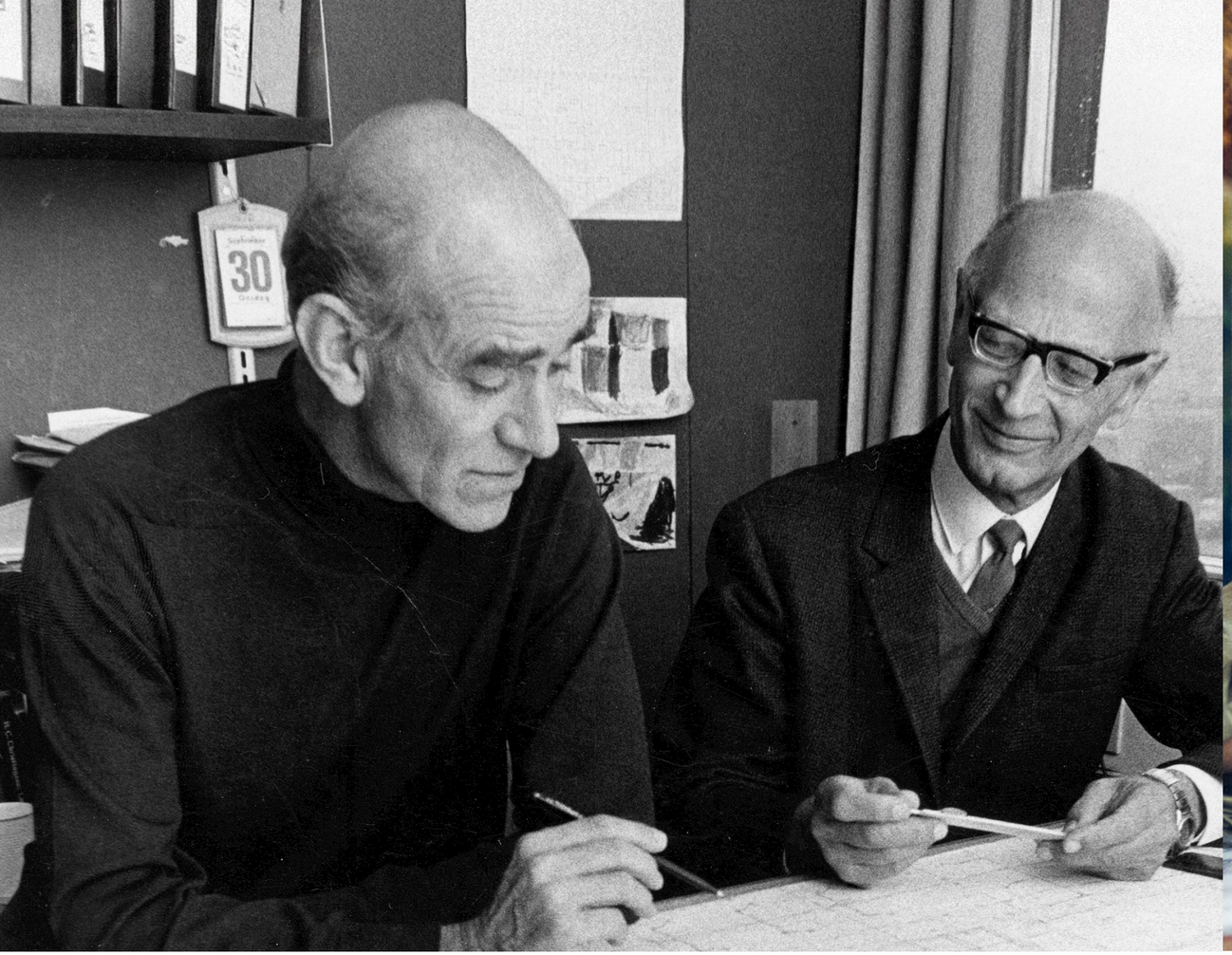
RAMBOLL GLOBAL

DESIGN

COMPENDIUM 2026

A Playbook for Design Excellence

A Ramboll Design Excellence Publication...



80 years on ...
this edition of DESIGN is dedicated to the two young engineers
who started our journey all those years ago.

... to Børge Johannes Rambøll
and to Johan Georg Hannemann.

80 years of
sustainable change

Ramboll Global DESIGN Compendium 2026

A Playbook for Design Excellence

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Abstract

The core principles of Design Excellence are vital to Ramboll's pursuit of excellence. Emphasizing the collaborative nature of our approach, these principles bring together varied perspectives, as highlighted in our thought leadership sessions.

Design is different things to different people, and our principles reflect this diversity while ensuring regenerative thinking and addressing the multiplicity of client needs through tailor-made solutions.

The Ramboll Design System (RDS) consists of three parts: Purposeful Design, Responsible Design and Intelligent Design.

Purposeful Design aims for every action to contribute to something larger - success for our clients, value for society, care for the planet, and resilience for Ramboll itself.

Responsible Design connects purpose with accountability, combining material insight, environmental performance and long-term value to create places and systems that enable life to flourish.

Intelligent Design is how we learn and improve collectively - a culture of experimentation, feedback and shared intelligence that helps Ramboll deliver better, and more resilient outcomes.

The multiplicity of client needs is a central consideration, ensuring each project is tailored to meet diverse requirements while maintaining high standards of quality and performance. Tailor-made solutions are crafted through collaboration and the integration of varied perspectives, aiming to exceed client expectations and promote environmental stewardship.

Our hierarchy of design ensures comprehensive solutions at multiple levels.

At Ramboll, we ensure that every project is tailored to meet the unique needs and preferences of our clients while upholding high standards of quality and performance. We believe that thoughtful design has the power to transform spaces and enrich lives, which is why we prioritize the integration of user-centric approaches and empathetic understanding in our processes.

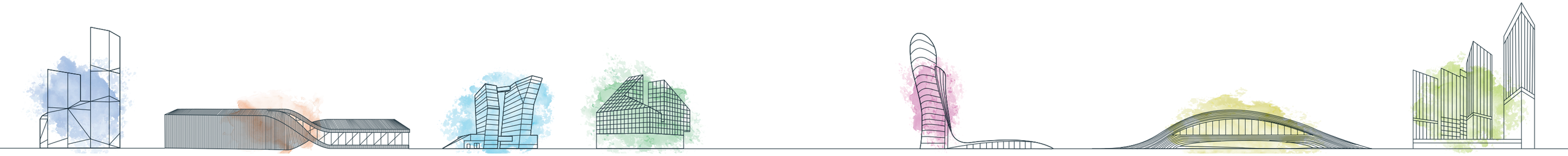
Foreword

Ramboll Global DESIGN Compendium aims to guide our engineering approach and establish coherence and consistency across Ramboll Buildings projects.

It integrates global principles with local adaptations, ensuring high standards of quality and innovation. This book is a key Design Excellence Publication, which can serve as onboarding material for new hires, professional development for current Rambollians, and positioning Ramboll as an active contributor to the agenda of design and excellence within the industry.

This is our strategy to promote excellence in design. It is not a rule book but a mindset through which we deliver purposeful design to our clients and the wider society at large. It underscores the universal impact of design in shaping our environments, highlighting how thoughtful design enhances technical functionality, sustainability, and aesthetic value. By presenting the very best design practices and projects from across Ramboll, this compendium becomes an inspiration and a strategic tool to help differentiate Ramboll from our industry partners.

This book is a guide to creative thinking and practices that enhance the quality and consistency of design decisions, leading to purposeful and meaningful values embedded in every project.



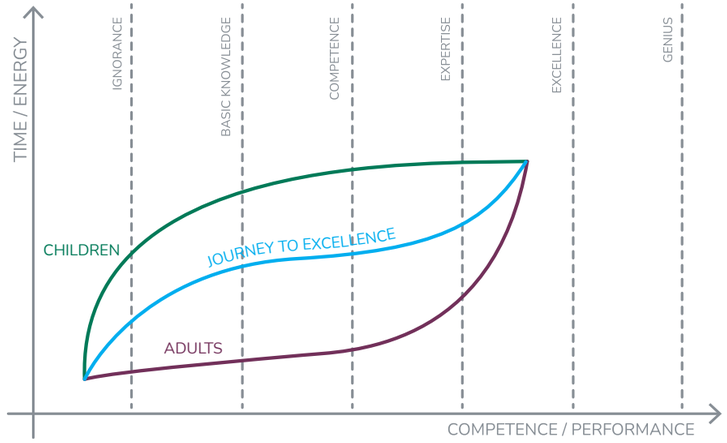
On the Journey to a Culture of Excellence

Excellence occupies a special space across the spectrum from ignorance to knowledge. It combines the confidence of knowing with the anxiety of realizing how much more there is to learn.

This duality makes excellence elusive. It is not a destination but a state of mind, something we pursue rather than achieve. As we get closer, the goalposts appear to shift, compelling us to keep striving. This is why we tend to speak of being in “pursuit of excellence,” acknowledging its unattainable nature while valuing the journey.

The meandering journey across the spectrum varies. Children may face immense challenges in the early stages of learning, but subsequent learning feels more effortless and fluid.

For adults however, the pattern is different. Early progress appears easier because it builds on existing frameworks and habits. However,



gains diminish over time. Advancing from competence to expertise, and especially towards excellence, requires greater effort, focus and energy.

Perhaps the most accurate model reflects a mixed trajectory: achieving genuine foundational knowledge is challenging; progress then becomes easier for a while, but the climb toward excellence ultimately grows more arduous. This nuanced journey underscores why excellence remains a pursuit, not a destination. It also explains why there is always less excellence than mediocrity.

The 80-year history of Ramboll is a story of continuous striving for excellence and for socially responsible design and consultancy.

As far back as 1986, our founders wrote the company’s philosophy. These were further developed into the following principles over many decades:

- **We behave decently and responsibly**
- **Our employees are our strength**
- **We are active members of society**
- **Excellence and insight are our hallmarks**

Design and design thinking have evolved in the company over recent decades. This book collates the ideas that are currently debated and practiced within the company across the globe.

It contains ideas, concepts, tools, and practices that are collectively unique to Ramboll, and which holistically differentiate our approach and practice across the industry.

The book is widely distributed within Team Ramboll. All Rambollians are encouraged to engage with it, use it, and apply the ideas to their specific projects in all disciplines and across all geographies.

Ramboll Global DESIGN Compendium helps strengthen our position as a world leading consultancy, creating value for our clients and for the planet at large…

April 2026

Peter Heymann Andersen
Chief Operating Officer

Arne Birkeland
Managing Director, Buildings

Hossein Rezai-Jorabi
Global Design Director

> How do we differentiate in a world where everyone knows everything?

The Advent of the Artificial

Hossein Rezai-Jorabi

In a world where everyone has access to a GPT or other tools powered by Large Language Models, and where it appears that everyone "knows" everything — how do we differentiate?

For decades, access to more powerful machines and cutting-edge digital tools has been a key differentiator.

But with the advent of artificial intelligence — in the form of accessible, user-friendly GPTs and LLMs — anyone can now seem all-knowing.

In this new landscape, how do clients distinguish between competing offerings when all appear equally comprehensive and compelling? Accessible AI is shifting the balance between the digital and the analogue — and, for the first time in decades, it is the analogue that defines the difference.

The differentiator is no longer the machine or the technology. These have, in fact, become the great equalisers.

The true differentiator is the analogue, the person — the operator.

You are the differentiator now


Everything
we see
around us
has been designed
by someone
FLYING CINEMA
TOUR OF HELSINKI & FINLAND
Allas Restaurant

01

Design is Different Things to Different People

Hossein Rezai-Jorabi

While we often celebrate the positive outcomes of our designs, we must also acknowledge our collective responsibility for their adverse impacts - on the environment, on humanity, and on the planet as a whole.

We have all played a part. Some of us have designed objects, buildings, or cities; others have commissioned, manufactured, or constructed them. Many are responsible simply by using or promoting these designed products. The responsibility is total and shared.

This enormous burden is only slightly eased by one truth: design is an ongoing, continuous **process**. It offers us the chance to redesign what has caused harm, to improve upon what came before.

But what is design?
Design means different things to different people. To one, it is **aesthetics**; to another, **purpose**. it is about "**justice**" or "**outcome**" to some, "**environment**" or "**impact**" to others.

> Purposeful design is not vain. It does not celebrate itself, nor is it only about aesthetics; instead it is in the service of a higher purpose. It is often reflected in the success for our clients, value for society, care for the planet, and resilience for Ramboll itself.

For us at Ramboll, design is about a systemic approach to all that we do.

Design is about **water**, and the acute scarcity of it.

It is about **biodiversity**, and its near annihilation down to as little as 30% of what it was in as recently as 1970s.

