SECTION 15412 – EMERGENCY EYE WASHES AND SHOWERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Emergency Showers, Emergency Eyewash Stations and Combination Emergency Eye Wash/Shower Stations

B. Related Sections:
   1. Section 01790CP – Campus Utility Connections And Interruptions
   2. Section 15001PPRS – Plumbing Trade Preferences
   3. Office of Environmental Health & Safety - Emergency Eye Wash and Shower Safety Program

1.2 GENERAL DESIGN CRITERIA:

A. The design and installation of emergency showers, emergency eye wash units, and combination-type emergency eye wash stations and showers shall be determined based on the guidelines provided herein, as well as in consultation with Brown Facilities Management and Department of Environmental Health and Safety staff.

B. The design requirements for installation of emergency showers, emergency eye wash units and combination-type emergency eye wash stations and showers shall conform to applicable ANSI Z358.1, OSHA 29 CFR 1910, and applicable NIH and AAALAC Guide guidelines, many of which are noted herein. Refer to the Department of Environmental Health and Safety Policy and Procedure for Emergency Eyewash and Shower Safety Program for additional requirements. This equipment shall be configured and installed in a manner to allow other applicable Brown University Standards requirements to be met.

1.3 SPECIFIC DESIGN CRITERIA:

A. Locations required: Where the eyes or body of any person may be exposed to injurious or corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. These situations include:
   1. Solutions of inorganic or organic acids or bases with a pH of 2.0 or less, or 12.5 or more.
   2. Other organic or inorganic materials that is corrosive or irritating to eyes or skin.(e.g., methylene chloride, phenol).
   3. Organic or inorganic materials that is significantly toxic by skin absorption (e.g. phenol).
   4. Areas where corrosive chemicals are used in a closed system that can catastrophically fail and cause the chemicals to leak (i.e., liquid lead-acid battery charging areas, water treatment chemical use/storage areas or areas where pressurized systems with corrosive liquids are used).
   5. Storage areas where breakable containers of injurious or corrosive materials (1 gal or more) are handled outside their original shipping cartons.
   6. Waste accumulation areas that could contain corrosive waste materials.
B. Emergency Eye Wash /Shower Unit Locations:
   1. Units shall be located in accessible locations that require no more than 10 seconds to reach.
   2. The unit shall be located on the same level as the hazard and the path of travel shall be free of obstructions that may inhibit the immediate use of the equipment.
   3. A door is considered to be an obstruction. Where the hazard is not corrosive, one intervening door can be present so long as it opens in the same direction of travel as the person attempting to reach the emergency equipment and the door is equipped with a closing mechanism that cannot be locked to impede access to the equipment.

C. Accessible Locations: In labs designated as accessible provide combination eyewash shower units that conform to space and reach requirements of the ADA and ANSI A117.1 standards.

1.4 Signage:
   A. Emergency Eye Wash /Shower Units shall be identified with a highly visible sign positioned so the sign is visible within the area served by the unit.
   B. Each valve location shall be identified with a highly visible sign.
   C. Signs must be designed and positioned so that they are highly visible within the area served by the emergency eyewash and/or shower. In most interior rooms, flat wall mounted signs will be adequate. In other locations, such as hallways, a flat wall mounted sign may not be adequate; in this instance, double sided or triangular signs visible from either end of the hallway are required.

1.5 Illumination: The area around Emergency Eye Wash /Shower Units shall be well-lit.

1.6 Emergency Showers and Eyewash Station Valves:
   A. Design of valves shall be so that the water flow remains "on" without requiring the use of the operator's hands (hands-free) and shall remain activated until intentionally shut off.

1.7 Emergency Showers:
   A. Showers shall be located so that the water column is provided that is not less than 82 inches nor more that 96 inches in height from the surface on which the user stands.
   B. The center of the spray pattern shall be located at least 16 inches from any obstruction; spray pattern shall be a minimum diameter of 20” measured 60” from the shower head.
   C. Showers shall be capable of delivering a minimum of 20 gallons per minute at 30 PSI.

1.8 Eyewash Stations:
   A. Eyewash stations shall be positioned with the water nozzles 33 inches to 45 inches from the surface on which the user stands and 6 inches minimum from the wall or nearest obstruction.
B. Eyewash stations shall be designed to provide water to both eyes simultaneously, be of a continuous flow design, and operate hands-free (although they can be actuated by hand).

C. Eyewashes shall be capable of delivering to the eyes not less than 0.4 gallons of water per minute at 30 PSI.

D. Eyewash nozzles shall be protected from airborne contaminants: the protector cap's removal shall not require a separate motion by the operator.

E. Deck-mounted (sink mounted) eyewash stations shall only be approved for use in limited circumstances where installation of a wall-mounted eyewash or combination eyewash/shower is impractical. Written approval from EHS for installation of deck-mounted eyewash must be obtained prior to installation.

1.9 Water Supply:

A. Water supply for emergency eye wash and shower systems shall be tepid, moderately warm; design shall permit mixing of hot and cold water near the showerhead or eye wash; the warm water section of pipe between the control valve and the showerhead shall be self-draining. Tepid is defined per ANSI Standard Z358.1 as between 60F and 100F. To ensure tepid water on initial use, HW connections should include a recirculation line connection at the mixing valve.

