



**LIGHTING FIXTURES AND
CIRCUITRY & SWITCHING
SECONDARY SCHOOLS**

1. GENERAL

- 1.1.1. Consultants MUST prepare a *Summary of Fixtures* which will include catalogue cuts, schedules, and cost summaries for all fixtures to be utilized on a project. Catalogue cuts are to include a minimum of 3 comparative and cost competitive types for each fixture.
- 1.1.2. For Theatrical; Lighting Fixtures, refer to Secondary School Performing Arts Guideline for details, but include the competitive types of fixtures in the *Summary of Fixtures*.
- 1.1.3. With the exception of the dimmable or accent lighting fixtures listed below, all fluorescent fixtures are to be either 600 mm x 120mm or 300 mm x 1200 mm. All fluorescent tubes are to be 1200 mm without exception.
- 1.1.4. Generally, all tubes are to be T8 In high ceiling areas but consideration may be given to T5 tubes in the Gymnasias. Review with the Design Department.
- 1.1.5. The number of T8 tubes in fixtures will depend on the possible differing heights of each of the specific areas, but preference is for single ballast. All fixture types will be discussed and approved by the Design Department.
- 1.1.6. The list below is not comprehensive, but identifies fixtures most commonly used on Secondary School projects.

2. LIGHTING FIXTURES

2.1. MAJORITY OF FIXTURES TYPES

- 2.1.1. 600 mm x 1,200 mm (2 ft. x 4 ft.) 2 @ T8 tube light fixtures with reflectors, flush mounted hinged frame, non parabolic type lenses. Design layouts to achieve approximately 60 ft. candles. Typically, these fixtures are to be located in such spaces as:
 - CLASSROOMS
 - SEMINAR ROOMS
 - LOW CEILING AREAS IN SHOPS
 - OTHER TEACHING SPACES WITH T-BAR CEILINGS
- 2.1.2. Same as Item 2.1.1 above, except without reflector. Design layouts to achieve approximately 50 ft. candles. Typically, these fixtures are to be located in such spaces as:
 - COMPUTER ROOMS
 - COMMUNICATION LABORATORY
 - STAFF WORK ROOMS (+task lighting)
 - EXERCISE ROOM (with t bar ceiling)
 - ADMINISTRATION AREAS
 - GUIDANCE AREAS
 - ALL OFFICES
 - DANCE STUDIO (with t bar ceiling)

2.1.3. Same as Item 2.1.1 above, except either surface mounted or pendant type. Typically, these fixtures are to be located in such spaces as:

- TEACHING AREAS WITH PARTIAL OR NO CEILINGS @ 60 FT. CANDLES
- LECTURE ROOM @ 60 FT. CANDLES
- EXERCISE ROOM AND DANCE (WITHOUT T-BAR CEILINGS) @ 50 FT. CANDLES

2.1.4. Same as Item 2.1.1 above, except without reflector. Design layouts to achieve approximately 30 ft. candles. Typically, these fixtures are to be located in such spaces as:

- CORRIDORS
- BARRIER FREE WASHROOMS
- TOP LANDINGS OF STAIRWELLS
- STAFF WASHROOMS

2.1.5. 300 mm x 1,200 mm (1 ft. x 4 ft.) or 600 mm x 1,200 mm (2 ft. x 4 ft.) 2 @ T8 tube light fixtures without reflectors, vandal proof, flush mounted hinged frame in a drywall ceilings, non parabolic type lenses with protective wire guards. Cove lighting in washrooms is unacceptable. Design layout to achieve approximately 30 ft. candles. Generally these fixtures are to be located in such spaces as:

- ALL STUDENT WASHROOMS
- ALL STUDENT CHANGE ROOMS
- STUDENT WASHROOMS IN ALTERNATIVE AREA

2.1.6. 300 mm x 1,200 mm (1 ft. x 4 ft.) fixtures, with reflectors, surface mounted or pendant type, non parabolic lenses. Design fixture layout to achieve 50 ft. candles. Typically, these fixtures are to be located in such spaces as:

