KIRUNA HOUSING

ACCESSIBILITY, FLEXIBILITY AND ADAPTABILITY IN APARTMENTS

Source: http://www.kiruna.se/PageFiles/9354/Aerial%20winter%20FINAL__.jpg?epslanguage=sv

DIFFERENT APPROACHES TO ACCESSIBLE HOUSING

- Set-Aside Approach (USA)

  5% of housing funded by government accessible and set aside for disabled people.
  Cons: all disability features (not adapted to specific needs).

- Adaptable housing (Sweden)

  Suggested by Fokus Society in 1970s, housing that could be easily converted to full access housing.

- Visitability

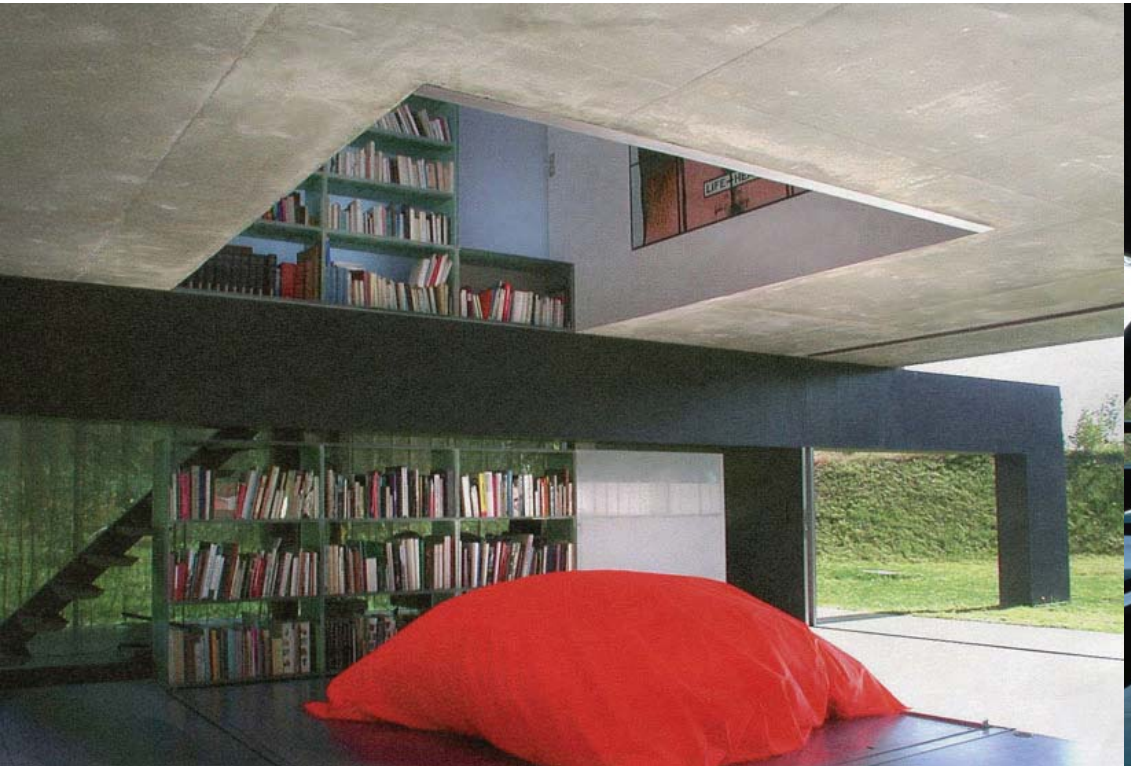
  We always have to consider visitability of all housing by other people than residents.

- Life Span Design (GB)

  Design principle that counts with adapting of housing to residents needs throughout his/her whole life.

POSSIBILE SOLUTIONS - CASE STUDIES

HOUSE IN BORDEAUX - REM KOOLHAAS



Source: http://www.designboom.com/cms/images/erica/--part4/bordeaux01.jpg

Source: http://themodernhouseblog.files.wordpress.com/2013/03/bh.jpg

\+ hydraulic lifting platform - unique feature, creates interesting spaces and transitions
\+ it doesn't look like it was designed specifically for person with physical impairment
\- expensive, custom made
\- takes up a lot of space

