EXECUTIVE SUMMARY

Grumman/Butkus Associates' Sustainability Report is an annual document prepared in the first quarter. G/BA has six offices, which are described in this report. However, this report and its content pertain specifically to the business and sustainability efforts of the Evanston, IL (Chicago region) office. Throughout the report, the Evanston G/BA office will be referred to simply as G/BA.

During the past 44 years, sustainability has remained the guiding principle in G/BA’s practice and culture. While the firm has historically promoted and engaged in sustainability practices, the founding of the Sustainability Tracking Committee in 2013 represented the first formal effort to benchmark, document, and promote G/BA’s own practices.

This report is written to conform to and reference the Global Reporting Initiative (GRI) and was developed using the G4 Sustainability Reporting Guidelines. Information on GRI can be found at www.globalreporting.org. The report will not be registered with GRI and has not been reviewed by an independent committee; it is a collaborative effort of the G/BA Sustainability Tracking Committee.

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ENVIRONMENTAL COMMITMENT STATEMENT | G4–1

Grumman/Butkus Associates (G/BA) is committed to continually working toward a sustainable society and planet through the work we do, the services we offer our clients, and our internal corporate sustainability practices.

SUSTAINABILITY IN THE WORK WE DO

G/BA was founded in 1973 as an energy consulting firm at a time when most saw energy usage and expense as a cost of doing business. Since then, G/BA has grown into a full-service engineering firm and has continued to specialize in energy efficient systems design, including infrastructure assessments and upgrades. Energy studies and related analytical work remain a fundamental component of our service offerings and account for approximately 15% of our business. G/BA is also an industry leader in commissioning and retro-commissioning services that assist our clients in achieving maximum energy efficiency in systems performance.
Our sustainability commitment to the work we do involves:

- Offering hospitals involvement in our free annual Hospital Energy and Water Benchmarking Survey (grummanbutkus.com/why-we-excel/hospital-energy-water-survey)
- Specializing in engineering services for energy-intensive facilities
- Searching for energy- and water-efficient solutions to all MEP designs
- Striving to help our clients reduce electricity, natural gas, and water usage and costs through a variety of services
- Challenging and assisting our clients (building owners) and vendors to strive for more energy efficient policies

**SUSTAINABILITY IN OUR CORPORATE ENVIRONMENT**

Our corporate environmental policy is supported by all employees. In addition, we have developed a Sustainability Tracking Committee to benchmark and monitor our internal sustainability efforts and to produce our annual Sustainability Report.

Our sustainability commitment to our in-house, corporate environment involves:

- Monitoring and reducing our energy and water usage
- Reducing waste levels and actively recycling waste materials for reuse
- Establishing policies that assist employees in sustainable behaviors
- Raising employee awareness through activities and challenges
- Challenging and assisting other G/BA stakeholders, including our landlord, to strive for more energy efficient policies
- Providing a safe and enjoyable work environment
- Striving to retain staff and providing continuing education and training
- Supporting the local community through volunteer and advisory efforts

For a complete listing of the services G/BA offers and a detailed description of our internal sustainability efforts, visit our website: grummanbutkus.com.
Grumman/Butkus Associates (G/BA) is a nationally recognized professional consulting firm specializing in sustainable design engineering and energy efficiency consulting. Dave Grumman founded the firm in May 1973 as Enercon, Ltd. As a one-person energy consulting firm in Evanston, IL (Chicago region), Enercon offered services to help building owners and managers reduce the operating cost of their buildings through energy conservation at a time when few were thinking about energy. In 1981, Enercon, Ltd. became Grumman/Butkus Associates with the promotion of Al Butkus to principal. That year, G/BA opened an office in Wauwatosa, WI (Milwaukee region), which was later augmented by an office in Madison, WI.

The establishment of our Wisconsin-based practice significantly contributed to the firm's growth through the 1980s. During that period, G/BA expanded to offer a wide range of specialized consulting services, as well as full mechanical, electrical, and plumbing design. In 2013, G/BA celebrated its 40th anniversary and opened a New York regional office, which specializes in commissioning, retro-commissioning, and analytical services. A small Florida branch location was opened in 2016. In 2017, an additional branch office opened in Arizona.

G/BA is an Illinois corporation. The Wisconsin and New York regional offices are separately incorporated in their respective states. As of December 2017, the current number of employees in the Evanston (Chicago region) office was 82.
G/BA Sustainability Report 2017

PRIMARY SERVICES
G/BA is a leader in MEP design that is sensitive to sustainability and the efficient use of energy and water. However, a majority of our business consists of our correlative services, including commissioning and retro-commissioning, energy and resource benchmarking, energy conservation studies, MEP infrastructure planning and upgrades, LEED consulting, and computerized building energy modeling. These services are aimed at improving and maintaining the performance and efficiency of systems throughout the lifetime of a facility.

ANALYTICAL SERVICES
Energy studies and related analytical work remain at our firm’s foundation and currently amount to approximately 15% of our business. Our experience in energy efficiency and management has also aided the firm’s technical consulting expertise for sustainable design certification programs such as LEED and Green Globes.

DESIGN SERVICES
G/BA offers full mechanical, electrical, and plumbing design engineering services, including infrastructure assessments and upgrades. While G/BA provides state-of-the-art MEP design for large, new construction projects, the majority of our design work is in existing buildings. G/BA has extensive experience in designing systems for spaces with demanding environmental requirements, including laboratories and spaces dedicated to medical and animal research, and spaces designed to house environmentally sensitive items, such as museums and library rare book storage. Also critical in design work for existing buildings is our experience with spaces that need to remain occupied during the project.

