

Inside Lights

Office

- 2×4 Lay-In L.E.D.
- 3" Paralouver recessed series
- High efficiency electronic ballast (T8)
- High color rendering lamps (3500k)
- Low iridescence louvers
- Wall switch motion sensor dual technology for < 200sq.ft. rooms. Ceiling sensor dual technology for > 200sq.ft.

Classroom

- 2×4 Lay-In L.E.D.
- 3" Paralouver recessed series,
- High efficiency electronic ballast (T8)
- High color rendering lamps (3500k)
- Low iridescence louvers
- Light sequencing will be
 - Front of Class = On/Off
 - Rest of Lights = dual switching to provide 1, 2, or 3 tube light levels
- Ceiling mount motion sensors w/ light switches at door entrances (similar to Watt Stopper DT300) – passive dual technology sensor controls using passive infrared and ultrasonics in combination with a Fresnel lens, 360 degree coverage, adjustable time delay from 30 seconds to 20 minutes)
- Emergency lights should only come on in case of an emergency

NOTE: Room darkening requires All lights to be turned off by wall switch.

Bathroom(Academic), Bedroom, Residence Hall Bathroom

- 2×4 or 2×2 Lay-In L.E.D.
- 3" Paralouver recessed series
- High efficiency electronic ballast (T8)
- High color rendering lamps (3500k)
- Low iridescence louvers
- Ceiling mount motion sensors w/ light switches at door entrances (similar to Watt Stopper W500A or W1000A)- sensor controls using ultrasonics in combination with a Fresnel lens, 360 degree coverage, adjustable time delay from 30 seconds to 20 minutes) that controls 50% of light fixtures. The other fixtures controlled by light switch only.
- Emergency lights should only come on in case of an emergency.

Hallways

- Recessed compact L.E.D.
- High Hat lights, (8" diameter opening or greater)
- High color rendering lamps (3500k)
- Ceiling mount motion sensors w/ light switches at door entrances (similar Wattstopper DT300) – passive dual technology sensor controls using passive infrared and ultrasonics in combination with a Fresnel lens, 360 degree coverage, adjustable time delay from 30 seconds to 20 minutes) that controls 50% of light fixtures. The other fixtures controlled by light switch only.
- Emergency lights should only come on in case of an emergency.

Stairways, Lobbies, Any area over 14' high

- Recessed H.I.D.
- Metal Halide bulb
- Bulb must be replaceable from floor level, using a pole bulb changer, therefore fixture must be anchored for bulb replacement
- Use wattage suitable for proper light levels (70 W is customary)

Custodial, Mechanical, Tele, Electrical Closets

- Suspended 2×4 lights
- High efficiency electronic ballast (T8)
- High color rendering lamps (3500k)

Exit Lights

- 120v-RED-L.E.D.
- Minimum of 115 LED's spelling exit and 9 LED's for arrows
- Battery with self – diagnostic testing
- Short circuit and voltage surge protection

Emergency Lights Centrally Powered

For emergency, exit and fire alarm shall be fed from one of power sources listed below:

- Generator (Covington preferred) w/ weekly exerciser clock
- Central Battery System (Exide Chloride Centaurus Interruptible power supply)

Emergency Lights (Stand Alone) Battery Pack

- Two flush mounted Fresnel lenses
- Sealed lead calcium maintenance free batteries
- Two PAR 36 emergency lights

- 6V high intensity lamps
- Emergency / Exit lights in each hallway and stairway are to be on dedicated circuit (from local area panel) to allow monthly annual testing by breaker.

Note: Do not use Incandescent or Halogen lights.

Outside Lights

Roads and Parking lots

- 30' Metal L.E.D.
- Shoebox style light cover
- Steel pole straight, square-bronze color
- 400watt shoebox fixture
- Use photocell to control
- With multiple lights use Photocell controlled relay with maintenance bypass switch

Crosswalks

- Illumination levels for crosswalks shall be a minimum of 1.0 avg fc (horizontal) and 2.2 avg fc (vertical)
- 16' round straight 4-bolt anchor base aluminum alloy pole such as Valmont Industries: 40404-S4-open top-DBL
- Greenlee Lexington luminaire: LXM-PT-V-FT-400-PSMH-F-MT-BLK-IHSS w/metal halide lamp
- Controlled by Photocell
- Light(s) is (are) to be positioned on the oncoming traffic side of the crosswalk

