



# Sustainability & Resilience

OPTIMIZE PERFORMANCE. ANTICIPATE AND ADDRESS STAKEHOLDER NEEDS WITH TAILORED SOLUTIONS.

As a trusted national consultant for over 40 years, Marx|Okubo provides sustainability and resilience services to improve new builds and existing structures as well as consider adaptive reuse. Our proactive, multidisciplinary teams can customize reliable, impactful advancements that reduce operating costs while maximizing returns, reducing emissions, improving efficiencies, and aiding in occupants' well-being.

 Owner's Representation

 Property Condition Assessment

 Project Management

 Constructability Reviews

 Repair | Reconstruction

 Facility Condition Assessment

 Construction Loan Monitoring

 Accessibility

 Building Enclosure

 Fire | Life Safety

 Sustainability & Resilience

 Mechanical | Electrical | Plumbing

 Structural Engineering

 ASAP® - Automated Structure Alert Program

Attached to every building and portfolio are important, distinct investment goals and opportunities—and high on the list these days are needs to improve building performance, protect from natural hazard impacts, or how to fulfill local jurisdictional and state mandates. Providing thorough and thoughtful environmental, social, and governance (ESG) consulting, Marx|Okubo tailors services and programs that incorporate best practices and anticipate/address real estate owner, investor, and other stakeholder needs and concerns around the lifecycle of a building.

## Sustainability & Resilience Services:

### Advisory Services

- > Net-zero carbon emissions strategy
- > ESG property benchmarking analysis
- > Regulatory compliance assessments
- > Environmental management systems
- > EHS policy and compliance
- > Physical and transitional climate-risk analysis and mitigation
- > Reporting framework advisory services
- > Adaptive reuse consulting

### Zero Net Energy

- > Energy analysis and studies
- > Design consulting
- > Documentation support

### Building Certifications

- > LEED Certification
- > Energy Star Certification
- > WELL Certification
- > FitWel Certification

### Building Efficiency

- > Energy auditing and modeling
- > Energy and water benchmarking
- > Commissioning/retro-commissioning
- > MEP Assessments
- > Carbon footprint analysis
- > [Carbon Risk Real Estate Monitoring \(CRREM\)](#)
- > Water and waste management
- > ESG property analysis

### Occupant Health and Wellbeing

- > Industrial hygiene services
- > Hazardous materials testing/abatement
- > [Indoor air & environmental quality assessments](#)
- > Air and water permitting
- > Development of facility wellness criteria

*We consult to limit your exposure now, giving you greater confidence in your decisions for the future.*





# Sustainability

## SMARTER PROPERTIES: BUILDING INCREASED VALUE.

Whether you are looking to address long-term ownership and operational efficiencies, get assistance with development design, improve portfolio sustainability metrics, or boost investment ROI, Marx|Okubo's sustainability solutions go beyond traditional engineering to consider all elements of sustainability and their relation to current and future code requirements, industry trends, building operations, durability, and ultimately, value.

Marx|Okubo understands the intricacies of buildings and how they often end up wasting energy and money. While green design is becoming a more standard practice and solution, it's critical to have guiding expertise in this process to reduce the long-term operating costs of a property as well as add greater efficiencies and value to the built environment for the next generation.

The Marx|Okubo team includes architectural and engineering professionals with additional LEED, WELL, Fitwel, Certified Energy Modeling, and Certified Indoor Air Quality Professional accreditations. Providing sustainability consulting on both new construction and existing property projects, Marx|Okubo's teams help owners, investors, lenders, and tenants determine the sustainability potential of a property and lifecycle cost benefits; navigate government regulations and environmental certifications; and comply with/prepare for sustainability benchmarking and reporting initiatives, such as Global Real Estate Sustainability Benchmark (GRESB) and Global Reporting Initiative (GRI).

