University of Virginia
GREEN BUILDING STANDARDS
Appendix G: UVA Facility Design Guidelines

The University of Virginia Green Building Standards outline UVA's minimum expectations for aligning University-wide sustainability goals with building design, construction, and maintenance. The Standards include a comprehensive package of prescriptive requirements, an implementation process to support projects in meeting the Standards in a cost-effective manner, and for capital projects, an enhanced process to embed sustainability into the decision-making process. The Standards consolidate existing Facility Design Guidelines (FDG) Requirements, bring additional value to existing requirements, and propose additional requirements to align projects with meeting UVA's sustainability goals beyond what LEED certification can accomplish or for projects for which LEED certification is not required. Each specification has one or more of the following goals: reduce environmental impact, reduce anticipated life cycle costs, and/or promote healthier and safer buildings.

Section 1 of the Green Building Standards apply to all projects (any project requiring a building or project permit), within the project's scope of work. **Section 2 includes supplemental standards for new construction and major renovations** (for which LEED certification is already a minimum requirement).

Where there is a conflict between the Facility Design Guidelines and this appendix, the more specific and stringent requirement shall be applicable. Where different sections of the Facility Design Guidelines and this appendix specify different materials, methods of construction, or other requirements, the most restrictive shall govern.

Please contact the UVA Office for Sustainability as early in the project as possible:
sustainability@virginia.edu

For more information, including updates, visit:
sustainability.virginia.edu/topics/buildings/greenbuildingstandards.html

TABLE OF CONTENTS

1. GENERAL REQUIREMENTS FOR ALL PROJECTS

The following requirements apply to all projects (any project requiring a building or project permit) and are broken down into five categories: Energy, Indoor Environmental Quality, Material, Water and Site & Landscape.

1.1. ENERGY

The following requirements focus on building energy consumption.

1.1.1. HVAC

1. Equipment rooms (lab equipment rooms, autoclave rooms, and all other spaces with a high heat load) shall be separately zoned and provided with dedicated cooling.
    a. Where dedicated cooling is provided, provide from central chilled water where feasible. Verify chilled water is available year-round.
2. Provide airside economizers for all air handling systems with a cooling capacity equal to or greater than 33,000 Btu/h. The system shall be capable of modulating outdoor air and return air dampers to provide up to 100% of the design supply air quantity as outdoor air for cooling.
3. The maximum allowable fan system power shall be ten percent (10%) less than the requirements outlined in ASHRAE Standard 90.1 (Table 6.5.3.1-1), latest edition for each fan system. Provide a table illustrating fan compliance (e.g., COMcheck compliance form) during all significant design submissions.
4. All heating water systems shall be provided with an outdoor air reset schedule.
5. All heating water strainers, control valves, and balancing valves, including 1" and smaller, shall be insulated in accordance with Table C403.2.10 Minimum Pipe Insulation Thickness of the 2015 Virginia Energy Conservation Code (or current adopted version).
6. Intermittent local exhaust & make up air systems (such as kitchen hoods, paint spray booths, etc.) shall be switched.

1.1.2. REHEAT

1. All equipment served by the reheat system shall be provided with variable flow pumping and 2-way control valves to prevent unnecessary heating. Ensure the heating water system being utilized for reheat is available year-round.

1.1.3. LIGHTING

1. Comply with the UVA Lighting Properties Table – Figure A.
2. Provide lighting power densities (LPD) no greater than the 'Space-by-Space' allowances and/or 'Building Exteriors' allowances provided in ASHRAE Standard 90.1-2016 (Table 9.6.1 and 9.4.2, respectively).
3. The interior lighting average to minimum uniformity ratio shall not exceed 4:1.
4. All site and exterior architectural accent lighting shall be on a separate control circuit, controlled via an astronomical schedule or on a photocell with a schedule override.

5. Provide high trim for all dimmable lighting via the lighting control system.
6. Exterior lighting required for safety and security (including egress) shall be on whenever the exterior is dark. Site and exterior architectural accent lighting should be on a different schedule so it can be shut off during certain hours.

