

An aerial night view of a city skyline, likely New York City, with numerous skyscrapers illuminated. Overlaid on the city is a complex, glowing digital network of white and blue lines, representing data connections and infrastructure. The lines form a dense web of circles and straight paths, creating a futuristic, high-tech atmosphere. The overall color palette is dominated by blues, purples, and whites, with the warm lights of the city buildings providing a contrast.

Asia Pacific

DATA CENTERS

Delivering 24/7 data centers infrastructure solutions

From planning, permitting, designing and constructing, AECOM is providing integrated and customized solutions to address clients' needs on data center facilities. Our services and solutions help our clients to achieve value and scalability.

The Experience We Bring

Data is everywhere and continuously expanding, as is the need to manage it. Corporations are challenged to keep up with the ever present responsibility to supply data storage solutions for themselves and their customers. We bring together the right resources within our organization, from around the world and locally, to collaborate virtually and on-the-ground as needed, to help clients achieve their goals when planning new or maintaining existing data center facilities.

Greenfield Development / Build-to-suit

2MW to 100 + MW Sites

Varying Tier Redundancies

Hyperscale Advancements

Operational Site Retro-fits

Power & Cooling Innovation

Infrastructure Upgrades & Expansions

40M SF

Mission Critical space
delivered to date

30 YRS

Supporting the evolution of
data centers

100+ MW

Mission Critical campus designs

20M SF

Operations & Maintenance
for existing data centers

Areas of **EXPERTISE**

Design + Engineering

- Architecture
- Mechanical and Electrical Engineering
- Civil and Structural Engineering
- Security and Resilience

Consulting + Planning

- Site Selection Due Diligence and Permitting
- Environmental Services

Construction Services

- Project Management
- Construction Management
- Cost Consulting

Consulting + Planning SITE SELECTION DUE DILIGENCE + PERMITTING

AECOM understands how important site selection is to clients and to the local community when planning new data centers and renovating facilities. We provide comprehensive site selection due diligence (SSDD) and permitting services, which are built on 3 key pillars: understanding of clients' needs; knowledge of local experts on regulatory, security, environmental and utility requirements; and expertise from AECOM's global data center network.

SSDD + Permitting services:

- Determination of owner requirements
- Infrastructure availability assessments
- Site inspections and surveys
- Geotechnical engineering
- Civil site design
- Remedial liability assessments
- Building condition surveys
- Wetland and ecological evaluations
- Cultural resource studies and compliance
- Environmental site assessments (ESAs)
- Noise modeling and impact assessments
- Air emissions modeling and permitting
- Local jurisdiction/agency coordination and entitlements negotiation
- Incentive analysis
- Tax and others
- Preliminary schedule and budget analysis
- Sustainability consulting
- Labor force assessments

Consulting + Planning ENVIRONMENTAL SERVICES

AECOM is committed to helping protect the environment, health, and safety (EHS) of our clients' employees, customers, and the global communities in which they operate. Our services are tailored to helping our clients evaluate policies, procedures, and practices that govern EHS management against applicable legal requirements and industry best practices. Our unique International Audit Protocol Consortium® (IAPC) supports the cost-shared development of leading EHS audit protocols that address regional and national requirements around the world, contributing to the environmental quality and safety of data centers.

EHS services:

- EHS compliance audits
- EHS program development
- EHS management systems
- Environmental permitting
- Regulatory reviews
- Risk assessments
- Site assessments
- Social compliance audits (SCA)
- Permitting
- Supplier compliance audits
- Training
- Construction safety management
- Environmental, social, and governance (ESG) due diligence
- Sustainability assessment and efficiency programs
- Data analytics

Design + Engineering ARCHITECTURE, MEP, CIVIL + STRUCTURAL ENGINEERING

At the core of successful data centers, is their effectiveness in supporting their owners' day-to-day needs, and this is a fundamental focus for AECOM when designing and developing these facilities for our clients. Our specialized capabilities, such as in power and cooling infrastructure, are applied through the filter of what the client needs, enabling us to provide cost-effective solutions without disadvantageous trade-offs.

