

Regenerative Evolution III

Resilient Tectonics

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Extended Brief

Resilient Tectonics | Abstract

“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.” – Buckminster Fuller

Diploma 16 continues its quest beyond sustainability towards a regenerative architecture that gives back more to the environment than it costs to build. The research centres on the development of resilient tectonic that evolves with our inhabitable environment and with nature through technological innovation and design intelligence. It reframes both practice and the construction industry to propose a new ontology of architecture and city with new environ-cultural possibilities extending beyond the current model of excessive consumption. Over the past two years the unit has examined various regenerative opportunities, from development strategies to material production via technological advances. This year we shift our efforts towards the design of buildings, tectonic experimentation and speculation in search of an architectural morphology that co-evolves with the Third Ecological Revolution. Design experimentation takes place in three phases: first, through a series of physical constructs of resilient tectonics based on critical projects; secondly through specific modification and re-appropriation according to ecological factors; and finally, through theoretical constructs of regenerative living set in the near future. The anticipated project output is centred on a form-driven architecture and resilient tectonic that is speculative, projective, creative and yet rigorous. Our aim is to achieve both quality and performance in order to make our buildings learn from experience and evolve their reciprocal relationship with nature. By creating an intelligent ecological architecture we reinforce the future relationship between natures, the city, architecture and human beings.

Diploma 16 continues investigating new grounds for the creation and development of innovative and visionary architectural design propositions embracing development of

new technology. We expect the speculation and projection of an adaptive, time-based, and inhabited architecture, not only resilient to change, but also formative for new directions of extreme urbanization, rapid infrastructural development, and lifestyles capacitating a reduction of our ecological footprint and a flourishing biodiversity. It's too late for sustainability, conventional building practice, or a return to the past, but Diploma 16 keeps promoting a paradigm shift towards regenerative design.

Last year's Resilient Habitats was looking to understand the environmental impact of the building industry and the necessity for developing industries using local resources allowing for alternatives to conventional global forms of construction. We started from an idea of local resources and emerging industries turning resource into material and ultimately building and cities in an attempt to radically change design, material and production technologies giving birth to an architecture giving back more to the natural environment than it costs it, in the pursuit of a resilient habitat. **RESILIENT TECTONICS** on the other hand, builds on this knowledge but aspires to reach a regenerative architecture by exploring the medium of building, both as in terms of design and construction, in the development of an increasingly resilient idea of tectonics and regenerative architecture. **RESILIENT TECTONICS**, as in the past years of diploma 16, aspires for a regenerative holistic architectural invention and ultimately an innovation driven, resilient architectural design, intrinsically linked to our cities, lifestyle and natural environment. This year these architectural concerns are going to be researched, treated and developed using the medium of building using primarily one singular scale. We are trying to take a step back from the design of cities, infrastructures and new material opportunities in favour of having a more specific building output allowing for a conversation on how buildings have a bearing on larger issues rather than favouring the issue itself by doing abundant topical research.

Diploma 16 | Ethos

Diploma 16 firmly believes in architectural intelligence that capitalizes and masters the co-evolution between the development of the architectural discipline, design technique and spatial consequence; and changes the very principles in how we conduct our lives in relationship to the physical environment. We harbour the simple belief that the design of our physical environment, contrary to what many scholars say, can have an impact on larger issues. Evolution of new lifestyles is instrumental in changing our impact on our natural environment, shaping our built environment or being created by it. Diploma 16 is looking for novel material design output manifested in physical models, large scale drawings and the ultimately the production of an architectural affect fulfilling the

transformative capacity of architectural design, curation and production processes through rigor and a design feedback mechanism. Diploma 16 is assisting students to develop their own design repertoire and communications skills based on associative design modelling, design feedback techniques, environmental simulation and digital fabrication through a series of computational workshops. Our explicit pedagogic aim is to work on how to evolve your understanding, abilities, techniques, craft and use of consultants in the design process, in order for you to develop new sensibilities and skills as architects interested in working on the design and construction of our physical environment.