POSSIBLE SOLUTIONS - CASE STUDIES

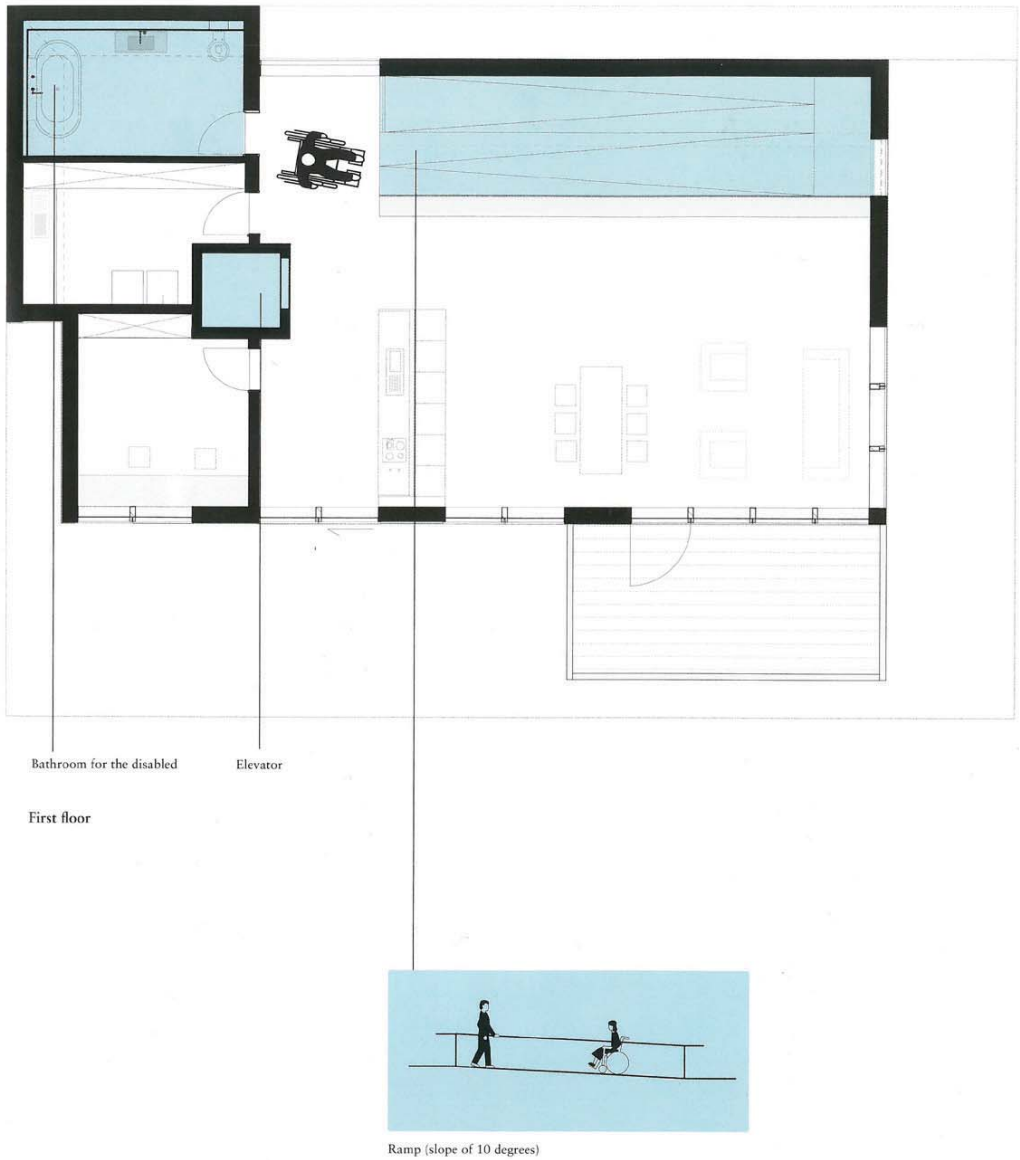
HOUSE AT CHIEMSEE - WESENFELD HÖFER ARCHITEKTEN

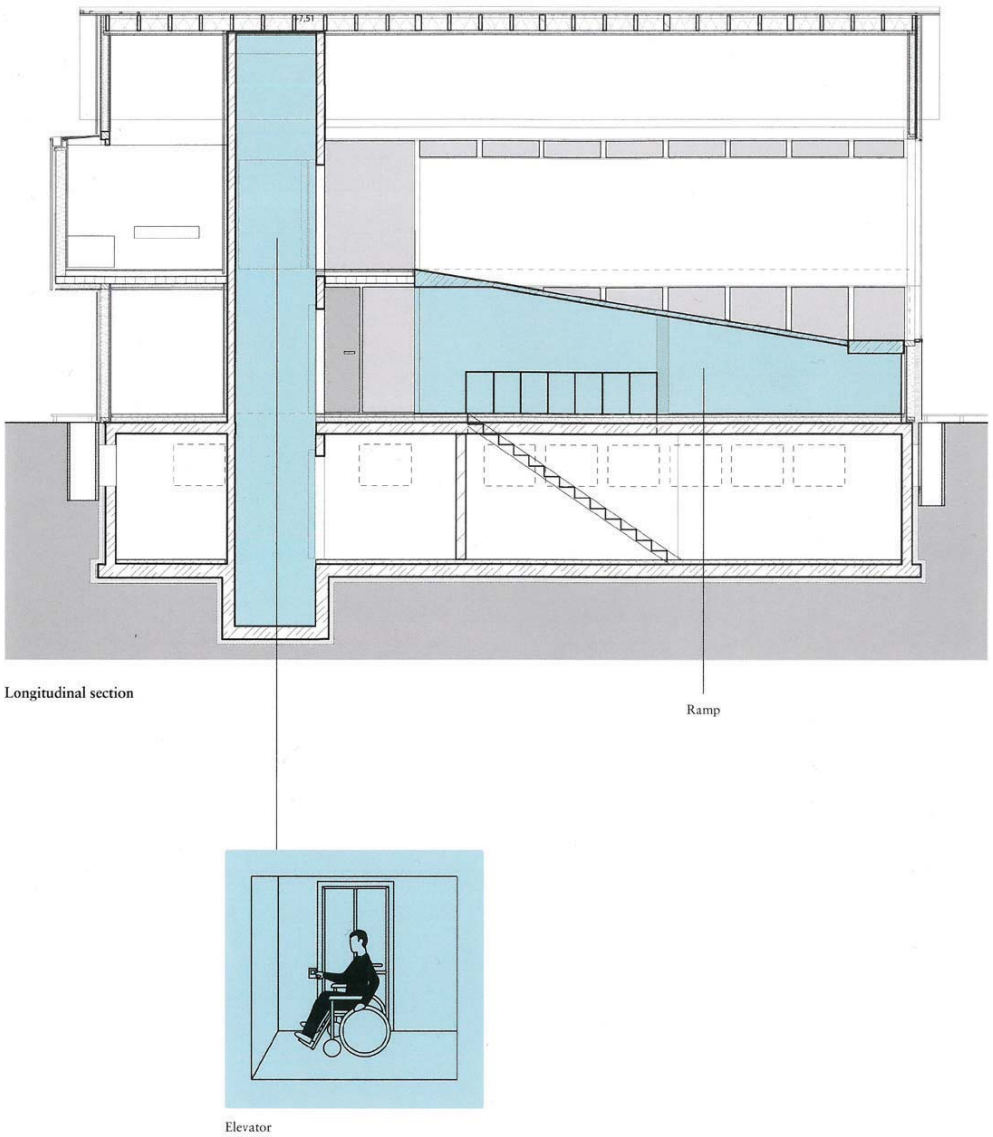
Source: Meuser, P.: Construction and Design Manual: Accessible Architecture, Berlin: DOM publishers, 2012

