

# DESIGNING FUTURES THAT COULD NOT BE FORESEEN

## Collective Future-Making in the Deltawerken, 1953–1997

### THE QUESTION

The Netherlands faces infrastructure challenges that unfold across decades: climate adaptation, flood defence renewal, the reconstruction of institutional knowledge lost through outsourcing. These challenges demand the capacity to design collectively under conditions of deep uncertainty. But how is that capacity built, and how is it lost?

This thesis re-reads the Deltawerken (1953–1997) through a design-theoretic lens to answer that question. It assembles an analytical vocabulary from pragmatist epistemology, C-K theory, design-ability, and boundary work, and uses it to uncover conditions for collective future-making that the engineering narrative alone leaves invisible.

### WHAT THE ANALYSIS FOUND

The Deltawerken's capacity for collective future-making rested on a configuration of institutional, epistemic, and relational conditions that reinforced each other. The Deltadienst sustained generative doubt as a design resource: 25 scale models at De Voorst, the begrepen ervarings protocol, the *Stafgroep Totaalontwerp*'s exploration of approximately 360 design variants for the Oosterschelde. Boundary spanners like Saeijs and Ferguson carried knowledge across community boundaries with enough standing to make it consequential.

The analysis also showed how this capacity was dismantled. The *bedrijfsmatige wending* of the 1980s and 1990s replaced

collaborative structures with competitive procurement. Outsourcing transferred tacit knowledge to contractors. The monitoring architecture continued to reproduce the performed future as the only institutionally legible reality. The Maeslantkering, designed entirely by an external consortium, demonstrated that the institutional achievements of the *Deltaschool* were contingent rather than permanent.

Ten lessons, organised across three capacity domains (perceptive, connective, generative), gather these findings into recognisable aspects of collective future-making practice.

### PRACTITIONER INTERVIEWS

The ten lessons were recomposed into six reflection axes, each structured as a tension between two poles, and confronted with the experience of four Rijkswaterstaat practitioners working on contemporary water safety and infrastructure programmes.

The practitioners recognised all six tensions as present and consequential in their own work. They converged, independently, on the same core problem: the deferral of consequential decisions under conditions where deferral progressively narrows the space for future action. Their accounts describe an organisation optimised for production, in which the knowledge integration that collective designing requires has limited structural presence.



The convergence across four independently conducted interviews, with practitioners working at different levels of the system and framing the problem in different vocabularies, lends credibility to the analytical frame developed from the historical case.

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Figure above: Construction of the Hollandse IJsselkering (Rijkswaterstaat, 1957)

Figure left: Aerial photograph of the closure of the breach at Ouwerkerk using Phoenix caissons (Anefo, 1953)

A programme that knows where it stands can choose where to head. The question is whether yours can see where it stands.

## COLLECTIVE DESIGN COMPASS

An orientation instrument for programmes facing complex, uncertain, long-horizon challenges

PROGRAMME

DATE

### THE PERFORMED FUTURE

What future is this programme currently enacting?

#### PERCEPTIVE CAPACITY

What does the programme see?

#### VISIBILITY



"Does your monitoring system make certain futures invisible?"

- Who determines what is measured?
- Do results feed back into design, or only execution control?
- What new measurements would reveal a different picture?

#### CONNECTIVE CAPACITY

How does the programme relate to uncertainty and difference?

#### PRODUCTIVE DOUBT



"Is not-knowing treated as a problem to be resolved, or as a starting point for design?"

- When facing the unknown: contract out, or investigate in-house?
- Is there protected time/budget for exploration without fixed outcomes?
- Which decisions expand options by waiting, which contract them?

#### GENERATIVE CAPACITY

How does the programme organise for the unknown?

#### DESIGNABILITY



"Can the programme's brief be fundamentally revised, or is it structured only to deliver what was decided?"

- Could new knowledge challenging the core premise be absorbed?
- What is settled (contractable) vs. still being designed (in-house)?
- Does governance allow reframing, or only scope changes?

#### IMAGINATION



"Is your programme limited by what it knows, or by what it can imagine?"

- When was a fundamentally different alternative last explored?
- Does the programme generate new concepts, or only evaluate existing ones?
- Are there people whose role is to imagine, not only to analyse?

#### BOUNDARY SPANNING



"Who carries knowledge across community boundaries, and do they have standing in more than one community?"

- Can you name individuals bridging knowledge domains?
- Does a new perspective have a carrier with institutional standing?
- Are there forums where communities confront each other's assumptions?

#### GENERATIVITY



"If no crisis occurs in the next decade, can this programme still open fundamentally new directions?"

- What mechanisms exist for challenging the trajectory from within?
- Is there a structural role for dissent or alternative scenarios?
- Has the programme ever changed course without external shock?

### THE COLLECTIVE DESIGN COMPASS

The reflection axes were translated into the Collective Design Compass: an orientation instrument built around six diagnostic questions across three capacity domains.

PERCEIVE → CONNECT → GENERATE

The Compass asks a programme team to collectively articulate the future they are currently enacting, then work through six questions that surface how the conditions for collective design manifest in their practice. The collectively formulated answers meet the analytical vocabulary

from the Deltawerken analysis. The confrontation between the team's own language and the theoretical frame is where the instrument becomes diagnostic: it reveals gaps, tensions, and patterns that remain invisible when each practitioner carries only their own perspective.

The Compass orients rather than prescribes. It tells its users where they stand relative to a set of directions grounded in historical evidence, while leaving the specific route to their situated judgement.

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