Resilient Tectonics | the Undertaking

RESILIENT TECTONICS focuses on the re-generative design experimentation, creation of a resilient tectonic and the design of an architectural building project. The unit work is supported by critical support from specialists and consultancy, to produce architectural novelty, invention and in some cases innovation towards RESILIENT TECTONICS and new forms of living. The expected outcome is evolving around creative and projective design of resilient tectonics and a regenerative building design. The ensuing RESILIENT TECTONIC demonstrates that there are smarter ways of conceiving buildings with the potential to become regenerative by rethinking conventional models of normative building practice.

Diploma 16 releases a unit programme, including assessment criteria and deliverables, at the beginning of the autumn term and appended an initial draft to this Extend Brief. The following outline and descriptions are guides. All students select their own city/site with specific Resilient Living opportunities. Each student has to outline in their research abstract how they intend to be relating to the unit framework and organisation. Dip16 is also open to conversations with students wishing to enter the unit with an already existing research interests relevant the unit agenda.

Fourth year students are asked to focus on the formation of a Resilient Tectonic based building project, and programmatic content to be defined for specific mode of future living. The site is open for discussion but it should stay urban and we expect everyone to do an individual site field study. The anticipated output is an ambitious building design that can be discussed from the point of view of resilience, regenerative design and future living.

Fifth year students have more freedom to discuss their starting point and underlying issues but it should relate to a building design that can be discussed in terms of regenerative design. We are also insisting on the outcome to have a clear physical manifestation and all ideas to be discussed in direct relation to a material outcome. The site is open for discussion but the choice in the 5th year demands further consideration since we also expect the building design to be more context specific requiring a larger urban understanding and clearer reading of the city. The anticipated output for the 5th year students is also an ambitious building design that can be discussed from the point of view of resilience, regenerative design future living and cities. The fifth year projects should also be developed to a larger scale with a more detailed understanding of building performance and technology to be developed in parallel with the 5th technical studies.

Resilient Tectonics I the Anticipated Deliverables

Diploma 16 encourages diverse research and design interests but focused on the built environment. We strongly encouraging students to go on their own site field study trip as well as we have a number of planned trips with the unit that is beneficial to go on.

The following outline and descriptions of portfolio content is a guideline. Detail output will be discussed on individual bases during the course of the year.

1. A formal design and research **Abstract** from the beginning of the autumn term outlining a proposed thesis and ideology. This abstract will be evolved continuously throughout the year serving as a critical appraisal and communication instrument. The Abstract should clearly identify the following: 1. Thesis; 2. Hypothesis; 3. Discussion 4. Design Methodology; 5. Assessment Criteria; and 6. The relevance of the Anticipated Outcome and Dissemination.
2. A series of Physical Models of the building design and its **Resilient Tectonics** in relationship to the unit agenda. The Physical Constructs are evolved and re-iterated continuously throughout the year for experimentation, assessment & presentation. The models are aimed at being the centre point of the portfolio.
3. A 1X Extra Large (min. 1188 x 2520 tbc) Composite **Meta Drawing** as a critical manifestation of your entire project, demonstrating with following:
 1. The design experimentation on future proof environmental resilient conscious architectural production & design
 2. The innovation and inhabitation of the proposed resilient tectonic building prototypes and its feedback mechanism;
 3. The resilient building technology, process and regenerative properties;
 4. The resilient living technology, process and regenerative contributions;
 5. The resilient operation of the project and the changes in inhabitation;
 6. The components and critical design manifestation of the resilient community and its regenerative inhabitation.
4. A series of large scale drawings (format tbc) that are going to be defined jointly as a unit focusing at presenting and communicating your designed building outcome..
5. A **Progress File**, in a minimum 30 x 30 cm book format with clear structure and organization, including a table of content to curate the development of your ideas, concept, thesis and design development in details. This is the only record / portfolio of all your work from sketch to abolished design concept to unfinished drawings and models and final communication materials, with some form of structure and organization to be agreed prior final submission. This is a critical *reflective* and *communication instrument* required a great editorial effort.
6. A **Research File** identifying their *consultants* and *collaborators*, affiliated research specialists, stakeholders and producers etc. This is also a record and a key communication of your Resilient Habitats proposals, tectonic and architectural production; urban, ecological [CREW] and contextual [SPEEC] research.
7. A 5 min **Screen Presentation**, a communication tool to organize the critical observations, considerations, narratives and parameters of your thesis and allow a swift delivery of relevant information for any third party to understand framework and design decisions of your project. This is a critical devise for every mini review, jury, preview and final review. Please allow proper presentation scripts and annotation throughout presentation.
8. For all 5th yeas we also require a bound copy of your technical studies as well