\+ the whole house was designed with physical impairment in mind
\+ all rooms are accessible on the wheelchair - ramp and elevator
\- ramp can be too steep for some people/visitors - designed according to the owner's needs
\- ramp takes a lot of space

POSSIBLE SOLUTIONS - CASE STUDIES

HOUSE AT CHIEMSEE - WESENFELD HÖFER ARCHITEKTEN

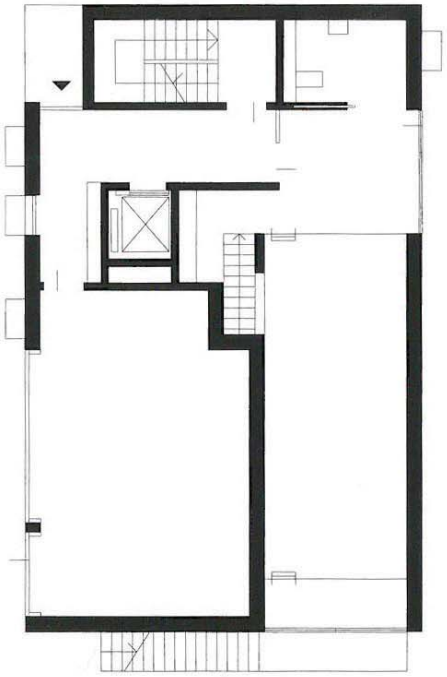




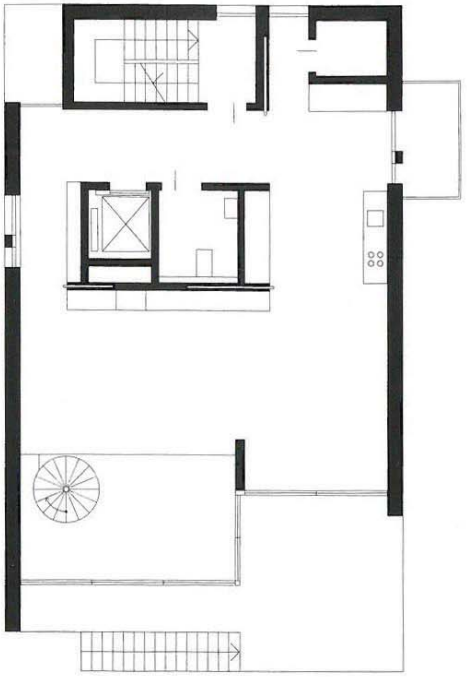
Source: Meuser, P.: Construction and Design Manual: Accessible Architecture, Berlin: DOM publishers, 2012

