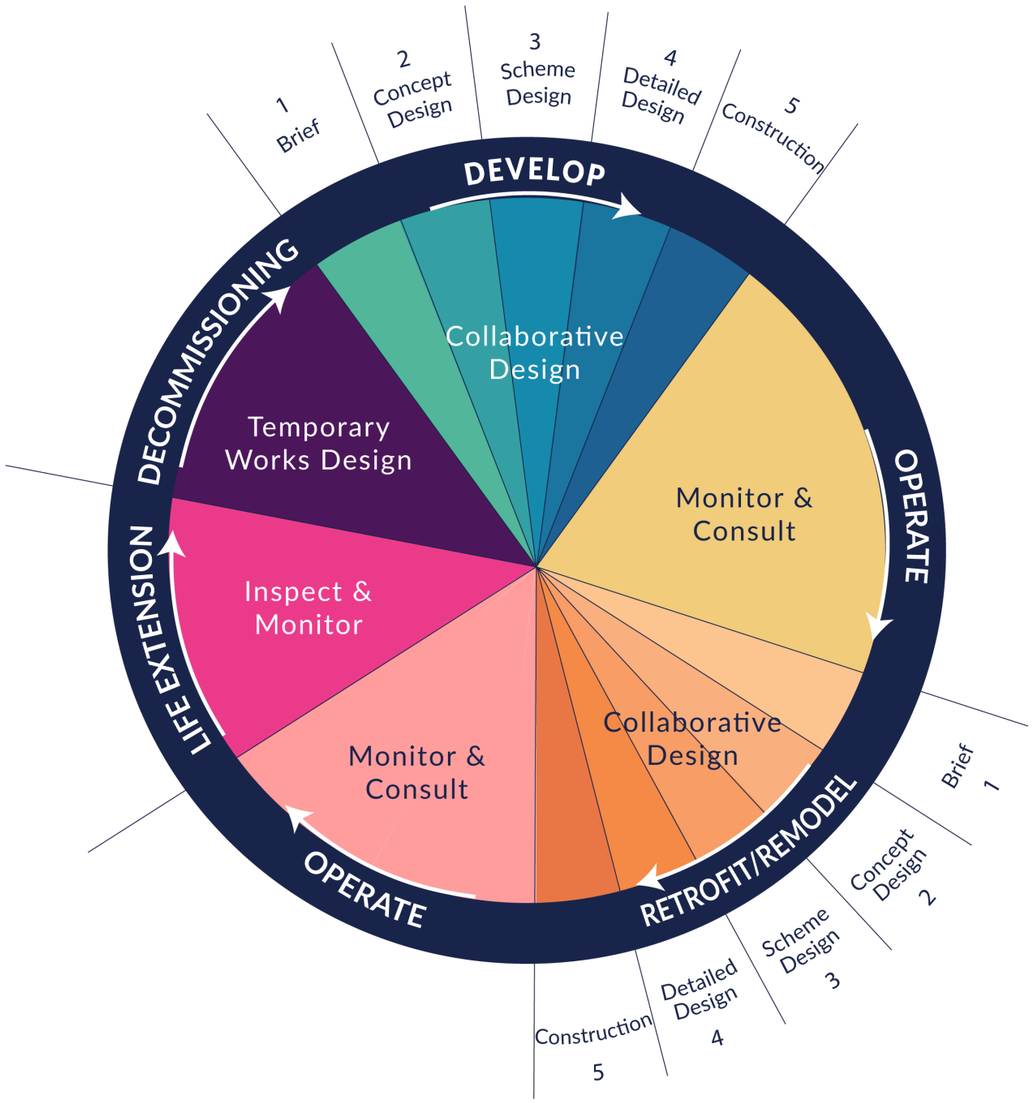
Arthian

INDUSTRIAL BUILDING STRUCTURES

www.arthian.com

Asset Lifecycle **Design Solutions**



Multi-disciplinary **Design**

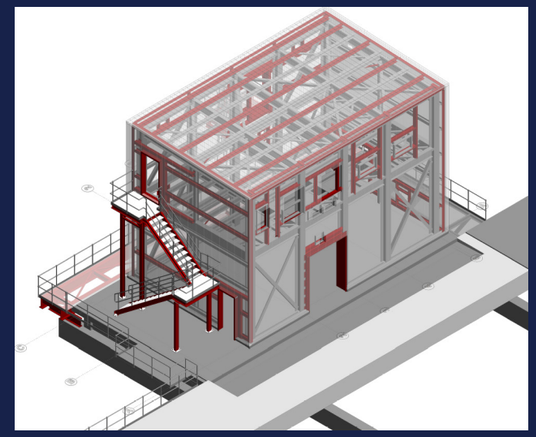
Our structural engineering team specialises in industrial building design, collaborating across disciplines to provide integrated solutions.

