

DIPLOMA PROGRAM FALL 2017

Diploma candidate: Jan K. Godzimirski and Vilde Vanberg

Institute: Architecture

Main supervisor: Christian Hermansen

Second supervisor: Catherine Sunter

External supervisor:

Company cooperation:

Title of project: Eco Moyo Mushroom Farm

ECO-MOYO MUSHROOM FARM

PRE-DIPLOMA REPORT

MYKO STUDIO

Vilde Vanberg & Jan Kazimierz Godzimirski

candidates: vilde vanberg
jan kazimierz godzimirski
institute: architecture
main supervisor: christian hermansen
second supervisor: catherine sunter
company cooperation: eco-moyo education center

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Figure 1. Panorama of the site (Vanberg, 2017)

Introduction

The aim of our diploma is to take part in every stage of what we believe is the complete architectural process. We wish to take into account the client, the social context and environmental challenges that come with building in a rural community located in the Kenyan tropics. Our focus will be to investigate architecture with limited resources.

Our collaboration with Eco-Moyo started January 2017, and springs out from an initiative by Lindsey Sanner, founder of Eco-Moyo Education Center. In Autumn 2016 Sanner contacted the Oslo School of Architecture to seek a possible collaboration to expand the current facilities with two classrooms of the freshly established Eco-Moyo. In the following semester (spring 2017) Jan became an assistant teacher for the Scarcity and Creativity Studio for the planning of the two classrooms which SCS was commissioned. This generated further collaboration with Sanner and an aspiration to make a long-term strategy for the site and help to provide more facilities for the education center. Initially Sanner proposed the need for more classrooms, sportsfield, playground, computer lab, staff room and offices for teachers. In addition she addressed the need for making an income for the school and aspiration for having facilities for gardening such as aquaponics, greenhouse and a farm to grow, serve and sell local food. Agricultural facilities can contribute in the making of a self sustained school; by producing the food consumed by students, sell produce as an income, etc. In addition the farming facilities can be integrated in the curriculum and help expand the vision of the green school principles.

To conclude; our diploma project is to propose an expansion plan and a mushroom farm. The farm will host specific facilities mimicking the climatic requirements of Oyster mushroom production. Situated in relation to the Educational Centre the ambition is to provide spaces where the students can interact and learn from the farm.



Figure 2. view from village road (Godzimirski, 2017)



Eco Moyo Educational Centre¹

The Education Centre consists of two parts: The first is *Eco Moyo Primary School* which is modelled on Green School Principals with emphasis is on practical approaches to each subject together with ethics, ecology, training in individual thinking and communication skills.

The second part is *Eco Moyo Farm* which will be based on Permaculture Principals for the cultivation of food crops, timber and animal husbandry. The goal is to meet the consumption needs of students and staff, while functioning as a demonstration site for locals and visitors.

Studio MYKO

Studio MYKO is our architectural diploma project that explores a mushroom farm in Kilifi, Kenya. The name "studio MYKO" derived from the Norwegian term describing the general study of mushrooms "Mykologi" or mycology in English.

We run a blog and instagram, with the aim of showing our project as a live and real initiative. We will engage in ongoing projects at Eco Moyo and take part in presentations and exhibitions to promote our work and collect sponsors. The project is to take part in the discussion on how architecture can contribute to cultural empowerment and sustainable growth in African countries.

¹ <https://www.ecomoyo.com/>



Vilde Vanberg

Has experience with workshops in participatory design approaches with 'Architecture Sans Frontieres- UK' (ASF-UK) in both South America (2013) and South Africa (2015). She has experience from the Scarcity and Creativity studio at AHO, planning and building a 1:1 project in Chile (2015) and Galapagos (2016). She has worked as an architectural assistant at Karakusevik Carson Architects (KCA), London, with focus on masterplanning and social housing. Work experience from UK made her familiar with different stages of building regulations and RIBA plan of works.



Jan Kazimierz Godzimirski

Has experience from the Scarcity and Creativity studio (SCS), when planning and building a 1:1 project in Galapagos autumn 2016. In spring 2017 he gained experience in Kenya while working as a teaching assistant with the SCS Studio when planning and building two classrooms at Eco-Moyo. In addition he has partaken in organizing the biggest student competition in the world, named 120 hours, and has great experience on planning and organizing project for larger groups.

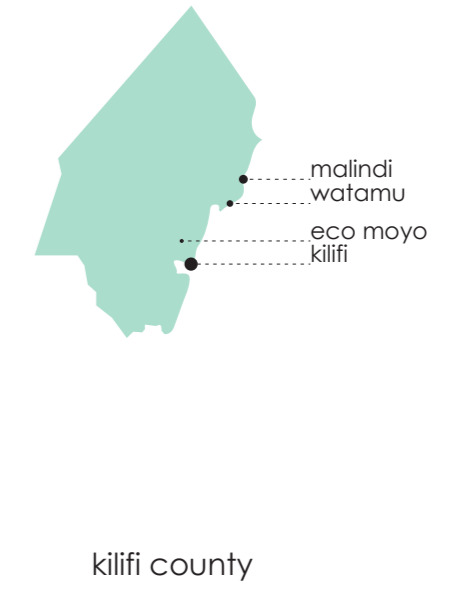
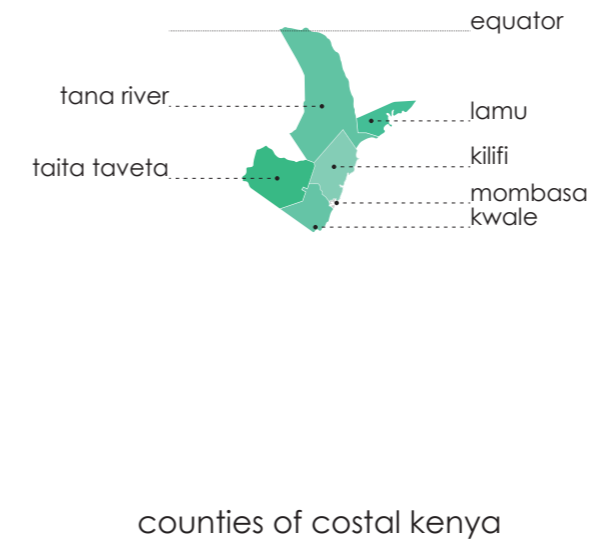
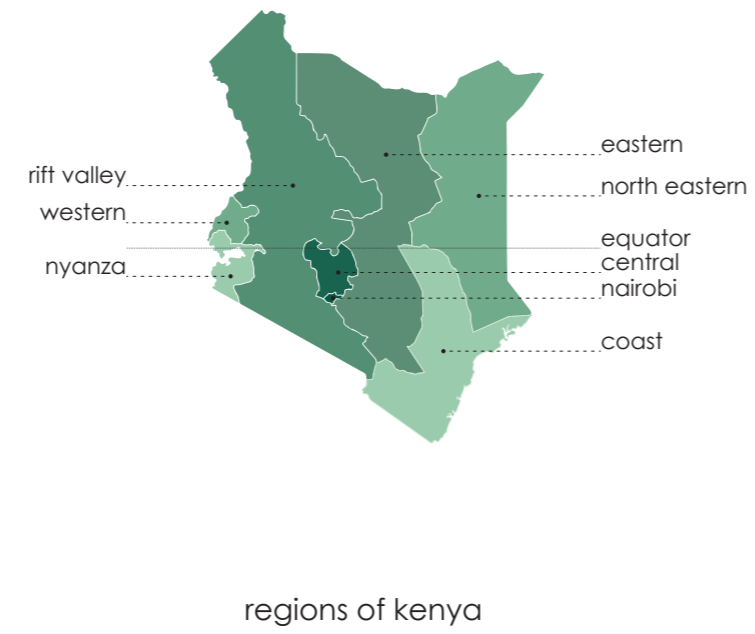
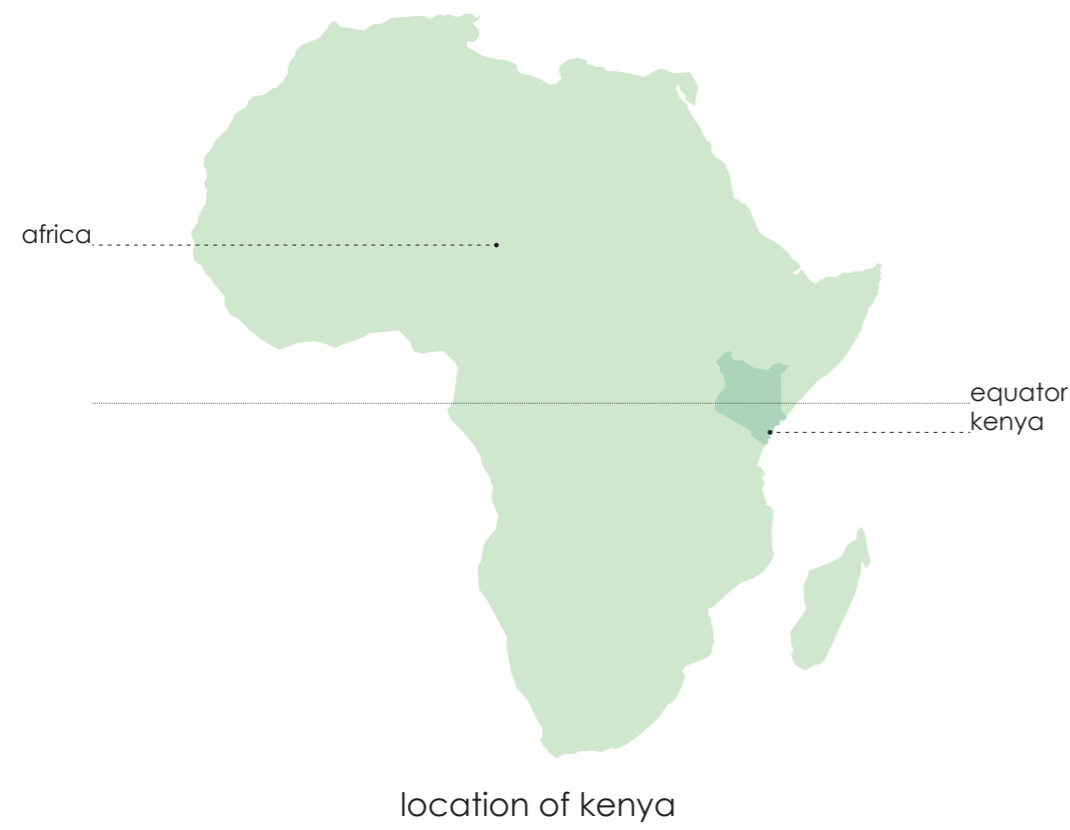


