

# Resilience, Security and Risk Consulting



ARUP



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*“We knew from working with Arup in the past that, as the client, we would be involved in the solution and that’s something that sets the company apart from its competitors. There are some consultants who go away and make assumptions about how things should be but Arup doesn’t do this. It provided us with a very broad understanding and it was this ability and willingness to engage with the client that sets the company’s service apart. I would work with Arup again.”*

Paul Catlow, Victoria & Albert Museum

Arup’s experience and services span a broad spectrum of physical and operational environments, against a varied backdrop of hazards and threats. Arup’s Resilience, Security and Risk practice provides resilience consultancy for clients throughout the world.

Whether exposure originates from natural hazards like earthquakes or human-driven threats of political instability, terrorism and crime, our world-class professionals help regional and global organisations understand the risks to their people, assets and services, enabling them to develop practical, cost-effective strategies to manage those risks in the long term.

Operating from regional hubs in Abu Dhabi, Berlin, Hong Kong, London, Los Angeles, Madrid, Melbourne, New York, San Francisco and Sydney, we can call upon analysts based in our offices around the world to give local context to global issues.

Arup’s Resilience, Security and Risk business is approved by several governments and international organisations to work routinely with protectively marked material. We have worked with state governments in Africa, the Middle East, South East Asia, East Asia, the UK, Continental Europe and the Americas. We have advised industry in shaping both national and global strategies. Our team includes engineers, scientists, designers, technologists and former military and other government personnel who are experienced in both working to existing codes of practice and developing new standards on a national and international level.

We make tactical and strategic recommendations for facility design, system specifications, methodologies and processes, business continuity and compliance with regulatory matters, including public law. Our approach is applicable from project inception through detailed design, to construction and operation.

Our key services include:

**Protective intelligence:** Assessment of malicious risks to the people, assets and services of an organisation to determine appropriate mitigation against man-made risks.

**Technical risk assessment:** We cover all industry sectors, from operational safety protection to accident risk management in construction, reliability of systems, assessment of and mitigation against natural hazards.

**Business continuity planning:** Comprehensive business continuity solutions that include advice on prevention of and planning for disruption to IT, facilities access, staffing levels, our clients’ supply chains and other activities within their value chain.

**Enterprise risk management:** Risk education, policy development, risk response planning and advice on organisational risk tolerance, cultural issues and appropriate ERM software.

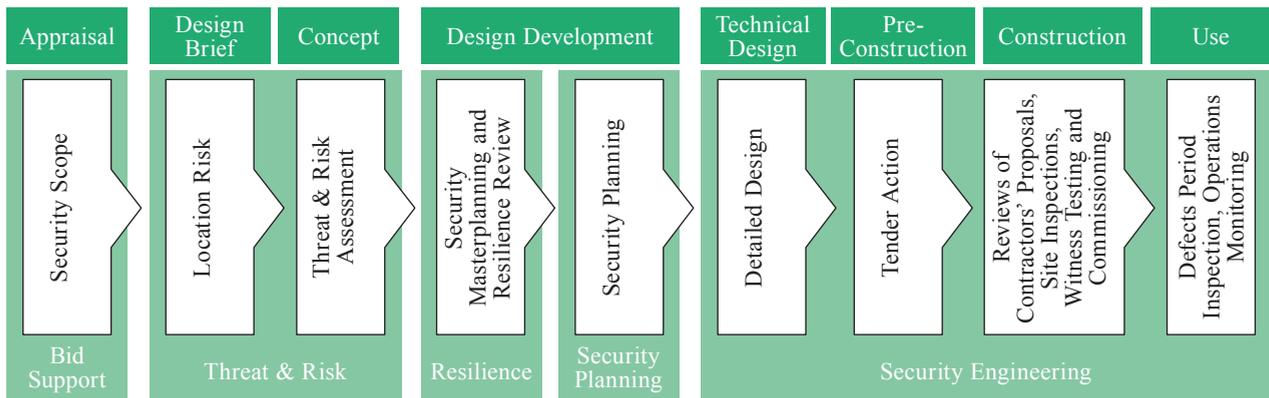
**Security engineering:** Risk-led security engineering to design and deliver safe and secure environments.

**3D and geomatic services:** Spatial solutions to challenging situational awareness and command and control problems, through the integration of 3D models, real-time technologies, Geographic Information Systems (GIS) tools and data acquired with our in-house LiDAR scanning equipment.

**Counter-terrorism and building resilience:** World-leading engineering expertise in structural and façade resilience against blast and other extreme actions, hostile vehicle mitigation and evacuation/invacuation strategies.

These capabilities are supported and strengthened by Arup’s global network of designers, engineers, consultants, and technical specialists.

## RIBA Outline Plan of Work



Arup activities and deliverables are matched to each stage of the design process

### The Arup approach

Arup approaches each project according to its needs. A common element is a collaborative relationship with our clients integrating our various skills. Not only can we rely on our global network of specialists but we can draw upon a number of different resilience, security and risk skills and services in order to provide the client with a comprehensive solution that takes account of the relevant risks before delivering our recommendations.

The model above shows how, in the built environment, we provide advice from a secure by design perspective. This means that, through a structured approach, we carry out a threat and risk assessment of the project and then assess the resilience of the site. We progress from there to security planning and finally provide advice on security engineering. Applying this approach ensures our recommendations are based on assessed risks and follow prescribed design stages used by the Royal Institute of British Architects (RIBA) and other national bodies.

