

Annexe S.2

The formal reports of three workshops: Delft/ Bucharest/ Milan



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CWP

Confronting Wicked Problems : Adapting Architectural Education to the New Situation in Europe

Agreement no.: 2014-1-N001-KA203-000366

The Project

Project title: Confronting Wicked Problems : Adapting Architectural Education to the New Situation in Europe	Project period: 01.09.14 – 31.08.17
Grant awarded: 284 815 EUR	
Agreement number: 2014-1-N001-KA203-000366	
Partner institutions: The Oslo School of Architecture and Design (AHO), coordinator European Association for Architectural Education (EAAE) Architect's Council of Europe (ACE) Politecnico di Milano Universitat Politecnica de Catalunya (ETSAB) Universiteit Hasselt Ceske Vysoke Ucení Technické v Praze Technische Universiteit Delft Universitatea de Arhitectură și Urbanism "Ion Mincu" (UAUIM) Università degli studi di Genova (UNIGE)	

The Activity

Name of the activity (please choose): Transnational Project Meeting/Staff Training Event/Charrette
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Name of think tank: Think Tank 3, Sustainability
Purpose of the activity: 1 st Wicked Workshop on Architectural and Urban Sustainability
Date and time for the activity: 19 th -25 th April 2015
Grant awarded to this category of activity (YES/NO): YES
Receiving organization/hosting institution: Faculty of Architecture and the Built Environment Delft University of Technology, The Netherlands
Mandatory attendance for the following partners: Delft University of Technology, Ion Mincu Technical University Bucharest, Politecnico Milano, EAAE, ACE
Participants (name and institution): Delft University of Technology Susanne Komossa S.Komossa@tudelft.nl Negar Sanaan Bensi N.SanaanBensi@tudelft.nl Ion Mincu University of Architecture and Urbanism Zeno Bogdanescu zenobogdan@yahoo.com Ana-Maria Dabija am.dabija@yahoo.com Maria Ionescu (volunteer) maria.ionescu@gmail.com Politecnico Milano Adalberto del Bo adalberto.delbo@polimi.it Maria Vittoria Cardinale arch_vittoria.cardinale@hotmail.it EAAE Maria Faraone mfaraone@brookes.ac.uk ACE Veronika Schröpfer veronika.schropfer@ace-cae.eu Maria do Carmo Caldeira carmo.caldeira@ordemosarquitectos.pt
Documentation from the meeting: 1: Report 2: Presentations 3: Photographs, film 4: Other documentation 5: Proofs of attendance



Report:

Topics: *The architectural profession continues to suffer from the economic crisis. Between 2008 and 2012 construction output fell at a faster rate than GDP in general, impacting workload salaries and profits in the architectural profession, and leading to higher unemployment rates and more architects working part time. Alongside this development more architects are educated in Europe than ever before. This new normal also implies that the pressure on the employed architects is increasing. This project, including its workshops, addresses the Wicked problem of what should be the contribution of education's sector to a successful adaption to this "new normal".*

With the following main aims, the project will create synergies both between European architecture schools and between the educational and professional sectors:

- *Improving the architectural teaching methods in European schools.*
- *Strengthening the architectural graduates' ability to face the wicked problems at hand, and thus improving their employability.*





- Strengthening cooperation and exchange of good ideas and best practices within the European Architectural Educational Area, and strengthening the EAAE as the central infrastructure/arena for production and dissemination of relevant new knowledge.

- Strengthening the bonds between the profession sector (ACE) and the education sector (EAAE) and connecting Academia, Education and Profession facing the 'New Normal' in Europe.

Thus, Adapting Architectural Education to the New Situation in Europe, the Delft Department of Architecture / Chair of Public Building has been invited to a one-week workshop which was focusing on the wicked problem of Sustainability in Architectural Design. The issue of 'sustainability' and cities includes almost all of our Built Environment. As a wicked problem it faces, rather fundamental contradictions.

In order to address the various dimensions of 'sustainability', correct research questions are needed, running through all urban and building scales from city to detail and from building to territory. Additionally specific technical knowledge and innovative solutions have to be combined with design knowledge in order to develop adequate future architectural and urban models. All of these models are related to the un-going transformation of our Built Environment and have to take into account contemporary socio-cultural, technical, economic and political changes.





Planning: *The planning of the workshop included a matrix of various organizations which enhanced the possibility of revealing the complexity of the thematic, i.e. sustainability and the introduction and experimentation with various design scale, tools as well as educational method.*

- the program of the one-week workshop: *the program of the Wicked Workshop Week included several field trips to Rotterdam, Delft and Amsterdam, visiting projects which address or deal with this theme from various points of view. Moreover, the daily thematic lectures and subsequent three- day intensive design workshops were organized to stimulate and activate the involvement of the students and tutors and lecturers. Hence, the first day (19th April) began with a walk tour in DELFT INNERBLOCK, for the second day (20th April) two lecture series on the topic of the educational curriculum of Master of Architecture in TU Delft were held and afterwards a site visit and field study in Rotterdam, were planned. The next three days (21st, 22nd, 23rd April) were assigned to a three-day charrette, starting with a lecture by an academic or professional on a specific topic regarding the sustainability, continuing with the intensive work of students and tutoring sessions and ending with a short presentation in which the outcome of the day was discussed and debated. The last day of the charrette (24th April) included the final presentation of the students, concluding notes by the organizers and a final meeting with the students in which they were asked to reflect on the outcome of workshop and teaching methods. And eventually the last meeting among tutors from various institutions and academia to discuss and evaluate and debate the results of the workshop and to propose new ideas for the next coming Wicked Problem Workshop in Bucharest.*





- **Charrette working methods:** *The wicked problem of sustainability must be discussed at a European level. Due to the European 'new normal' there is a stronger need, than ever before, for European architectural educators to stand together and share the best practices. Hence, the sustainability workshop hosted 10 students from Delft and accordingly 10 students from Ion Mincu University of Architecture and Urbanism in Bucharest and Politecnico di Milano in Milan (each university 5 students). To maximize the interaction among the students from various universities (thus different teaching methods and cultures), the students were divided in five mixed groups to enhance the possibility of sharing, discussion and exchange and thus learning and experimenting.*





- **Charrette contents:** Regarding the theme of the workshop, i.e. sustainability, our aim was while addressing the complexity and multi-faced of the topic- to provide the possibility of a rather deeper understanding of specific selected dimensions of the problem and an intense experimentation on the proposed topic and teaching methods.

To do this, it was necessitated to work with three different scales, methods and design tools. The concern was to position the problem in a bigger context and to take distance from mere generic-technical problem-solving in fragmentary situations. Thus, by positioning the urban block at the centre of our investigation and design, we focus on the wicked problem of sustainability in architectural design. In this case we studied the urban block not only in regard to the various scales – as an urban entity, as being part of an urban section and urban metabolism such as its relation to water and greenery and as well as in craftsmanship of the details- but also in relation to private sphere and public realm and eventually in its very act of drawing and making. The first day charrette addressed the problem of sustainability within the scale of an urban block and in relation with the changes of the city. The students were expected to reflect on a specific urban block- the Cinerama Block- in Rotterdam. The second charrette focused on the territorial scale of the topic by working through a 'territorial section' of the site, in order to address the processes and inter-relations involved in approaching architectural sustainability. Eventually, the last charrette, raised the problem of materialization and the exercise of focusing on specific 'point' through making 'drawing', as the proposed tool for this exercise.





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Management: *Delft Faculty of Architecture, A2 BE managed the preparation and organization of the workshop and hosted the meetings. Next to the two representatives of TU Delft architecture faculty (Susanne Komossa and Negar Sanaan Bensi), one secretary from Architecture faculty (Salma Ibrahim) and one student assistant (Mar Muñoz Aparici) were involved in the preparation of the workshop. Regarding the lectures, several colleagues - teachers and professors- kindly contributed to our workshop in giving introductory lectures of each day, in relation to the proposed topic by the organizers.*





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Conclusions: *the workshop and charrette days followed two main purposes: on one hand, the aim was to provide some lenses where it becomes possible to pose some questions regarding the topic of sustainability. On the other hand, through implementing various educational means from lectures, seminars, tutorship sessions, student presentations and as well, involving different parties being busy with this topic from professors and teachers within the academic arena to the architectural practitioner and agents in building material markets, we hoped to provide a possibility to unfold the complexity and importance of such a wicked problem as a design challenge. However, more than finding solutions the attempt was focused on urging the students to ask proper questions and thus to create discursive sessions with tutors in posing ideas and new problems.*





- Conclusive Notes for the next workshops:

From this one- week workshop there were various results achieved in the level of didactic and student's material productions. The workshop was a testing ground for didactic teaching methods and communication with the students. For this reason, we tried to change and evaluate our teaching methods at the end of each day of the workshop and putting more emphasis on an open discussion and experimentation next to the intensive student's work.