Figure 4. Illustrations of site and location (Godizmiski, 2017)

Site and client

Location : Ezo-Moyo, Kilifi, Kenya (-3.509092, 39.838974)

Client : Lindsey Sanner, Eco-Moyo Education Center

Area : 50 000 sqm

Project Year : 2014

Eco Moyo Educational Center, run by Lindsey Sanner a voluntary engagement, is situated in the outskirts of the coastal town Kilifi on the east coast of Africa. The project is modeled on Green School Principles and currently consists of 7 facilities on site (by May 2017).

The background for this project was Sanner's vision to provide a center for education with the focus on permaculture and self reliance. The starting point for the project was the lack of educational institutions in Kenya. The average student-teacher ratio in public primary schools, is 47 to 1 and over-crowded classes have led to a poor quality of education (Eco Moyo, 2016).¹ Despite the fact that Primary Education is free in Kenya, many parents cannot afford to pay for textbooks, uniforms and transport. Nationwide, only half of all primary students continue to secondary education and less than half of these proceed to college or university.

Youth unemployment rate has now exceeded 80% (Eco Moyo, 2016).² The project started in August 2014 and was supposed to be covering the basic needs of the students, staff and visitors, by providing water, food and shelter.

1 Sanner, L. and Pointon, L. (n.d.). Education in Kenya. [online] Eco Moyo Education Centre. Available at: <http://www.ecomoyo.com/education-in-kenya> [Accessed 7 Feb. 2017].

2 Sanner, L. and Pointon, L. (n.d.). Education in Kenya. [online] Eco Moyo Education Centre. Available at: <http://www.ecomoyo.com/education-in-kenya> [Accessed 7 Feb. 2017].

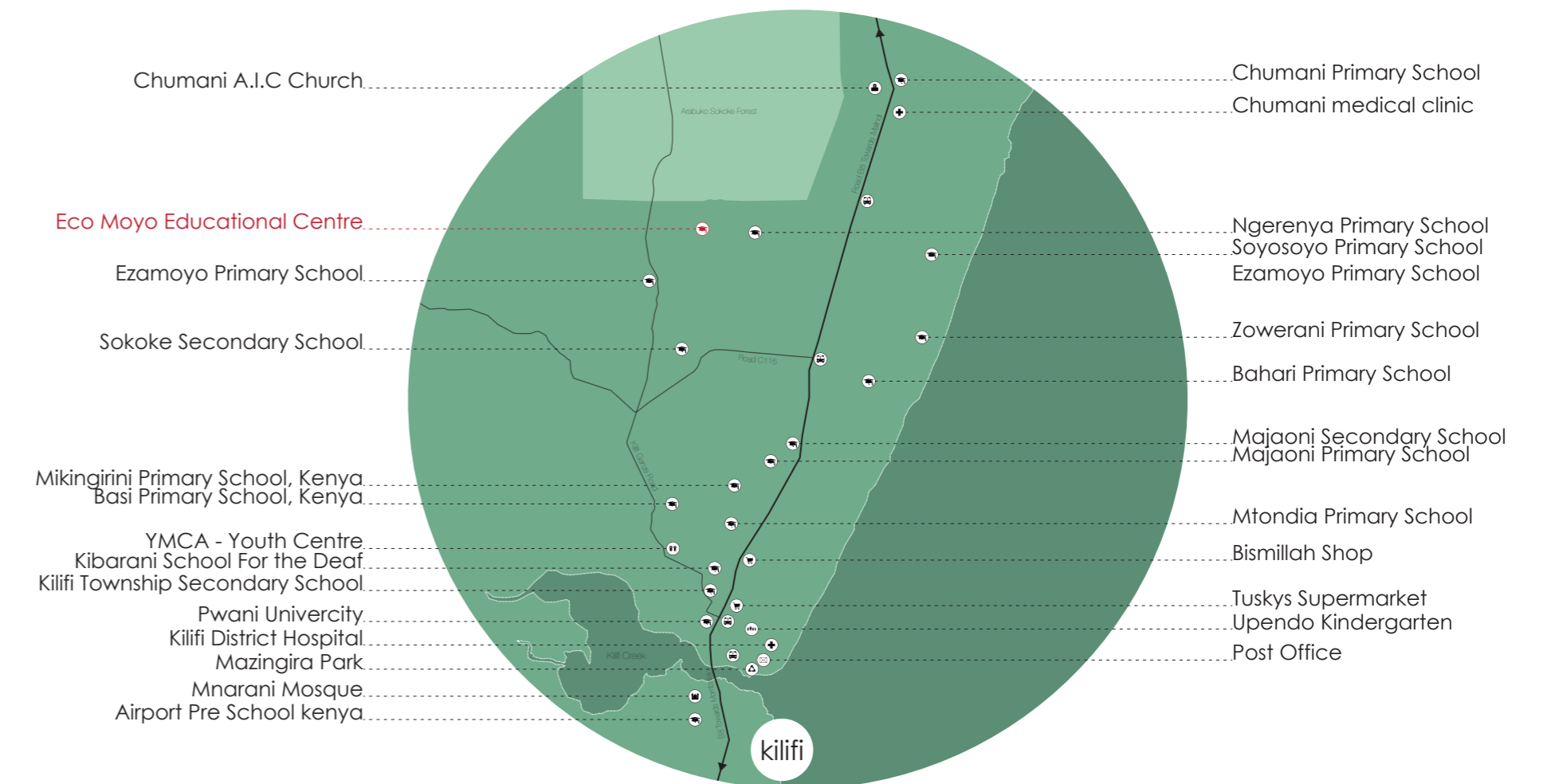


Figure 5. Illustrations of site analysis (Vanberg, 2017)

Environmental challenges

Eco Moyo aims to promote connections between schools, communities and the environments that sustain them. The aspiration of creating Green Schools include characteristics such as growing chemical-free and ecological food, utilizing water in a sustainable manner, executing waste management and recycling, conserving energy and natural resources and constructing buildings with natural materials to name but a few (Eco Moyo, Green School, 2016).³

Ongoing & future plans for Eco Moyo

In mid 2016 the Eco-Moyo Foundation bought a 5 hectare site. Currently it has a newly constructed path, four classrooms, a kitchen, dormitories for visiting children and staff units for visiting teachers. In addition there is a need for an office, school kitchen, dining hall for all pupils to eat, a playground, computer room and storage facilities for various objects. Furthermore the Eco-Moyo Foundation wants to develop into a self-sustaining farm and education center. The Farm is to be based on the Permaculture Principles for the cultivation of food crops, timber and animal husbandry. The goal is to meet the consumption needs of students and staff, while functioning as a demonstration site for locals and visitors.