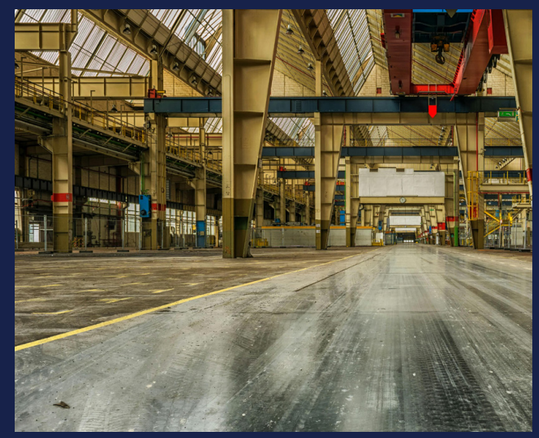
With decades of experience in industrial buildings, from manufacturing plants to high-hazard environments, Arthian delivers responsive, high-quality designs that enhance client assets. Our deep understanding of these settings allows us to identify practical, cost-effective solutions while managing project risks.

We prioritise client needs and engineering constraints, always seeking to add value.

Our team excels in designing new buildings and the inspection, assessment, repair, and adaptation of existing structures. We have particular expertise in the following structures:

- Manufacturing & Process Plants
- Workshops
- Storage Buildings
- Substations
- Administration and Welfare Buildings
- Control Buildings
- Modular Buildings
- Security Gatehouses
- Blast Resistant Structures
- Building Substructures, Basements & Foundation Systems.
- Machine Plinths / Foundations.
- Tank & Silo Foundations
- Services Tunnels, Trenches and Culverts
- Structural Framing and Access Systems for Process Equipment & Machinery
- Pipe & Cable Support Gantries
- Overhead Travelling Crane Runway Beams & Supporting Structures
- Concrete Hard Standings & Pavements
- Containment Bunds and Water Resisting Retaining Walls
- Flood Protection Walls
- Vehicle Bridges
- Temporary Structures





Comprehensive **Design Services**

Arthian offers a comprehensive range of structural engineering services across the complete lifecycle of client assets, from small scale local inspection & assessment to extensive new build projects.

The structural engineering team works closely with our other disciplines, including external parties, to provide the following integrated design services for new build developments.

RIBA 1

Client Brief

- Engage with client team to understand project aspirations
- Assist with development of the brief
- Identify constraints and opportunities associated with existing site structures, ground conditions, site constraints
- Seek opportunities for regenerative design

RIBA 2

Concept Design

- Develop Project Criteria & Design Concepts with Project Team
- Survey the site and existing structures
- Identify Design Risks and Specify Intrusive Investigations
- Explore Alternative Solutions for Building Structures, Foundations, External Pavements etc
- Present Options & Outline Specification in RIBA 2 Report

RIBA 3

Developed Design

- Oversee & Manage Intrusive Investigations
- Develop the coordinated design with project team
- Building Information Modelling
- Present Scheme Design Drawings and Specification in RIBA 3 Report
- Planning Application

RIBA 4

Detailed Design

- Detailed Design Calculations, Modelling and Detailed Drawings
- Building Warrant Application
- Tender Information and Technical Support during the Tender Process
- Construction Information

RIBA 5

Construction

- Technical support and Inspection of Site Works
- Temporary Works Design

Structural Surveys **& Assessments**

Structural inspections and condition assessment are required to understand existing constraints prior to remodelling or adapting structures and for the endorsement of ageing assets.

We are experienced in the assessment of a wide range of building and civil engineering structures and well versed in the technique and process of inspecting, investigating and appraising structural systems including:

- Building Structures in steel, concrete, masonry and timber
- Roof Structures and Cladding Support Systems
- Steel Gantries
- Concrete foundations, grounds slabs, rafts and piles
- Concrete Jetties
- Retaining Walls
- RAAC Assessment

Assessment typically comprises a review of record information, measured surveys, visual inspection and a condition assessment report outlining recommended next steps. These may include periodic monitoring, intrusive investigation & materials testing to better inform assessment, remedial measures or repair works.

Testing & Intrusive **Investigations**

Intrusive investigations often require removing finishes or concrete to expose structural sections for NDT and materials testing.

With extensive experience in structural assets and materials, we specify targeted investigations that minimise the impact on the use of the facility.

We take a practical approach to working in operational environments, considering access and plant protection. Where fixed access is impractical, we coordinate with specialist roofing and rope access contractors.

Remedial Work
& Strengthening Services

Commercial pressures and sustainability goals are driving the need to keep structural assets in service.

We maximise asset value by designing targeted remedial works that account for condition, environment, and future needs—aiming to extend service life wherever possible. Through focused investigations and efficient structural design, we reduce cost and disruption for asset owners.

