



# indoor pools



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Baden



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  - 2. penthouse pool under construction**

An aerial photograph of a person floating on a bright pink inflatable ring in clear, turquoise water. The person is lying on their back with arms outstretched. The water shows some ripples and a sandy bottom visible in the lower half of the frame.

# 1 indoor pools: pros & cons



# Pros

- + no wind displacement of organic input
- + limitation of daylight/ no UV-light
- + evenly conditions in terms of water and air temperature
- + no fertilizer input through surface water or rain
- + clients are target group „Premium“/ gains *should* be premium, too
- + there are a lot of renovation projects in the market

All these facts should produce a better result in terms of **water quality** and amount of **maintenance effort** – let's see the results later.



# Cons

- very costly construction
- difficult and very detailed planning necessary
- a lot of communication effort with other trades (structural engineering, heating and dehumidification, tiling, sealing level of the building, ...)
- high flexibility necessary because of many preliminary works – schedules often unreliable



## 2 market estimate/ average project size



# market estimate/ average project size

- ▣ there are plenty of projects in the premium segment (new /renovation projects)
- ▣ planning and engeneering has to be most professional
- ▣ contact persons are architects and housing firms
- ▣ average project revenue for new/ renovated indoorpools (pool technique only)

**70 – 120 k €**



# 3 successful project



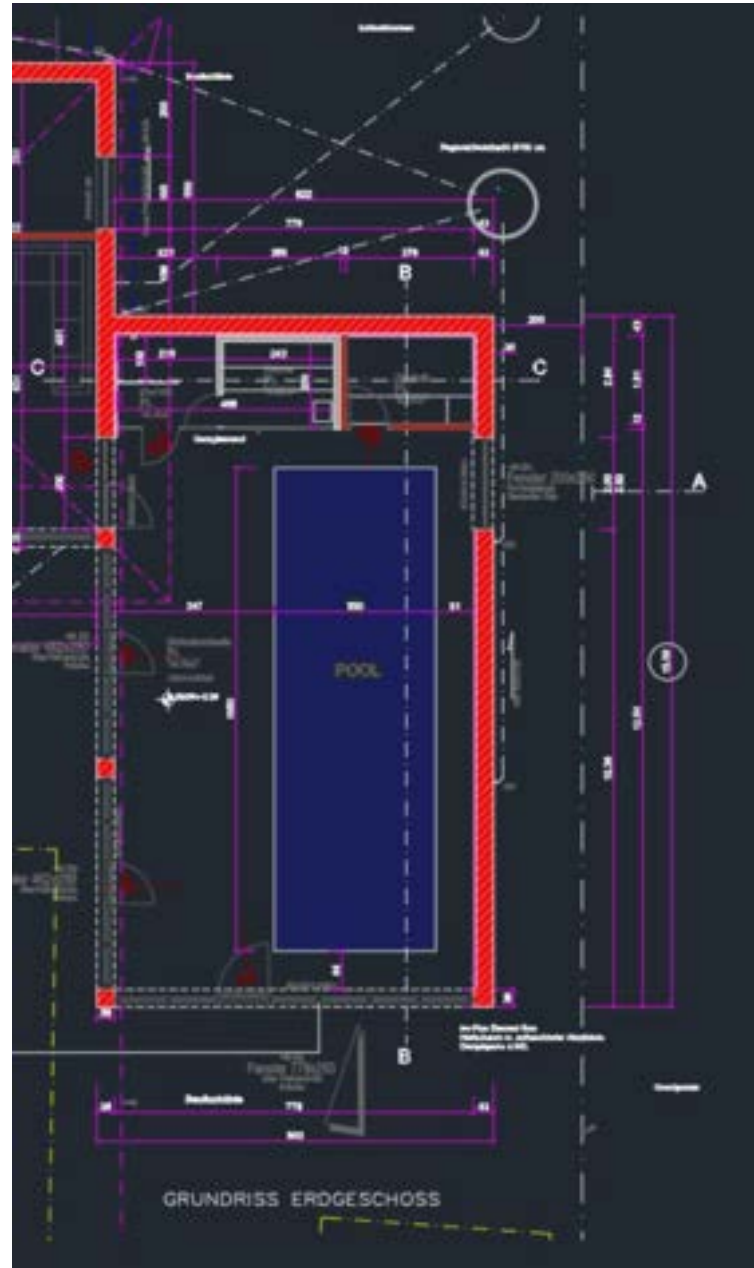
# indoor Living Pool



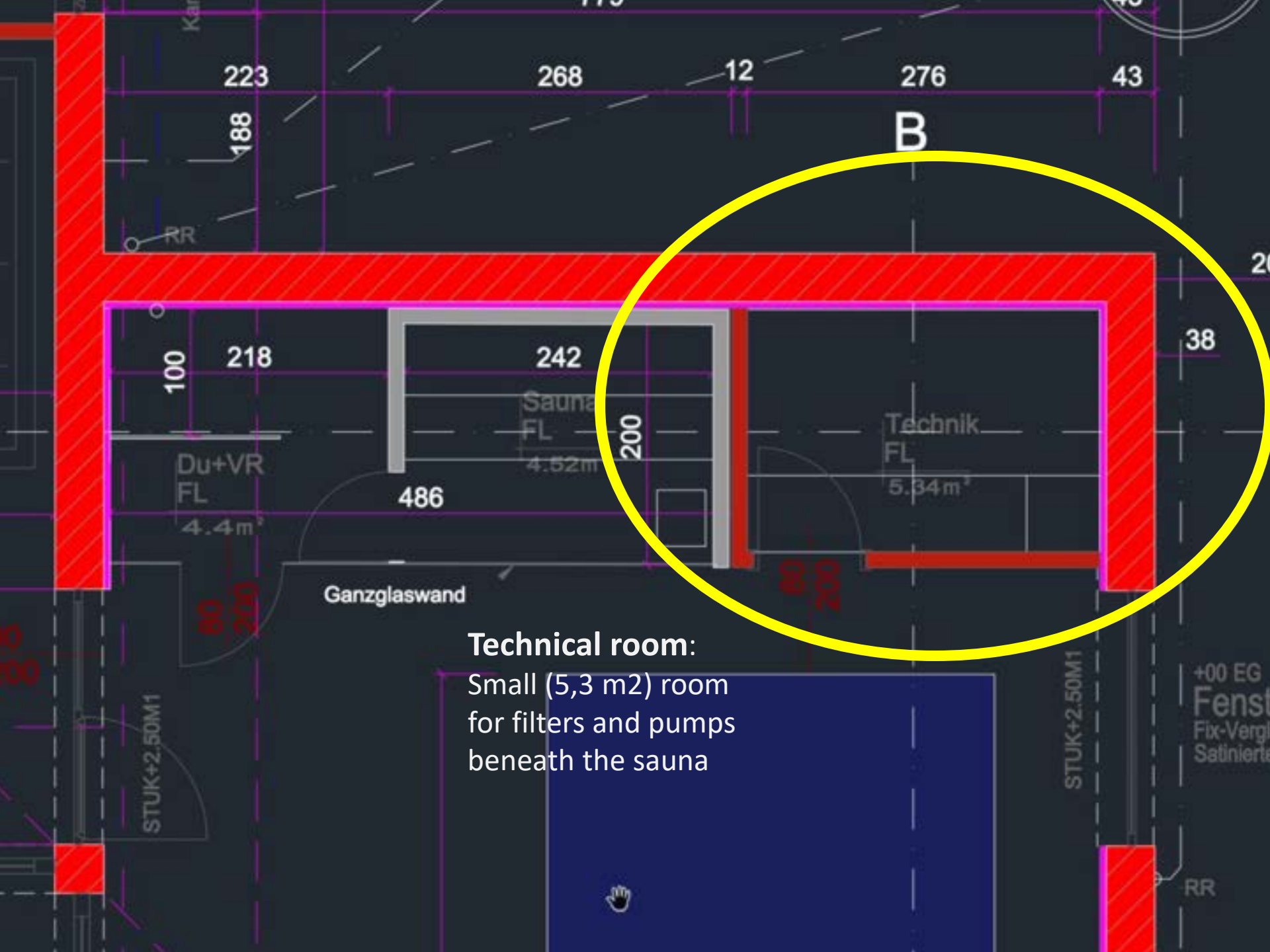
- ❑ size: 11x3,5m
- ❑ liner: bluegrey
- ❑ Biotop Converter Upstream V75 Box
- ❑ pool cover T&A
- ❑ filling water filter (PhosTec Ultra) in pressure vessel
- ❑ underwater lighting RGB
- ❑ dehumidification system combined with heat exchanger
- ❑ standard skimmer and impeller pump from conventional pool supplier

