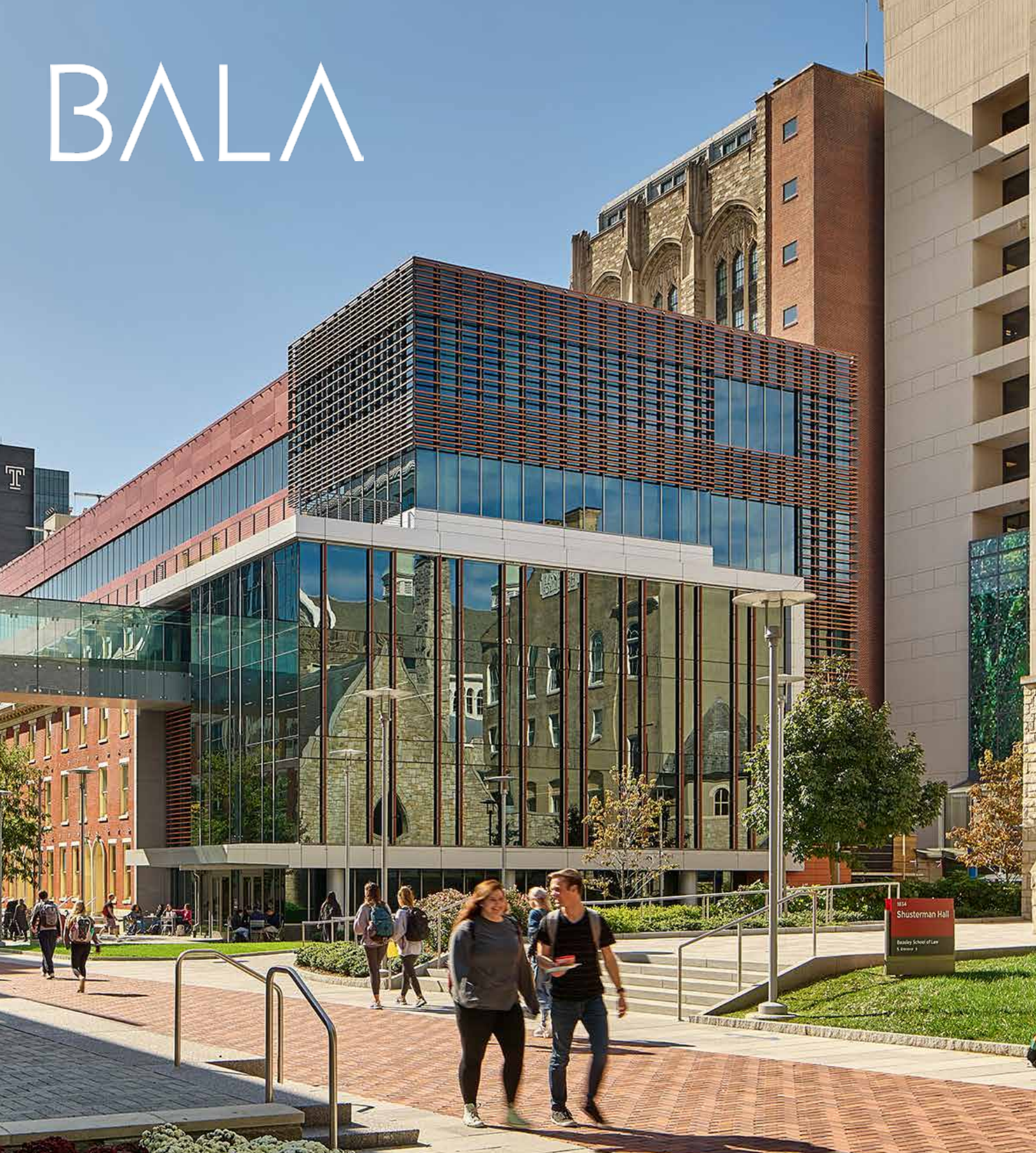


# BALA



BALA CONSULTING ENGINEERS  
HIGHER EDUCATION

# FIRM INFORMATION

Bala's mission focuses on People, Environment and Social Well-being. We are built on relationships first — relationships with our staff, clients and business partners. Bala's culture creates an environment for relationships to thrive and careers to flourish, helping our employees and clients achieve their personal and professional goals. Our passion and thought leadership for sustainability coupled with ideation focuses on creating an improved quality of life - for people and the environment. We create meaningful relationships and spaces that connect all people.

