PART 1: GENERAL

1.01 RELATED SECTIONS

01005 - ENVIRONMENTAL HEALTH
11600 – LABORATORY EQUIPMENT
15020 - LABORATORIES
15130 - PIPING SPECIALITES
15400 - PLUMBING
15420 - PLUMBING FIXTURES

1.02 REQUIREMENTS:
Any Cornell laboratory workplace retrofit or new construction must follow these emergency shower and eyewash standards and comply with ANSI Z358.1-2004. Where safety showers and eyewashes are required, obtain design approval from Cornell's Department of Environmental Health and Safety (EH&S). Installations shall meet the following:

A. ANSI Z358.1 – 2004
B. Local codes
C. NYS Mechanical Code
D. Current OSHA standards

1.03 EMERGENCY SHOWERS:
An emergency shower is required if a workplace uses 2.5 liter or larger containers of concentrated corrosives (acids and bases), cleaners, disinfectants, or other chemicals or substances that could be injurious to the eyes or skin. Examples of these areas include laboratories, fine arts studios, battery charging stations, pesticide mixing stations, darkrooms, chemical transport corridors, animal holding rooms, and other workplaces. New installations must be supplied with tempered water. Tempered water is defined as between 60°F and 100°F, with 85°F being the ideal temperature. Grandfathering of old emergency showers (or eyewashes) units is not allowed for major renovations.

A. Emergency Shower Location:

1. Emergency showers must be accessible from any point in the lab or work area within 10 seconds.

2. Within a single room laboratory (standard room size), one shower is acceptable.
3. Within a larger/multiple room laboratory, safety showers should be located no more than 50 feet from each other.

4. Emergency showers may be placed in hallways, as long as eyewashes are installed within the laboratory or research/shop space. The safety showers must be no more than 100 feet apart and not more than 50 feet away from the nearest laboratory entryway.

B. Emergency Shower Requirements:

1. Equipment shall be stainless steel or high impact plastic.

2. The corrosion resistant control valve shall go from “off” to “on” in one second or less and shall remain on without requiring the use of the operator’s hands. It shall remain activated until manually shut off.

3. The shower must provide clean potable water.

4. All new installations must be supplied with tempered water. Tempered water is defined as between 60°F and 100°F, with the ideal temperature being 85°F.

5. Water service to emergency showers must have a shut off valve. The valve must be accessible with a 6-foot ladder to provide shut off capability in order to service the fixture or group of fixtures. The shutoff valve shall be labeled with a shutoff valve tag available from EH&S.

6. Shut off valve shall be of the removable handle type. A single valve shall serve to shut off both the hot and cold water.

7. A privacy curtain is recommended but not required.

8. Exterior units require freezing protection.

9. The shower must deliver a minimum of 20 gallons per minute for minimum 15 minute duration.

10. Minimum water pressure of 30 psi is required.

11. The spray pattern of 60 inches above the floor must be at least 20 inches in diameter.

12. Emergency showers must be provided with signage. Signs must have letter coloring and size that is highly visible and positioned so that the sign is visible within the area served by the shower.
13. The design engineer will verify that system pressure is adequate for specified shower, eyewash, and tempering valve. Provide new piping or modify existing for required flows, and the engineer should insure that the design provides a complete and operational system.

14. Domestic cold and hot water lines to eyewashes and showers will be insulated to meet Cornell Standards. Provide PVC jacketing on exposed piping subject to damage.

C. Configuration:

1. The unit shall be unobstructed by other permanent or temporary features. Note: The eyewash section of a combination shower/eyewash station is not considered an obstruction.

2. The activation pull shall not be more than 69 inches off the floor.

3. The activation pull must be located out of the normal pathway in the room, preferably within two inches of a wall or bench.

4. The showerhead shall be between 82 and 96 inches above the floor.

5. The center of the showerhead must be at least 24 inches away from obstructions (walls, benches, etc.).

6. Strainers are recommended in the hot and cold water lines ahead of tempering valves and eyewashes or showers.

7. It is preferred the shower be located near a floor drain, and the floor shall be sloped towards that drain. Floor drains with removable plugs are acceptable. For units not plumbed to a drain, ensure the waste connection points away from the wall.

8. The shower must not be located directly over or within three feet of electric power sources such as outlets, switches, or power supply panels.