POSSIBLE SOLUTIONS - CASE STUDIES

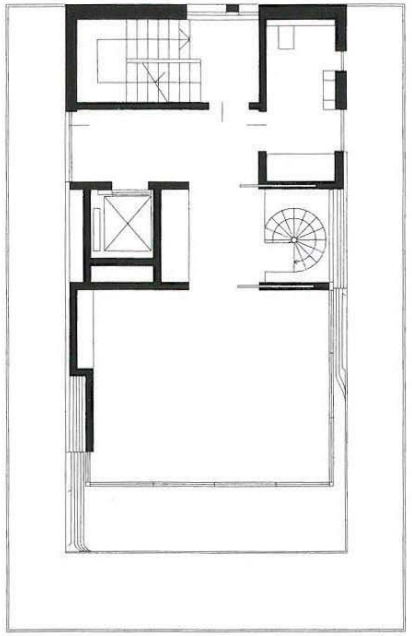
RESIDENCE AT THE SPREE RIVER IN BERLIN - CLARKE UND KUHN FREIE ARCHITEKTEN BDA



Ground floor



First floor



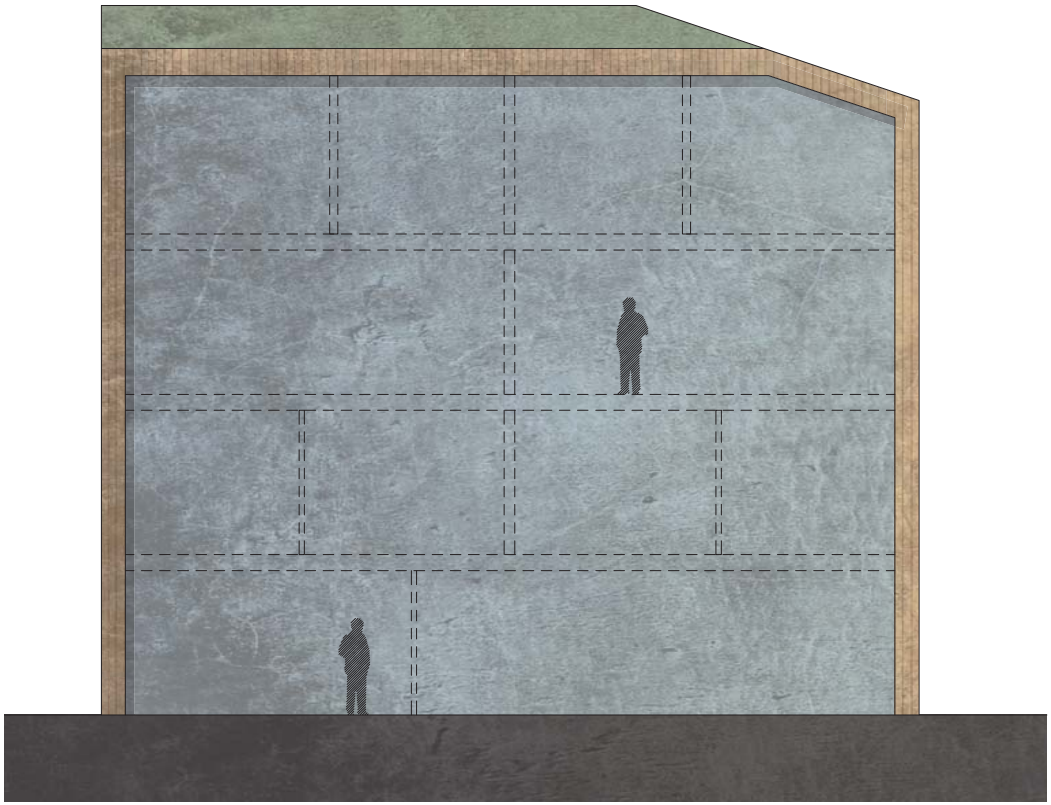
Stacked storey

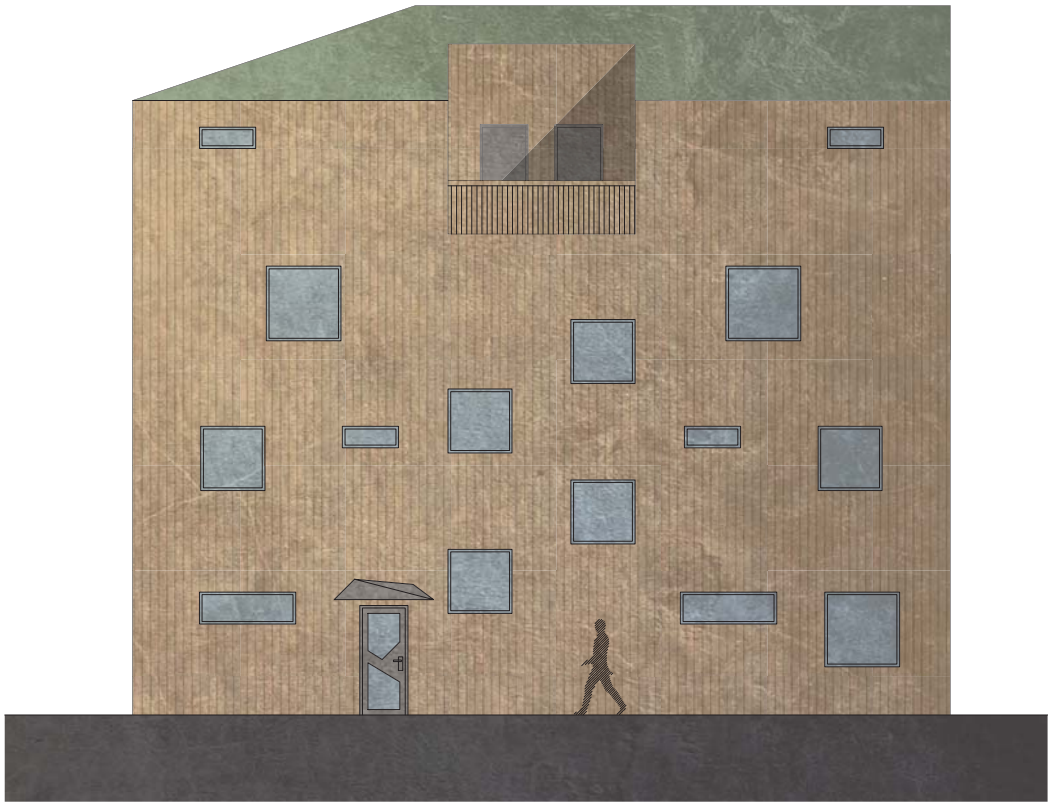
Source: Meuser, P.: Construction and Design Manual: Accessible Architecture, Berlin: DOM publishers, 2012

\+ it shows that accessible housing can be designed in vertical direction as well
\+ highly flexible and adaptable inside
\- need of using the elevator more often because of smaller storeys