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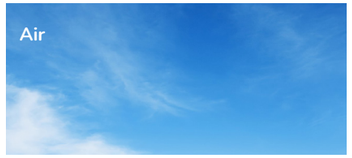
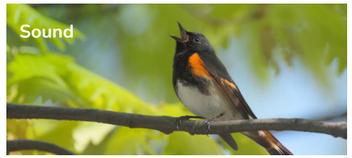
It is about **vegetation**, perhaps not so much the manicured landscapes but the rewilding agenda.



It is about **air, carbon and greenhouse gases** which have gone up in the atmosphere by a factor of 7 since the 1940s.

It is about **colours of nature versus those of a mono-culture plantation.**



But design is about more than these. it is also about sound; **sound** of a primary forest is very different from that of a tree orchard. The sound of a healthy neigbourhood is very different from a polluted one.

It is about **shades** and massings of our buildings, **lines, edges** and adjacencies in our built environment, as well as about **solids** and **voids** that allow light and natural ventilation through.

The list continues, into **coexistence, collaboration, justice**: both environmental and social justice, and extends to include **economy**: our value system, and **politics**: the way we run ourselves and the governance we have created.

In its purest and most valuable form, design is about the **impact** we have on the societies we live in, and equally, about the ecology we shape **as part of nature**.

02

The Playbook

Ollie Wildman and Ian Lund Rockliffe

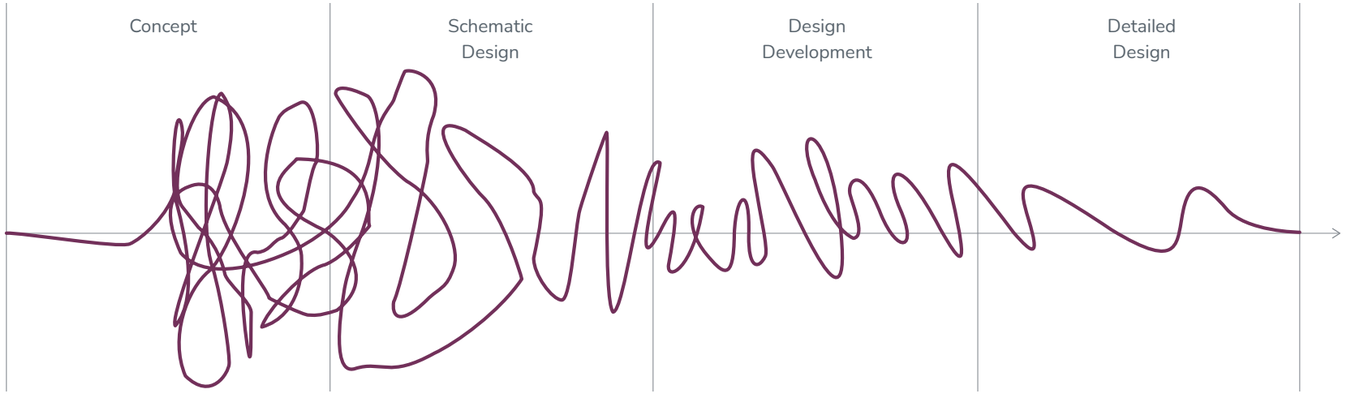
A playbook is not a rulebook. It presents a mindset through which we deliver purposeful, intelligent, and responsible design to our clients and to society at large.

Can the conceptual design of buildings be guided?

The start of every project may feel disorganised, messy, iterative, and resistant to order.

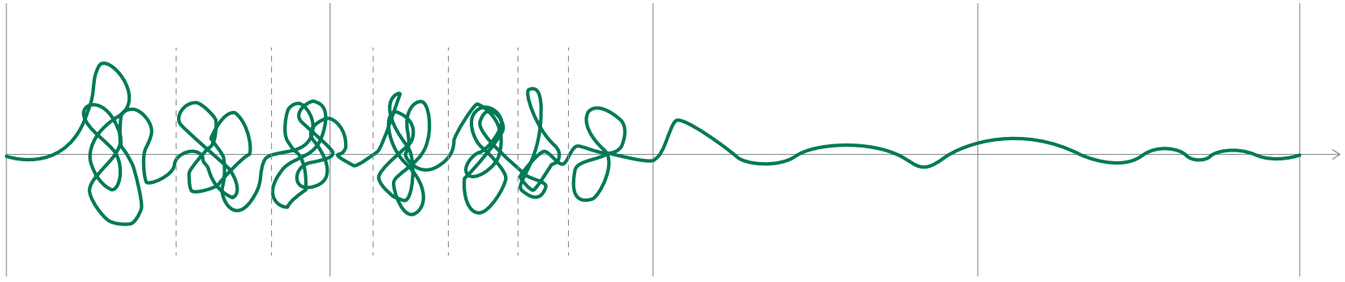
Attempts to tame it usually fail, as this is the nature of exploration. We may know where we want to end up, but not how to get there. Some ideas bear fruit; others lead to dead ends.

We accept this reality as part of design. Avoiding it only leads to generic, one-size-fits-no-one solutions. At Ramboll, our clients need bespoke outcomes that respond to specific requirements, but within a strict timeframe. So the question becomes: how do we guide a process that resists being fully prescribed?



Design: Messy, iterative, uncontrolled

Execution: Not as smooth as we'd like...



Design: Messy, iterative, but a controlled complexity

Execution: A smooth landing...

Our answer is to embrace the chaos, but within guardrails. We break the marathon into sprints.

At the start of each design stage, we identify the main challenges.

We prioritise them and plan them out, tackling them one by one. This doesn't mean reducing the problem to isolated parts. We think in interconnected systems - explored individually, but always in context.

The client is part of our team throughout. By focusing on one design challenge at a time, we explore problems, options and solutions and identify further opportunities to create value together. This makes the results highly tailored for the project. We question the brief, look to precedents, and use data to drive our decisions. Each sprint builds on what came before, creating a continuous feedback loop of learning.

We therefore channel the messy, iterative nature of design into a series of timeboxed windows, or sprints.

This gives us structure without stifling creativity. Within these constraints, a coherent, holistic design emerges on time, and with intent.

Our playbook is a way of guiding the design process in our often non-linear and iterative journey through our projects.

It is a meaningful brief where we have, together with our clients, defined what we are designing, which is crucial prior to planning the project work to be carried out. During the planning for each design stage the work is broken down into smaller components, all informed by the brief. These components can be worked on in a controlled and coordinated manner which we call design sprints.

Explore components of the brief to create value

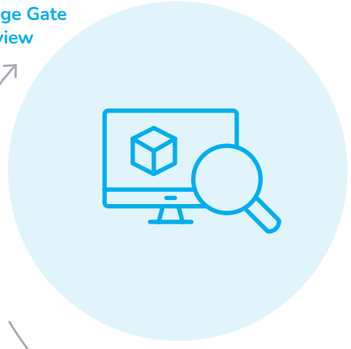
For each component, a design sprint is carried out where we focus all our efforts for a short period of time. This involves exploring the component and identifying opportunities to create value through co-authoring within Ramboll and the industry.

Design sprints

Options can be explored in an open and creative environment, bringing the best of Ramboll to the forefront. These investigations are then recorded and presented in a compelling manner to lead our clients through the design process to our recommendations. A key step is to have these investigations reviewed by experts in the specific area to deliver quality to our clients.

Interim Design Review

Stage Gate Review



This process is not linear but iterative, such that the detailed design stage at times informs the preceding concept stage in a systemic and interconnected manner and always in parallel with the wider design team. These can be collated into Stage reports and our basis of design at the end of each stage and packaged as part of the Stage Gate Review.

Check and deliver

03

Ramboll Design System

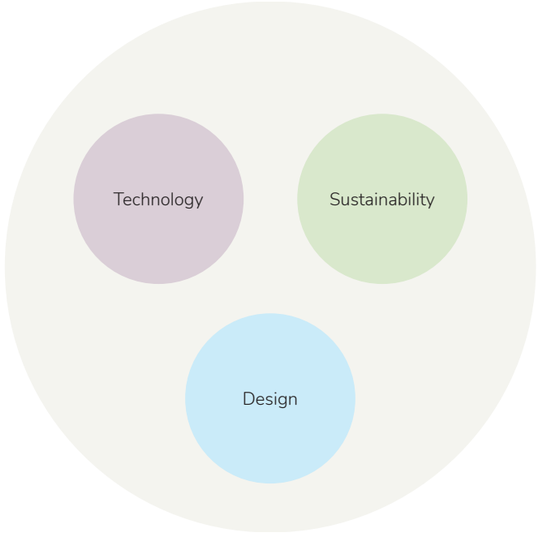
From Typical to Systemic...

Paul Astle, and Lora Brill, based on an idea by Peter Heymann Andersen and Hossein Rezai-Jorabi

The typical approach to design treats sustainability, technology, and design as isolated and separate parts.

Within this model, designers and design thinkers focus primarily on aesthetics, shape, and form. Technologists, in turn, address technological tools and innovation as a distinct pillar, while sustainability professionals engage separately with lower-carbon materials and other environmental drivers.

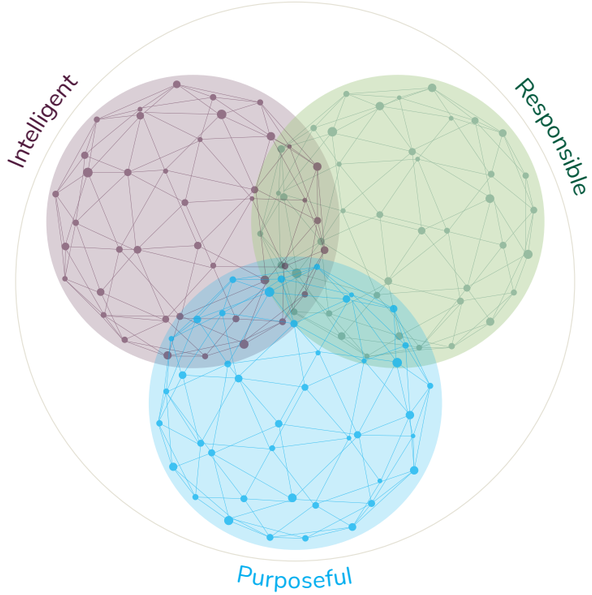
In a systemic approach to design, these three elements form parts of an integrated whole, working interactively to produce outcomes that none could achieve independently. The Ramboll Design System is predicated on this active interplay between the three.



The ultimate goal and desired outcome can only be achieved when design, sustainability, and technology work together in a cohesive and systemic manner.

Ramboll Design System describes our common mindset for delivering design success across Buildings. It was developed to overcome the fragmentation of design practice - where design, sustainability and digitalisation often operate in silos - and to ensure every client experiences the same value-driven approach, regardless of project scale or location.

The Ramboll Design System encourages deliberately doing things differently at the moments that matter most. It helps teams share knowledge, use consistent language, and present a unified identity to clients. It reinforces the culture that underpins Ramboll's ambition to be the world's leading building consultants, pioneering sustainable design solutions that drive client success.



At its heart, the Ramboll Design System brings together three key components:

Purposeful design serving planet, society, and clients

Responsible design helping people and nature flourish

Intelligent design learning, experimenting and improving

The Ramboll Design System is not a tool but a shared mindset - a way to organise our knowledge, curate our best ideas, and strengthen our culture.

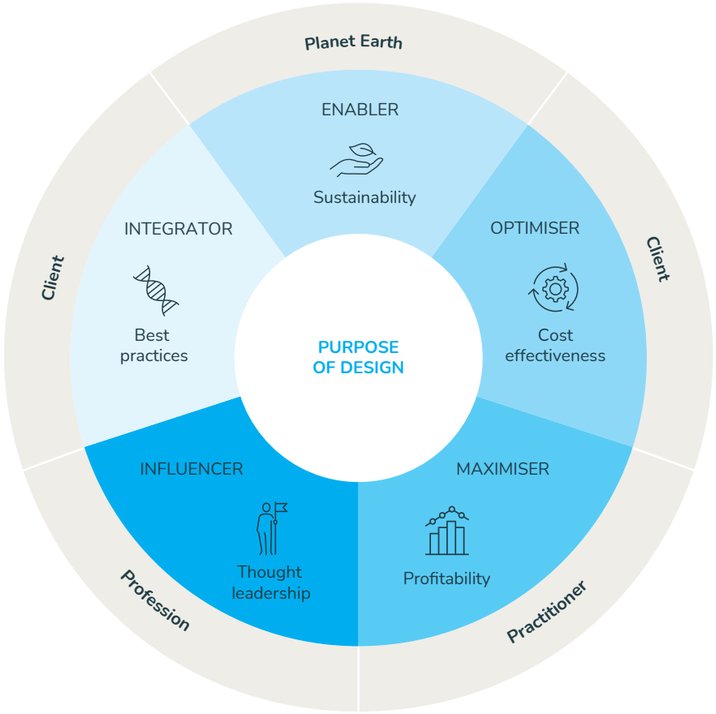
It brings our ambition to life: Connected design. Consistent delivery. Shared success.