Architecture, MEP, Civil + Structural Engineering services:

- Master Planning
- Architecture/interiors
- Civil engineering
- Structural engineering
- Mechanical engineering
- Electrical engineering
- Geotechnical engineering
- Water & wastewater
- Power solutions
- Facility engineering
- Strategic facilities/ infrastructure planning
- Logistics
- Value engineering
- Generation plant and fuel system
- IT infrastructure/video services
- High-voltage/low-voltage power distribution systems
- Uninterruptible power supply (UPS) facilities
- N+1 through N+N redundant systems
- Coordinated services distribution
- Rack layouts/space planning
- High-density services provisions
- Control and building management systems
- Fire detection/protection systems
- Security and access systems
- Internal and external lighting
- Heating, ventilation, and air conditioning
- Structured cabling system
- Water leak detection systems
- Aboveground public health
- Condition/pre-acquisition surveys
- Computational fluid dynamics (CFD) analysis
- Fire engineering

Design + Engineering **SECURITY AND RESILIENCE**

Our approach provides integrated, holistic solutions that bolster our clients' ability to anticipate, avoid, and absorb threats. We specialize in the design of security systems for critical facilities. Our structural and mechanical designs guard against natural and man-made hazards for the protection of critical assets and people. AECOM has implemented layered security design for existing buildings converted for large-scale, mission-critical operations as well as for new complexes on greenfield sites.

Security + Resilience services:

- Threat risk vulnerability assessments
- Enterprise architecture and design
- Cyber operations/network monitoring
- Wireless and remote sensing
- Secure industrial control system
- Disaster recovery and backup
- Exercises and security evaluations
- Information assurance
- User training and cyber awareness
- Policy and regulatory requirements
- Bomb blast analysis
- Secure cloud solutions
- Access security assessment and remediation

Construction Services

PROJECT MANAGEMENT / CONSTRUCTION MANAGEMENT

Longer term cost and time efficiency can only be achieved by a proactive and structured approach to preparing for the changing environment. Collaborating with clients, AECOM pinpoints potential issues early in order to mitigate risks and impacts, and enable our clients to get maximum performance from their resources.

PM/CM services:

- Design management
- Contract development
- Quantity surveying
- Value engineering
- Cost and schedule management
- Project controls
- Document control
- Program cost consultancy
- Inspection
- Contract compliance
- Claims avoidance/dispute resolution
- Critical path method (CPM)
- Master scheduling
- Delivery and contracting strategies
- Design standards
- Risk management
- Plans and procedures
- Procurement
- BIM- Project administration
- Change management
- Estimating and budgeting
- Quality assurance/quality control
- Construction inspection
- Construction management
- Program and project management
- Bid administration
- Engineering, procurement, and construction management (EPCM) services
- Equipment pre-purchasing
- Integrated project delivery

Construction Services COST CONSULTING

AECOM offers a full range of program cost consultancy (PCC) services for data centers around the world. During the planning and design phases, we identify cost sensitive items and build in a customized procurement strategy for the client's longer run implementation, balancing project requirements and funding availability.

PCC services:

- Cost consultancy
- Cost modeling and cost planning
- Quantity surveying
- Benchmarking
- Value and risk consulting
- Life cycle costing
- Funding schedules
- Cash flow analysis
- Procurement
- Project controls
- Project planning
- Scheduling
- Engineering cost management
- Project/program management
- Post-contract cost management and final account settlement
- Capital and asset optimization
- Sustainability consulting and research

The Future of DATA CENTERS

Owner / Operator / User

- Accelerating update of aging facilities to support digital innovation and data growth
- Innovation for enhanced efficiency, such as floating, underwater or underground facilities

Data Consumer

- Meeting demand with expanding Internet of Things from Asia's urbanization growth
- Providing smarter services and simultaneously more security from data disruptions and privacy invasion