Please note that this collection of documents and artefact constitute your portfolio and there is no other type of portfolio output unless agreed with your tutors.

Resilient Tectonics I the Brief

“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”¹ – Buckminster Fuller

Diploma Unit 16 is aiming to reshape the way we live in the future, a life style that respects and gives back more to nature than what we consume. We push the ambition to rethink architecture and design in the way we conceive of buildings using the context of regenerative technologies and innovations in building industries, and the design opportunities for urban settlements as Resilient Cities in a city. We formulate the intense relationship between Resilient Inhabitation, Tectonic Design and Future Evolution.

This year Dip 16 Resilient Tectonics focuses on regenerative architecture through building design projects, in medium scale that oscillate between individuals and the collectives, neighbourhood and localities, in an ever intensifying urban environment. We start investigating the normative understandings of sustainable architecture and their design, volumes, tectonics and inhabitation; we analyse these architectural interventions through physical constructs and living speculations. We conduct experimentation to formulate innovative architectural and tectonic design, form and volume, incorporating technological innovations, in order to project possible future living that is worthy for a third ecological revolution.

During the course of the year, Diploma 16 will participate specific workshops to study critical considerations in *Urban Growth* and speculative projection of *Future Living*.

4th & 5th year students

Innovative Building Form and Tectonics, and Resilient Living in the Framework of Localised Neighbourhood, now and near future

All students study the current normative understandings on ecological and sustainable architectural design and technologies, as well as resilient opportunities especially its resilient potentials through ***physical modelling*** and ***speculative analysis***. You formulate your own innovative Resilient Tectonic design techniques and repertoire, and articulate your building projects with the aim to formulate a new form of living that is ***resilient in geo-economic and socio-cultural ecologies***. Dip 16 also formulates a collective vision of resilient living based on, but not limited to, a critical review and interpretation of *UN Habitat Making Cities Resilient Framework*. All students subsequently select a city relevant and specific to their interests anywhere around the globe to position their design projects. Details to be agreed by the end of Term 1.

Diploma 16 continues the development of ***resilient knowledge, architectural tectonics and design specificities*** through procedural and iterative processes where

individual projects and specific tectonic interests should constantly be evolving with accumulative information and design feedbacks following site visits and consultations. In Term 2 & 3, we utilize the collective visions of ***Resilient Living*** conducted from Term 1 as spring board to test and appropriate the architectural and design experimentation, and further speculate the integral relationship between urban resilience, buildings and public domain. During Term 3, we extend the experimentation of the architectural projects to the future and encourage ***projective speculations*** on the new form of architecture in relationship with futuristic life style, towards a new resilient tomorrow. The projects become not only an architectural model for, but also a model of the future. The design thesis is interrogated and evolved by assessing questions of *Resilient* specificities, *Technologies*, and *Inhabitation* feedback in relationship with rapid contextual and regional transformation², supported by its very manifestation in thesis abstract writing, physical constructs, meta-drawings, panels and documentation.

5th year students

Innovative Building Form and Tectonics, and Resilient Living in the Framework of Urban Expansion, longevity and speculative evolution in 2050

All 5th year students consider and emphasize a holistic view of an architectural design using Building as a medium as Diploma 16 positions tectonics intelligence and design relationship between technologies, inhabitation and living with nature at the core of our possible *Resilient Future*. All 5th year students are encouraged further the design challenge to speculate new architectural premises and transformation in ***longevity*** and ***future resilience and robustness***. We aim to have formulated design projects by the start of term 2 and plan to do Technical Studies Option 1 meaning that you conclude your Technical Studies by the end of term 2 leaving the Easter holiday and term 3 for the development of your designed outcome. It is the ambition and tradition of Diploma 16 for the thesis project(s) to be competing in various ecological architectural competitions such as Holcim Awards, and may be also the qualification of a World Heritage Site (or RIBA Gold Medal for City) as part of the agenda for ***Resilient Tectonics***.