1.2. INDOOR ENVIRONMENTAL QUALITY

The following requirements focus on improving the health and wellbeing of building occupants.

1.2.1. FILTRATION

1. Provide a minimum of a 12", MERV 13 filter with an initial pressure drop no greater than 0.22 in. w.g. (at 1970 CFM) for all outside air units and all other air-handling units with an air volume greater than 2,500 CFM. A separate pre-filter shall not be used. A separate final filter shall only be provided as dictated by programmatic requirements.

1.2.2. ACOUSTICS

1. The Project Manager shall direct questions regarding noise generating equipment and processes or spaces requiring unique acoustical requirements to the University's Office of Environmental Health and Safety. When placing noise-generating equipment, the A/E shall consider uses of surrounding spaces that may dictate sound levels lower than typical spaces.
2. HVAC systems noise levels shall meet Noise Criteria and dBA sound pressure levels specified per ASHRAE 2019 (or most recent) HVAC Applications Handbook, Chapter 49 Noise and Vibration Control. Where sound attenuating treatments may be required, limited extents of acoustical duct liner (per FDG 6.4.5.2) shall be preferred to duct silencers.
3. Provide acoustic duct liner for a minimum of the first 20'-0" on the supply and return/exhaust air unit connections for all air handling equipment 2,500 CFM and above. Provide acoustic duct liner for the first 10'-0" on the supply and return air unit connections for all air handling equipment below 2,500 CFM. These requirements are exempt if otherwise prohibited by ASHRAE Standard 170.
4. Provide acoustic duct liner for the first 3'-0" downstream of all VAV boxes. These requirements are exempt if otherwise prohibited by ASHRAE Standard 170.

1.2.3. HUMIDIFICATION AND DEHUMIDIFICATION

1. Humidification shall not be provided unless required by code or as dictated by unique programmatic requirements. If deemed necessary, evaluate whether humidification should be provided at the air handling unit level or via decentralized systems. All water for humidification shall be reverse osmosis water.
2. A system capable of maintaining a maximum allowable relative humidity of 60% shall be provided.

1.2.4. VENTILATION

1. No outside air shall be provided to spaces during scheduled unoccupied times. If an occupancy sensor determines the space is vacant during scheduled occupied times, the outside air shall be set to the minimum allowed by code. During scheduled unoccupied times, if occupancy is sensed

either by an occupancy sensor or by manual override of a temperature sensor, the requisite outside air shall be provided for that period of time.

1.2.5. DURING CONSTRUCTION

1. Meet or exceed all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3 (Aligned with LEED v4 - Construction Indoor Air Quality Management Plan). Use and customize the UVA IAQ Plan for each project (contact the UVA Office for Sustainability for the most up-to-date plan).

1.3. MATERIALS

The following requirements focus on providing building materials that are safe for contractors and building occupants and provide guidance toward proper disposal of trash and recycling.

1.3.1. LOW EMITTING INTERIOR MATERIALS

1. In conjunction with LEEDv4:
    a. All paints and coatings wet-applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.
    b. All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, July 1, 2005, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168.
    c. New furniture and furnishing items must be tested in accordance with ANSI/BIFMA Standard Method M7.1–2011. Comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach.
    d. No composite wood with added formaldehyde shall be used. Composite wood which passes CARB 93120 ATCM testing for ultra-low emitting formaldehyde (ULEF) is acceptable.
    e. Products achieving GreenGuard Gold certification meet the intent of these requirements.
2. Additional Requirements:
    a. No fiberglass insulation for walls, ducts and piping with added formaldehyde shall be used. Insulation achieving GreenGuard Gold certification meets the intent of this requirement.

1.3.2. TRASH AND RECYCLING DURING CONSTRUCTION

1. Construction and demolition debris separation on site is encouraged. Coordinate with UVA Recycling for cardboard & scrap metal containers and service. Coordinate with UVA Reuse Storeto dispose of usable furniture. Use a material recovery facility for remaining waste. Preference shall be given to material recovery facilities that provide waste diversion rates verified by a third party such as the Recycling Certification Institute.