Things to Learn from this workshop in the level of didactic and organization and their application to the next workshop series of Wicked Problems :

- In Regard to the constant generalizations concerning the 'sustainable' design and the overwhelming of the technical problem- solving, we experienced an urge for defining a context in which the problems of sustainability can be formulated. This means a better understanding of the contextual field in which these problems are addressed. This includes the socially engagement of design by practicing on specific conditions, involving social, political and economic agents and institutions. Thus it seemed necessary to have a better emphasis on the local conditions, field work and contextual understanding of the wicked problem in relation to the chosen site of the exercise for the workshop. Therefore, while education should become a global issue where exchange of information and cross institutional knowledge transfer is crucial, the topic requests for a certain level of contextual specification next to a rather more general technical solutions and institutional environmental propositions.

- Appearing as a new field of discovery in the academic arena, perhaps the sustainable design education requests for a rather more participatory didactic methods, from various parties as well as from students and thus we propose speculations on interactive / innovative teaching methods to further involving the students in discussions. For example applying the seminar formats rather than lecturer/ Audience format. This means more experimentation and intuition on improving the communication and exchange of knowledge and ideas between teachers and students. As a result, the workshop should encourage the students to be creative, to develop a critical way of thinking and to speculate outside the box, come up with innovative strategies and rather more precise and alternative definitions and terminology.

- Regarding the previous proposition for organizing a rather more interdisciplinary workshop, we might think of different ways to achieve this. For example, including not only the tutors and lecturers, but also the students who come from different disciplinary backgrounds, might be a good step toward this experimentation.

- In the methodological level, not only the various disciplines but also different scales of intervention should be included in the design process. While focusing on the problem of the design per se, as mentioned before, we should be able to look at the underlying interrelations which might concern other disciplines. Although this is not a new topic within the discourse of architecture and urban design, however, it seems that within the field of sustainable design has been constantly



neglected.

- For Addressing the didactic methods which are experimented during the workshop, we would suggest that the tutorship should maintain an open approach attitude to allow for dialogue and debate, with enough feedback from the tutors. Our experience during the first workshop in Delft showed that the creation of this open field has been much more fruitful for both tutors as well as the students ...

- Concerning the very tight timing of the workshop, it seems to be necessary to provide an a priori and better introduction of the teachers to each other and to the students and the better organization of the teaching teams. By a better introduction to the background and interests of tutors, the students can refer easier to the various tutors and as well the teachers can create a better tutorship sessions.

- In relation to the tight schedule of the workshop, it seems fruitful for the students to already start the workshop with some visions. In this sense giving some exercises, in relation to the topic, prior to the workshop to the students to activate them for thinking and taking positions would be very helpful. As well providing the students with some materials in relation to the topic prior to workshop and requesting them to read them can be helpful in creating some discursive lenses.

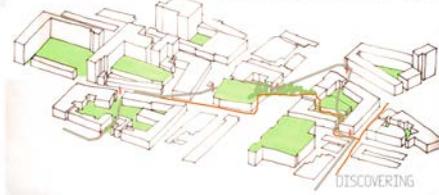
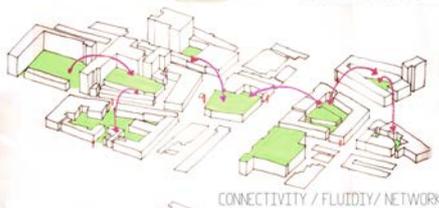
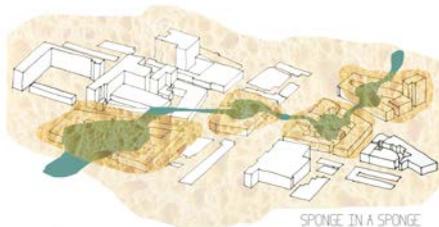
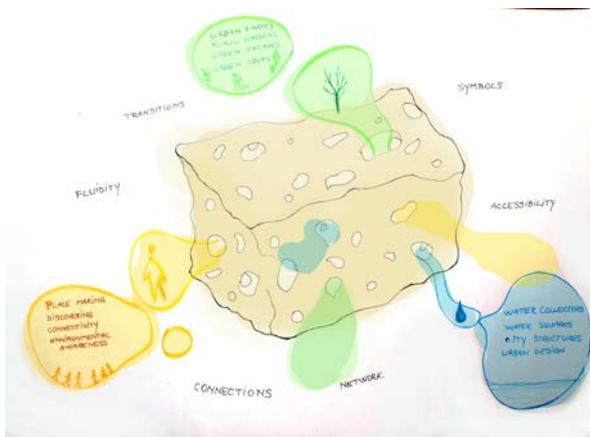
- Again in regard to the previous proposition, it is suggested to introduce more accessible and concise, multiple media sources and alternative means of communication, for further involvement of the students prior to the beginning of the workshop such as videos, blog posts, social media environments. To initiate this attitude, the creation of a Wicked Workshop Facebook page was proposed as a means to continue the dissemination of information acquired so far and start a wicked workshop community. Moreover, the creation of such a platform can help the extension of the initiative and sharing moment, established in a week workshop and thus its developments.



Examples of the students' work in charrettes days :

Group1 : *The sponge*

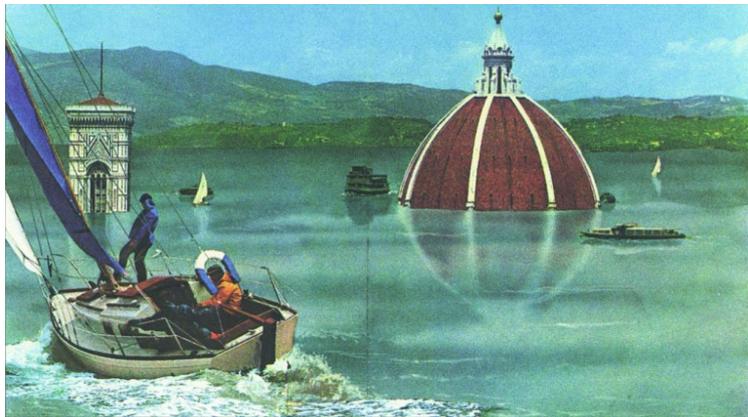
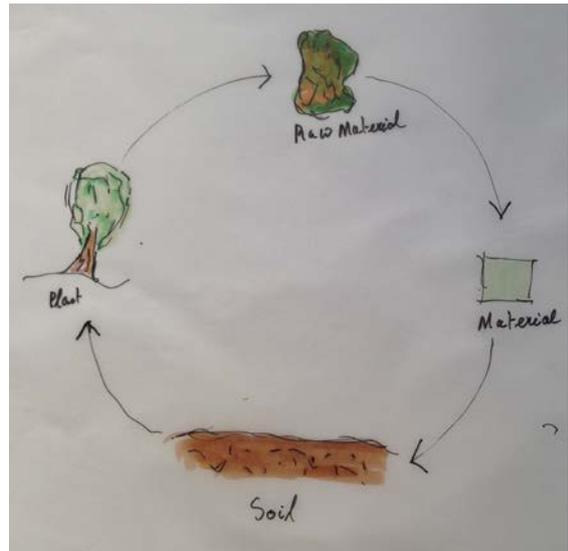
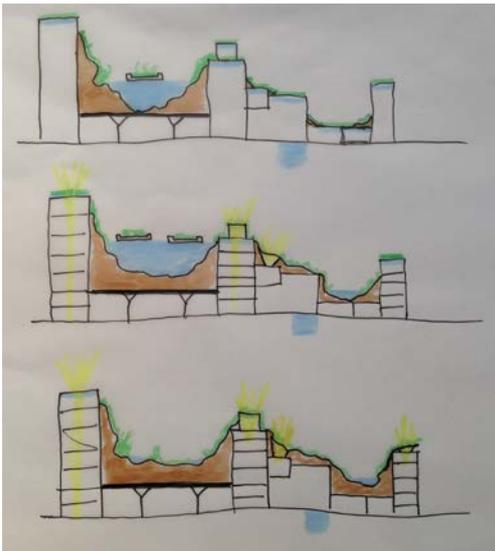
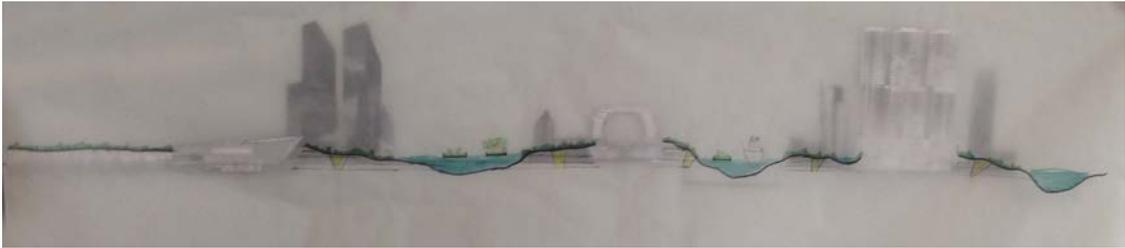
Students : *Raluca Dobre, Erpinio Labrozzi, Vincent Marchetto*