¹ R Buckminster Fuller 1975, Buckminster Fuller Institute “*Everything I know*” Lecture Series January 1975

² SPEEC: society, politics, economics, environment, and culture - to be selective but specific.

Resilient Tectonics I the Organization

Term 1 – Assignment 01 [4 weeks]

1. Physical Construct 1 [1:100], **volumetric** based tectonic experimentation, 50 x 50 cm, 4 weekly charrette
2. Wk1: Sky; Wk2: Ground; Wk3: Enclosure; Wk4: Integral Inhabitation [all models to be in exhibition quality]
3. Progress Files* focus – the iterations, the novelty and the resilient speculations

*30x30cm template for the booklets will be circulated at the beginning of Term 1 Inc. drawings, diagrams, appraisals, consultations, research, all support materials

Term 1 – Assignment 02 [4 weeks]

1. Resilient Living Manual [30 x 30cm booklet]: research summary, essential documentation and projective speculation on a new life style.
2. Wk5-6: daily routine, fashion, food & shopping, banking, education, social life, culture, and work;
3. Wk7-8: transport, infrastructure, sports, leisure and entertainment, library & storage, intercontinental transportation, communications and logistics;
4. Meta-drawing [3+m]: speculative, holistic and resilient life styles – composite over 4 weeks
5. Progress Files* focus – drawings development – fragments of Resilient Living, their evolution and complexities
6. Research Files* focus – the understanding of Resilience and its ecology, and the relationship between projective living and relevant architectural tectonics

Term 1 – Assignment 03 [3 weeks]

Wk9:

1. A1 panel: Based the collective ideas on Resilient Living, select a City which exemplifies individual resilient interests' the most, with comparison to two similar cities, with current and projective resilient matters. Final site/city selection to be agreed.

Wk10-11:

2. A1 panel: Urban Growth Laboratory 1 – study the premises of urban growth, the relevant issues in the laboratory and the possible innovative thinking
3. A1 panel: Urban Growth Laboratory 2 – study innovative urban growth in relationship to resilient design intelligence and its speculative effects
4. A1 panel: Initial speculation on potential architectural intervention to implement individual Resilient Living Manual.
5. Progress Files* focus – the urban principles in Medway, the relevant urban principle for selected site/city, and the possible resilient implementation
6. Research Files* focus – from Medway to selected site, the ecology, the resilient opportunities and the future speculation

Wk12: Term 1 Jury

Term 2 – Assignment 04 [3 weeks]

1. P Physical Construct [1:100] Architectural appropriation on site with specific local conditions based on tectonic design from Term 1, 50 x 50 x 50cm, 2 weeks
2. Wk1: Enclosure – Interiority; Wk2: Sky + Ground;
3. Physical Construct [1:50] Architectural appropriation on site with specific local conditions based on tectonic design from Term 1, 100 x 100 x 100cm, 2 weeks
4. Wk3-4: Resilient Living – sectional model [all models to be in exhibition quality]
5. Progress Files* focus – physical construct development – test models, tectonics, technologies, their evolution and complexities
6. Research Files* focus – the implementation of resilient technology and innovative design, and the consequences in inhabitation and experience
7. Wk5: Technical Studies 5 Interim Jury

Term 2 – Assignment 05 [4 weeks]

1. Wk6: Physical Construct [1:50], Situated Resilient Living – continue to develop physical construct to implement Resilient life style for **current** condition.
2. Wk7: Physical Construct [1:50], Situated Resilient Living – continue to develop physical construct to implement Resilient life style for **near future** condition.
3. Wk8-9: Physical Construct [1:50], Situated Resilient Living – continue to develop physical construct to implement Resilient life style for **2050** [5th years only].
4. Focus: resilient community formation in relationship with urban expansion, the design of public domain and the time based evolution of resilient life style.
5. **Meta-drawing** [3+m]: speculative, holistic and resilient life styles with architectural intervention – composite over 4 weeks
6. **Progress Files*** focus – drawings development – tectonic implementation of Resilient Living, their evolution and complexities
7. **Research Files*** focus – the understanding of Resilience and its ecology, and the relationship between projective living and relevant architectural tectonics
8. Wk10: 4th years Preview; Wk11: 5th years Preview