04
Purposeful Design

Hossein Rezai-Jorabi

Ramboll Design is PURPOSEFUL

It does not exist to celebrate itself. Good design is not solely about aesthetics, problem solving, beauty, or iconic forms, although these qualities can coexist. At its core, design must be purposeful, aimed at addressing the critical challenges facing humanity and the planet. These challenges are numerous, but they can be summarised into five key principles, as outlined in the Ramboll Design Rosette.



Ramboll Design Rosette

Design as an integrator

to bind our efforts and resources within Ramboll together, and to ensure that the best of Ramboll comes out of every Ramboll project, no matter where we operate. as depicted in the Ramboll Design Rosette. The immediate beneficiary of this will be the project client.

Design as an enabler

to help achieve our sustainability and environmental goals. The immediate beneficiary of this will be planet Earth.

Design as an optimiser

to help ensure that all our designs are fully optimized vis-à-vis efficient use of materials and the ultimate cost of the projects we deliver. The immediate beneficiary of this will be the project client.

Design as a profit maximiser

to help increase our productivity, efficiency and profitability (see McKinsey design index, MDI). The immediate beneficiary of this will be the practioner.

Design as an influencer

to help enhance our influence across the industry. To elevate the valour and position of the engineer in the society at large to help attract bright minds to our industry and to make it more attractive to the younger engineers and those planning for their tertiary education. The immediate beneficiary of this will be the profession at large.

Design Excellence Resources

Purposeful Design	**Creating buildings that serve people, place and long-term value**
Design Stream 1	Horizon Broadening
Design Stream 2	Global Design Reviews
Design Stream 3	Global Design Audits
Design Stream 4	Design Resolution
Design Publications	Communication
Design Excellence Events	Advocacy

05

Responsible Design

Paul Astle and Lora Brill

Remiseparken
Copenhagen, Denmark

Responsible Design connects intent with consequence. It means understanding that every design decision has effects beyond the project boundary and beyond the moment of completion. A successful outcome is not simply one that works today, but one that remains safe, useful, and valuable throughout its life.

Responsible designers think in systems and think holistically. Buildings interact with climate, infrastructure, materials, people, and future regulation.

Decisions about structure influence maintenance. Spatial layout affects operational safety. Material selection shapes carbon impact and future reuse. Because of this, optimisation of individual components in isolation is avoided in favour of holistic whole-life performance.

Design for endurance is central. A responsible project adapts rather than expires. Flexibility, maintainability, and future modifications are treated as design requirements, not optional extras.

The brief is interpreted as a starting point, not a limit. When necessary, designers challenge assumptions to avoid locking in short-term solutions that create long-term risk.

Carbon leadership is part of accountability. Embodied and operational carbon are addressed early, not corrected late. Materials are selected for provenance, performance, and recoverability. Reuse is investigated before replacement. Circularity is planned intentionally so that elements can be disassembled, retained, or repurposed. The goal is not minimal compliance but credible reduction.

Responsible Design also protects value. Climate resilience, regulatory change, and operational reliability are considered at the concept stage. Designers make trade-offs visible so clients understand consequences over time, not only initial cost. A feasible option is not automatically a good option.

Ultimately, Responsible Design treats the project as part of a wider system composed of the environment and society and over a longer timeline.

It reduces harm, avoids future intervention, and ensures assets remain useful, insurable, and trusted. Success is measured not only at handover, but in decades of successful operation.

06

Intelligent Design

Paul Astle and Daniel Sandhav

Intelligent Design is the practice of learning while designing. It replaces isolated expertise with connected expertise and treats each project as part of a growing collective knowledge base.

Integration comes first. Disciplines do not coordinate after decisions are made; they shape decisions together. Engineering, architecture, sustainability, and digital workflows operate as a single design process. Bringing the right expertise at the right moment prevents late compromise and reduces rework.

Intelligent designers use evidence rather than habit. Assumptions are tested early through modelling, benchmarking, and scenario analysis. Data informs judgement but does not replace it. When information changes, the design adapts. Feedback is expected, not resisted.

Innovation is applied deliberately. New methods or materials are introduced where they solve a defined problem, not for novelty. The approach adapts to context, regulation, and delivery constraints. The aim is dependable improvement, not experimentation for its own sake.

Digital tools extend understanding and capabilities. Simulation, parametric modelling, machine learning and analytics are used to explore options, reveal trade-offs, and support decisions. The value of technology lies in efficiency, clarity and predictability, enabling teams and clients to make informed choices earlier.

Technical excellence remains essential. Accuracy, verification, and engineering rigour underpin every solution. Intelligent Design is not faster by cutting corners, but by avoiding unnecessary iterations and late changes.

Finally, knowledge is shared. Lessons from one project inform the next. Designers actively seek expertise beyond their immediate team and contribute back to the wider organisation. Over time this builds consistency, confidence, and better outcomes.

Intelligent Design, therefore, creates reliability through learning. It improves quality not by standardising solutions, but by improving how decisions are made.

07

Hierarchy of Design and Collaboration

Hossein Rezai-Jorabi

Design and collaboration can be viewed through the lens of the value they produce.

At the most basic level, designers and engineers function as calculators or compliance checkers, ensuring regulations are met. The next level involves pattern recognition, where collaborators' inputs fit together, often due to coincidental alignment rather than intentional collaboration.

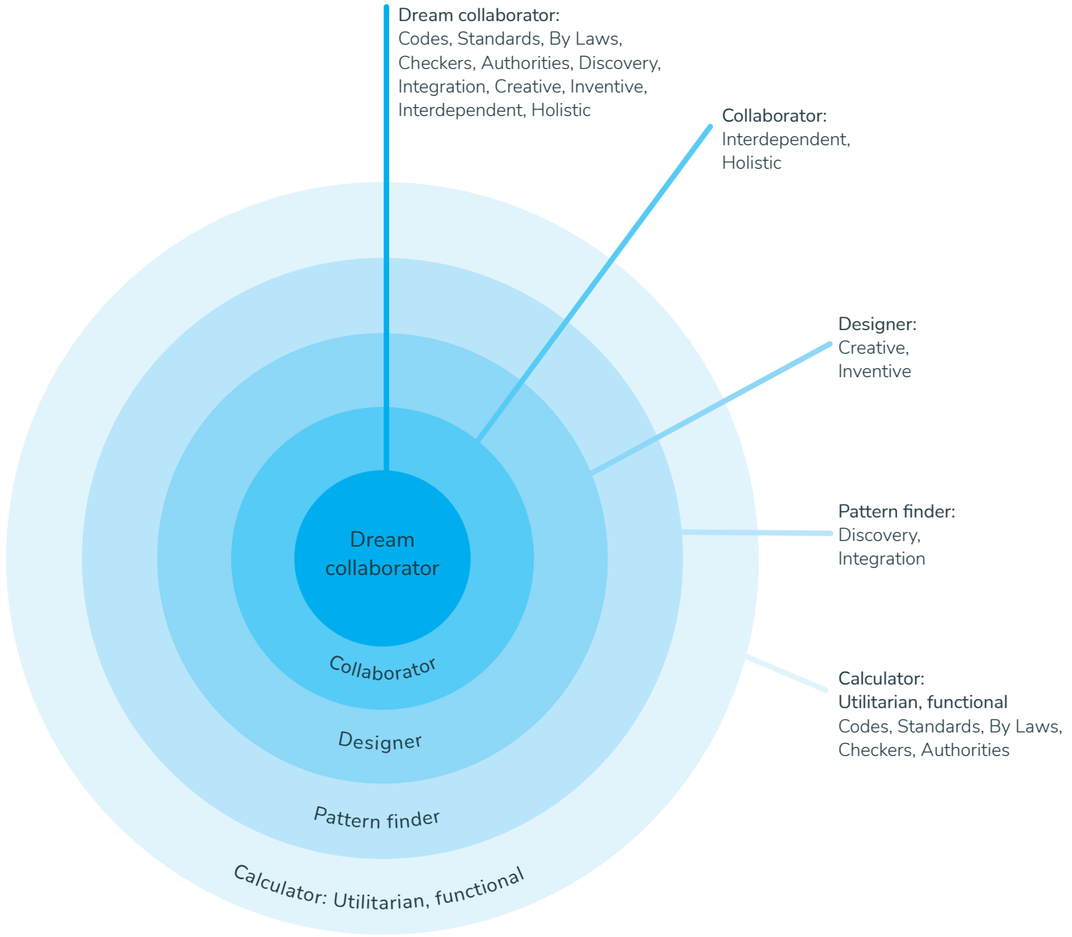
At these two levels, differentiation and collaboration are minimal.

The third level introduces some degree of design and interaction, where one party's input may need adjustment to align with another's. Here, collaboration begins to add value.

At a higher level, collaborators co-develop ideas, working together toward a common goal of improved design.

The highest level features "dream collaborators", where each party values others' contributions over their own. Roles blur, the best ideas thrive, and everyone pursues a shared objective.

> We must evolve from mere calculators and problem solvers into dream collaborators and value creators, in order to differentiate."



08
Multiplicity of Clients

Hossein Rezai-Jorabi

Multiplicity of clients is one of the concepts in progressive and regenerative design. The notion of the diversity of clients suggests that in our business-as-usual practice, each project has a contractual client with **a site**, a brief, and an ambition.

It is our responsibility to assist the contractual client to achieve or enhance their development goals.

However, many of us limit our focus on this aspect, believing that fulfilling these objectives complete our professional obligations. The concept of the multiplicity of clients asserts that the **streets** themselves are our clients; we are obligated to ensure that they improve because of our projects.

01 The site

02 The street

03 The neighbourhood
Similarly, the **neighbourhood** is our client, and our projects should contribute to uplifting the entire community.

04 The city grid
We consider the **urban grid** as a client. if there is a precinct or district under our influence or which we have control over, and the grid of the city has been broken, it becomes our responsibility to rectify and enhance it.

05 The city
The **whole city** is our client. Sometimes, through a single project, one can elevate the whole city - the Bilbao effect.

06 The country
in fact, the **whole country** is our client; we have a duty of care to the country in which we work, and of course,

07 The planet
... Ultimately we have a duty of care to the **planet**.

08 The tree

09 The bird

10 The lady bird

When we express concern about the environment, we should prioritise the interests of the planet in the same manner. The planet and the trees surrounding our sites, **the birds** nesting in **the trees**, and even the **ladybirds** residing on the site are our clients.

Therefore, we advocate for biodiversity conservation; we have a responsibility to care for everyone and everything. Nine out of these ten clients are recurring and are relevant to nearly every project, with only one client - the paying client - varying from one project to another.

By adopting a multiplicity of clients' model and mindset, we Rambollians make design decisions and select design options which are at once in the interest of the project brief, our clients, the neighbourhood and the environment affected by our designs and decisions ...

09

Design Thinking

Ollie Wildman and Hossein Rezai-Jorabi

Design thinking is different from design. Design thinking is not design, itself. It is rather a structured process that can lead to good design.

The key components of an effective design process include active listening, questioning others, crafting ideas, engaging in self-reflection, and continuous optimisation.

Designers tend not to listen enough, as we are eager to share our ideas and insights generously. Starting with deep listening is key to good design.

