COST Action CA16114 RESTORE: REthinking Sustainability TOwards a Regenerative Economy,
Working Group Three Publication: REGENERATIVE CONSTRUCTION AND OPERATION

RESTORE

REthinking Sustainability TOwards a Regenerative Economy

Regenerative Construction and Operation

Bridging the gap between design and construction, following a Life Cycle Approach consisting of practical approaches for procurement, construction, operation and future life.

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IMPRESSUM

RESTORE Working Group Three Report: Regenerative Construction and Operation

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7. SUSTAINABLE REGENERATIVE TOOL – SRT (TRAINING SCHOOL WG3)

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TEAM 6: SRT COLLABORATIVE PLATFORM FOR MATURITY ASSESSMENT

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Climate change is a fact. We have the responsibility to take all necessary steps to reduce global warming within the next 10 years (IPCC). The construction sector is key to achieving this ambitious goal. However, our current structure is obsolete and has not been prepared to perform at the level now required.

To date, the linear sequence of **pre-construction, construction, maintenance/ operations and end of life** was working to achieve a built environment which was not designed for future thinking. An initial attempt to improve our existing building stock was to define the built environment as an element that could adapt to life changes and was capable of having several lives and functions.

Unfortunately, this is approach is not enough. A radical change is required, changing from a Top-Down approach to a **Bottom-Up approach** where the future of the product is defined at the same level as the initial project requirements. In a top-down approach, the different construction stages are conducted as information silos, where there is little or no knowledge transfer between the different involved agents.

SRT is proposing a **collaborative platform** where an advisory committee representing the four stages is established to work alongside the project from the early decision stages through construction to the operation and maintenance phase, with the second life targets as initial constraints.

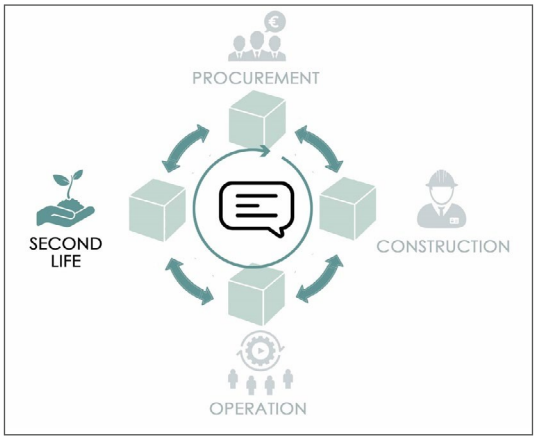

Figure 7.10 - Circular Built Environment Sequence

To achieve the goals and assure the success of the implemented strategies. Communication and common language are core to the **SRT** approach.

SRT is configured as a **matrix** to evaluate the **maturity level** of a project in respect of the nine RESTORE themes: Place, Energy, Water, Wellbeing, Carbon, Resources, Equity, Education and Economics. It is an analytical methodology that seeks to provide optimal strategies to enable the transition of buildings and the built environment from business- as-usual to regenerative.

The nine themes are divided into quantifying criterion that is evaluated regarding the descriptions provided at each level. These descriptions would be supported by the most current available data defining each criterion. The same matrix is used at each of the four stages, with different expected outcomes, with increasing maturity level in the final stages.

The matrix evaluates the current maturity stage and identifies a road map towards a regenerative level using a visual system, easily understood for discussion by all project stakeholders at different hierarchy levels.

In conclusion, SRT is created to be a tool that will allow a common language that needed across the different construction stages and all project stakeholders. The SRT tool, initially, structured as a matrix that would be continuously revised and updated with the last and more updated data of each criterion would readily transfer to a web-based open-source application. In addition, the SRT matrix would quantify the maturity level by providing a grade to be used as a rating system.