Group2 : *TAKING IT BACK*

Students : *Wiebe de Boer, Tiwane van der Horst, Claudia Pipoş Luci Croci Candiani*

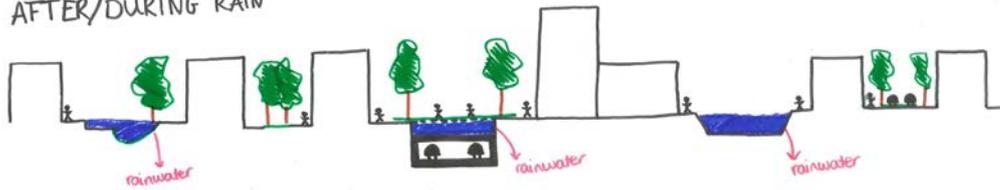




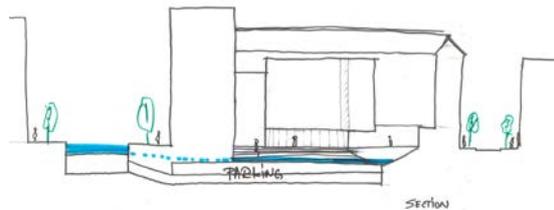
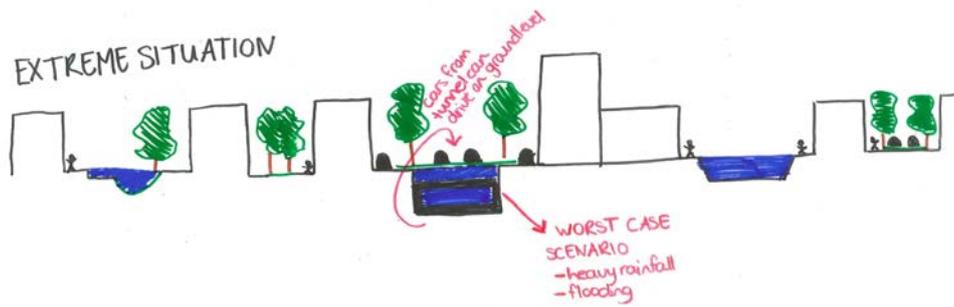
Group3 : Hidden Icon (cultural sustainability : collective memory and sustaining an image, Environmental sustainability: the physical relation of a city block to the neighbourhood and the articulation of an infrastructural proposal)

Students : Alice Corno, Francesco Rolfo, Radu Stanescu

AFTER/DURING RAIN



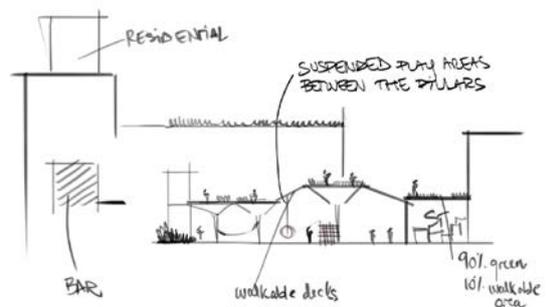
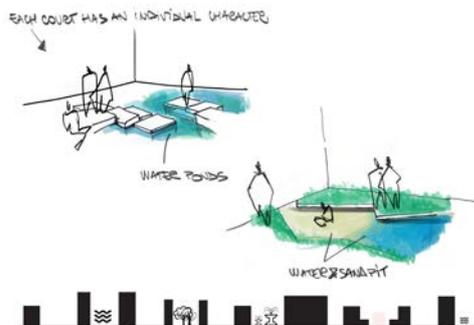
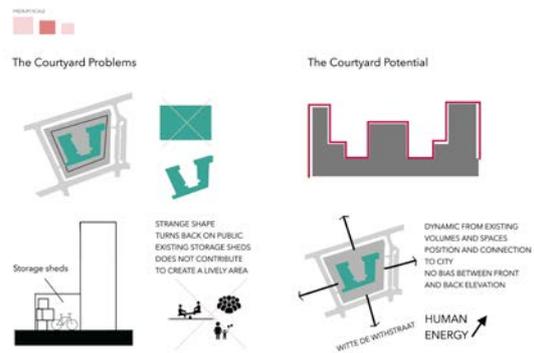
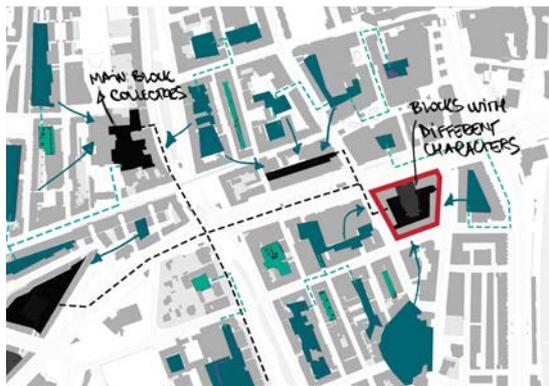
EXTREME SITUATION





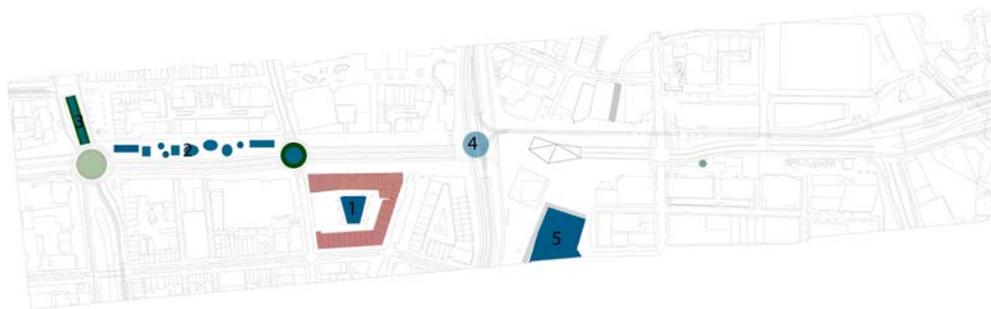
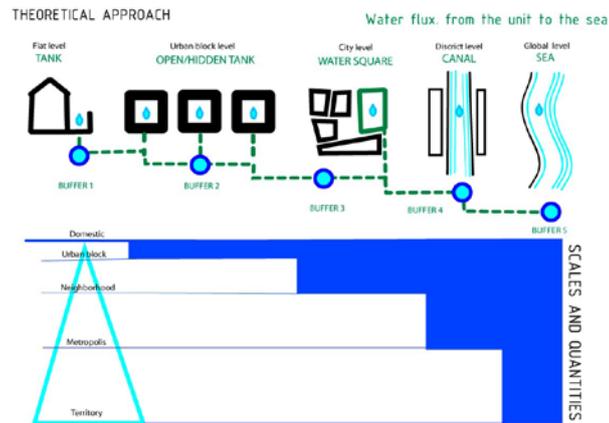
Group4 : From Backyard to Courtyard- Cinerama Block (Sustainability is practiced not only in the sense of traditional green design but also through the conservation and regeneration of the Cinerama as an urban block, proposing strategies for densification and the interaction between small scale intervention and the territorial scale of the city)

Students : Corina CHIRILĂ, Lana FATTAH, Jiří KABELKA, Joseph RIGO





Group 5 : Cinerama Block, The water dance ballet (Students : Razvan Gheorghe, Marco Lunati, Aly Hajhassani, Daniele Beacco





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Place: Delft

Date: 19th-25th April 2015

Name: Susanne Komossa

Member of the think-tank, (hosting institution)

CWP**Confronting Wicked Problems : Adapting Architectural Education to the New Situation in Europe**

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The Activity

Name of the activity: Charrette



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Name of think tank: Sustainability
Purpose of the activity:
Date and time for the activity: June 18-24 2016
Grant awarded to this category of activity (YES/NO): YES
Receiving organization/hosting institution: "Ion Mincu" University of Architecture and Urbanism
Mandatory participation for the following institutions: Architect's Council of Europe (ACE) European Association for Architectural Education (EAAE) Politecnico di Milano, Department of Architecture Delft University of Technology, Department of Architecture "Ion Mincu" University of Architecture and Urbanism
Documentation from the meeting: 1: Report 2: Presentations (if relevant) 3: Photographs, film (if relevant) 4: Other documentation (if relevant) 5: Certificate of attendance

REPORT

Introduction

The theme of the second Wicked Workshop was, in general lines, how to teach a theme that relates to the territory as well as to the building, with connections and intersections with disciplines from other scientific





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fields: historic, cultural, sociological, economical, administrative etc

The theme is a “wicked” one, as it is replicating in many parts of the world (Europe, America, Asia) The charrette focuses on the wicked problem of sustainability in vernacular architecture and rural communities. In this case, we studied the vernacular architecture in the relation with the depopulation of the rural area: the role of the architect in approaching this issue.