MY PROJECT - SITE PLAN

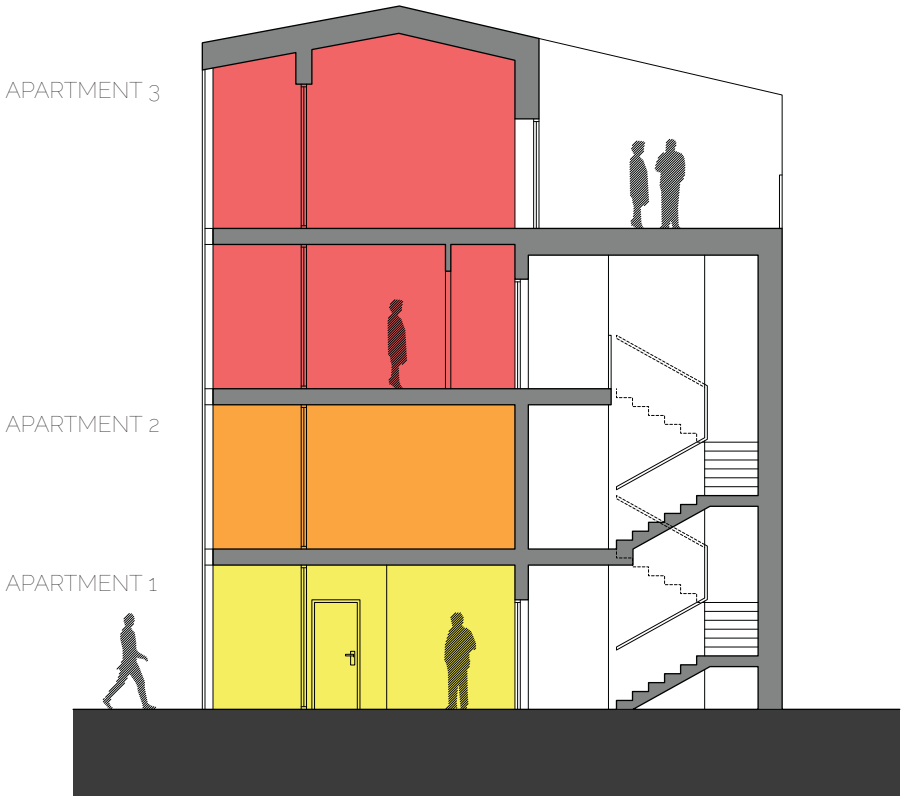
MY PROJECT - ELEVATION





Author: Michal Kotvan

MY PROJECT - SECTION

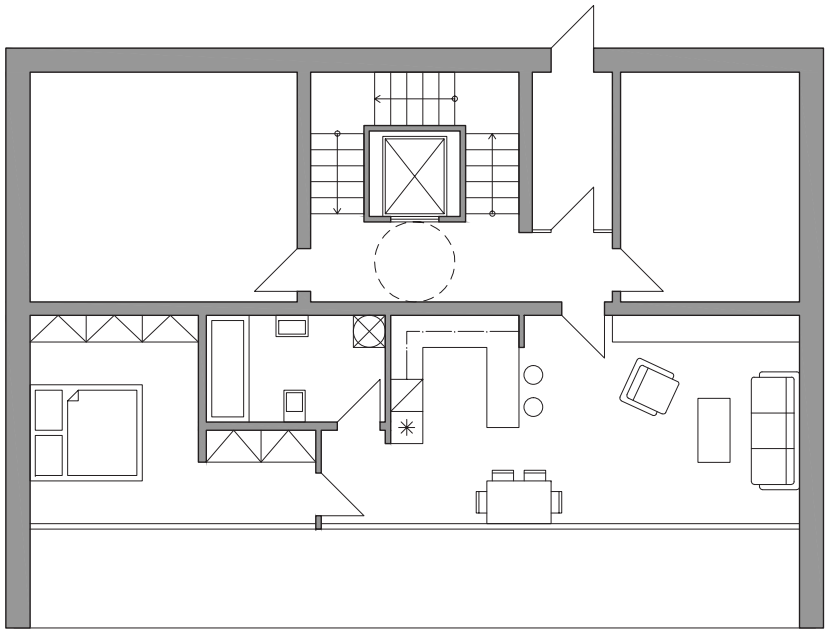


My project is located to Kiruna, a city that is situated in northern Sweden. My project contains several apartment buildings with 3-5 apartments and semi-detached houses. I have focused my analyses on the 4-storey high apartment buildings. All in all, these hold 3 different apartments: one apartment on the ground floor, two apartments on the first floor, and two maisonette apartments on the two upper floor levels. Out of sustainability concerns, the building is small and compact in order to prevent heat loss and save energy. The dominant construction material is in wood - cross laminated timber (CLT) panels. Known for exceptional strength, dimensional stability and rigidity.

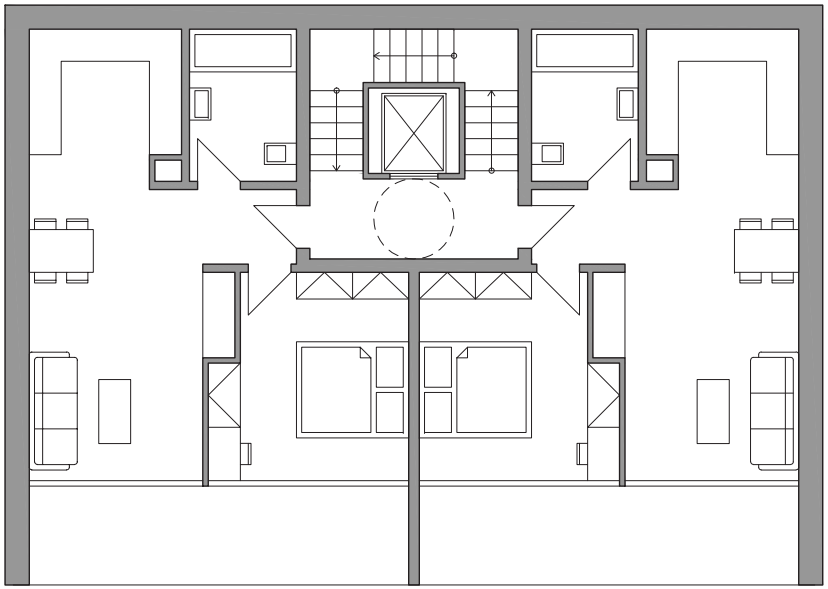
http://www.rethinkwood.com/masstimber/cross-laminated-timber-clt