We apply this same structured approach to assist clients beyond the built environment including insurance, business continuity and research.

Our Resilience, Security and Risk services include:

#### Context

- Threat and Risk Assessment
- Corporate/Organisational Risk Profiling
- 3D and Geomatic Services
- Due Diligence/ Business Intelligence

#### Strategy

- Security Masterplanning
- Crime Prevention Through Environmental Design (CPTED)
- Cost/Benefit Analysis
- Location Analysis and Comparisons

#### Operations

- Operational Planning
- Enterprise Risk Management (ERM)
- Business Continuity Management (BCM)
- Travel Risk Monitoring
- Penetration Testing

#### Technical risk

- Environmental Risk Assessment
- Natural Hazard Assessment
- System Failure Impact Analysis
- Road/Rail Tunnels and Bridges Risk

#### Systems

- Operational Requirements Definition
- Electronic Systems
- Barrier Technologies
- Chemical, Biological, Radiological and Nuclear (CBRN) Resilience
- Witnessing and Commissioning
- Integration and Visualisation

#### Structural

- Explosive Blast Resilience
- Hostile Vehicle Mitigation
- Shelters, Evacuation and Invacuation

Working with clients around the world, we deliver effective resilience, security and risk solutions both locally and internationally.



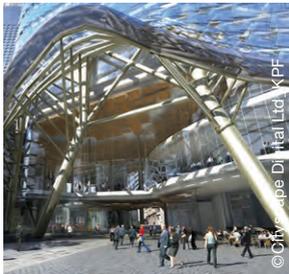
### Singapore Sports Hub

Arup provided initial strategic advice to the design team on master planning the layout of the complex to achieve the security objectives set out in the project brief, primarily in connection with a potential terrorist attack.



### SPIRIT

Arup is co-operating with ten European partners to develop a new methodology and tools for threat assessment, cost/benefit analysis of counter-terrorism measures and conducting an extensive review of existing products for blast protection.



### The Pinnacle, United Kingdom

Arup developed an electronic and physical security strategy to achieve a robust level of resilience against wilful attack. The design was specifically tailored to complement accessibility, pedestrian flow and the aesthetic and environmental design of the public realm.



### InterContinental Hotels Group

Arup completed an assessment of the client's exposure of their North American property portfolio to natural hazards including earthquakes, windstorms and flooding enabling them to prioritise estate enhancements and negotiate more favourable insurance terms.



### HSBC Data Centre, Hong Kong

Arup developed a security strategy and designed electronic and physical systems to deter and detect security breaches for a facility operating 24 hours a day, 365 days of the year, supporting the client's East Asia IT operations.



### Abu Dhabi International Airport, UAE

Arup made design recommendations to improve the structural robustness and counter-terrorist resilience of the 120m roof arches of the new terminal complex. We also provided an in-depth blast resilience review and blast engineering.



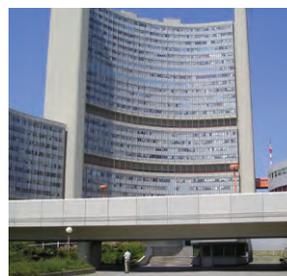
### Transbay Transit Centre, San Francisco, California, USA

Arup is providing risk and security consulting for a six-level transit centre spanning four city blocks providing intercity, regional and commuter bus services for four major transit providers at ground and bus deck levels.



### Security Audits of Water Assets and Sites, United Kingdom

Arup provided advice on the protection of critical national infrastructure in accordance with UK Government requirements matched to the site operational needs.



### United Nations Vienna International Centre, Austria

Arup carried out an audit of security measures at the 180,000m<sup>2</sup> international centre including an assessment of the threats and risks posed by international terrorism.



### Øresund Bridge, Europe

Arup participated in the risk assessment for the vital road and rail link between Denmark and Sweden. The risk assessment demonstrated that the link met the safety criteria, a vital element in securing planning and operating consents.

## About Arup

Arup is the creative force at the heart of many of the world's most prominent projects in the built environment and across industry. We offer a broad range of professional services that combine to make a real difference to our clients and the communities in which we work.

We are truly global. From 90 offices in 35 countries our 10,000 planners, designers, engineers and consultants deliver innovative projects across the world with creativity and passion.

Founded in 1946 with an enduring set of values, our unique trust ownership fosters a distinctive culture and an intellectual independence that encourages collaborative working. This is reflected in everything we do, allowing us to develop meaningful ideas, help shape agendas and deliver results that frequently surpass the expectations of our clients.

The people at Arup are driven to find a better way and to deliver better solutions for our clients.

We shape a better world.

### UK, Europe, Africa

13 Fitzroy Street,  
London,  
W1T 4BQ  
United Kingdom  
+44 20 7755 3763

### Asia

Level 5, Festival Walk,  
80 Tat Chee Avenue,  
Kowloon  
Hong Kong  
+852 2268 3632

### Americas

499 Thornall Street,  
9th floor, Edison,  
NJ 08837  
United States of America  
+1 732 623 7474

### Middle East

PO Box 212416, Dubai  
United Arab Emirates  
+971 25 075 622

### Australasia

Level 17, 1 Nicholson  
Street, Melbourne, 3000  
Australia  
+61 2 9320 9224

560 Mission Street,  
Suite 700, San Francisco,  
CA 94105  
United States of America  
+1 415 946 0705

[security-consulting@arup.com](mailto:security-consulting@arup.com)

[www.arup.com](http://www.arup.com)