Ground plan:

the indoor pool is located in a own part of the building

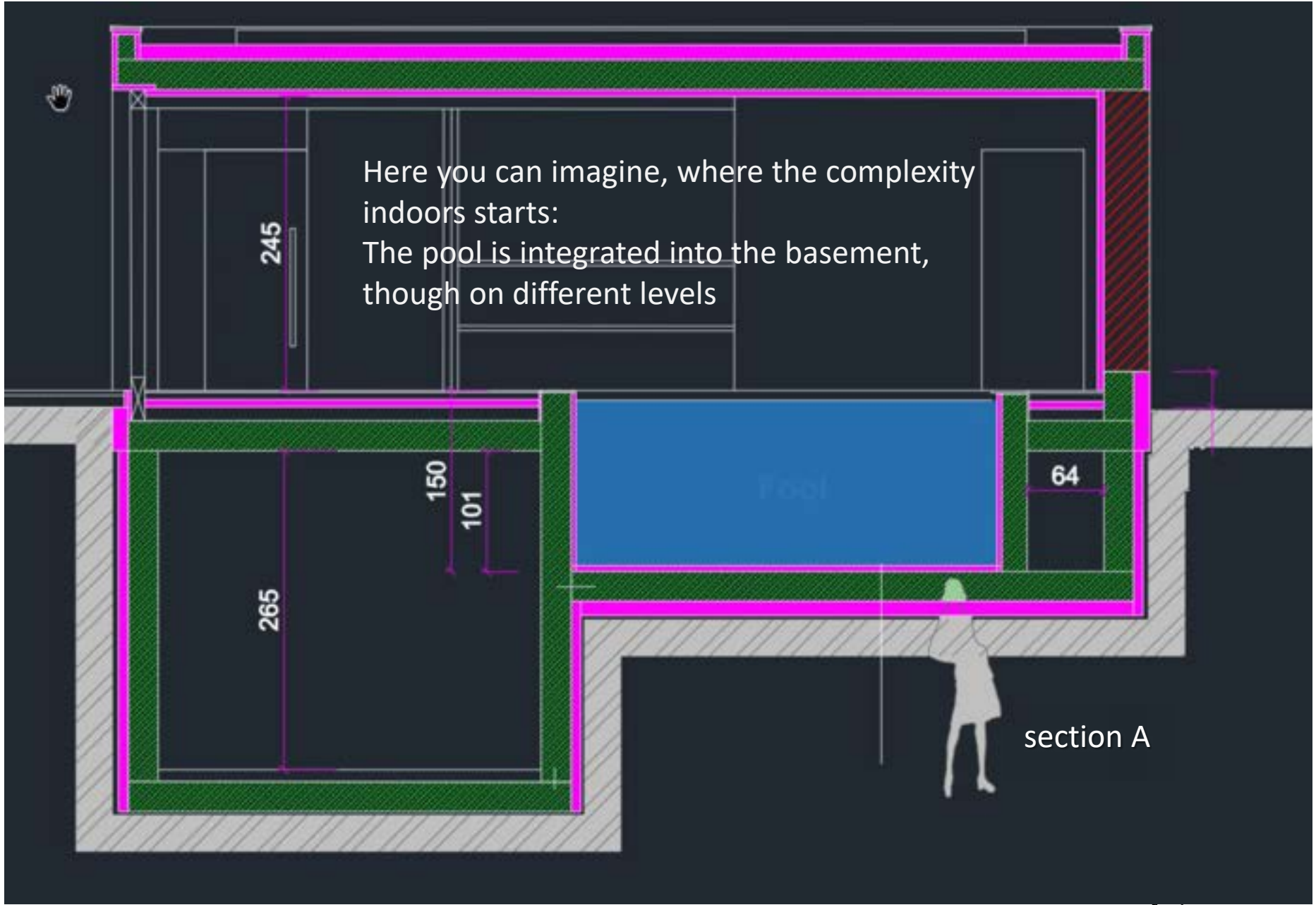


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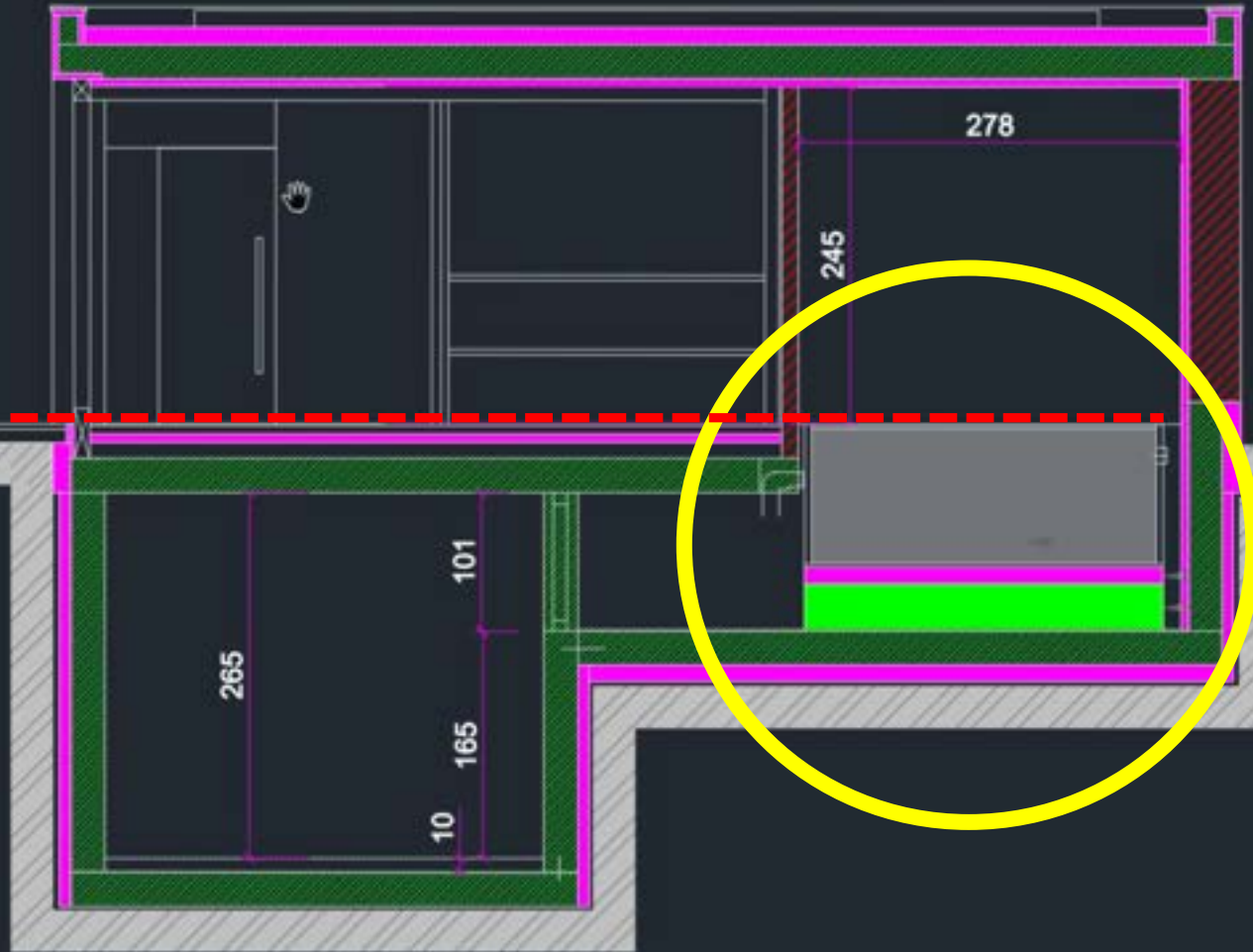
**Technical room:**