**40+**  
YEARS IN  
BUSINESS

**200+**  
EMPLOYEES

**5**  
OFFICES



## OFFICE LOCATIONS

PHILADELPHIA, PA  
(Headquarters)  
1285 Drummers Lane  
Wayne, PA 19087

NEW YORK, NY  
462 Seventh Avenue  
19th Floor  
New York, NY 10018

BOSTON, MA  
52 Temple Place  
Boston, MA 02111

BALTIMORE, MD  
8140 Corporate Drive  
Suite 150  
Baltimore, MD 21238

WASHINGTON, DC  
1515 Wilson Boulevard  
Suite 710  
Arlington, VA 22209



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# WHO WE ARE

## About Bala

Bala Consulting Engineers is a multi-discipline engineering and design organization comprising more than 200 engineers, designers, and support personnel. Established in 1982, Bala services educational, commercial, institutional, and industrial clients. We are privately held and actively managed by our Principals. Our staff is licensed to practice in 45 states and have completed projects both nationally and internationally.

## Serving Higher Education

Bala has been at the forefront of providing critical and technologically advanced engineering for more than four decades.

Our project history is rich with solving complex engineering challenges for over 100 universities and independent schools.

Bala's versatility enables us to provide a wide range of services for education project types including research/teaching laboratories, classrooms, libraries, athletic facilities, residence halls, campus utility upgrades and others depending on the needs of the institution.

Our services span all project phases from site selection and space planning through preliminary and detailed design, bid documentation, contract administration and post-construction support.

**100+**  
UNIVERSITIES  
& SCHOOLS

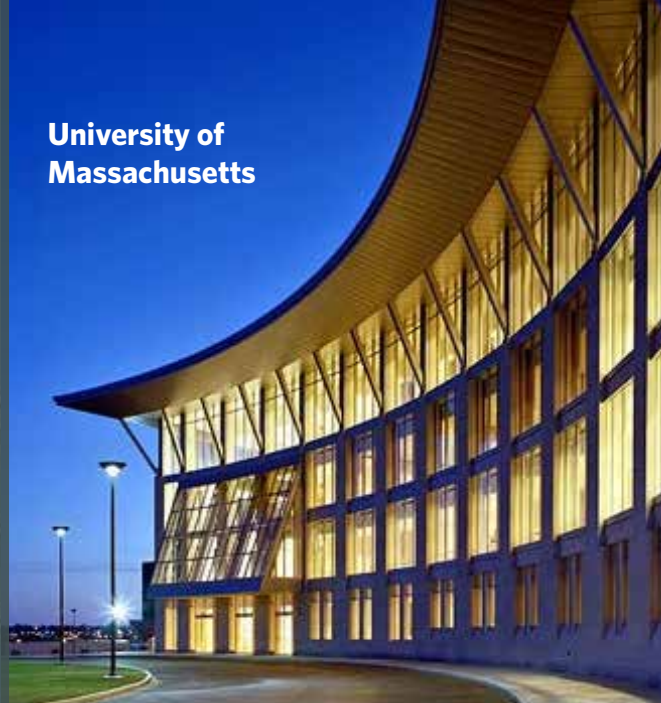
## Practices

- Mechanical
- Electrical
- Plumbing / Fire Protection
- Structures
- Technology
- Commissioning
- Sustainability

## Services

- Master Planning
- Digital Planning
- LEED Design & Commissioning
- Sustainability Strategies
- Building Operations Support
- Critical Systems Testing
- Telecommunications
- Audiovisual Systems

# HIGHER EDUCATION HIGHLIGHTS





# BALA EXPERTISE

STUDENT HOUSING  
ACADEMIC  
ENTERTAINMENT & PAC  
STUDENT LIFE  
DECARBONIZATION  
TECHNOLOGY  
CLIMATE RESILIENCY

# STUDENT HOUSING

## Enabling Community Development

Understanding how students engage on campus, where and how they collaborate, how they connect, and what nurtures community building is at the core of Bala's holistic engineering and technology services for building an engaging space to call "home" while on campus.

