



COMMISSIONING | CERTIFICATIONS | MANAGEMENT

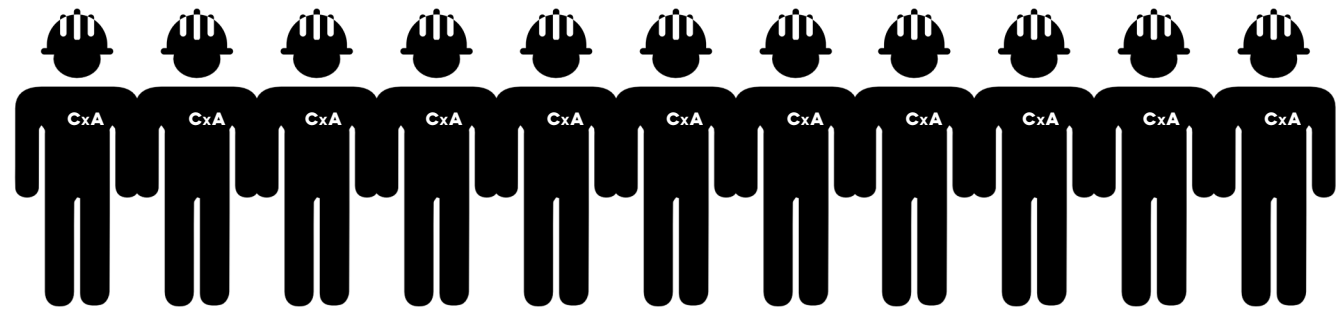
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GMC Cx - AT A **GLANCE**



100%

FULL-TIME, DEDICATED
COMMISSIONING STAFF

LARGEST DEDICATED COMMISSIONING FIRM IN CALIFORNIA

FULL SERVICE



- ✓ MECHANICAL
- ✓ ELECTRICAL
- ✓ PLUMBING
- ✓ CONTROLS
- ✓ PROCESS
- ✓ ENVELOPE
- ✓ FIRE PROTECTION
- ✓ FIRE ALARM
- ✓ LIGHTING
- ✓ IR SCANNING
- ✓ FUME HOOD CERTIFICATION
- ✓ DUE DILIGENCE & ASSESSMENT
- ✓ DESIGN REVIEWS
- ✓ SOPs
- ✓ INDOOR AIR QUALITY
- ✓ ENERGY MODELING
- ✓ LOAD BANKING
- ✓ AUDITS

- ❖ REGISTERED PROFESSIONAL ENGINEERS
- ❖ CERTIFIED COMMISSIONING AGENTS
- ❖ CERTIFIED ENERGY MANAGERS
- ❖ LEED ACCREDITED PROFESSIONALS
- ❖ BUSINESS CONTINUITY PROFESSIONALS
- ❖ CERTIFIED M&V PROFESSIONALS

CERTIFIED



100% INDEPENDENT

GMC CX IS A FULLY INDEPENDENT
COMMISSIONING PROVIDER AND A TRUE
THIRD-PARTY, OWNER-OPERATED FIRM



LIFE SCIENCE
TECHNOLOGY
HEALTHCARE
DATA CENTER
PHARMACEUTICAL
HIGHER EDUCATION

MARKETS



175

PROJECTS
DELIVERED

10M

SQ. FT.
CX'ED

\$4B

PROJECTS
BUDGETS

COAST TO COAST COVERAGE



2

STAFFED
OFFICES

Why Commission?

Poor quality is expensive - save your time and money. Commissioning is proven to reduce risk, improve performance and have positive payback.

Why GMC Commissioning?

Because quality counts. We are your trusted, independent partner with dedicated experts who provide clear communication, superior service, and attention to detail.

Why Now?

Small errors now become big problems later. Building systems are increasingly complex and speed to market is critical today more than ever.

“Few people today would consider producing a product without a formal quality control process. Yet, buildings are built without systematic quality control procedures and are turned over with undetected deficiencies resulting in key systems failing to function as intended.” -ASHRAE

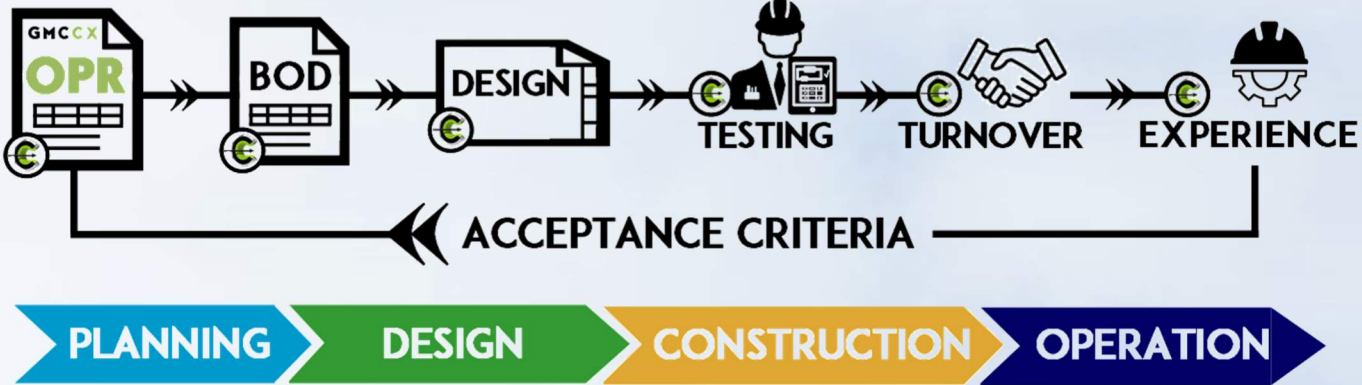
Bringing hands-on experience to the forefront of facility planning, design and construction.