Author: Michal Kotvan

MY PROJECT - BEFORE



GROUND FLOOR

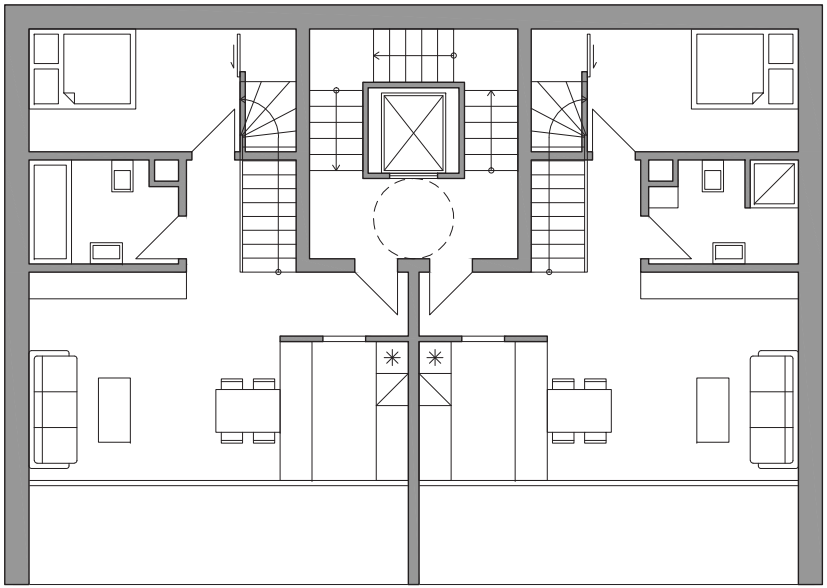


FIRST FLOOR

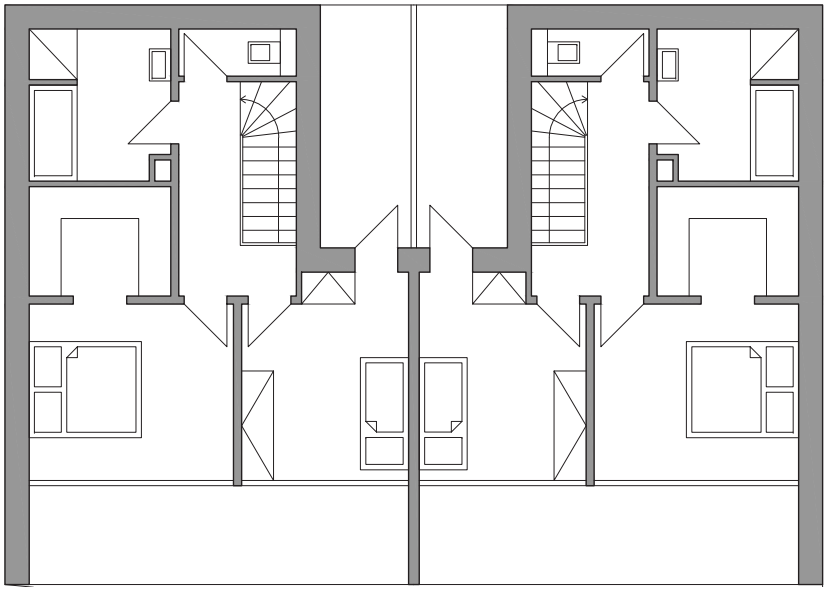
The original layout of two lower floors without any special focus on accessibility or flexibility in the apartments. All floors, except the top floor, are accessible by an elevator that is shared by the residents.

Author: Michal Kotvan

MY PROJECT - BEFORE



SECOND FLOOR

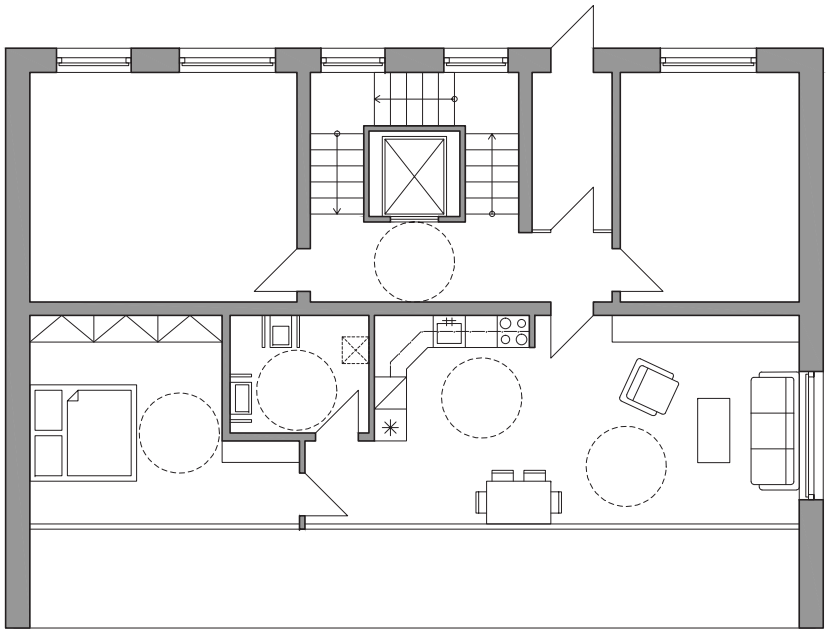


THIRD FLOOR

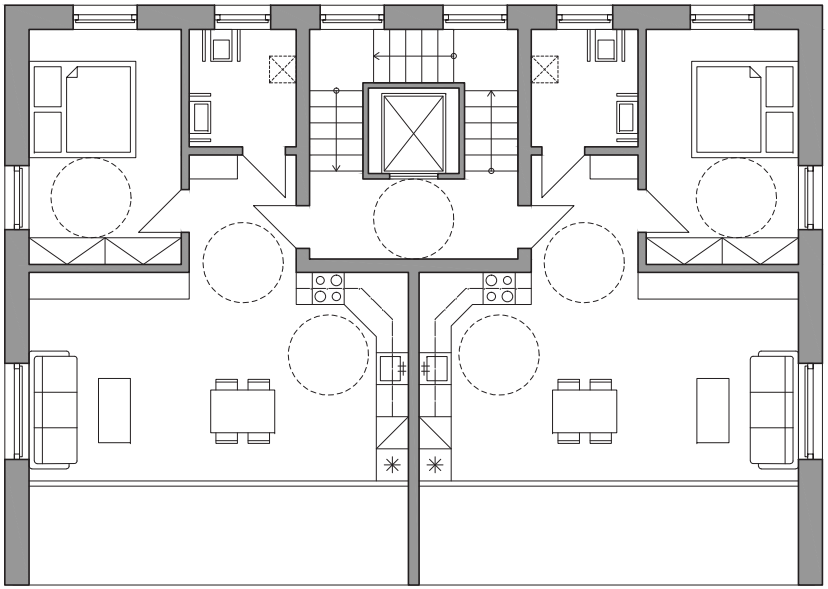
The original layout of two upper floors without any special focus on accessibility or flexibility in the apartments. All floors, except the top floor, are accessible by an elevator that is shared by the residents.