We are an active stakeholder in building communities. A residence hall is now defined as both a home and a place of learning. When the classroom can be as close as your bed or 100' down the hallway, universities have to juggle between the consumer needs of students and the commercial technology requirements of our learning platforms. We can't make every lounge a full lecture hall but we need to focus on opportunities to bring any potential education space up to new standards that have been established for student comfort.

Whether university owned or a public developer/university (P3) project, Bala works with administration to deliver student spaces that are aesthetically interesting and functional. Living space that has all of the technologies students demand, and the security to keep them safe, is a priority at Bala.

**30,000+ STUDENT HOUSING BEDS  
DELIVERED FOR 20+ COLLEGES  
& UNIVERSITIES**

## Bala's services enable the creation of:

- Stylish and functional individual spaces
- Flexible lounges
- Remote learning in room, or in lounge
- In-residence hall mental health facilities
- Full building automation
- Retail, recreation, outdoor and cafe spaces



### PROJECT HIGHLIGHT

Lehigh SouthSide Commons is a 5-story, 163,460 SF undergraduate student housing facility with 426 beds. The rooms are a mixture of singles, doubles, triples, and quads. It also includes 3 courtyards and surface parking lot.

## Unique Services

- MEP/FP Engineering
- Structural Engineering
- Commissioning
- Office to Student Housing Design
- Technology Design
- IT Infrastructure Cabling
- Security Design

## Signature Projects

**PRINCETON UNIVERSITY**  
Meadows Graduate

**VILLANOVA UNIVERSITY**  
The Commons

**UNIVERSITY OF PENNSYLVANIA**  
Sansom East

**MORGAN STATE**  
Thurgood Marshall Hall

**IT'S NOT JUST A DORM ANYMORE  
IT'S AN ENTIRE WORLD**



# ACADEMIC

## Dynamic Classrooms Are Expected

Providing flexible academic space that promotes student development is essential. Students who have been learning in sophisticated K-12 environments are expecting curriculae that is inspirational about their future career paths and fully prepares them to leave school ready to jump straight into professional worlds. Students are demanding professorial engagement to be individualized and instantaneous using all of the communications methods they use in their daily lives. All of this has translated into adding more pressure on academic institutions to provide state of the art classrooms regardless of undergraduate or graduate-level programs.



UNIVERSITY OF PENNSYLVANIA  
Tangen Hall

## Signature Projects

**CARNEGIE MELLON UNIVERSITY**  
Cloud Lab

**TEMPLE UNIVERSITY**  
Fox School of Business

**UNIVERSITY OF DELAWARE**  
Otis Smith Lab

**ST. JOSEPH'S UNIVERSITY**  
Science Center

**LEHIGH UNIVERSITY**  
Iacocca Hall & Whitaker Lab & Data Center

**UNIVERSITY OF PENNSYLVANIA**  
Tangen Hall

Because Bala has focused on both academic and non-academic environments for more than 40 years, we are able to parlay our technical expertise preparing professional environments into scholastic space development. We understand the pressures on internal systems from incorporating advanced laboratory and communications systems, especially when retrofitting existing rooms, and can provide solutions for safely creating these advanced classroom settings.

## Unique Services

- Fundamental & Enhanced Commissioning
- MEP/FP Infrastructure Upgrades Planning & Design for Building Repositioning
- Structural Planning & Design for Lab Systems for Adaptive Reuse
- Digital Equity Planning for Hybrid Teaching Environments

## Science + Innovation Fostered by Colleges & Universities

Academic research & teaching laboratory needs differ from commercial lab spaces. Some unique aspects of academic labs include:

- Labs are designed for many and frequently changing users
- Labs accommodate a multitude of functions
- Institutional standards must be incorporated into designs
- Labs often require upgrades of older systems



LEHIGH UNIVERSITY  
Health, Science and Technology

## PROJECT HIGHLIGHT

University of Pennsylvania  
Tangen Hall

**70K SF**  
Building  
Size

MEP/FP Engineering  
IT Infrastructure Cabling  
Security Design

Tangen Hall is the first-ever dedicated space for cross-campus student entrepreneurship at Penn.

Located at 40th and Sansom Streets, the building is 70,000 SF and includes meeting and collaboration spaces, storefront retail space for student ventures, a test kitchen for food-centric startups, a Maker Lab, a Virtual Reality cave and a cafe. Bala provided MEP/FP design services.