COMMISSIONING SERVICES
Commissioning (Cx) is the process of verifying and optimizing the ability of all or some of a building’s subsystems to achieve the owner’s project requirements (OPR), as intended by the building owner and as designed by the architects and engineers. Commissioned systems can include mechanical, electrical, plumbing, fire/life safety, building enclosures, interior systems, cogeneration, utility plants, sustainable systems, lighting, wastewater, controls, and security.

G/BA has extensive experience and expertise providing Cx services for new building systems. Cx is a core service for G/BA. The firm has received third-party validation from the Building Commissioning Association as a Certified Commissioning Firm. In 2017, commissioning and retro-commissioning accounted for approximately 20% of the firm’s gross billings.

RETRO-COMMISSIONING SERVICES
Retro-commissioning (RCx) is a systematic process for improving an existing building’s performance. Using a whole-building systems approach, RCx seeks to identify operational improvements that will increase occupant comfort and save energy.

G/BA is a leader in the RCx industry and has been providing RCx services for the past 18 years on a diverse array of projects. Over three years, G/BA successfully completed 25 RCx projects resulting in:
• Total energy cost savings of over $3 million
• Annual electricity savings of over 20 million kWh
• Annual natural gas savings of over 1 million therms

G/BA is a qualified RCx service provider under these programs:
• ComEd’s Energy Efficiency Program
• Gas utilities (Peoples, North Shore, and Nicor Gas)
• Indiana Michigan Power’s retro-commissioning custom incentive program
• DTE Energy’s Retro-Commissioning Pilot Program in Michigan
LEED AND OTHER GREEN GUIDELINES

Developed by the U.S. Green Building Council (USGBC), Leadership in Energy & Environmental Design (LEED) is an internationally recognized green building certification system. LEED provides third-party verification that a building or community was designed and built using strategies aimed at improving performance across several metrics, including energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources. To date, G/BA has been involved in more than 45 LEED-certified projects, including three Platinum certifications, in the capacity of MEP designer, commissioning agent, or LEED consultant. Related services include energy modeling for new construction projects and energy audits for existing buildings.

G/BA has also been involved with projects using other guidelines, including active staff involvement with documentation and assessment for Green Globes. In fact, G/BA staff authored the Assessment Guidance sections in the Green Globes Technical Reference Manual. G/BA Associate David Eldridge is serving on the GBI ANSI Consensus Body, working to re-issue the standard that is the basis for the Green Globes for New Construction rating system. As part of that work, he is a voting member of the body approving the new standard, as well as serving as the chair of the energy subcommittee.
MARKETS SERVED | G4–8

G/BA specializes in energy-intensive, mission critical facilities, and this expertise has led to a leadership position in the higher education, healthcare, pharmaceutical, and laboratory markets. G/BA is also a leader in specialized, mission critical work for data centers, whether as stand-alone facilities or as a component of another project. Another significant market is composed of major resorts and hotels. Other commercial facilities, including corporate office buildings, multifamily residential buildings, retail sites, transportation facilities, and industrial facilities, round out the markets we serve.

A majority of the work produced by the Chicago regional office is located in the Midwest, but other markets are also served. G/BA has provided services to clients in a large number of states and a few international locations. For more information about G/BA’s markets, services, and projects, visit grummanbutkus.com.
SIGNIFICANT CHANGES DURING THE REPORTING PERIOD | G4–13

In 2017, G/BA completed third-floor renovations to create a large new 850-square-foot training/conference room, as well as a new open stairway in the atrium between its third- and fourth-floor offices. Sustainability details are provided in the Sustainability Strategies Recycled and Sustainable Materials section of this report. The firm opened a small Arizona branch office in 2017.

AWARDS

G/BA has been nationally recognized for its work, having received Energy Innovation Awards from the United States Department of Energy; Technology Awards from the American Society of Heating, Refrigerating, and Air Conditioning Engineering (ASHRAE); and an M/E Engineering Achievement Award from *Specifying Engineer* magazine. Since 1981, G/BA has received more than 100 awards from ASHRAE at the state, regional, and international levels. In 2010, G/BA received the Lab of the Year award from *R&D Magazine* for the Daniel F. and Ada L. Rice Plant Conservation Science Center at Chicago Botanic Garden.

During the 2017 reporting period, G/BA received the following awards:

• ASHRAE – Illinois Chapter Excellence in Engineering Award for Boiler Plant Optimization at six Advocate Health Care hospitals, Illinois (team shown above)

• ASHRAE – Illinois Chapter Excellence in Engineering Award for Assessment, Modeling, and Improvements at 801 Grand, Des Moines, IA

• *ENR Midwest* magazine – Best Project: K12 Education for MEP design at Legacy Charter School, Chicago, IL
GOVERNANCE | G4–34

G/BA is governed by a Board of Directors and managed by seven principals. The Board maintains organizational oversight, and the principals set strategy and manage the day-to-day operations. Each principal oversees certain office functions, and all principals are active with specific clients in a principal-in-charge capacity on projects. The principals attend an annual, three-day, strategic planning meeting in the fall. Outcomes of this meeting include analysis of the past year, strategies for the new year market sector and client focus, and identification of firm needs or changes. The following is a description of the principals and their responsibilities to the firm during the reporting year of 2017.

Daniel L. Doyle, PE, LEED AP O+M – Chairman
Mr. Doyle was responsible for the firm’s marketing and recruiting activities. He was also principal-in-charge for numerous designs and studies.

T. Chad Luning, PE, LEED AP O+M – President and Chief Financial Officer
Mr. Luning was responsible for the general management of the firm, as well as management of financial and administrative activities. Project responsibilities included principal-in-charge and/or project manager for numerous designs, including several multimillion-dollar retrofit projects.