GET WHAT YOU EXPECT

Calibrated Commissioning® is our trademark process of managing project quality from the onset and aligning our commissioning efforts with the owner's expectations.

GET QUALITY

We leverage operational expertise and first-hand knowledge to make sure your systems work, day one and day one hundred.





WHAT

WE

DO

- ❖ NEW CONSTRUCTION COMMISSIONING
- ❖ EXISTING BUILDING COMMISSIONING
- ❖ COMMISSIONING MANAGEMENT
- ❖ SPECIALTY SERVICES
- ❖ LAB SERVICES

COMMISSIONING AND QUALIFICATION

Quality is everything. We help clients meet the demands of global cGMP regulations.

- ✓ C&Q PLAN
- ✓ ASTM E2500
- ✓ URS
- ✓ IMPACT ASSESSMENT
- ✓ SAT/FAT PLANNING
- ✓ IQ/OQ/PQ
- ✓ Cx PROTOCOLS
- ✓ GDP
- ✓ SOP
- ✓ AUTOMATION



ENERGY CODE

We take on the responsibility of Cx code compliance activities and deliverables compliant with all state and local energy codes.

- ✓ TITLE 24
- ✓ CALGREEN
- ✓ ASHRAE 90.1
- ✓ IECC / IGCC
- ✓ Cx PLAN
- ✓ DESIGN REVIEW
- ✓ NRCC CXR FORMS
- ✓ PFC/FPT/IST
- ✓ SYSTEMS MANUAL
- ✓ FINAL Cx REPORT



MISSION CRITICAL

Our team has extensive experience designing, commissioning, and operating data centers and other mission critical spaces.

- ✓ PEER REVIEW
- ✓ RISK ASSESSMENTS
- ✓ LEVEL 1 - FAT
- ✓ LEVEL 2 - SAT
- ✓ LEVEL 3 - PFC
- ✓ LEVEL 4 - FPT
- ✓ LEVEL 5 - IST
- ✓ LOAD BANK PLAN
- ✓ SYSTEMS MANUAL
- ✓ FINAL Cx REPORT



HEALTHCARE

We help your health care organization achieve its envisioned return on investment in facilities and equipment.

- ✓ HFCX
- ✓ ASHE
- ✓ OSHPD-1
- ✓ OSHPD-2
- ✓ OSHPD-3
- ✓ Cx PLAN
- ✓ DESIGN REVIEW
- ✓ PFC/FPT/IST
- ✓ SYSTEMS MANUAL
- ✓ FINAL Cx REPORT



LEED FUNDAMENTAL & ENHANCED

GMC Cx provides LEEDv4.1 compliant commissioning for all categories of the LEED Professional Program.

- ✓ LEED PLATINUM
- ✓ IAQ
- ✓ ENVELOPE Cx
- ✓ MBCx
- ✓ Cx PLAN
- ✓ DESIGN REVIEW
- ✓ NRCC CXR FORMS
- ✓ PFC/FPT/IST
- ✓ SYSTEMS MANUAL
- ✓ FINAL Cx REPORT



COMMISSIONING & QUALIFICATION

GMP SUPPORT

Integrated Commissioning and Qualification (C&Q) is a powerful verification process. Validated processes in sectors such as food, manufacturing, pharmaceutical, and bio-tech rely on a thorough C&Q effort to ensure equipment and systems are designed, installed, started-up, and operated per owner requirements, codes, and regulations.



SERVICES

- Commissioning and Qualification Plans
- Impact Assessments
- User Requirements Specifications (URS)
- Site Acceptance Testing (SAT)
- Factory Acceptance Testing (FAT)
- cGMP Protocol Development and Execution
 - Installation Verification (IV)
 - Functional Performance Testing (FPT)
 - Installation Qualification (IQ)
 - Operational Qualification (OQ)
 - Performance Qualification (PQ)
- Good Documentation Practices (GDP)
- Standard Operating Procedures (SOP)
- Calibration and Asset Induction
- Issue Tracking and Resolution
- Leverageable Test Protocol

IN HOUSE SMEs FOR ALL SYSTEMS

- Process Chilled Water
- Clean Compressed Air
- Vacuum
- Hazardous Chemical Systems
- Solvent Delivery
- Liquid Nitrogen
- CO₂, O₂, N₂
- Clean Rooms
- Cold Rooms
- Freezer Rooms
- Waste Neutralization
- Carbon Capture
- BIBO
- Purified Water & RODI
- WFI
- BMS, EMS
- Parts Washer
- Fume Hoods



