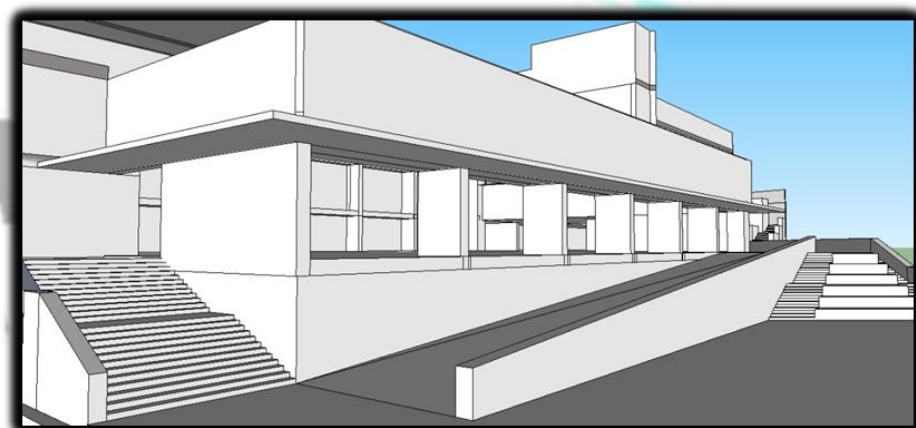
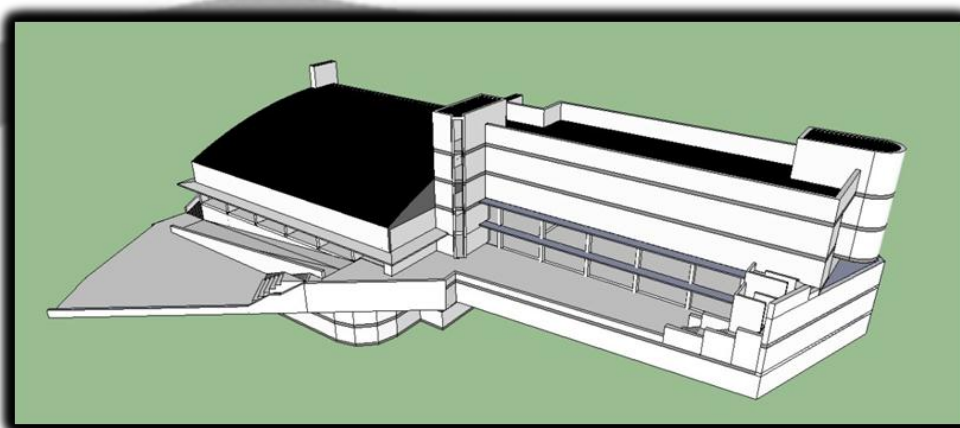


FINAL PROJECT



NEW BUILDING AND DEVELOPMENT
OF THE ENVIRONMENT IN THE
CAMPUS OF ALCOY.

Devolder Lawrence
Universidad politécnica de
Valencia
2012-2013

1.Introduction

- Devolder Lawrence
- Belgium
- Erasmus
- campus KAHO SINT LIEVEN-DIRK MARTENS AALST
- Construction site: Alcoy

2.Objectives

- Learn about the way of construction in another country
- Expand knowledge
- Vocabulary
- Express myself in Spanish and English

3.Methodology

- Studying project documentation
- Visits
- Visit reports → general view from the progress
- Pictures
- Asking questions
- 3D model → geometry
- Phases = 3 parts
 - 1)Phases before my arrival (Cellar, main structures)
 - 2)Phases during my stay (Stairs, carpentry, facades, installations...)
 - 3)Phases after my stay (Facades, carpentry, environment)

- Built to expand the UPV campus in Alcoy.
- Old parking area.
- 3819 m² usable construction space.
- 13 500 m² floor area.
- Construction code C2
- 2 Lots:



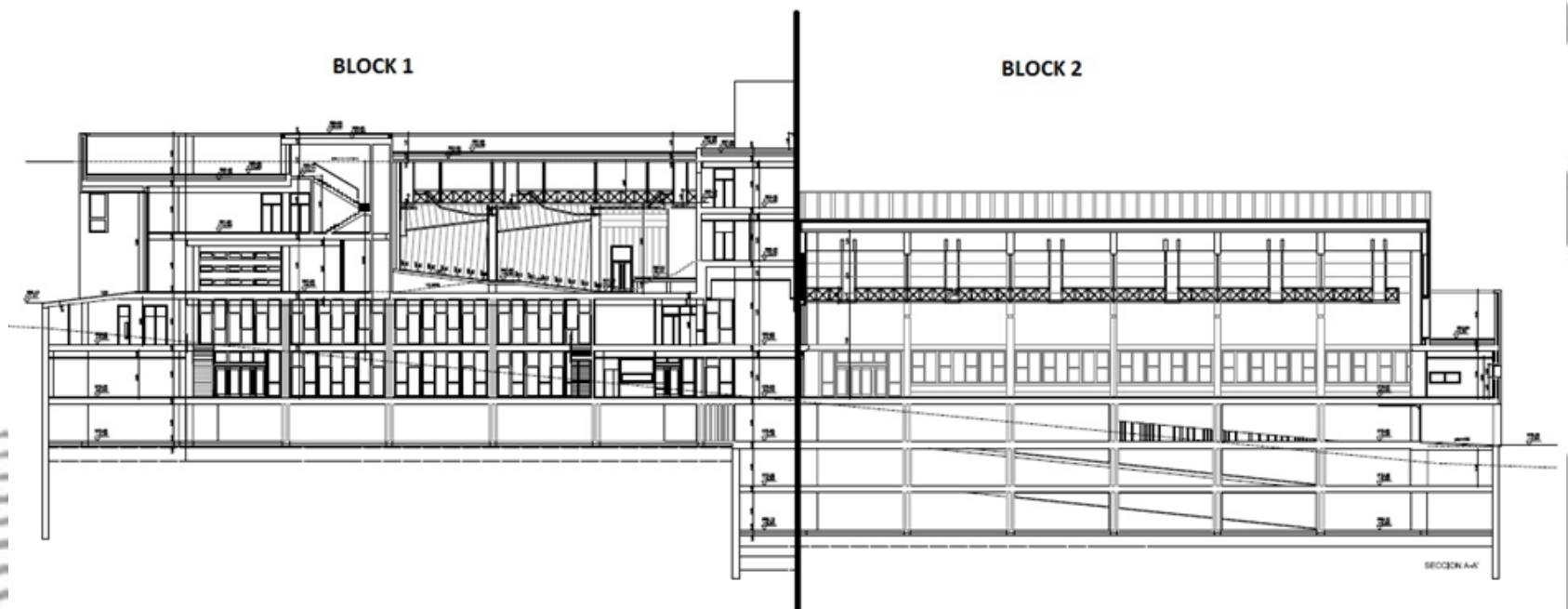
- Built to expand the UPV campus in Alcoy.
- Old parking area.
- 3819 m² usable construction space.
- 13 500 m² floor area.
- Construction code C2
- 2 Lots:
 - 1) Construction + environment (Acciona infraestructuras SA).
 - 2) Installations (Fulton SA).

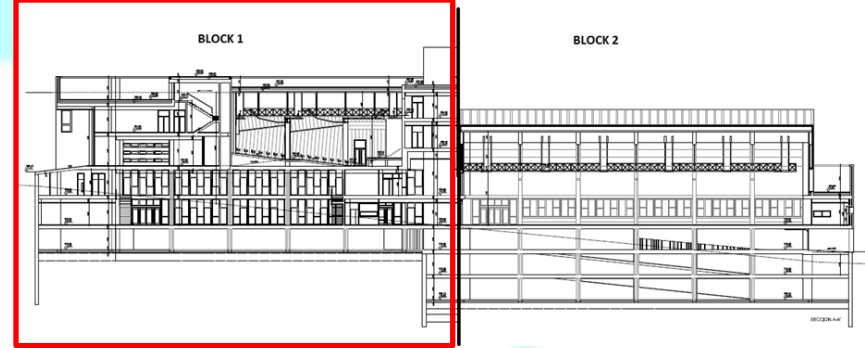
- [illegible]



