



Montana Photonics & Quantum Alliance

Architecture and Engineering Services



Cushing
Terrell®



Our Story

Back in 1938, founders Cushing and Terrell believed integrating architecture, engineering, and design opened the doors for deepened relationships and enhanced creativity — and that hasn't changed. Generations of collaborative practice have proven the benefit of working shoulder-to-shoulder to yield broader viewpoints and better design solutions.

Our passion to forever improve is inherent. "The way it's always been done" isn't always the best way, which is why we implement programs that challenge us to perform above standards and beyond past successes. As a team, we

champion diversity, equity, and integrity in all forms — this means placing people at the center of our practice.

After all, our mission is to invent a better way of living. We find joy in uncovering imaginative solutions for the people who work here, the people we work for, and the planet as a whole. Our broad range of specialized service offerings and global project locations make every day unique, and a love for exploring new frontiers keeps our founders' pioneering spirit alive.



The buildings exceed all expectations. The feedback from [the team] was glowing, citing how amazingly inclusive the whole [design] process was, how individuals felt heard (and that their voice actually made a difference) and how proud they now are of their workplace.

Jessie [Woodyard] Simerlein

Business Partner to People Operations | Google

Imagine. Create. Improve.

*We believe integrated,
holistic design achieves
better results every time.*

Cushing Terrell

Integrated Design

Our Approach

As an integrated firm of architects, engineers, and designers, our mission is to use our expertise and creativity to serve our clients as a means to enlighten, sustain, delight, and forever improve to shape a brighter future for the world. Through a culture of openness, honesty, and trust, we at Cushing Terrell take collective responsibility for one another and our world. We recognize that our success begins with hiring talented employees and empowering them to exchange ideas, collaborate, and perform freely. Our approach to leadership is grounded in a servant-leadership model, as we support our project teams to ensure their triumph, ultimately leading to successful outcomes for our clients. By promoting an environment where our employees thrive, they are better equipped to fully dedicate themselves to understanding and realizing our clients' aspirations, making them a reality. Our unwavering commitment is to serve our clients with the care and attention we would expect if we were in their shoes.

Values

At Cushing Terrell, we believe that successful, holistic, integrated design requires more than just adhering to best professional practices - it is firmly grounded in our values. This includes:

Be kind. We emphasize integrity, compassion, and understanding, founded on the Golden Rule.

Work together. Diversity + collaboration = creative solutions.

Listen. Unique clients inspire unique projects — we're here to listen and learn.

Share success. We seek partnerships where the client, the community, the planet, and Cushing Terrell all win.

Think responsibly. We recognize that what is good for the earth is good for our clients.

Have fun. We take our work seriously, but not ourselves.



Our Offices

COLORADO	Denver
IDAHO	Boise Caldwell
LOUISIANA	New Orleans
MINNESOTA	Minneapolis
MONTANA	Billings Bozeman Great Falls Helena Kalispell Missoula
TEXAS	Austin
WASHINGTON	Seattle

By the Numbers

400+

team members

1.3B

annual construction volume

85

years in business

100+

green-certified projects since 2005

13

office locations

1

client-driven mission

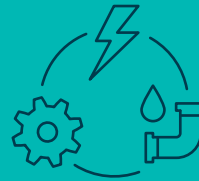
What We Do

To learn more, visit:
cushingterrell.com/services



DESIGN

ARCHITECTURE
BUILDING ENCLOSURE DESIGN
CONSTRUCTION ADMINISTRATION
GRAPHIC DESIGN AND WAYFINDING
HISTORIC PRESERVATION
INTERIOR DESIGN
LANDSCAPE ARCHITECTURE
LIGHTING DESIGN
URBAN PLANNING
VISUALIZATION



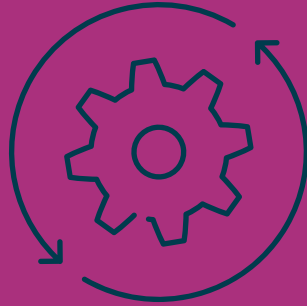
ENGINEERING

BUILDING COMMISSIONING
CIVIL ENGINEERING
ELECTRICAL ENGINEERING
ENERGY SOLUTIONS
FIRE PROTECTION
MECHANICAL ENGINEERING
MICROGRID DESIGN
PLUMBING DESIGN
REFRIGERATION ENGINEERING
STRUCTURAL ENGINEERING



SUSTAINABILITY

BUILDING PERFORMANCE
DECARBONIZATION
ENERGY SERVICES
ESG PROGRAM SUPPORT
GREEN BUILDING CERTIFICATIONS
HEALTH, WELLNESS, AND SOCIAL IMPACT



LAB & MANUFACTURING FACILITIES

Featured Projects



Lab & Manufacturing Design

Cushing Terrell understands the unique challenges and opportunities associated with designing and engineering manufacturing facilities, whether they are ground-up facilities, remodels, or retrofits. With extensive knowledge in this area, we create innovative and efficient solutions tailored to our clients' unique requirements. From site selection and equipment layout to building design, our holistic approach to design helps us achieve your goals.