Author: Michal Kotvan

MY PROJECT - AFTER



GROUND FLOOR

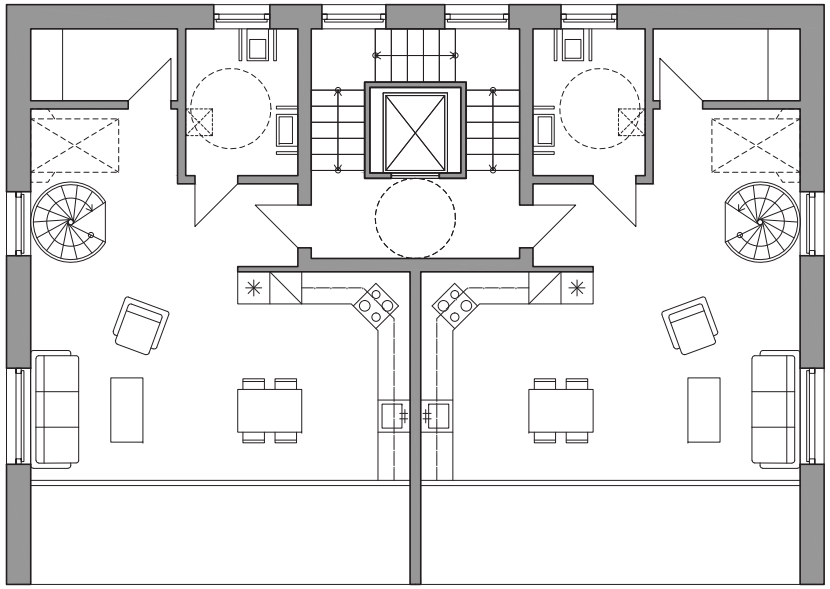


FIRST FLOOR

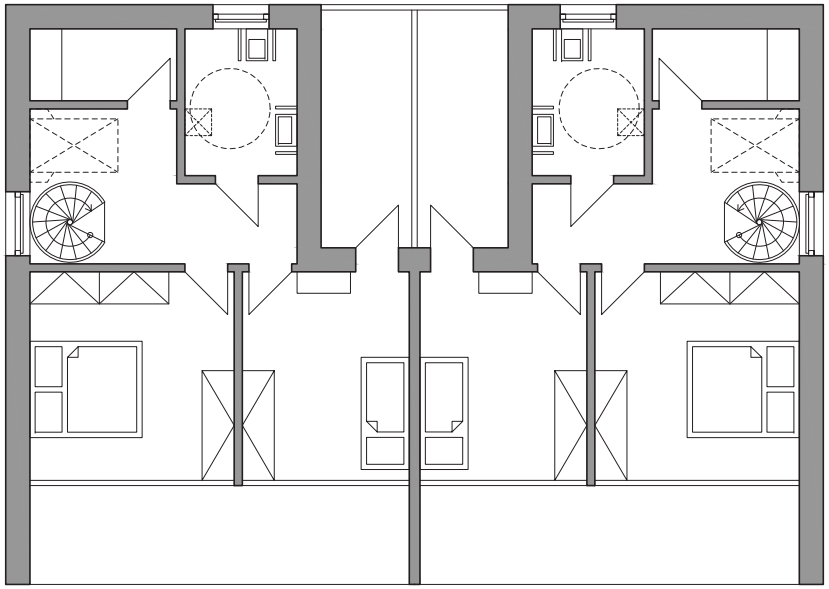
Motivated out of concerns for accessibility and flexibility, I made some minor changes in the configuration of the ground floor apartment: This concerned mainly the size of the bathroom, which was increased so that it became flexible and easily adjustable to the residents' various needs. On the first floor, the two apartments with a mirrored configuration underwent larger changes. The bedroom was moved compared to its original location, and I created a larger kitchen in an open connection with the living-room.

Author: Michal Kotvan

MY PROJECT - AFTER



SECOND FLOOR



THIRD FLOOR

The main changes due to concerns for accessibility and usability were made in the maisonette apartments on the second and third floor. These changes were entangled with the placement of the individual staircase in each apartment. I chose a round staircase in order to prepare space for the slow-speed elevator that could be installed depending on the residents' needs. On both floors, the apartments have barrier-free bathroom. On the lower floor of the maisonette apartments there is a large kitchen with an open connection.

Author: Michal Kotvan

TECHNICAL SOLUTIONS - ELEVATOR

Source: http://www.altech.cz/eshop/photos/full1/--13.jpg

+ suitable for renovation, adding barrier-free features to existing dwelling
+ adjustable
- impractical for new apartment
- requires strong staircase frame
- slow operation
- not aesthetically pleasing