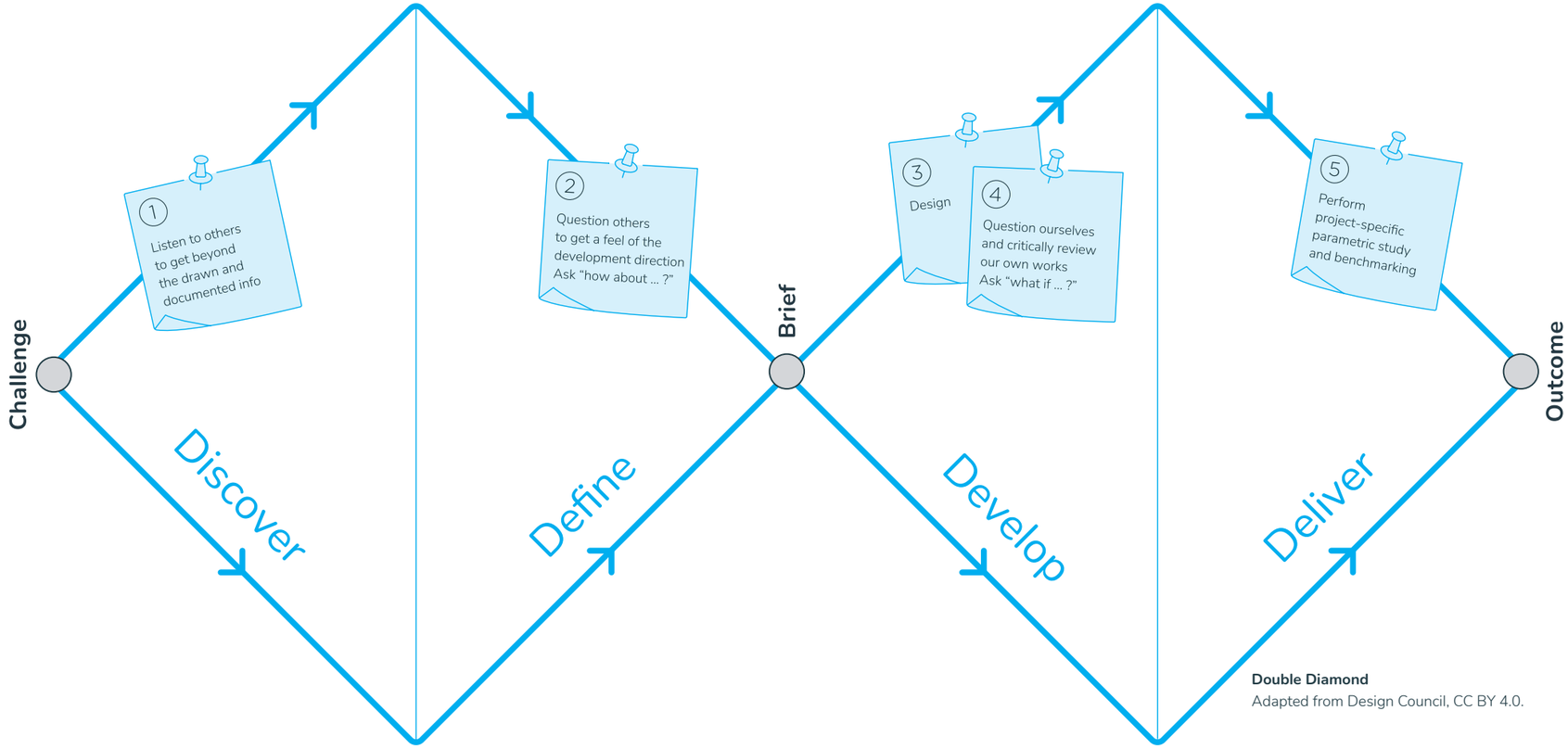
Double Diamond clearly conveys a design process to designers and non-designers alike. The two diamonds represent a process of exploring an issue more widely or deeply (divergent thinking) and then taking focused action (convergent thinking).

This is not a linear process, as the arrows on the diagram show. Many of the organisations we support learn something more about the underlying problems which can send them back to the beginning. Making and testing very early-stage ideas can be part of discovery.

And in an ever-changing and digital world, no idea is ever ‘finished’. We are constantly getting feedback on how products and services are working and iteratively improving them.

Design thinking is a continuous cycle of learning and improvement. It views design and re-design as ongoing phenomena, where each iteration builds upon the previous one to achieve optimal solutions. This iterative nature allows us to adapt to changing circumstances and requirements, ensuring that our designs remain relevant and effective.

> “Design and re-design as a continuous disruption/phenomena...”



Double Diamond
Adapted from Design Council, CC BY 4.0.

Discover
The first diamond helps the designer understand, rather than simply assume, what the problems and potential values are in our projects. It involves speaking to and spending time with our client and people who will be affected by the project.

Define
The insight gathered from the discovery phase can help you to define the challenge in a different way.

Develop
The second diamond encourages and challenges the designer to offer different options, seeking inspiration from elsewhere and co-designing with a range of different people.

Deliver
Delivery involves testing out different options at small-scale, rejecting those that will not work and improving the ones that will.

10

Strategic Design for Optimal Value Creation

Aino Mensonen and Maj Bastholm Petrin

Our aim is to build a strong value proposition for the early stages of projects where we can engage, co-create and co-innovate with our clients, and create the most value.

The key to achieving this goal is design, which is not limited to the traditional understanding of the term as a result but more so understood as a design process which uses design thinking.

When applying design thinking in the later design stages, it works as a problem-solving approach to developing a final product. But when it is applied as a design process, it becomes an approach for innovation and optimal value creation.

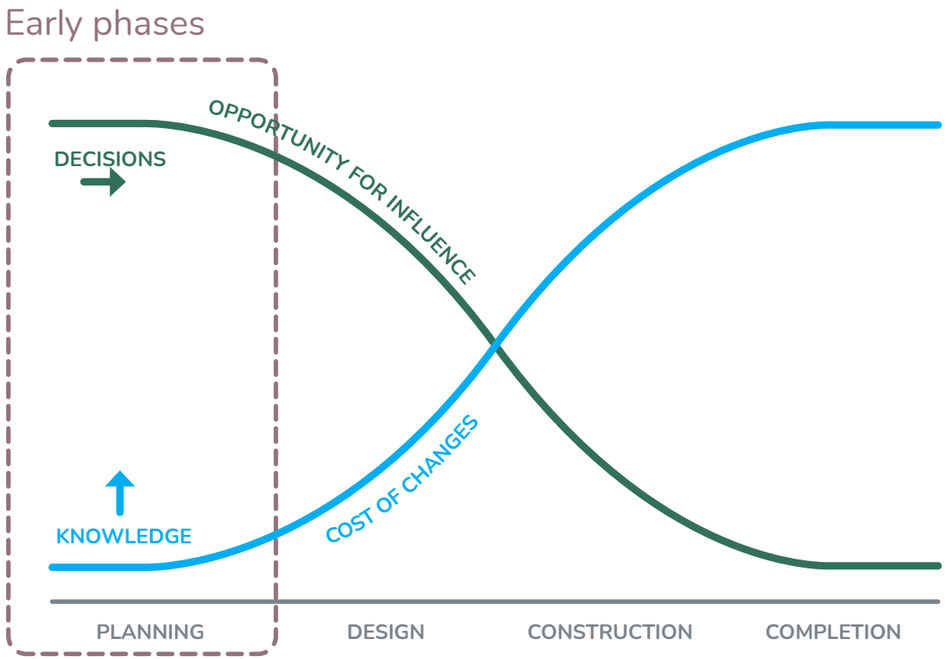
For the highest impact of the design thinking methodology, we apply the approach from the beginning of a project.

At the start of a project knowledge is limited and uncertainty is high, and at the same time it is where all key project decisions are made. This offers the chance to explore the potentials of a project before making key decisions at low cost but with high impact. For example, assessing sustainability opportunities early on can yield significant results with minimal expense. The process of exploration is based on the design thinking methodology. We engage the client and other relevant stakeholders in a series of workshops. The first workshop is dedicated to creating a shared understanding of the challenge at hand and setting the strategic direction for the project to ensure high-level alignment with the client's business strategy and long-term goals.

In the following workshops we explore the issue further from multiple perspectives and co-define the brief before moving into the technical design stages, to ensure the right challenges and opportunities are clearly defined.

By embracing design thinking, Ramboll is able to deliver tailor-made solutions that are innovative, sustainable, and effective in addressing the complexity of modern design challenges. This approach not only enhances the quality and functionality of our projects but also drives positive change in the communities we serve.

This approach ensures that the process and outcomes align with real needs and lead to a meaningful impact instead of rushing into solutions. It enables us to deliver optimal value, frequently guiding the client towards new insights and revealing needs that were not initially recognized. We are able to bring the best of Ramboll together with our clients in every project, everywhere.



11
Safety by Design

Paola Casagrande

Safety by Design is an essential component of our design approach to achieve our mission:

To develop a unified culture and a way of working which underpin everything we do and always and above all else, prioritise the health and safety of our team and of anyone impacted by our work.

Safety by Design (SbD) is an approach that integrates safety considerations into the design from the very beginning, when critical design decisions can have the strongest impact. It goes beyond the construction phase and focuses also on the safety of those who will use, operate and maintain the building over its life as well as public safety.

It focuses on buildability and maintainability, but also on managing design-related risks such as safety-critical assumptions and design interfaces, SbD is underpinned by clarity in accountability and responsibilities as well as by effective change management.

SbD aims at systematically identifying hazards and eliminating or mitigating risks as much as possible through deliberate and proactive design choices. It is a collaborative effort where safety is a shared responsibility, and it is underpinned by a robust and structured learning culture.

Stop Work Authority for Safety
Stop Work Authority for Quality

Optioneering
This can be achieved by assessing and proposing options, prioritising safety considerations and flagging risks to be managed.

Managing risks
We review gaps in the available information and question our assumptions to understand the safety implications and plan appropriate risk mitigation.

Safety by Design Review
Design reviews are essential forums for discussing the project, aligning decisions, and ensuring safety, efficiency, and functionality, prioritising the elimination of risk wherever possible.

Leveraging Technology and Innovation
Technology and innovation can enhance safety. In a refurbishment project, we explore the use of robots or self-cleaning coatings for maintenance, which helps to eliminate risk wherever possible.

Accessibility and Transport Logistics
The design process considers site accessibility and transport logistics. This involves designing with flexibility in element sizes to minimise disruption to the public. For instance, smaller components can be sized to pass beneath a low archway, while larger elements may require temporarily closing a public road to allow safe transport and installation.

2 Finsbury Avenue ▸

12

Upholding Design Quality Together at Ramboll

Søren Brøndum, Paola Casagrande, Lars Ostenfeld Riemann and Lai Wan Sing

Rigorous Design Quality

The quality of our services is defined by how much value we create for the client and the stakeholders of a project. Quality is the outcome of controlled processes and not just the detection of errors. The quality level of every project must be aligned with the client up front and a project quality plan describing the design process must be agreed upon. Quality planning should be rigorous, tailored and specific, incorporating enhanced checks and reviews at every stage to ensure achieving the specified level of performance.

Our Stop Work Authority for Quality demands and empowers everyone at Ramboll to halt any process or design that compromises our unwavering standards.

Successful design quality requires:

Competence - Engaging the right people at the right time ensures expertise is applied where it matters most.

Clarifying Roles - Understanding our roles, scope, and responsibilities helps manage interfaces effectively, reducing risks and preventing errors.

Supplier Selection - Prioritize suppliers with strong Quality and Health & Safety records over those selected merely for price or convenience.

Quality reviews are conducted meticulously, to ensure that advice given is clear, well-documented, and actionable. This approach is clearly outlined in Ramboll's Quality Management System (QMS).

Stop Work Authority for Safety
Stop Work Authority for Quality

Robust Design Reviews and Design Audits

To ensure that all projects uphold Design Excellence, they are subject to multiple layers of design reviews. The first two layers are carried out locally on all projects, in accordance with the process described in Chapter 2. Their format and frequency are coordinated between the project owners and the local Design Directors or Heads of Design. The third layer is the Global Design Review, which is conducted on selected projects of a more complex nature.

The three layers are as follows:

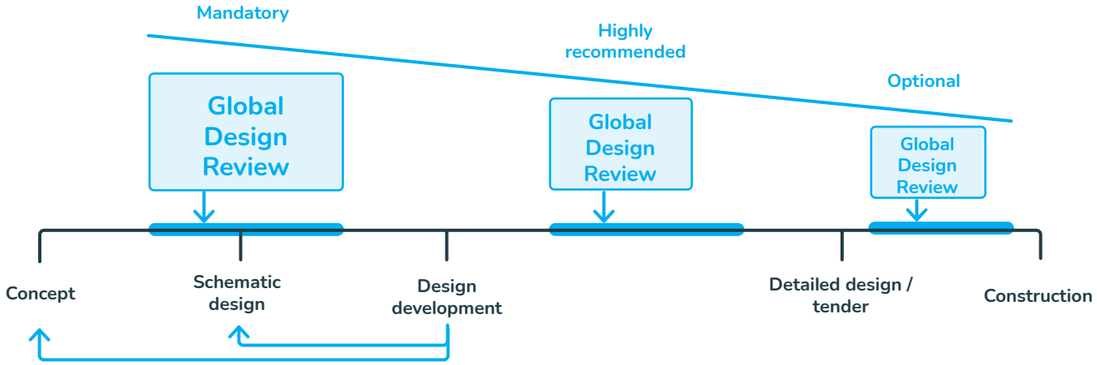
1. Interim Reviews
These are carried out by the design team as part of an activity, work package, or design sprint. They take place during each stage to verify that parts of the design or interim deliverables meet the project requirements.

2. Stage Gate Design Reviews
These are conducted at the conclusion of a project stage. Their purpose is to provide an overview of the overall approach and solution, as well as how it is communicated, rather than to undertake a detailed review of individual deliverables. They are performed locally by Directors and recognised experts, with support from the Head of Design where required. This review process is scalable, depending on the size and complexity of the project. The level of review should be agreed upon during project planning and documented in the Project Quality Plan.

3. Global Design Reviews
In Ramboll Buildings, Global Design Reviews are mandatory for Building projects with Project Level Ratings defined as "medium or high" and technical complexity classified as a difficult technical solution. The latest criteria for projects requiring mandatory reviews are available in the PI Tool or CRM and are updated from time to time, with the aim of streamlining the overall Design Review process with the input from Head of Design in each geography.

