

# Response and Recovery

Solutions for COVID-19



BLACK & VEATCH

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## for COVID-19

### About Black & Veatch

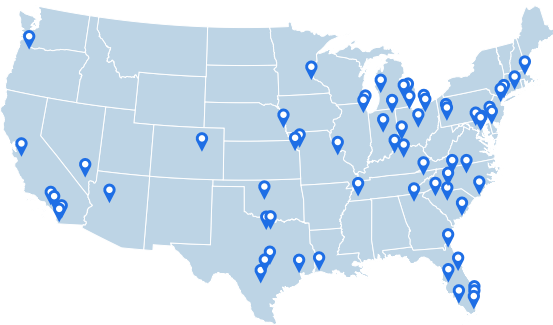
As a global leader in mission critical, high consequence infrastructure development, we specialize in engineering, design, construction support, and contingency operation services for government civilian agencies, FEMA, the United States Army Corps of Engineers (USACE) and the Defense Threat Reduction Agency (DTRA). We are experts in U.S. Government systems and tools, that are FAR compliant, utilizing DCAA approved accounting and procurement systems. Leveraging over 100 years of experience, we partner to integrate stakeholder requirements into executable engineering and construction solutions that will help respond to emergent COVID-19 requirements in rapidly changing environments. Our capabilities continue beyond design and construction by sustaining the mission critical infrastructure through delivery of contingency operations services.

**BV has specialized engineering disciplines** for performing building/facility assessments, preparing designs and providing field engineering for converting existing facilities and structures to Alternative Care Sites/Facilities (ACS/F). These engineering disciplines include: mechanical (HVAC), electrical, structural, and fire protection. BV brings specialized capabilities in delivery of negative pressure environments for contamination control, emergency backup power systems, air emissions instrumentation, closed circuit communications systems and secure wireless networks directly applicable to the ACS/F conversion scope.

**BV's construction professionals** deliver safe and reliable projects that are founded and supported by world class training, innovative techniques and a client-first mindset. Our 100 year history of successfully completing projects safely and on time lends itself to a vast network of highly trained craft, superior management and quality subcontractors in every region of the country. We continue to pursue our goal of becoming the most innovative and rapidly evolving company in the Engineering & Construction (E&C) space, providing our clients with the highest degree of competency.

BV has relevant experience and capabilities in the **design, construction and sustainment (contingency operations)** in support of USACE, DTRA's Worldwide Contingency Operations Program, the Biological Threat Reduction Program and US commercial projects. BV has partnered with multiple firms providing solutions to medical facilities to accomodate the impending critical heathcare needs in response to COVID-19.

### Rapid Response



BV has 6,717 professionals located in 69 offices and 31 states and can provide immediate response to all project needs **within 48 hours to all 50 states.**

### E&C Capability

E&C CAPACITY	STAFF COUNT
Architects	21
Construction Managers	28
Construction Superintendents	11
Electrical Engineers	640
Fire Protection Engineers	3
Mechanical Engineers	618
Safety & Health Managers	11
Security Engineers	8
Structural Engineers	182
Telecom/Network Engineers	120
<b>TOTAL</b>	<b>1,642</b>

### Black & Veatch at a Glance



**10,000+**  
Professionals  
worldwide



**100+**  
Offices



**6 CONTINENTS**  
with projects



**7,000**  
Active projects  
worldwide



**\$3.7 BILLION**  
2019 Revenues



**SAFETY  
PERFORMANCE**  
0.24 - Recordable  
incident rate

# Black & Veatch Delivers Confidence & Trust: Providing Infrastructure Solutions That Strengthen Our Nation's Security, Economy and Environment

## No LEARNING CURVE

We are experts in U.S. Government systems and tools, utilizing DCAA approved accounting and procurement systems. We use your business systems, tools and criteria everyday to deliver successful solutions.

## Confidence in DELIVERY

We offer high quality proven industry expertise in Power, Water, Telecommunications and Facilities. ENR Sourcebook BV No. 1 in Telecommunications, No. 2 in Power, No. 5 in Water Supply and Water Treatment and No. 7 in Government Offices.