ENERGY CODE COMMISSIONING

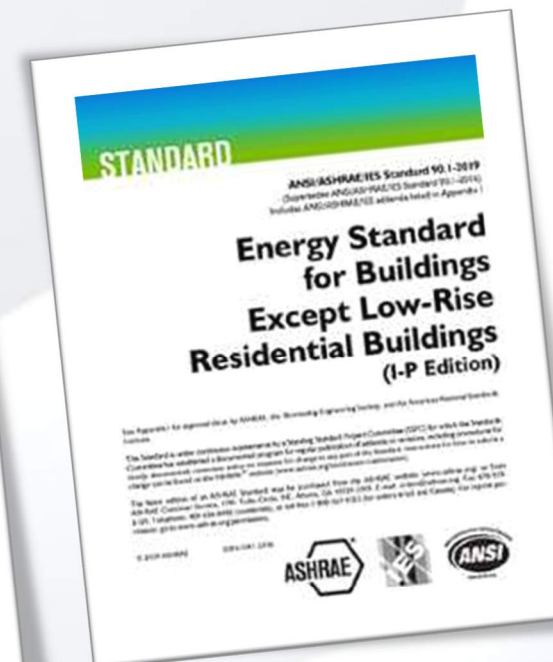
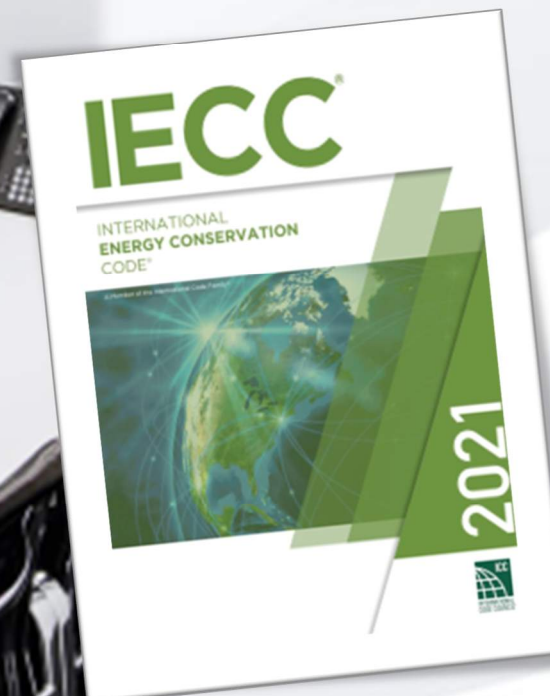
Energy Codes are enforced in 39 out of the 50 US states. One of the most stringent energy codes in California's Title 24 Part 6 (California Energy Code) and Part 11 (CALGreen).

Typical systems included in Energy Code commissioning are Heating, Ventilating and Air Conditioning systems and Controls, Indoor Lighting Systems and Controls, Water Heating Systems and Controls, and renewable energy systems

Our simplified commissioning process will minimize the work required by your architect, engineers and contractors.

STATES WITH STRINGENT ENERGY CODES

▪ California ▪ Washington ▪ Oregon ▪ Texas ▪ Florida ▪ Nevada



MISSION CRITICAL COMMISSIONING

Uptime of mission critical data centers is essential to business continuity. Our team has extensive experience designing, commissioning, and operating mission critical spaces. GMC Cx provides reliable, safe and compliant commissioning services.

With mission critical experienced engineers in every discipline, GMC Cx thrives on closely engaging with our clients to solve even the most challenging requirements.



LEVEL 1: FACTORY WITNESS TESTING

Factory witness testing ensures that new equipment is performing to the requirements of the engineer, client and industry standards before leaving the factory.

LEVEL 2: SITE ACCEPTANCE INSPECTION

Once the equipment is on site, it is inspected by the commissioning agent. This is to ensure that the equipment brought to the site meets the client's specifications before it enters the facility.

LEVEL 3: PRE-FUNCTIONAL TESTING (PFT)

The commissioning agent determines if the equipment was installed correctly and complies with contract documents, industry requirements and regulations.

LEVEL 4: FUNCTIONAL PERFORMANCE TESTING (FPT)

Functional testing of equipment ensures operation as designed and intended including verification of fault and safety systems.

LEVEL 5: INTEGRATED SYSTEMS TESTING (IST)

The final tests that include all systems working together as designed. This includes a blackout (pull-the-plug test) as well as integration of fire-life safety and backup systems.