In addition to the minimum of one mandatory Global Design Review, voluntary Global Design Reviews may also be arranged for projects that fall outside the mandatory criteria, where the project team sees value in doing so. Project owners are encouraged to coordinate with their country's Head of Design in such cases. Details of Global Design Reviews are available in the PI Tool.

Global Design Audits
Global Design Audits also play a vital role in fostering a safe and creative environment. They ensure the safety, accuracy, and correctness of our designs. Details of Global Design Audits are available from the Head of Design in each Geography.



13

Heads of Design Perspectives

Design for Excellence

Yvonne YB Wong

The steps in the Ramboll design process ensure that every project adheres to Ramboll's core design principles, maintaining high standards of quality and precision throughout execution. It begins with comprehensive stakeholder engagement to understand the specific requirements and context of the project. This is followed by rigorous environmental assessments and sustainability evaluations to align our designs with global goals for reducing carbon footprints and enhancing biodiversity.

The design development phase involves collaborative ideation sessions, utilizing advanced computational tools to refine and optimize design solutions. Prototyping and iterative testing play a crucial role in validating these solutions, ensuring they meet functional and aesthetic criteria. Continuous feedback loops with all stakeholders help us adapt and improve designs dynamically.

An essential aspect of this process is the emphasis on not designing or redesigning poorly. This means avoiding shortcuts that compromise the integrity and quality of the design. Instead, every phase of the project is meticulously planned and executed to ensure that all aspects - from aesthetic appeal to functional efficiency and sustainability - are rigorously maintained.

Avoiding poor design or redesign involves several key practices:

Attention to detail
Ensuring every element of the design is carefully considered and implemented to meet the highest standards.

Quality assurance
Regular reviews and audits to check for compliance with design principles and standards.

Sustainable practices
Incorporating design elements that promote sustainability and minimize environmental impact.

User-centric approach
Keeping the end-user in focus, ensuring the design serves its intended purpose effectively.

Proactive problem-solving and value creating
Anticipating and addressing potential issues before they become significant problems and identifying opportunities to add value beyond the immediate challenge. By adhering to these practices, the Ramboll design process is thorough, robust, and capable of delivering Design Excellence. This approach not only meets the immediate needs of clients but also contributes to long-term sustainability and innovation, differentiating Ramboll as a world leader in thoughtful, high-quality design.

Design never stops

Joona Tuikka

The Finnish approach to design is guided by the principle that design never stops. It is a continuous process that adds value at every stage of a project and plays a decisive role in achieving high-quality, sustainable outcomes. While the greatest impact is achieved when design thinking is embedded from the very beginning, the Finnish perspective also recognizes that it is never too late to strengthen a project through thoughtful design.

The Finnish perspective stresses the importance of timely and effective action, advocating for designers to be involved from the very beginning of the project lifecycle. Recognizing the substantial benefits of early-stage design helps mitigate risks, prevent costly redesigns, and ensures that sustainability goals are embedded from the outset. Proactive guidance and leadership from Ramboll's designers to architects and other disciplines are essential components of this approach.

Storytelling is a pivotal tool in this strategy. By effectively communicating the advantages of early-stage design, clients can better appreciate its value, leading to improved collaboration and project outcomes. Training staff to follow the Design Compendium tailor-made for Finnish contexts ensures that everyone is aligned with core principles and methodologies.

Looking ahead, new carbon emission limits for buildings prior to obtaining a building permit will demand more early-stage design, making this proactive approach increasingly vital. The Finnish strategy underscores that integrating design excellence, even later in the project, can transform outcomes and deliver significant long-term benefits. In a world of continuous change, a mindset where design never stops - and where it is never too late to improve outcomes through design - becomes increasingly important.

Let's take our Clients with us on an Engineering Journey

Ian Lund Rockliffe

By focusing our efforts on carefully defined project-specific technical challenges and opportunities one at a time, we are able to bring the best of Ramboll together with our clients in every project, everywhere.

We collect precedents, think laterally and evolve design solutions collaboratively to then present to the client in a coherent and understandable manner. The design thinking behind alternatives is communicated together with pros/cons, risks, opportunities and our recommendations to allow a joint decision to be made by the whole design team on the way forward.

Through this proactive approach to engineering design by actively proposing and agreeing to solutions, rather than reacting when redesign is required, we avoid frustrating and costly changes at later stages in the project.

Exploring Options and Navigating Design Direction

Kaare K.B. Dahl

During the early stages of a project the playing field is extremely wide, and it almost seems without any boundaries. In Denmark we usually get involved in the early phases of projects, and this is where we can make a big impact on the project.

In Denmark we use the Design Clip methodology. In a Design Clip we can explore several different options, specify the differences and narrow down the best option. Using a Design Clip enables you to think out of the box and without constraints on exploring different options.

During design development, we can then perform calculations and evaluate the options based on different metrics such as cost, LCA, buildability, construction timeline, sustainability and many more depending on the evaluation.

By doing these evaluations we enable the design team to collectively make decisions based on facts rather than intuition.

This process enables the team to collaborate and openly discuss and provide feedback on the best option, thus mitigating future rework or redesign.

This methodology allows the team to play with different ideas in designing during the early stages of design, including some considerations for maintenance, retrofit, and end of life of the building.

14

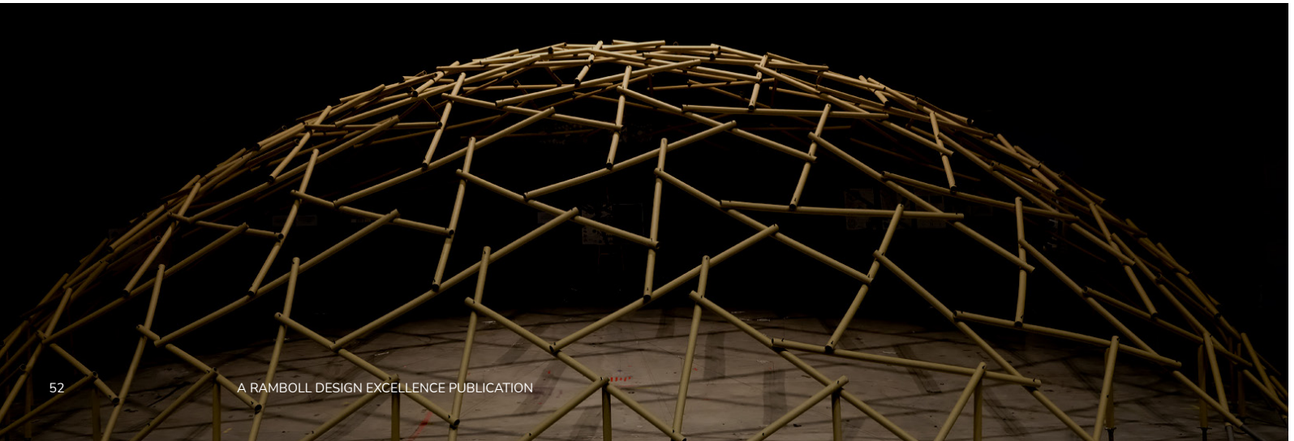
The Complex Reciprocity of Good Design

Hossein Rezai-Jorabi

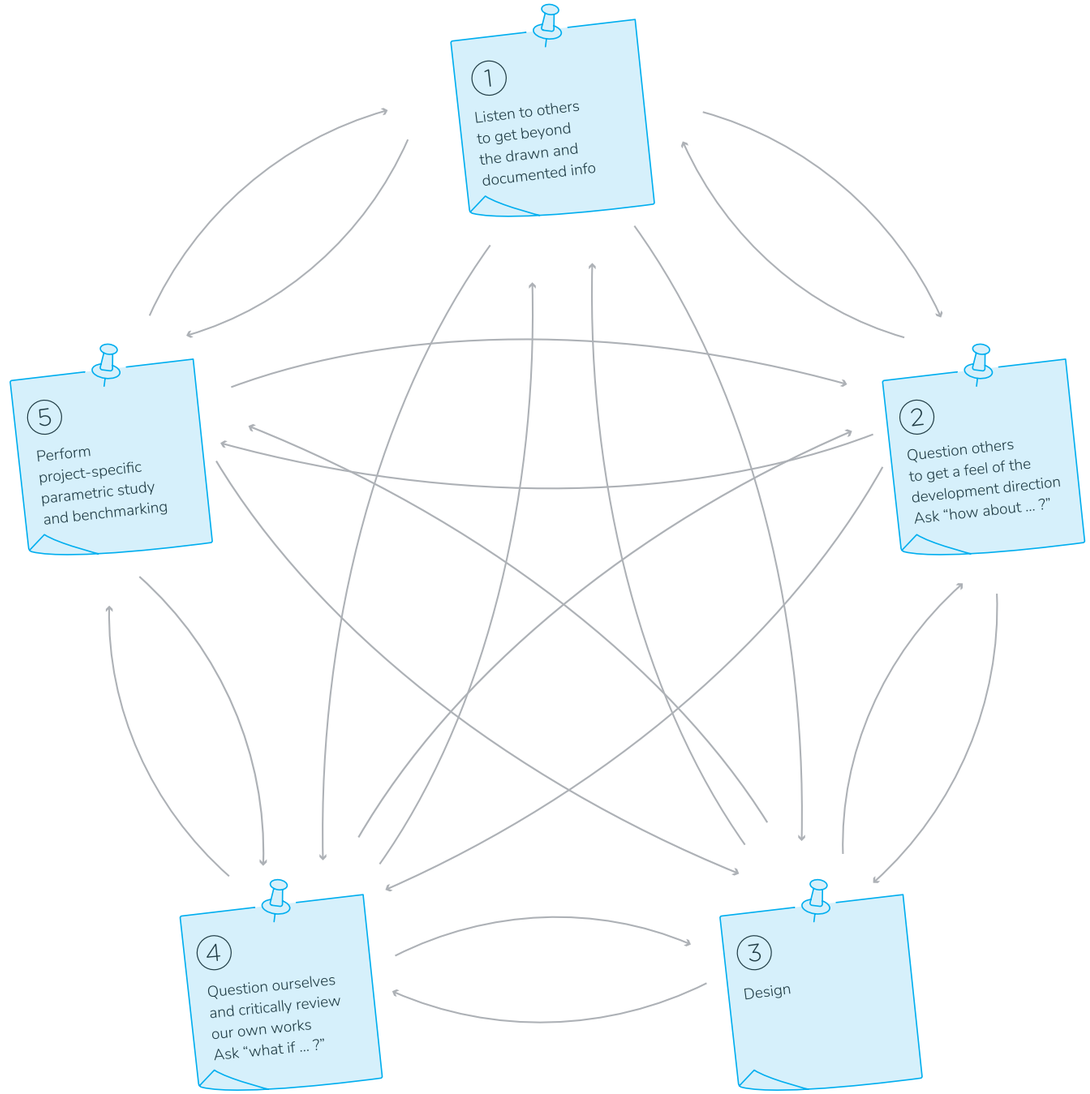
A good design process is not a linear progression through the various stages of design, where one step follows another in a fixed sequence. Instead, it is a dynamic and interconnected approach where each stage of the process informs, enriches, and is enriched by both the stages that precede it and those that follow. This reciprocal exchange creates a continuous feedback loop, enabling the design to evolve and adapt in response to emerging insights, challenges, and opportunities.

In this iterative process, early decisions are not only shaped by the immediate context but also by the anticipated requirements and outcomes of future stages. Similarly, later stages draw on the foundation established by earlier steps while revisiting and refining them as needed. This fluid interplay ensures that the design remains responsive and holistic, fostering a deeper integration of ideas and solutions across the entire process.

By embracing this iterative and reciprocal framework, a regenerative design process becomes a living system - one that evolves over time, guided by the synergy between past lessons, present realities, and future aspirations.



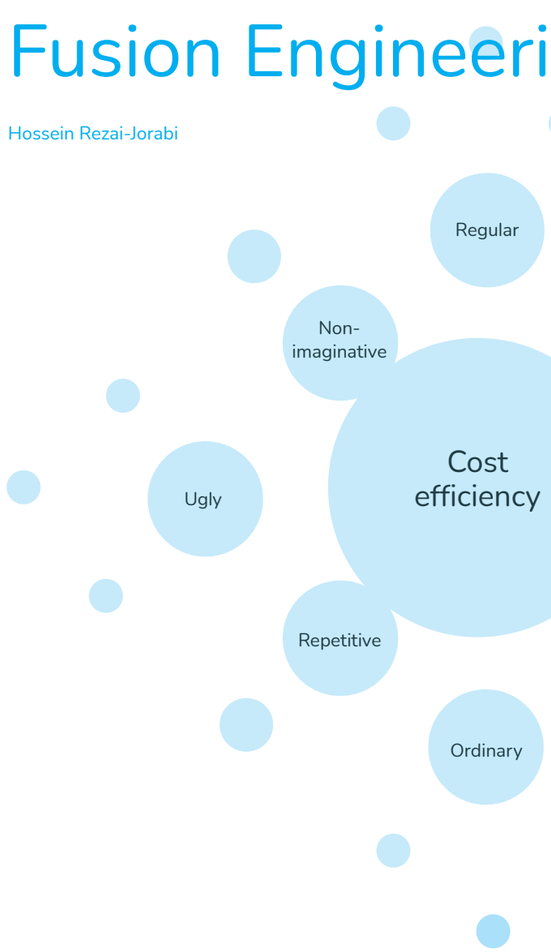
Ramboll's Reciprocal Frame Dome, Malaysia
An embodiment of aesthetic, mathematical, structural, sustainable, and philosophical beauty.