Small (5,3 m2) room for filters and pumps beneath the sauna



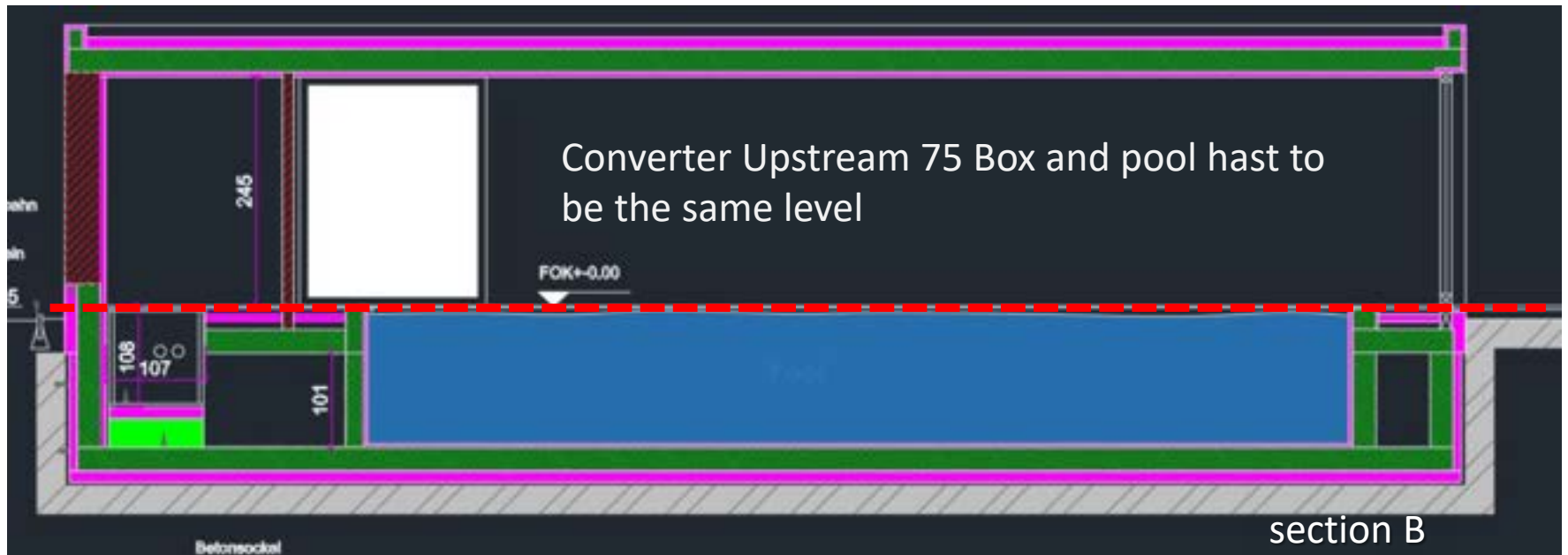
Here you can imagine, where the complexity indoors starts:  
The pool is integrated into the basement, though on different levels

section A



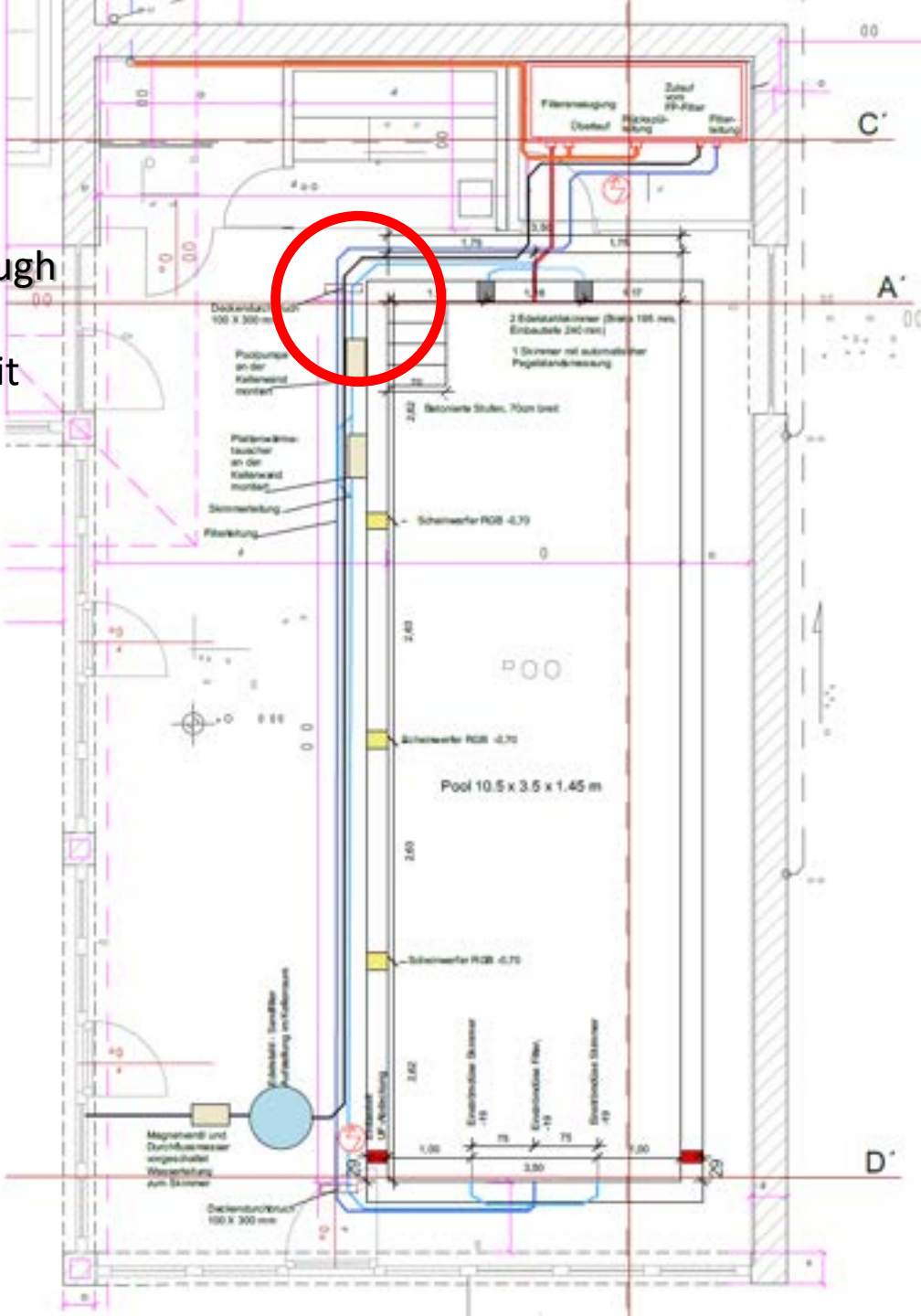
**Technical room:**  
Converter Upstream 75  
Box  
Situating on a concrete  
base to fulfill the  
technical restriction of  
the Biotop Living Pool  
system (filter box has to  
be on the same level as  
pool)

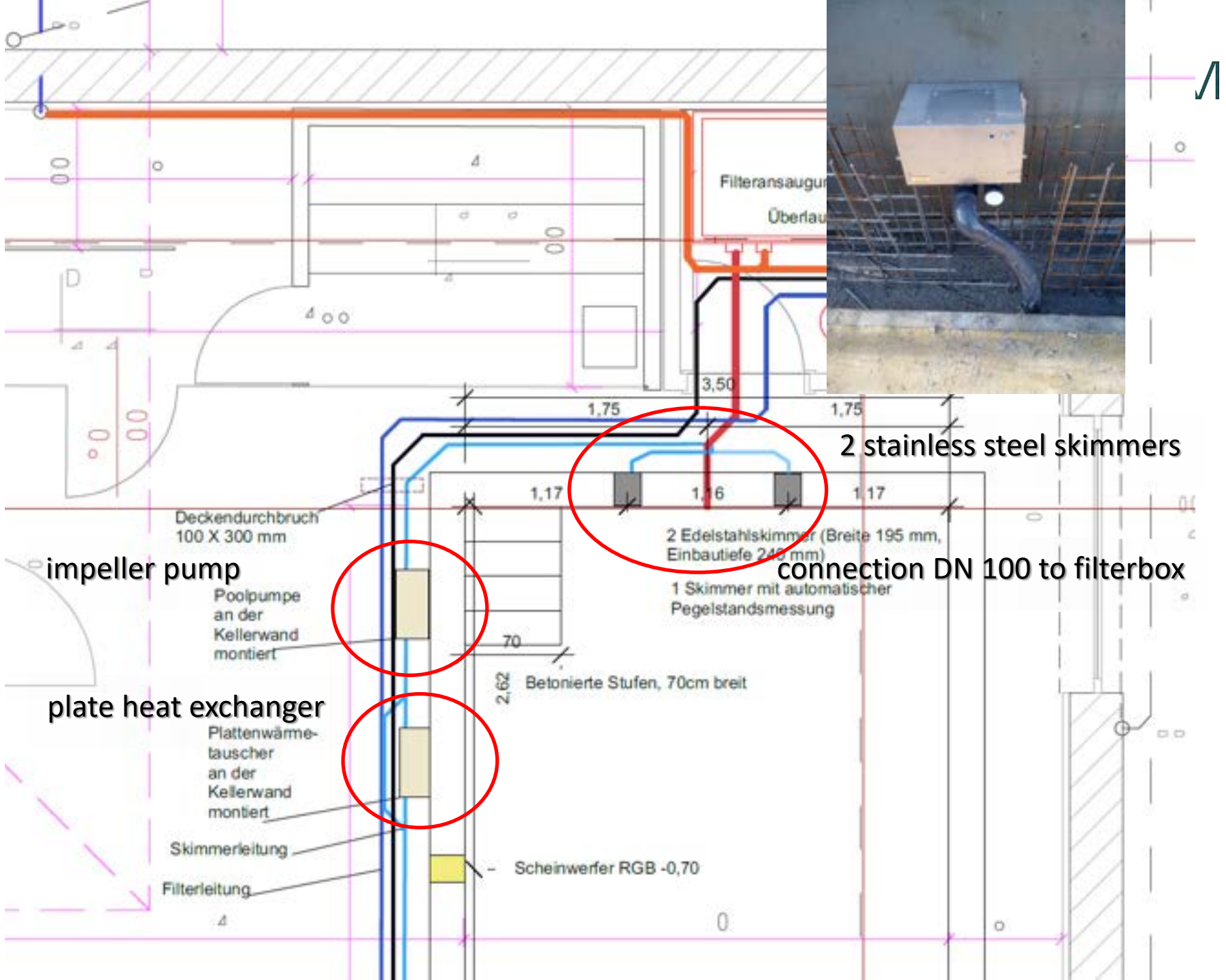
section A"