We are experts in new facility design and can transform existing outdated facilities into modern, efficient production centers, identifying opportunities for improvement and designing solutions that maximize space utilization, streamline operations, and enhance overall productivity. We have the expertise to update equipment, optimize workflow, or reconfigure floor plans - unlocking the full potential of your existing manufacturing space.

At Cushing Terrell, we are committed to delivering quality manufacturing designs that maximize efficiency, minimize costs, and position our clients for long-term success.



FLIR, Research & Manufacturing Facility

BOZEMAN, MT

Cushing Terrell designed a 67,000 sq. ft. building for FLIR to set the standard for photonics companies throughout the region. Sustainable design principles were used, such as a closed-loop geothermal well system to cool the crystal growth stations. BIM-generated clash detection was used to coordinate complex mechanical, plumbing, and electrical systems during design, which improved on-site installation between subcontractors during construction. Additionally, Cushing Terrell developed work areas, labs, process rooms, and a clean room to meet ISO 6 standards.

The clean room was 4,500 sq. ft. and included 8 individual Class 4 Laser labs and ceiling diffusers with HEPA filtration. Additionally, three enclosed rooms for materials processing were designed to control airflow and particulates generated. Plumbing design and assistance on the reverse osmosis and de-ionized water systems, process water, industrial gas supply (nitrogen, oxygen, purified air, argon and carbon dioxide), and oil-free clean dry air was also provided. Cushing Terrell provided a range of services including architecture and interior design, civil, mechanical, electrical, and structural engineering, architectural landscaping, and land planning.



To learn more, visit:
cushingterrell.com/portfolio/flir





Ultima Genomics, Headquarters TI

FREMONT, CA

Cushing Terrell provided services to a growing genomic sequencing manufacturing and processing company to effectively divide operations across two buildings totaling 100,000 sq. ft. Our team provided architecture, programming, conceptual design services, civil, structural, mechanical, electrical and plumbing engineering, and landscape design. We explored different lab types and configurations for the new facility (listed below) to reflect the company's vision and provide all employees with a functional, healthy, and engaging workplace. This resulted in a sequencing production lab at the center of the main headquarters facility with floor-to-ceiling windows, showcasing the company's primary product in full function.

- Custom versus modular ISO Class 8 clean room systems
- Wet lab space, including chemistry labs and a Biosafety Level 2 (BSL-2) lab
- Consumable reagents manufacturing lab
- Dry labs for hardware and optics development, including Class 4 photonics
- High-performance computing (HPC) lab for data processing with cooling strategies and power distribution
- Manufacturing and assembly space for genomic amplifiers and sequencers
- Compressed Dry Air (CDA), nitrogen, and oxygen distribution
- Reverse Osmosis/Deionized Water (RO/DI) distribution





Micron Technology Campus

BOISE, ID

For over a decade, Cushing Terrell has been an integral part of the Micron Technology campus, contributing to several projects that showcase our expertise in design and engineering. Our collaboration with Micron has left a lasting impact on the campus, and we are proud to have played a crucial role in its evolution.

Our most recent new build is the south campus entry of Building 37, a new three-story office building that represented a significant achievement in design and sustainability. Our team surpassed LEED Certification goals, resulting in Micron's first LEED Certified building in Idaho.

Micron Technology Projects

- Mechanical Services, Building 25, 2 Chiller Installations
- Mechanical Services, Mask Main Lines
- Mechanical Services, Remodel Veeco /Wet Bay 108H
- Mechanical Services, Remodel DEV/ETCH Bay, Unaxis GENS
- Mechanical Services, B80 Install new Zeiss Merit E-Beam Repair Tool
- Mechanical Services, SpecTek -Training Remodel Rm 107D
- Mechanical Services, B80-Relocate Steag Cleaner
- Mechanical Services, Remodel Pellicle Room
- Mechanical Services, Remodel Fab Production Area
- Existing Clean Room Remodel
- Site 13 Office Remodel
- FAB 1D Bench Shop
- MTI Building Electrical Engineering Support
- New UPS ATS Scheme
- Bldg 4 Bulk Sulfuric
- Fab 1-D Hookup
- BLDG 24 LED R&D
- Building 27 Fitness & Wellness Center Remodel
- Building 36, Cafeteria Addition
- Building 37 Site Work, Utilities, & Superstructure
- Building 37, New 3-Story Office Building