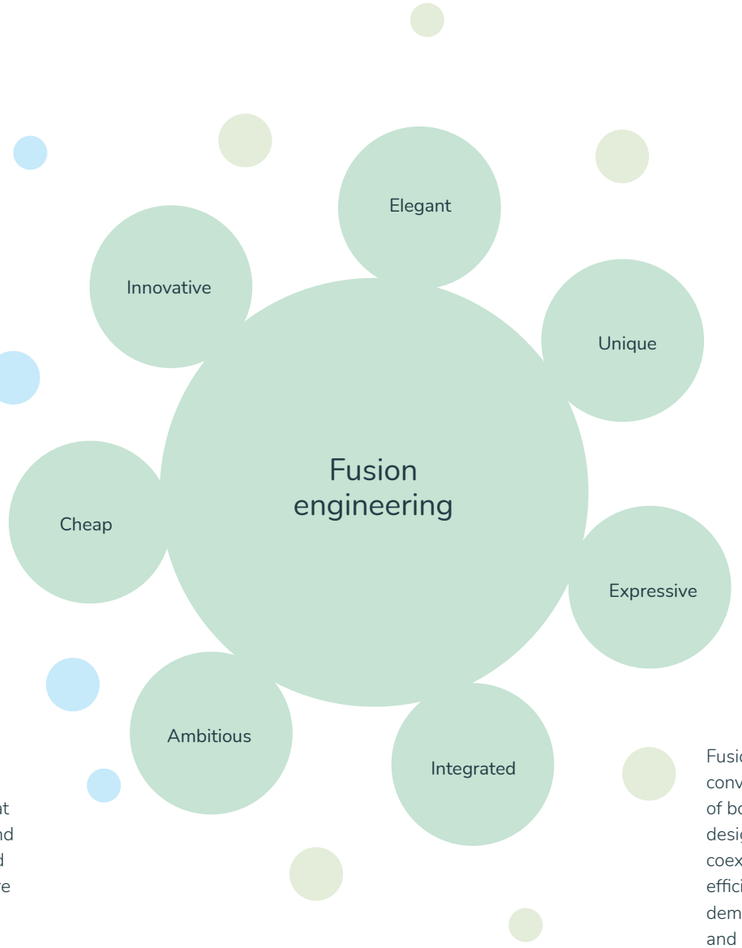
15

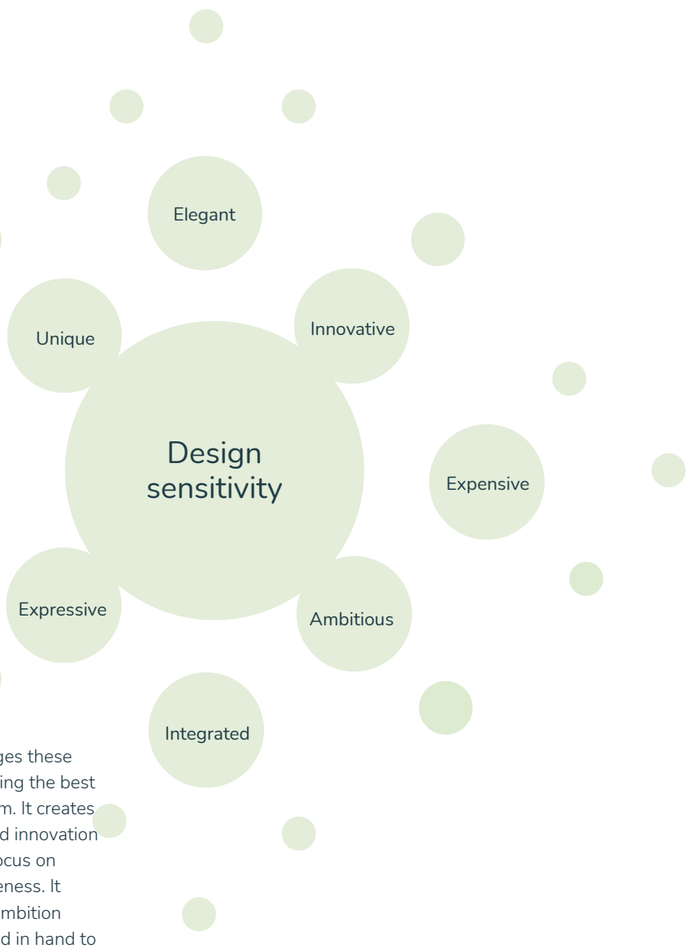
Fusion Engineering

Hossein Rezai-Jorabi



Fusion engineering bridges the two extremes of the conventional design spectrum. On one end are designs that are uninspiring, repetitive, ordinary, and routine - often perceived as “ugly” and therefore “cheap.” On the other end are designs that are expressive, elegant, unique, integrated, ambitious, and innovative - often seen as “expensive.”





Fusion engineering challenges these conventional notions, blending the best of both ends of the spectrum. It creates designs where elegance and innovation coexist seamlessly with a focus on efficiency and cost-effectiveness. It demonstrates that design ambition and economy can work hand in hand to achieve exceptional outcomes.

16

Creativity, Continuity, System Improvement, and System Change

Hossein Rezai-Jorabi

> Creativity is an attitude. It is a mindset. It drives the desire in one to produce something new rather than reproduce existing tried and tested ideas.”

Disruption is a fundamental attribute of creativity and innovation. A creative act introduces something entirely new, something that did not previously exist. By definition, it is non-continuous, diverging from mere enhancement or improvement of what already exists. Continuous improvement within a system or organisation may enhance efficiency, expedite production, lower costs, or better processes, or a mix of these, but does not result in a fundamental change to the system’s outcome or purpose.

To achieve a change in a system’s outcome, to shift to a desired state, a system change is required. Such a transformation involves rethinking and redesigning the system itself, not simply optimising its existing processes.

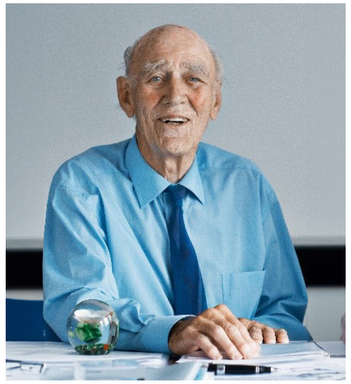
Foresight and future resilience are inherently tied to understanding systems, complexity thinking, and the navigation of uncertainty.

They demand an ability to identify when incremental improvements suffice and when disruptive system changes are necessary to create meaningful and lasting outcomes.

17

On Børge Rambøll, and Striving for Excellence

Hossein Rezai-Jorabi



A journey through his thoughts, a force for change, and a beacon of light.

An original thinker, a committed pacifist, and a visionary engineer...

...Børge Rambøll's contribution to engineering, the built environment, and society at large, deserves a rigorous study and recognition. An upcoming book slated for publication in 2026 will be a positive step in that direction.

This book will cover his journey and growth after the war when he started Rambøll and Hannemann with Johan Hannemann, another exceptional engineer and educator whose legacy continues to inspire many.

His ideas on the then contemporary issues like regional conflicts, the natural environment, and social justice deserve rigorous examination in light of their connection with today's challenges of a similar nature.

Børge's books and writings like "the webs we weave", "one night the trees will burst into bloom", "the criss cross web", "wide outlook", though written decades ago, pose pertinent questions and provide some answers to persistent environmental and social challenges of our times..

The impact of his critique of major global issues like "...continuous economic growth...", the sustainability of the Brundtland Report, the separation of the natural and the built environment, is also noteworthy in the context of contemporary dialogue on these topics.

Rambollians today deserve to know more about the legacy of the man whose name they carry into the four corners of the world; a man, clearly ahead of his time, and in pursuit of excellence, the excellence which exists in all of us, and which ought to be put into practice with the same vigour and enthusiasm as the two founders practiced and preached...

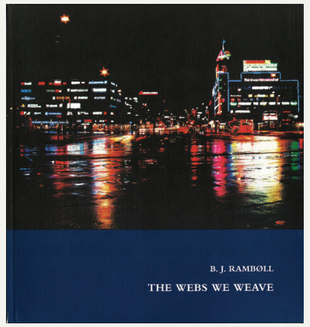
> "We want to have a philosophy because it makes us distinctive."
>
> **Børge Johannes Rambøll**

The current design excellence initiative in Ramboll pays homage to the excellence that the founders of Ramboll pursued all those years ago, as far back as the late 1940s.

Børge Rambøll and Johannes Hannemann, both young engineers, thinkers, and academicians, started Ramboll with the optimism that prevailed in the post-war era. Europe was in desperate need of reconstruction, and the two young engineers wanted to be part of that reconstruction movement, not only in Denmark but also elsewhere in the world.

In these endeavors, purposeful design and differentiation were highly ranked in their ambitions.

Their writings, primarily by Børge Rambøll, and the manifesto of the company, were clear indications of their intent to use engineering and the company in the best interest of all stakeholders: societal, corporate, and environmental.

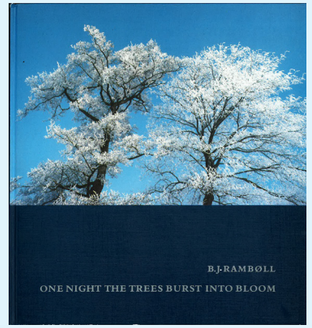


The Webs We Weave
- a book by Børge Rambøll, 1995

This is a collection of a number of essays by Børge Rambøll. The book starts with 'They returned home 50 years ago", then covers contemporary topics like The Brundtland Report, The greenhouse effect, the sustainability of continuous growth, Nature's superiors, The information technology age and Linking the connections' in which he makes statements like;

"Corelations are a concept that calls for a focusing of the attention", and "Information technology advises us about movement in the world around us and when we know about them, we decide which path we ourselves are going to walk and tread in".

These are the ideas of a man way ahead of his time.



In Børge Rambøll's 1981 book, One Night the Trees Burst into Bloom,

a story titled "A Wild Beast on the Loose" delves into the enduring struggle to master the mighty Mississippi, a river of serene beauty and treacherous fury.

Before the Civil War, Americans reveled in river cruises, basking in lush vistas and tranquility. Post-war, the relentless pursuit of wealth transformed the river into a symbol of opportunity and peril.

The Corps of Engineers undertook a monumental task, erecting dams, dikes, and reservoirs to quell its capricious nature. Yet, the Mississippi remains an untamed giant, with its tributaries threatening devastation despite human ingenuity.

This account captures the timeless dance between mankind's ambition and nature's indomitable force.

18

What does Good Look and Feel Like?

Case studies of Ramboll projects from across the globe

Denmark


Lighthouse
Aarhus,


Redmolen spidsen
Denmark


Aqua Mundo, Waterpark,
Nordborg


Marmormolen,
Copenhagen

Finland


Pohjoisesplanadi 37
Helsinki


Oodi, Central Library
Helsinki


T2, Airport Terminal 2
Helsinki-Vantaa


Tammela Stadium,
Tampere

Sweden


Pier G
Arlanda


Kaj 16
Gothenburg


The Sheaf
Varberg


Nova Offices
Stockholm

Italy


The City Life II
Milan

United Kingdom


2 Finsbury Avenue
London


250 City Road
London


Tate Modern,
London


1 North Quay
London

Norway


Haukeland University Hospital
Bergen


Kistefos Museum,
Jevnaker


Husnes Kulturhus
Husnes


Kunstilo
Kristiansand

Middle East

The Opus
Dubai

The Green Planet
Dubai


Shining Towers
Abu Dhabi


The Jumeirah Marsa
Al Arab Hotel, Dubai

Asia-Pacific

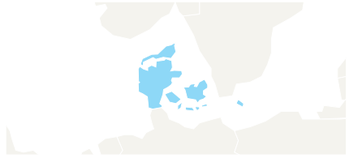

Plaza Equatorial
Kuala Lumpur, Malaysia


Founders' Memorial
Singapore


Imperial Lexis
Kuala Lumpur, Malaysia


Affin Bank
Kuala Lumpur, Malaysia

Denmark



Project title
Lighthouse

Project description
A 142-metre high residential landmark overlooking Aarhus Bay, designed to become an iconic addition to the Danish skyline.