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Ceiling breakthrough  
for skimmer circuit  
filling water filter  
heat exchanger





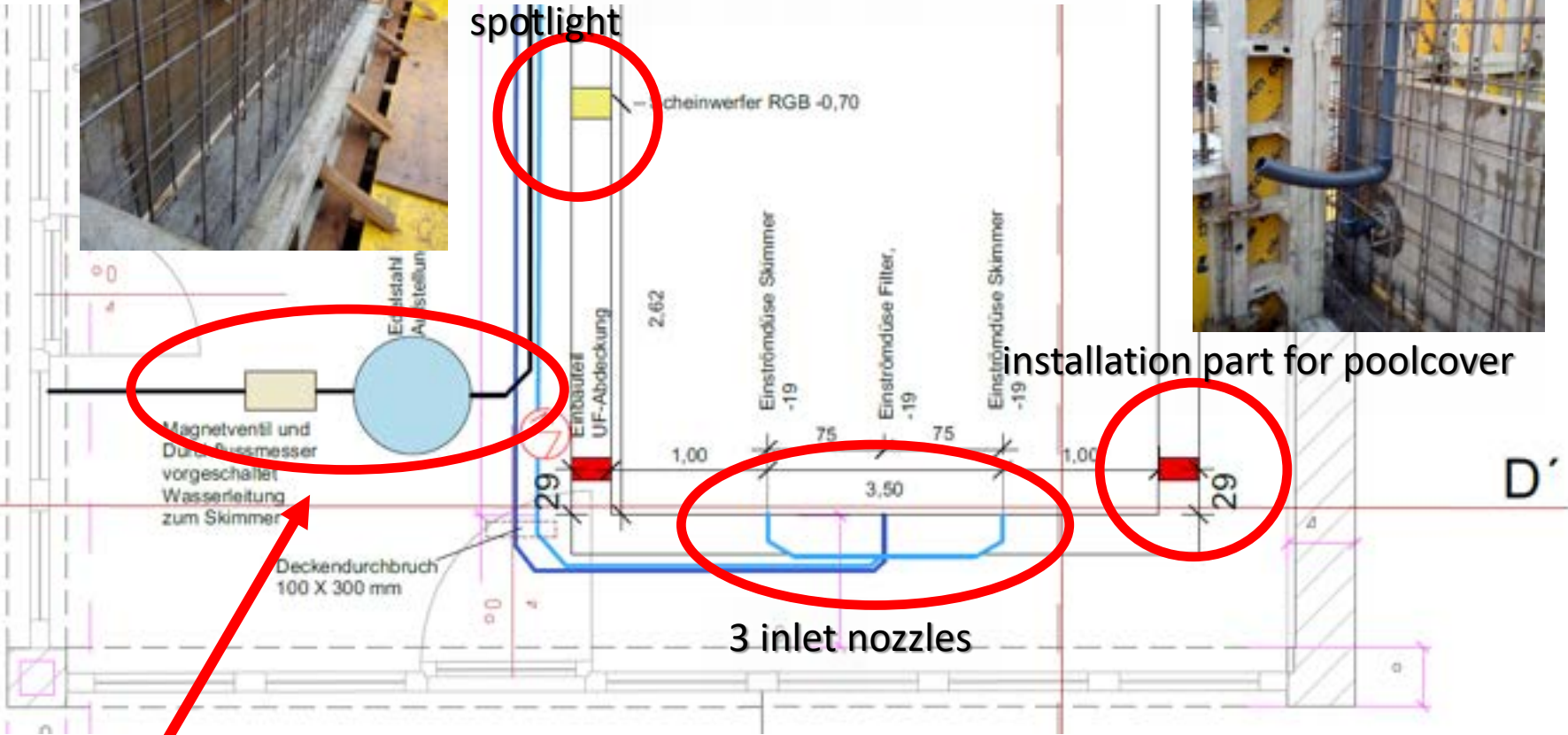




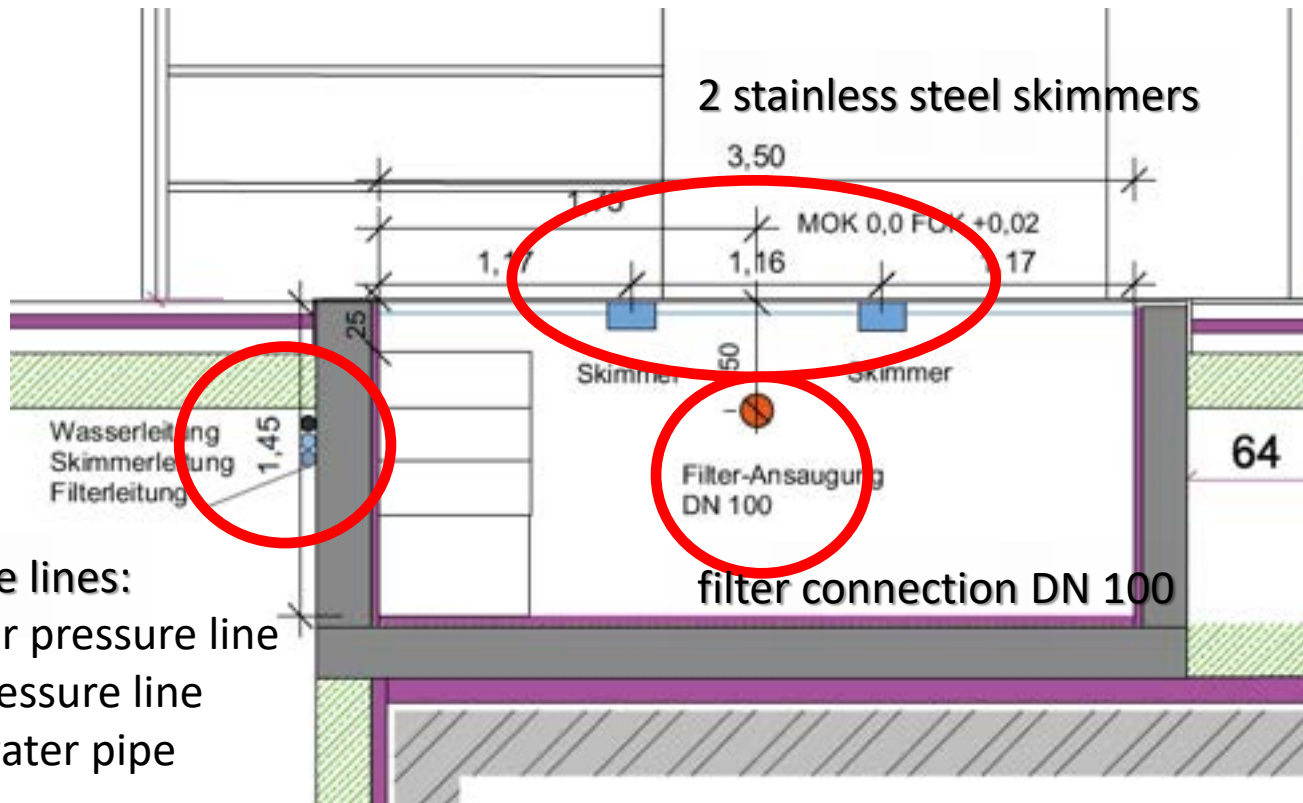
installation part for RGB underwater spotlight



installation part for poolcover



filling water filter in stainless steel vessel + magnetic valve



- 3 pressure lines:  
 1 skimmer pressure line  
 1 filter pressure line  
 1 filling water pipe