3 Sanner, L. and Pointon, L. (n.d.). Green Schools. [online] Eco Moyo Education Centre. Available at: <http://www.ecomoyo.com/green-schools> [Accessed 7 Feb. 2017].



1. 07.30 Waking up in the dormitories. Students from Mtwapa village live at Eco-Moyo



2. 08.00 Breakfast



3. 08.30 Local students from Ngerenya walk to Eco-Moyo ready for first lecture



4. 09.00 Lecture in mathematics, English and geography in the new classrooms

ECO MOYO SHAMBA PLAN



5. 12.00 Communal lunch



6. 13.00 Outdoor classes, making compost, planting trees and growing vegetables



7. 14.30 Welcome new students and parents



8. 16.00 Site visit by assistant chief and discussions on further development

Figure 6. Illustrations of 24 hours routine (Vanberg, 2017)

Thesis

The facilities for the mushroom farm and the agricultural ethos for the school is central in the project and influence the layout for the expansion plan. When starting the diploma the school had already opened. Within short time classrooms, student dormitories and staff rooms were spread out on the site. The proposal for our expansion plan is based on the idea that the school would benefit from a more structured layout. Therefore the first step is to define and establish a plan for developing further, and find a location for the mushroom farm to benefit the overall layout of the school. Several outdoor learning facilities are arranged around the site in relation to the compost and watering systems. The mushroom farm will need to be integrated into this network to make it complete - and to improve the ecosystem. The aim is to provide a facility which can improve the overall ecosystem of the land, in addition to allow the students to interact and learn from the farm.

The size of the mushroom farm is to be small in scale with the possibility for expansion, and an aim of providing a substantial economic contribution to the school. Through our diploma project we want to get involved in the entire process of managing and designing the farm, with the aim of partaking in the construction process on site in Kenya in 2018. To realize this our diploma will include a set of construction drawings, a building manual for building in 1:1 and a business plan and budget. We seek to find sponsors to support the project financially. From September 2017 we've run a blog⁴ and Instagram⁵ to document important processes from start to finish.

The project will be illustrated through diagrams, models, drawings and illustrations in relevant scales. In addition we aim to make an overall expansion plan for the site which will illustrate the different stages to develop the project and site.

4 <https://studiomyko.wordpress.com>

5 <https://www.instagram.com/studio.myko>



Figure 7. sokoke forest (Zandbergen, 2016)

Manifesto

By transcending from macro to micro scale we want to design a building that can impact the site. Our ambition is to explore how one building can impact the ecology and further development of the site by having a significant role, yet contributing to a larger network and cycles. Does this building enrich the lives of the people who will use it and interact with it in other ways? Can its shape and placement improve how the students learn about growing and farming?

The topic of this thesis is chosen due to our aspiration of realizing a construction project where we are engaged in the full process. We want to get experience in managing a real and live project that addresses aspects of the relationship between architects and clients, users and stakeholders. Student projects normally only explore the first stages of appraisal, design brief, design development, but exclude the stages of pre-construction information, aspects of mobilisation, contact with contractor during construction and practical completion. We have an interest in partaking in all work stages with the ambition to present good architectural solutions when working with limited resources.

Our key themes can be summarized as:

- The social role of architects
- Designing with consideration of working with local workers and materials.
- Passive climatic solutions
- Building with an impact on a larger school area
- Designing with ambition to be realized and built in full scale.

Program

Masterplan : 1st. September 2017

Facility : 1st. November 2017

Design Freeze : 15th November 2017

Diploma : 15th December 2017

Eco Moyo Educational Center is a constantly growing project, and as of today there are currently 20 students living there and 50 students enrolled to the primary school. By January 2018 the school aim to host facilities for approximately 100 students and during autumn 2018 it is expected to grow drastically and facilitate a total of 200 students. This puts a lot of pressure on the 5 hectare piece of land and for the sustainable aspect concerning the school.

By studying and proposing a long term expansion plan we then define the location of the mushroom farm. The production process for cultivation mushrooms will be thoroughly investigated and the program will including facilities for:

- Laboratory, ca. 9m²
- Incubation room, ca 40m²
- Spore-running room, ca 25m²
- Cropping room, ca 50m²
- Office, ca 6m²
- Storage, ca 6 m²
- Learning and visitor center, ca 20 m²



Figure 8. Button mushroom farm, Hungary



Figure 10. Funghi Italia, Oyster Mushroom farm



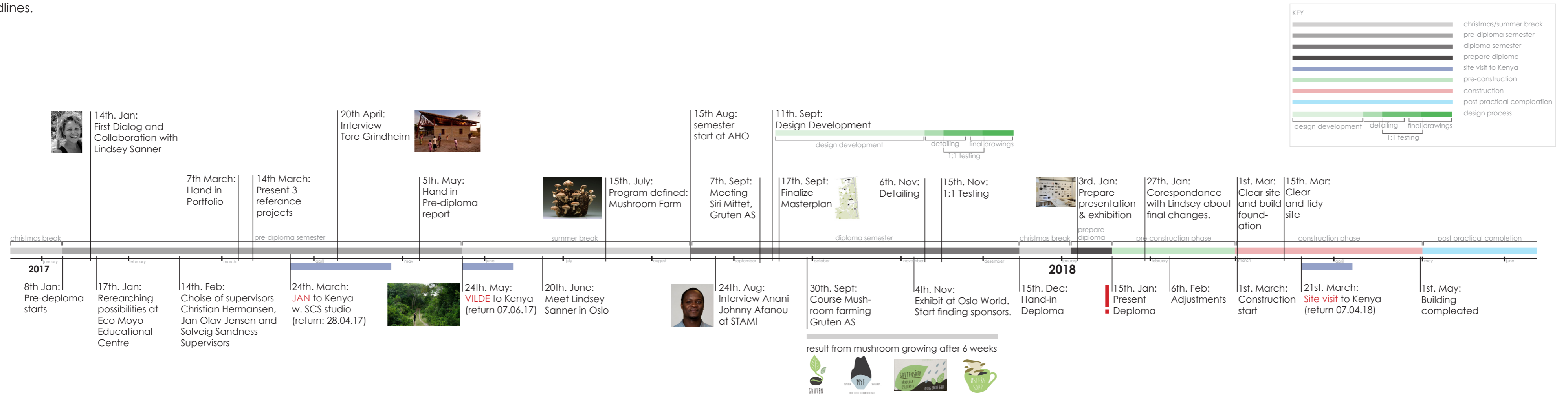
Figure 9. GroCycle Urban Mushroom Farm, UK



Figure 11. Oyster mushroom cultivation, Nambor

Approach & timetable

The project we plan stretches over a longer period and past the diploma hand-in and timekeeping is crucial. In the pre-diploma semester we aim to visit the site, meet the founder of Eco Moyo and research the context of the site and relevant precedents. During the research stage we aim to conduct interviews to support the design process. Close correspondence with our client and the user will form the project, as well as speaking to people with expertise in mushroom cultivation and farming facilities. We aim on spending 10-12 weeks on design development, before going into the detailing stage and produce a building manual for the construction process. When the design is set, our ambition is to display our project and look for sponsors to help fund the project. Our time line, calendar and gantt chart is crucial to meet our deadlines.