Project genre
High-rise residential tower

Location
Aarhus, Denmark

Client
Kilden & Hindby and Domis

Architect
3XN Architects

Services provided
Structural engineering
Foundation engineering
Data-driven design analysis
Multidisciplinary coordination
Optimisation studies
Construction support

Overview
A 142-metre residential tower engineered through data-driven design, delivering Denmark's tallest and most materially efficient high-rise.

Challenge and Objectives
The project required creating Denmark's tallest residential tower on a challenging coastal site with limited bearing capacity. The objective was to deliver a structurally efficient, materially conscious superstructure that balanced architectural ambition, constructability, and tenant comfort. Ramboll needed to minimise weight, reduce concrete use, and integrate architectural requirements without compromising performance or adding complexity to the construction programme.

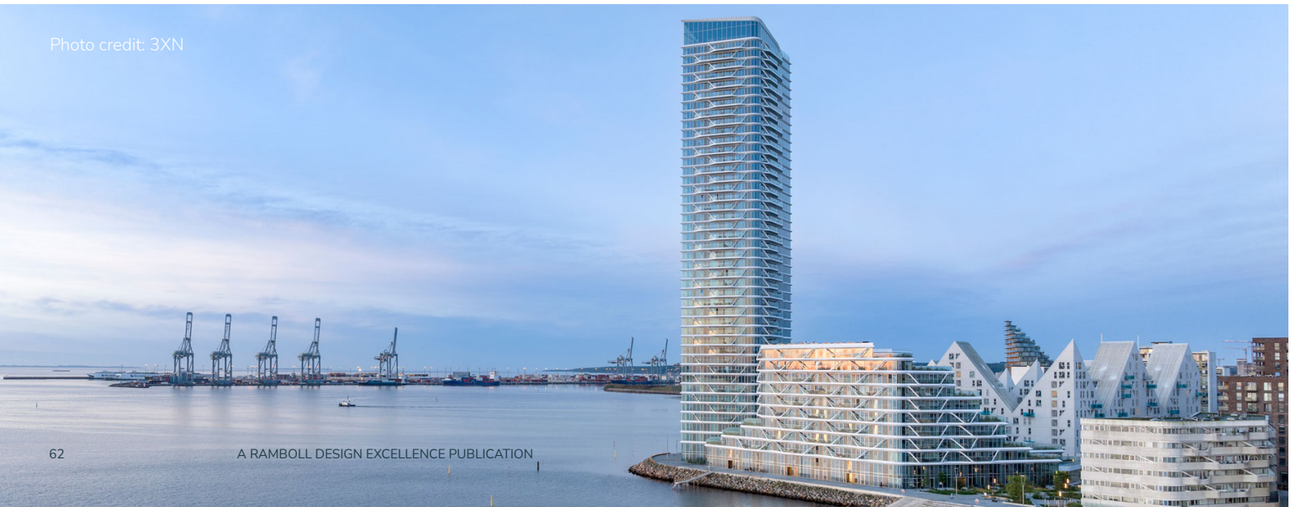


Photo credit: 3XN

Initial Assessment
Ramboll conducted extensive early-stage assessments, exploring more than 30 structural typologies with architects, contractors, and the client. Using a structural performance dashboard, the team compared strategies based on material consumption, weight, pile count, and floor plan efficiency. This enabled a clear understanding of the most viable solutions under local ground conditions, cost constraints, and architectural intentions.

Design Development Phase
The design development centred on achieving maximum structural efficiency. The team introduced a core-in-core system and optimised blade wall configurations to reduce concrete usage, improve stiffness, and minimise visible structural elements. Slim 200mm post-tensioned slabs reduced floor depths and unlocked additional usable floors. Blade walls were integrated seamlessly into partitions and façades, supporting the architectural vision without compromising performance.

Prototyping and Testing
Using parametric analysis, real-time simulation dashboards, and iterative modelling, Ramboll refined material quantities and system behaviour. The team validated slab performance, blade wall placement, and foundation responses through scenario testing. The piled raft foundation solution was optimised to accommodate reduced building mass, ensuring settlement control and long-term performance despite challenging soil conditions.

Feedback and Iterative Refinement
Collaborative workshops with 3XN, contractors, and client stakeholders enabled iterative refinement of every major element: slab thicknesses, blade wall positions, core geometry, and construction lifts. This feedback-led process ensured the final structure balanced material efficiency, architectural quality, buildability, and cost. The transparent digital workflow also allowed design decisions to be evaluated quickly and collectively.

Final Proposal and Outcomes
The final design delivered Denmark's tallest residential tower with exceptional material efficiency and a significantly reduced Concrete Usage Index. The building has earned multiple international awards, including the *IABSE Large Building Structures Award 2024, CTBUH Best Tall Building (100 -199m), and an Award of Excellence*, recognising its innovation in structural design and integrated engineering.


Redmolen spidsen, Denmark


Aqua Mundo, Waterpark, Nordborg, Denmark


Marmormolen, Denmark

Finland

Photo credit: Mika Huisman

Project title
Pohjoisesplanadi 37

Project description
Design of the slender steel structures of the new glass roof

Project genre
Refurbishment project of a historic building

Location
Helsinki, Finland

Client
KEVA

Architect
JKMM Architects

Services provided
Structural Engineering

Overview
A refurbishment and roofing of the inner courtyard of a historic landmark property in the capital, Helsinki.

Challenge and Objectives
This was a geometrically demanding project. The realisation of the geometry, the large number of unique parts, the volume of fabrication, and the experimental nature of the build required an advanced approach to design.

In addition, limitations of the modelling software could not deliver the geometric precision or workflow flexibility required, so the steel frame and glass supports were delivered using computational design methods based on Rhino. Manufacturing files as well as assembly and installation documentation were also generated largely programmatically.

Initial Assessment
As part of the refurbishment, the property's courtyard was covered with a glass roof supported by slender steel structures, creating an inviting interior space.

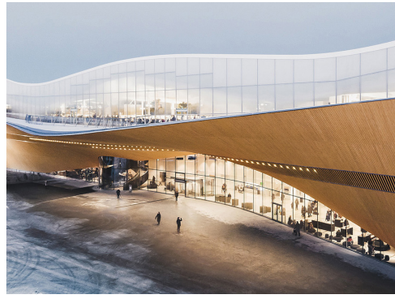
Design Development Phase
During the refurbishment, substantial spatial alterations were made to the lower floors of the property, which now largely accommodate restaurants and retail units. The former parking area at the centre of the building was transformed into a warm interior space beneath a sculptural glass roof. Supported by four large steel truss columns inspired by natural forms, the glazing provides a light counterpoint to the massive stone walls.

Prototyping and Testing
The design process also developed various solutions to achieve dimensional accuracy in execution. 3D files were created for all members and installation supports, from which CAM files were generated for laser cutting .

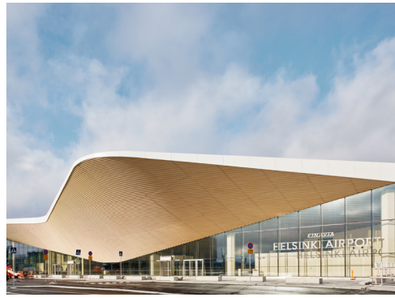
Feedback and Iterative Refinement
Ramboll developed the fabrication and installation design for the frame in close collaboration with experts from the contractor for the glass roof and steel structure.

Final Proposal and Outcomes
The property's courtyard was covered with a glass roof supported by slender steel structures, creating an inviting interior space.

The refurbishment project won Finland's Steel Structure of the Year 2025 award.



Oodi, Central Library in Helsinki



T2, Airport Terminal 2 in Helsinki-Vantaa
Photo credit: Tuomas Uusheimo

Tammela Stadium, Tampere
Photo credit: ©2024 Tuomas Uusheimo, all rights reserved.

Sweden

Project title
Pier G

Project description
A new pier for passenger arrivals/ departures with up to 14 airplanes including extensive baggage handling facility

Project genre
Airport expansion

Location
Arlanda

Client
Swedavia

Architect
Nordic Office of Architecture
Services provided
Structural Engineering

Overview
A major project of around 420,000 m2 to increase the capacity of the Stockholm Arlanda airport as part of the development plan through to 2050. Swedavia, who runs the airports in Sweden, has a roadmap for decarbonisation aligned with the Swedish Transport Authorities to be net zero by 2045.

Challenge and Objectives
The challenge was to reduce the carbon footprint and overall project costs by challenging the brief, changing to lower carbon materials and optimising the structural system to achieve significant carbon savings. To follow the net zero roadmap set out in Swedavia's strategy, the embodied carbon (A1-A4) in the building needs to be reduced by 73% compared to the 2018 baseline when the building will enter operation in 2033.

Initial Assessment
The structural engineering team carried out a desktop study of the previous scheme and identified carbon hotspots and possible ways of working to reduce

Photo credit: Nordic Office of Architecture

the impact of these. Ramboll hosted a workshop with Swedavia where possibilities around these hotspots were discussed collaboratively prior to the project work being planned. The work was broken into 7 distinct work packages: basement, superstructure, stability system, roof, gatehouse, building details and regulations. Within each work package such as the superstructure, extensive investigations were carried out and further split into focus areas: material choice, loadings, deflections, spans, beam types, optimisation etc.

Design Development Phase
During the development stage we initially explored within Ramboll the precedents for low-carbon design, borrowed from similar projects, and involved a wider group of colleagues to get a long list of ideas. A quick assessment was carried out of potential carbon savings as well as identifying stakeholders who would be affected by the design change. Collaborative sessions with client stakeholders, the architect and environmental experts were carried out to reduce the list to ideas for which sustainable changes could be feasible to implement. A key part of this work was daring to challenge the client's brief as well as pushing the architect to consider major design changes which could lead to significant carbon savings.

Prototyping and Testing
During the testing phase the slightly shorter list was worked up to a concept stage, through collaboration with Ramboll experts and industry engagement with suppliers. Each suggestion was evaluated for its impact on the function of the airport as well as from a cost, time, risk and carbon perspective to ensure a holistic approach. These were documented in one place to give the client transparency in the design development and allow them to be in the driving seat when deciding which options to pursue further.

Feedback and Iterative Refinement
Iterative testing was conducted to validate the solutions, whether this meant refinement of the design, adjustment to reflect industry feedback or incorporating construction techniques, while ensuring the projects' functional and aesthetic criteria were retained. This process was very fluid requiring compromises to be met between the engineering, function, architecture and cost. The use of smaller work packages within the planning was critical in maintaining focus and coordinating time plans and decisions required from the client. This continuous feedback from stakeholders helped refine the design and produce solid data which could be used to take design decisions from an informed perspective.

Final Proposal and Outcomes
Out of the 65 ideas which were co-authored and tested during the design phase, almost half were chosen for implementation. The final proposal showcased a reduction in embodied CO_2 (A1-A4) of approximately 25% for the substructure and building frame, contributing to Swedavia's and Ramboll's sustainability goals.

Kaj 16

The Sheaf

Nova Offices

United Kingdom

Project title
2 Finsbury Avenue

Project description
Located within the largest pedestrianised neighbourhood in central London, the development consists of 70,000m² of office floorspace, 1,000m² of retail space and 1,800m² of learning space.

Project genre
Mixed development

Location
London, UK

Client
British Land

Architect
3XN and Adamson Associates

Services provided
Structural Engineering
Civil Engineering
Building Services Engineering
Geotechnical Engineering
Wind Analysis

Photo credit: 3XN

Overview
Located within the largest pedestrianised neighbourhood in central London, the development consists of a 12-storey podium and 38- and 23-storey towers.

Challenge and Objectives
In line with our client British Land's sustainability strategy, the building will target BREEAM 'Outstanding' certification.

To achieve this ambitious goal, a series of forward-thinking environmental initiatives are being incorporated.

In addition to its sustainable focus, the building is being designed for flexibility for current and future needs, interspersed with healthy, green areas and terraces to inspire creative collaboration and social interaction.

Initial Assessment
The team has undertaken extensive rationalisation to minimise construction interventions, employed circular economy, resource efficiency, operational efficiency and a hybrid energy concept to deliver this outstanding blue-chip office development, which, at the time of going into planning, led the field as the best-performing building in London, in terms of carbon reduction.

Design Development Phase
The team worked closely with the architect and the contractor using 3D BIM environment to achieve net zero aspiration. Adopting circular economy approaches, the building is being designed for disassembly, with many existing building elements being reused, including the existing façade.

Prototyping and Testing
Hybrid energy is a fresh approach to systems design that delivers leaner and lower carbon buildings. Standard design in the UK regularly results in building systems with up to 50% more electrical capacity and 30% more heating and cooling capacity than needed. Using data and analysis to design building systems more efficiently, ultimately delivers considerable savings in capital expenditure and CO_2. The team also tested a prototype demountable composite floor.