Gerry Noorts, PE, LEED AP, HFDP – Vice President
Mr. Noorts was principal-in-charge and project manager for numerous study and design projects and was responsible for the firm’s staffing and project scheduling.

James C. Shults, PE – Vice President
Mr. Shults was responsible for maintenance of the firm’s technical resources and safety. Project responsibilities included principal-in-charge for numerous projects and studies.
GOVERNANCE, COMMITMENTS, AND ENGAGEMENT

John D. Villani, PE, LEED AP, CCP, QCxP, CEM, GBE – Vice President
Mr. Villani was responsible for the standardization, management oversight, and execution of the firm’s commissioning projects, and general management of the New York regional office. He also managed the firm’s administrative staff. Project responsibilities included conducting all phases of commissioning design with numerous clients.

John E. Tsingas, PE, LEED AP – Vice President
Mr. Tsingas was principal-in-charge and project manager on HVAC system design projects for new and existing facilities, energy and feasibility studies, and systems troubleshooting. Mr. Tsingas also managed staff training and continuing education.

Jonathan E. Gehrt, PE, LEED AP – Vice President
Mr. Gehrt was principal-in-charge and project manager for projects including design of mechanical systems for new and existing facilities, facility studies, master planning, and analysis of central plant operating problems. He is also responsible for management of the firm’s technical master documents.
STAKEHOLDER ENGAGEMENT | G4–24

The stakeholder groups engaged by the organization include G/BA staff, clients, consultants, product suppliers, professional organizations, and the community.

G/BA STAFF

G/BA views its staff as its most important asset. G/BA strives to make employment at the firm an exciting and important part of life and not just a job. G/BA considers its staff “family.” Official events like the holiday party and summer picnic, as well as unofficial events like office after hours and an annual chili cook-off, add to the enjoyment of working at G/BA.

G/BA strives to create a supportive environment for its employees, helping them to develop in their jobs and empowering them with the ability to make independent decisions. Annual training goals are established for all personnel, including formal out-of-office training sessions, recommended reading lists, and in-house training. G/BA maintains an aggressive continuing education program for employees to assist in training goals established with G/BA and to provide the continuing education requirements of professional licensure.

G/BA believes in teamwork. Process-oriented teams are assigned to all G/BA projects. Principal involvement in each project is significant. The project managers, project engineers, designers, and administrative staff work closely together to ensure the quality of the final product.

Weekly scheduling meetings for project managers are held to communicate about efficient use of personnel. The firm holds semi-annual office meetings at which communication is facilitated between all employees and management. At these meetings, financial information is shared and discussed; the future goals and prospects of the firm are presented and discussed; and employee anniversaries, special achievements, and promotions are recognized.

Life-work balance and healthy living are key company values. In 2017, corporate health support activities included an office stair-climbing challenge, a bike-commuting challenge, provision of an employee bike storage and dressing room, financial support for health club memberships and bike commuting, a full range of medical/dental/vision care insurance plans, and company-provided stand-up desks for each employee who desires one. Currently, 34 of Evanston’s 82 employees have elected to use stand-up desks.
Expanding upon the firm’s commitment to health and wellness, G/BA became a League of American Bicyclists recognized Silver Bicycle Friendly Business in 2017. The firm joined a cutting-edge group of nearly 1,400 Bicycle Friendly companies and local governments across the United States. The League scores organizations according to their activities in cycling-related encouragement, engineering (including equipment accommodations), education, and evaluation and planning. In June, G/BA celebrated Chicago Bike Week by hosting a free lunchtime workshop, “Bicycle Maintenance 101,” for employees and other tenants of the building. VP John Villani led the one-hour session on how to change a tire, fix a flat, and perform general maintenance.
CLIENTS
G/BA has built a reputation of meeting or exceeding our clients’ expectations every time. G/BA’s success is born in the commitment to meeting the needs of clients by providing quality consulting services. By listening closely to our clients and incorporating solutions specific to their needs, we develop long-term relationships based on trust, commitment, and quality. G/BA is committed to helping our clients improve operations. This requires working closely with our clients to understand their businesses and the challenges they face so that we can respond knowledgeably to their strategic plans.

Since 1987, G/BA has sought written input from clients regarding their satisfaction with our work. We are currently working to develop an electronic tool for client feedback.

CONSULTANTS
G/BA strives for consistency and quality when teaming with subconsultants. We work with a short list of subconsultants in specialties where we do not have in-house staff, such as civil engineering, structural engineering, architecture, acoustical consulting, building enclosure commissioning, and cost estimating. G/BA’s goal is to offer the client a seamless, unified team whose work is coordinated by the project manager. Sometimes, G/BA serves as a subconsultant to an architecture firm or another engineering firm. We strive to give these firms the same high-level attention and high-quality work that we offer to any other client.

PRODUCT SUPPLIERS
State-of-the-art engineering demands state-of-the-art product specification. G/BA maintains strong relationships with product suppliers. Our suppliers are active in our staff’s continuing education efforts to ensure that G/BA staff has current knowledge of products and trends. G/BA strives to specify products with outstanding performance, stellar reputation, and a good customer support structure.
PROFESSIONAL ORGANIZATIONS

G/BA actively supports participation in professional societies such as ASHRAE, ASPE, BCA, I2SL, IEEE, GBI, IBPSA, and USGBC. Firm members frequently serve in leadership positions and on technical committees at both the local and higher levels. Among the notable positions held by G/BA staff during 2017 were the following:

- **Chairman Dan Doyle**, P.E., LEED AP O+M, served on the Board of Directors and was Chief Financial Officer for the International Institute for Sustainable Laboratories (I2SL).