## KEY SUSTAINABILITY SERVICES:

- > Sustainability reviews: baseline, enhanced, customized sustainability, management reports
- > Net-zero energy studies
- > [Whole building life cycle analysis \(WBLCA\)](#)
- > Certification gap analysis
- > [Solar](#) and battery storage feasibility studies
- > [ASHRAE Level I, II, and III energy audits](#)
- > [Carbon Risk Real Estate Monitoring \(CRREM\)](#)
- > Building commissioning: new building, building envelope, LEED, and code-required
- > Healthy building services: WELL & Fitwel certifications, [indoor air quality testing/monitoring](#)
- > [Electric vehicle charging station reviews](#)
- > [Governmental, code and local jurisdiction regulations and incentive programs](#)

# Projects: UBS Energy Audit Portfolio

CLIENT	UBS Realty Investors
LOCATION	Various cities and states throughout the US
SERVICES	Sustainability, MEP (Mechanical, Electrical, Plumbing)



Our team worked with UBS Realty Investors, LLC, to complete seven ASHRAE Level II energy audits on 39 buildings, spread out over seven properties, totaling more than 2,209,325 square feet. Our survey included a review of the physical conditions related to systems, equipment, and components of the building infrastructure to determine recommended energy conservation measures (ECMs), water conservation measures, and how to improve building operations.

The energy audit identified energy conservation measures that could result in approximately \$594,743 in potential energy cost savings from reduced annual energy consumption and annual maintenance savings.

The audit also identified low-cost measures such as lighting upgrades as well as capital improvement measures that include HVAC equipment upgrades. In general, the results of an energy audit tend not to recommend replacing HVAC equipment because the high cost outweighs the relatively low annual savings. However, our evaluations considered the incremental cost of replacing equipment that is at the end of its useful service life with high-efficiency equipment, and thus installation of this equipment was included with our recommendations.



# Projects: Multifamily Residential in New Jersey

CLIENT Withheld

LOCATION West New York, New Jersey

SERVICES Sustainability, Constructability Review, Owner's Representation, MEP (Mechanical, Electrical, Plumbing)



Marx|Okubo provided constructability review services on behalf of the client for the development of a new, 426-unit multifamily project in West New York, New Jersey. The client owned the land and engaged a fee-developer to manage design and construction activities.

The developer for this project originally proposed a luxury apartment project with a target of achieving LEED Silver certification, which is in line with comparable projects in this market. The client directed the developer to pursue a more ambitious outcome, with a goal of achieving LEED Platinum, LEED Zero Energy, LEED Zero Carbon, and a substantial reduction of fossil fuel consumption.

Marx|Okubo integrated with the design team during the schematic design phase and orchestrated studies to replace gas-fired space heating and domestic hot water systems with air-source heat pumps or ground-source heat pump systems. As this was the first project for which the design team had specified fully electric systems, Marx|Okubo's project lead and MEP engineer were deeply engaged in assessing the coordination and detailing of these systems. In a collaborative effort, Marx|Okubo, the developer, and the construction manager arranged acoustical testing of heat pump water heaters. Using data from the testing, the team worked with the mechanical engineer and acoustics consultant to acoustically isolate the water heaters from adjacent spaces while also ensuring that adequate ventilation will be provided to ensure the units operate efficiently.

During the construction document phase of design, Marx|Okubo found that the mechanical engineer had specified gas-fired rooftop HVAC units; the design was revised to ensure that all heating systems will use heat pumps. Marx|Okubo's contributions also led to an expansion in electric vehicle charging stations, integration of a peak electricity demand management strategy, and specification of "solar ready" infrastructure to facilitate efficient installation of a rooftop solar array.

At the completion of the construction document phase, the project was on track to achieve the client's LEED certification goals along with a 92% reduction in fossil fuel consumption and a projected reduction in operating carbon emissions of 35% when compared to the project that was originally proposed by the developer.

# Projects: 455 Sherman Street

CLIENT Sherman Joint Venture

LOCATION Denver, Colorado

SERVICES Sustainability



Built in 1983, this project consisted of a Class A, five-story, 117,305-square-foot office building with an upgraded conference room, showers/lockers, covered parking, and onsite ownership/management.

Marx|Okubo performed an ASHRAE Level II energy audit of the property to identify and provide a savings and cost analysis of practical measures that met the owner's constraints and economic criteria as well as discuss effects on operation and maintenance procedures. Our assessment included a review of the existing building envelope (windows, doors, roofing, insulation, wall systems, etc.) together with the mechanical, electrical, and plumbing systems as they relate to the building energy and water usage.