TECHNICAL SOLUTIONS - ELEVATOR

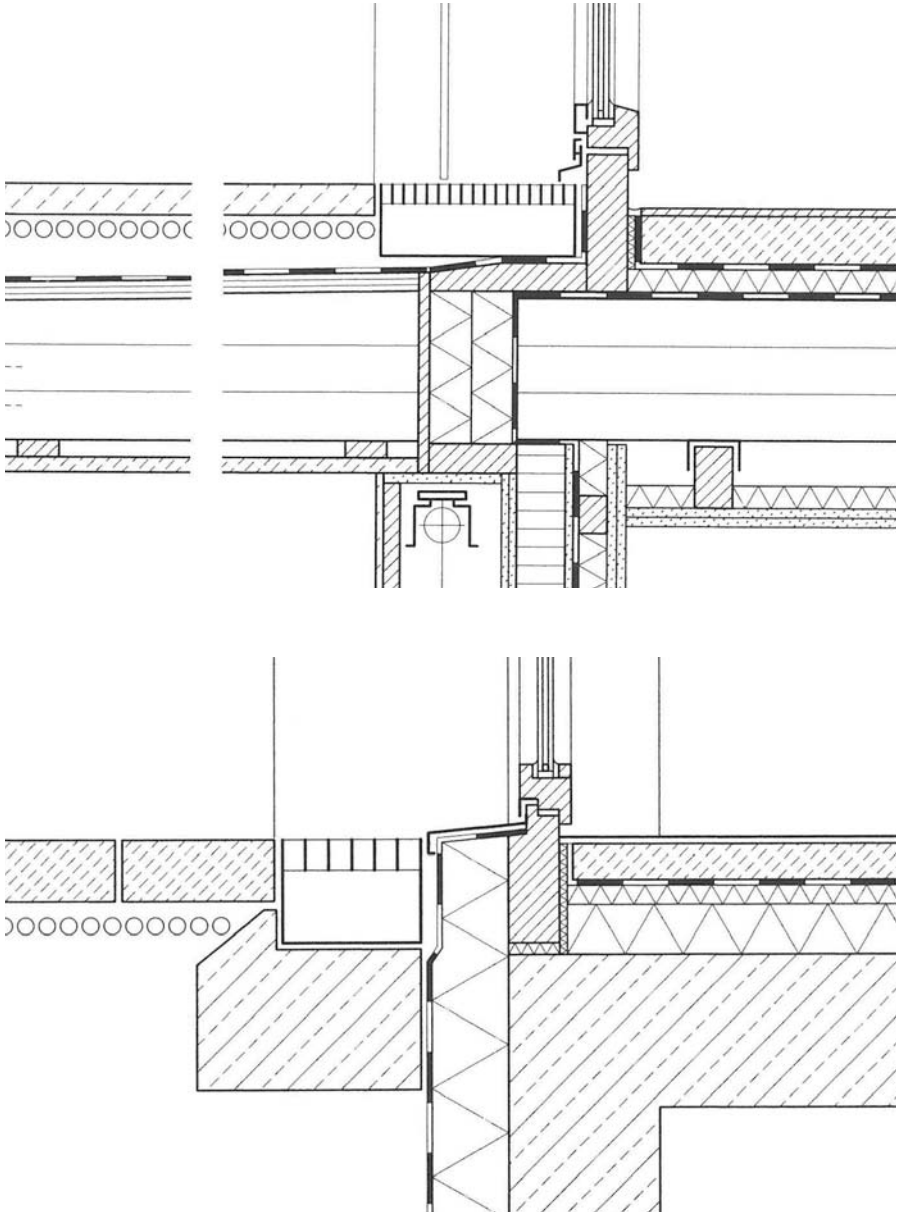
Guldmann™

Source: http://www.guldmann.se/Default.aspx?ID=4723&ProductID=PROD194

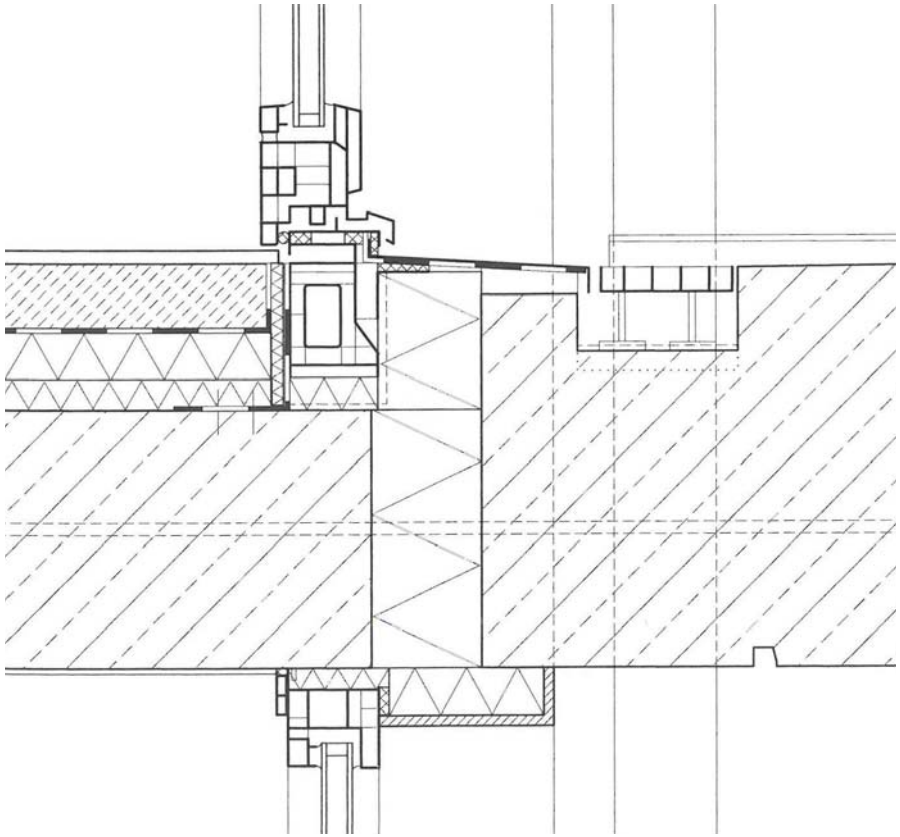
Slow-speed elevator - can span up to 3 meters height difference. Chosen solution for the maisonette apartments, making them accessible for everybody.

MICHAL KOTVAN, UNIVERSAL ARCHITECTURE IN THE DESIGNER'S EYE– ACCESSIBILITY, SOCIAL INCLUSION, SUSTAINABILITY, USABILITY AND UNIVERSAL DESIGN, 2014/2015

TECHNICAL SOLUTIONS - STEPLESS TRANSITION



Another approach is to create as few physical obstacles as possible. One way of doing that is is to use stepless or better level-free transitions between interior and exterior (kitchen - balcony, entrance hall - pavement in front of the building).



Source: Heiss, O., Degenhart, C.; Ebe, J.: DETAIL: Barrier-Free Design, Wemding: BIRKHÄUSER, 2010

THANK YOU FOR YOUR ATTENTION

Sources:

[1] *http://www.kiruna.se/PageFiles/9354/Aerial%20winter%20FINAL__.jpg?epslanguage=sv*
[2] *http://www.designboom.com/cms/images/erica/--part4/bordeaux01.jpg*
[3] *http://themodernhouseblog.files.wordpress.com/2013/03/bh.jpg*
[4] *Meuser, P.: Construction and Design Manual: Accessible Architecture, Berlin: DOM publishers, 2012*
[5] *http://www.altech.cz/eshop/photos/full1/--13.jpg*
[6] *http://www.guldmann.se/Default.aspx?ID=4723&ProductID=PROD194*
[7] *Heiss, O., Degenhart, C.; Ebe, J.: DETAIL: Barrier-Free Design, Wemding: BIRKHÄUSER, 2010*
[8] *Steinfeld, E., Maisel J. L.: Universal Design - Creating Inclusive Environments. Hoboken, New Jersey: Wiley, 2012*