- **Vice President John Villani**, P.E., CCP, CEM, LEED AP, was Secretary of the Building Commissioning Association. He actively participated in the best practices, training, and education committees. He also served on the Chapter President’s Advisor Council.

- **Associate David Eldridge**, P.E., LEED AP BD+C, BEMP, BEAP, HBEP, provided services as a Green Globes Assessor and served on the GBI’s ANSI Consensus Body. He was a voting member of ASHRAE Technical Committees TC 7.6 (Building Energy Performance) and TC 9.6 (Health Care Facilities). He was Treasurer on the board of IBPSA-USA. He served as a senior verifier with the local USGBC and ASHRAE chapters in providing pro-bono facility benchmarking assistance to community organizations.

- **Project Manager Heather Beaudoin**, P.E., LEED AP BD+C, CEM, BEMP, GBE, provided services as a Green Globes Assessor. She is a board member of the Chicago Chapter of the IBPSA-USA.

- **Project Manager Kevin Vander Klay**, P.E., LEED AP, QCxP, served as President of the Building Commissioning Association’s Central Chapter.

- **Project Manager Fiona Martin McCarthy**, P.E., QCxP, BEAP, LEED AP O+M, was the ASHRAE Illinois Chapter Treasurer. She helped plan the chapter’s Technology Awards and Holiday Party, and participates in the YEA Group. She also sits on UIC’s Master of Energy Engineering Advisory Council.

- **Senior Project Engineer Frank Sanchez**, CPD, GPD, was active on the ASPE Technical and Research Committee.

- **Senior Project Engineer Chris Sbarbaro**, P.E., LEED AP BD+C, GPD, CPD, served as Vice President, Technical, for ASPE’s Chicago Chapter.

- **Marketing Director Julie Higginbotham** served as Secretary of the Windy City Chapter of the International Institute for Sustainable Laboratories (I2SL).

- **Engineer Natalia Dankanich** is Women of ASPE (WOA) Chicago Chapter Liaison.

- **Project Manager Jason McDonald**, CPD, was Chairman of the ASPE National Membership Committee.
COMMUNITY

Many G/BA firm members are active in local community organizations promoting conservation issues. Of note, Eric Rosenberg is currently involved with the City of Evanston’s Utilities Commission. G/BA founder David Grumman and G/BA Project Manager Joel Freeman have each previously served as Chairman of the Commission. In 2017, Freeman was selected to serve on the Mayor’s Climate Action Resilience Plan Working Group.

The Utilities Commission addresses issues related to electrical and natural gas systems reliability; energy benchmarking policy for the city; energy procurement for city buildings and municipal power aggregation; renewable energy considerations, water consumption, and conservation in city buildings; policies for stormwater management; and capital improvements for the city’s water and sewer infrastructure. Freeman previously served on the working group that developed an energy and water benchmarking ordinance for the city, which was adopted by the City Council at the end of 2016. Evanston is now one of 25 cities nationwide with such a policy. As of November 2017, 85 local “Type 1” commercial properties (100,000 square feet or greater) were in full compliance with the ordinance (over 90% of eligible buildings in this size category, for which compliance became mandatory in 2017). Smaller buildings in the 20,000- to 99,999-square-foot range (excluding some condominiums) will be required to comply in coming years.

Evanston was recognized as an official Green Power Community by the U.S. Environmental Protection Agency in 2014. The city has maintained this status, with 27.1% of total electricity usage (more than 197 million kWh) coming from green sources. This far exceeds the 3% minimum green power use requirement to earn GPC recognition for cities of Evanston’s size, and ranks Evanston among the nation’s Top 10 Green Power Communities based on green power usage. The participation of G/BA staff on the Utilities Commission was instrumental in the municipality’s decision to purchase 100% of its own electricity from green sources, including Renewable Energy Certificates.

In a compassionate response to the major hurricanes of summer 2017, G/BA collaborated with several other Evanston businesses to sponsor the “Give for the Gulf” initiative. The effort included fundraising events that ultimately collected nearly $13,000 in donations to flood relief — an amount then matched by the sponsoring firms, including G/BA. The company also provided in-kind publicity support through its blog and social media. Charities benefiting from the program included the American Red Cross, Team Rubicon, and Rotary International’s donor-advised funds for 2017 hurricane relief.

G/BA’s Sustainability Tracking Committee promoted community service and the responsible use of recycled materials by conducting its fourth annual in-office coat drive benefiting Connections for the Homeless, an Evanston-based nonprofit. The community also benefited from the staff’s annual Toys for Tots donation drive, held in cooperation with the American Society of Plumbing Engineers Chicago. The firm’s community focus extends to the greater metropolitan area through its charitable contributions (see section G-EC1).
ECONOMIC VALUE GENERATED AND DISTRIBUTED | G–EC1
As a private company, G/BA does not reveal its financial information publicly. Cash contributions for calendar year 2017 are estimated at $20,000, including sponsorships of galas, golf outings, and a youth flag-football team, as well as various other charity efforts.

RISKS AND OPPORTUNITIES DUE TO CLIMATE CHANGE | G–EC2
As an energy consulting company, many of G/BA’s activities are closely aligned with reducing climate change through energy consumption reduction. Growing awareness of the implications of climate change present an opportunity for G/BA to assist more building owners by analyzing their energy consumption and providing engineering solutions to help reduce their impact on climate change.

Of course, climate change also poses a risk to overall financial health of the national and global economy, which tends to have an accentuated impact on the construction industry and could greatly reduce demand for G/BA’s engineering services that are not directly related to energy conservation.

DEFINED BENEFIT PLAN COVERAGE | G–EC3
G/BA does not offer a defined benefit plan.