2 stainless steel skimmers

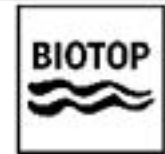
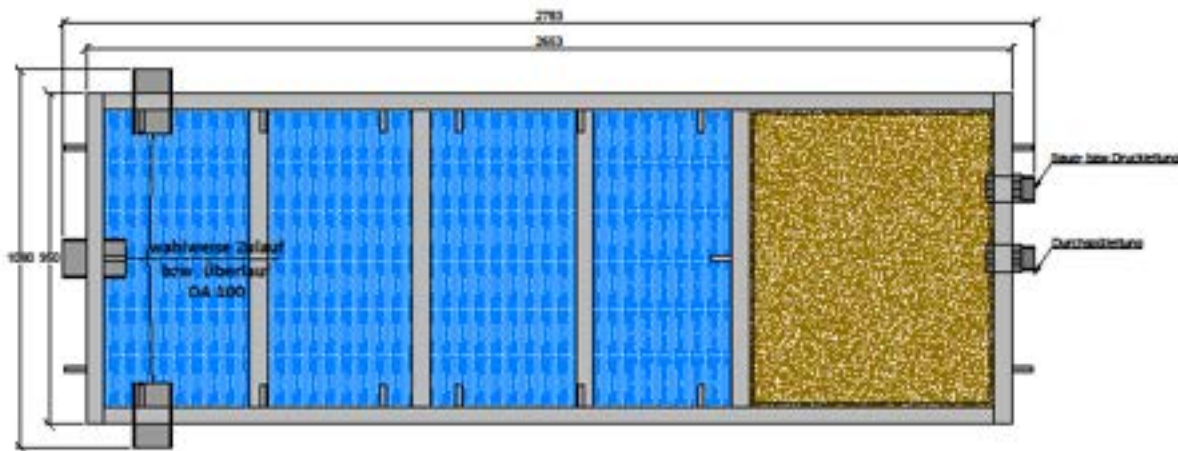
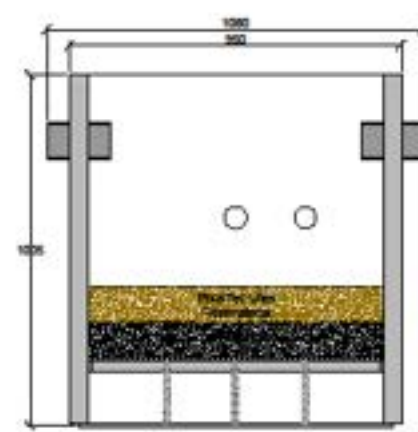
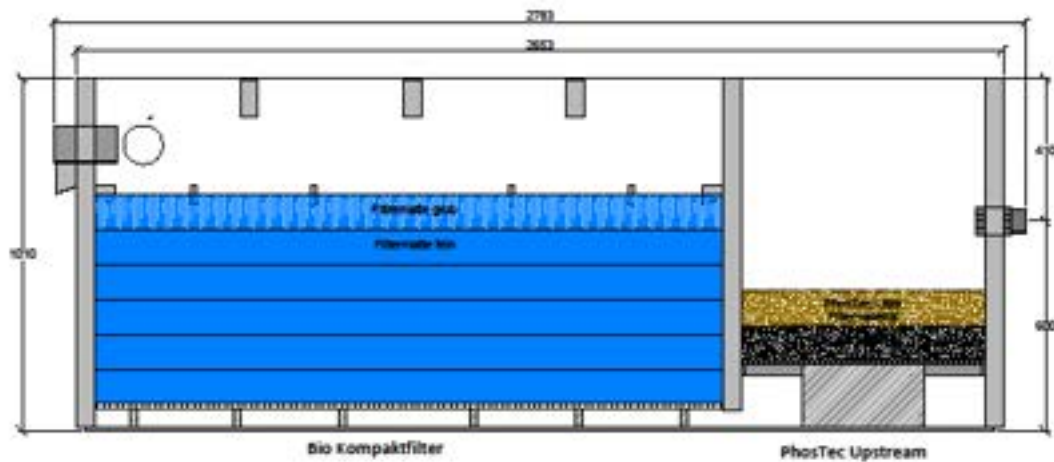
filter connection DN 100



3 inlet nozzles

installation part for RGB underwater  
spotlight





BIOTOP Landschaftsgestaltung Ges.m.b.H.  
AT-3411 Klosterneuburg-Weidling, Hauptstraße

Produktbezeichnung:

Converter Upstream V75

Planzeichner:

Moritz Demel

Maßstab(A3):

1:16

Freigegeben durch:

Christian Steinbichler

Art:

BIO0000127

Erstellungsdatum:

02.04.2019

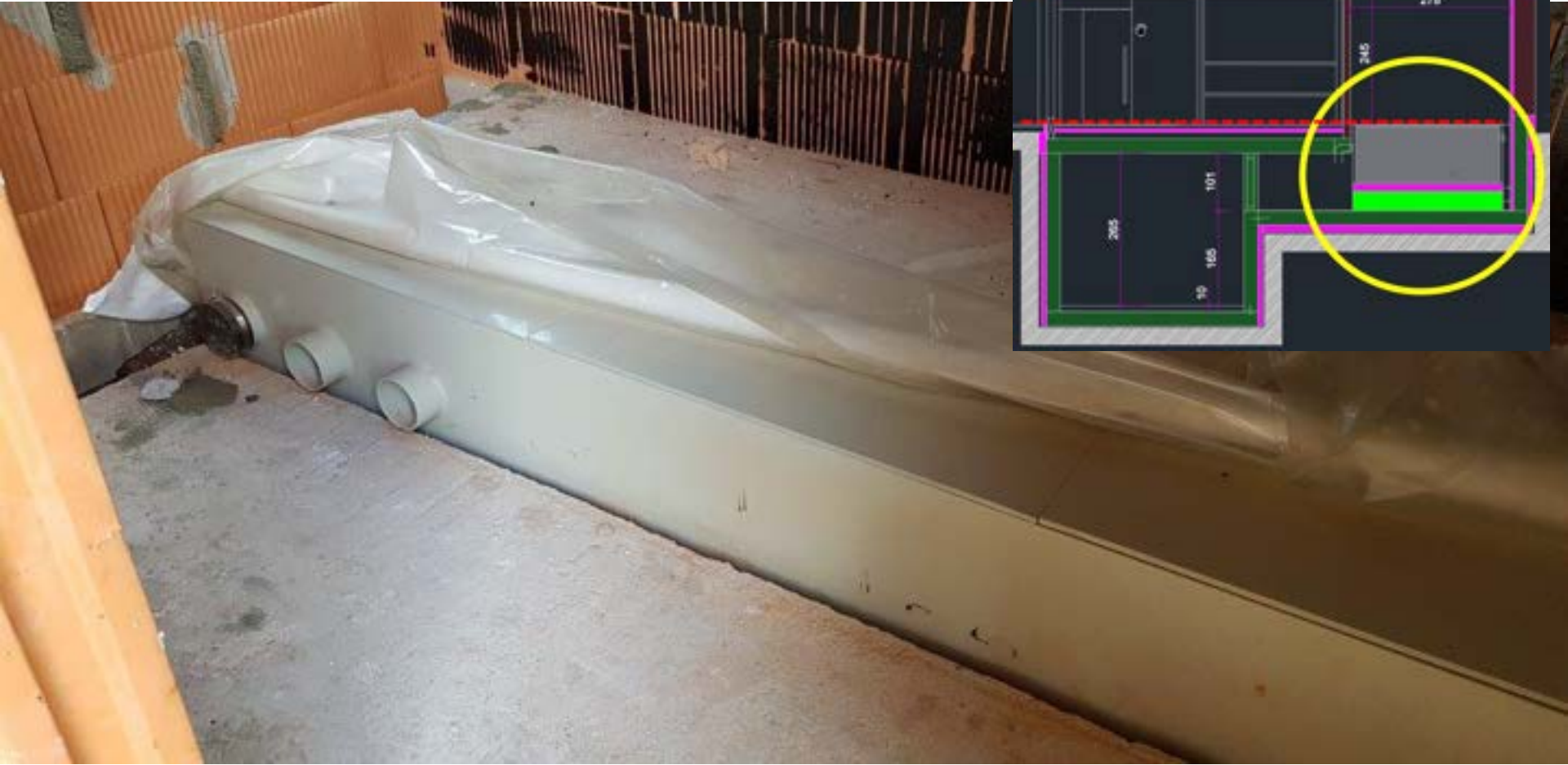
Version:

version\_02.01

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BIOTOP Converter V75 – technical detail: box size 2,8 X 1,1 X 1,1 m

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BIOTOP Converter V 75 – technical room pool floor

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BIOTOP Converter V75 – basement view



# Challenges

- ❑ sealing level **building–pool** was difficult, we could not use the standard Biotop skimmer
- ❑ detailed planning for the construction company was necessary
- ❑ leak test of the liner showed problems with the seal of the poolcover (power supply line)
- ❑ high flexibility necessary because of many companies on site

# filling water analysis

10.05.2019



pH value	-log H <sup>+</sup>	<b>7,5</b>
conductivity	μS/cm	<b>411</b>
turbidity	NTU	<b>0,36</b>
<b>total hardness</b>	<b>°dH</b>	<b>17,4</b>
carbonate hardness	°dH	<b>16,4</b>
ammonium (NH <sub>4</sub> <sup>+</sup> )	mg/l	-
nitrate (NO <sub>3</sub> <sup>-</sup> )	mg/l	<b>12,92</b>
<b>total phosphorus (P tot)</b>	<b>μg/l</b>	<b>13</b>
potassium (K <sup>+</sup> )	mg/l	<b>0,76</b>