LEED Silver Certification

# ENTERTAINMENT | PERFORMING ARTS CENTERS

## Delivering Premiere Performance Venues

Theaters and performance arts centers (PACs) are the hub of activity for university arts. Composed of performance spaces, rehearsal rooms, broadcast centers, and prop management -- to name a few -- these venues can be extremely complicated to create and even more difficult to maintain.

Bala understands how performance spaces are operated and the coordination needed to bring a show in front of the bright lights. We recognize that audience and performer experience is paramount, but we also know that universities need space flexibility to recover some of the cost of ownership for these costly, marquis venues. We work with university administration, arts departments and facilities managers to deliver spectacular, yet versatile PACs with state of the art theatrical lighting, sound and technology.



## Signature Projects

**SETON HALL**  
Bishop Dougherty University Center

**HAVERFORD**  
Roberts Hall

**DARTMOUTH COLLEGE**  
Black Family Visual Arts Center

**TUFTS UNIVERSITY**  
Perry & Marty Granoff Music Center

**TEMPLE UNIVERSITY**  
Ritter Hall

## PROJECT HIGHLIGHT

Villanova University | John & Joan Mullen Center for the Performing Arts

As part of the university's larger effort to increase their presence along Lancaster Avenue, Villanova constructed a new \$60M performing arts center.

The center's two main performance spaces are - a 400 seat Proscenium style theatre and a 200 seat courtyard theatre.

The 85,000 SF center includes a large lobby and atrium featuring a cafe and catering kitchen for students, audiences and receptions. It also includes classroom and rehearsal spaces, dance and art studios, a scenery shop and offices. One of the larger rehearsal spaces also serves as a performance lab for small audiences.



## Unique Services

- Broadcast Studio Design
- Sound, Video & Communication Systems
- Integrated Control Systems
- New & Existing PAC Upgrades
- Portable Event Spaces - Outdoor Venues
- Specialty Rigging Design
- Balcony & Parking Structures

# STUDENT LIFE

## Building a Life on Campus

Student life encompasses an ever-widening array of activities and amenities to support them. Wherever students work out, hang out, and eat out is an opportunity for an improved collegiate experience. On-campus gyms and facilities rival professional athletics. Cafeterias resemble upscale restaurants and cafes. Libraries are research technology hubs and gathering centers for groups and individuals. There is space for every interest. Are you a gamer? Here are rooms where you can gather and play in groups. Into yoga and meditation? Studios and meditation spaces with soundproofing and individual temperature controls can be found in student centers as well as in residence halls.



All of these amenities can be a collegiate recruiter's dream, or their worst nightmare. As prospective students visit schools to make one of the biggest decisions of their young lives, the range of student life options is very high on the list for selecting a college.

## Unique Services

- HVAC Design Assessment & Upgrade
- Indoor Air Quality
- Digital Planning
- Smart Building Systems / IOT

Enabling the quality and diversity of activities on campus is a Bala specialty. All of these spaces have HVAC, plumbing, electrical and technology requirements. Gamers cannot play if there are internet capacity constraints. Lighting control and design can be critical to creating a space that students want to hang out in. Gym cooling and indoor air quality are paramount for an optimal training experience. Bala provides the infrastructure to support a quality student life program.



## Signature Projects

UNIVERSITY OF THE SCIENCES  
Recreation Facility

PHILADELPHIA COLLEGE OF  
OSTEOPATHIC MEDICINE  
Activities Center

RUTGERS UNIVERSITY  
Robert Wood Johnson Health Athletic  
Performance Center & Livingston  
Student Center

UNIVERSITY OF PENNSYLVANIA  
Sansom Place East



RUTGERS UNIVERSITY  
Robert Wood Johnson Health Athletic Performance Center



# CAMPUS DECARBONIZATION

Universities have taken the lead in decarbonization planning and execution. Providing safe and healthy places to live and work for students, faculty and staff has always been a priority, and sustainability initiatives have moved front and center as a means to achieve these campus goals.

More than 650 higher education institutions have signed on to The President's Climate Leadership Commitment. However, in many cases these pledges occurred prior to concrete plans for actually executing on this commitment. This has left many institutions in need of practical planning guidance and expertise across all campus facilities to meet these important deadlines, some of which are arriving by 2030. Bala has that expertise.






