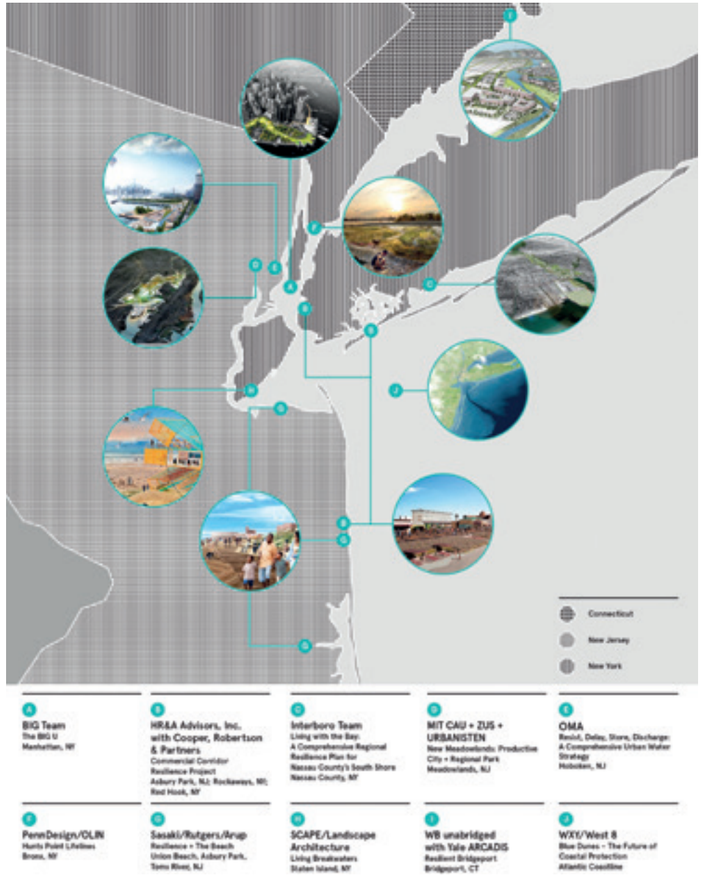
Figure 1. Overview of the 10 Rebuild by Design competition finalists (Rebuild by Design (2015: 64)).



Rebuild-by-Design Competition New York

In response to Hurricane Sandy's devastation the Northeast United States, U.S. Federal Department of Housing and Urban Development (HUD) Secretary Donovan launched 'Rebuild by Design' in 2013, in collaboration with multiple public and private organizations in New York. This new take on the design competition model would develop innovative, implementable solutions to respond to the region's most complex needs.

The Rebuild by Design competition was structured as a successive and connected set of stages, established to orient the design process around in-depth research, cross-sector, cross-professional collaboration, and iterative design development. Rebuild by Design gathered the talent of the world to work with the local talent of the Sandy-affected region. From 148 international applicants, 10 interdisciplinary teams were selected to compete in Rebuild by Design's year-long process. In June 2014, the HUD announced $930 million to be awarded to seven projects that were developed as a result of the Rebuild by Design competition.

Source: www.rebuildbydesign.org

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MATERIALIZING THOUGHT

THE ROLE OF VISUAL REPRESENTATIONS IN PARTICIPATORY MFFD DESIGN PROCESSES

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(Tentative) dissertation title:
'Look Closer: Semiotic reflections on the visual communication of multifunctional flood defence landscape designs.'

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Research through designing
A landscape architect conducts research through designing (Lenzholzer, Duchhart, & Koh, 2013). New ideas can be generated, tested, evaluated, and implemented using tools such as design workshops, charrettes, or even a full-fledged design competition such as Rebuild by Design in New York (Rebuild by Design, 2015)(see textbox and Figure 1). The design process generates innovation: the kind that is more than the sum of its parts. The designer is an expert in creativity, and looks for new solutions to myriad problems. In a participatory setting, the designer invites stakeholders to engage with that creativity, to come together on neutral grounds, with every participant transcending their own discipline, frame or expertise, thinking with each other instead of for each other, looking for consensus, not conflict (Kempenaar, Westerink, van Lierop, Brinkhuijsen, & van den Brink, 2016).

The process described above is an ideal model, and, like all models, it simplifies reality. A design process, and certainly that of a multifunctional flood defense (MFFD) project, is not linear. It does not take place in a social, political or financial vacuum. If put on a timeline, that line would be more circular than straight, more jagged than smooth. Participatory design processes bring together a diversity of stakeholders, each with their own frames (i.e., their professional and personal backgrounds) and each with their own perception of problems and solutions. Since each MFFD project is different, the involved functions and the involved stakeholders vary. Each project thus poses different challenges and requires different solutions, not only in the design of a physical flood defense structure or landscape, but also in the design of a participatory design process.

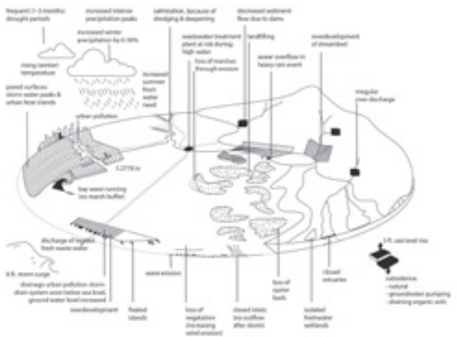
To facilitate such processes, landscape architects apply a range of visual tools, techniques and styles. Information is gathered, shared, documented and analyzed; ideas are formed, experimented with, criticized, praised, developed further or taken apart completely - all by means of visual representation. Such a range of communicative functions requires a range of visual representation techniques (Raaphorst, Duchhart, van der Knaap, Roeleveld, & van den Brink, 2017). Designers continuously ask themselves which visual representations are appropriate for a given situation. This question is often answered implicitly and pragmatically; tools are used simply because they work, or avoided because they don't. But why do some tools work and others not? Do they work for everyone? Can they be improved?