# filling water analysis

10.05.2019

measures to take:

- carbonate hardness 17,4 °dH :

Living Pool limit: 10 °dH:

➔ lower carbonate hardness

- P (tot) 13 µg/l limit: 10 µg/l:

➔ phosphorus precipitation (Biotop Teichklar)

➔ permanent filling water treatment (Biotop Phostec Upstream filter)





# water analysis

		05/19	07/21	08/21	09/21
<b>pH value</b>	-log H <sup>+</sup>	7,5	8,3	7,8	7,5
<b>conductivity</b>	μS/cm	411	231	229	215
<b>turbidity</b>	NTU	0,36	0,37	0,56	0,36
<b>total hardness</b>	°dH	17,4	6,2	6,8	5,8
<b>carbonate hardness</b>	°dH	16,4	4,8	5	5,2
<b>ammonium (NH<sub>4</sub><sup>+</sup>)</b>	mg/l	-	< 2,5	0,04	0,02
<b>nitrate (NO<sub>3</sub><sup>-</sup>)</b>	mg/l	12,9	12,4	13,6	13,4
<b>total phosphorus (P tot)</b>	μg/l	13	< 10	< 10	< 10
<b>potassium (K<sup>+</sup>)</b>	mg/l	0,76	0,28	0,28	0,06

# water analysis results

- ☒ all values are in a perfect range for Living Pools
- ☒ **conductivity** is decreasing, an effect we observe also in outdoor Living Pools – after 2-3 years of use, we normally have values between 50-100  $\mu\text{S}/\text{m}^3$
- ☒ **carbonate hardness** is low – our Living Pool limit is 10  $^\circ\text{dH}$  max. – actually we allow low values down to 2  $^\circ\text{dH}$
- ☒ **phosphorus** is lower than 10  $\mu\text{g}/\text{l}$ : we fulfill our promises of a pool with clear water, no biofilm on surfaces and minimum of maintenance



# feedback of our client

- ☒ room and water temperature 25° C all year long
- ☒ use of pool robot 2 times a MONTH
- ☒ extreme **low costs** of dehumidification because of relative low temperature and usage of pool cover
- ☒ gain of a full-fledged **room without bad smells** of chemicals
- ☒ in comparison to his natural pool (gravel filter) outside the **maintainance efforts are minimal**
- ☒ very low energy consumption of the complete filter system due to energy saving pumps
- ☒ minimal water consumption

# learnings

- ❑ higher engineering costs have to be calculated in further projects (we estimate 7 – 10 k €)
- ❑ better using a prefabricated pool in PP because of tightness issues
- ❑ intensive documentation of all construction phases (leak test and documentation etc....)
- ❑ meetings/ support costs for building company, architect and building services planner have to be calculated (5 meetings minimum on site)



# impressions of the project



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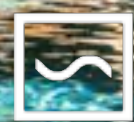


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An aerial photograph of a person floating on a pink inflatable ring in a swimming pool. The water is a vibrant turquoise color with visible ripples and splashes. The person is positioned in the upper center of the frame, with their arms outstretched.

# 4.1 renovation project indoor pool



# indoor pool: renovation project

- ❑ size: 10,6 x 4,5 - 5,5m, depth 1,7 – 2,6 m
- ❑ blue tiles – to be changed
- ❑ no pool cover
- ❑ dehumidification system
- ❑ underwater lighting – to be renovated
- ❑ overflow system
- ❑ 2 huge pump systems – to be changed



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APA


Pool grobe Maße +/-

Dach  
geschützt  
 $3,5 \times 7,5$



Tiefe



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# renovation project - ideas

- ❑ change from overflow to skimmer system due to costs
- ❑ liner PVC: bluegrey
- ❑ pool cover
- ❑ dehumidification system
- ❑ filling water filter
- ❑ underwater lighting in LED
- ❑ downsizing pool and reducing depth/ volume



## 4.2 penthouse pool under construction



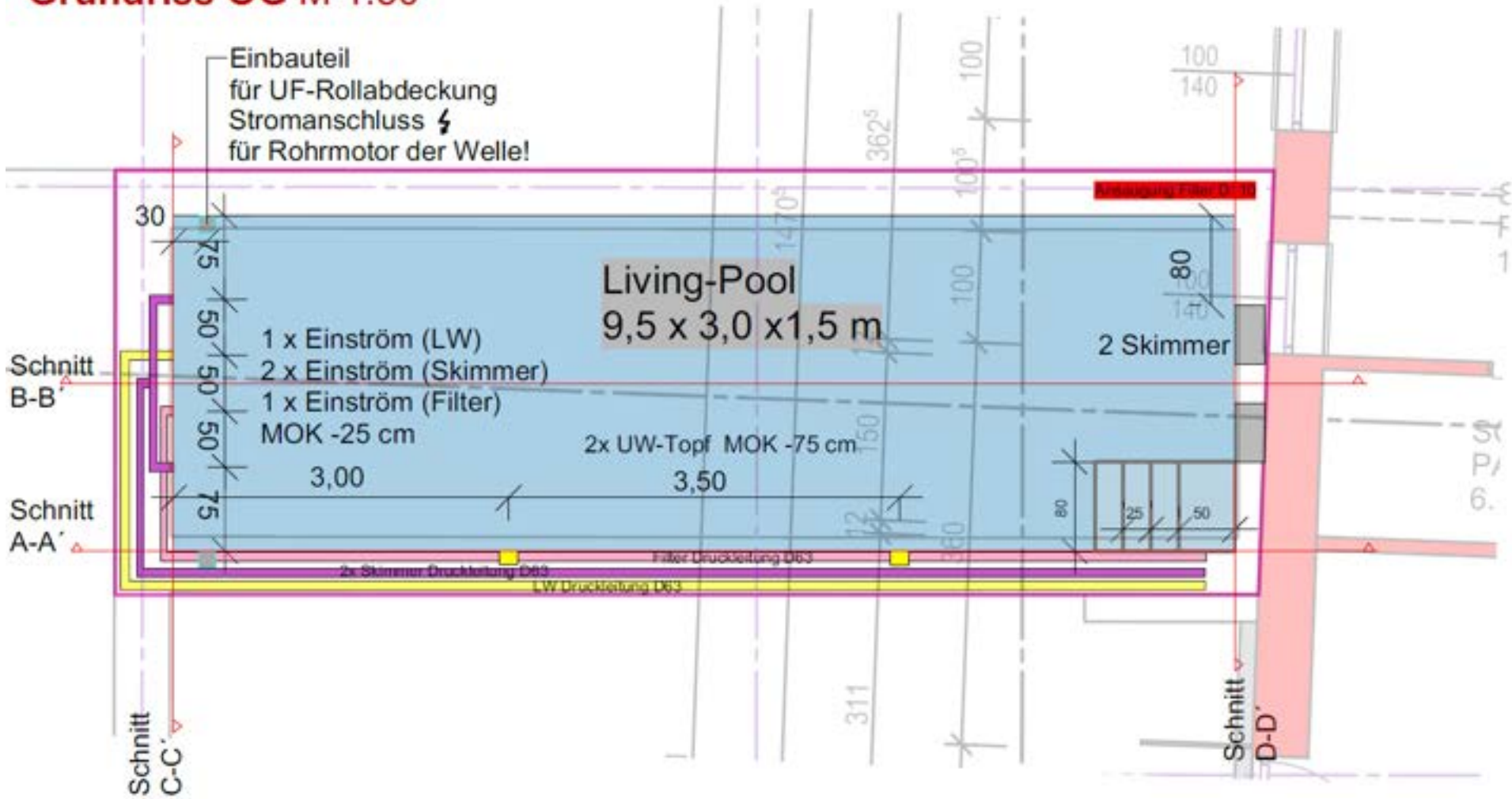
# penthouse Living Pool

filter system one floor below

- ❑ size: 9,5x3m
- ❑ liner: bluegrey
- ❑ pool Cover
- ❑ compensation tank
- ❑ underwater lighting
- ❑ air heat pump
- ❑ 2 standard skimmer integrated in wall
- ❑ skimmers adapted for a fix water level
- ❑ back-pressure valves for all circuits
- ❑ filling water filter FP10
- ❑ Kombibox V50 (biofillter, phostec upstream filter)