## A True Partner for Efficiently Achieving Campus-Wide Decarbonization on an Aggressive Schedule

### Unique Services

- Net Zero Planning & Design
- Building/Campus Electrification
- Carbon Accounting & Mitigation
- Building Certifications
- Energy Modeling
- Whole Building Life Cycle Assessments
- Building Audits & Life Cycle Costing
- Building Electrification
- Renewable Energy
- Sustainable Product Vetting
- Adaptive Reuse

Bala helps you navigate the ever-changing complexities of implementing sustainability programs. We have worked with world-class educational institutions who are finalizing their master sustainability plans and are moving into implementation phasing. This includes assuming the role of liaison between university leadership, campus design, and facilities management to develop a framework for implementation and prioritization of new and existing buildings across university grounds.

### Bala's Process

-  **Phase 1** - Facility Condition Assessments & Energy/Greenhouse Gas Emissions Audit
-  **Phase 2** - Goal Setting
-  **Phase 3** - Analysis, Design & Phasing
-  **Phase 4** - Life Cycle Cost & Carbon Analysis
-  **Phase 5** - Implementation

## Building Electrification Creating Pathways to Net Zero Buildings

Designing all-electric buildings and using renewable energy are some of the most feasible and effective solutions to reduce buildings' GHG emissions. These practices improve air quality, offer an affordable and secure energy supply, and increase efficiency. Bala understands the value and importance of all-electric design in order to help campuses achieve their net-zero commitments.

### Staff Accreditations



## Maximizing Adaptive Reuse of Campus Structures

The most sustainable building is the one that already exists and there are many buildings on campuses that will not be replaced. Adaptive reuse not only reduces building materials, embodied carbon and energy consumption, but it also revives communities. Bala has been involved in several adaptive-reuse projects that prioritize minimal environmental impacts and breathe new life into old structures. These projects create new opportunities to bring people together for new purposes.

# TECHNOLOGY

## Technology in Higher Education is EVERYWHERE

Bala's Technology practice group marries our digital and physical environments; aligning pedagogy, community, security and resilient building design into a holistic technology infrastructure.

### Space Planning

Bala's classroom technology designs address the physical requirements of the space including space sight lines, seating layouts, lighting and finish impacts to digital engagement. Our hybrid classroom planning work addresses a variety of room modes and collaboration opportunities while working with education technology staff to minimize the complexity of av and telecommunications systems.



### Unique Services

- Long Range Planning
- Classroom AV Design
- Broadcast AV Design
- Digital Experience Design
- Wi-Fi Heat Mapping
- Distributed Antenna System
- Campus Security Planning

### Campus Security and Planning

For many of our clients, upgrading access control and video surveillance platforms to address emerging new campus security requirements is a key focus of new capital improvement projects. Bala's security planning work can address individual building requirements or a campus approach to security technology deployment and management. Either integrated into the campus telecommunications backbone or as separate security cabling plant, our work will address security resiliency, ongoing and future upgrade opportunities and managing a growing security infrastructure.



### Community Building Through Technology

Outside of the classroom: in dorms, libraries, common spaces, the hallways between classrooms and social media is where our campus communities are built. Digital enablement of these spaces allows our physical and digital communities to meet and reduces the barrier to engagement. Often this is seen in small efforts: a student lounge display with remote collaboration capability to bring a TA into a study session or a cafeteria menu board with web feed for students with visual impairments provide opportunities for access to people and information that otherwise would have been a barrier to access. Bala's designs focus on the human aspects of educational technology with the goal of serving the widest community with an appropriate application of technology.



### Support for Emerging Pedagogies

We learn wherever people come together to share information and support each other. Whether synchronous, asynchronous, in person or virtual; access to digital collaboration and creation tools is essential to the learning process and the speed at which we can access and utilize these tools helps define the quality of the learning experience. The ability to react to new teaching practices, program requirements and student needs is supported by simple to use and deploy systems. Bala's education technology design work addresses digital engagement and focuses on providing these easy to use and manage technology platforms.