## Reliable PARTNERSHIP

Our partnership with the U.S. Government results in client satisfaction in our delivery of projects that face intense financial, schedule and quality demands. Approximately 80% of our CPARS past performance ratings are "Exceptional" or "Very Good".

## Low Risk SOLUTIONS

We leverage proven solutions to meet our client's needs that result in reliable solutions. We are a low risk partner reinforced by our long history delivering infrastructure solutions to the DoD for more than 100 years.

## Leadership to Meet YOUR MISSION

We bring fully integrated expertise, and business processes that deliver success to the U.S. Government. BV has the capacity with more than 6,700 professionals located in 69 offices and 31 states for immediate response to all project needs.

## Working Across Multiple Agencies To Exceed Mission Goals

BV has partnered with a variety of different government agencies to help them meet their mission goals. Our proven record of success helps us develop strong relationships with our partners and maintain relationships with many agencies for over 100 years.



USACE



DTRA



USAID



USEPA



MDA



USAF



NAVFAC



WHS



DOD



DOE



NSA



USTDA



DHS

## Master Services Agreements To Support Medical Requirements

Black & Veatch is proud to partner with the following firms to accomodate the impending critical healthcare need



Gensler





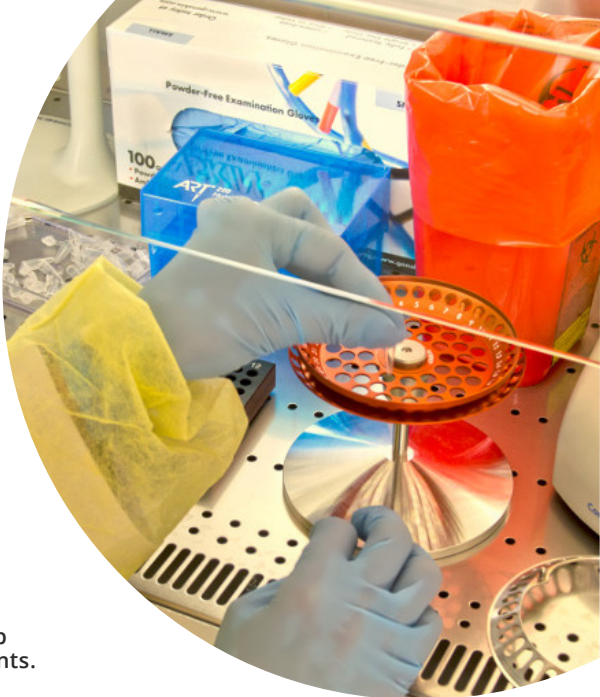
## Relevant Project Experience

The project summaries below demonstrate relevant experience to the COVID-19 conversion to ACS response. The comparable relevant experience includes:

Ability to  
**RAPIDLY RESPOND WITH ADEQUATE CAPACITY**  
Within 24 hours, BV had 120 engineers volunteer to immediately mobilize, supporting USACE in their COVID-19 taskings.

Performance on projects with  
**COMPARABLE NEGATIVE PRESSURE SYSTEM REQUIREMENTS FOR PATHOGEN CONTROL**

Installation and integration of  
**BACKUP POWER SYSTEMS FOR CRITICAL INFRASTRUCTURE**  
Our engineers analyze site conditions to recommend specific backup power solutions tailor made for unique client and/or site requirements.