Subthemes that were taken into consideration were:

- Causes and possibilities to bring the rural areas (and the buildings) back to life.
- Historic approaches.
- Vernacular architecture as a part of the rural landscape.
- Examples of good practices.
- Ideas, scenarios, strategies.

The theme of the charrette is challenging, as the (rural) depopulation issue is a worldwide problem. Causes are different, geo-climatic and political conditions are different but the fact remains: people are deserting the villages and move into the cities. The deserted / remaining localities represent a built heritage that needs to be carefully considered: should it be preserved, with the original function, preserved but conversed to a different architectural programme, updated, retrofitted, integrated, demolished...

It is not only the physical building that is to be taken into consideration but also the entire world of links, connections to the culture, economy, sociology that the building / the environment, the territory was influenced by.

The idea of updating – retrofitting of localities / neighbourhoods was emphasized from the beginning of the charrette, as an exhibition of the Lafayette Park in Detroit was launched, courtesy of Prof. Adalberto Del Bo.

Previous (historic) approaches of preserving the built vernacular environment were presented, on the site of the Dimitrie Gusti Village Museum [Annex 1] in Bucharest (in the first day) and the Astra Museum in Sibiu [Annex 2], in the second day.

The charrette began in Bucharest and continued in Dealu’ Frumos in the Sibiu County [Annex 3] from the second day – where all the work was carried out – to the last day.



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The outcome was presented in Sibiu, in the last day (Saturday), the venue being the "Ion Mincu" University headquarters, for Architecture Conservation and Restauration.

Architects of the Sibiu county were invited, as well as administrative responsables of the City of Sibiu.

The charrette included two distinct phases:

- During the first phase the students were provided with information regarding previous policies / strategies / steps that were made in order to preserve the built heritage; therefore the guided visits to the Village Museum in Bucharest, the `Astra` Museum of Traditional Folk Civilization and the presentation of the Citadel, the Church, the school, the village of Dealu' Frumos the were meant to undestand the Romanian vernacular architecture and its typologies as well as to offer some examples of interventions on sites, buildings, spaces. The preliminary theme [Annex 4] included suggested readings, (that were sent via e-mail prior to the charrette)

- The charrette (that took place from Wednesday to Friday) was carried out in the Dealu' Frumos village (in fact the accommodation was in the Citadel and in the School across the street from the Citadel), giving the students the opportunity to feel and touch the space, the environment and to interact with locals.

While hosted in a XVI-th century fortification, the XXI-st century facilities were available so the groups managed to find documentation on the internet and to present their ideas in the manner they considered to represent them best.

The idea of the workshop and the charrette was to physically ploung in the built environment (not to visit the site and go back to the city or have only documentation about the site and theme) and experience it with all senses. Walking the path of the village gives the sense of the place, with more tangible informations than any of the written or visual documentations

1. Activities

- participation, formal program for the event

Monday 18.04

9.30 - Visit of UAUIM. Presentation of the workshop





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11.00 - Visit of the Village Museum Lecture in the Village Museum
14.00 - Lunch.
17.00 - Opening of the Lafayette Park Exhibition – Adalberto del Bo

Tuesday 19.04.

7.00 - Departure for Sibiu (260 km distance). A stop on the way at the Cozia Monastery, monument of architecture dating from 1388
14.00 - Lunch
16.00 - Visit of Astra Museum in Sibiu (about 80 km from Sibiu)
19.00 - Arrival in Agnita. Dinner
20.00 - Arrival in Dealu' Frumos (about 80 km from Sibiu)

Wednesday 20.04

9.00 - Beginning of the charrette
Visit and presentation of the fortified medieval church, the school (with the ethnographic museum) and the village (history)
11.00 - Technical presentations. Teams and themes
13.00 - Lunch
14.00 - Site and studio work
18.00 – Dinner, work and leisure in the citadel

Thursday 21.04

9.00 - Critics and comments
Site and studio work
Extra lectures: Dr. Veronika Schröpfer & Carmo Caldeira (ACE) delivered a presentation of The Architects' Council of Europe (ACE)
13.00 - Lunch
14.00 - Site and studio work
18.00 – Dinner work and leisure in the citadel

Friday 22.04

9.00 - Critics and comments
Site and studio work
13.00 - Lunch
Site and studio work
18.00 - Dinner work and leisure in the citadel
19.00 - Transnational meeting of the staff

Saturday 23.04

9.00 - Departure for Sibiu
10.00 - Final presentations in the UAUIM School in Sibiu (expected guests: Astra-Sibiu Museum representatives, Sibiu Order of Architects representatives, students). Critics and comments. Conclusions



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12.30 End of the Charette
Lunch and visit of Sibiu
15.00 - Departure for Bucharest
20.00 – Arrival in Bucharest

- **actual work, examples/documentation**

1. case studies of preserving the rural landscape, environment, tradition, techniques and culture, by visiting

- the Dimitrie Gusti National Village Museum, Bucharest





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- The `Astra` Museum of Traditional Folk Civilization –The Open Air Museum, Sibiu



Aim, related to the theme of the charrette:

- to get contact with one of the first ways of preserving the built heritage and to approach rural depopulation
- to understand the notion of living museum of traditional living and folk technics.
- to prepare the students (and tutors) for the site where the workshop was being held: Dealu' Frumos, Transylvania, the center of Romania.



2. lectures:



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PhD.C. Arch. Adrian Ibric, UAUIM: "European Villages Depopulation Risk Management"

Key aspects:

- the European depopulation context (tendencies West/East, North/South, EU/non EU, immigration, emigration etc)
- Values affected by European rural depopulation
- Connected issues & follow-ups, focusing mainly on the local architecture and identity.
- International/EU national counteractions on the matter
- having the purpose of counteracting methods of depopulation and the accompanying loss of values



Dr. Arch. Mihaela Hărmănescu, UAUIM: „Sustainable Rural Development”

Examples of good practices, strategies, solution and projects emerging from local culture which contribute towards sustainability of rural territory/ settlements/landscape – the relation between rurality, heritage and sustainability.

Key aspects

- The rural eco-economy
- Heritage and rural landscape
- Sustainability lessons from vernacular knowledge



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- Resilience of the vernacular architecture

Aims:

- To find a sustainable development for rural communities regeneration, to enable rural communities to have access to new cultural and technical resources, and deploy arts projects to promote rural regeneration and farm diversification initiative
 - To identify new aesthetic, ethical and intellectual issues and challenges in rural contexts, which could inform policy discourse on the future of local activities
 - Designing-in rural environmental sustainability
 - Opportunities and challenges to design for environmental sustainability

The lecture completes the theme of the charette with the following questions:

- How to provide rural development scenarios for Dealu Frumos settlement?/ Which are the possible sustainable development solutions?
- How to value settlement' built culture?



PPT and PDF presentations on strategies, examples, NGOs activities as well as the on site examples of approaching the existing heritage and giving it a new use completed the first stage of the charrette, the where we offered them information and know-how.



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At the end of this stage the groups of students were formed, each having 1 Dutch student, 1 Italian student and 3 Romanian students (one group had only 2 Romanian students but had 2 Italians).

In 4 of the 5 groups the 'leader' of the group had previously attended the charrette in Delft, in 2015.

After a short presentation delivered by Maria Faraone, that provided the guiding lines of approaching the theme in 3 phases (issue / vision / scenario), each group was required to develop the 3 phases of the project, dealing with 3 scales of the final proposal

1st phase: ISSUE: to integrate the problematic of the wicked

2nd phase: VISION:

3rd phase: SCENARIOS: Accurate design of the proposal and the chosen topic: new design, intervention on vernacular architecture, on rural household/landscape

The phases corresponded with the 3 days of effective work of the students, within the charrette, and at the end of each day the teams presented their work and got feedback from their colleagues and tutors. The international group of tutors, advisers and experts assisted and contributed with suggestions, comments and recommendation to the students' presentations and work.



The theme is 'wicked', as it meets issues far beyond the building and its



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surroundings, dealing with tradition, ethnography, sociology, economy, agriculture, history only to mention some of them. The links between all these fields are almost tangible and care should be taken not to destroy the balance.