Feedback and Iterative Refinement
Ramboll is the primary project engineer, delivering structural and services engineering. Together with the project team and client, we are working closely to co-create this ground-breaking building. Early client engagement and close collaboration have been key to the project's success, with the team ensuring the brief was right from the outset and challenging standards to deliver on the client's aspirations for a highly sustainable blue chip high rise.

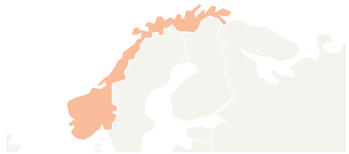
Final Proposal and Outcomes
The building is designed to use 100% renewable electricity, and using heat pumps, highly efficient water-cooling chillers will ingeniously be brought together in an energy system that operates as efficiently even if the building is only operating at 2% capacity.

250 City Road (38 Storey residential)
Credits: Foster + Partners

Tate Modern, London

1 North Quay
Kiasm and Cityscape images copyright / credit KPF as client

Norway



Project title
Haukeland University Hospital

Project description
Refurbishment and extensions of Haukeland University Hospital

Project genre
Hospital

Location
Bergen, Norway

Client
Helse Bergen, Norway

Architect
Henning Larsen Architects,
PKA Arkitekter and KHR Architects

Services provided
Structural Engineering
Mechanical Engineering
Electrical Engineering
Acoustics Consulting
Consulting Environmental
Integrated Technical Building Systems Coordinator
Fire Safety Consultant
Building Physics Consultant
Project Management

Overview
Situated in the Årstad district of Bergen, Haukeland University Hospital has evolved continuously since its first building was completed in 1912. As Norway's second-largest healthcare centre, it has undergone significant redevelopment over the past two decades to meet modern needs.

The new extension of the children's and women's hospital within the university is designed to be a child-friendly, warm and welcoming environment.

Challenge and Objectives
The hospital's technical systems have become opaque after four decades of continuous refurbishments and extensions. Multiple concurrent projects currently face undocumented changes, inconsistent standards, and restricted space, all while clinical operations remain active. Objectives are to develop a comprehensive overview, harmonise solutions, and optimise spatial utilisation to meet current and future requirements

Initial Assessment
By designing for reuse, Ramboll and the design team find solutions to integrate the existing structures and components whilst planning for the new facilities. This approach reduces environmental impact and improves efficiency.

Design Development Phase
In order to improve energy efficiency, the team look into implementing various passive and active design strategies such as high-performance thermal skin, optimised ventilation systems, heat recovery, and connecting to a local district heating system.

Prototyping and Testing
Innovations such as advanced logistics and robotics were also suggested to minimise transport costs and free resources that could be used for patient care. These were prototyped and tested.

Feedback and Iterative Refinement
The energy consumption is further modelled and simulated to further analyse and enhance energy efficiency.

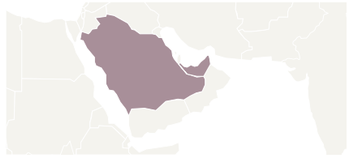
Final Proposal and Outcomes
The effective reuse of existing components reduces embodied carbon. We delivered BIM-ready performance specifications and co-authored mandatory manuals for the hospital's operational modelling environment to assist the client with operation and maintenance.

Kistefos Museum, Norway

Husnes kulturhus / Kvinnherad kulturskulesenter in Husnes, Norway

Kunstilo Kristiansand, Norway
Photo credit: Melisa Fajkovic

Middle East



Project title
The Opus Mixed-Use Tower

Project description
The Opus is a landmark mixed-use development comprising two interlinked towers unified by a shared podium and sky bridge, distinguished by its sculptural form and complex façade geometry.

Project genre
High-Rise Mixed-Use / Complex Buildings

Location
Business Bay, Dubai, United Arab Emirates

Client
OMNIYAT

Architect
Zaha Hadid Architects

Services provided
Structural Engineering
MEP Engineering
Façade Engineering
Computational Fluid Dynamics (CFD)
SMART Technology

Overview
A sculptural mixed-use tower where geometry, performance, and digital engineering converge.

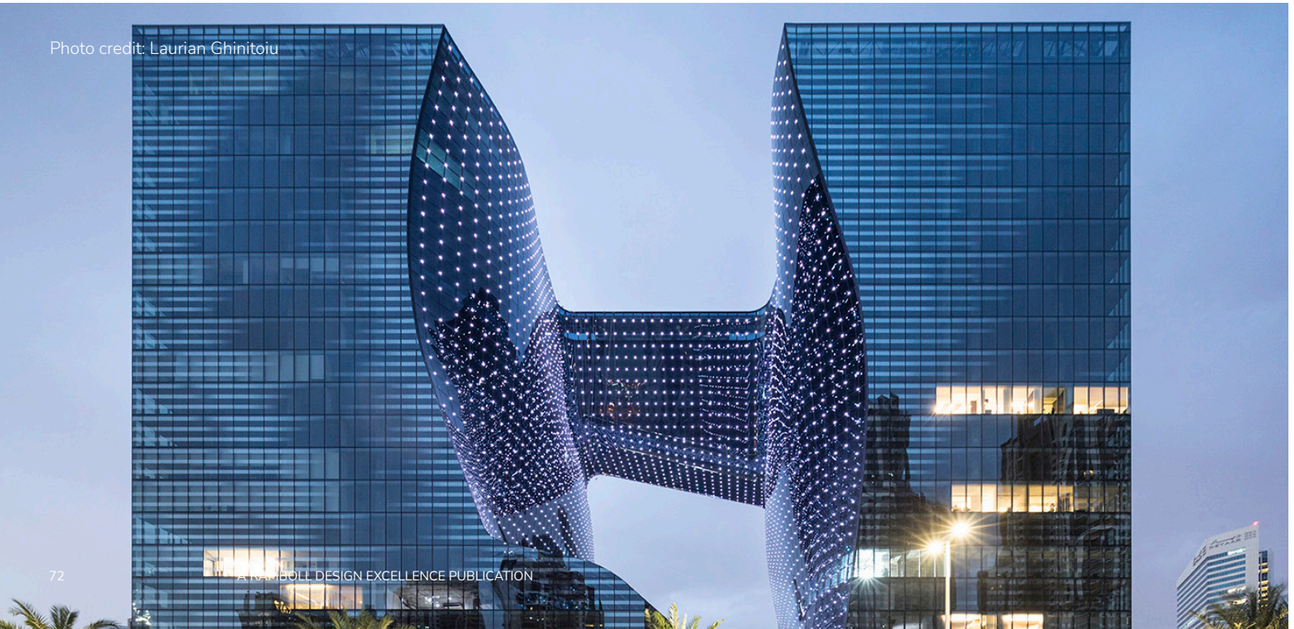


Photo credit: Laurian Ghinitoiu

Challenge and Objectives
The primary challenge was translating an iconic architectural concept. It is defined by its complex curvature, leaning columns, and a central void translated into a high-performing, buildable structure. The project required engineering solutions that could support mixed-use functions while responding to extreme façade geometry, variable solar exposure, and demanding environmental conditions, without compromising architectural intent or user comfort.

Initial Assessment
Early studies focused on understanding the implications of the building's geometry on structural behaviour, environmental performance, and building services distribution. Detailed analysis of load paths, façade orientation, solar gain, and airflow patterns informed initial zoning strategies. The team assessed how the tower's form would affect MEP integration, fire safety, and operational efficiency across hotel, office, and F&B uses.

Design Development Phase
During design development, Ramboll integrated structural and MEP systems to respond directly to the building's form. Parametric modelling and CFD simulations were used to refine zoning, ventilation strategies, and thermal comfort within the central void and sky bridge. The HVAC system was tailored to façade orientation and micro-climatic conditions, ensuring efficient performance despite highly irregular geometry and extensive glazing.

Prototyping and Testing
Advanced digital simulations supported system optimisation, including airflow behaviour, solar exposure, and smoke movement within the central void. Façade heat-gain data, occupancy profiles, and environmental conditions were modelled to test system responses under varying operational scenarios. These studies ensured that comfort, safety, and energy performance targets were met across all building uses.

Feedback and Iterative Refinement
Design iterations were informed by continuous coordination between façade, structural, and MEP disciplines. Feedback from modelling and system testing guided refinements to ventilation strategies, control algorithms, and façade-related detailing. This iterative process ensured that engineering solutions remained aligned with the architectural vision while responding to constructability, operational efficiency, and long-term performance requirements.

Final Proposal and Outcomes
The Opus was delivered as a highly integrated mixed-use tower where engineering systems respond intelligently to architectural form. The project demonstrates how data-driven design, smart building technologies, and multidisciplinary collaboration can transform complex geometry into a high-performing, user-focused environment. The building stands as a benchmark for engineering innovation within architecturally ambitious high-rise developments.

The Green Planet, Dubai
Image credit: Maria Fe Garcia

Shining Towers, Abu Dhabi

The Jumeirah Marsa Al Arab Hotel, Dubai
Image Credit: Jumeirah Marsa Al Arab Hotel I Killa Design

Asia-Pacific

Photo credit: GDP Architects

Project title
Plaza Equatorial

Project description
A high-rise mixed-use development engineered on a tight urban plot, integrating innovative structural solutions and high-performance building systems.

Project genre
Mixed-use high-rise (hotel, offices, commercial)

Location
Kuala Lumpur, Malaysia

Client
Hotel Equatorial Group

Architect
GDP Architects

Services provided
Structural Engineering
Geotechnical Engineering
Environmental Sustainability Design

Overview
Engineering a high-performing mixed-use tower on a compact site through structural innovation, integrated design, and precise optimisation.

Challenge and Objectives
The project was built on a highly constrained 0.8-hectare site, requiring the tower to achieve maximum efficiency while maintaining architectural intent. The building's eccentric core introduced the risk of bending under its own weight - a challenge that required a non-traditional engineering response. The objective was to maintain structural stability, reduce unnecessary material use, and deliver strong long-term operational performance.

Initial Assessment
The district is equipped with latest Ramboll began by analysing the geometric behaviour of the tower, identifying how the eccentric core would influence vertical alignment and cause potential deflection. Early-stage studies assessed stiffness distribution, load paths, and the impact of wind and gravity loads under the tower's asymmetrical massing. Benchmarking against regional high-rise performance helped define the parameters for structural optimisation and energy efficiency targets.

Design Development Phase
Through detailed modelling and iterative simulation, Ramboll developed a structural strategy that counteracted the "banana effect" and kept the tower straight without unnecessary material reinforcement. The design integrated structural and geotechnical systems with environmental and building performance solutions, allowing passive design measures, cooling efficiency and smart controls to be embedded cohesively. This collaborative development ensured both stability and lifecycle performance.

Prototyping and Testing
Advanced digital models were used to test various structural configurations, façade responses and building systems behaviour under dynamic loads. The team evaluated differential movement, deflection control, and thermal comfort outcomes to ensure the building met performance targets. Environmental systems - including greywater reuse, heat recovery and climate-response strategies - were tested to validate their impact on overall operational efficiency.

Feedback and Iterative Refinement
Continuous dialogue between the Ramboll team, the architects and the client enabled refinement of structural efficiency, core design and environmental systems. Adjustments were made to balance stability, buildability, and cost, while maintaining the project's sleek architectural expression. Collaborative refinement ensured every engineering decision supported both occupant comfort and long-term resilience.

Final Proposal and Outcomes
The completed development achieved GBI Gold Certification, with excellent operational performance: 92 kWh/m² for office areas and 183 kWh/m² for hotel operations. Annual savings reach 14.5 million kWh and reduce emissions by 11 million kilograms of CO_2e. The structural solution solved the eccentric-core challenge while delivering a straight, stable tower - positioning the project as a model of engineering clarity and integrated design excellence.


Founders' Memorial, Singapore
©Image courtesy of Gardens by the Bay and National Heritage Board


Imperial Lexis, Kuala Lumpur, Malaysia
Image credit: VERITAS Architects Sdn Bhd


Affin Bank, Kuala Lumpur, Malaysia

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March 2026

DESIGN is a publication by the Design Excellence Board (DEB) within the Buildings Global Business Area in Ramboll. The publication promotes and articulates the latest ideas on matters relating to design, technology, environment and ethos within the design industry and the built environment, at large. It aims to address key issues facing contemporary design professionals, including our evolving relationship with the natural environment; as well as pressing political and social agendas for the built environment.

Read our publications

Ramboll Global DESIGN Compendium aims to guide our engineering approach and establish coherence and consistency across Ramboll Buildings projects.

It integrates global principles with local adaptations, ensuring high standards of quality and innovation. This book is a key Design Excellence publication, which can help with the professional development of current Rambollians, and for positioning Ramboll as an active contributor to the agenda of design excellence within the industry.

This is our strategy to promote excellence in design. It is not a rule book but a mindset through which we deliver purposeful, intelligent, and responsible design to our clients and the wider society at large.

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