PROJECT NAME/ LOCATION/CLIENT	PROJECT TYPE(S)	DATES	DESCRIPTION
<b>Backup Generator System Design and Installation, United States, Hensel Phelps</b>	Backup Power Systems for Critical Infrastructure	2018-2019	BV provided design and installation services for providing backup power to a multi-building data center complex. BV provided design engineering for specification of generator requirements integrated into each of the buildings power distribution centers, and installation of 20 generators with a total capacity of 80 megawatts (MW).
<b>Miramar Microgrid, California, USMC</b>	Backup Power Systems for Critical Infrastructure	Ongoing	BV is designing and constructing a microgrid at the Marine Corps Air Station Miramar in San Diego on an EPC (engineer, procure, and construct) basis. The microgrid is being designed to provide energy security for mission critical facilities. The microgrid will consist of 7 MW of diesel and natural gas fueled power generation, microgrid controls, energy management systems, and integration with renewable energy generation previously installed at the base such as landfill gas, solar PV, and energy storage systems.
<b>Off Grid Microgrid System, Overland Park, KS, World Headquarters Suncrate®</b>	Backup Power Systems for Critical Infrastructure	2018	BV completed the EPC of a temporary off grid microgrid system. The microgrid is based on a 20-foot shipping container that ships with all the equipment in it which can be assembled quickly. The Suncrate® Microgrid features 11.5kWdc of Solar Photovoltaic, 15 kWh of DC connected Battery Energy Storage, 15 kW of inverters, and an Electric Vehicle car charger.
<b>Microgrid Design, Buffalo, NY, Buffalo Niagara Medical Campus</b>	Comparable Negative Pressure System Requirements for Pathogen Control	2019	BV was retained to develop a detailed design and cost estimate for a community microgrid at the medical campus that comprises of several medical institutions and research centers. The core of the microgrid solution is a 7-15 MW CHP solution. BV will work with several stake holders on the campus to right size the CHP solution for the electrical modeling component of the CHP-Microgrid design. BV will also work with the stake holders to develop a business case model for a possible third-party ownership structure.
<b>University Of Texas Health System, Texas, CPS Energy</b>	Comparable Negative Pressure System Requirements for Pathogen Control	2008	CPS Energy retained BV to perform a feasibility study to evaluate CHP alternatives for the University Hospital System (UHS). The CHP plant would serve the hospital expansion utilities needs in lieu of a traditional central utilities plant (CUP). UHS is planning a Phase I Expansion to its hospital of 910,000 sq ft, followed by a Phase 2 consisting of an additional 214,000 sq ft. The CHP facility considered consisted of a solar mercury 50 combustion turbine and a heat recovery steam generator to provide the steam for heating and other uses at the hospital. All the steam produced by the heat recovery steam generator was to be used for heating and cooling of the hospital facilities.
<b>Superstorm Sandy Back Up Power at 700 Sites, New York, New Jersey, USACE</b>	Rapidly Respond with Adequate Capacity  Backup Power Systems for Critical Infrastructure	2012	In the aftermath of Superstorm Sandy, many companies accelerated their timelines to implement backup power for their towers. Black & Veatch was hired to provide site acquisition and engineering services for the installation of fixed generators in the challenging NY / NJ region. The work included conducting feasibility studies, site acquisition, and A&E design for 700 sites.