1.04 EMERGENCY EYEWASHES - Plumbed units only:
Emergency eyewash equipment is required wherever persons are subject to exposure to concentrated corrosives (acids and bases), cleaners, disinfectants, or other chemicals or substances that could be injurious to the eyes. Examples of areas where emergency eyewashes are required include laboratories, fine arts studios, battery charging stations, pesticide mixing stations, darkrooms, chemical transport corridors, animal holding rooms, and other workplaces. Please note, hand held eyewash bottles are not acceptable alternatives to plumbed eyewash units.
A. Emergency Eyewash Location:

1. Eyewashes should be accessible from any point in that lab or work area within 10 seconds.

2. Any single room laboratory that uses any quantity of acids or bases, or other chemicals/substances that could be injurious to the eyes must have emergency eyewash installed within the room.

3. For large rooms and connected laboratories the minimum spacing of eyewashes is one per lab with a maximum travel distance of 50 feet and accessible within 10 seconds.

4. There are access limitations with sink-mounted eyewashes for individuals who might need them at a lower height due to disability or short stature. Lower eyewash stations may be required in areas where needs have been identified.

5. Eyewash units may be combined with safety showers. If the combination eyewash/shower units are installed in the hallway, then an eyewash still needs to be installed in the laboratory room.

B. Emergency Eyewash Requirements:

1. Equipment shall be stainless steel or high impact plastic.

2. Sink mounted swing-a-way eyewashes, free standing eyewashes, and combination emergency shower/eyewash units are preferred in lab applications. Pull-down eyewash units are not recommended because they have characteristics that discourage regular testing. Faucet mounted eyewashes are not acceptable alternatives for new installations or renovations.

3. Drench hoses and hand held eyewash bottles are considered as supplemental equipment and do not meet the requirements for emergency eyewashes.

4. Nozzles shall be protected from airborne contaminants with caps.

5. The corrosion resistant control valve shall go from “off” to “on” in one second or less and shall remain on without requiring the use of the operator’s hands. It shall remain activated until manually shut off.

6. The eyewash must provide clean potable water.
7. All new installations must be supplied with tempered water. Tempered water is defined as between 60°F and 100°F, with the ideal temperature being 85°F.

8. Exterior units require freezing protection.

9. The eyewash must deliver a minimum of 0.4 gallons per minute for a minimum 15-minute duration.

10. Minimum water pressure of 30 psi is required.

11. The spray pattern shall conform to 5.1.8 of the ANSI standard using an eyewash test gauge as specified by ANSI.

12. Signs must have letter coloring and size that is highly visible and positioned so the sign is visible within the area served by the eyewash.

13. The design engineer will verify that system pressure is adequate for specified shower, eyewash, and tempering valve. Provide new piping or modify existing for required flows, and the engineer should insure that the design provides a complete, operational system.

14. Domestic cold and hot water lines to eyewashes and showers will be insulated to meet Cornell Standards. Provide PVC jacketing on exposed piping subject to damage.

C. Configuration:

1. The eyewash must be installed with sufficient space to allow the user to hold their eyelids open with both hands while the eyes are being rinsed.

2. Nozzles should be positioned between 33 and 45 inches from the floor, and 6 inches minimum from the wall or nearest obstruction. The nozzles must be easily accessible to the operator with no obstructions. Combination drench hose/eyewash units must be positioned so that the eyewash can be activated and used without having to pull out the drench hose.

3. Strainers are recommended in the hot and cold water lines ahead of tempering valves and eyewashes or showers.

4. The eyewash should be located on a sink or near a floor drain. For units with a waste connection that is not plumbed to a drain, ensure the waste connection points away from the wall.
5. The eyewash must not be located directly over or within three feet of electric power sources such as outlets, switches, or power supply panels.

PART 2: PRODUCTS

2.01 PREFERRED MANUFACTURERS

A. Emergency Showers:
   Haws
   Speakman
   Bradley
   Encon
   Guardian
   Watersaver

B. Emergency Eyewashes:
   Lab Safety Supply
   Haws
   Speakman
   Bradley
   Encon
   Guardian
   Watersaver

C. Thermostatic Mixing Valves:
   Lawler
   Encon
   Bradley
   Lab Safety Supply

END OF SECTION