## DIGITAL EQUITY

all participants having a common experience, toolset and ability to contribute in a collaboration to facilitate a more sustainable and inclusive experience

# CLIMATE RESILIENCY

## Preparing for Climate-Change Impacts on Campus

Administrators and facilities managers are increasingly facing extreme weather conditions that were unheard of in the past.

Universities in northern and midwestern states were ready for snowstorms and had plans and systems in place for handling them. Now, they are facing the opposite with sweltering temperatures while students are still on campus. Dorms and classrooms that never had air conditioning are having to be retrofitted into structures that are lacking the ductwork and power generation needed to run them. Tornadoes are becoming more frequent in the northeast. Smoke from fires choked campuses from Chicago to North Carolina. The repercussions of climate change are affecting all universities everywhere.

The new normal is that there is no normal. Campus management, and their facilities team's responses, have to be flexible to ensure that students, faculty and staff are safe and protected. New and existing buildings need resilience assessments that take into account current and future climate risks in order to plan or upgrade accordingly.

With a keen focus on the adaptability of all building spaces, Bala has the expertise to perform climate risk and resiliency studies. From hurricanes, flooding and sea level rise, high winds and tornadoes to ambient temperature rise - we provide proactive climate solutions and retroactive design options.



### Unique Services

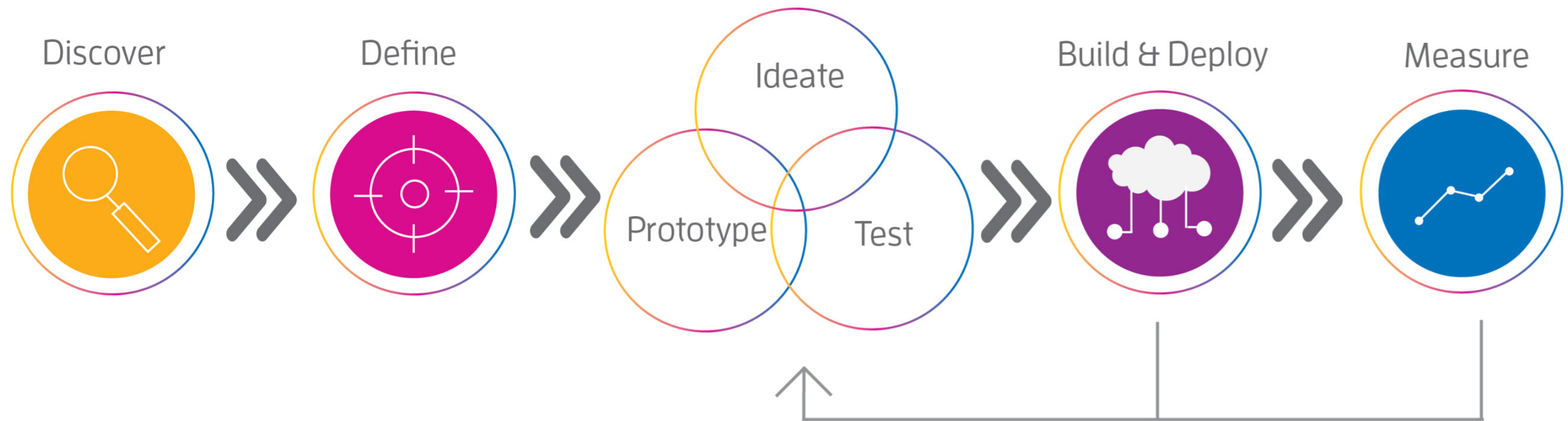
- Resilience Assessments
- Mechanical Equipment and Placement Review
- Structural Analysis
- Indoor Air Quality Assessment & Ventilation Design
- Upfront and Operational Adaptation Strategy Planning



PREPARING FOR  
*WARMER WETTER WINDIER*



# IDEATION



Bala Ideation was formed around the understanding that our work is in the service of the users who occupy and manage the spaces we design. To meet the evolving needs of our users requires creating spaces which are resilient not only to future construction and technology improvements but to changes to the mission and importance of place.

Resilience is a measure of the ability to facilitate change in a building and this property is woven into a design by employing an agile design process that relies on prototyping, information gathering and informed iteration. When change is built into the design process it is inherited into the design itself.