Thus, the conjugated effort of the students and the tutors to evaluate the hypothesis, to take the steps, to construct a vision and a strategy of intervention is, we consider, probably the best outcome.

We extracted some relevant slides from the 5 teams' presentation, that we insert as Annex 5.

Outcomes:

In a highly globalized world, the importance of preserving the heritage – whatever kind it may be – is vital: common values should be highlighted and particular values should be identified. Even though the principles or the type of approach may be similar, even though different causes may lead to similar actions, each situation, each site, each neighbourhood must be dealt with individually, with care and respect.

The inter-disciplinarity of the studied topic of rural depopulation represented a challenge for the students that had to choose how and where can the architect, as a professional, contribute.

Active preservation of the heritage of the depopulated localities (in this case study, the villages) is one of the roles of the architects of today and tomorrow. The questions that we have to answer may be, among others)

- how to teach this and how to contribute to the future
- how to reuse the existing built heritage (the vernacular buildings) while maintaining the characteristics that give unicity to the environment
- how to use the existing professional know-how and how to communicate / interact with specialists from other fields of knowledge
- how to find the common principles and mechanisms of/for intervention despite the different causes / locations in Europe that generate depopulation



2. Findings

- **With relevance to future architectural education**

One of the strongest points of this Erasmus+ project is the international collaboration: Schools of Architecture– tutors and students - professionalists from ACE and AEEA together in an effort to improve / increase the teaching methods in architectural education, in the challenging globalized world. The expertise and professional line mix and the outcome is a better understanding of where we are and how to reach the students' mind in terms of principles of approaching and developing a theme and a project.

The experience of being located in the built environment in which one has to intervene proved to be a good one, as the students managed to feel the sense of the place at any time of the day (and night, for that matter)

The positive outcomes of the previous workshop / charrette in Delft were maintained or further exploited: international students' teams, international tutors ho teamed for the common effort

The idea of less 'ex cathedra' lectures was also tested, in this workshop the two professionalists who delivered presentations (Adrian Ibric and Mihaela Hărmănescu) tutoring the students in the charrette.

The presentation of the results, at the end of each day, was shifted to the next morning, as it gave the students more time to think, research, discuss, propose

- **(eventually: with relevance to a "professional knowledge"-curriculum)**

- We consider depopulation of the built (rural mainly but not only) areas (in Romania, but also in Europe) as a new situation and a complex problem. It is. However, it is not entirely new: throughout history such situations occurred and examples of deserted localities are all over the world. What this workshop brings new is the approach and it should be looked upon as a professional knowledge curriculum, as the contemporary principles of sustainability and resilience imply the use of what we already have, focusing on how to evaluate the impact of our way of life on the built environment, what needs to be changed, how can we



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adapt what is already there and how to accommodate new functions in existing buildings / built sites, without destroying the balance of the network that connects the materiality to the immaterial spheres of the specific place (culture, religion, economy, tradition etc etc etc)

- Depopulation varies extremely, in term of cause and effect, in rather small scale neighbouring regions inside both Romania/other European countries/from transnational euroregion to euroregion;
- Depopulation greatly affects architecture – heritage and new build as well
- People mobility issues like depopulation are phenomena that directly affects architectural heritage and people's culture in general and as such they should be studied by architects and urban planners.
- Practical and in-situ approaches tend to give more result in studying issues, as the data gathered on-site and local interaction had a lot of impact on the final proposals.
- Architectural education should take more into consideration the social aspects of the population benefiting from the envisioned planning. Furthermore, architects and planners should be educated to proper use a larger field of instruments of social and (multi) ethnographical origin.
- Site specific approach is still not yet (or not enough) large scale used in architectural approach and in regional economy as well.
- Regional evaluation and strategy planning can lead to specific architectural solutions inside a certain village of that region (in terms of heritage protection, promotion and valuation).
- Local and regional branding focused on material or immaterial heritage could be a field of activity into which architects can naturally make a positive difference and impact.
- Local strategies should take into consideration a broader regional spectrum of analysis and villages alliances, matters in which the future architect should be involved not only as a designer of material objects but as well as a manager.



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- EU architectural research funding, as well as EU regional development funding are overall instruments overlooked by the majority of European architects, probably mainly due to low impact in the European Architectural Schools Curricula and Strategies that need to adapt to these opportunities.
- Built patrimony and culture landmarks that loses its original population CAN be assumed by a new population over generations and with serious in advance planning and funding.
- Religious landmarks and issues are not so easily absorbed by population shifts and need to be take into a larger area consideration and strategy.
- Local economy can be both autonomous and deeply affected by global economy. While the population can survive locally at a minimum level of existence, it cannot evolve/ thrive past a certain point without external intervention or serious local collaboration efforts.

3. Evaluation

- **discussion of findings**

Throughout the three days of the charrette the progress made byf the teams was almost tangible: the issues were in the same time from architectural, sociological, urban, economical, demographical and ethnical and the effort to brush all these fields and to place things in order, on a scale, was remarkable. In the end, the result is an architectural perspective of how to deal with the built heritage, that is... feasible...

- **evaluation/priorities of findings, related to architectural education**

Exchanging knowledge was a strong point: mixing different students from different levels of education, tutors from different schools of architecture adds value to the students' education, completing it.

Site location was of great practical value to the workshop as it exposed the participants to a various (somewhat unexpected by the foreign groups) array of issues, like multi ethnical background, multi religious aspects, planning disfunctionalities as well as strengths, a sort of a



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"time-capsuled" environment etc.



Special thanks to Adrian Ibric and Mihaela Hărmănescu for the contribution to this report and to the workshop

Bucharest, 09.06.2016



Name: Prof. Dr. Arch. Zeno Bogdănescu

Signature:

Members of the think-tank Sustainability, "Ion Mincu" University of Architecture and Urbanism

Name: Prof. Dr. Arch. Ana-Maria Dabija

Signature:

Member of the think-tank Sustainability, "Ion Mincu" University of Architecture and Urbanism

Name: Prof. Dr. Arch. Marian Moiceanu, Rector

Stamp and signature:

Legal representative, "Ion Mincu" University of Architecture and Urbanism



ANNEX

CWP

Confronting Wicked Problems : Adapting Architectural Education to the New Situation in Europe

Agreement no.: 2014-1-NO01-KA203-000366

The Project

Project title: Confronting Wicked Problems : Adapting Architectural Education to the New Situation Europe	Project period: 01.09.14 – 31.08.17
Grant awarded: 284 815 EUR	
Agreement number: 2014-1-NO01-KA203-000366	
Partner institutions: The Oslo School of Architecture and Design (AHO), coordinator European Association for Architectural Education (EAAE) Architect's Council of Europe (ACE) Politecnico di Milano Universitat Politecnica de Catalunya (ETSAB) Universiteit Hasselt Ceske Vysoke Ucení Technické v Praze Technische Universiteit Delft Universitatea de Arhitectura și Urbanism "Ion Mincu" (UAUIM) Università degli studi di Genova (UNIGE)	

The Activity

Name of the activity: Charrette



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Name of think tank: Sustainability
Purpose of the activity: 3rd Wicked Workshop on Architectural and Urban Sustainability
Date and time for the activity: 7 th -13 th May, 2017
Grant awarded to this category of activity (YES/NO): YES
Receiving organization/hosting institution: Politecnico di Milano, Department of Architecture
Mandatory participation for the following institutions: Architect's Council of Europe (ACE) European Association for Architectural Education (EAAE) Politecnico di Milano, Department of Architecture Delft University of Technology, Department of Architecture "Ion Mincu" University of Architecture and Urbanism
Documentation from the meeting: 1: Report 2: Presentations (if relevant) 3: Photographs, film (if relevant) 4: Other documentation (if relevant) 5: Certificate of attendance

REPORT



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Topics

For the third phase of strengthening the theme of adapting Architectural Education to the New Situation in Europe focusing on the wicked problem of Sustainability in Architectural Design, the Politecnico di Milano, School of Architecture Urban Planning Construction Engineering, has been invited to organize the last one-week charrette. The Milano charette was an occasion to deduce the conclusions of the three charettes, for testing and consolidating programs and teaching methods tested in the previous ones.

During the charrettes, students were asked to reflect on a wide range of distinct but inextricably related issues: typological and morphological, urban planning, technical, environmental, economic and social issues. These are integrated issues in the urban transformation projects and contribute to the overall teaching themes about sustainability, European heritage and the future profession of the architect.

The importance of considering these issues as being related to each other has been underlined by the choice of case studies for the three workshops. During the charettes, the approach to diverse aspects of sustainability allowed us to encourage debates on positions of sustainability in architectural design and urban planning and on specific technical contributions about the single related issues.

