224500 SAFETY SHOWERS AND EYEWASHES

Cornell's Design and Construction Standards provide mandatory design constraints and acceptable or required products for all construction at Cornell University. These standards are provided to aid the design professional in the development of contract documents and are not intended to be used verbatim as a contract specification nor replace the work and best judgement of the design professional. Any deviation from the Design and Construction standards shall only be permitted with approval of the University Engineer.

PART 1 GENERAL

1.01 RELATED CORNELL DESIGN AND CONSTRUCTION STANDARDS

A. Section 013010 –Accessibility for People with Disabilities

B. Section 115000 – Laboratory Equipment

C. Section 220500 – Plumbing Basic Materials and Methods

D. Section 230540 – Laboratories

1.02 GENERAL REQUIREMENTS

A. Every Cornell laboratory workplace retrofit or new construction project must follow this standard. Where emergency showers and eyewashes are required, obtain design approval from Cornell's Department of Environmental Health and Safety (EH&S) and Facilities Engineering (FE).

B. Installations must meet the following Codes and Standards:

1. ANSI/ISEA Standard Z358.1, American National Standard for Emergency Eyewash and Shower Equipment

2. Building Codes of New York State

3. Occupational Safety and Health Administration (OSHA) 29 CFR 1910.151 (c)

4. ICC/ANSI Standard A117.1 – Accessible and Usable Buildings and Facilities

5. ASSE 1071: Performance Requirements for Temperature Actuated Mixing Valves for Plumbed Emergency Equipment

C. The Consultant shall verify that the system pressure is adequate for the specified devices. New piping or system modifications shall be designed to ensure provision of the required flows at the devices. It is up to the Consultant to ensure that the design provides a complete and operational system.

1.03 ACCESSIBLE EMERGENCY FIXTURES FOR LABORATORIES

A. Each laboratory, including research and teaching, shall have emergency fixtures that are accessible to people with disabilities in accordance with Chapter 3 of the ICC/ANSI A117.1 and ADA Standards for Accessible Design. Barrier-free emergency fixtures should include the following ANSI A117.1 requirements:

1. Minimum knee clearance

2. Extension from the wall

3. Maximum forward and side reach limit

4. Less than 5 pounds of force for activation

5. Maximum height of the eyewash

B. If there is only one sink provided in a laboratory, a deep sink with side approach is generally preferred over using a shallow sink with front approach, which means that a bench top emergency eyewash is not suitable. In this event, it is generally recommended that an accessible combination eyewash/shower unit be provided within the lab.

1.04 DEFINITIONS

A. The following definitions are included in the ANSI Z358.1 Standard, and can be used to assist in choosing units that are allowable on the Cornell campus:

1. Combination Unit: An interconnected assembly of emergency equipment supplied by a single source of flushing fluid.

2. Drench Hose: A supplemental device consisting of a flexible hose connected to a flushing fluid supply and used to provide fluid to irrigate and flush face and body areas.

3. Emergency Shower: A device specifically designed and intended to deliver flushing fluid in sufficient volume to cause that fluid to cascade over the entire body.

4. Eye/Face Wash Equipment: A device used to provide fluid to irrigate and flush both the face and the eyes simultaneously.

5. Eyewash: A device used to provide fluid to irrigate and flush the eyes.

6. Flushing fluid: Potable water, preserved water, preserved buffered saline solution or other medically acceptable solution manufactured and labeled in accordance with applicable government regulations.

7. Personal Wash: A supplementary device that supports plumbed and/or self-contained units, by delivering immediate flushing fluid to the eyes or body.

1.05 LOCATION

A. Emergency showers and eyewashes must be located so they are accessible from any point in the lab or work area and can be reached within 10 seconds. An accessible emergency device shall be installed where a disabled person can access it within 10 seconds walking distance of a hazard on the same floor level.

B. Emergency showers and eyewashes must be in a location that is highly visible, well lit, and have a sign that is positioned such that it can be easily identified.