Bala Ideation re-aligns our practice groups to our mission of sustaining people through design. Regenerative Design emulates nature's power, harnessing technology, nature and the environment to renew energy and materials while also contributing to social equity in the local community. Using principals of **regenerative design** and design thinking, we began looking at our work as the net

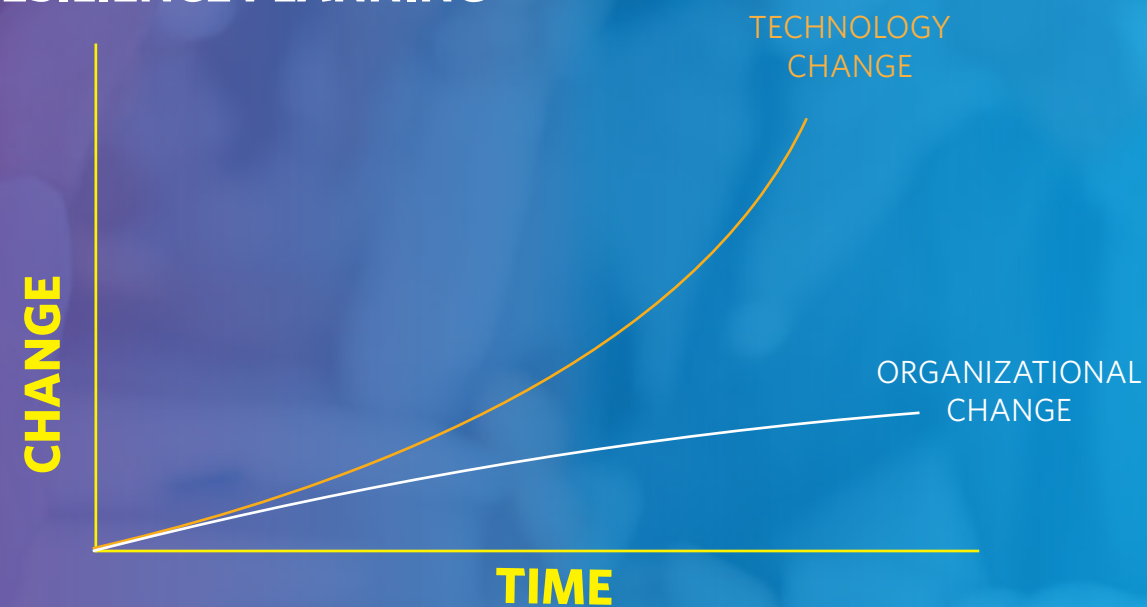
impact to the health and welfare of the communities we serve as well as our own staff. We encouraged our staff to approach projects from a holistic systems approach and use our practice group engineering capabilities as a flexible toolset to apply in service of the overall project goals. We introduced new deliverables focused on client education and consultative leadership.

Ideation requires the flexibility to evaluate and modify any piece of the design process, including the traditional design-bid-build format. Successful projects are built from partnerships between owners, the design and construction team that last well past occupancy. Prior to any design effort, procurement and contracting options are evaluated which then inform the design process, material selection and the ability to integrate ideation into the construction and turn-over process. **Integrated Design** goes beyond BIM coordination and clash detection and informs all design team members of design progress and shows how change can improve the user experience.

# IDEATION

is the key factor in the creation of resilient designs, positioned to grow and evolve to user and business requirements.

## RESILIENCE PLANNING



With the rate of technology change outpacing the ability for most organizations to react, our buildings need to be platforms for change; with resilience being a core aspect of design.

Ideation is embracing an agile development process in our sometimes-rigid construction environment which provides our clients and our own team members the space to learn by doing. Most importantly, ideation identifies a clear set of project goals and principals from which all project decisions can be weighed against.

Regardless of the project size or importance; ideation benefits all our work.

# CORE PRINCIPALS

1

## DESIGN BY EXCEPTION

Bringing design options to the table to react to. Utilize a foundational systems process to delineate known vs. unknown decisions.

2

## EDUCATION

Education is the first step in our design process. "State of the Possible" sessions are used to level set the project team on current leading edge and future capabilities.