In performing the energy audit, Marx|Okubo recommended two capital improvement options including replacement of the obsolete air distribution system with a variable air volume system, and a shift from the pneumatic control system to electronic controls with direct digital control (DDC) logic. Marx|Okubo assisted the client in performing owner's representation services for these capital improvement projects by creating performance drawings and specifications, providing bid process oversight with three design/build contractors, selecting the contractor, and providing design construction administration throughout the construction.

With work completed in 2021, the building shows increased efficiency, in time for the latest energy efficiency requirements through the Energize Denver ordinance.

# Projects: Multifamily Residential in New York

CLIENT Withheld

LOCATION Westchester County, New York

SERVICES Sustainability, Owner's Representation, Accessibility



The client engaged Marx|Okubo to provide owner's representation services for the ground-up development of a senior living facility with 26 memory care units and 74 assisted living units in Mt. Pleasant, New York. During the design phase, our team identified multiple indoor environmental quality risks and opportunities, including potential radon risk for dwelling units proposed at grade level, substandard acoustic assemblies, opportunities to improve HVAC filtration, and vulnerabilities in the building enclosure design that presented a water intrusion risk. Marx|Okubo also led studies to assess potential costs and benefits of a ground source heat pump system and rooftop solar arrays, and our team identified opportunities to add electric vehicle charging stations to the project. Among other design modifications that resulted from Marx|Okubo's analysis, the development team added a radon mitigation system, electric vehicle charging stations, and rooftop solar arrays to the project.

During construction, our team conducted detailed reviews of waterproofing and roofing systems to ensure these systems were installed in conformance with the approved construction documents and manufacturer's installation requirements. In addition, the team performed thorough accessibility reviews to verify compliant access for occupants with mobility challenges.

Marx|Okubo also performed comprehensive solar consulting services, including solicitation of bids from qualified contractors, bid leveling, an interconnection study with the local utility, a review of state and federal financial incentives, an analysis of electricity demand and estimated solar production, a review of carbon avoidance impacts, and contract negotiation for a 160,000 kWh rooftop solar electricity system. The client executed an agreement with a solar contractor, and energy savings are anticipated to result in a payback period of less than five years, with an anticipated 15% reduction of total operating carbon emissions from the project.





# Resilience

DEDICATED TO IDENTIFYING AND MINIMIZING NATURAL DISASTER RISKS, WHILE MAXIMIZING CONTINUITY OF OPERATIONS.

Marx|Okubo works with investors, owners, tenants, and property managers during site selection, design, construction, operations, and event response activities to identify property risks, understand how to reduce risks and repair costs, and maximize the continuity of operations of a property. With our in-house resiliency specialists, we are committed to evaluating and improving the built environment's response to climate-related natural disasters and assisting clients to ultimately create assets that are passively survivable and supportive of the surrounding communities.

Through an understanding of climate risks and building science and operations, Marx|Okubo can help determine how a building will likely respond to potential hazard events. Our team works with a client to determine an acceptable level of physical, operational, and transitional risk and provide recommendations on how the property or operations can be altered to future-proof their properties or meet portfolio-specific goals.

Our in-house resiliency team is a dedicated group of professionals, including licensed architects and engineers, who specialize in identifying potential physical and social vulnerabilities of the built environment, as caused by natural hazards. Physical hazards include earthquakes, flooding, hurricanes, wildfires, severe winter storms, and tornadoes.

We consult on all phases of a building's lifecycle to anticipate and develop solutions for a variety of natural events. We are focused on how the design and construction, pre-event operations, and post-event response can reduce repair costs and maximize the continuity of a property's operations. Ultimately, as climate risk exposure levels can influence insurance costs, capital improvement costs, and overall integrity of buildings across a portfolio, clients need to perform more frequently a portfolio resiliency analysis to identify the properties that decrease the portfolio's overall resiliency rating while maintaining buildings' overall operational integrity.