GOVERNMENT ASSISTANCE | G–EC4
G/BA has not directly received financial assistance from any government entity.

WAGE COMPARISON | G–EC5
G/BA maintains competitive compensation practices, with both hourly and salaried entry-level employees receiving total compensation packages well above local and U.S. federal minimum wage requirements.

LOCAL PURCHASING | G–EC6
As a professional services company, G/BA does not purchase large quantities of consumable goods. To the extent possible, local sources are preferred for our purchases, which mostly consist of office supplies, technology equipment, and food/catering for events. Our office products are sourced through a privately held, woman-owned and -operated corporation based in Elk Grove Village, a Chicago suburb.

We also select locally based services firms, including our banking and accounting providers.
DIRECT ENERGY CONSUMPTION | G–EN3

G/BA uses no direct energy in its facility operations. Natural gas or direct renewable energy sources are unavailable for use at the building in which G/BA’s leased office space is located.

INDIRECT ENERGY CONSUMPTION | G–EN4

All of G/BA’s facility energy consumption is indirect and consists of electric energy. The building in which G/BA’s leased office space is located is an all-electric building. When originally constructed, ComEd’s electric heat rate offered a significant discount on the cost of electric service charges. All building electric energy costs are allocated among the tenants, as tenant submetering does not currently exist.

Electric energy consumption attributable to G/BA’s office activities for 2017 is estimated to be approximately 490,000 kWh. This quantity is based on our percentage of the total building square footage; our third and fourth-floor spaces occupy an estimated 30% of the total. Beginning in 2014, G/BA has purchased Renewable Energy Certificates (RECs) to cover its estimated portion of the building electric energy consumption. These RECs are Green-e Certified and represent wind generation with high carbon power displacement in the Midwest (MN, IA, Dakotas, NE, KS, MO). RECs are understood to claim the clean energy generating benefits of renewable power generation. Costs provide a supportive revenue stream to renewable power generators that helps foster growth of the renewable power generating industry.

G/BA’s electric energy consumption consists of the following categories:

- HVAC - supply and return fan motor energy, mechanical cooling, and electric reheat energy for zone terminals. A single air handling system and associated air conditioning system serves the entire building. Our usage also includes an allocated share of energy used by unit heaters and cabinet heaters in unleased spaces, such as the loading dock and stairwells.
- Lighting - general lighting, emergency lighting, and task lighting.
- Computers - desktop computers and network equipment.
- Kitchen Appliances - refrigerators, dishwashers, coffee makers, microwave ovens, and toasters located in break room kitchens.
- Domestic Water Heating - used for sinks in restrooms (one domestic water heater serves the entire building). In 2015, instantaneous hot water heaters were installed by G/BA in its third- and fourth-floor kitchen/break rooms. This equipment reduces standby losses attributable to domestic water heating.
- Office Equipment - plain paper printer/copiers and drawing plotter/printers.
- Miscellaneous Occupant Power Receptacles.
- Miscellaneous Core Services - allocated share of energy use attributed to elevators, lighting in unleased spaces, exterior lighting, temperature control air compressor, unleased receptacles, and so on.
CONSUMPTION DETAILS BY CATEGORY | G-EN4

LIGHTING

• Most general lighting in the office consists of 2x4-foot recessed fluorescent fixtures. When G/BA moved into the space, these fixtures consisted of four T12, 40-Watt lamps with magnetic ballasts (base building standard at the time). G/BA spent its own money to convert each fixture in our offices to two T8 lamps, an electronic ballast, and a specular reflector, cutting our lighting energy consumption by nearly two-thirds.

• Approximately seven of the 2x4-foot fluorescent fixtures have been retrofitted with tubular LED lamps. These further reduce the fixture wattage. They primarily serve as test areas to evaluate different LED lighting retrofit products.

• Other lighting fixture types include 1x4-foot fluorescent fixtures in the two restrooms and 2x2-foot fluorescent fixtures in the high-bay atrium space. The seven restroom fixtures each have a single T8 lamp, electronic ballast, and specular reflector. The eight atrium fixtures each have three biax lamps to provide sufficient light levels from a ceiling height of approximately 30 feet. The atrium fixtures utilize photocells to reduce power when ambient light levels allow (see Section G-EN5).

• The third-floor office has approximately 310 total fixtures with an estimated total lighting power of 18.2 kW using a floor area of about 16,200 square feet, which results in an overall lighting power density of 1.1 watts per square foot for the third-floor office space. The fourth-floor office has 121 light fixtures with an estimated total lighting power of 7.5 kW using a floor area of about 6,160 square feet.

• The light fixtures in the main open office plan are manually controlled by 11 wall switches. While this control has no automation, it does permit selective light use for areas that have occupancy. Occupants use these switches as needed in the evenings and on weekends. This switching arrangement helps limit the lighting energy consumed.

• Annual lighting energy consumption is estimated to be 61,500 kWh/yr. The owner of the base building in which we rent space has adopted our strategies for lighting.

COMPUTERS

Annual desktop computer energy consumption is estimated to be 70,000 kWh/yr. Users can power on, and log into, their computers from off-site, lessening temptation to keep computers running 24/7.

OFFICE EQUIPMENT

Annual energy consumption by office equipment is estimated to be 4,000 kWh/yr.

KITCHEN EQUIPMENT

Annual energy consumption by kitchen equipment is estimated to be 5,000 kWh/yr.
ENERGY CONSERVATION AND EFFICIENCY IMPROVEMENTS | G–EN5

LIGHTING
Annual lighting energy savings from the retrofits listed below are estimated at 115,000 kWh/yr, with a CO$_2$ reduction of approximately 110.8 MTCO$_2$e/yr.