In the first charrette, held at the Delft Technische Universiteit, the centre of our investigation and design was a typical Dutch urban block from the 1950s, the important after war reconstruction period. The urban block here was studied not only in regards to the various scales –i.e. as an urban entity, as being part of an urban section and urban metabolism such as its relation to water and greenery and as well as in craftsmanship of the details- but also in relation to private sphere and public realm.

In the second workshop, held at the Universitatea de Arhitectura si Urbanism “Ion Mincu”, the project area chosen was in a rural context characterized by a growing phenomenon of depopulation. The Dealu Frumos village, also called with the name of Schoenberg, is part of a series of similar linked villages in Transylvania, founded from the XII century by the Saxons. The sustainable intervention concerned here the understanding of the importance of territorial relation

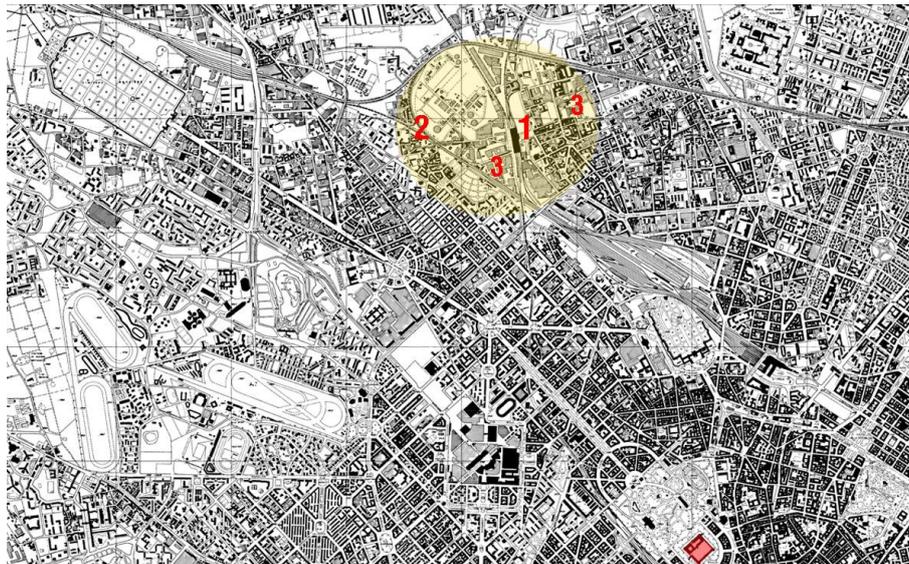


among the villages through potential intervention scenarios designed to boost the economy, by emphasizing a territorial and landscape heritage and local culture.

The last workshop, organized by the Politecnico di Milano School of Architecture Urban Planning Construction Engineering, was placed in a **brownfield site in the north of Milano, the Bovisa Drop area** between the two railway stations (Milano Villapizzone and Milano Bovisa) dating from the late 19th and the beginning of the 20th century.

The railroad tracks created a barrier between the closed Drop-shape area and different parts of the city, so including neighbourhoods never connected each other.

This area represents a crucial node for urban regeneration strategies not only for the city of Milano, but also for the entire northern Milano urban region (Fiera Milano and Expo 2015). Hence, it can be a strategic resource for the territorial continuity between the urban and the countryside scale system.



The Bovisa Drop area : 1. Bovisa railway station; 2. Villapizzone railway station; 3. Politecnico di Milano

The de-industrialization of this area started in the 70's. This resulted to the fact that during the last two decades this area was characterized by deep economic, social and urban transformations. The main was the placement of an important campus of the Politecnico di Milano, hosting in the history different engineering faculties (now the School of Industrial and Information engineering) and research centres. The campus has been considerably expanded after an international competition, banned in 1998 by the Politecnico di Milano in collaboration with local authorities

(Municipality and Region). This led to a general renewal of the area also due to the reuse of the former industrial buildings and the presence of the Campus of the Architecture and Design Faculties in via Durando, few meters far from the Bovisa Drop that created a revitalized and attractive area.

During the urban transformation process, the gasometers in Bovisa Area became both an icon with a strong symbolic value, but also an example of the difficulties to be faced for the transformation and integration of such a large-dimension brownfield and contaminated area.

Furthermore, the urban transformation of this area represented a central resource to develop socio-economic and spatial strategies on a metropolitan scale. This is due to the size of the area, its exceptional accessibility by the public rail transport system as well as its vicinity to other already transformed areas or those are in the process of transformation, i.e. the former Milano Farini railway goods.



The Bovisa Drop area : 1. Bovisa railway station; 2. Villapizzone railway station; 3. Gasometers ; 4. Brownfield areas ; 5. Politecnico di Milano

In fact, this area was the object of twenty five years of urban transformation projects, mainly developed by the Politecnico di Milano representatives.

These conditions led the selection of the Bovisa Drop area for the charrette.

To think and draw up scenarios for the future of the Bovisa area implied connecting different architectural and urban scales and issues addressing the industrial heritage, new activities and the relationship between the entire area and the railway system. The barrier created by the railroad tracks defined also the important issue on how to deal with the social aspect of the urban



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regeneration and with the identity of the area as a whole.

It is also necessary to draw scenarios considering the time phases linked to the decontamination process, that constitute the main problem of the brownfield areas as Bovisa.

Milano charrette program:

SUNDAY May 7, 2017 Arrival in Milano

15.30 pm Meeting at CASTELLO SFORZESCO
16.00-18.30 GUIDED VISIT OF MILANO CITY CENTER
19.30 DINNER AT PALAZZO CUSANI

MONDAY May 8, 2017 Campus Bovisa, Building 2, Room B2.1.6

9.00 a.m. Meeting at BOVISA STATION
9.15-11.00 VISIT THE PROJECT AREA
11.30-12.15 LECTURE 1: «ACTIVE LISTENING» prof. LAURA POGLIANI
12.15 -12.45 Questions and open debate on topic
LUNCH
14.15-15.00 LECTURE 2: «ARCHITECTURE AND SUSTAINABILTY» prof. STEFANO PEREGO
15.00 -15.30 Questions and open debate on topic
15.45 -18.00 CHARETTE
Working groups composition

TUESDAY May 9, 2017 Campus Bovisa, Room B2.1.6, Building 2

9.00 – 13.00 CHARETTE
LUNCH
14.15-18.00 CHARETTE

WEDNESDAY May 10, 2017

Morning: Campus Leonardo, Building 5, Room Castigliano

Afternoon: Campus Bovisa, Building 2, Room B 2.16

9.00 - 11.00 OPEN DISCUSSION ON PROJECTS
11.15 – 12.00 LECTURE 4: «HERITAGE AND SUSTAINABILTY» prof. STEFANO DELLA TORRE
12.00 -12.30 Questions and open debate on topic
LUNCH
14.30-18.00 CHARETTE

THURSDAY May 11, 2017 Campus Bovisa, Building 2, Room B 2.16

9.00 – 9.45 LECTURE 3: «URBANISM AND SUSTAINABILTY» prof. MASSIMO BRICOCOLI
9.45 -10.15 Questions and open debate on topic
10.30-13.00 CHARETTE
LUNCH
14.15-15.00 LECTURE 6: «TECHNOLOGY AND SUSTAINABILTY» prof. ALESSANDRO ROGORA
15.00 -15.30 Open debate on topic
15.45 -18.00 CHARETTE

FRIDAY May 12, 2017 Campus Bovisa, Building 2, Room B 2.16

9.00 – 13.00 CHARETTE (+ TEACHERS MEETING)
LUNCH
14.15 - 17.15 FINAL PRESENTATION (30 MIN/GROUP)
17.15 - 18.00 OPEN DISCUSSION
18.00 WORKSHOP CLOSING COCKTAIL





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SATURDAY May 13, 2017 Urban Center, Galleria Vittorio Emanuele II, 11/12

10.00 – 13.00 URBAN CENTER, Galleria Vittorio Emanuele II, 11/12

PROJECTS PRESENTATION AND CONCLUSIONS

LAFAYETTE PARK EXHIBITION OPENING

The charrette started on Sunday 7th of May with a guided visit of the Milano city center (by Pier Francesco Sarcerdoti, Phd in Architectural Composition in Politecnico di Milano) in order to understand the structure and the character of the city and let the students know each other and create the first bonds. The first informal meeting ended with a dinner at the central Palazzo Cusani, an historical building close to the Accademia di Brera, where the student had the time to talk laying the foundations for constituting the working groups.



The guided visit of Milano started in Castello Sforzesco (May 7, 2017)

The program provided one lecture a day by Politecnico di Milano teachers and researchers, experts in specific disciplines of urban transformations themers, in order to address the complexity of the project theme according to any issue that relates to sustainable design.