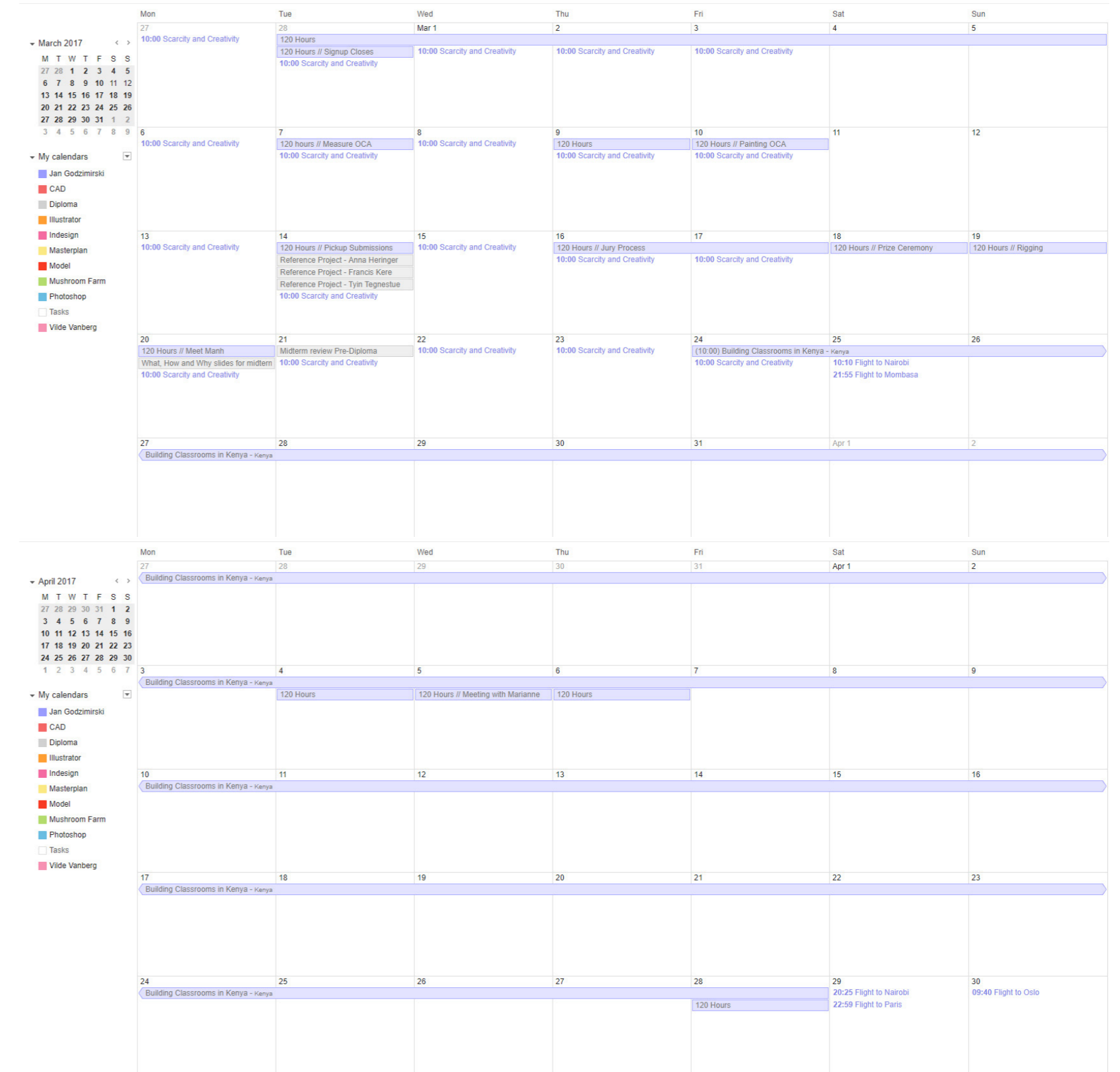
PROCESS STRUCTURE

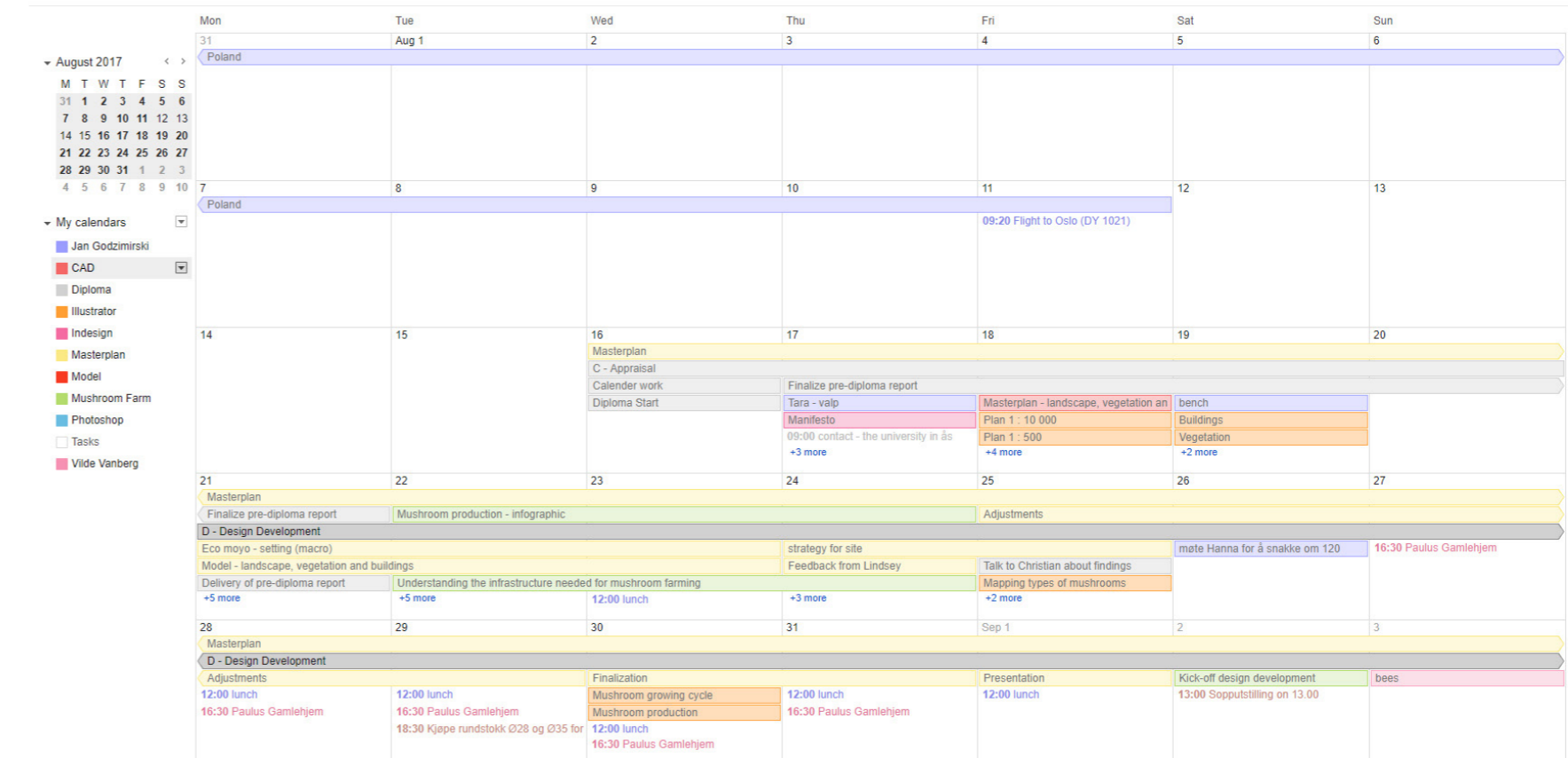
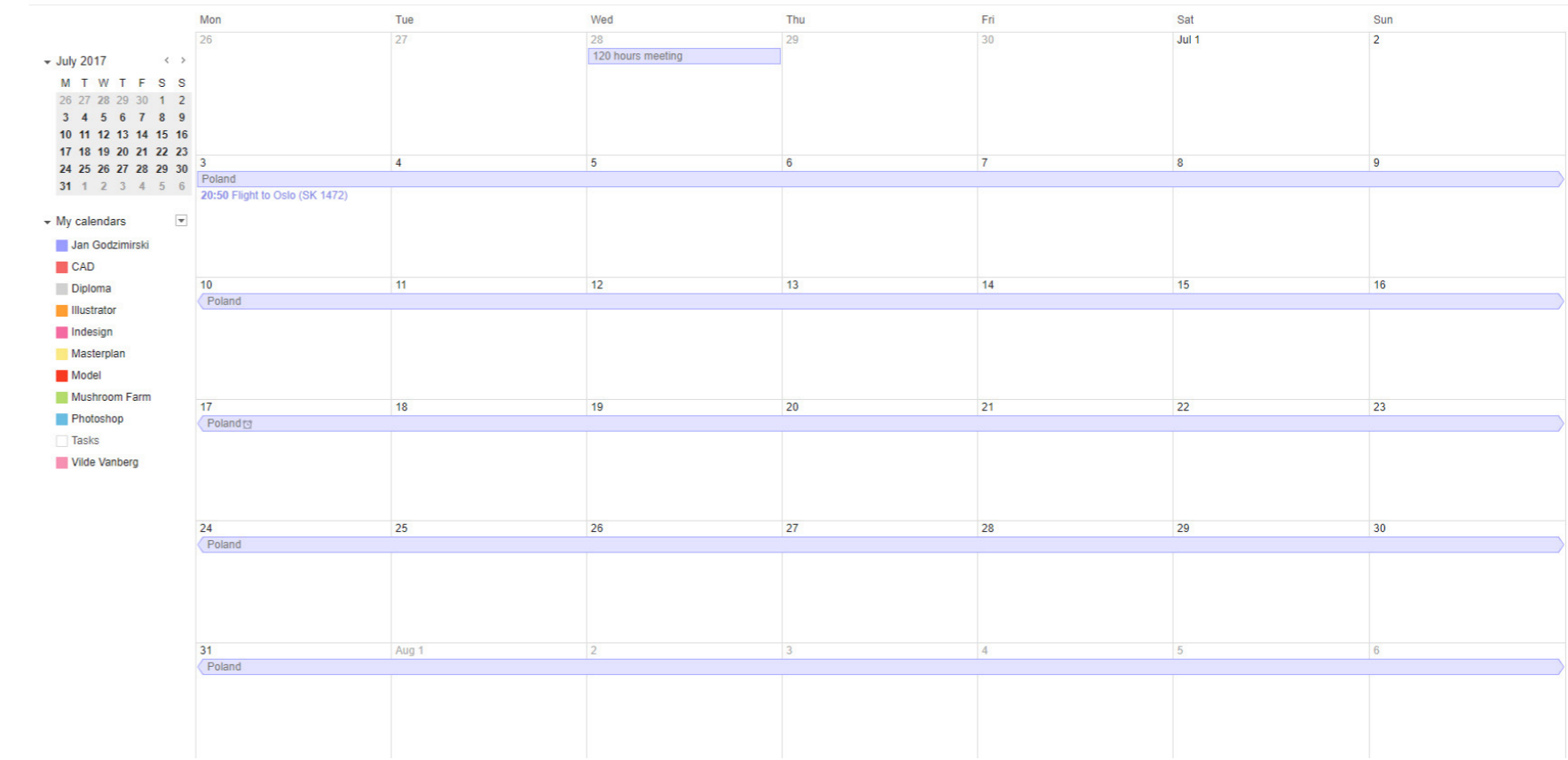
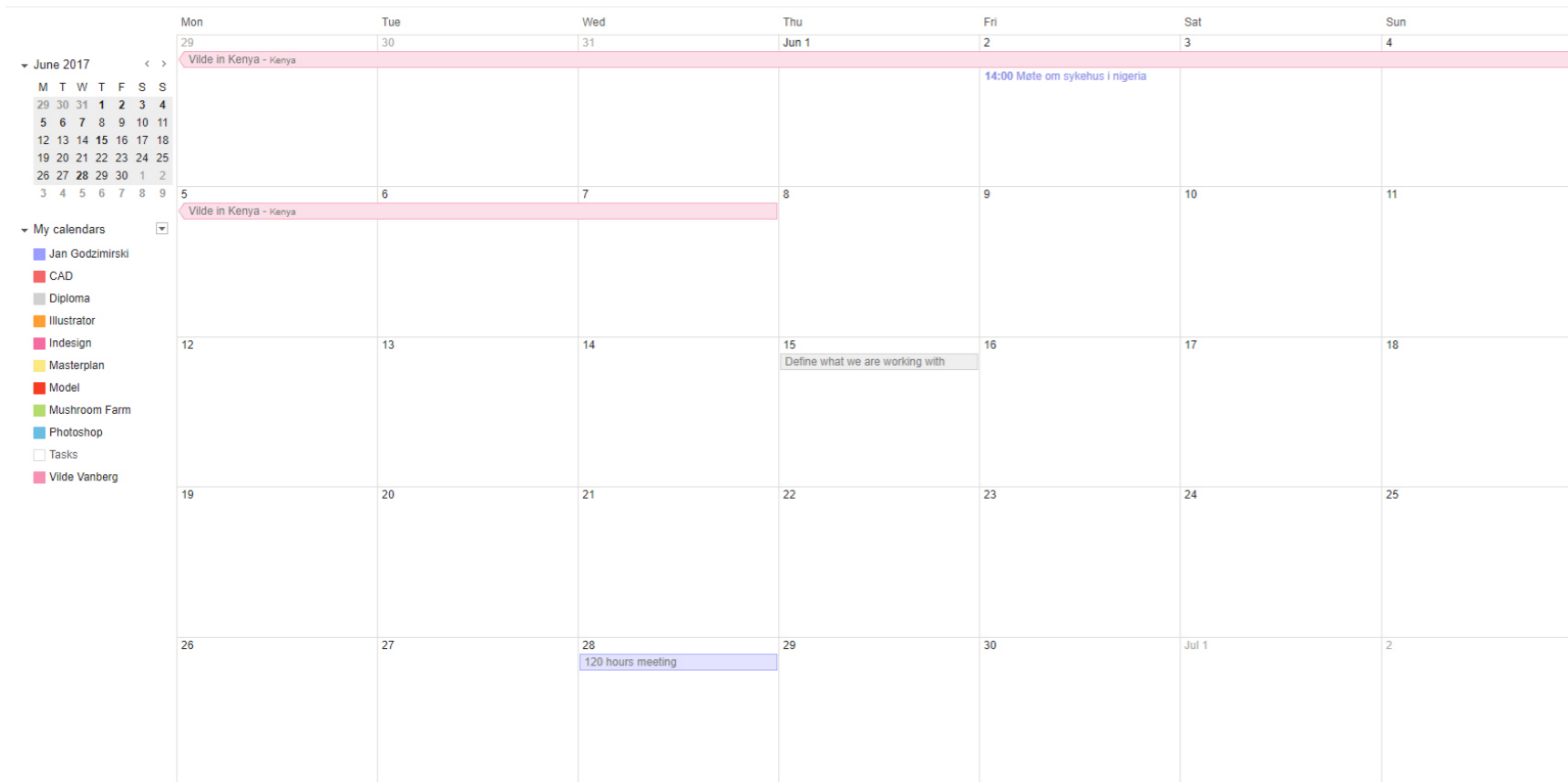
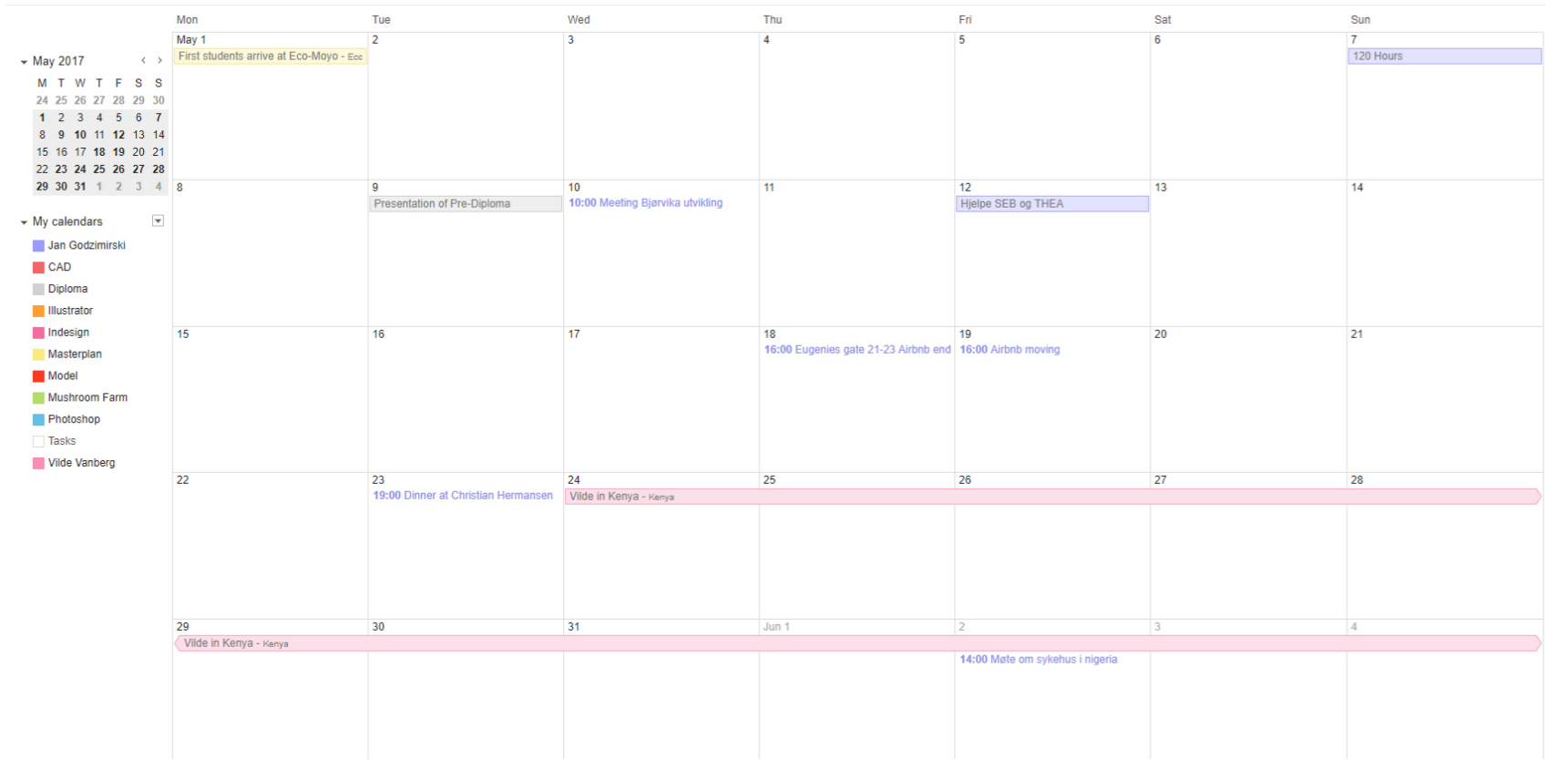
PREPARATION	A	Appraisal
	B	Design brief
DESIGN	C	Appraisal
	D	Design development
	E	Technical design
PRE-CONSTRUCTION	F	F1 F1 Production information
	G	Tender documentation
	H	Tender action
CONSTRUCTION	J	Mobilisation
	K	Construction to practical completion
USE	L	L1 L2 L3 Post-practical completion