- As discussed in section G-EN4, all of G/BA’s general office lighting has been retrofitted from the initial lighting in the building, which had four T12 fluorescent lamps and a magnetic ballast in each fixture. These retrofits reduced the lighting power usage to about one-third of the initial wattage. G/BA subsequently convinced our landlord to retrofit lighting throughout the building, with new standards serving as the basis for additional space build-outs by building management.
- Approximately seven of the 2x4-foot fluorescent fixtures have been recently retrofitted with tubular LED lamps, which further reduce the fixture wattage.
- Wall Switch Occupancy Sensors: This type of automated control replaced the standard manual wall switch in all of the third-floor private offices. They are also installed in third-floor support areas, such as the copy room, break room, kitchen, and plotter room. G/BA recently added this sensor type to the two private offices in our fourth-floor suite.
- Ceiling-Mounted Occupancy Sensors: The third-floor men’s restroom uses this sensor type with wireless communication to the wall switch. This control prevents lights from being left on at night, weekends, and extended periods during the day when unoccupied.
- Integrated Occupancy Sensors: Two fixtures near the main third-floor printer area have occupancy sensing built into the tubular LED retrofit lamps. These lamps operate at two light levels. The lower light level is the default setting. Upon occupancy detection, the fixture tubes go to full power.
- Photocells: The atrium light fixtures have three operating levels that depend on the amount of light detected through the atrium skylights. Two photocells are located in the ceiling of the fifth-floor office space. During full sun, only the center lamp of the three biax lamps is powered in each fixture. At moderate light levels, only the two outboard lamps are powered. With low ambient light levels, all three lamps are powered in each fixture.
- Bi-Level Switching: This type of manual control is used by the network administrator for control of lighting in the network server room.
- The newly renovated fourth floor utilizes lighting controls to help reduce energy consumption. The design includes a daylight harvesting zone, occupancy sensors in private offices and conference rooms, and dimming controls in conference rooms.
OFFICE EQUIPMENT
Pursuant to our Sustainability Policies, the workstation printers are ENERGY STAR and Ecologo CCD 035 certified. Additionally, all personal computers are custom-made by our in house IT staff, and, although they cannot achieve certification, we have confirmed that they meet all of the ENERGY STAR guidelines.

The two third-floor main scanner/copier/printers have energy efficiency modes that have been adjusted to best allow for efficient use of the equipment. Annual energy savings from this office equipment improvement is expected to be about 1,000 kWh/yr, with a CO₂ reduction of approximately 0.96 MTCO₂e.

KITCHEN AND RESTROOM EQUIPMENT
Efficiency improvements for kitchen appliances are prioritized when appliance replacements are necessary.

The most recently purchased refrigerator (fourth floor) is ENERGY STAR certified. Dishwashers in the third and fourth floor break rooms exceed ENERGY STAR requirements for water by at least 20%, and also have energy reduction features.

A new hand dryer was installed in the third-floor men’s restroom in 2014, to reduce paper towel waste. This is a high-efficiency model that uses one-third less power than other hand dryers and is 23 dB quieter. Efficient equipment will be prioritized when the women’s restroom is upgraded in 2018.

VEHICLES
In addition to its efforts to reduce building energy consumption, G/BA is striving to operate an environmentally responsible fleet of company vehicles. Vehicles include two hybrid vehicles, one plug-in hybrid, and five high-MPG gas-powered vehicles.
SUSTAINABILITY STRATEGIES RECYCLED AND SUSTAINABLE MATERIALS | G4–EN2; G4–EN14

All small-format office paper used in 2017 contained at least 35% post-consumer recycled content and was Forest Stewardship Certified. This paper is chlorine-free. Larger-format paper is Sustainable Forestry Initiative certified. Plotter paper is provided by our plotter supplier; we do not have control of plotter paper purchasing. However, our technical staff is increasingly using digital files rather than printed plans with its clients. When paper copies are desirable for in-house reviews, staff members are encouraged to output in smaller sizes rather than using the plotter.

In 2017, G/BA completed third-floor renovations to create a large new conference/training room, as well as a new open stair in the atrium between its third- and fourth-floor offices. Sustainability specs included:

- 75% waste material recycling. Existing partitions, drywall, wall studs, and carpet were sent to a local recycling facility. All metal ductwork and electrical conduit were also recycled. Existing cabinets were taken by a member of the building facility staff for personal use.
- Material reuse. Carpeting was pulled from existing attic stock. Furniture was a mix of tables from storage and newly purchased items.
- Indoor air quality. The contractor used an air scrubber throughout the project, reducing construction dust. All paints, stains, and carpet glue were low-VOC products.
- Sustainable materials. Products included Tubelite aluminum storefront (regional product produced in Michigan; finishes are applied using environmentally friendly processes); Nevamar plastic laminate cabinet fronts (FSC and GREENGUARD certified); quartz solid-surface countertops (GREENGUARD certified); and Titus ductwork (LEED certification eligible).
- Lighting. All fixtures in the training room area were switched from compact fluorescent to LED.

In addition, the company purchased 39 office “visitor chairs” to replace worn chairs in 2017. HON Ignition chairs were selected. HON practices Lean design and manufacturing to minimize use of raw materials and ensure efficient use of natural resources to reduce products’ environmental footprint. Products are designed to minimize indoor air emissions and maximize future recyclability of items.

To keep the older chairs out of the waste stream, G/BA employees were offered the opportunity to take them home. Chairs not wanted by staff were donated to a local church.