Dell Technologies

ROUND ROCK & AUSTIN, TX

Cushing Terrell enjoys a longstanding and successful partnership with Dell, offering extensive design services for various projects worldwide. Our collaboration has encompassed numerous new buildings, renovations, and expansions, containing millions of square feet across all functional space types within Dell's facilities. These services have created diverse environments such as open office workspaces, manufacturing, warehousing, laboratories, executive offices, showcase/briefing spaces, training rooms, demonstration spaces, critical operational command centers, and data centers. Additionally, we have contributed to developing numerous corporate standard guidelines relating to branding, office planning, and green design standards.

- R&D Engineering Flex Lab
- Product Test Labs
- Data Center Expansions
- Data Center Security Upgrades
- R&D Engineering Global Lab Standards
- Electrical Infrastructure Upgrades
- Mechanical Chilled Water Infrastructure Upgrades
- Rack-n-Stack Manufacturing
- High-Performance Computing Labs
- Executive Briefing Center
- Customer Solutions Center
- Smart Building Systems Standards
- Workplace Strategy Campus Restack
- Loading Dock Expansion
- Global Sustainability Standards
- Global Facilities Standards



Data Center Design

In sustainable data center design, Cushing Terrell stands at the forefront, offering innovative solutions to tackle the pressing challenge of decarbonization. Our team understands the importance of reducing environmental impact and prioritizes strategies to minimize embodied carbon, decrease energy consumption, and mitigate end-of-life carbon footprint.

Cushing Terrell recognizes the importance of understanding and addressing carbon emissions across all scopes. Through our expertise, we guide data center owners in navigating the complexities of Scope 1, 2, and 3 emissions, ensuring a comprehensive strategy for carbon reduction. Rather than merely aiming for certifications, we advocate for a holistic, performance-based approach tailored to each client's unique goals, ultimately striving for Net Zero outcomes through a combination of carbon offsetting and energy efficiency measures.

In our pursuit of sustainable excellence, Cushing Terrell integrates cutting-edge strategies into our data center designs. Every decision is made with sustainability in mind, from site selection considerations that prioritize renewable energy access to the detailed selection of low-carbon materials. Our innovative structural, electrical, and mechanical systems further underscore our commitment to reducing carbon footprint while ensuring optimal performance. With Cushing Terrell's expertise, data centers can operate efficiently, sustainably, and in harmony with the environment, setting new standards for the industry.