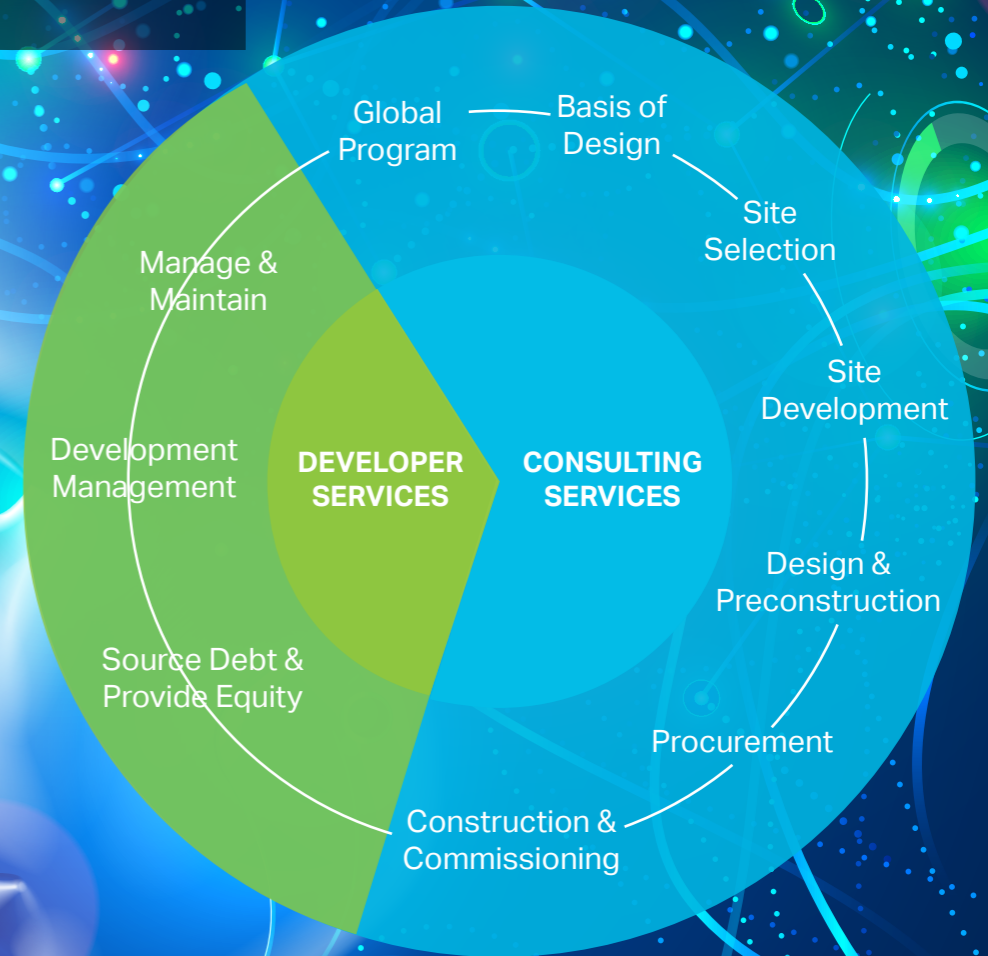
Regulator

- Increasing pressure for energy efficiency and reduced environmental footprint as the number of data centers grows
- Drawing the lines on data security governance – across borders, public and private sectors, corporates and individuals

WHY AECOM

Integrated solutions through the entire life cycle

Unlike any firm in the marketplace, AECOM offers complete services to deliver state-of-the-art data centers, as well as the infrastructure to power, cool and secure them.



OUR DIFFERENTIATORS

Our clients benefit from the solutions we can design and deliver as a global, fully integrated infrastructure services firm that takes a comprehensive approach, encompassing the most important aspects for successful data centers.



Safe Delivery

Seamless Transition | Safe Execution | Secure Operations



Experienced Supplier

Quality Team (Global and local) | Strong Governance | Best Practice



Efficient Execution

Reduced Operating Costs | Greater Productivity | Predictive Solutions



Scalable Solution

Programmatic Approach | Fast Start Deployment | Geographic Reach



Reliable Operations

100% Uptime | Better Facility Performance | Trusted Partner

OUR CLIENTS

Top 100 Digital Companies by Forbes (2018 ranking)

1 of Top 3

World's Most Innovative Companies by Forbes (2018 ranking)

2 of Top 10

Fortune 500 companies (2019 ranking)

3 of Top 10

World's Most Valuable Brands by Forbes (2019 ranking)

6 of Top 10

AECOM global and local teams have been engaged in delivering services to high technology clients worldwide who are leaders in the sectors of:

- Consumer electronics
- Internet-related services and products
- Computer software and hardware
- Social media platforms
- Telecommunication services
- E-commerce, cloud computing, artificial intelligence (AI)
- Automotive and energy company

A SELECTION OF OUR CLIENTS

* Some of our clients are not listed due to confidentiality.