1.3.3. TRASH AND RECYCLING CONTAINERS

1. All projects shall comply with UVA's Recycling Station Guidelines. For interiors, all capital projects and renovation projects involving significant spatial reconfiguration, the Project Manager shall coordinate with UVA Recycling to determine additional trash and recycling space requirements specific to the tenants' needs and building requirements. Wherever a trash receptacle is specified, also specify recycling receptacles. Exterior container locations shall be coordinated with the Office of the Architect.

1.3.4. COMMERCIAL TRASH AND RECYCLING

1. Provide space for exterior commercial trash, recycling, and compost containers. The containers should share the same concrete pad. Coordinate with UVA Recycling (434-982-5050; recycling@virginia.edu) for exterior commercial container requirements. Locations must be identified on plans.
2. Exterior commercial trash and recycling containers shall be provided by UVA Recycling. Coordinate with UVA Recycling to schedule the delivery of exterior commercial containers. Plan accordingly for longer-lead items such as compactors.
3. Personnel access from the building to the commercial containers shall be clearly identified on the plans and free of obstructions.
4. Trash and Recycling compactors and guide rails shall be provided by UVA Recycling. Compactor provided by UVA shall be 34 cubic yard, self-contained compactor, 208/230/460v, 3-phase power with 1.7 to 2 cubic yard charge box and appropriate enclosed hopper. Provide compactor pad, location, and 208/230/460v, 3-phase power based on Marathon model RJ-250SC 34 yd. Guide rails shall be installed on site in coordination with UVA Recycling.
5. Exterior commercial trash containers shall not be located above spaces sensitive to noise or vibration. Usable space below commercial trash containers shall not be occupied space (mechanical rooms, storage, etc. are acceptable). Exterior commercial trash containers located under cover shall be coordinated with UVA Recycling to ensure sufficient clear height for container pickup.

1.4. WATER

The following requirements focus on improving water consumption, and the efficiency of domestic water heating and delivery systems.

1.4.1. DOMESTIC HOT WATER

1. Central water heating systems shall be provided wherever practical. The whole building / project area shall be served by the central water heating system. If a tank is provided, it shall be insulated in accordance with the current edition of ASHRAE 90.1.
2. Lavatory piping systems shall be designed to deliver hot water within 10 seconds.

1.4.2. FIXTURES

1. Meet fixture requirements outlined in Figure B - UVA Water Fixture Requirements.

1.5. SITE & LANDSCAPE

The following requirements focus on water use reduction, sustainable plantings and protection / fostering of resources as related to site and landscaping.

1.5.1. IRRIGATION

1. Reduce potable water for landscape irrigation.
    a. Design landscapes to not require permanent irrigation systems, especially those using potable water.
    b. If irrigation is necessary, such as on an intensive green roof or an athletic field, use non-potable water sources such as condensate or rainwater capture wherever feasible.
    c. If irrigation is necessary, design irrigation systems for minimum water use using high-efficiency equipment with moisture sensing capabilities, contingent upon approval of a Determinations and Findings waiver to use potable water.
    d. Potable water may be used for temporary irrigation during plant establishment period.
    e. Specify plantings that typically do not require irrigation after establishment.

1.5.2. STORMWATER

1. Manage precipitation on site.
    a. Limit the volume of stormwater runoff and improve water quality through on-site management using biofiltration, permeable pavement, green roofs, direct infiltration, soil amendments, open area preservation, and other appropriate technologies and methods.
2. Design site stormwater features as amenities.
    a. Design and maintain site stormwater management facilities such as bioretention basins as amenities that benefit the University community by providing accessible and attractive landscapes, educational opportunities and effective habitat.
    b. Prioritize stormwater practices that are low impact, accessible and viewable. Viewability is desirable, but should not be prioritized over a more effective stormwater management practice.
    c. When possible, coordinate with concurrent or future projects within the same sub-watershed to satisfy stormwater requirements and limit impact on existing habitat.