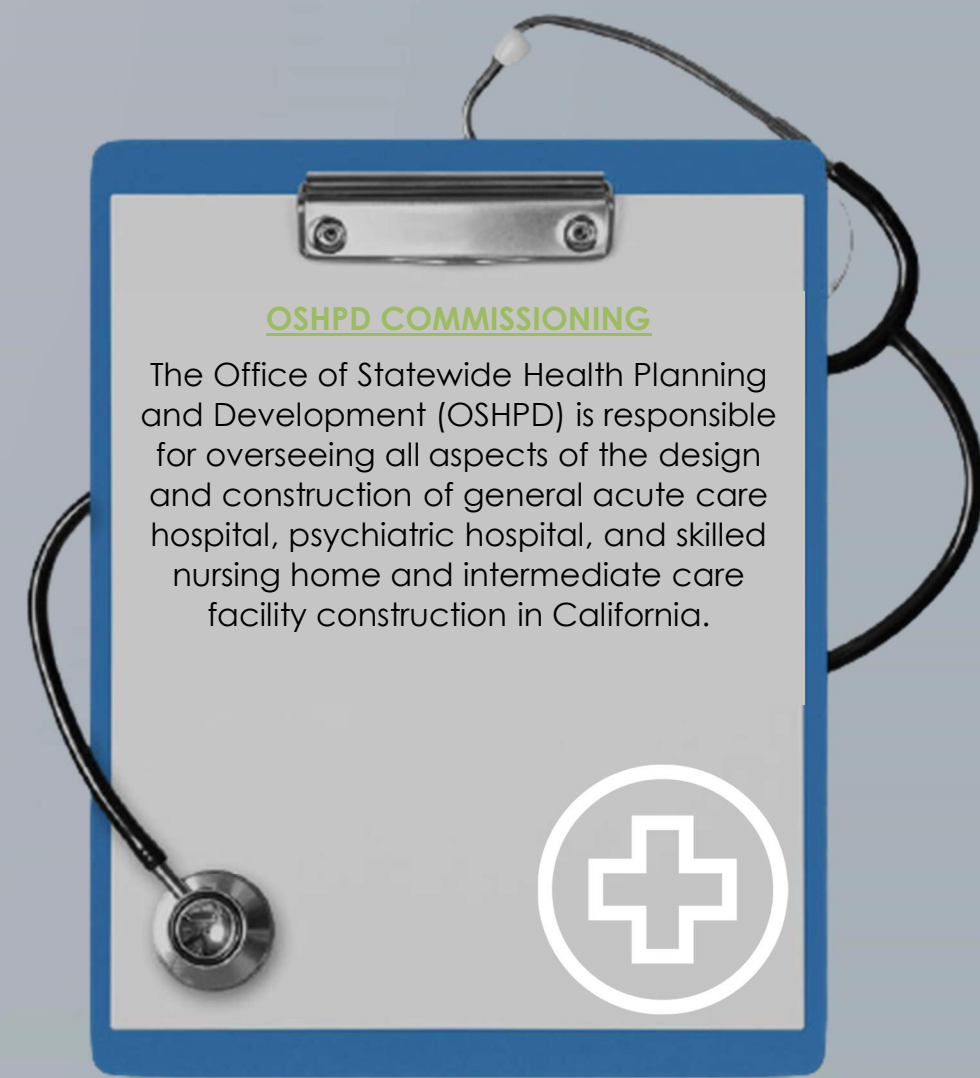
TYPICAL EQUIPMENT AND SYSTEMS

▪ Chillers ▪ Pumps ▪ CRACs/CRAHs ▪ Controls ▪ Economized Cooling ▪ Electrical Distribution ▪ UPSs ▪ Backup Generators ▪ Low Voltage ▪ Medium Voltage ▪ Fire Suppression ▪ Fire Life Safety ▪ Envelope ▪ Security ▪ Water and Fuel Storage



HEALTHCARE COMMISSIONING

Healthcare facilities are complex buildings containing distinct and diverse spaces – each with its own set of challenges and requirements. Hospital systems are numerous, critical and extremely complex, from HVAC, electrical, plumbing, lighting, fire alarm and security systems to specialty systems such as medical gasses, infection control, nurse call systems, and even the patient control of shades, lighting and televisions.



OSHPD COMMISSIONING

The Office of Statewide Health Planning and Development (OSHPD) is responsible for overseeing all aspects of the design and construction of general acute care hospital, psychiatric hospital, and skilled nursing home and intermediate care facility construction in California.

LEED COMMISSIONING

Leadership in Energy and Environmental Design (LEED) is the most widely used green building rating system in the world. Available for virtually all building types, LEED provides a framework for healthy, highly efficient, and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement and leadership.

GMC Commissioning provides both LEEDv4 *Fundamental* and LEED *Enhanced* compliant commissioning as well as optional Envelope and Monitoring Based commissioning for all categories of the LEED Professional Program.



8 POINTS UNDER LEED v4

ENERGY AND ATMOSPHERE	PREREQUISITE FUNDAMENTAL CX		
3 POINTS OPTION 1 PATH 1 ENHANCED CX	+	1 POINT OPTION 1 PATH 2 MONITORING BASED CX	
		+	2 POINTS OPTION 2 ENVELOPE CX
INDOOR ENVIRONMENTAL QUALITY	2 POINTS INDOOR AIR QUALITY ASSESSMENT		

RETRO-COMMISSIONING

Retro-commissioning existing buildings offers the most benefit in terms of opportunities for cost savings and improving energy efficiency in commercial and industrial building.

- ✓ RCx PLAN
- ✓ DESIGN REVIEW
- ✓ OPERATIONAL REVIEW
- ✓ FPTs
- ✓ FINAL CX REPORT
- ✓ UPDATED O&MS
- ✓ UPDATED TRAINING



RE-COMMISSIONING

As soon as a building is operational, systems begin to drift and wear. Re-Commissioning provides a reset as if the building systems were being installed new.

- ✓ ReCx PLAN
- ✓ CX REPORT REVIEW
- ✓ OPERATIONAL REVIEW
- ✓ FPTs
- ✓ FINAL CX REPORT
- ✓ UPDATED O&MS
- ✓ UPDATED TRAINING



ENERGY AUDITS

In these days of uncertainty, it is important to keep unnecessary expenditures to a minimum. An energy audit identifies potential energy efficient improvements by pinpointing where a building is losing energy.

- ✓ DOE AUDITS
- ✓ ASHRAE LEVEL 1 AUDIT
- ✓ ASHRAE LEVEL 2 AUDIT
- ✓ ASHRAE LEVEL 3 AUDIT
- ✓ M&V
- ✓ LCCA



SITE ASSESSMENTS

We use actionable intelligence to optimize and maintain your building's performance. Avoid down time and costly repairs with upfront data provided by a quality MEP Systems Assessment.

- ✓ LCCA
- ✓ END OF LIFE ESTIMATES
- ✓ MAINTENANCE REVIEW
- ✓ MEP
- ✓ FIRE LIFE SAFETY
- ✓ LIGHTING
- ✓ BMS & CONTROLS



DUE DILIGENCE

MEP systems are some of the most critical components of your building's infrastructure. Whether you're evaluating a property for a potential acquisition, or performing routine capital needs planning,

- ✓ ENERGY CONSUMPTION
- ✓ MAINTENANCE GAPS
- ✓ REPAIR/REPLACE
- ✓ ASSET ANALYSIS
- ✓ SAFETY REVIEW



BUILDING COMPLEXITY & SPEED-TO-MARKET CONTINUES TO INCREASE – BUT THE EXPECTATION OF TOP-NOTCH QUALITY STILL HOLDS.