# rooftop level ground plan

## Grundriss OG M 1:50



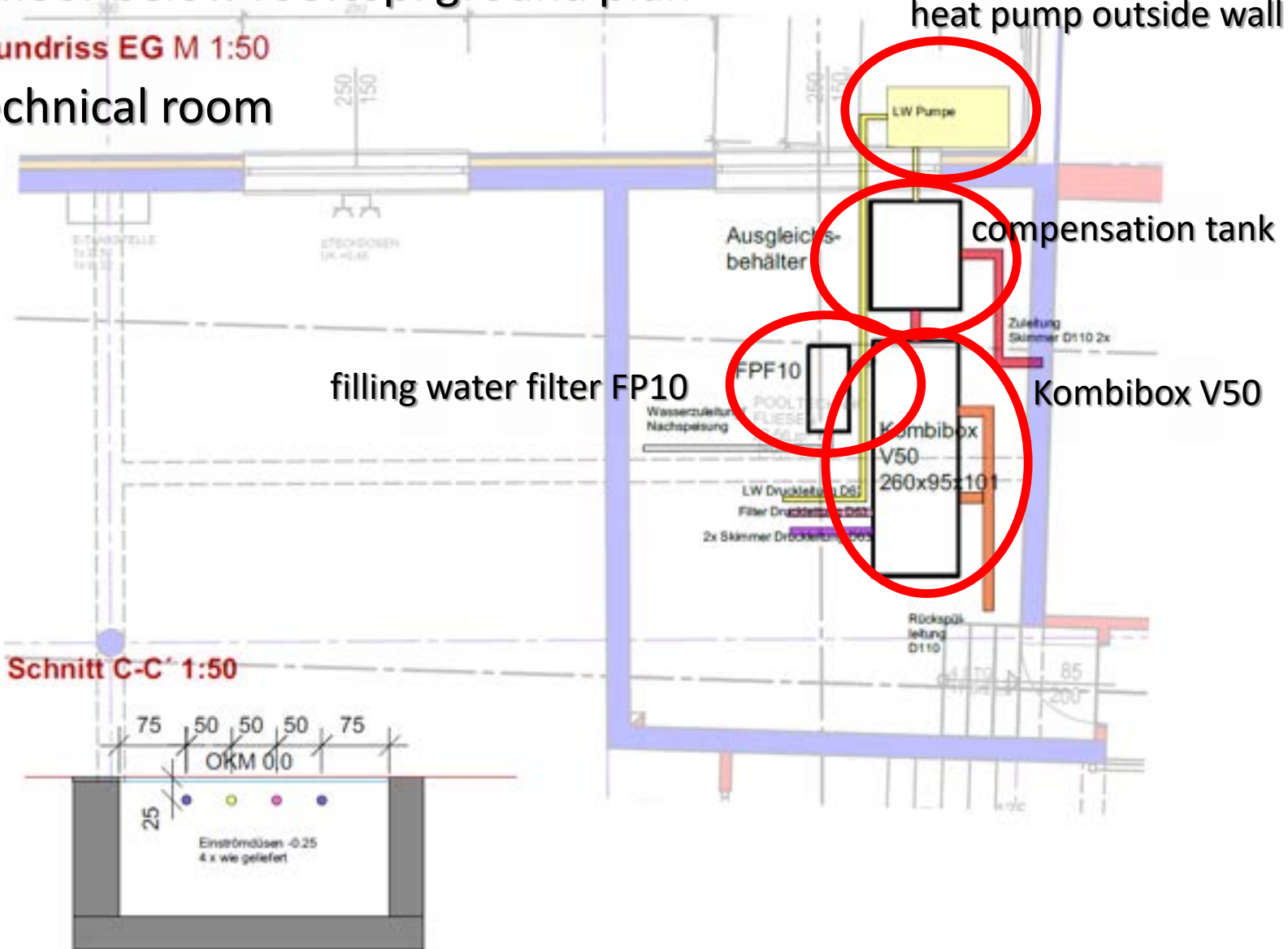
# 1 floor below rooftop: ground plan

Grundriss EG M 1:50

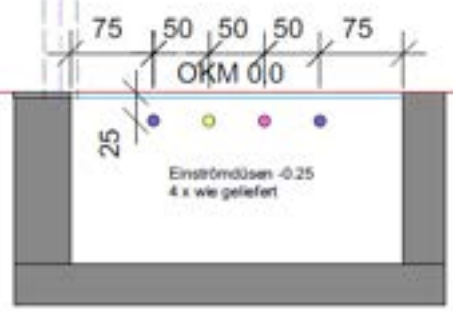
technical room

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heat pump outside wall



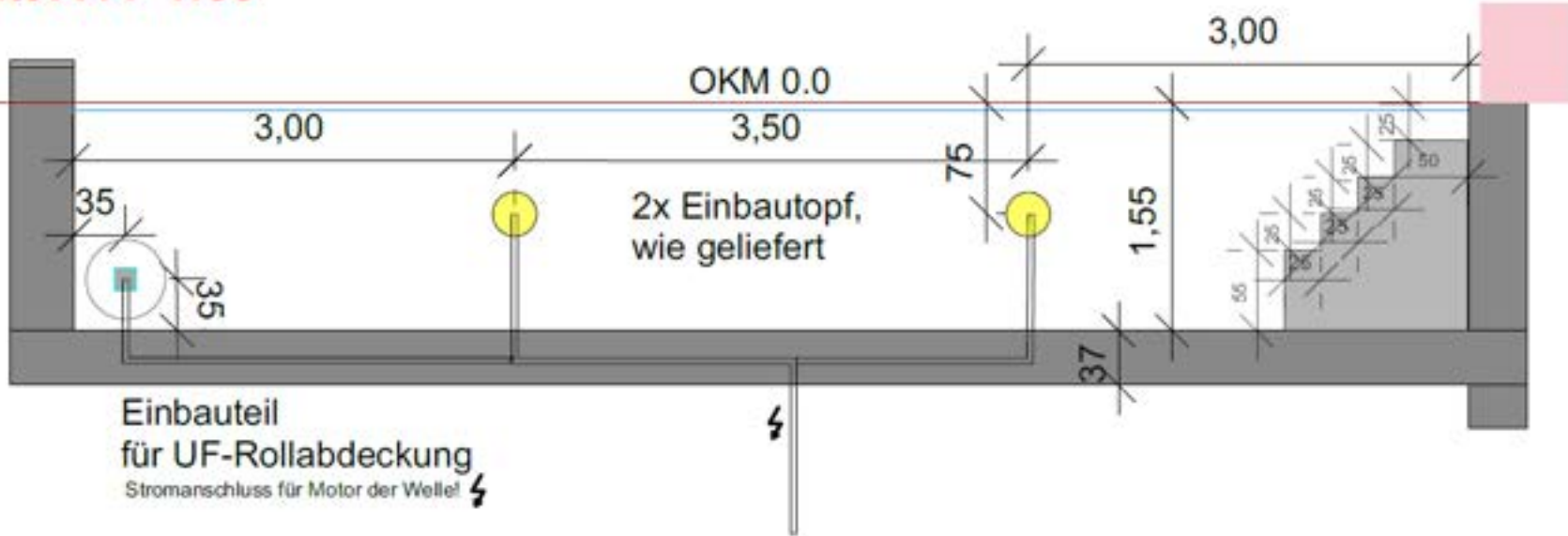
Schnitt C-C' 1:50





# section A-A" rooftop

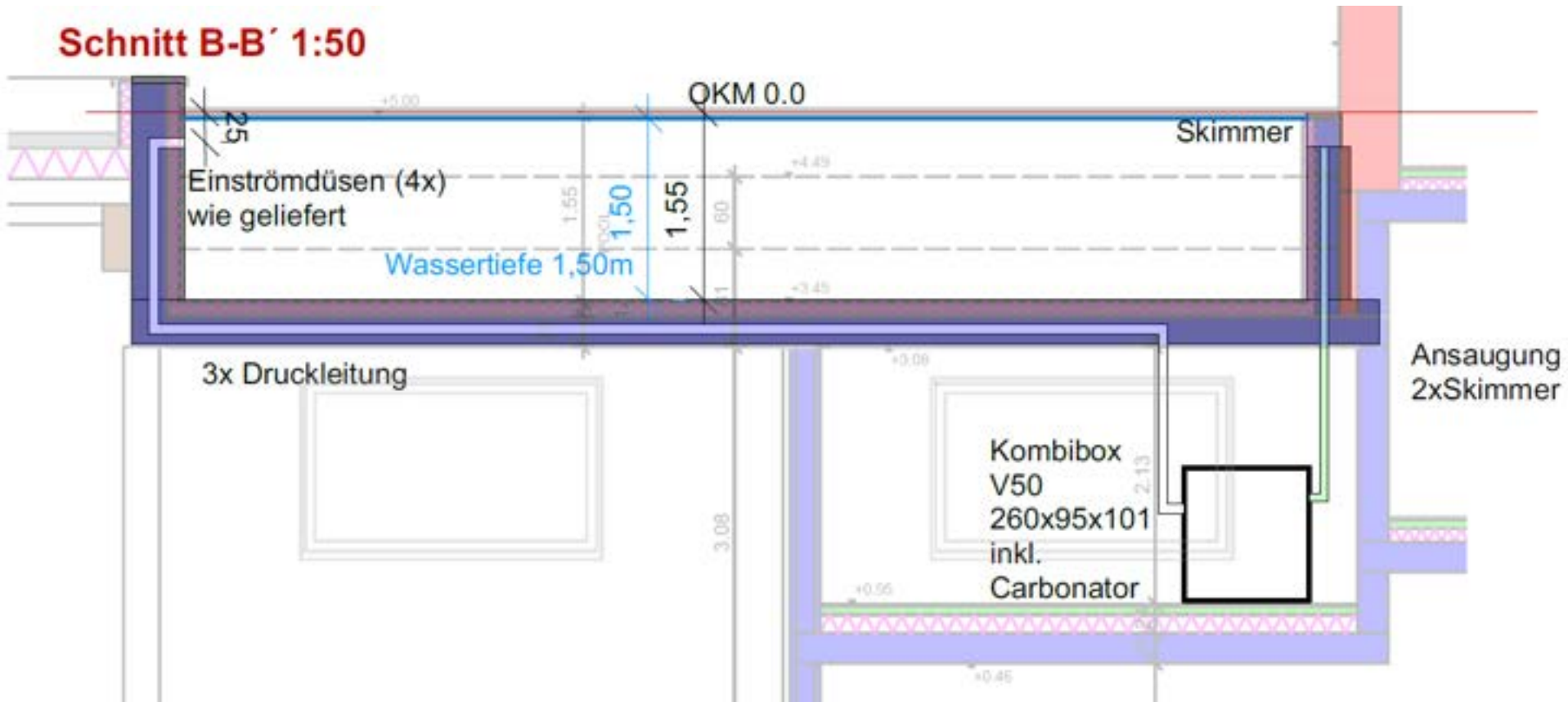
## Schnitt A-A' 1:50



# section B-B" rooftop/ lower floor



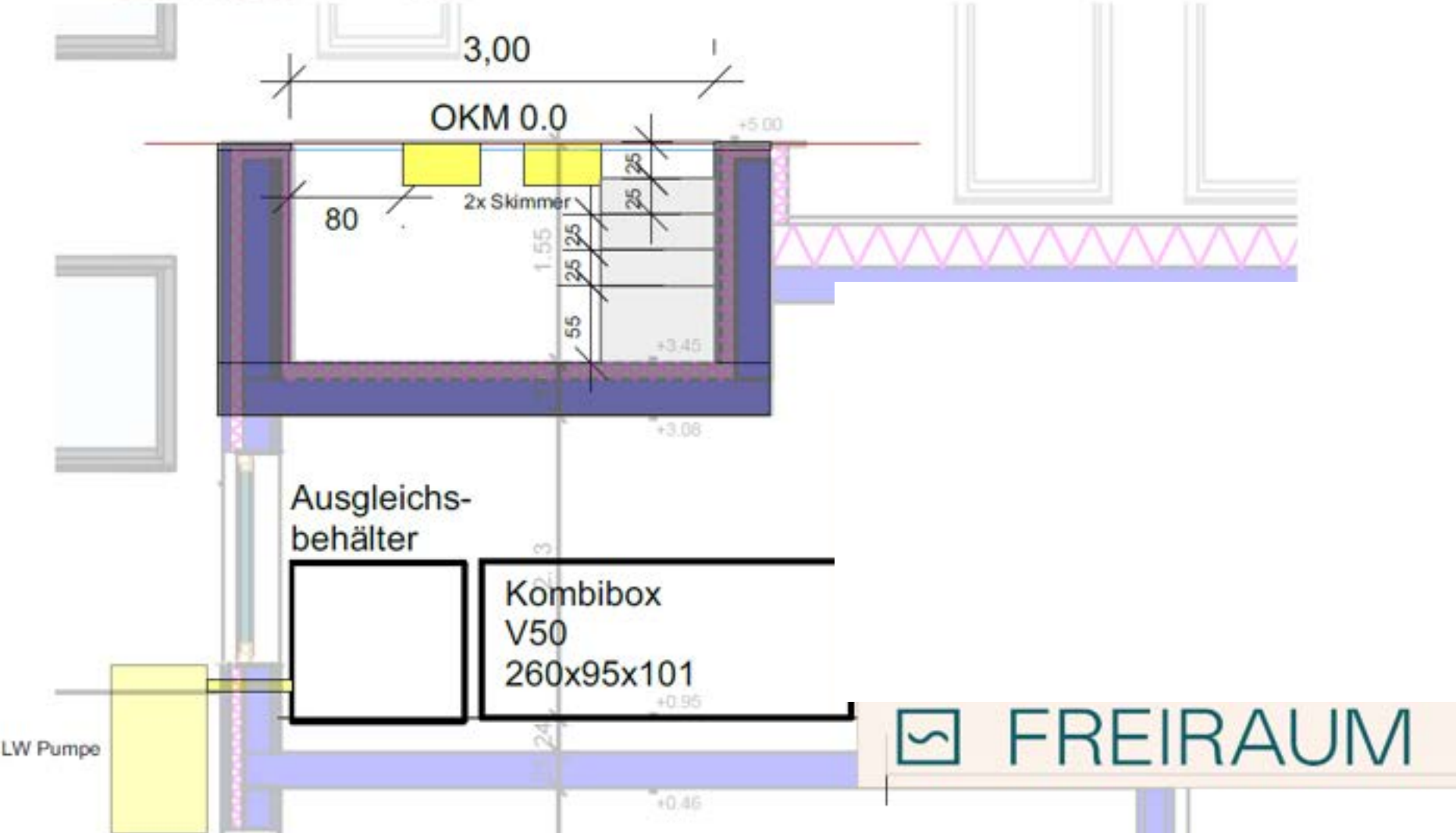
## Schnitt B-B' 1:50



section D-D" rooftop/ lower floor

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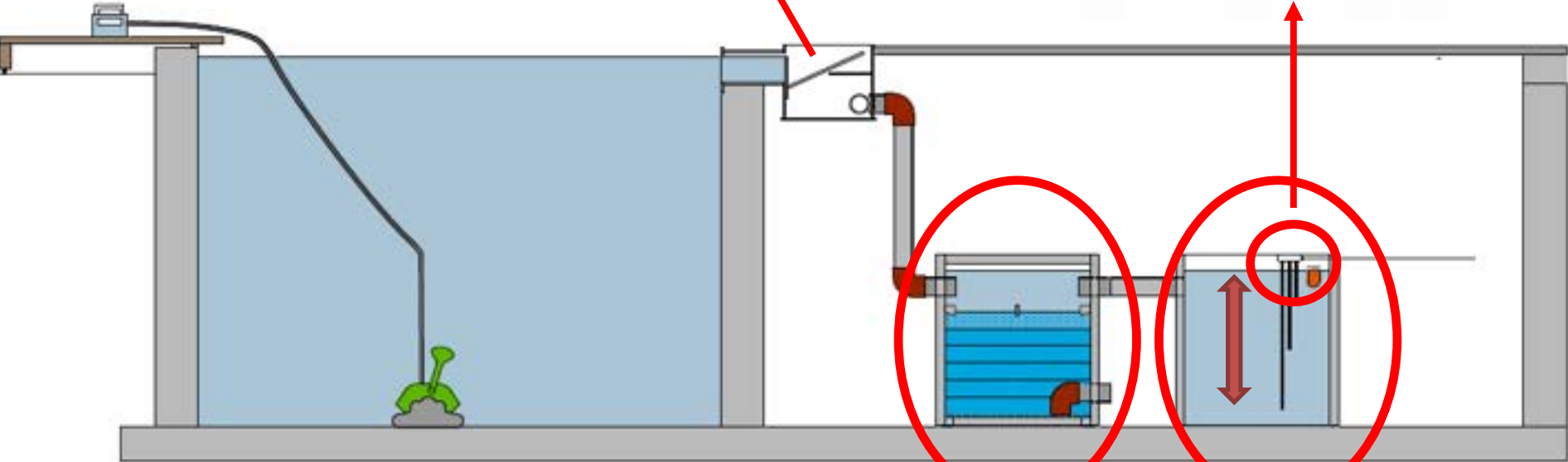
**Schnitt D-D' 1:50**



# hydraulic system

skimmer adapted for fix water level in pool

self-levelling system for refill



Kombibox V50

compensation tank

4 inlet nozzles



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ceiling technical room/ bottom plate pool

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ceiling breakthrough  
for skimmer circuit  
and outlet nozzels

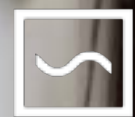
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back pressure valves

compensation tank



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back pressure valves

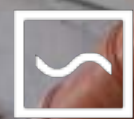
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Kombibox V50

filling water filter FP10



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to be finished soon...



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Thank you  
for your interest!

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**Richard Zauner is CEO and co-owner of FREIRAUM – natürlich die schönsten Pools.**

**He is selling high end gardens and naturally treated pools for more than 25 years.**

**As a trainer he is sharing his experience in sales in form of workshops and sales seminars.**

**Other topics he is teaching:**

- employee development**
- systematic sales process**
- business development**
- strategic**