1.5.3. SOIL

1. Protect and restore soil within the Project Limits of Disturbance.
    a. Identify existing healthy site soils not to be impacted by construction activities.
    b. Protect identified areas with chain-link fencing (or other fencing type acceptable to Landscape Superintendent). Fencing will not be removed or adjusted without permission by Landscape Superintendent.

c. Where site soils are disturbed that are scheduled for planting, plan for 18" topsoil/compost mix depth in areas to receive woody plants and 6" in areas to receive lawn. UVA Landscape provides and installs topsoil mix.

d. Subgrade of areas disturbed by construction activities must be scarified prior to placement of planting soil mixes, using equipment and means as acceptable to Landscape Superintendent.

e. Where equipment must access protected soil zones, coordinate access route alignment with Landscape Superintendent and Office of the Architect.

f. Treatment of surface for access routes will utilize strategies to lessen compaction such as mulch, plywood or logging mats; coordinate application with Landscape Superintendent.

1.5.4. PLANTINGS

1. Manage invasive species.
   a. With UVA Project Team and Landscape Superintendent, identify existing invasive plant species on site and specify their removal.
   b. Plants considered invasive will be identified as such on Federal and/or State of Virginia lists.
   c. Design landscapes, especially naturalistic landscapes such as bioretention swales or basins, to accommodate maintenance access for invasive species control.
   d. Employ strategies such as access paths or paved or turf edges within deeper planted areas.
2. Use appropriate plants.
   a. Specify plants that are low-maintenance and non-invasive, including both native and non-native plants. Use plants that are adapted for the local climate, microclimate, typography, exposure and design intent.
   b. Specify plants in locations that will not create a safety conflict, refer to Crime Prevention through Environmental Design guidelines.
   c. Design plantings for maturity so as to avoid overplanting and future removals.
   d. Site trees with mature canopies in mind to avoid conflicts with adjacent trees or buildings, site lighting, or emergency phones.
3. Use vegetation to reduce urban heat island effect and minimize building energy use.
   a. Specify and locate trees to shade paved areas, especially dark surfaces such as asphalt and brick.
   b. Specify vegetation such as green roofs, green walls and shade trees to reduce energy consumption associated with indoor climate control.

1.5.5. DESIGN

1. Articulate landscape design intent over time.
   a. Describe, via a narrative, intent of the landscape design over time as plants mature, to aid in maintenance practices and to include pruning, removals, additions, seasonal cutting, etc.
2. Plant Protection

a. See UVA Facility Design Guidelines, 12th Edition Sections 3.2.3 and 3.3.1.3 for plant protection and underground utility offset requirements

1.6. METERING

The following guidelines outline how building utility metering and submetering shall be installed.

1.6.1. BUILDING UTILITY METERING

1. See UVA Facility Design Guidelines, 12th Edition Section 6.1.3 and Appendix B.

1.6.2. TENANT SUBMETERING

1. All main utilities (domestic water, domestic hot water, building chilled water, building hot water, electricity) serving a non-UVA tenant (i.e., food service) shall be metered in accordance with this section and UVA Facility Design Guidelines, 12th Edition Section 6.1.3 and Appendix B.

1.6.3. DOMESTIC WATER SUBMETERING

1. Provide a non-utility grade flow meter for domestic water uses connected to cooling towers. Flow meters shall be owner furnished and contractor installed (OFCI). Flow meter shall be installed on the domestic cold water make-up line. Building automation system (BAS) integration via analog signaling is preferred.

1.6.4. DOMESTIC HOT WATER SUBMETERING

1. Provide a non-utility grade flow meter for domestic and service hot water uses connected to water heaters greater than 20,000 Btu (or 6 kW). Flow meters shall be owner furnished and contractor installed (OFCI). Flow meter shall be installed on the domestic cold water make-up line. The flow meter shall be paired with two temperature sensors for calculation of heat transfer (in BTUs) via the building automation system (BAS). BAS integration via analog signaling is preferred.