B. Emergency eye wash and shower systems shall be connected to building Potable water systems only; connection to lab water or non-potable water supplies is not permitted.

C. Eye wash and shower connections shall be shown on all plumbing drawings including the location and arrangement of the associated backflow preventer and system isolation valves.

1.10 Drains:

A. Connect emergency eye wash drains to building plumbing drains via a visible air gap in all new installations; provide open floor drains in the immediate vicinity of showers; provide automatic trap primers on drains as required.

B. In retrofit installations where eye wash drain connections are not feasible, terminate eye wash drains ~ 24” AFF to allow for installation of typical 5 gallon pail under the drain for eye wash station flushing and system testing purposes.

1.11 Electrical:

A. For new installations, no electrical branch circuit wiring devices, such as receptacles and wall switches, lighting fixtures, electrical junction boxes, or telecommunications/data wiring jacks, shall be located within 6 feet of eye wash and emergency shower locations.

B. For retrofit installations in existing building spaces, every effort shall be made to relocate any electrical branch circuit wiring devices, lighting fixtures, and electrical junction boxes located within 6 feet of an eyewash or shower location. Where such devices are
required to remain within this zone, all affected electrical circuits shall be provided with personnel protective ground fault circuit (GFCI) interrupter protection.

PART 2 - PRODUCTS

2.1 EYE WASH STATIONS

A. Wall-mounted eye/face wash: Barrier-free, wall mounted, with stainless steel wall brackets and 11” round bowl.

B. Approved Manufacturers:
   1. Haws # 7360
   2. Guardian # G1724 or # GBF1721

2.2 EMERGENCY SHOWER

A. Wall-mounted: Horizontal mounted, barrier-free drench shower with stainless steel showerhead, stay-open ball valve and stainless steel pull rod.

B. Approved Manufacturers:
   1. Haws # 8123 or # 8133 series
   2. Guardian # G1643 (horizontal), # G1635 (vertical) or # G-1629 (concealed)

2.3 COMBINATION EMERGENCY SHOWER/EYE WASH

A. Floor-mounted: Barrier-free combination type drench shower with eye/face wash with stainless steel showerhead, stay-open ball valve and stainless steel pull rod stainless steel wall brackets and 11” round bowl.

B. Approved Manufacturers:
   1. Haws # 8309 series
   2. Guardian # G1902

2.4 FIXED DECK-MOUNT EYE WASH STATIONS, SWIVEL-TYPE, AT SINKS

A. Approved Manufacturer:
   1. Guardian # G1805

2.5 THERMOSTATIC MIXING VALVES:


B. Showers: Leonard TM-850 series.

C. Combination eye wash/showers: Leonard TM-800 series.

PART 3 – EXECUTION
3.1 Plumbing system shutdowns shall be coordinated per the requirements of Section 01790CP.

3.2 All plumbing devices associated with emergency showers, emergency eye wash units and combination-type emergency eye wash stations and showers, including isolation valves, that may require scheduled preventive maintenance, shall be located where they are readily accessible for inspection, service and repair. Do not locate these devices in or above drop ceilings in laboratory spaces, except for devices associated with fume hoods, biosafety cabinets, or other laboratory equipment that cannot be located adjacent to space without diminishing research functionality.

3.3 All pipe, insulation and equipment supports shall be configured and placed in such a way that it does not interfere with the installation or removal of serviceable plumbing components including mixing valves and isolation valves.

3.4 Piping Installation:
   A. All piping to Emergency eye washes and showers to be copper, type L.
   B. Petroleum-based flux is not acceptable for use on water lines serving eye wash stations and showers.
   C. Pipe solder to be lead-free type.

3.5 Properly label and identify all eye wash and shower locations, isolation and mixing valves and water lines. Identify and label locations of concealed valves and water lines at eye wash location.

3.6 Ensure all electrical branch circuit wiring devices, lighting fixtures, and electrical junction boxes are located at least 6 feet from eyewash or shower locations. In retrofit applications, ensure that any devices located within 6 feet of an eye wash location are provided with personnel protective ground fault circuit (GFCI) interrupter protection.

3.7 Submit completed eyewash/shower turnover information requirements to Brown Project Manager; reference applicable Division 01 requirements for equipmentRecord documentation.

3.8 Emergency Shower and Eyewash Testing: Test showers and eyewashes in accordance with the following procedures:
   A. With the unit correctly connected to the water source and the valve(s) closed, visually check the piping for leaks.
      i. Remove eye wash filters.
      ii. Open the valve to the full open position. The valve shall remain open without requiring further use of the operator’s hands. Flush to ensure all foreign materials from installation are removed from piping system.
      iii. Ensure proper delivered water temperature to eye washes and showers.
      iv. After successful testing, reinstall eye wash filters and caps.

END OF SECTION
EMERGENCY EYE WASHES AND SHOWERS

ELEVATION

PLAN

Typical Emergency Eyewash & Shower Unit Diagram
Department of Facilities Management