Mechanical, Electrical, Plumbing, Process, and Fire Alarm/Fire Protection (MEPF) systems account for 60% of construction budgets. The cost of poor-quality including non-conformance rework, schedule delays, warranty claims, and callbacks can add **15-20%** to the total project cost. It is therefore critical that a quality control process is implemented on every project.

GET IT RIGHT - THE FIRST TIME

Our Commissioning Managers work directly for the General Contractor or Construction Manager. Understanding that many general contractors struggle to find qualified experts in these fields and may not have the workload to support full-time employees, we have created this position to fill the gap.

We are a liaison between the Owner, their third-party Commissioning Authority (CxA), and the subcontractors and vendors under the General Contractor. Teaming with our industry leading commissioning managers, and highly skilled subject matter experts, will raise the bar for quality on your next project.

- ✓ CONTRACT DOCUMENT REVIEWS
- ✓ SUBMITTAL, SHOP DRAWING AND RFI REVIEW
- ✓ STARTUP & TESTING
- ✓ SCHEDULING & PULL PLANNING
- ✓ BIM SUPPORT
- ✓ Cx PLAN IMPLEMENTATION
- ✓ ASSISTANCE WITH TITLE 24 CODE COMPLIANCE

- ✓ Cx COORDINATION MEETINGS
- ✓ MEPF SYSTEM PRE-TESTING
- ✓ RFI AND SCOPE GAP ASSISTANCE
- ✓ TROUBLESHOOTING & ISSUE RESOLUTION
- ✓ Cx TURNOVER PACKAGE
- ✓ CONTROLS & TAB COORDINATION
- ✓ PROJECT TEAM TRAINING



REVIEW



COORDINATE



OVERSEE



VERIFY

MONITORING BASED Cx (MBCx)

GMC Cx utilizes Skyspark analytics software platform to quickly analyze equipment operation and identify improvements over time.

- ✓ **FAULT DETECTION AND DIAGNOSTICS (FDD)**
- ✓ **ENERGY MANAGEMENT AND INFORMATION SYSTEM (EMIS)**
- ✓ **KEY PERFORMANCE INDICATORS (KPIs)**



BUILDING ENVELOPE Cx (BECx)

From detailed design phase reviews to comprehensive ASTM E 2813 commissioning programs, GMC Cx's building enclosure consulting and BECx expertise provides a critical, value-added service every project when performance matters most.



ELECTRICAL INFRARED (IR) SCANNING

Infrared scanning of electrical equipment by a certified thermographer is an essential measure for troubleshooting, diagnostics, and preventive maintenance in electrical power distribution applications.



ENERGY MODEL Cx

Studies show that energy consumption can be calculated with errors of up to 90%. Currently, energy models are built to comply with code or with owner energy saving requirements, and these models are rarely correct and do not represent actual results.

- ✓ **MODEL REVIEW**
- ✓ **ACCURACY REPORT**
- ✓ **RECOMMENDATIONS**
- ✓ **MODEL CALIBRATION**
- ✓ **MODEL UPDATES**
- ✓ **RE-MODELING**



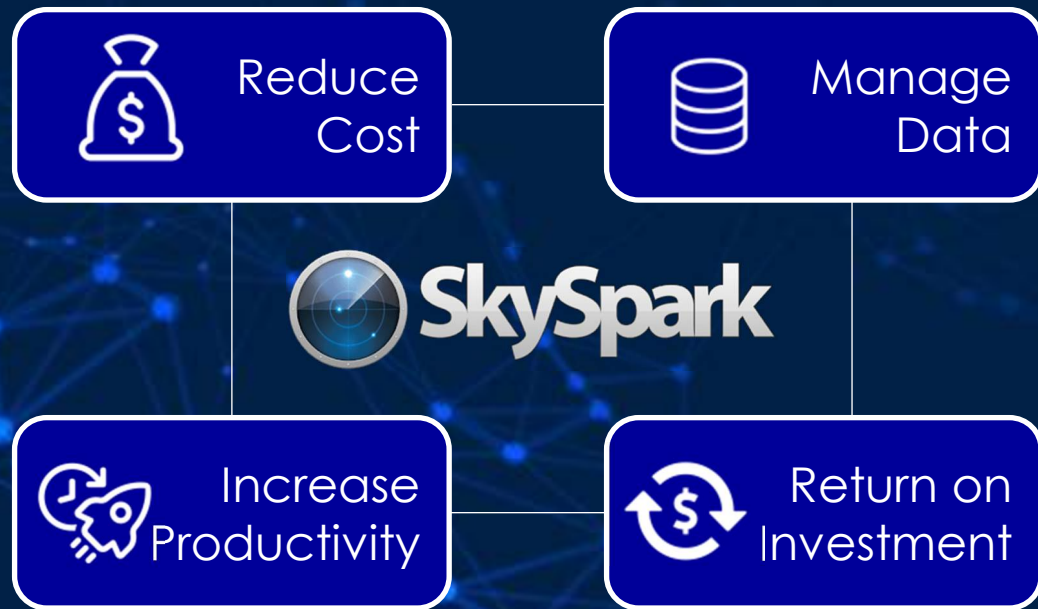
INDOOR AIR QUALITY

Poor indoor air quality (IAQ) has been tied to symptoms like headaches, fatigue, trouble concentrating, and irritation of the eyes, nose, throat and lungs. Also, specific diseases such as asthma and Covid-19 have been linked to specific air contaminants or indoor environments