PROJECT NAME/ LOCATION/CLIENT	PROJECT TYPE(S)	DATES	DESCRIPTION
<b>Worldwide Contingency Operations, Defense Threat Reduction Agency</b>	Rapidly Respond with Adequate Capacity  Comparable Negative Pressure System Requirements for Pathogen Control	2019-present	BV is supporting DTRA by providing near-term support for contingency operations around the world. A base camp and two forward camps are at each location. The base camp will support 130 people and includes temporary structures for DFAC, sleeping areas, a laundry facility, toilet and shower facilities, one MWR structure, medical facility, and two command centers. The forward TCL will include office, break/eating structure, and toilets. The BV-led team is providing all logistical and construction services to include equipment, materials, consumables, services, transportation, security, AT/FP considerations and medical to support DTRA's operations at the contingency locations.
<b>Ethiopian Public Health Institute and National Reference Laboratory Design, Ethiopia, Defense Threat Reduction Agency</b>	Rapidly Respond with Adequate Capacity  Comparable Negative Pressure System Requirements for Pathogen Control	2014-2017	BV completed on time design of a 11,000 m2 (118,000 ft2) research building with BSL-3 containment and enhanced security to house the Ethiopian Public Health Institute (EPHI) National Reference Laboratories and serve as Ethiopia's center for national disease research and surveillance, epidemic investigation, training, referral testing, and quality assurance, equipped to accommodate the projected growth of the Institute, and sustainable within Ethiopian Government financial and technical capacities. The BSL-3 laboratory includes a negative pressure containment and enhanced security design features.
<b>Biological Threat Reduction Program (BTRP), Iraq Laboratory Renovations, Equipment and Training, Iraq, Defense Threat Reduction Agency</b>	Rapidly Respond with Adequate Capacity  Comparable Negative Pressure System Requirements for Pathogen Control	2018-present	BV is executing program activities to coordinate with other BTRP implementers engaging with Iraq. The program activities include performing laboratory assessments, designs, renovations, procuring and installing equipment, sustainment and training. BV executes complete designs for 20 laboratory renovations. Design packages include: design basis; calculations; drawings; specifications; cost estimates; sample flow design; quality, security and commissioning plans; and construction schedules. BV is implementing aggressive construction schedules which necessitate procurement of long lead items such as incinerators, autoclaves, shredders, and film arrays. BV is providing overall sustainment of the program through establishment of supply chains for sample test kits, supplies and consumables.
<b>European Deterrence Initiative, Contingency Logistics Staging Area, Norway, Milcon, Air Force</b>	Rapidly Respond with Adequate Capacity  Backup Power Systems for Critical Infrastructure	2016-present	BV is providing a 100% Design for a 550-person Beddown Site in that will be used by the U.S. Air Force during training, contingency, and war time scenarios. The Beddown Site includes temporary structures including 72 billets, 2 latrines, 2 shower facilities, 1 laundry facility, 4 command operations facilities, 3 morale welfare and recreation (MWRs) structures, one 550-person dining facility (DFAC), and HESCO barriers for perimeter security. The design includes site investigations/surveys, site improvements, grading, drainage, utility connections, security, and Antiterrorism/Force Protection considerations.
<b>Navy Facilities and Infrastructure Design, Romania, USACE Europe District</b>	Rapidly Respond with Adequate Capacity  Comparable Negative Pressure System Requirements for Pathogen Control  Backup Power Systems for Critical Infrastructure	2013-2016	BV provided engineering, supporting infrastructure and construction phase services for the Aegis Ashore Missile Defense Facility in Romania. The site design included commercial power upgrades and connection, backup power generation, power distribution, fuel distribution, fuel storage, wastewater lift station, permanent security fence, lighting, grounding, lightning protection, cathodic protection, communication systems, physical and electronic security, power control and monitoring systems, building automation systems, utility systems (communications, power, water and sewers), grading, drainage, roads, parking, sidewalks, pavements, permanent security fencing, landscaping, vertical expeditionary landing area, and foundations for multiple pieces of government furnished equipment. One of the five buildings included design and construction of a 2,640 ft2 Medical Facility.
<b>Data Center Air Permitting Assessments, Multiple Locations including United States, Europe and Asia, Confidential Client</b>	Backup Power Systems for Critical Infrastructure  Air Emissions Monitoring and Calculations	2018	BV conducted air permitting assessments for existing and potential data centers. The primary goal of these assessments was to determine the maximum capacity of emergency generation that could be installed at each site while staying below relevant permitting thresholds that would trigger additional requirements. Each location was analyzed individually and accompanied by a memorandum summarizing the existing air quality at the site location, an overview of the permitting process, additional location-specific considerations and results discussing the permitting and emission control requirements associated with buildouts of various magnitudes. The buildout results were displayed for multiple engine types including natural gas, uncontrolled diesel (Tier 2 diesel), and controlled diesel (Tier 4 diesel) from multiple engine manufacturers and models in the 2-3 MWe range. Where relevant permitting thresholds were identified, a dynamic spreadsheet tool was also provided such that the client could input various buildout scenarios and controls to see if the identified thresholds may be exceeded for each unique scenario.