C. Emergency showers and eyewashes must not be located directly over or within 36-inches on either side of electric power sources such as outlets, switches, data ports, telephones, thermostats, or power supply panels.

D. It is not required that the shower be located near a floor drain.

E. A door is considered an obstruction. Where the hazard is corrosive, one door is permissible so long as it opens in the direction of travel and does not have a locking mechanism impeding access. For accessible labs, travel through a door is not recommended.

F. The eyewash should be located on a sink or be piped to drain.

1.06 PLUMBING CONNECTIONS

A. All new installations must be supplied with tepid water. Tepid water is moderately or slightly warm; lukewarm water with a temperature between 60°F and 100°F, with the ideal temperature being set at 85˚F.

B. The tepid 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. The shut off valve shall have a removable handle.

C. The cold water should bypass the mixing valve and provide full cold water flushing flow upon a hot water failure, or any other abnormal condition.

D. For combination units, the mixing valve should be sized to provide accurate control of the tepid water when either the eyewash or shower is in use. In system designs using one large valve, a recirculation loop shall be incorporated to maintain proper tepid water temperature control and prevent bacterial growth from stagnant water conditions.

E. 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.

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

PART 2 PRODUCTS

2.01 PREFERRED MANUFACTURERS

A. Emergency Showers and Eyewashes:

1. Bradley
2. Encon
3. Guardian

B. Thermostatic Mixing Valves:

1. Bradley
2. Encon
3. Guardian

2.02 EMERGENCY SHOWERS

A. A plumbed emergency shower is required in a workplace where a risk assessment indicates the potential for significant skin exposure to concentrated corrosives (acids and bases), cleaners, disinfectants, or other chemicals or substances that could be injurious to the eyes or skin. During renovations, existing emergency showers must be upgraded to meet current standards.

B. Emergency showers shall meet the following requirements:

1. Constructed of stainless steel or high impact plastic.

2. The shower head shall be installed between 82-inches and 96-inches above the finished floor.

3. The center of the water spray pattern shall be at least 16-inches from any obstructions.

4. The water pattern must be at least 20-inches in diameter when measured at 60-inches above the finished floor, and shall have the flushing fluid dispersed throughout the entire pattern.

5. The stay-open activation valve shall open in one second or less, and shall remain on without requiring the further use of the operator's hands. It shall remain activated until manually shutoff.

6. The activation pull must be located out of the normal pathway in the room. For standard emergency showers, the activation pull shall not be more than 69-inches above the finished floor; for ADA emergency showers, the activation pull shall not be more than 48-inches above the finished floor.

2.03 EMERGENCY EYEWASHES

A. A plumbed eyewash is required in a workplace 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. During renovations, existing emergency eyewashes must be upgraded to meet current standards.

B. Allowable Devices:

1. Sink mounted, swing-a-way eyewashes, free standing eyewashes, and combination emergency shower/eyewash units are preferred in lab applications.

2. Faucet mounted eyewashes are not acceptable devices for new installations or renovations.

3. If drench hoses are required by the program, they must meet the performance requirements of an eyewash.

4. Hand held eyewash bottles are considered as ***supplemental*** equipment and will not be accepted as the sole means of an eyewash installation within a

workspace. The use of these devices must be approved by EH&S and Facilities Engineering on a case by case basis.

C. Emergency eyewashes, and eye/face washes shall meet the following requirements:

1. Constructed of stainless steel or high impact plastic.

2.04 FIXTURE FLOW RATES

A. Emergency fixture flow rates need to comply with the flow requirements in ANSI/ISEA Z358.1. The unit shall be capable of supplying adequate flushing fluid to meet the requirements when all components are operated simultaneously and shall be positioned so components may be used simultaneously by the same user.

PART 3 PRODUCTS

3.01 TESTING

A. Emergency fixtures and system piping shall be installed to facilitate testing and flushing of the system. Systems and fixtures should be flushed weekly with fresh chlorinated water and tested annually for the full 15 minute duration. Flushing allows for purging of stagnant piping where bacteria could grow.