Asia Pacific

- Air New Zealand DC audit
Auckland, New Zealand
- ANZ Data Center, Tullamarine
Melbourne, Australia
- ANZ Data Center site selection
Auckland, New Zealand
- ASB Data Center Infrastructure
Auckland, New Zealand
- Bombay Stock Exchange,
Business Continuity Center
Hyderabad, India
- Cathay Pacific Data Center
Australia and New Zealand
- CBA Data Center
Sydney, Australia
- Chengdu Data Center
Sichuan, China
- China Mobile Data Center
Hong Kong
- China Unicom Global Solution
Management Center
Hong Kong
- City Telecom (HK) Limited,
CTI Multimedia Production and
Distribution Center,
Hong Kong
- Confidential Data Center Client
Sydney, Australia
- Confidential Client Tier 3+ Data Center
Hong Kong and Singapore
- CtrlS Data Center Ltd
Mumbai, India
- Department of Defence - Head Quarters
Joint Operations Command (HQJOC)
Canberra, Australia
- Digital Realty Data Centers
Sydney and Melbourne
- Reliance Communications, Navi
Mumbai, India
- EDS Mt Wellington upgrades
New Zealand
- Gen-i Data Center
Auckland, New Zealand
- HCL Technologies Data Center
Noida, India
- HKEX Next Generation Data Center
Tseung Kwan O Industrial Estate
Hong Kong
- Hong Kong Jockey Club
Data Center Expansion
Hong Kong
- HP, New Zealand dual Data Centers
Auckland and Wellington, New Zealand
- HP Data Center
Sydney, Australia
- HSBC Data Center
Hong Kong
- IBM Data Center site selection
Auckland, New Zealand
- IBM Newton Data Center upgrades
Auckland, New Zealand
- Intel PG12 Data Center, Penang–Data POS
1&2, Kuala Lumpur, Malaysia
- NTT Communications Data Centers
Hong Kong
- Pacific Century Cyber Works,
Tier II and Tier III Data Centers
India
- Patni Computer Systems Ltd
Noida, India
- QANTAM Computer Center
Sydney, Australia
- Qantek Data Processing Center
Sydney, Australia
- Spark, Project Gemini Data Center
Auckland, New Zealand
- SAP Labs India
- Telstra Clayton Data Center
Victoria, Australia
- UUNET Data Center, St Leonards
Sydney, Australia
- Vodafone Data Centers, Artarmon
Sydney, Newington, Ballaria,
Australia and New Zealand
- Westpac Data Center
Sydney, Australia
- Woolworths Data Center
Sydney, Australia

Rest of the World

- Bank of America Building at One Bryant Park
New York, United States
- Bank of New York Data Center,
Nashville Tennessee, United States
- Barclays
London, United Kingdom
- Barclays, Headquarters and Data Centers
New York, United States
- Cazenove & Co., Data Center
London, United Kingdom
- Citigroup Data Center
Frankfurt, Germany
- Deutsche Bank AG
Dubai, United Arab Emirates
- Galileo Connect London
Northwest Data Center
- Global Switch
London, United Kingdom
- Global Switch
Germany
- Goldman Sachs, 200 West Street
New York, United States
- Hawaii Regional Security Operations Center
Hawaii
- HSBC Bank Middle East Limited
Dubai, United Arab Emirates
- Imagination Data Center, Hertfordshire
United Kingdom
- Manitoba Hydro, Headquarters,
and Data Center
Manitoba, Canada
- Merrill Lynch Cabling and Infrastructure
New York and New Jersey, United States
- Morgan Stanley & Co.
Dubai, United Arab Emirates
- NASA, supercomputing facilities improvements,
California, United States
- NAVFAC Anti-Terrorism Force Protection
- OptiGlobe Telecommunications,
Internet Data Centers, various locations
Latin America
- Reuters, Docklands
London, United Kingdom
- Sentinel Data Centers
various locations
- Teleticity, Stockholm
Sweden
- Thomson Reuters Corporation Data Center
renovation and expansion projects
- Tyco International Ltd. Backup Data Center,
New Jersey, United States

VIRTUAL DESIGN AND CONSTRUCTION (VDC)

While technology is driving the growth of data center facilities, it is also transforming how we design and construct these facilities for our clients. Our approach to Virtual Design and Construction, founded upon effective deployment of Building Information Modeling (BIM) technology, is helping our clients to capitalize on their own data towards realizing optimised results for their projects. Augmented and virtual reality during our design and construction process, through our use of market-available software products in conjunction with AECOM's own developed systems and products, is enabling us to deliver projects to our clients faster, smarter, safer and better.

Our utilization of BIM has resulted in world class and award-winning performances, garnering numerous awards since 2015 for AECOM and our clients' projects. These include two Bentley Systems "Be Inspired" awards, a 2015 GEO Smart India award, the 2016 Platinum Award for the BIM Organization Category by the Singapore Building & Construction Authority, and the 2017 Asia Geospatial Excellence Awards in the Transportation Infrastructure and Digital Engineering categories.

VDC services:

Design

- Building Information Modeling (BIM)
- Design coordination
- Design communication
- Volume, threshold and scale
- Design review
- Pre-visualization
- Performance and sustainability analysis
- 3D and 4D modelling