On Monday May 8 (Bovisa Campus) there was the first survey of the project area in order to allow students a first direct knowledge of the project area.

Once in the classroom, in Politecnico di Milano Campus in Bovisa, just close to the project area, there was a first lecture about the socio-political aspects and the urban transformations of the area.



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Professor Laura Pogliani (Associate Professor of Urban Design And Landscape, DASTU-Department, Politecnico di Milano), explained the process of transformation of the Bovisa Drop area and the activity of listening and citizen participation to the urban transformation design of the Bovisa area (*Active Listening* project, DASTU Department, Politecnico di Milano).

In the afternoon there was a lecture on the topic *Architecture and Sustainability*. **Professor Stefano Perego** (Adjunct Professor in Architectural Design, Politecnico di Milano) gave a lecture on the principles at the base of the relationship between architecture and nature expressed in the relation between the architectural shape and the light and the solar control in architecture.

There were open discussions after the two lectures and students asked questions about the topic explained. Then the students constituted the working groups and started the charrette works discussing and sharing the first reflections about the area with the materials provided.

On Tuesday May 9 (Bovisa Campus) the students continued the charrette affording the analysis phase, elaborating the first draft related not only to the specific theme of the relationship between the two stations but starting from the general analysis of the whole area and its relations at the urban and territorial scale.

On Wednesday May 10 (Leonardo Campus – Bovisa Campus) the activities took place at the Leonardo Campus, the first historical site of the Politecnico University. Here the students were asked to show through slides the reflections and first hypothesis on the project area in a open discussion, interacting directly each other with questions and answers. As in the Bucharest charrette, the teachers decided not to make remarks in this occasion but to let and encourage the students to interact each others.

Then **professor Stefano Della Torre** (Full professor of Architectural Preservation, Director of DABC-Department of Architecture, Built environment and Construction engineering, Politecnico di Milano) gave a lecture on *Heritage and Sustainability* explaining the relationships between architectural and urban transformation and cultural heritage seen from an upstream perspective: economic, social, cultural, environmental issues could use the cultural heritage as a catalyst for cooperation with the local players and to increase the intellectual and cultural capital of people involved.

A debate followed the lecture.

In the afternoon, back in Bovisa Campus, the students continued the charrette exploiting the discussion of the morning, improving the speculation/scenario phase.



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On Thursday May 11 (Bovisa Campus) the last two lectures completed the framework on sustainability issues. In the morning **professor Massimo Bricocoli** (Associate Professor of Housing and Neighbourhoods and Urban Ethnography, Politecnico di Milano) gave a lecture on ***Urbanism and Sustainability***. The lecture concerned the social sustainability in urban transformations, urban regeneration policies in the context of the post-industrial city. He analyzed socio-economic changes such as territorialisation and the restructuring of local welfare policies, emerging social, economic and spatial trends in new urban developments and housing projects.



Above : lecture of prof. Stefano Della Torre (May 11, 2017, Leonardo Campus), lecture of Prof. Laura Pogliani (May 8, 2017, Bovisa Campus) ; Below : lecture of Prof. Stefano Perego (May 8, 2017 Bovisa Campus), lecture of Prof. Alessandro Rogora (May 11, 2017, Bovisa Campus)

In the afternoon **professor Alessandro Rogora** (Full professor of Ic Environmental-Technological Design In Architecture, Politecnico di Milano) gave a lecture about ***Technology and Sustainability*** concerning the ethic role of the use of technology in a sustainable way linked to the acceptance of the limits, the appropriate choice of forms and materials in relation to the place.

On Friday (May 12, Bovisa Campus) morning the students finished the work while the teachers had the formal meeting to discuss the week results. During the afternoon it was given a large space of

time to the final discussion on the projects realized by the students during the charrette, with questions and debate. A cocktail concluded the charrette activities.

On Saturday (May 13) the project were showed to the city of Milano at the **Milano Urban Center**, in the Galleria Vittorio Emanuele between Duomo and Piazza della Scala, in the heart of the city. At the end of the presentation there was the opening of the exhibition *Milano guarda Detroit. Il caso di Lafayette Park*, that was also present during the 2016 charette at the UAIM in Bucharest. This exhibition was once again a special occasion to innest a discussion about the Sustainability in Architecture and Urban transformations linking the example of the still innovative, functional and elegant Lafayette Park settlement.



Pictures of the presentation at the Milano Urban Center, in the Galleria Vittorio Emanuele and of the opening of the exhibition Milano guarda Detroit. Il caso di Lafayette Park, (May 13, 2017)

Charrette working methods and tools:

As the previous charrette, due to the necessity of discuss the wicked problems of sustainability at a European level, the workshop hosted 8 students from Politecnico di Milano, 6 students from Ion Mincu University of Architecture and Urbanism in Bucharest and 6 students from TU Delft.

To foster the interaction among the students from various academic years, various Universities and different teaching methods and cultures, the students were divided in five mixed groups to enhance the possibility of sharing, debate and exchange visions and experiences and thus learning and experimenting.

Socialization among the students was encouraged throught the first day of activities to get to know each other such as visiting Milano together and the opening dinner in Palazzo Cusani.

The complex topic of the Milano Bovisa–area urban regeneration required knowledge and discussions about different issues related to the Architectural and Urban Sustainability, thus it was planned to offer short lecture on the specific disciplines in order to stimulate debate and allow the students to apply the concepts learned directly to their project activities.



Students at work (Bovisa Campus)

The lectures marked the time of the different phases of the design process.

The first day they acquired the first information about the project area and the general theories about the relation between nature and urban transformations. This first phase led their early reflections and QUESTIONS. Then the third lecture on Heritage and Sustainability gave them the instruments to enrich the phase of the ANALYSIS.

The last two lectures on Social sustainability in urban transformations and the role of technological approach in Architectural design, led them to the SPECULATION/SCENARIO writing and the DESIGN phase.

The students were provided with historical maps and pictures of the area to possess the tools for a scientific analysis of the area. Also, other sources of analysing, survey and mapping, like aerial views and archival materials were made available for them together with the digital drawings of the area.

Along with this the proximity of the project site allowed them to carry out further surveys to learn information useful for the knowledge of the area and the problems experienced by the local people. The lectures about territorial, urban and architectural issues led the students to work on different scales as a design process requires above all in a such complex and big contest allocated near the city center and connected to the entire region.



The final presentation of the project and discussion (May 12 2017, Bovisa Campus)

As experienced in Bucharest charrette, the students were not asked to work with specific design tools and the means were selected by students according to the visions that they made and scenarios, which they proposed.

Although the analysis of the area we provided had highlighted specific issues to be addressed, students were left free to frame the hierarchy of issues themselves and propose the urban transformation scenario without specific limits of the intervention area.

Conclusions:

The goal achieved was that the students rapidly understood the complexity of issues that are related to the area and to the urban transformations and the strict relationships between them. This awareness let the raise of proper questions and critical thinking at the basis of a sustainable process of design. In addition they understood the necessity of a multiscalar interdisciplinary approach. The theme of a brownfield contaminated site let them to consider the time phases intervention in the proposed scenario.

Hence the choice of charrette as a pedagogic platform, alongside the preparation and the selection of three culturally diverse universities enabled positive cooperation for approaching a shared goal. A diversity which is not necessarily overt but still it is present in the traditions and attitudes rooted in schools and cultures. Despite this we are already on the way to a progressive and positive thematic and problem-based approach consequent to the global dimension of the problems and supported by the strong European incentive that, also with this program, significantly contributed to find shared solutions to architectural and urban issues.

From the methodological point of view gave good results the decision taken in Delft to change the teaching methods toward a more open discussion with the lectures invited to give a scientific seminar contribution, next to the intensive student's work.

We reached the goals of having a better emphasis on understanding the local conditions in relation to the chosen site of the exercise for the workshop.

The students were encouraged to be proactive, to develop a critical way of thinking and to speculate in a open mind way, coming up with innovative strategies and rather more precise and alternative definitions and terminology.