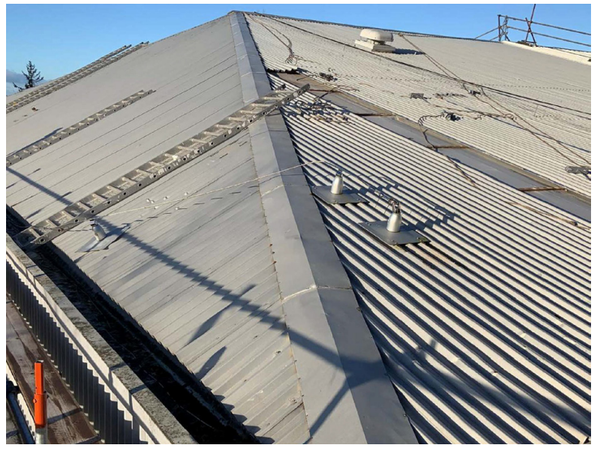
Our structures team has extensive experience in designing remedial works and strengthening for:

- Remediation of Concrete Structures Impacted by Harsh Environmental Conditions (Quaysides, Jetties, Bridges, Car Parks etc.)
- Strengthening of Steel Building Structures
- Strengthening of Roof Structures and Roofing Support Systems
- Strengthening of Steel Gantries.
- Strengthening of Bridges & Culverts
- Remediation and Strengthening of Concrete Substructures & Retaining Walls
- Design of remedial works for RAAC defects
- Remediation and Strengthening of Secondary Containment Bunds

Retrofit, Adaptation &
Remodelling Existing Structures

Larger remodelling or extension projects typically follow the RIBA Stages outlined above for New Build projects whilst smaller scale projects of limited scope may follow a simpler process. All projects involving the modification of existing structures, or change of loading to the structure, are likely to require the services of a structural engineer. Arthian can assist with the following project types:

- Over-cladding and upgrade of building envelopes
- Assessment and strengthening to incorporate renewables
- Integration of new plant and machinery
- Strengthening or modification to address site hazards
- Repurposing an existing building for a new intended use
- Extension of an existing building



Ageing Assets &
Extension of Service Life

Extending the life of an asset requires an understanding of the original construction, environmental exposure and current condition. Once these aspects plus future criteria & demands are known, remedial measures can be assessed against the ‘do nothing’ option to help identify the optimum solution.

Our structural engineering team has extensive experience of investigating aging assets and designing practical remedial works to maximise asset value.

Temporary Structures & **Temporary Works**

In addition to permanent works design, we assess and design temporary structures under appointment to asset owners and contractors, including:

- Demolition Specifications including Scoping and Pre-weakening Designs
- Design of Temporary Propping and Access Systems
- CAT 3 Checking of Temporary Works Systems
- Temporary Bridging Solutions
- Service / Utility Protection Systems
- Anchor Block Foundations
- Cofferdams
- Crane Foundations
- Construction Logistics Studies & Sequencing

SER **Certification**

Arthian provides SER Certification on building projects requiring Scottish Building Warrant Approval. Our Approved Certifiers of Design (Building Structures) are closely involved with the design process and hold staged reviews to ensure that designs develop in line with the Building Regulations. This provides greater client-side control of the building structure design with Arthian retaining overall responsibility for a compliant structure.

Blast Resistant **Structures**

Tailored building design solutions for hazardous environments

Our expertise in the design of blast resistant structures has been developed over several decades supporting clients within high-hazard, COMAH facilities. These skills remain valuable to both traditional and emerging industries in the UK. Typical projects include:

- Assessment & Upgrade of Existing Facilities to Resist Blast Overpressures
- Design of New Buildings to Resist Blast Overpressures. These include Modular and Traditional Build
- Design / Specification of Temporary Modular Accommodation to Support Site Activities

These buildings often come with further specialist design requirements and consideration such as toxic refuge, thermal shelter-in-place requirements.

COMPLEMENTARY DESIGN SERVICES

The design of building structures is, by its nature, multi-disciplinary. Our building structures team is well versed in the building design process and collaboration with project teams, including external parties.

Arthian offers a holistic and adaptable approach to every project. We offer a one-stop multi-discipline design service and collaborate with trusted partners as required to meet the project brief.

Alongside structural engineering we offer the following complementary design services under appointment to developers, asset owners & contractors.

Related services

- Geotechnical and Geoenvironmental engineering
- Civil Engineering Design including Vehicle Tracking, Pavement Design and Drainage Design
- Buildings & Blast Resistant Structures
- Measured Surveys including Topographical Surveys, Utility Surveys and Measured Building Surveys (Including Laser Scans)
- Revit Models of Existing Structures
- Lead Designer Role for Industrial Buildings
- Architectural Design
- Building Services Engineering
- Principal Designer Role
- Project Management
- Quantity Surveying
- Planning Consultant Services
- Acoustic Assessment & Design
- Carbon Lifecycle Analysis
- Built Heritage Consultancy