Analytic framework
Due to the diversity and complexity of MFFD projects, we cannot give clear-cut recommendations for use of visual representations in participatory design processes. Rather, we suggest a way of organizing the processes and looking at visual representation that enables facilitators to determine the most appropriate communicative strategy at a specific moment, for specific stakeholders. Making appropriate visual representations requires both the ability to look critically at the design's content, as well as the ability to express that content in a visual way while taking into account the creative and interpretive context of a participatory design process. This means one needs to be sensitive to stakeholders' backgrounds, both their personal and professional frames, and understand how visual techniques function, and which are appropriate in a given context.

Figure 2 (right). 'Readability', what do you see: a specific depiction of the study area, or a re-designed flood defence landscape? (Rebuild by Design, 2015, p. 120) (© MIT-CAU + ZUS + URBANISTEN)

Figure 3 (below left). 'Interactivity', scale model in a presentation hall invites discussion. (Rebuild by Design 2015, p. 115) (© MIT-CAU + ZUS + URBANISTEN)

Figure 4 (below right). 'Validity', Schematic drawing with captures that explains the design challenges from a landscape system perspective. (Rebuild by Design, 2015, p. 99) (© Interboro team)



In this research project we have developed a framework that can guide a way to take into account stakeholder configurations and the role of visual techniques in participatory processes (Raaphorst et al., submitted). In general, the communicative power of how a design is represented, is determined by an interplay of three key elements:

1. Interactivity: how the design representation engages with the world
2. Readability: the visual qualities of the representation
3. Validity: the ideas embedded in the representation.

The interactivity of a design representation (Figure 2) refers to the social context within which the design is created and interpreted. For instance, the degree of co-creation influences the authority of a design and public support for it. Who is allowed to make the design? How iterative is the design process? Are there enough occasions for feedback? If participants feel involved in the creation of a design, they are more likely to support it. If people feel ignored or unappreciated, they are more likely to oppose it. This question of 'ownership' is an issue for all stakeholders and participants, whether that be a city council, an environmental protection agency, or an engineering firm.

The readability of a design representation (Figure 3) refers to the degree people can read and understand that design as a result of its visualization. For instance, we know that reading a map is a learned skill, but so is reading and understanding a photomontage; one needs to be able to distinguish the existing situation from what has been added to the picture. Other visual choices, such as scale, perspective or color scheme also greatly influence the readability of a design and carry with them certain visual authority. For instance, a 3D rendering with a lot of detail suggests a finished design: this would not be a good choice for a first community meeting unless one wanted to provoke discussion. Similarly, a hand drawn sketch might be a good product of a design workshop, yet it is likely that an engineer would discount it because of its lack of technical detail.

The validity of a design representation (Figure 4) is determined by the design's content. Content can be both objective and subjective. It can consist of data and knowledge, but also ideas, inspiration, feelings and emotions. The design's content influences the possibilities and choice of representation: maps, photomontages and 3D models can each communicate different types of content in different ways. To be able to talk about content in this way requires a certain level of education, awareness of design challenges, and expertise in the field. The process of designing is therefore not just about getting ideas on paper, but also about educating each other. This approach helps participants to value each other's input better, which increases the validity of the choices made during the process.

Participatory context

Stakeholders are organized according to certain levels of participation. Scientific experts contribute valuable knowledge, but rarely meet with local inhabitants. Legislators and mayors convene with city planners, yet rarely meet ecologists or hydrologists. Integrated knowledge can only be created and shared if it is mediated between these groups. This means that stakeholders at all levels need to be included, and that the communication between them needs to flow in both directions. If this is not monitored and evaluated, specific stakeholder groups may develop their own ways of designing, knowledge about the project, visual language to express that knowledge, and ways of interacting. Since these different design processes will tend to diverge, the designs' content may become incompatible, which will make it complicated to integrate them at a later stage.

The diversity of stakeholders is reflected in the diversity of interaction, readability and validity of designs. These three elements may complement each other, but they can equally well overpower, or even contradict, each other; the balance and outcome will, of course, vary from project to project. For instance, visual techniques are not equally interactive, and can be created and interpreted differently: GIS maps can be overlaid with hand drawn sketches, photomontages can be created using photos made by local inhabitants, and 3D models can be explored at leisure with online gaming engines. Readability will also depend on the stakeholder: participants who are intimately involved with the project might understand a design without actually 'reading' it because they know the content by heart, while an outside jury of a design competition, without such involvement, will need to interpret the design's content purely on its visual and interactive merits. The validity of content will also depend on the interpreter: an engineer will consider the feasibility of the project based on mathematical calculations, a designer may appreciate a project for its visual aesthetics, and local inhabitants may worry about the sunset being hidden by a dike. All of these values contain a certain validity, which will influence how the design is interpreted.

For a visual representation to be effective and communicate successfully, all three elements need to be considered. In practice, the details will depend on the nature of the project, the stakeholders involved, and how their participation is organized. By acknowledging this complexity, and by creating (and interpreting) visual representations according to the three-step analytical framework built in this research, communication will be more conscious and empathic, and ultimately more effective. This can lead to an increased sense of confidence and design ownership among the stakeholders, which in turn will improve the chance that the design will be implemented as it was intended.