Building description

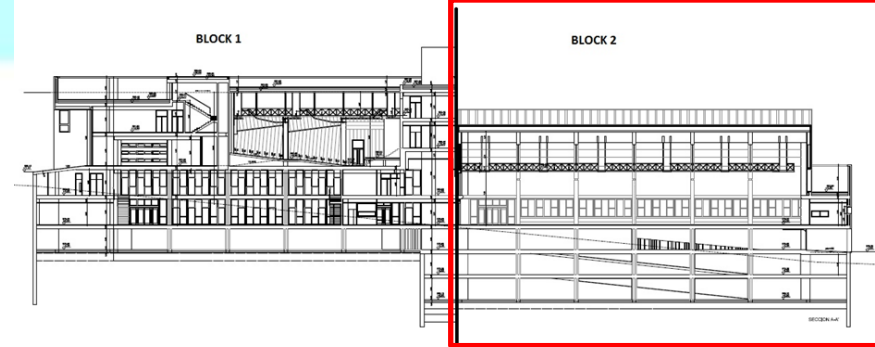
- 2 Blocks
- Situated on a very steep slope next to a valley
- Difference in depth





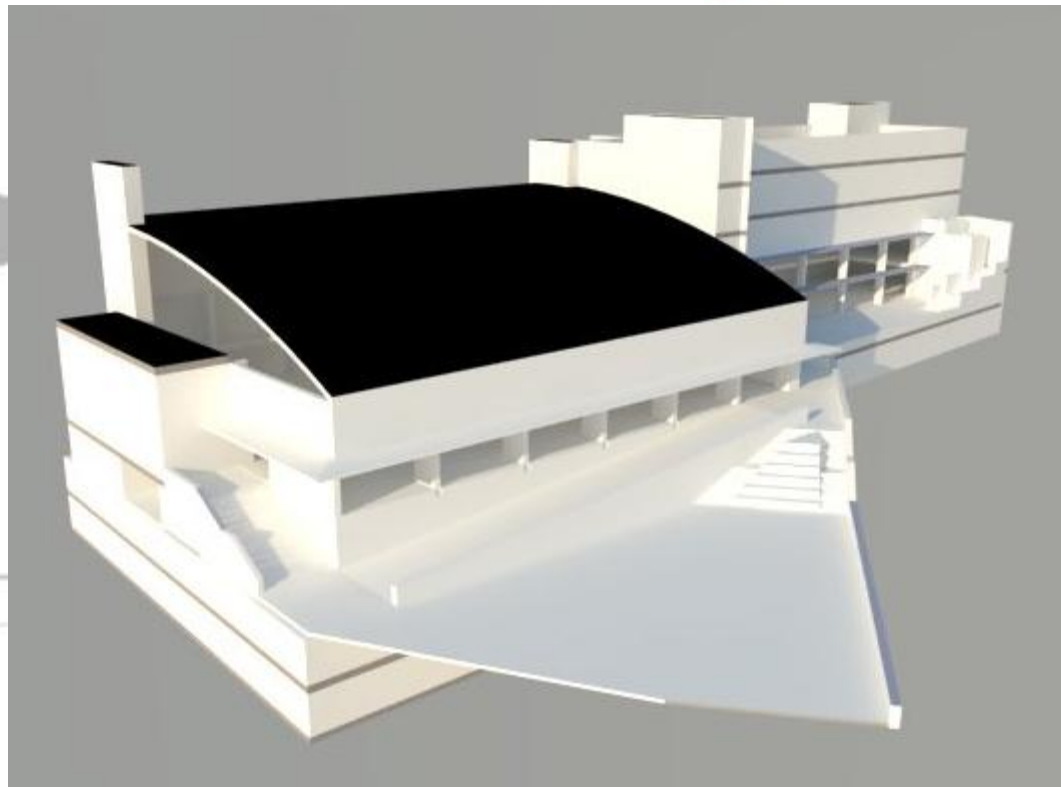
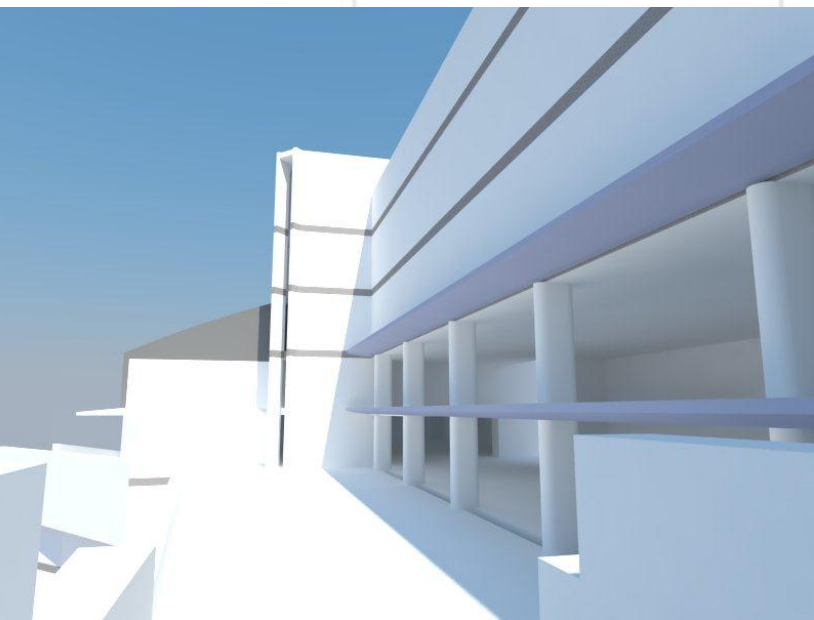
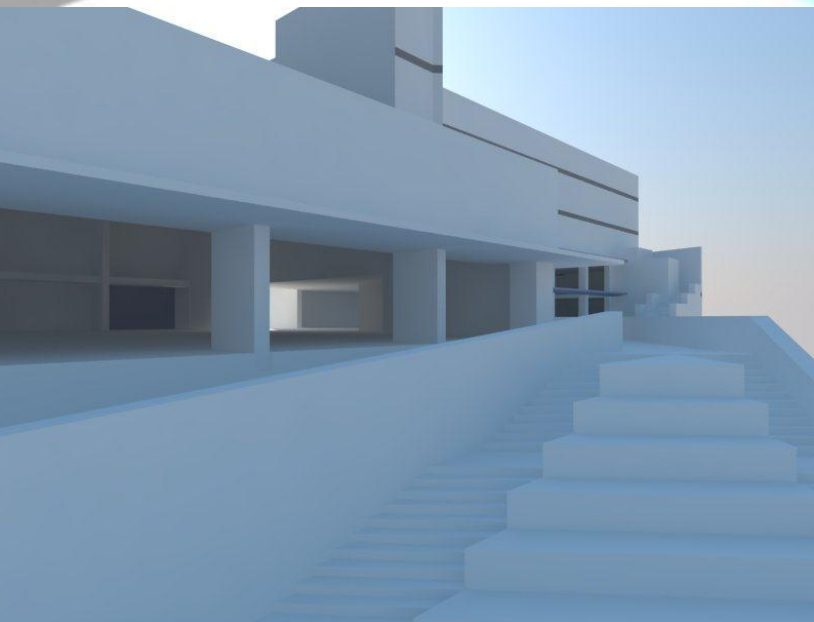
Block 1: (-3.85m)