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teacher's meeting (May 12, 2017, Bovisa Campus)

Remarks for the Final Report

(From the May 12 meeting 9.00-13.00 a.m)

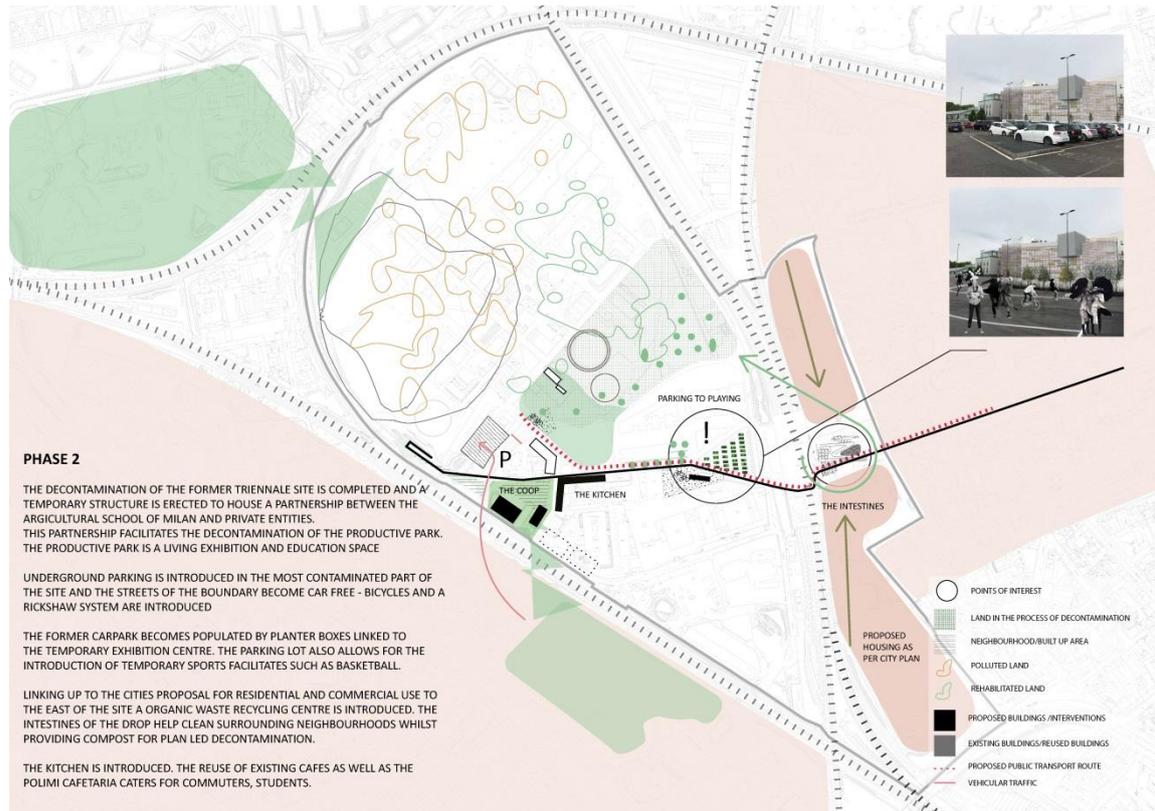
- 1) Emphasize the need for a holistic, open-minded multiscalar approach, capable of favoring a critical thinking that considers a wide variety of issues and problems. Sustainability as a cultural problem, a state of mind
- 2) It is not considered useful, as some suggested, to introduce a 12th point on Sustainability in the Architecture Directive but we support the need of the transversal presence of this topic in all design-related disciplines and in particular: urban planning, urban design, technical/ structural sector, building restoration and conservation



Examples of the students' work in charrettes days :

Group1 : Post- Spaces.Revealing the process

Students : Raluca Sabau, Elena Belvedere, Alice Barontini, Serah Calitz





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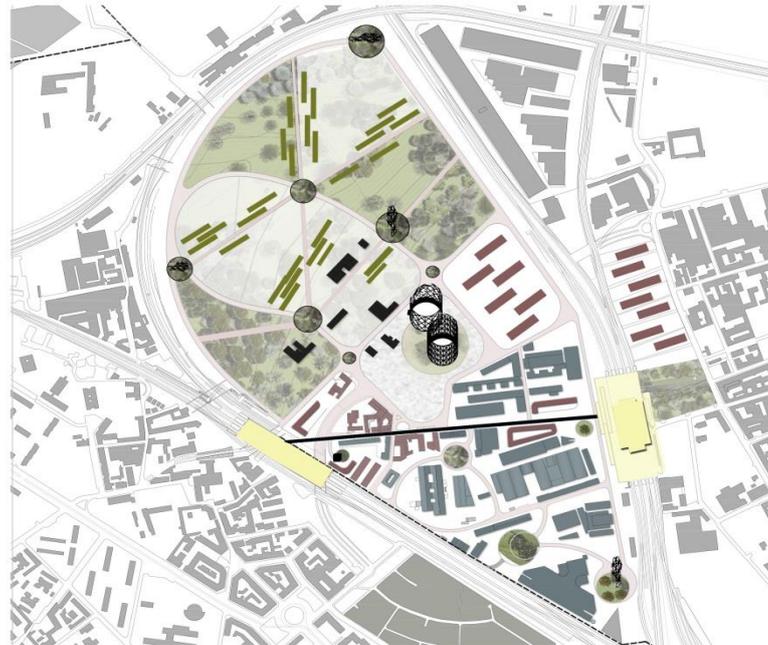
Group 2 : Bovisola. Boosting the island – a trigger for community

Students: Derya Erdim, Irina Petra Gudana, Lorenzo Maria Benzoni, Wessel De Jong

Spatial Organization

Phase 3

- new areas opening for investment
apertura di nuove aree a rendita
- new public spaces
nuove aree pubbliche
- community sharing
network di condivisione fra enti
- new landmarks
nuovi luoghi-identità



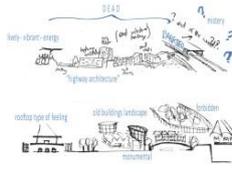
environment *ambiente*

- decontamination of the area
decontaminazione dell'ex suolo industriale
- replacing the pollution factor with a green-self-sustainable intervention
sostituzione dei fattori inquinanti grazie ad un intervento economicamente sostenibile
- big impact on the environment through business development
impatto positivo dell'intervento dato dall'incremento di attività locali



urbanism *scala urbana*

- helping the city heal itself with its own tools
aiutando la città a guarire se stessa con i suoi stessi mezzi
- revitalization of the area re-connecting it to its identity
potenziamento dell'identità collettiva dell'area attraverso il recupero del proprio carattere industriale
- becoming a strong landmark in the metropolitan area
raggiungimento di un'interesse culturale su scala metropolitana



society, community *scala sociale*

- a destination for public society
un luogo di arrivo per la comunità
- community development
sviluppo delle comunità locali
- collaboration
raggiungimento di una fitta rete di collaborazioni tra enti



economy *scala economica*

- production management that supports local economy
riflessione sull'incremento del livello di benessere delle comunità confinanti grazie ad un alto livello di ricerca e qualità di prodotti
- job opportunities given to brilliant students
grandi opportunità di business offerte a studenti o ex studenti privi di basi monetarie solide





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Group 3 : *Axis - ability*

Students: Alexandru Baciu, Michelle Bettman, Martina Buzzo, Virginie Guillaume

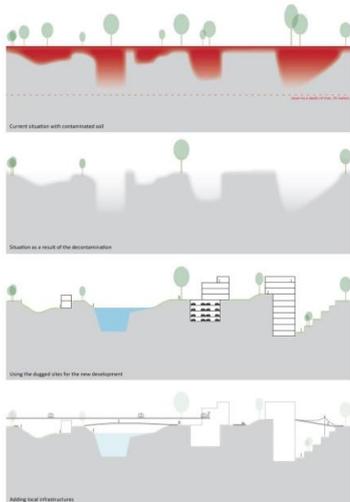




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Group 4 : green O₂ meter

Students: Giulia Bina, Jorien Cousijn, Mara Wang, Rares Urzica





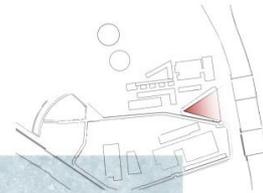
Group 4 : Shaping borders. Durable durations in Bovisa

Students: Helena Andersson, Daniele Ceragno, Ana- Maria Cojocaru, Rares Fotau



PHASE 5: 'EXPANSION' ESPANSIONE (10 YRS+)

- 1 The former Bovisa coal plant buildings are renewed as a Cultural Heritage District.
- 2 Areas to be exploited according to the city needs. The first in priority is the former industrial area.
- 3 Green direct access from Parco Certosa neighborhood, in case to be exploited only after area 2.
- 4 Green 'lung' to be preserved as long as it is economically sustainable.
- 5 Eventually exploitable area (if existing factories are dismissed) to be renewed. Housing or office spaces could be housed in the flexible factory typologies.
- 6 Housing added, and Green Belt to be preserved, as it connects the inner city parks with the outside regional parks.





Milano, 23/05/2017

Name: Adalberto Del Bo

Signature:

Member of the think-tank Sustainability, Politecnico di Milano,
Department of Architecture

Name: Maria Vittoria Cardinale

Signature:

Member of the think-tank Sustainability, Politecnico di Milano,
Department of Architecture

Name: Rector Ferruccio Resta

Stamp and signature:

Legal representative, Politecnico di Milano