Building/construction

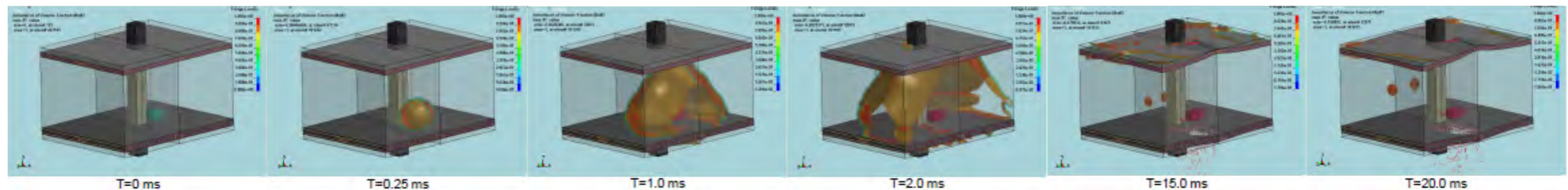
- Construction and fabrication coordination
- Hazard perception

Financing

- Cost estimation
- Cost validation

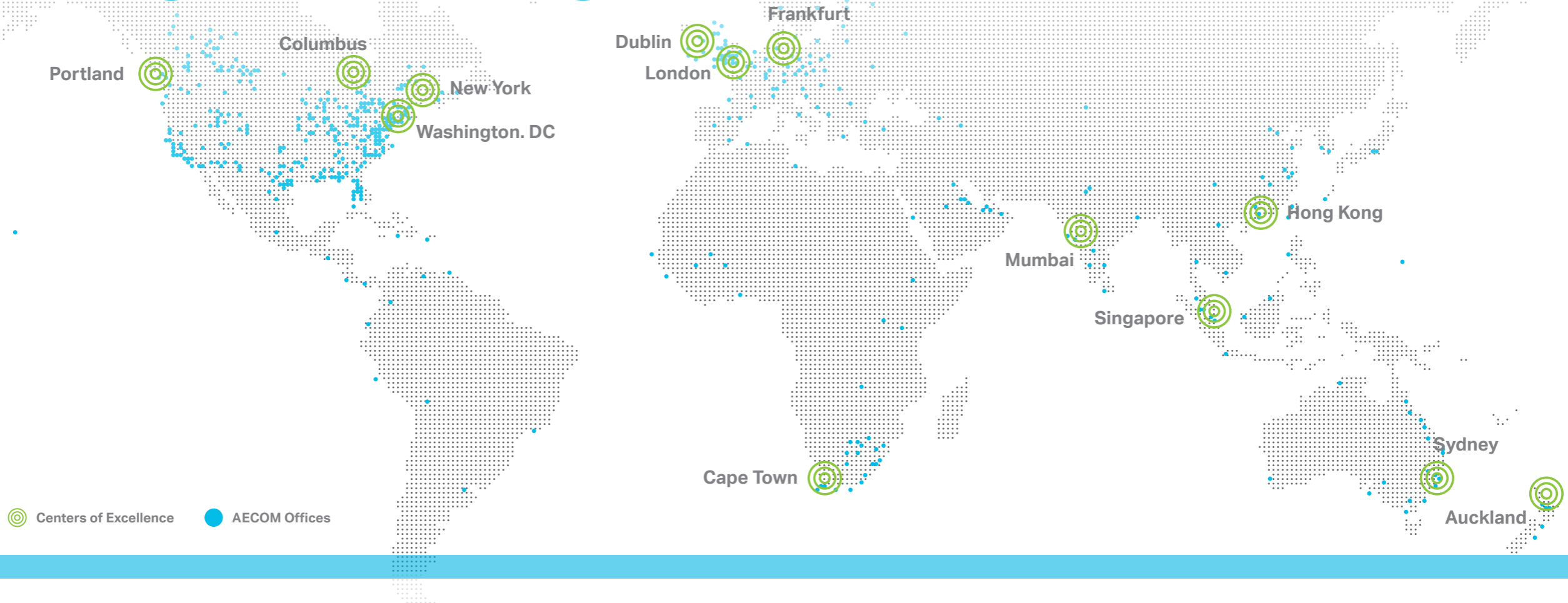
BLAST RESISTANT DESIGN AND RISK ASSESSMENT

Resiliency is crucial for data center facilities. For existing and new facilities, we help our clients to identify potential risks and significantly improve resistance and performance with minimal financial impact. We offer our specially developed vulnerability assessment and risk mitigation strategy that provides innovative, structural details which enhance the resistance of facilities to blast effects and progressive collapse.



Reinforced concrete structure subjected to blast - Blast simulation

AECOM Centers of **EXCELLENCE**



About **AECOM**

AECOM is a global network of experts working with clients, communities and colleagues to develop and implement innovative solutions to the world's most complex challenges.

As one of the world's largest engineering and construction companies, we deliver professional services in critical markets throughout the entire project life cycle. We believe in achieving mission critical facilities, such as data centers, that provide resilient, innovative and sustainable solutions for our clients, and for the communities that are served by them.

Imagine it. Delivered.



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