Term 3 – Assignment 06 [4 weeks]

1. Wk1-4: Physical Construct [1:50], Situated Resilient Living – continue to develop physical construct to implement Resilient life style for **Near Future** [4th years] and **2050** [5th years].
2. Physical Construct [1:100], **Urban Sample**, 100 x 100 cm
3. **Meta-drawing** [3+m]: speculative, holistic and resilient life styles with architectural intervention – composite over 4 weeks
4. **Progress Files*** focus – evolutionary documentation
5. **Research Files*** focus – knowledge and information documentation
6. Wk5 **Final Jury**. We will conclude the design work in Final Jury & focus on **Communication & Rehearsal** after

Full anticipation and commitment are expected as well as your full corporation in preparing and dismantling the end of year exhibition until mid July.

Resilient Tectonics | READINGS

Reference reading for the critical thinking and agenda:

- Buckminster Fuller 1978, *Operational Manual for Spaceship Earth*, Hardcover (1978) Amereon Ltd, E. P. Dutton; First edition (March 9, 1978), ISBN-10: 0525474333, ISBN-13: 978-0525474333, 143 pages
- Jeffrey Kipnis, Alexander Maymind, 2013 *A Question of Qualities: Essays in Architecture*, MIT Press, ISBN-10: 0262519550, ISBN-13: 978-0262519557, 288 pages
- John Tillman Lyle, 1994 *Regenerative Design for Sustainable Development*, NY, Wiley [Merit Award for Communications 1994, American Society of Landscape Architects]
- Sir Ebenezer Howard 1898, *To-morrow: a Peaceful Path to Real Reform*, Swan Sonnenschein & Co Ltd, London; new edition Cambridge University Press 2010
- Felix Guattari 1989, *The Three Ecologies*, Continuum Series; New Edition 2008
- Le Corbusier 1929, *The City of To-morrow and Its Planning*, Payson & Clarke, Ltd., New York, 1929; and
- William Morris 1891, *The Influence of Building Materials on Architecture*, Century Guild Hobby Horse Jan 1892, Longmans, Green & Co. London UK, NY USA.

On geometry & morpholy, type and form

- Jesse Reiser and Nanako Umemoto, "Intensive and Extensive" and "Geometry and Matter", in *Atlas of Novel Tectonics* (New York: Princeton Architectural Press, 2006)
- Andrew Atwood, "Monolithic Representations," in *Matter: Material Processes in Architectural Production* (Oxon: Routledge, 2012)
- Francois Blanciak: *Siteless; 1001 Building Forms* (2008)
- Farshid Moussavi, Alejandro Zaera-Polo, "Foreign Office Architects: Phylogenesis: Foa's Ark" *Actar Editorial*, 2003

On domestic Environments

- Geoffrey Hoyle, 2010: *Living in the Future* (1972)
- <http://2010book.tumblr.com/post/310745454/cover>
- Emilio Ambasz (ed.), *Italy: The New Domestic Landscape* (New York: The Museum of Modern Art, 1972)
- http://moma.org/d/c/press_releases/W1siZiIsjMyNjc5NyJdXQ.pdf?sha=d7b409f3b9d216ed

On robotic fabrication and material processes

- Gail Peter Borden and Michael Meredith, eds., *Matter: Material Processes in Architectural Production* (Oxon: Routledge, 2011)
- Greg Lynn, "Robots", in *Greg Lynn FORM* (New York: Rizzoli, 2008)
- Peter Testa, "Autonomous Translations," in *Fabrication and Fabrication* (Los Angeles: SCI-Arc Press, 2014)

Please check other reference reading at the diploma 16 shelf in the library