3

## EMPATHY

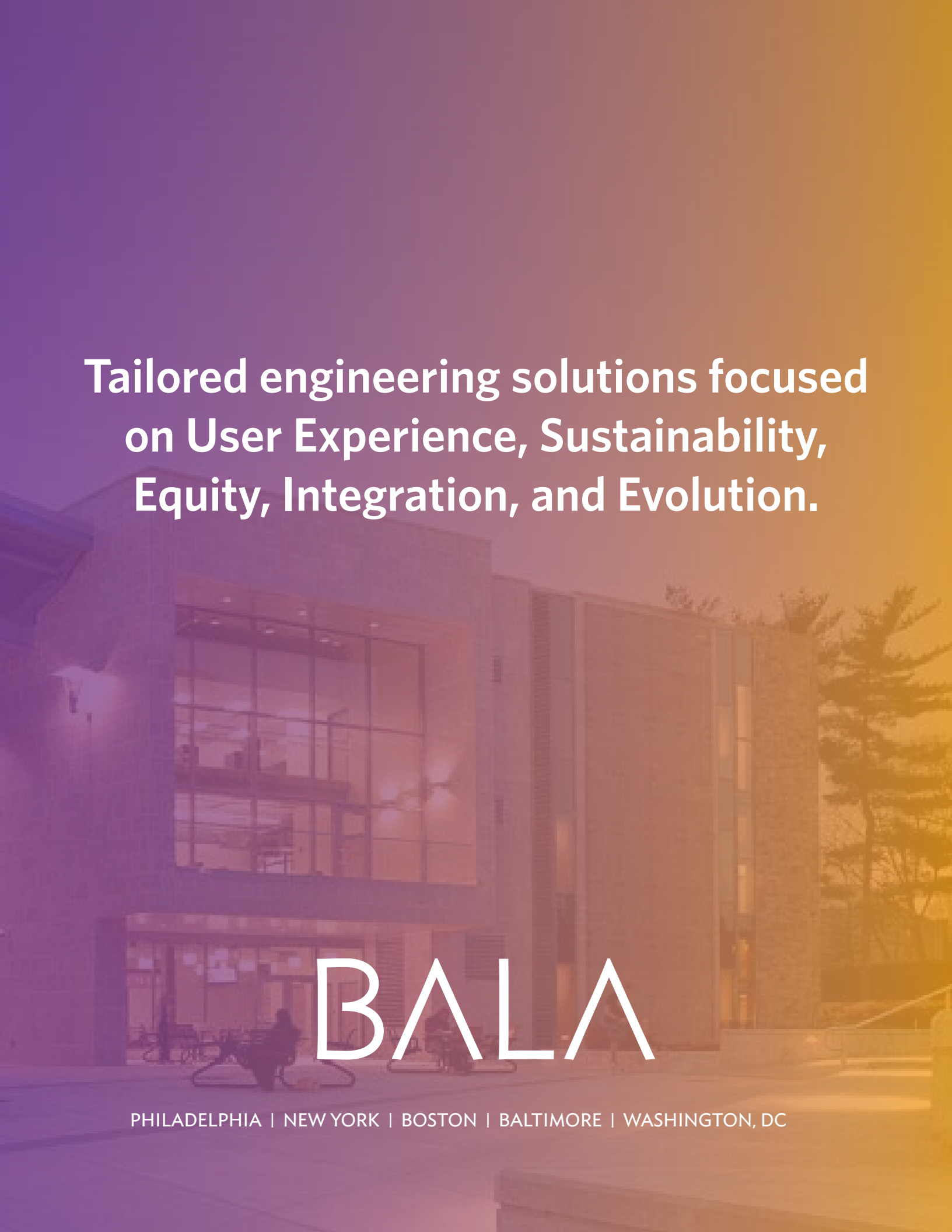
Our process, work product and designs will be matched with the needs of the team and will focus on the combined impact of the physical and digital environment on our users.

4

## FAMILIARITY

Our deliverables are actively built and iterated as part of our meeting cadence and our final deliverables will be the composition of our ongoing work together.

*Agile Innovation, especially in the built environment, must be supported by data driven analysis and user feedback with decisions formed in a collaborative environment.*

A modern building with large glass windows and a courtyard with people on bicycles. The image is overlaid with a purple-to-orange gradient.

**Tailored engineering solutions focused  
on User Experience, Sustainability,  
Equity, Integration, and Evolution.**

**BALA**

PHILADELPHIA | NEW YORK | BOSTON | BALTIMORE | WASHINGTON, DC