Coffee service is provided as a benefit to G/BA staff. The firm purchases several coffee blends that are organic, Fair-Trade Certified, or Rainforest Alliance Certified. All coffee blends are produced with sustainable farming methods.
ENVIRONMENTAL PERFORMANCE MATERIALS AND UTILITY USAGE | G4–EN1; G4–EN8

In 2017, paper usage in our small-format workstations totaled approximately 2,200 pounds, averaging 183 lbs/month and 213 sheets/employee/month (210,000/year). By comparison, the U.S. Environmental Protection Agency estimates that the average office worker uses 10,000 sheets per year. G/BA’s printers all default to double-sided printing, and the firm continues to emphasize digital documents for communication with both internal and external clients.

Our estimated water usage for 2017 (using industry standard assumptions and currently installed fixtures) was 238,201 gallons/year. This includes both the third-floor and fourth-floor office areas.

BENCHMARKING OUR CARBON FOOTPRINT | G4–EN16

2017 was the fifth year in which G/BA tracked data related to our corporate carbon footprint. Due to restrictions in our office building, we are presently only able to estimate our direct utility usage. Energy usage is based on our percentage (based on square footage) of the overall building’s actual electricity use. Our office building is 100% electric. Water consumption is based on calculations performed using installed plumbing fixtures and industry assumptions. The direct emissions that we were able to track included small-format paper usage. In future years, we hope to be able to track additional emissions sources such as employee work-related travel, employee commuting travel, and waste (including recycling).

The pie chart below shows that the majority of our currently reported emissions come from energy usage.

Grumman/Butkus Carbon Footprint 2017

<table>
<thead>
<tr>
<th></th>
<th>2017 MTCO₂e</th>
<th>2013 MTCO₂e (baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>239.77</td>
<td>194.68</td>
</tr>
<tr>
<td>Paper¹</td>
<td>2.49</td>
<td>3.17</td>
</tr>
<tr>
<td>Water²</td>
<td>0.76</td>
<td>0.59</td>
</tr>
</tbody>
</table>

¹ Calculated using the Environmental Paper Network (including recycling)
² Calculated based on the EPA’s GHG Conversion Tool

Grumman/Butkus 2017 GHG Emissions MTCO₂e

- Purchased Electricity, kWh
- Paper Usage, lbs
- Water Usage, Gallons
OFFICE WASTE & WATER MANAGEMENT | G4–EN8; G4–EN18; G4–EN23

In addition to promoting the use and purchase of sustainably-produced goods, G/BA encourages the recycling of waste whenever possible. In 2013, G/BA initiated a building-wide recycling program for non-paper goods to supplement the existing paper recycling program already in place; this program has remained in place. We offer rechargeable battery, small-electronics, and compact fluorescent lamp (CFL) recycling that employees may use to dispose of used items generated both in their homes and in the workplace. Signage indicating the location of available recycling receptacles is posted throughout the office.

All of our e-waste is disposed of through trusted services or given away to our employees in periodic raffles.

G/BA also strives to generally reduce the amount of waste we generate. Double-sided printing is the default setting for all of our in-house printing, and we have encouraged the digital transmission of documents using cloud-based services (e.g. ShareFile, CxAlloy) wherever possible to reduce the amount of paper we generate.

The third-floor men’s room has a hand dryer that reduces paper towel use. We anticipate 2018 remodeling of the third-floor bathrooms including hand dryers in both men’s and women’s rooms. The fourth-floor office uses restrooms that are outside the G/BA suite.

To reduce water consumption, we have worked with our landlord in providing low-flow fixtures in third-floor restrooms.
All new employees were issued a company-provided water bottle in 2017 (continuing employees had already received them), complementing a filtered water dispenser in our break rooms and a hallway bottle-filling station offering chilled, filtered water. These amenities are part of our ongoing effort to discourage employees from buying bottled water.

The new dishwasher installed as part of the 2016 4th floor remodeling exceeds ENERGY STAR requirements for water consumption by more than 20%. The unit in the 3rd floor break room also significantly exceeds ENERGY STAR requirements for water consumption. We will continue to purchase water-conserving and energy-efficient dishwashers for all future needs.

In May 2017, G/BA contracted with Evanston firm Collective Resource for commercial composting services. Weekly delivery and pickup of a 32-gallon tote is provided, with G/BA staff collaborating to fill the totes from smaller containers in the third- and fourth-floor break rooms. Collective Resource delivers the compostable materials to a commercial facility, which can handle “anything that was once alive.” An estimated 10 to 15% of our office waste stream (by volume, excluding recyclable paper and cardboard) is now being composted.
SOCIAL: LABOR PRACTICES AND DECENT WORK

WORKFORCE SIZE AND DEMOGRAPHICS | G4–LA1; G4–LA13

G/BA strives to hire, train, develop, promote, and retain minority and female staff. We currently have 19 women on our staff, including engineers and technical and administrative support staff.

At the end of 2017, the Evanston (Chicago region) office had 82 total employees. The firm enjoys a culturally diverse staff with people from a variety of ethnic backgrounds.

NEW HIRE AND TURNOVER RATE | G4–LA2

G/BA is growing. In 2017 G/BA hired seven new staff. Over the summer months, we employed two college interns.

G/BA successfully retains our staff and typically enjoys a very low turnover rate. In 2017, four people left the firm.

CONTINUING EDUCATION | G4–LA10; G4–LA11

G/BA seeks to create a supportive environment for its employees that develops them in their jobs and empowers them with the ability to make independent decisions.

G/BA has an aggressive continuing education program for employees. Employees are encouraged to attend seminars and technical training sessions and to join technical and professional organizations and attend their meetings. Licensed professional engineers are required to maintain bi-annual Professional Development Units (PDUs). G/BA and its suppliers provide ample in-house seminars to assist the engineering staff in maintaining this continuing education requirement. G/BA also has a tuition reimbursement program for employees who wish to pursue additional formal educational training. All G/BA training and educational policies are spelled out and available to all staff through the employee handbook.