1.6.5. CHILLED WATER SUBMETERING

1. Provide a non-utility grade flow meter for chilled beam supply and process chilled water uses. Provide a meter at all process chilled water heat exchangers. Flow meters shall be OFCI. The flow meter shall be paired with two temperature sensors for calculation of heat transfer (in BTUs) via the BAS. BAS integration via analog signaling is preferred.

1.6.6. RECLAIMED WATER SUBMETERING

1. Provide a non-utility grade flow meter for all reclaimed water installations. Flow meters shall be OFCI. All meters shall be connected to the BAS.

1.6.7. ELECTRICAL SUBMETERING

1. Where a project requires additional electrical submetering beyond building-level metering, electrical submeters shall be contractor furnished and contractor installed (CFCI).

1.7. LIFE CYCLE COST

Perform ongoing life cycle costing analyses according to the following requirements:

1. Using the UVA Life Cycle Cost (LCC) Calculator, analyze major systems options at significant design stages. Coordinate with energy modeling efforts, where applicable.
2. Provide life cycle justification, including documentation of LCC metrics for all life cycle cost-based decisions.
3. When evaluating cost-saving measures (e.g., value management sessions), present operational costs in addition to first costs using the UVA Life Cycle Cost Calculator.

2. CAPITAL PROJECTS - NEW CONSTRUCTION & MAJOR RENOVATIONS

This portion of the Standards applies to Capital Projects for which LEED certification is already required. **The prescriptive requirements in section 1 above also apply to these projects.**

2.1. PROJECT INITIATION

Collaborate with UVA's Capital Project Sustainability Working Group (email sustainability@virginia.edu) to provide the following:

1. Project-specific sustainability goals and priorities (stretch goals beyond minimum UVA and LEED requirements) via Owner's Project Requirements (OPR) early in the planning process, prior to initiation of design. At a minimum, consider the feasibility of the following approaches in the project's goals:
   a. **Deep energy reductions** – a 'net zero' building or 'net zero ready/capable' building.
   b. **Water reclamation** - AHU condensate, rainwater, etc.
   c. **Passive House certification**.
   d. **Living Building Challenge certification**.
   e. **Green Healthcare Initiatives** - alignment with the LEED Integrated Process for Health Promotion credit and/or the GRESB Health and Well-being Module.
2. **Develop a building energy performance target** based on the UVA Building Energy Performance Requirements (summarized below). Confirm this target with the UVA Office for Sustainability as early as possible, and no later than the end of the Pre-Design / Project Initiation phase.

Building Type	UVA Maximum Building Energy Performance Requirement (kBtu / ft^2 / year)
Academic	47
Residential	37
Multi-Use	51
Research	130
Inpatient	229
Outpatient	130

2.2. DESIGN & CONSTRUCTION

Articulate and refine the project's sustainability goals throughout the design process. Discuss and document progress in narrative form towards goals at each major phase, including Schematic Design, Preliminary Design, and Construction Documents. Revisit goals in the post-occupancy evaluation phase and as a team. Document lessons learned.

Comply with the following process and prescriptive requirements.

2.2.1. PROCESS REQUIREMENTS

1. **Follow LEED v4 Integrative Process credit requirements** (UVA prerequisite). Meetings are to include Office of the Architect, Office for Sustainability, HSPP/O&M staff, Automation Services, School/Department representation (including user group), Project Manager, Architect, and Engineer]. If changes occur, update the Owner Project Requirements (OPR) accordingly.
2. **Use the UVA Life Cycle Cost Calculator** to analyze major systems options at Schematic and Preliminary Design stages. Coordinate with energy modeling efforts, where applicable. Submit results and outcomes to the UVA Office for Sustainability.
3. **Provide energy modeling as a design and decision-making tool** throughout the design process. Demonstrate that the project was designed to use the least amount of energy feasible.
    a. Energy modeling shall begin as early as feasible in the project timeline and be regularly updated to provide design feedback and illustrate compliance with the energy use intensity (EUI) target per section 2.1.2. A simple box model is sufficient for Pre-Design stages, and a whole building energy model shall be developed no later than the Schematic Design milestone.
    b. Energy modeling inputs and results shall be submitted in accordance with the UVA Energy Modeling and Reporting Standards and include parametric analyses for significant design alternatives (e.g., envelope construction, shading, window-to-wall ratio, mechanical systems). These results shall be shared with the UVA Office for Sustainability during each major design phase.
        i. For all non-single pass air systems, provide an energy model of a dedicated outside air system with energy recovery and terminal (chilled beams, fan coils, blower coils, air handlers) heating / cooling units compared with the proposed system in order to evaluate system life cycle costs.
    c. The full, working energy model shall be provided to UVA for ownership at the completion of the project.