Data Center Experience

North America

Bresnan Communications

Billings, MT | Tier II

Community Medical Center

Missoula, MT | Tier I

DELL Aliso Viejo, CA | Tier II

DELL Edmonton - Alberta, Canada | Tier III

DELL Herndon, VA | Tier II

DELL McGregor, TX | Tier II

DELL Nashua, NH | Tier II

DELL Oklahoma City, OK | Tier III

DELL Ottawa - Ontario, Canada | Tier III

DELL Phoenix, AZ | Tier II

DELL Plano, TX | Tier II

DELL Roseburg, OR | Tier II

DELL Round Rock, TX | Modular

DELL San Jose, CA | Tier II

DELL Tempe, AZ | Tier II

DELL Toronto - Ontario, Canada | Tier II

DELL Twin Falls, ID | Tier II

DELL Wallingford, CT | Tier II

Flathead County 911

Kalispell, MT | Tier III

Green House Data*

Cheyenne, WY | Tier III

Humboldt County 911

Winnemucca, NV | Tier I

Langley Air Force Base*

Hampton, VA | Tier II

Missoula Federal Credit Union

Missoula, MT | Tier I

Montana Opticom

Four Corners, MT | Tier II

NIFC

Boise, ID | Tier II

Ptolemy Data Systems*

Sheridan, WY | Tier I

Ravalli County 911

Hamilton, MT | Tier II

Ritter Communications

Jonesboro, AR | Tier II

St. Joseph Regional Medical Center

Lewiston, ID | Tier I

TeleTech

Kalispell, MT | Tier II

University of Montana

Missoula, MT | Tier II

University of Wyoming - Emerson Building*

Cheyenne, WY | Tier I

University of Wyoming - Hershler Building*

Cheyenne, WY | Tier I

Washington Corporation

Missoula, MT | Tier I

Yellowstone County 911

Billings, MT | Tier II

Asia Pacific

DELL Pasay, Philippines | Tier III

DELL Quezon City, Philippines | Tier II

Central America

DELL Confidential & Location | Tier IV

DELL Panama City, Panama | Tier II

DELL San Salvador, El Salvador | Tier III

Europe

DELL Bratislava, Slovakia | Tier III

DELL Halle, Germany | Tier III

DELL Warsaw, Poland | Tier III

North Africa

DELL Casablanca, Morocco | Tier III

South Asia

DELL Bangalore, India | Tier III

DELL Chennai, India | Tier IV

Collation Data Center

Confidential Client

Santa Clara, CA | Tier IV

DELL Top Hat Seattle, WA | Tier IV

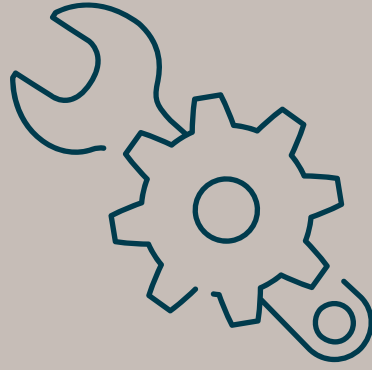
High-Density Server Labs

DELL Force 10 Site San Jose, CA

DELL Santa Clara, CA

DELL Nashua, NH

**Same Cushing Terrell team with prior company*



INDUSTRIAL FACILITIES

Featured Projects



Industrial Facility Design

We Know Industrial

Consumer behaviors drive industrial development, and Cushing Terrell's team of architects and engineers specialize in the industrial market. With a deep understanding of the supply chain, our team is able to develop pioneering solutions for our clients. We strive to create efficient designs that improve the efficiency of product handling from manufacturing to consumption. Our team actively listens to and interacts with our clients to ensure innovative and proven outcomes, keeping Cushing Terrell at the forefront of architecture and engineering design for industrial facilities.

Cushing Terrell understands that successful industrial development requires a balance of form and function to optimize productivity, safety, and efficiency. Our extensive knowledge and experience enable us to create innovative solutions that meet our clients' specific needs. We stay ahead of emerging technologies, designing spaces that can accommodate automation and robotics to enhance operations and keep businesses competitive in a rapidly changing market. Whether it's warehousing, distribution centers, or manufacturing, our industrial knowledge and process-oriented design approach help clients turn their visions into dynamic, innovative developments that empower businesses to thrive and grow.

To learn more, visit:
[cushingterrell.com/markets/
commercial/industrial-design](https://cushingterrell.com/markets/commercial/industrial-design)





Industrial Park Planning

Cushing Terrell is committed to creating long-term, sustainable growth for communities through their approach to industrial park planning. By taking a holistic view of the entire ecosystem, Cushing Terrell considers the needs of the businesses and the community, planning for both short-term and long-term growth. Through smart investment in infrastructure and efficient design, Cushing Terrell creates sustainable industrial parks that foster innovation, safety, and resilience, providing a foundation for communities to thrive now and into the future.

Warehouse Design

Cushing Terrell provides tailored solutions to meet your specific warehouse design needs. From layout planning to equipment selection, our experts can help streamline processes, enhance automation, and achieve maximum ROI. We look to create a fully-integrated, future-proof warehouse that meets the demands of tomorrow. Our creative approach helps you overcome even the most challenging design obstacles, creating a functional and aesthetically pleasing space.



Scentsy Campus Planning

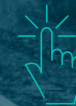
MERIDIAN, ID

Cushing Terrell has worked with Scentsy, Inc. for more than 13 years to develop their corporate campus along Eagle Road in Meridian, Idaho. The 70-acre campus features ten buildings, which house Scentsy's corporate offices, processing facilities, distribution centers, warehouses, and a park setting for community and corporate events. Cushing Terrell provided architectural, interior design, landscape architecture, structural, mechanical, electrical, and fire protection engineering for all of the buildings. Each building is designed to be flexible and adaptable to Scentsy's changing needs. The office building received four Green Globes, while the distribution center received three, and all other buildings were designed to the same sustainable standards. Cushing Terrell has collaborated with the client and the contractor, Engineered Structures, Inc., throughout the design and construction of the campus.



To learn more, visit:

cushingterrell.com/portfolio/scentsy-commons





Distribution Center Design

Cushing Terrell understands the critical importance of distribution centers in today's global economy. Our team has extensive knowledge in designing facilities that optimize space utilization, streamline operations, and enhance overall productivity. We combine our design expertise with an in-depth understanding of site design to create distribution centers that maximize accessibility, reduce transportation costs, and improve overall supply chain efficiency.