# Black & Veatch Provides Innovative Integrated Disease Surveillance System & Pathogen Asset Control Systems Expertise

## ELECTRONIC INTEGRATED DISEASE SURVEILLANCE SYSTEM (EIDSS)

Black & Veatch developed the EIDSS under Biological Threat Reduction Program funded by the US Government. EIDSS provides a capability to collect, transmit and analyze information on infectious diseases throughout the country. EIDSS integrates epidemiological and laboratory information, and assists with decision making about outbreak response measures. EIDSS is the official disease surveillance system in three countries, and is being now used by Ministries of Health to collect and analyze COVID-19 epidemiological and laboratory data. Two more countries are rapidly rolling out the system to **support COVID-19 disease surveillance and response activities**. Black & Veatch is responsible for implementation and sustainment of EIDSS.

## PATHOGEN ASSET CONTROL SYSTEM (PACS)

Black & Veatch also developed the PACS under Biological Threat Reduction Program funded by the US Government. PACS is a software solution for accounting and management of biological samples in laboratories. PACS provides a reliable method of tracking sample information throughout its lifecycle. PACS is being used by over 50 laboratories in 20 countries. At least 8 of those organizations use PACS to capture laboratory information on COVID-19 samples. Black & Veatch is responsible for implementation and sustainment of PACS in all those laboratories.

## Why Black & Veatch

- 10,000+ employees worldwide, 6,717 US based employees with 69 offices in 31 states.
- Expertise in designing and constructing Bio-Security Level (BSL) -2, -3 and -4 laboratories with negative pressure ventilation systems supported by backup power supplies. Systems are designed to prevent pathogen contamination outside of control areas.
- Expertise designing and installing backup power systems for mission critical infrastructure.
- Experience and expertise with facility security engineering, hard barriers and other features for government civilian agencies and the military.
- Experience and expertise with portable potable water delivery system design and installation.
- Expertise in secure wired and wireless voice and data communications networks.
- Vast network of highly trained craft, superior management and quality subcontractors in every region of the country.
- Detailed design and switchgear upgrade expertise will improve power reliability for critical hospital and research electrical loads.
- Provide comprehensive physical and electronic security and access control systems design and construction.
- Structural analysis of roof loading for new/ additional HVAC equipment.
- Black & Veatch assists our clients with obtaining the necessary air permits by performing regulation review, calculating air emission estimates, and completing the necessary required application material.
- Fire protection engineering capability to perform assessments and provide designs for modification and upgrade.







# Services We Provide

## Telecom Solutions

BV is a vital partner to plan, design, and build the network, IT and transportation infrastructure essential to realizing our sustainable, resilient and connected future. From strategy through project execution, we deliver innovative solutions to build complex networks faster.

**50+**  
YEARS

**LEGACY**  
of utility  
telecommunications  
projects



**150k+**  
wireless sites



**40k+**  
miles of fiber  
networks



**1,000,000+**  
sq. ft. of mission  
critical facilities



**1,000+**  
high-power EV  
charging sites



DEPLOYED  
**100,000+**  
public safety RF  
communication  
sites

## Power Solutions

A global solutions provider with highly skilled professionals delivering planning, consulting, engineering, construction, program management and combined EPC solutions to meet our clients' rapidly changing infrastructure needs. We offer conventional, renewable, and distributed power generation, transmission and distribution, microgrids, and behind the meter services.



**700+**  
Distributed Energy  
Buildouts



**14,000+**  
projects delivered in  
the last two decades



**THOUSANDS  
OF MILES**  
of Transmission line  
projects from 69kV  
to 500kV



**14**  
first-of-a-kind OEM  
technology projects



**180 GW**  
of Conventional Power  
Generation deployed  
globally



**~60 GW**  
of Solar & Wind  
Renewable Energy  
deployed globally

## Water Solutions

BV Water offers global expertise across the diverse fields of water and wastewater specialties. Black & Veatch's water business provides leadership and works collaboratively in communities worldwide.



**PLANNING  
AND ASSET  
MANAGEMENT**



**FACILITIES**



**INFRASTRUCTURE  
SYSTEMS**



**HYDROPOWER**



**PMCM**



