1 **General Controls**

1.1 Unless noted below, all lighting is to be controlled via “dual technology” vacancy sensors.

1.1.1 The intent is that a room occupant will be required to turn the lights on manually when entering a room and have the ability to turn the lights off while in the room or upon leaving the room.

1.1.2 Lights will time off if the occupant leaves the room without manually turning the lights off. “Time-Delay-Off” feature shall be set for less than 15 minutes.

1.1.3 Lighting controls shall be designed to be intuitive to multiple end users who may or may not be familiar with the space.

1.1.4 The use of combination/multi-function type switch button (tap for ON or OFF, press/hold for Raise or Lower) is not acceptable.

1.1.5 Control station buttons shall be engraved or labeled to indicate specific function i.e. On, Off, Raise, Lower, Bright, Medium, Dim.

1.1.6 Switches with dimming function shall have the low end trim set such that the lights do not dim to a level where they appear to go off.

1.1.7 Control systems shall be designed as standalone individual room type, not a building wide or multiple room type.

1.1.8 Acceptable manufactures for Digital Type room control systems;

1) Wattstopper
2) Cooper Greengate
3) Acuity
4) Intelligent Lighting Controls (ILC)

1.2 Corridors

1.2.1 Occupancy sensors only, no manual controls.

1.3 Mechanical, Electrical, and Communications Equipment Rooms

1.3.1 No automatic controls, wall mounted manual switches at all entries.

1.4 Laboratories

1.4.1 All under-counter/under shelving lighting is to have separate On/Off control as well as being tied to the room occupancy sensor(s) as well as the master lighting control switch(es) located by the door(s). Individual occupancy sensors in fixtures is undesirable and should be avoided.

1.4.2 Ambient lighting is to be controlled from ceiling or wall mounted sensors as well as the master lighting control switch(es) to manually turn the lights on and off.

1.5 Offices, Huddle and enclosed Celebrative rooms

1.5.1 Smaller offices, where cubicle partitions are not used, wall mounted vacancy sensors are to be utilized. In larger (multi occupant) offices, a combination of ceiling and wall mounted sensors may be used.

1.5.2 In offices with glass walls, care should be taken to select any occupancy sensor(s) with a coverage pattern such that the sensor(s) will not detect corridor traffic. Care should be taken to position the sensors according to their coverage pattern to avoid nuisance trips.

1.5.3 A means to manually turn off the lights will be provided.

1.6 Interior stairwells

1.6.1 Light fixtures are to remain illuminated at all times. In an effort to conserve energy each fixture will be fitted with an integral occupancy sensor in order to provide dual lighting levels (10-15 fc when the space is occupied and 1-5 fc when unoccupied).

1.7 Exterior controls

1.7.1 In general, exterior fixtures will be controlled via a photocell and timeclock with a manual override switch. This control system shall stand alone and separate from building automation controls, or building lighting controls.

1.8 Classroom and Student Presentation Spaces

1.8.1 lighting controls consist of On/Off control at entry door, preset control at presenters location (ON/Bright mode - all ceiling lights on 100%, Medium mode - lights dim to 70% and lights in front of screen/whiteboard to off (light above a presentation podium/lectern should remain on), Low/Dim mode - lights in front of screen/whiteboard/ceiling mounted video projector turn off (light above a presentation podium/lectern should remain on),, others dim to 30%, and Off mode- all lights off) and a rocker switch or separate 2 button raise lower switch that can adjust the light level of the presets. If chalkboard/whiteboard lights are installed a separate two button switch is installed at the
presenters location to operate lights ON/OFF, lights will also go OFF from the master switch in the Low/Dim mode as well in the Off mode and from the entry door switch(s). Switches at entry doors to be 2 button ON (all ceiling fixtures at 100%)/OFF (all fixtures in room off), the preset and dimming switches are located near the lectern.

2 Daylight Harvesting
2.1 In all larger spaces (other than labs) where it is determined that a significant amount of sunlight may be present during the day, photosensors may be utilized to take advantage of daylight harvesting opportunities.

3 Sequence of Operations
3.1 The engineer shall provide a written sequence of operations on the electrical drawings for each type of space being controlled.

4 Wiring Diagrams
4.1 The engineer shall provide wiring diagrams of the lighting controls on the electrical drawings for each type of space being controlled. Include enlarged detail of control stations to indicate desired labeling/engraving of button functions.

1) In lieu of a complete conduit system, the lighting control CAT 5 control cables and the Class 2 dimming control wires can be installed in a skeletal type conduit system using plastic push-on bushings (Arlington Industries) on conduit ends and appropriate supports from building structure or bridle rings/J-Hooks that are attached to building structure, spaced no farther than 5’ apart and 10” minimum above ceiling tiles.

2) The use of Factory Terminated CAT5 control cables is preferred. If field terminated cables are used, they shall be tested to BICSI standards and test resulted provided to lighting control commissioning agent.