MYKO STUDIO

First correspondence with Lindsey. Site visit. Research
Get overview of full site and list of potential facilities
Define program, confirm with Lindsey ongoing projects and what to build next.
Sketches, drawings, models and testing in 1:1
Explore design details and full scheme in 1:50, 1:20 and 1:10 details. Testing in 1:1
Design freeze. Drawing package with drawings, construction drawing, building manual and spread sheet for construction process.
Budget Order materials Organise and book local labor.
Construction process start Spring 2018. Organize and partake in construction process 15th March - 29th May.
Keep in touch with Lindsey when the building is in use

PRE-DIPLOM
DIPLOMA SEMESTER
POST DIPLOMA
CONSTRUCTION





	Mon	Tue	Wed	Thu	Fri	Sat	Sun
September 2017	28	29	30	31	Sep 1	2	3
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	Adjustments	Adjustments	Finalization	Mushroom growing cycle	12:00 lunch	Presentation	Kick-off design development
D - Design Development	12:00 lunch	12:00 lunch	Mushroom production	12:00 lunch	12:00 lunch	13:00 Soppustilling on 13.00	bees
D - Design Development	16:30 Paulus Gamlehjem	16:30 Paulus Gamlehjem	18:30 Kjøpe rundstokk Ø28 og Ø35 for	16:30 Paulus Gamlehjem			
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	11	12	13	14	15	16	17
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	diagrams	development diagram	snakke med solveg - designers saturs	12:00 lunch	(08:30) Work - designers Saturday -- Merdalsveien 29		12:00 send photos of DS to Vera
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	11	12	13	14	15	16	17
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	10:00 SCS presentations	sun path diagram	room analysis	study the life, activities and routs at ec	look at references - references	work on bench	
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	18	19	20	21	22	23	24
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	Martin Colot in Oslo	12:00 lunch	plants	12:00 lunch	12:00 lunch		
D - Design Development	10:45 male med lindsay	13:00 Pinup of diploma	12:00 lunch	(15:00) Juvet Landscapehotel	12:00 lunch		
D - Design Development	12:00 lunch	18:00 Hest dugnad	13:00 help lord with moving a table at s	19:00 Galleri			
D - Design Development	25	26	27	28	29	30	Oct 1
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	london	bench pick up	SCS - help	Galleri	Strategy	13:00 Mushroom growing course	
D - Design Development	11:15 Presentation at Lund and Statto	08:00 meeting at kulturhuset with christ	12:00 lunch	10:00 SCS Presentations	12:00 lunch	12:00 lunch	14:00 Send pictures/establish contact v
D - Design Development	12:00 lunch	09:00 David Turnbull	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	14:00 Send pictures/establish contact v
D - Design Development	14:00 bench - finish	16:45 Mate Mauricio at Byporten					

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
October 2017	25	26	27	28	29	30	Oct 1
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	london	bench pick up	SCS - help	Galleri	Strategy	13:00 Mushroom growing course	
D - Design Development	11:15 Presentation at Lund and Statto	08:00 meeting at kulturhuset with christ	12:00 lunch	10:00 SCS Presentations	12:00 lunch	12:00 lunch	14:00 Send pictures/establish contact v
D - Design Development	12:00 lunch	09:00 David Turnbull	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	14:00 Send pictures/establish contact v
D - Design Development	14:00 bench - finish	16:45 Mate Mauricio at Byporten					
D - Design Development	2	3	4	5	6	7	8
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom	kenyan italians from where?	09:15 Picture Mushroom	Grasshopper - circle packing	Grasshopper - hatching
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	16:45 Pictures Mushroom	12:00 Munch Museet	16:45 Pictures Mushroom	20:00 Beers with architects	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom
D - Design Development	9	10	11	12	13	14	15
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	sketch	Concept models	09:15 Picture Mushroom	Research more plants	Sketch	09:15 Picture Mushroom	09:15 Picture Mushroom
D - Design Development	09:15 Picture Mushroom	09:15 Picture Mushroom	12:00 lunch	Sketch linear building	Solve plan	18:00 Jon får i kål	09:15 Picture Mushroom
D - Design Development	12:00 lunch	12:00 lunch	16:00 Talk with Christian	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom
D - Design Development	12:00 lunch	15:00 Leireklubben		+3 more	+2 more		
D - Design Development	16	17	18	19	20	21	22
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom	Work at Vides	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom
D - Design Development	10:00 Versted på hjul Kick-off	12:00 lunch	12:00 lunch	09:15 Picture Mushroom	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	23	24	25	26	27	28	29
D - Design Development	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan	Masterplan
D - Design Development	Work on masterplan	09:15 Picture Mushroom	09:15 Picture Mushroom	Disagreement	comple presentation	3d model	Finish plan and section for review
D - Design Development	09:15 Picture Mushroom	12:00 lunch	12:00 lunch	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	30	31	Nov 1	2	3	4	5
D - Design Development	Masterplan	09:15 Picture Mushroom	Plan and Render for Oslo World	Layout for Oslo World Exhibition	Photo Diploma	Afro Mania - Kulturhuset	Send mail to Kunlé Adeyemi
D - Design Development	review with Cathrine	12:00 lunch	09:15 Picture Mushroom	Photo Diploma	Print for Oslo World	09:15 Picture Mushroom	Send mail to Nick
D - Design Development	09:15 Picture Mushroom	20:00 Calypso Rose - Oslo World	12:00 lunch	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom	Sand model
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	09:15 Picture Mushroom

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
November 2017	30	31	Nov 1	2	3	4	5
D - Design Development	Masterplan	09:15 Picture Mushroom	Plan and Render for Oslo World	Layout for Oslo World Exhibition	Photo Diploma	Afro Mania - Kulturhuset	Send mail to Kunlé Adeyemi
D - Design Development	review with Cathrine	12:00 lunch	09:15 Picture Mushroom	Photo Diploma	Print for Oslo World	09:15 Picture Mushroom	Send mail to Nick
D - Design Development	09:15 Picture Mushroom	20:00 Calypso Rose - Oslo World	12:00 lunch	09:15 Picture Mushroom	09:15 Picture Mushroom	09:15 Picture Mushroom	Sand model
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	09:15 Picture Mushroom
D - Design Development	6	7	8	9	10	11	12
D - Design Development	Review architectural concept	Plan	Section	Layout Pre-Diploma	Fix pre-diploma report	Galleri	Detailed sections
D - Design Development	review with Cathrine	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	13:00 meeting Jan Olav	Pre-Diploma
D - Design Development	09:15 Picture Mushroom	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch
D - Design Development	13	14	15	16	17	18	19
D - Design Development	Finish Pre-Dipoma	Bag new mushrooms	E - Technical Design	12:00 lunch	12:00 lunch		
D - Design Development	Send Pre-Diploma to Cathrine	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	20	21	22	23	24	25	26
D - Design Development	Bag new mushrooms	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	27	28	29	30	Dec 1	2	3
D - Design Development	E - Technical Design	Bag new mushrooms	12:00 lunch	F - Production information	12:00 lunch		
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
December 2017	27	28	29	30	Dec 1	2	3
D - Design Development	E - Technical Design	Bag new mushrooms	12:00 lunch	F - Production information	12:00 lunch		
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	4	5	6	7	8	9	10
D - Design Development	F - Production Information	Bag new mushrooms	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	11	12	13	14	15	16	17
D - Design Development	F - Production Information	Bag new mushrooms	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch	12:00 lunch		
D - Design Development	18	19	20	21	22	23	24
D - Design Development	Bag new mushrooms	09:30 Flight to Warszawa (D8 342)					
D - Design Development	25	26	27	28	29	30	31
D - Design Development				12:00 Flight to Oslo (D8 343)			

Reference projects

The precedent studies we have looked into for our project, varies in scale and holds different focus. Our program is situated within a school site, providing distinctive facilities for mushroom production, placed on a sloping site and with the purpose of being built in full scale.