- ✓ **TEMPERATURE**
- ✓ **RELATIVE HUMIDITY**
- ✓ **CO AND CO2**
- ✓ **MOLD**
- ✓ **FORMALDEHYDE**
- ✓ **PARTICULATES**
- ✓ **OZONE**
- ✓ **TARGETED VOCs**
- ✓ **CDPH STANDARD V1.1-2010**

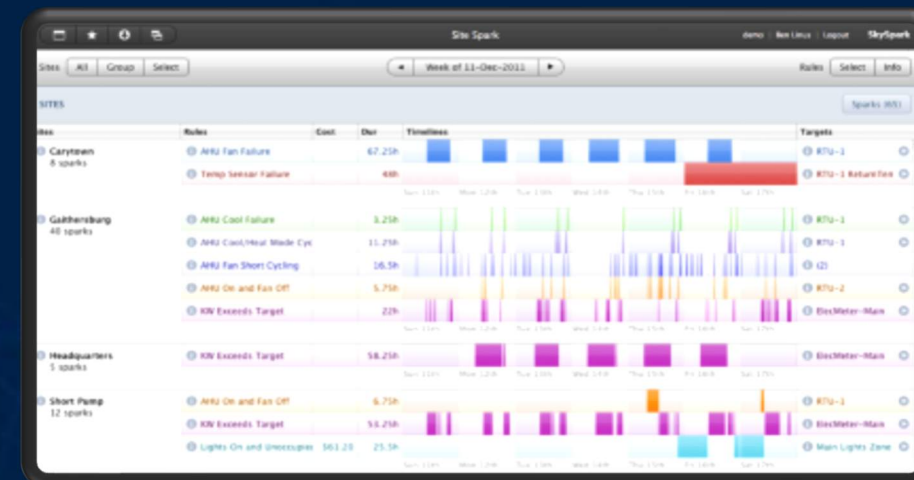


MONITORING BASED COMMISSIONING (MBCx)



The MBCx process has been shown to reduce energy waste up to 30%. The benefits of MBCx include increased energy efficiency and more precise operation of a building by ensuring the building meets its design and optimize utility consumption. MBCx uses 24/7 trend data to monitor and evaluate of a building's operation and energy consumption.

- ✓ Fault Detection and Diagnostics (FDD)
- ✓ Energy Management and Information System (EMIS)
- ✓ Key Performance Indicators (KPIs)
- ✓ Automated Reporting

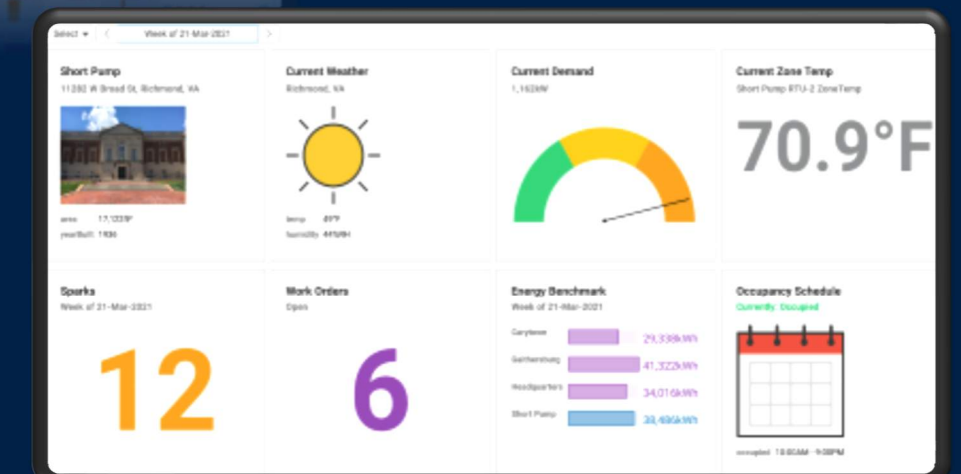


Focus on What Matters

Our advanced analytics software comes with built-in rules - you don't need to be an expert to identify inefficient operation – our software has the smarts to do it for you.