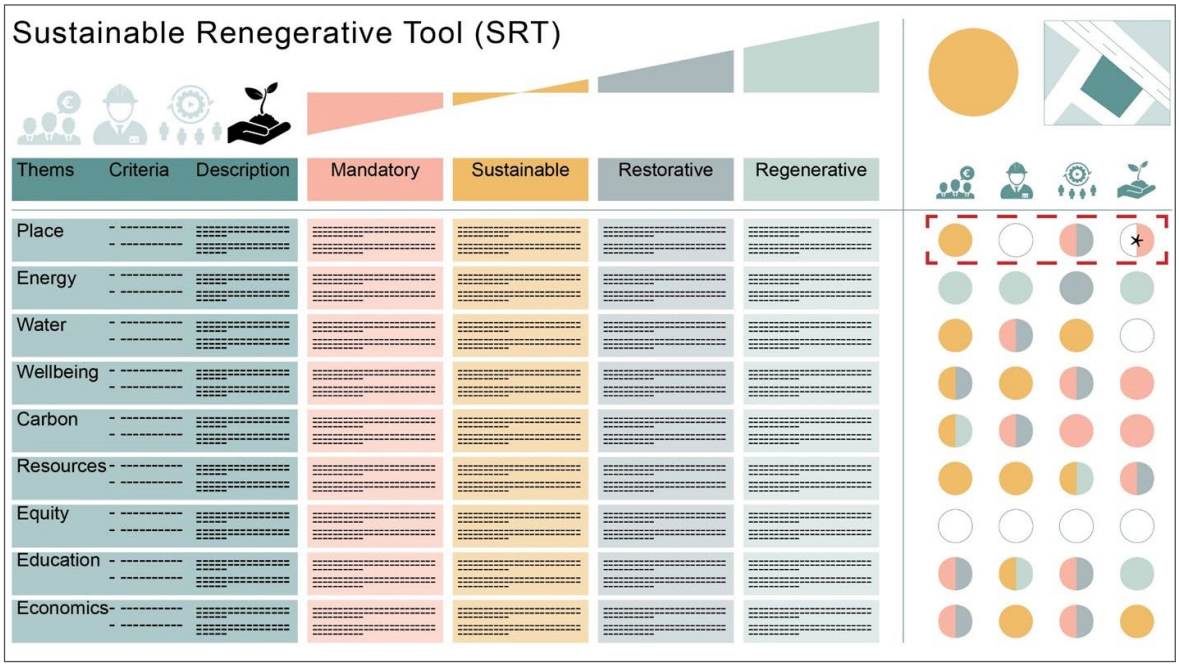

Figure 7.11 - SRT Categories - Evaluation

				Maturity Level			
				Mandatory / Business-as-usua	Sustainable	Restorative	Regenerative
	Indicators	Description	ase to be implement	1	2	3	4
Theme 1: Place	Bioclimatic Design	Design of buildings and spaces (interior – exterior – outdoor) based on local climate, aimed at providing thermal and visual comfort, making use	- Procurement - Construction - Second Life	- Design not linked with initial climate conditions - Design for demolition - Cradle to grave	- Design for disasembly - Simplicity of structure and form - Minimize or eliminate chemical connections	- Place-based design - All stakeholders engaged in the place - Continous learning and feedback	- Support the co-evolution of human and natural systems in a partnered relashionship. - Catalyst of positive change within the unique 'place' - Focused in enhancing life
	Heritage	Heritage sustainability aims for revitalization and readapting using flexible and eco-friendly materials.	- Procurement - Construction - Maintenance/Operations - Second Life	There are no mesures taken related to new materials and reversibility. No strategy adressing second life. Demolition and redevelopmnt.	- Eco-friendly materials are used - Recycling - Initial second life concept - Standarized solutions	- Adaptative Reuse - Increase accessibility and flexibility - hybridization of functions	- Revitalize surrounding - cultural integration - social and ecological systems - regenerate and evolve
	Design	Design of buildings and spaces (interior – exterior – outdoor) based on local climate, aimed at providing thermal and visual comfort, making use of solar energy and other environmental sources.	- Procurement - Construction - Maintenance/Operations - Second Life	- Strictly compliance with the technical country regulations - Compliance with minimum energy targets - Design not related to climate	- eco materials - LCA plan	- Document materials and methods for deconstruction - Material passport - Design Accessible connections - Design for simple forms	- Cradle to cradle materials - Carbon positive footprint - Material Conservation Plan - Plan for deconstruction -

Figure 7.12 - SRT Maturity Levels

SG 4 - SECOND LIFE - CONTRIBUTION TRAINING SCHOOL

Elena Gualandi
Architect and PhD Researcher in Environmental technological Design.
Elena Gualandi (Rome, 1992) is a European Licensed Architect and a PhD student in Environmental technological Design, based in the “Sapienza” university, in Rome. She studied also in France at “École Nationale Supérieure d’Architecture de Montpellier” and in Spain, at “E.T.S.A.M. – U.P.M.” polytechnical university of Madrid, where she began her thesis investigation. In 2016, she graduated with a project of urban retraining and sustainable construction recovery. Since 2017 she has been working with different architectural firms, both in Spain and Italy, focusing on the matter of architectural rehabilitation.

Katarzyna Kalinowska
holds a master’s degree from Białystok University of Technology (BUT) in the speciality of Construction and Engineering Structures. In 2018, she obtained a PhD in technical sciences. She is a lecturer at the BUT and interested in concrete technology, methods of recycling, properties of cement composites based on recycled aggregates and mortars, the second life of materials and sustainable construction. She has participated in nearly 50 scientific publications related to the above subjects, participated in several scientific conferences and co-authored a patent. She cooperates with universities in Córdoba and Madrid and works with the industry on the implementation of ecological, innovative technologies for construction.

SRT TOOL - TRAINING SCHOOL

Jonas Manuel Gremmelspacher
is a Master student at Lund University, Sweden, working on the assessment of building retrofits under future-climate scenarios as his Master thesis. He graduated in 2017 as Bachelor of Engineering from the Cooperative State University Baden-Württemberg (DHBW Mosbach), Germany. During his Bachelor studies, he combined theoretical education with his function as a project manager in a mid-sized enterprise specialised in energy-efficient retrofits. Throughout his Master education, he fostered knowledge in the field of energy-efficient and environmental building design. Focusing on building performance simulations led to part-time employment as a teaching assistant at Lund University.

Rafael Campamà Pizarro
is doing research on the assessment of daylight and electric lighting integration in retail stores, in collaboration with Lund University, IKEA and IEA-SHC (Task 61, Subtask D). He worked as a site manager and construction project manager in Spain and France for 12 years, mainly in the public sector. While finishing his master’s degree in Sweden, he strengthened his expertise in building performance simulations, which allowed him to work as Assistant Lecturer.
He currently combines academic research with environmental design consultancy in Scandinavia as a specialist in Daylight and Wellbeing in Buildings.