Reference project no. 1 -overall layout for a large site

Its been useful to study different types of school typologies to look at structures and facilities which are spread out, but yet connected on a larger site. Rudolf Steiner Schools and Bali Green School was relevant for our studies when looking into an overall layout for a large school site with several outdoor facilities and different garden zones.

Reference project no. 2 - placement on site

The orientation and placement of the building effect energy consumption and the way it works within it surroundings, such as shading from trees, placed in a slope, or dug under ground. By looking at reference projects which is highly effected by its soundings we have drawn inspiration which both effect climate conditions, but also how its architectural form and language sits within its context.

Reference project no. 3 - climate conditions

Mushroom production require very significant climate conditions. We have investigated possibilities of achieving specific thermal conditions despite working on a site with limited resources and no electricity. By looking at project which mimics nature and uses natural ways of ventilating and cooling down buildings, we found studies of old traditional pit houses relevant when designing the spore running room for mushroom production.

Reference project no. 4 - completion and construction

With the ambition of part-taking in complicating and construction the building, we have researches the work of other architects who has done the same. Much must be taken into consideration when working in a foreign country and other communities. Correspondence and communication with people with other language and limited reading/writing skills. Allocating jobs and how to structure the construction process. We are restricted by limited resources, materials and budget. By looking at work by Frances Kere, Anna Heringer and Tyin Tegnestue, to name but a few, we have investigated the role between architecture, client and community.

Casa Ugalde, Jose Antonio Coderch

Casa Ugalde is situated on a hilltop site overlooking the sea near the village of Caldes d'Estrac. The slope, the rocks, pine trees and stunning view is partaken in the architectural layout, 'growing out of the brow of a hill' stated by Colin Davis (2006).⁸

Responding to its context and landscape the stone retaining walls following the contour lines create an organically shaped terrace. 'Here the house is a restless articulated from that seems reluctant to remain confined within the boundaries of the space prepared for it' (C. Davis) Steps down, extended walls and room oriented for climate conditions create a journey through different levels and outposts. Our ambition for the mushroom farm is to design a building which sits well in the landscape, which responds to existing slope gradient and surrounding vegetation.



Figure 18. (Hic Arquitectura, 2012)



Figure 19. Sections (Arquitecturayempresa, 2011)

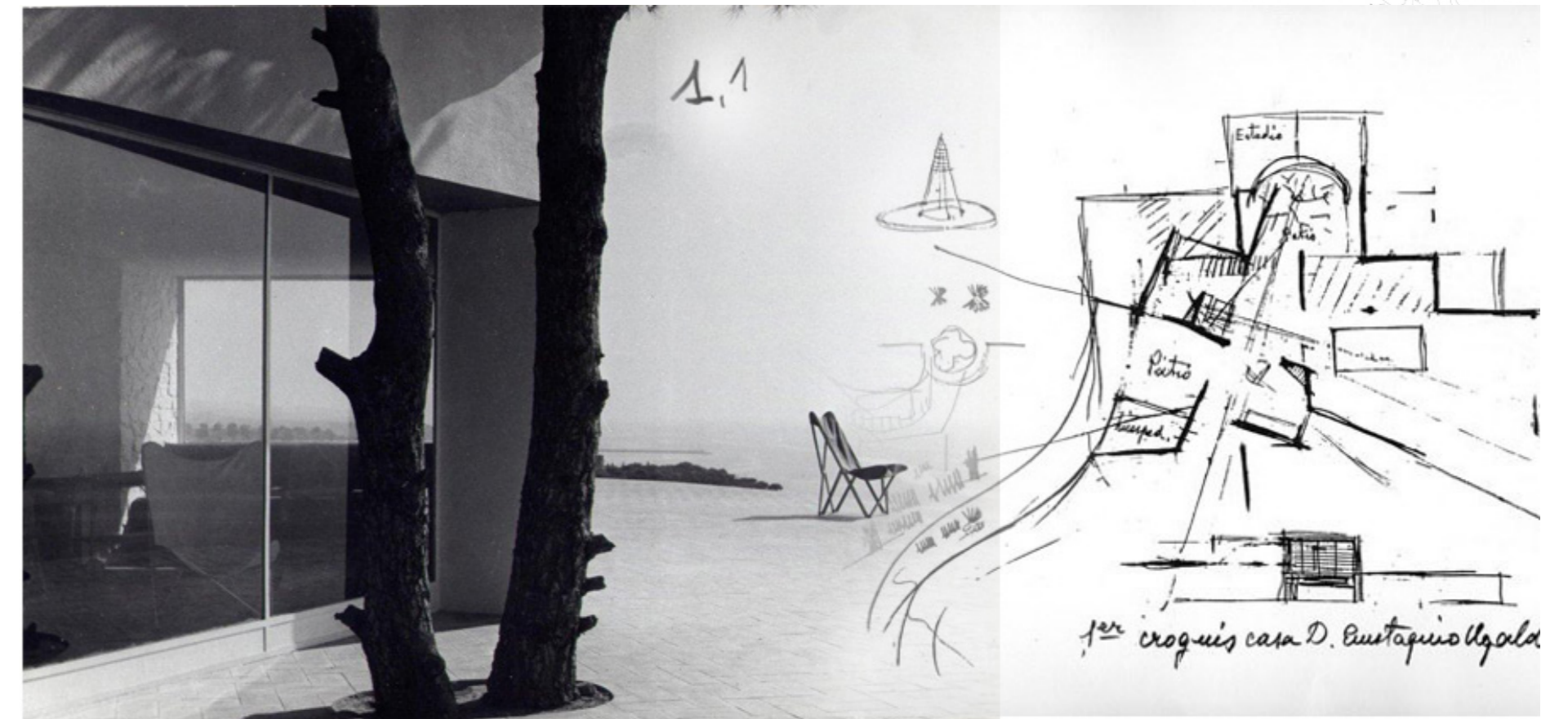


Figure 20. (BZ arquitectura, 2002)

8. Book: Key Houses of the Twentieth Century Plans, Sections and Elevations, p. 12-13 Colin Davies, 2006, Publisher, Laurence King

Climatic zones

Pit house

The pit house is a great example of a sustainable architecture that takes into account the site and while serving a very specific function.

The structure adapts to the ecological and environmental features of the specific space or site. It has minimal impact and uses the subtractive method as the main construction technique.

Through history a pit house has been a space for storing food. Therefore it can be appropriate for cultivating mushrooms as its main feature is that it uses the mass of the surrounding soil as an element to deal with heat fluctuation - thus keeping the temperature inside the structure more constant between day and night.

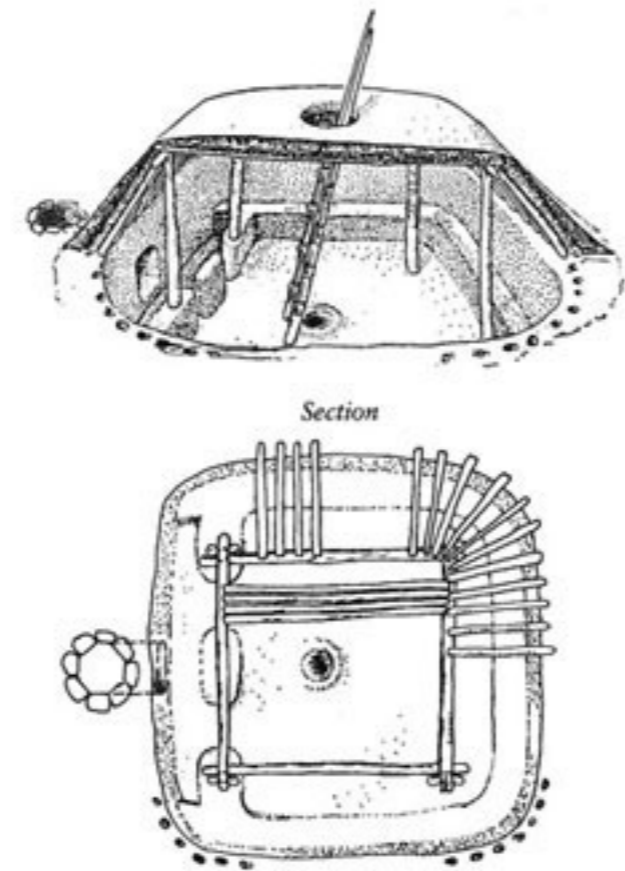


Figure 16. Pit house plan (NSCU, 2011)



Figure 17. A reconstruction of a pithouse, without the earthen roof, in India (Deschenes, 2007)

Construction project in rural community

Frances Kéré

The importance of community engagement and participation is central in Francis Kéré's work and has a catalytic effect in the community. Kéré defines himself as "a bridge between cultures, between the technically and economically developed countries of 'the north' and the less developed African countries (the south)" (Harvard Graduate School of Design, 2011).⁹ Kéré's expertise in preserving and developing traditional clay techniques and his engagement of local communities has made him renowned internationally. His ability to design well-functioning spaces is combined with a significant building technique where the local residents are directly involved in the building process.