Staying ahead of technological advances in automation, robotics, and other emerging technologies, we provide our clients with the most innovative and efficient solutions for their distribution center needs. We are committed to future planning and designing for the long term, understanding the importance of creating facilities that are flexible and adaptable to future business needs. For this reason, we work closely with our clients to understand their long-term goals and design facilities that can be easily adapted to their evolving needs. We are dedicated to delivering top-quality distribution center solutions that maximize efficiency, minimize costs, and position our clients for long-term success.



UPS, Parcel Distribution Center

BOZEMAN, MT

Cushing Terrell worked with UPS to deliver a new 35,100 sq. ft. parcel distribution facility in Bozeman, Montana. This facility was one of the first to begin design and construction within the Nelson Meadows commercial subdivision. The project was created to respond to the Bozeman community and local landscape, merging the critical need for shipping goods and consolidating two existing UPS operation locations in Bozeman, which had exceeded their operating capacity since the start of the COVID-19 pandemic.

The facility was designed to include a package distribution area for employees to unload trailers and sort packages for local delivery, a customer counter for package pickup and point of sale, an automotive shop for vehicle inspections and minor repair or maintenance tasks, and an employee office area including bathrooms and locker rooms. To ensure efficiency and safety, the site design also considered truck and package delivery vehicle maneuverability and staging on the project site while meeting the landscape and screening expectations of the City of Bozeman and the Nelson Meadows development. Cushing Terrell provided full architecture, civil, structural, mechanical, structural, and electrical engineering, land surveying, and landscape architecture services.



Innovation

Data Centers of the Future

- Site Selection
- DR Strategies
- Speed to Market
- Carbon Reduction
- Workplace Experience
- Omniverse | Metaverse | Digital Twins
- Direct-to-Chip Cooling
- Renewable, Onsite Power Generation
- Green Data Centers

BOYD

CoolIT
systems™





SUSTAINABILITY

Featured Projects

“Our vision for sustainable design is a balance between the built and natural environments that will provide a healthy future for our clients, colleagues, and communities. Our mission is to contribute to this balance by making sustainability a foundation of our design and business operations.”

To learn more, visit:
cushingterrell.com/sustainability



Sustainability

At Cushing Terrell we wholeheartedly accept our responsibility and leadership role to advance sustainable design and building practices. Cushing Terrell is an active national member company of the U.S. Green Building Council, participates in local USGBC chapters in multiple states, and is a proud signatory of the AIA 2030 Commitment to achieve carbon-neutral buildings by the year 2030. Cushing Terrell has over 40 LEED-accredited professionals and roughly 20 Living Futures Accredited, Well Building, and Green Globe Professionals across multiple disciplines, contributing to the certification of over 100 buildings within the firm.

Our in-house engineering and expertise allows Cushing Terrell to offer, as part of our basic services, building simulation modeling in evaluating design decisions and energy performance benchmarking. With our integrated team, extensive experience, and proprietary resources, we are excited for the opportunity to have these conversations with you to create opportunities for efficiency, savings, environmental stewardship, and certification.

Taking Responsibility

ACOUSTIC DESIGN STRATEGIES
BIOPHILIC DESIGN
BUILDING COMMISSIONING
BUILDING ENCLOSURE CONSULTING
BUILDING PERFORMANCE ANALYSIS
ENERGY SERVICES
HAZARD ASSESSMENT AND MITIGATION
HEALTHY INDOOR AIR STRATEGIES
HEALTHY MATERIAL SELECTIONS
NET-ZERO / HIGH-PERFORMANCE DESIGN
POST OCCUPANCY EVALUATIONS
SENSITIVE SITE DESIGN
THIRD-PARTY BUILDING CERTIFICATION
UTILITY INCENTIVES AND ENERGY AUDITS

Proud signatory of the
AIA 2030 Commitment to
achieve carbon-neutral
buildings by the year 2030.





Montana Tech Natural Resources Research Center

BUTTE, MT

Cushing Terrell designed the new Natural Resources Research Center at Montana Tech, featuring a petroleum research lab, concrete strengths lab, wood stress research area, fluids lab, nanotechnologies suite, safety training center, and project shop. The addition promotes cross-disciplinary collaboration and social interaction, connecting existing and outdoor spaces while enhancing accessibility and sustainability. We completed the project on time and budget, earning three Green Globes.

To learn more, visit:

cushingterrell.com/portfolio/montana-tech-natural-resources-research-center





University of Montana Champions Center

MISSOULA, MT

Cushing Terrell provided full design services for the new University of Montana Washington-Grizzly Champions Center, a synthesis of education and athletic-related activity groups. Focused on providing space for both the present and the future, this 52,000 sq. ft. facility combines a weight room, nutrition station, sprint track, and cardiovascular training with a group of classrooms intended to serve both athletics and the University's student population. A large team room anchors the main level, and the facility accommodates access to the existing Adams Center Gymnasium, the main plaza, and the stadium concourse.