- HIGH SHOP AREAS
- TV STUDIO

2.1.7. Same as Item 2.1.6 above, except without reflector. Design layout to achieve 30 ft. candles. Generally, these fixtures are to be located in such spaces as:

- DRAMA STUDIO
- STAGE AND GREENHOUSE
- STORAGE ROOMS
- SERVICE ROOMS
- SERVICE ROOMS
- MECHANICAL ROOMS

2.1.8. Wall mounted fixtures are to be 1,200 mm (4 ft.) long fixtures. Typically, these fixtures are to be located in such spaces as:

- HEAT PUMP CLOSETS (ABOVE DOOR)
- MID LANDING OF STAIRWELLS (BOTH SIDES)

2.2. LIBRARY

2.2.1. Over the main library section, provide 600 mm x 1,200 mm (2 ft. x 4 ft.) T8 tube light fixtures with reflectors, flush mounted hinged frame, non parabolic type lenses. Design layout to achieve approximately 60 ft. candles.

2.2.2. Over the computer area in the library, provide fluorescent fixtures, without reflectors to achieve approximately 50 ft. candles.

2.2.3. Depending of the ceiling heights in the Library fluorescent pendant light fixtures may be considered. Review with the Design Department fixture design.

2.3. GYMNASIA

2.3.1. Gymnasia shall have fluorescent fixtures, complete with safety sleeves and protective wire guards.

2.3.1.1. Switching is to be located in the Instructor's Room.

2.3.2. For EACH single gym, detail multi-level lighting to provide 30/60/90 foot candles. Two tier lighting levels and T5 tubes may also be considered. Review multi-level options with the Design Department.

2.4. CAFETERIA

2.4.1. Cafeteria lighting shall be a combination of fluorescent fixtures (**preferably 600 x 1200 – 2 @ T8 light fixtures with reflectors**) and dimmable light fixtures. (Refer to Secondary School Performing Arts Guideline for details.)

2.4.1.1. Dimmable light fixtures are to be used only for performance functions.

2.4.2. Number of tubes in fluorescent fixtures should be detailed to achieve 50 ft. candles.

2.5. MATRIX

2.5.1. Typically, the lighting for the Matrix may be a combination of HID fixtures and fluorescent fixtures.

2.5.2. Lighting fixtures are to be mounted at an accessible level of 4,000 mm (13 ft.).

2.5.3. Some accent lighting may be considered for low ceilings.

2.6. CHAPEL

2.6.1. Fixture options for the Chapel are to be reviewed with the Design Department.

2.6.2. Lighting shall be fluorescent fixtures and dimmable lights.

2.6.2.1. Limit dimming switches to four (4),

2.7. DARK ROOM

2.7.1. To be reviewed with Design Department if included in the Program.

2.8. STAFF WORKSTATIONS

2.8.1. Fluorescent task lighting below the upper cupboards of staff work stations must be comprised of a continuous row of 1,200 mm (4 ft.) long, exposed single tube fixtures with safety sleeves. Fixtures are to be centred along the counter.