What we find inspiring about his architecture is the rhythm and simplicity of his design. Allowing him to make methods that are easily understood by anyone partaking in the construction of his buildings. It seems as if there is very little room for mistakes as every element is clearly defined at follows a simple but refined construction.

We acknowledge that Kéré's relation to the local community he was working with, is very different to the building work we will carry out. We might meet issues with language barriers and culture differences, but raising awareness about this in advance can help prevent misunderstandings. In addition is the project we are building is a continuation of an ongoing collaboration between Eco Moyo and AHO. The local workers are familiar with the layout of the previous projects and relations are already built.

Tyin Tegnestic

Issues regarding cultural understanding and building in foreign countries was also raised when interviewing

9. Harvard Graduate School of Design (2011) Francis Kéré, "Bridging the Gap" [Online] Available from <http://www.gsd.harvard.edu/#/events/francis-k-r-bridging-the-gap.html> [Accessed: 10th December 2015]

Tore Grimstad, who collaborated with Tyin Tegnestic on designing and building a youth center in Niafourang, Senegal. He shared their experience in setting up building teams and creating good relations on site when planning the projects. They arranged building teams consisting of both local workers and volunteer students, as well as hosting small workshops where their expertise could be shared and exchanged. This allowed for good collaboration and the students to learn local building techniques which were implemented in the design.

Being situated in a rural setting where unemployment is high and work wanted. It is important to take these things into consideration and have both communities benefit from each other. We can benefit from available workforce, and they can help with the farm in periods of unemployment, and earn a small amount. A question that has to be addressed is about manual labor versus machinery or more technical solutions. This is a topic that has come up a few times when talking to people, and it is therefore important to clarify some of our choices or ethics surrounding the project.

Anna Heringer

The work of Anna Heringer is relevant as she designed and built METI Primary school in Rudrapur, India, together with local craftsmen, pupils, parents and teachers. The building was constructed over a 4 month period and uses traditional materials of earth and bamboo, but adapted in new ways to make them more durable (Designboom, 2010).¹⁰

The building is situated in a tropical climate and the thermal capacity of the different materials used in the buildings assure to make a comfortable climate within the school. The thick earth walls offers a cooling effect in these facilities, yet the soft interiors of these spaces provides areas for touching and for the students to play and crawl into.

10. Design Boom (2010) Meti School [Online] Available from <https://www.designboom.com/architecture/earth-architecture-handmade-school-bangladesh/> [Accessed: 29th November 2016]



Figure 21. Gando Primary School by Francis Kéré, during construction (Moma, 2003)



Figure 22. A. Heringer (Archdaily, 2010) Figure 23. F. Kéré (Kere Architecture, 2017) Figure 24. Youth Centre (Archdaily, 2012)

References

- 1 Sanner, L. and Pointon, L. (n.d.). Education in Kenya. [online] Eco Moyo Education Centre. Available at: <http://www.ecomoyo.com/education-in-kenya> [Accessed 7 Feb. 2017].
- 2 Sanner, L. and Pointon, L. (n.d.). Education in Kenya. [online] Eco Moyo Education Centre. Available at: <http://www.ecomoyo.com/education-in-kenya> [Accessed 7 Feb. 2017].
- 3 Sanner, L. and Pointon, L. (n.d.). Green Schools. [online] Eco Moyo Education Centre. Available at: <http://www.ecomoyo.com/green-schools> [Accessed 7 Feb. 2017].
- 4 <https://studiomyko.wordpress.com>
- 5 <https://www.instagram.com/studio.myko>
- 6 "The Green School / IBUKU" 13 Oct 2010. ArchDaily. Accessed 1.oct 2017. <<https://www.archdaily.com/81585/the-green-school-pt-bambu/>>
- 7 The Green School, Caroline James 12. Dec 2010, Accessed: 10. Oct 2017. Available <https://www.domusweb.it/en/architecture/2010/12/12/the-green-school.html>
- 8 Book: Key Houses of the Twentieth Century Plans, Sections and Elevations, p. 12-13 Colin Davies, 2006, Publisher, Laurence King
- 9 Harvard Graduate School of Design (2011) Francis Kéré, "Bridging the Gap" [Online] Available from <http://www.gsd.harvard.edu/#/events/francis-k-r-bridging-the-gap.html>[Accessed: 10th December 2015]
- 10 Design Boom (2010) Meti School [Online] Available from <https://www.designboom.com/architecture/earth-architecture-handmade-school-bangladesh/> [Accessed: 29th November 2016]

Picture reference

- Page 21, Figure 7.Sokoke Forest (Zandbergen, 2016), Available at: <https://www.safaribookings.com/arabuko/photos>
- Page 25, figure 2 Button mushroom farm, Hungary, Available at: https://upload.wikimedia.org/wikipedia/commons/c/c3/IMG_0408_-_Hungary_-_Mushroom_Farm.JPG
- Page 25, figure 3 GroCycle Urban Mushroom Farm, UK, Available at: <https://www.kickstarter.com/projects/1514164848/grocycle-help-secure-our-urban-mushroom-farm>
- Page 25, figure 4 Funghi Italia, Oyster Mushroom farm. Available at: <https://www.funghitalia.com/galleria>
- Page 25, figure 5 Oyster mushroom cultivation, Nambor Availbale at <https://www.flickr.com/photos/faoofttheun/22822905525>
- Page 36, Figure 12. Site plan (Raw Wine, 2013) Availbale at <http://www.rawwine.com/blog/permaculture-design>
- Page 36, Figure 13 (Green Camp Bali, 2017) Availbale at <http://www.greencampbali.com/green-school/>
- Page 36, Figure 14 (Eco Custom Homes, 2012) Availbale at: <http://ecocustomhomes.com/2012/08/25/pt-bamboo-pure-green-school-bali/>
- Page 36, Figure 15 (Dar Dan Voyages, 2015) Availbale at: <http://www.dardanvoyages.com/2015/12/24/saraswati-day/>
- Page 38, Figure 16. Pit house plan (NSCU, 2011) Availbale at: <http://images.lib.ncsu.edu/luna/servlet/view/all/when/Native%20>
- Page 39, Figure 17 (Deschenes, 2007) Availbale at: https://www.trekearth.com/gallery/North_America/United_States/West/Utah/Anasazi_State_park/photo754479.htm

Page 40, Figure 18 (Hicarquitectura, 2012) Availbale at: <http://hicarquitectura.com/2012/01/jose-antonio-coderch-manuel-valls-casa-ugalde-caldes-destrac/>

Page 41. Figure 19 (Arquitecturayempresa, 2011) Availbale at: <https://www.arquitecturayempresa.es/noticia/casa-ugalde-una-vivienda-infinita>

Page 41. Figure 20 (BZ arquitectura, 2002) Availbale at: <http://bzarquitectura.com/coderch-arquitecto/>

Page 43, Figure 21. Gando Primary School by Francis Kere, during construction (Moma, 2003) Availbale at: https://www.moma.org/interactives/exhibitions/2010/smallscalebigchange/projects/primary_school.html

Page 43, Figure 22. A. Heringer (Archdaily, 2010) Available at: <https://www.archdaily.com/51664/handmade-school-anna-heringer-eike-roswag>

Page 43, Figure 23. F.Kéré(Kere Architecture, 2017) Available at: <http://www.kere-architecture.com/>

Page 43, Figure 24. Figure 24. Youth Centre (Archdaily, 2012) Available at: <https://www.archdaily.com/217208/youth-center-in-niafourang-project-niafourang>