- Cellar floor (-1): Parking (58 places) → 1626.22m²
- Ground level (0): Gym, monitors office, changing rooms, toilets, lobby. → 988.01m²
- First floor (+1): Gym, reception, changing rooms and monitors office. → 735.50m²
- Second floor (+2): Summer school, multipurpose spaces, walkways, toilets, offices. → 927.76m²
- Third floor (+3): Offices, laboratories. → 481.00m²
- Rooftop: Installations → 168.80m²



Block 2: (-10.30m)

- Cellar floor (-3): Parking (71 places) → 2354.38m²
- Cellar floor (-2): Parking (67 places) → 2331.36m²
- Cellar floor (-1): Parking (55 places) → 2195.13m²
- Ground level (0): Sports hall. → 1525.48m²



Earthworks

- Excavation on different levels.
- Several stages
- Asphalt and pavements (25cm).
- Ramps.
- Geotechnical study.



Foundations

- Foundation = reinforced concrete diaphragm wall.
- Situated on a very steep slope next to a valley.
 - Diaphragm walls was the best option.
- Dimensions:
 - Width: 0.50m
 - Concrete: HA-30/F/IIa + QA
 - Steel: B500 SD



Preparation works:

- Coordination.
- Before excavation: study panel plan.
- Important to fill a full panel without any concrete begins to harden.