Energy modeling for this project focused on large amounts of fresh air, domestic hot water demands in the building, and significant variations in occupants based on stadium use and the athletic program schedules. Additionally, this project had access to a campus steam system and shallow water table for groundwater cooling systems, which the team could incorporate; the challenge was designing how to tie it all together effectively and efficiently.

To learn more, visit:

cushingterrell.com/portfolio/university-of-montana-washington-grizzly-champions-center





FLIR, Research & Manufacturing Facility

BOZEMAN, MT

Sustainability Features

Teledyne FLIR's building program required installing up to 30 crystal growth stations for their photonics manufacturing process. Each growth station utilizes around 4000 degrees Fahrenheit of electric heat for crystal growth and closed-loop water for cooling. Heat exchangers were implemented throughout the mechanical system to manage the high temperatures.

An open-loop geothermal system was incorporated into the heat exchange process, working in conjunction with a water-cooled chiller to reduce the temperature of the growth station's cooling water. Heat exchangers were also utilized to heat lab process water and provide heat to the building's variable air volume HVAC system.

Given the significant electricity demand and the paramount need for 'clean power,' an advanced battery system was carefully designed. This system acts as a robust filter for incoming electricity from the utility company, ensuring a secure and stable power supply. Moreover, this setup was engineered for the seamless integration of future photo-voltaic cells on the building's roof, enhancing the reliability and sustainability of our power source.



To learn more, visit:
cushingterrell.com/portfolio/flir





ELECTRICAL ENGINEERING

Featured Projects

Electrical Engineering

To learn more, visit:
cushingterrell.com/services/electrical-engineering



High Performance Power Inside and Out

Powering the built environment, electrical design, and engineering require careful coordination and integration of intricate systems. Our team's expertise spans from the initial planning stages to the final commissioning of installations, ensuring seamless operation.

Backed by years of experience, we employ thorough research and observation to guide our process. We consider factors such as facility planning, operation, maintenance requirements, and long-term master planning to deliver effective solutions.

Client satisfaction is our top priority, and we aim to create innovative, durable, and cost-efficient designs. Cushing Terrell has gained a reputation as a leading industry expert and a trusted advisor to many facility managers, maintaining strong relationships long after project completion.

Lighting Design

Great lighting design subtly enhances the built environment with elegance and illumination. We tailor every design to timelessly fit the unique needs of a space, but always emphasize performance, efficiency, and comfort.

Power Distribution

Electrical infrastructure is the beating heart of a building. Our engineers design reliable, size-appropriate power distribution systems for a wide variety of facility types. We work with medium- and low-voltage power distribution systems, and are well-versed in arc flash and coordination studies.

Mission-Critical Facilities

Our diverse, global project portfolio includes 911 centers, data centers, and other mission-critical buildings, including some of the largest data centers in the United States. Our team develops efficient, cost-effective power distribution and cooling systems for these high-density facilities.

Power Generation and Alternative Energy Systems

Keeping power supplied to your facility in the midst of outages is critical. To ensure you're "always on," we're equipped to design and deploy emergency and standby power systems, UPS systems, and micro grids. We understand the intricacies of alternative energy sources and have experience implementing CHP and CCHP, solar PV, micro hydro power generation, and micro turbine systems. These systems, when properly configured, provide grid resiliency to protect your facility in the event of extended outages.

Information Technology and Low-Voltage Systems

Today's smart buildings require connectivity to a wide variety of systems supported by high-speed data networks, and our team is well-versed in all necessary technologies. Our low-voltage experience includes LAN and WAN networks, GPON, and fire alarms, plus access control, CCTV, and many other systems.



Horn Rapids Solar, Storage & Training Project

RICHLAND, WA

The Horn Rapids Solar, Storage, and Training Project is one of Washington state's first utility-scale solar and storage projects. It will allow the state to integrate another clean energy source into its existing generation profile of hydro, nuclear, and wind. The City of Richland will purchase the energy generated by this site to help it continue to provide clean energy to its customers.

Cushing Terrell's scope for this project included:

- Photovoltaic (PV) Production Calculations
- PV Racking Design
- PV String Design
- Electrical Distribution Design (DC, 480 V AC, 12.47 KV AC)

The site will also provide opportunities for utility workers to train on the battery energy storage system (BESS) and PV systems. This training plan will cover plant construction, maintenance, operations, and safety.