## KEY RESILIENCY SERVICES:

### New Construction:

- > **Property hazard assessment**
- > **[Property resilience assessment \(PRA\)](#):** Site selection hazard screening, desktop-based vulnerability assessment of project documents, and mitigation strategy recommendation

### Existing Building:

- > **Property hazard assessment**
- > **[Property resilience assessment \(PRA\)](#):** Site hazard screening, observation-based vulnerability assessment, and mitigation strategy recommendation
- > **Post-disaster assessment:** Observation-based damage assessment, repair recommendation, and mitigation strategy recommendation
- > **Flood zone analysis and management:** Evaluation to help prepare for/mitigate insurance issues.



# Projects: Climate Hazard and Property Physical Resilience Assessment

CLIENT	Withheld
LOCATION	Boston Metro Area, Massachusetts
SERVICES	Resilience



An equity investor involved in a proposed multifamily project engaged Marx|Okubo to conduct a climate hazard and property physical resilience assessment as part of the project's due diligence. The project comprised 259 residential units within three separate buildings with a total area of 320,000 square feet. As a requisite step to close on the deal, the client required that our team use the Munich RE hazard assessment tool for this project, with the assessment taking place within the client's limited due-diligence period.

Marx|Okubo identified the climate hazards that presented the highest risk to the project, assessed vulnerabilities based on a technical review of the construction documents, investigated potential measures to mitigate risks, and submitted recommendations to the client and their development partner. Throughout this process, Marx|Okubo provided practical solutions to reduce exposure to potential damage related to high wind events, localized flooding, and loss of power. The insights that our team contributed enabled our client to negotiate with their development partner to mitigate risks to an acceptable level for all parties.

# Projects: Warehouse Facility

CLIENT Withheld

LOCATION Miami-Dade County, Florida

SERVICES Resilience



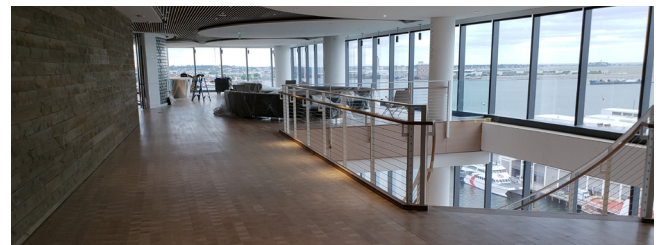
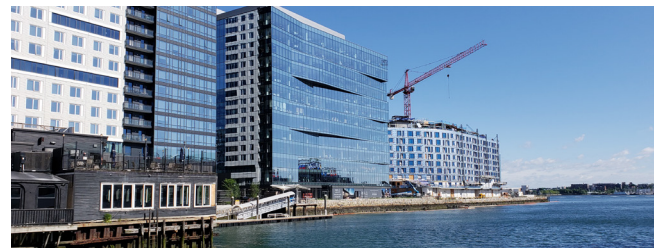
The client for this project, a warehouse facility located in an area subject to hurricanes, flooding, tornadoes and associated disruption to utilities, engaged Marx|Okubo to conduct a preliminary site vulnerability assessment, which identified and quantified potential physical hazards and how they could affect the subject property. This assessment allowed the client to make an educated decision on whether to pursue the project and to ensure that hazards are discussed with the design team and vulnerabilities will be addressed.

Identifying risks prior to development streamlines design efficiencies and minimizes change orders during construction. Marx|Okubo's evaluation allowed for a collaborative approach between architecture and engineering design professionals in order to provide the highest quality product without unnecessary costs.



# Projects: Pier 4

CLIENT	Commonwealth Partners
LOCATION	Boston, Massachusetts
SERVICES	Property Condition Assessment, Resilience



Marx|Okubo's resiliency assessment included identifying key climate threats and assessing the property vulnerability. We made recommendations to reduce the climate hazard risk to the client's acceptable level appropriate to its unique resiliency protocols, property management relationships and capital improvement budgets.

As the property is located in an area with frequent hurricanes and also where rising sea levels threaten continuing development along the Boston Harbor, we incorporated strategies and tools to reduce the flood risk, including flood-resistant finishes, separated sub-grade vertical transportation, and implemented various methods of site detention and storm surge protection.



Marx|Okubo is a national AEC consulting firm that works with real estate owners, investors and lenders—at every point of the property lifecycle—to **evaluate** their building projects, **solve** complex challenges and **implement** tailored solutions.

We help clients understand their projects' complexities, so they can make more informed decisions and, ultimately, mitigate their risk.

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