Guide walls:

- Faster and easier to work.
- After the works → removed.
- Following functions:
 - 1) Guidance for excavator.
 - 2) Storage of the bentonite mud: at the start of the excavation.
 - 3) Ensure that the slots are closed and not collapse under the weight of the excavators on the edge of the excavation.
 - 4) Guidance for the reinforcement cages.
- 80*20cm.
- One side against ground, the other against a mold.
- Light reinforcement 12mm.



Guide wall excavation:

- Excavation from the ground between the guide walls.
- Great precision.
- Can't happen in one fluid time → length
- Joints.



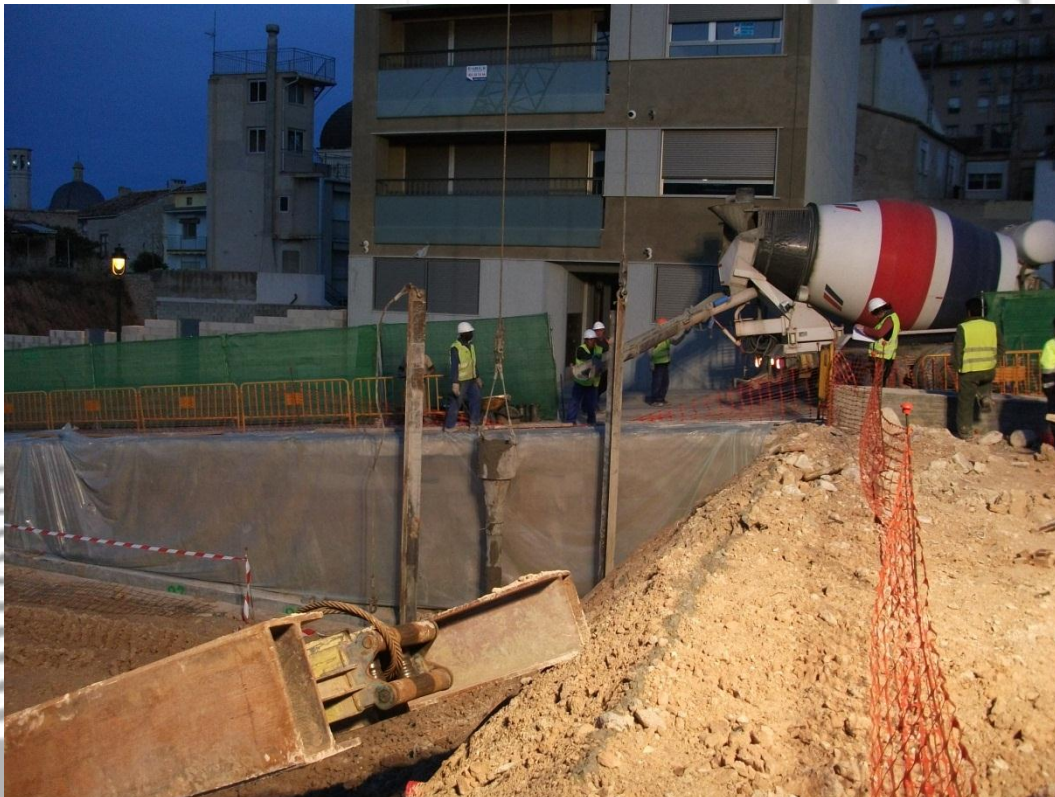
Reinforcement:

- Reinforcement cages lowered by crane.
- Adjustment of several cages on the site.
- Steel: B500 SD
- Mesh size vs. granulate size



Concreting:

- Needed in large amounts.
- Breaks → great consequences.
- Concrete: HA-30/F/IIa + QA