System Information

- Annual generation: 5,853 MWh
- 3.25 MW (ac) PV array
- 1 MW/4 MWh BESS

To learn more, visit:

cushingterrell.com/portfolio/horn-rapids-solar-storage-and-training-project



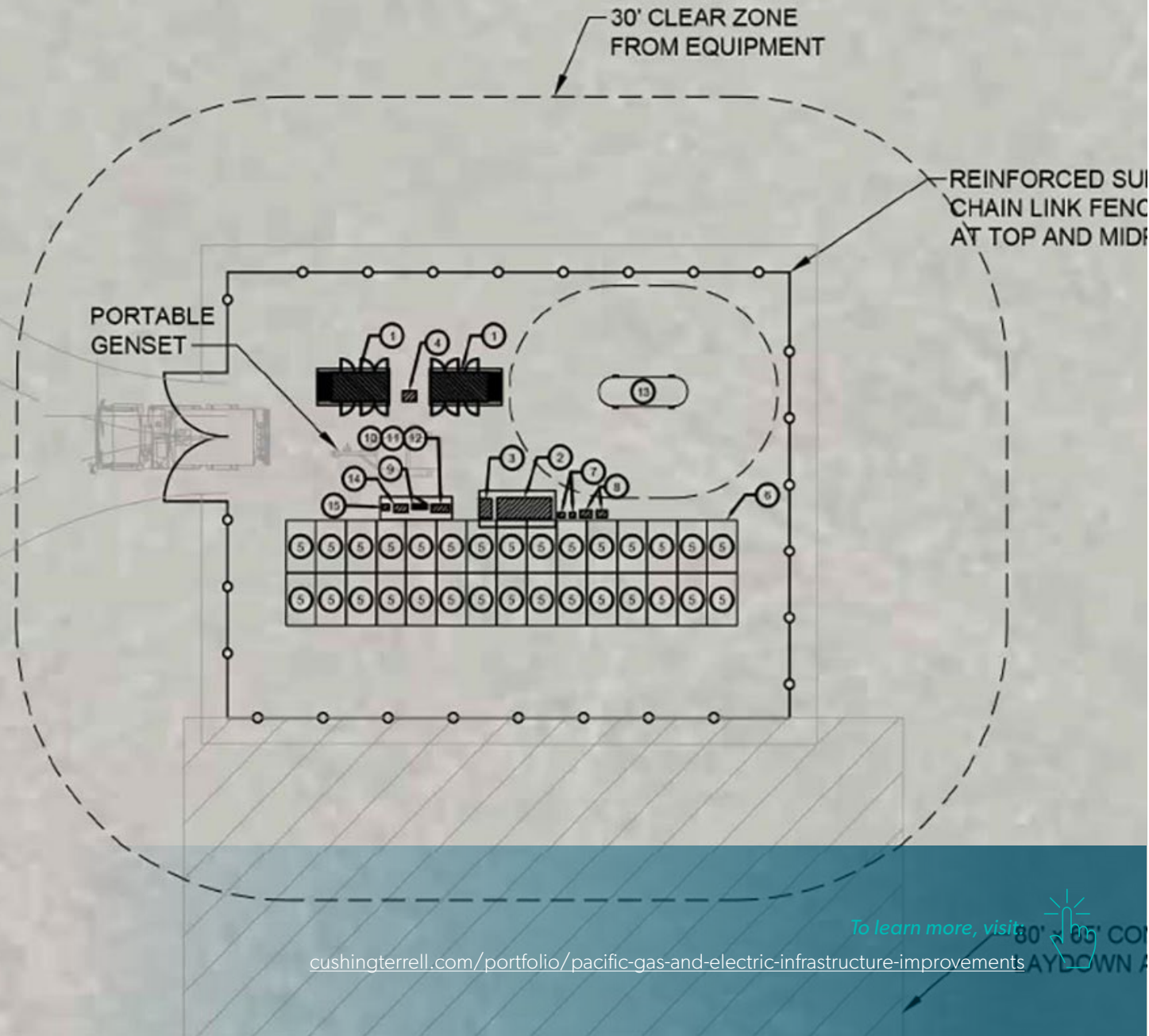
Pacific Gas and Electric Infrastructure Improvements

VARIOUS LOCATIONS, CA

As part of Pacific Gas and Electric's infrastructure improvements and wildfire mitigation plan, the utility is working with Cushing Terrell to install new microgrid facilities at remote sites throughout its service area. Each site features a standalone photovoltaic (PV) array, battery energy storage system, and backup propane generator to ensure resilience and reliability.