2.2.2. PRESCRIPTIVE REQUIREMENTS

1. **Solar-ready design**. All low-slope roofs shall be designed to be “solar-ready” and include conduit to the roof, room for future inverters, confirmation that structural design is sufficient for future solar photovoltaic (PV) installation, and a rooftop equipment layout that optimizes solar access. Coordinate with UVA Energy and Utilities for engineering, procurement, and installation of solar panels. See NREL Solar Ready Buildings Planning Guide for more information about solar-ready best practices.
2. Achieve LEED v4 MR Credit: **Construction and Demolition Waste Management** Option 1 (Diversion).
3. Achieve LEED v4 EA Credit: **Enhanced Commissioning** Option 1, Path 2 (Enhanced and Monitoring-Based Commissioning) and Option 2 (Building Enclosure Commissioning).

FIGURE A – UVA LIGHTING PROPERTIES TABLE

Space Type	Task Lighting Desired	Vacancy Control (Manual On / Auto Off)	Occupancy Control (Auto On / Auto Off)	Other Control	Dual Technology Motion Sensor	Default Shutoff Time	High End Trim Setpoint	Energy Savings Recommendations	Notes
Classroom / Lecture / Training	n/a	**Yes**	n/a	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory. Provide a vacancy grace period.
AV Classroom	See FDG Classroom Lighting Control Requirements								
Conference / Meeting / Multipurpose	n/a	**Yes**	n/a	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory. Provide a vacancy grace period.
Corridor	**No**	n/a	**Yes**	n/a	Yes	15 minutes	n/a	n/a	
Dining Area	**No**	**Yes**	n/a	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory. Provide a vacancy grace period.
Dormitory: Living Quarters	**Yes**	n/a	n/a	**Manual Switch**	n/a	n/a	n/a	n/a	
Electrical / Mechanical Room	**No**	n/a	n/a	**Timed Switch**	Yes	12 hours	n/a	n/a	
Laboratory - Teaching	**Yes**	**Yes**	n/a	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory. Provide a vacancy grace period.
Laboratory - Research	**Yes**	**Yes**	n/a	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory. Provide a vacancy grace period.
Lobby	**No**	n/a	**Yes**	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory.
Office - Enclosed	**Yes**	**Yes**	n/a	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory. Provide a vacancy grace period.
Office - Open Plan	**Yes**	**Yes**	n/a	n/a	Yes	15 minutes	100% of design (fc)	Dimming, Perimeter Daylight Harvesting	High end trim should be set via building lighting controls, not by setting drivers at the factory. Provide a vacancy grace period.
Parking Garage: Garage Area	**No**	n/a	**Yes**	**High / Low Control**	Yes	15 minutes	n/a	Dimming, Perimeter Daylight Harvesting	High / Low output control instead of On / Off control. High = 100% Output, Low = 20% Output
Restroom	**No**	n/a	**Yes**	n/a	Yes	15 minutes	n/a	n/a	
Stairwell	**No**	n/a	**Yes**	**High / Low Control**	Yes	15 minutes	n/a	n/a	High / Low output control instead of On / Off control. High = 100% Output, Low = 1 fc minimum
Storage	**No**	n/a	**Yes**	n/a	Yes	15 minutes	n/a	n/a	
Telecom Room / Closet	**No**	n/a	**Yes**	n/a	Yes	15 minutes	n/a	n/a	
Building Mounted Exterior Egress Lighting	n/a	n/a	n/a	**Photocell**	n/a	n/a	n/a	n/a	
Building Mounted Exterior Architectural Lighting	n/a	n/a	n/a	**Time of Day Schedule**	n/a	n/a	n/a	n/a	
Walkway, Ramp, Parking, and Pedestrian Area	n/a	n/a	n/a	**Photocell**	n/a	n/a	n/a	n/a	
Exterior Steps	n/a	n/a	n/a	**Photocell**	n/a	n/a	n/a	n/a	