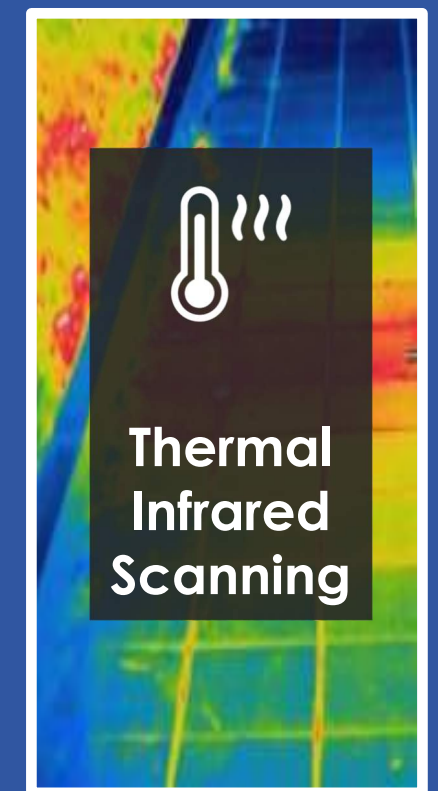
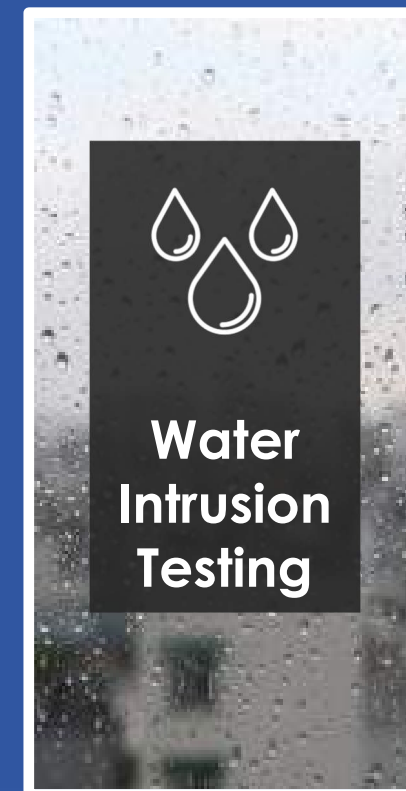
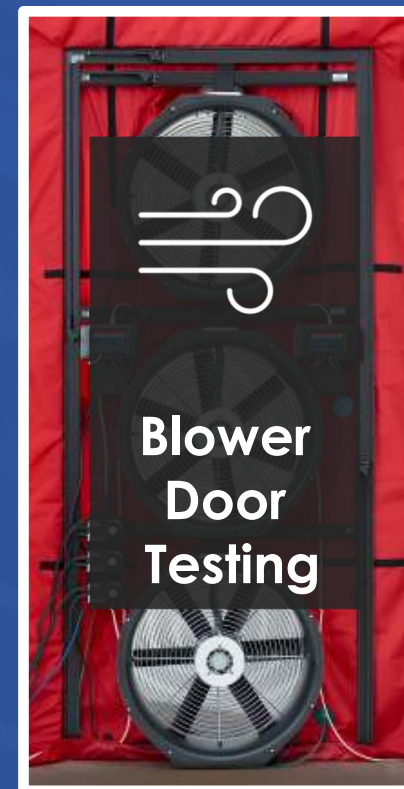
Gain New Insight

Increase visibility of your equipment and understand how your assets are performing in real time.



BUILDING ENVELOPE COMMISSIONING (BEC_x)

The building envelope is one of the largest and most crucial systems that affect a building's energy performance and occupant comfort. Some of the most common and costliest sources of building failure involve the envelope, or enclosure. BECx - sometimes referred to as building enclosure commissioning - is a quality-based process for evaluating the performance of a facility envelope to determine if a project is meeting the defined objectives, standards, and requirements of the owner.



ELECTRICAL INFRARED SCANNING

Heat generated by a loose electrical connection can quickly destroy electrical equipment or become a fire and safety hazard if it is not addressed. Common points of failure such as loose connections, corrosion, and faulty assembly can all be detected through Infrared Scanning.

Our trained and thermography certified technicians use a state-of-the-art high-resolution infrared camera to scan electrical equipment and detect hot spots under load.



DISTRIBUTION & EQUIPMENT

- ✓ PANELBOARDS
- ✓ SWITCHBOARDS
- ✓ SWITCHGEAR
- ✓ TRANSFORMERS
- ✓ VFDs
- ✓ MOTORS
- ✓ BREAKERS
- ✓ UPS
- ✓ PDUs
- ✓ DISCONNECTS



High Resolution Images



Certified Thermography



Quick Action Report



Safety and Security

FUME HOOD CERTIFICATION

GMC Cx will certify the airflow for installed VAV and CAV fume hoods in accordance with ASHRAE Standard 110-2016. The certification includes the airflow face velocity test and VAV response time test procedures



HEPA CERTIFICATION

COMING

SOON!

In-situ certification using cold atomized poly-dispersed DOP or poly alpha olefin (PAO) to scan for filter leaks. This method can reveal leaks in the HEPA filter and frame or housing gaskets and/or seals.



CLEAN ROOM CERTIFICATION

COMING

SOON!

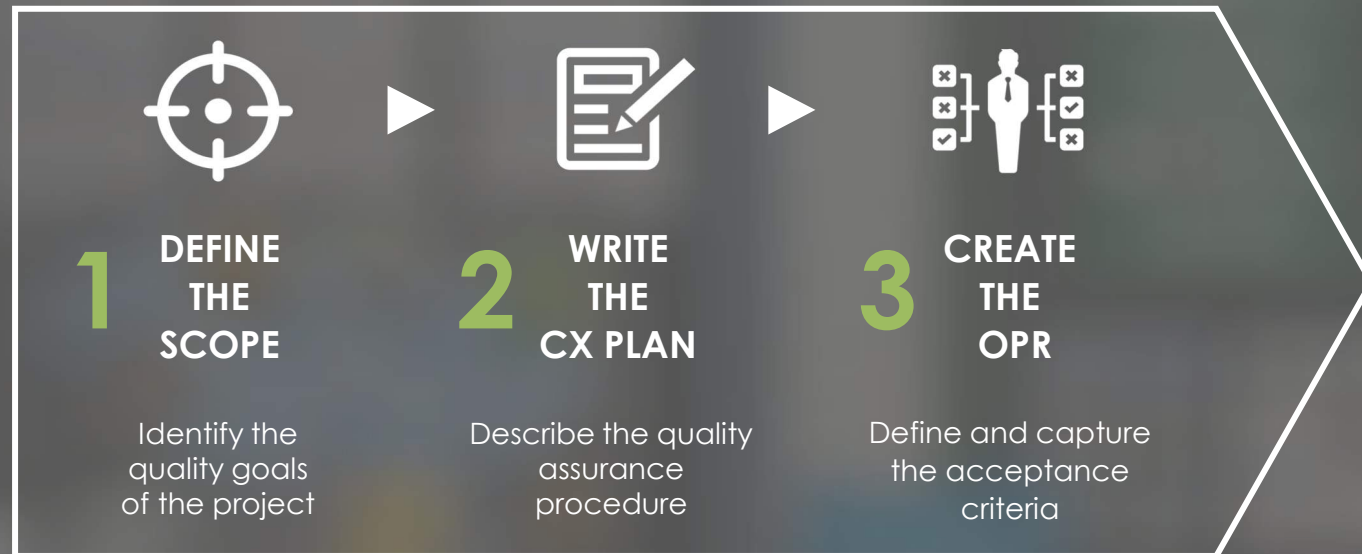
GMC Cx will test cleanrooms to ISO14644-1, ISO 144644-2 and ISO 14644-3 using ACH, airflow visualization, HEPA and particle testing.