The microgrid systems will enable the removal of overhead distribution lines for these sites, reducing the risk of wildfires. Additionally, they will provide a minimum of a 75% renewable energy fraction at year 10, meaning that 75% of the energy consumed each year comes from the PV systems.

The microgrid system sizing, design, and energy modeling were all performed by Cushing Terrell's Infrastructure Group.



To learn more, visit:

cushingterrell.com/portfolio/pacific-gas-and-electric-infrastructure-improvements



ENERGY SERVICES

Featured Projects



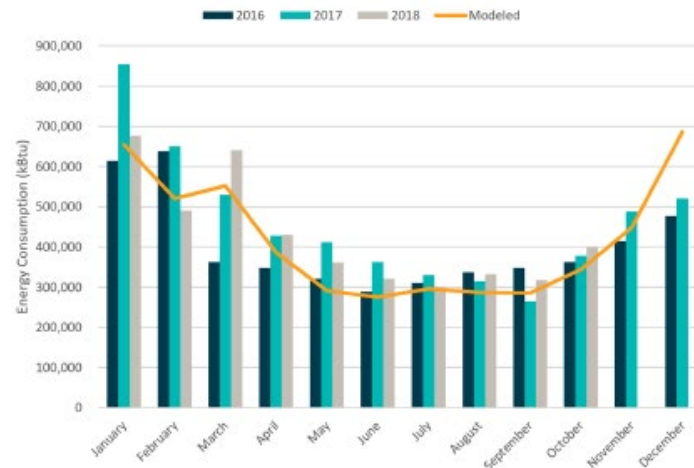
Energy Services

Energy Solutions That Make Sense

Efficient, reliable, sustainable, and cost-effective drive our Energy Services team's decisions about energy systems in our designed buildings. They work closely with clients to analyze energy-use scenarios and develop strategies to reduce consumption, cut costs, and increase the reliability and efficiency of building energy systems.

Our team is passionate and knowledgeable, and they focus on long-term performance by integrating energy-use strategies into projects from the conceptual design phase through implementation and operation. Our energy services include:

- Microgrids
- Advanced building energy modeling
- Energy use benchmarking and Energy Star certification
- Computational Fluid Dynamics
- Utility incentive coordination and energy audits
- Energy measurement and verification
- Building performance analysis
- Distributed energy systems feasibility and design
- Combined heat and power



To learn more, visit:

cushingterrell.com/services/energy-services





Montana State University Romney Hall

BOZEMAN, MT

The increase in student population at Montana State University (MSU) has created a demand for more classroom seats on campus. Cushing Terrell was instrumental in designing the renovation of the historic Romney Gymnasium, transforming it into a modern learning environment with over 1,000 classroom seats, learning spaces, and administrative offices. Working closely with MSU and the State of Montana, we successfully blended state-of-the-art design, functionality, and technology while preserving the historical features of the building.

Our initial goal for the project was to achieve LEED Silver certification, but we set our sights higher, aiming for LEED Gold. This ambitious goal guided our design choices, with a strong focus on energy efficiency. The building's HVAC systems were carefully chosen to align with MSU's long-term energy strategy. Romney Hall is part of the South Campus Energy District, a connection that extends to the future Wellness Center. The building's ventilation system is a testament to our commitment to sustainability, utilizing a solar transpired collector for pre-heating air, a heat-recovery air handler, and demand-control ventilation in classrooms to maximize energy savings. Furthermore, distributed water source heat pumps are used to heat and cool the interior spaces of the building, further reducing our environmental footprint.



To learn more, visit:
cushingterrell.com/portfolio/montana-state-university-romney-hall-adaptive-reuse





Lamar Buffalo Ranch Zero Emissions Power System

YELLOWSTONE NATIONAL PARK, WY

Lamar Buffalo Ranch, a remote site 100% off-grid in Yellowstone National Park, previously relied on a small photovoltaic (PV) array and two propane-fired generators for power. The existing generators operated about 1,000 hours yearly, consuming 6,500 gallons of fuel to address power consumption of about 28,000 kWh annually.

Cushing Terrell designed and implemented a new micro-hydroelectric turbine, configured the electrical integration and designed the architectural buildings housing this first-of-its-kind, off-grid power system, completely replacing the existing setup. The system integrated PV array, battery storage, inverter/rectifier, backup generator, energy monitoring system, and a 4.5 kW micro-hydro turbine. The new system produces more power than needed and allows propane loads to be run on electricity. Similar systems have been implemented in Mammoth Hot Springs and Whitefish, MT, showcasing the effectiveness of off-grid energy solutions.

To learn more, visit:

cushingterrell.com/portfolio/lamar-buffalo-ranch-zero-emissions-power-system



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thank you.

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