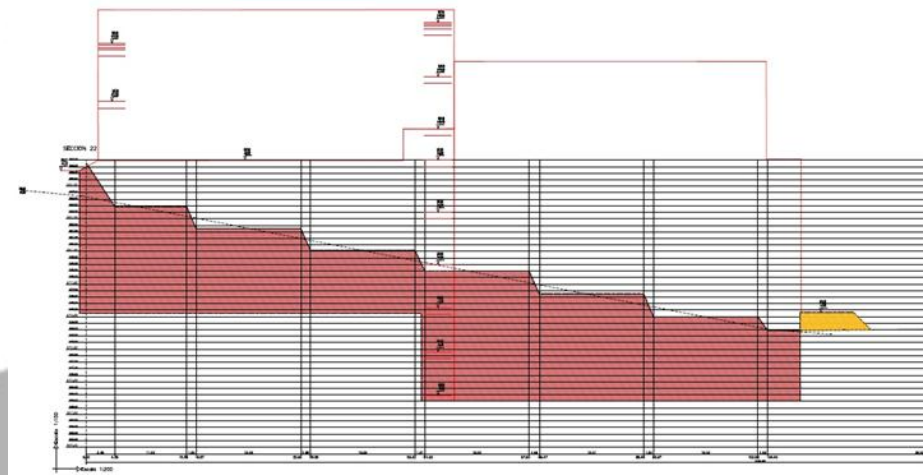
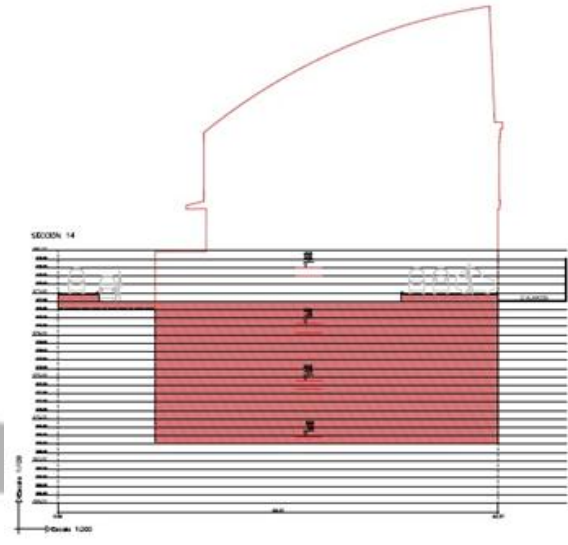
Demolition top layer:

- Demolition 0,5 – 1m top layer.
- Less quality.
- New concrete beam.
- Formwork.



Excavation

- Depth varied due to slope.
- 12m south part.
- 10m north part.
- 13.50m Junction part between block 1 and 2.
- Sections.



- Removing top layer. (2652.15m³)
- Excavation in several stages.
- Ramps.
- 44259,40 m³ of ground



Staircases

- Central staircase.
- Links floors and blocks.
- In situ.
- 1 Week/level.
- Very precise.
- Metal mold (visual)
- Marble finishings



Façades


Width of 40cm.

- 1) Integral insulation, 6cm with a final surface of outside plaster.
- 2) Double hollow brick $\frac{1}{2}$ foot thick.
- 3) Polyurethane insulation, 5cm thick.
- 4) Air chamber
- 5) Double hollow ceramic brick of 7cm thick
- 6) Inside Plastering




Climate + wall construction

- Warmer climate = other way of insulating.

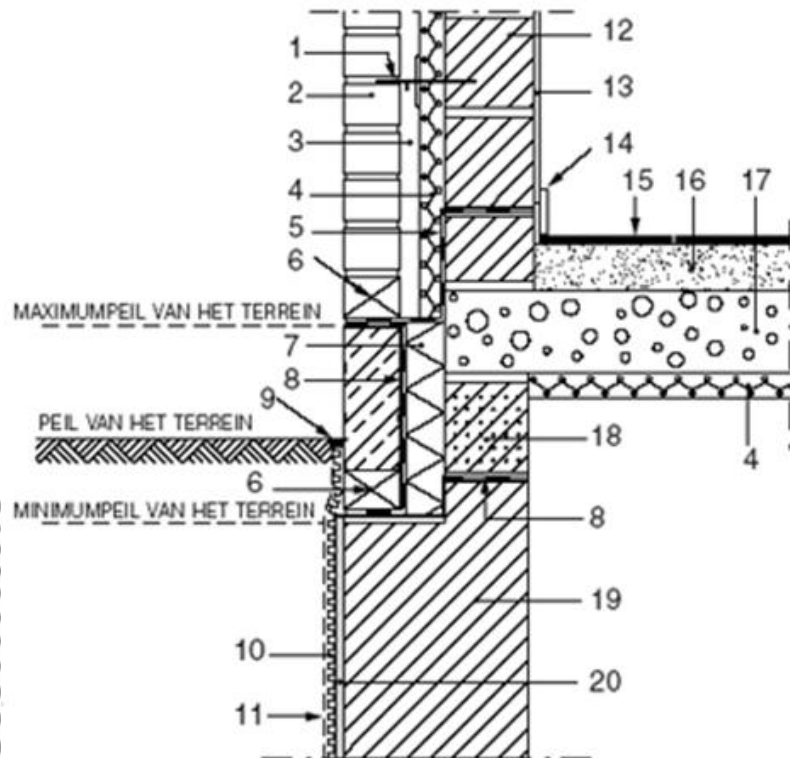
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januari	5	0	2	20	☁☁☁	7
februari	5	0	3	16	☁☁	6
maart	8	2	4	19	☁☁☁	7
april	12	4	5	15	☁☁	8
mei	16	8	7	17	☁☁☁	10
juni	20	12	7	14	☁☁	13
juli	22	14	7	14	☁☁☁	16
augustus	22	13	7	15	☁☁☁	18
september	19	11	5	15	☁☁☁	18
oktober	15	7	4	17	☁☁☁	15
november	9	4	2	20	☁☁☁	12
december	6	1	2	19	☁☁☁	8