- ✓ TEMPERATURE & HUMIDITY MAPPING
- ✓ LIGHTING INTENSITY MAPPING
- ✓ SOUND MAPPING



PLANNING

Define Quality



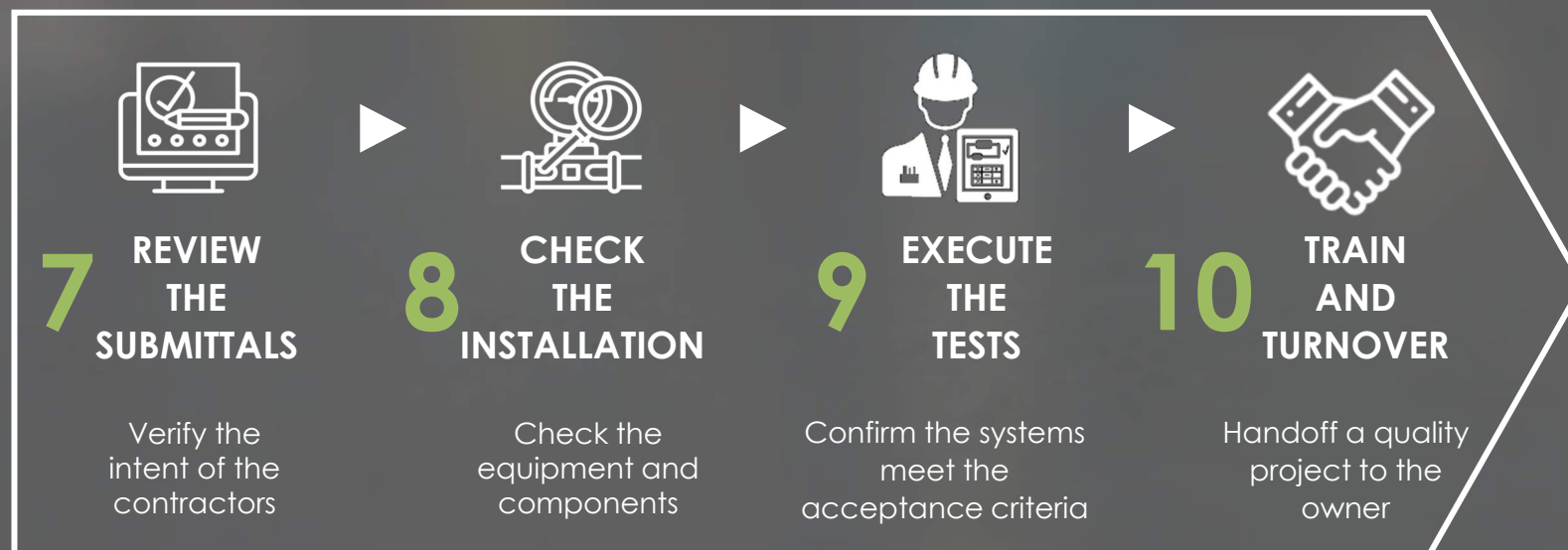
DESIGN

Ensure Quality



CONSTRUCTION

Verify Quality



OPERATION

Preserve Quality





ALEXANDRIA



Healthpeak
PROPERTIES

illumina



SONY

Qualcomm



**GMC COMMISSIONING HAS VERIFIED THAT THE
FOLLOWING ITEMS HAVE BEEN COMPLETED IN
PREPARATION FOR OPERATION AND OCCUPANCY**

- ALL COMMISSIONED EQUIPMENT HAS BEEN INSTALLED PER THE CONTRACT DOCUMENTS.
- ALL COMMISSIONED EQUIPMENT HAS BEEN STARTED UP BY QUALIFIED PERSONNEL.
- ALL COMMISSIONED EQUIPMENT AND SYSTEMS HAVE BEEN FULLY FUNCTIONALLY TESTED.
- THE FACILITIES TEAM HAS BEEN PROPERLY TRAINED ON ALL COMMISSIONED EQUIPMENT.
- THE FACILITIES TEAM HAS RECEIVED ALL PROJECT AND OPERATIONS DOCUMENTATION.
- ALL ISSUES IDENTIFIED HAVE BEEN CLOSED OR HAVE A CLEAR PATH TO RESOLUTION.

Ben Gilbert
BEN GILBERT PE, LEED AP

Alex Mathers
ALEX MATHERS PE, CxA

Michael Conway
MICHAEL CONWAY, CxA, CEM



CERTIFICATE OF QUALITY