Crosswalk Approaches

- For high pedestrian conflict areas, pedestrian approaches shall have a minimum illumination of 10 avg fc (horizontal) 0 to 7' above walking surface for a 25 foot distance leading to the crosswalk
- Lighting of crosswalk approaches shall not increase night-time glare for traversing motorists

Sidewalks

- 10' Metal L.E.D.
- Hanover, Providian fixture (mock gas light style) – Fixture type B 1630 BP housing only, see below for bulb
- 10' fiberglass black pole direct buried, (No concrete pedestal)
- Lamp to be LED, Sylvania retro item # 78532. (mounts in top of fixture)
- Controlled by photocell

Wall Pack

- Metal L.E.D.
- Lithonia, adjustable angle bracket
- 175 w, medium base
- vertical mount bulb, photocell

Fire Alarm (addressable only)

- Manufacturers:
 - Simplex (1st choice)
 - Notifier
 - Silent Night
- Digital Transmitter (DACT) is to be integral addressable point reporting type. Once points are programmed in the fire alarm control panel, these

points are to be programmed in the Sur-Gard MLR2 Central Station Receiver at the Elon Security office as well by the fire alarm contractor. **Note: Elon Electrical Department to provide Building account identification number when requested by fire alarm contractor.**

- Smoke detectors in bedrooms shall have programmable sounder bases (horn in base). They shall be programmed for local base alarm initiation only at 2% smoke obscuration/foot and for system alarm at 5%.
- All wires run plenum-rated wires with wall conduit stubbed out 6" above finished ceiling.
- Connect the Area of Rescue dry contact to channel three of the fire panel digital alarm communication transmitter so that security is notified by a fire alarm trouble signal that the area rescue system has been activated.

Computer Power

- All designated computer sub-panels shall have a safety ground (this is usually the conduit system itself) to satisfy the NEC. A "clean" ground is to go back to service ground. It is to be sized the same as the phase conductor's for a low resistance purposes.
- All computer receptacles are to have isolated ground receptacles.
- The grounding electrode system is to yield 5 ohms or less resistance to ground.
- All computer sub-panel neutrals shall be at least the size of the phase conductor's to allow for harmonic's.

Receptacle Spacing

- Offices shall have a minimum of one receptacle per wall space.
- Classrooms shall have a maximum of 12' of wall space between receptacles.

Switch Plate Covers & Outlet

- Thermoset P-Line (Non Breakable), Manufactured by Pass & Seymour/Legrand
- Floor outlets
 - Walkerbox (Wire mold) recessed box
 - 4 wiring compartments (power and data combined in one box)
 - hinged cover plate for access to outlets

Wiring

- There is to be no back wiring of any electrical devices. All connections shall be either wire-to-wire or wire-to-screw.
- In all multi-wire receptacle circuits, the neutrals shall be joined together to a single wire. The device shall then be attached to this one neutral wire. This will eliminate feedback's of higher voltages when changing the device in the future.
- All above ground branch circuit joints shall be joined together with wire nuts. Sta-kons are not acceptable for branch circuit conductors.
- Pre-wired flex conduit is acceptable for general receptacle and lighting wiring. Conduit is required from the subpanel to each room. Kitchens are to use conduit only to allow for future load.
- The minimum size conduit is to be 3/4".

Exposed Raceways

Any exposed surface raceway shall be run in a manner that will make it least noticeable. Such as running wire mold down in corners of the room and over to receptacle location. The purpose is to leave the wall space as open as possible for decorating purposes.

Panel Boards

- Copper bolt in buss bars

- “Square D” (preferred)

Metering

- Each building should connect to the University’s energy management system so that energy consumption can be metered individually by building.
- Monitor total electric, natural gas, domestic water, and solar DHW (if used) at a minimum.
- Use btu meter for HW or CHW and totalizing Onicon meters for water and natural gas.
The resolution for water should be 1 gal/pulse for low use buildings and 10 gal/pulse for larger flow (dormitories); natural gas 1 ft³/pulse.
- Use Shark 100-S -60 -10 -V4 -WIFI for electrical metering. All the data is to be connected to the building automation system and be served to Duke Energy and Lucid Technologies in XML format.

Generators

Acceptable generator manufacturers for non-residential use:

- Caterpillar
- Covington (Detroit)
- Cummins