3. CIRCUITRY AND SWITCHING

- 3.1.1. Lighting should be 347 volt with 347 volt switches and dimmer controls. Switch plates are to be metal with 347 Volt stamping.
- 3.1.2. All classrooms, the majority of specialized teaching spaces, seminar rooms, and multi discipline staff workrooms will be on one circuit, controlled by a motion sensor.
 - 3.1.2.1. Consideration may be given to a separate circuit controlled by a light sensor for a row of fixtures closest to the windows.
 - 3.1.2.2. In windowless classroom/staff areas provide one row of lights on one switch, the remaining rows on another switch.
- 3.1.3. Each gymnasium will be designed with multi-level lighting. Preference is for separate switching rather than dimming.
- 3.1.4. Specialized theatrical lighting for the Stage, Drama Room and TV Studio is, described in the *Performing Arts* Guideline on the Design Department web site.
- 3.1.5. All classrooms, seminar rooms, and other teaching/staff areas that are normally controlled by manual switches, are to have fixtures on a remote occupancy sensor with a switch at control panel.
 - 3.1.5.1. Switch enables occupancy sensor and allows fixtures to come on only if room is occupied, or if occupancy sensor is not functioning. Fixtures are turned off by lack of motion or switch.
 - 3.1.5.2. Low voltage switches are unacceptable.
- 3.1.6. Staff and Student Washrooms, Change Rooms and unisex barrier free washrooms:
 - 3.1.6.1. Fixtures are to be controlled by an Ultrasonic/Passive Infrared System Key switches are unacceptable.
- 3.1.7. Academic & Custodian Storage rooms, Server Room, Mechanical and Service rooms & Closets:
 - 3.1.7.1. Occupancy sensors activate lighting when area is occupied – no switches.
- 3.1.8. Gymnasium:
 - 3.1.8.1. The 30 ft. candle lighting level and fans are to be controlled by a occupancy sensor in each Gym. The mid level and high level fixtures are to be controlled by switches in the Instructors' Room and controlled by the BM system.
- 3.1.9. Cafeteria:
 - 3.1.9.1. House fixtures are controlled by an occupancy sensor, overridden by switches at the stage and through the dimmer rack. Dimmable fixtures are controlled only through the dimmer rack. Fans are controlled by an occupancy sensor.
- 3.1.10. Lecture Room:
 - 3.1.10.1. House fixtures are controlled by a occupancy sensor, overridden by switches in the Drama Room and at the rear of the Lecture Room. Dimmable fixtures are controlled only through the dimmer rack.

3.1.11. Chapel:

3.1.11.1. Dimmable fixtures are controlled by dimmer switches in the Chapel and controlled by the BM system. Fluorescent fixtures are switched.

3.1.12. In Secondary School corridors:

3.1.12.1. Detail a separate circuit(s) for ONE ceiling mounted fixture in each of the main ground vestibules. These fixtures are to be continuously ON. Other corridor night lights are unnecessary.

3.1.12.2. Remaining corridor fixtures are to be controlled by the BM System, and switched on/off at breaker panel(s).

3.1.12.3. For interconnection between the Intrusion Alarm System and lighting fixtures in corridors, refer to below.

4. INTERCONNECTION OF FIXTURES WITH INTRUSION ALARM SYSTEM

4.1.1. The interconnection between corridor/stairwell fixtures and the Intrusion Alarm System is as follows:

Intrusion Alarm turned ACTIVE	All fixtures except 1 fixture in lower vestibules OFF
Intrusion Alarm BREACHED	Siren sounds & ground floor corridor & stairwell fixtures ON
Intrusion Alarm System turned OFF	Ground floor corridor fixtures automatically come ON

5. EXTERIOR LIGHTING

5.1.1.1. It is preferred to have fewer light standards with multiple heads. Do not specify “decorative” heads or globes.

5.1.2. Exterior lighting fixtures should be metal halide, or compact fluorescent.

5.1.3. Design adequate security lighting around the perimeter of the building, located on the walls as high as possible.

5.1.4. Use of short light poles, lights that illuminate the school sign only, or lights installed at grade level to illuminate the building, are not acceptable.

5.1.5. Each light standard, regardless of location, must be mounted on a minimum of 1000 mm (36”) concrete base. The Design Department must approve any exceptions to this requirement.

5.1.6. Light standards must be a minimum of 6,100 mm (20 ft.) but not exceed 9,100 mm (30 ft.) in height and illumination must not interfere with neighbouring properties.

5.1.7. Locate light standards 600 mm (2 ft.) from curbs.

5.1.8. Light standards and heads are to be anodized aluminium with connection access at the base.