PERFORMANCE REVIEWS | G4–LA12

All G/BA staff receive an annual performance review. The review is an interactive event in which the employee can discuss job performance and goals with a G/BA Principal. The Principal has the opportunity to identify effective performance, address work-related problems, and establish goals for future performance, growth, and career development.
HOSPITAL ENERGY AND WATER BENCHMARKING SURVEY | G4–PR1

Every year since 1995, G/BA has compiled data for its annual Hospital Energy and Water Benchmarking Survey (HES). Hospitals are invited to participate in the survey by submitting responses to a short list of questions regarding their usage of electricity, natural gas, oil, purchased steam, purchased chilled water, and domestic water/sewer.

G/BA provides this benchmarking service free of charge to aid the healthcare market in evaluating performance. The HES has helped hundreds of hospitals benchmark their energy performance against others in an anonymous format. Participants are provided with graphic comparisons to all hospitals in the survey as well as numeric comparisons to their facility’s overall average usage and costs. The data graphed in the survey includes:

- Fossil fuel energy consumption in Btu/sf/yr
- Fossil fuel energy cost in $/sf/yr
- Average fossil fuel energy cost in $/therm
- Electric energy consumption in Btu/sf/yr
- Electric energy cost in $/sf/yr
- Average electric energy cost in $/kWh
- Total energy consumption in Btu/sf/yr
- Total energy cost in $/sf/yr
- Average water and sewer cost in $/thousand gallon
- Carbon footprint in lbs/sf/yr

G/BA is able to assist the participating facilities in analyzing the data and determining measures to reduce energy consumption, and ultimately, carbon footprint.

Results of the survey are also available free to the public at grummanbutkus.com/HES

ADHERENCE TO CODES | G4–PR3

Professional engineering services must adhere to a number of codes, including building codes and energy codes. Also, engineering work in hospitals includes regulations established by the Illinois Department of Public Health.

G/BA views all codes, especially the energy codes, as a minimum requirement and strives to design systems that exceed the requirements.

CUSTOMER SATISFACTION | G4–PR5

G/BA’s quality management program consists of four key elements: ensuring client satisfaction, creating a supportive environment, developing a team concept, and using effective procedures. Not only does our quality management program help to ensure the highest standards of engineering product output and client satisfaction, but our employees are also invested in the process, and their longevity with G/BA attests to their satisfaction.

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**Year 2017 G/BA Hospital Energy and Water Benchmarking Survey**

For 2016 Fossil Fuel Energy Consumption (BTU/SF/YR)

Fossil fuels included in the survey include natural gas, fuel oil and district steam.

Facilities with Absorbers: 18, 24, 46, 48, 51, 53, 57, 80, 95, 100, 104, 107, 206, 215, 219, 221 and 222

Facilities with Electricity Self-Generation: 19, 23, 24, 40, 46 and 107


Facilities with In-House Laundry: 19, 30, 79, 84, 97, 98, 105, 200, 210, 211 and 223

Facilities with Purchased Chilled Water: 63, 64, 65, 89, 80, 91, 111, 120, 200, 206, 216 and 222

Facilities with Purchased Steam: 59, 63, 64, 69, 78, 80, 111, 112, 200, 206, 213, 216 and 222

Facilities with Geothermal Systems: 19, 19, 38, 41, 49, 50, 201, 202, 222 and 224
**THE G/BA SUSTAINABILITY TRACKING COMMITTEE**

G/BA started our in-house Sustainability Tracking Committee in 2013, and the group has remained active. The committee engaged staff in events throughout the year to promote in-house sustainability efforts and to make the efforts fun.

On April 21, 2017, G/BA celebrated Earth Day with a number of festivities. The day included a pot-luck lunch with a presentation on sustainability initiatives in Evanston by Kumar Jensen (below) from the City of Evanston. That afternoon, a sustainable happy hour featured wines, locally produced sodas, craft beers, and snacks. We also staged a poetry-writing competition related to the holiday. A 50/50 raffle was held, with 50% of the total donated to the Evanston Environmental Association. The event concluded with a drawing for sustainable prizes, which were awarded to staff. The Sustainability Tracking Committee will again use Earth Day in 2018 to celebrate sustainability efforts.

The committee supported employee health by organizing a February Stair Challenge, inviting teammates to add movement by using the stairs to access the third- and fourth-floor office space at 820 Davis St. Thirteen employees participated in the challenge.

The committee also sponsored employee participation in the two-week Chicagoland Bike Commuter Challenge, sponsored by the Active Transportation Alliance, in June 2017. Seventeen staff members commuted 144 trips during the challenge period, a total of more than 1,300 miles. The firm ranked fourth among participating firms with 25 to 99 employees and 34th overall among 306 organizations. Vice President John Villani logged an impressive 591 miles and earned recognition as the Top Male Rider in the event.

The Sustainability Tracking Committee was responsible for benchmarking and tracking our sustainability efforts. Members of the committee compiled this report.

In 2018, G/BA and the Sustainability Tracking Committee plan to continue exploring and supporting sustainability initiatives. As a leader in energy consulting, G/BA is also “walking the walk.”

The committee supported employee health by organizing a February Stair Challenge, inviting teammates to add movement by using the stairs to access the third- and fourth-floor office space at 820 Davis St. Thirteen employees participated in the challenge.
G/BA acknowledges the 2017 Sustainability Tracking Committee for their efforts:

Heather Beaudoin
David Cohen
David Eldridge
Joel Freeman
Julie Higginbotham
Deborah Korkosz
Jordan Martin
Frank Sanchez
Eric Peyer