Lighting power densities (LPD) for each space type shall be no greater than the 'Space-by-Space' allowances and/or the 'Building Exteriors' allowances provided in ASHRAE Standard 90.1-2016 (Table 9.6.1 and 9.4.2, respectively).

FIGURE B – UVA WATER FIXTURE REQUIREMENTS

FIXTURE TYPE	REQUIREMENT
Faucets - Public Bathrooms	0.5 gallons per minute (GPM)
Faucets - Residential Bathrooms	0.5 GPM
Faucets - Laboratories	1.5 GPM
Faucets - Teaching Laboratories	1.0 GPM
Faucets - Kitchenettes / Breakrooms	1.5 GPM
Water Closets - Patient Care	1.6 gallons per flush (GPF)
Water Closets - Residence Halls	Dual Flush: 1.1/1.6 GPF and Water Sense label
Water Closets - All Other	1.28 GPF and Water Sense label
Urinals - Patient Care	0.5 GPF and Water Sense label
Urinals - All Other	0.125 GPF and Water Sense label
Showerheads	1.8 GPM; verify adequate pressure available to provide required flow
Washing Machines	Energy Star rated
Ice Makers	Energy Star rated
Dishwashers	Energy Star rated
Refrigerators and Freezers	Energy Star rated
All other water consuming fixtures and equipment not listed (i.e. lab equipment, commercial kitchen equipment, etc.) shall be selected to be energy efficient/ water conserving. All equipment shall be submitted for review to the University of Virginia.	

UVA GREEN BUILDING STANDARDS
Capital Project Checklist

The following checklist is meant to be a tool for coordinating significant requirements as outlined in Section 2 of the UVA Green Building Standards.

Project Name: _____

2.1.1 PROJECT INITIATION — Completed on Date

- ☐ Initiate meeting with UVA Capital Project Sustainability Working Group _____
- ☐ Develop OPR with project-specific sustainability goals and priorities _____
- ☐ Feasibility studies _____

Net zero energy building	☐ Feasible	☐ Not Feasible
Water Reclamation	☐ Feasible	☐ Not Feasible
Passive House	☐ Feasible	☐ Not Feasible
Living Building Challenge	☐ Feasible	☐ Not Feasible
LEED / GRESB Health Promotion	☐ Feasible	☐ Not Feasible

2.1.2 DESIGN & CONSTRUCTION — Completed on Date

- ☐ Pre-design meeting with stakeholders _____
  - ☐ Confirm building energy target _____ kBtu/sf/year
  - ☐ Develop simple box energy model
- ☐ Schematic design meeting with stakeholders _____
  - ☐ Develop full building energy model
  - ☐ Use LCC calculator and energy model to evaluate design alternatives
  - ☐ Share LCC and energy modeling inputs and results with OFS
  - ☐ Hire commissioning agent
  - ☐ Identify construction waste streams and diversion methods
  - ☐ Share updated SD LEED scorecard with OFS
- ☐ Preliminary design meeting with stakeholders _____
  - ☐ Use LCC calculator and energy model to evaluate significant VM items
  - ☐ Share LCC and energy modeling inputs and results with OFS
  - ☐ Develop commissioning plan
  - ☐ Confirm construction waste streams and diversion methods
  - ☐ Share updated PD LEED scorecard with OFS
- ☐ Construction documents submission _____
  - ☐ At OUBO CD submission, share LCC and energy model results with OFS for verification
  - ☐ Share updated CD LEED scorecard with OFS
- ☐ Project close-out meeting and documentation of lessons learned _____
  - ☐ Provide OFS with full working energy model