☁☁☁ = 0-5 mm • ☁ = 6-30 mm • ☁☁ = 31-60 mm • ☁☁☁ = 61-100 mm • ☁☁☁☁ = 101-200 mm • ☁☁☁☁☁ = meer dan 200 mm

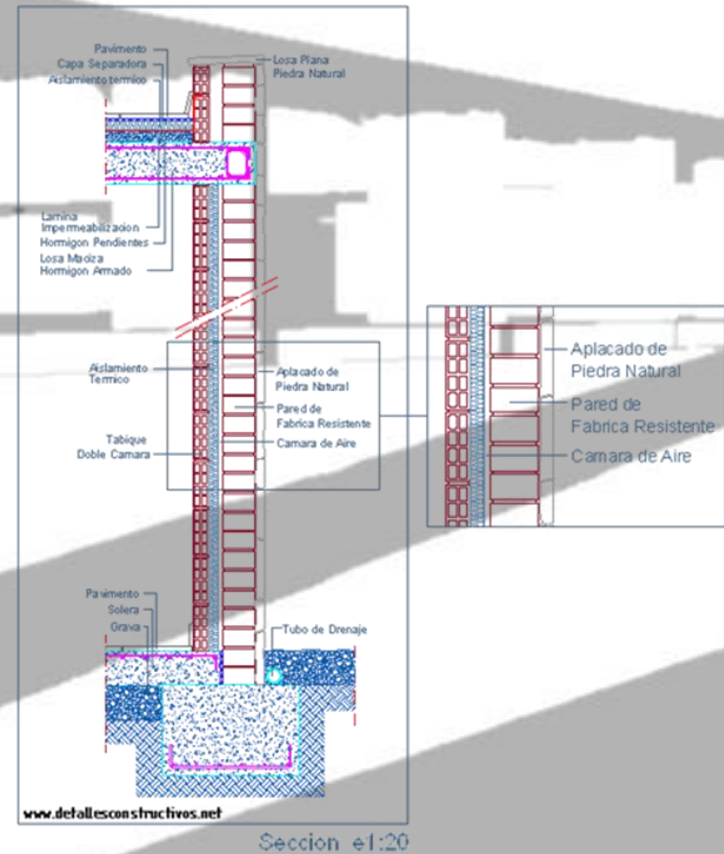
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januari	16	6	5	11	☁☁	14
februari	17	7	6	10	☁☁	13
maart	19	8	7	10	☁☁	14
april	20	10	7	9	☁☁	15
mei	23	13	8	8	☁☁	17
juni	27	17	9	5	☁	21
juli	30	20	10	2	☁	24
augustus	30	20	9	3	☁	26
september	28	18	8	5	☁☁	24
oktober	24	14	6	8	☁☁☁	21
november	19	9	5	10	☁☁	18
december	16	7	5	11	☁☁	15

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Belgian wall construction



Spanish wall construction



Carpentry

Belgian carpentry



Spanish carpentry



Rainwater tank

- Belgium = rain.
- Rain = free water.
- Underground tanks.
- Shower, toilet, wash, car, ...
- Not to cook with.



Eventually there is no big difference between both countries

6. Conclusions

- Learned a lot about diaphragm walls.
- Very interested in cellars.
- No big differences between Spain and Belgium.

For me this final project was a very interesting experience and I learned a lot new things about the way of building in Spain.

In this way I can say I completed my goal which I had set before my arrival.



Thanks for your attention.