



PPE & Fire Station Design

By Richard Barlette

Hazardous Service

Today's firefighters face an ever growing number of hazards while performing fire suppression, while on fire, emergency medical calls, victim recovery, hazmat incidents, vehicle extrication, and in live fire training sessions. Many of these hazards are obvious - the direct contact with fire, exposure to products of combustion, smoke, fumes, chemicals, or in contact with blood and body fluids. Firefighters of the past were known as smoke eaters, advancing a hose line into fires under the worst of conditions, with little or no protection. Today's OSHA and NIOSH Standards, including NFPA 1500 and 1851 recognize that fires, hazardous material incidents, victim rescue and EMS calls are contamination events. Operating at these incidents pose a serious contamination and health dilemma to today's firefighters and EMS personnel.

Studies by Federal, State and numerous other organizations bear the point that dirty PPE is no longer a badge of honor, and in fact may be a contributor to causing cancer in firefighters and EMS personnel. Studies have shown that contaminated gear and equipment from fires contain substances classified by NIOSH as potential occupational carcinogens. Health risks associated with exposure to smoke and toxic substances released in fires are evident, as smoke consists of a mixture of gases, liquid droplets and solid particles. These combustion products include hydrogen cyanide, hydrogen chloride, Sulphur dioxide, phosgene, formaldehyde and asbestos to name a few.

NFPA 1851 - Decontamination and Storage



Dirty PPE and clothing is no longer acceptable in today's fire service. Fire officials have come to terms and recognized that cleaning PPE, SCBA and equipment after a fire is an important first step in protecting their emergency response personnel from known toxins, carcinogens and ultimately cancer. Decon on scene after the fire is extinguished, and at the station, should be a priority outlined in the department's safety and health guidelines (SOG).



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Over two decades ago several fire industry and fire equipment research organizations established the first PPE industry-wide guidelines for cleaning PPE, which became the basis for NFPA 1851- *Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. Three levels of cleaning - routine, advanced, and specialized - were established.

Routine Cleaning – This takes place at the incident scene and is considered gross decontamination, as soon as possible after the event, while the firefighter is still on air.

Advanced Cleaning - The NFPA 1851 Standard is proposed to be tightened, specifying that cleaning take place in a washer/extractor, as the use of a top loading washing machines shall be prohibited. The advanced cleaning process will have additional provisions specifying how the cleaning is carried out, including the use of validated wash chemicals and further details for cleaning helmets, gloves, footwear, and hoods.

Specialized Cleaning - Further details describing how specialized cleaning shall occur and when it shall take place are being worked on and will cover cleaning procedures for heavily soiled fire ground clothing and clothing subject to blood-borne pathogens. The standard is looking to provide a flow chart to make the decision process easier for firefighters to follow to ensure proper cleaning is carried out.

Today's Design Standard

Mitchell Associates Architects (MA) looks at all aspects of building design with a special focus on decon and safety features that protect first responders. With federal, state and local fire officials pointing to an increase in cancer rates among firefighters, MA tackles the issue by designing laundry decon facilities utilizing NFPA 1851 Guidelines to ensure that dirty, contaminated PPE is thoroughly cleaned and properly stored.

MA builds into their design a standalone laundry decon room with large washer extractor(s) to handle multiple PPE ensembles, along with a stainless steel side-by-side wash sink and table ensemble for SCBA, face piece, and helmet cleaning, and special SCBA washing machines. The room or station is typically outfitted with a dual function air drying cabinet to expedite the PPE drying cycle, getting the gear back in service quicker. Design also calls for controlling the relative humidity and ventilation rate for turnout gear storage, greatly reducing the transfer of carcinogens and preventing a growth environment for pathogens.

Mitchell Associates Architects fully understands how proper firematic station design can meet the health & safety needs of first responders and the community they serve. Talk with us to learn more.

