, p.28-35, Oct. 21*

www.unstudio.com

www.nmr.chem.uu.nl