Bay of Rigs

More than just a place to park, the apparatus bay is an integral part of a fire station's aesthetics and function. Make sure it's designed for current needs and future wants. By Dennis A. Ross

When contracting a new apparatus bay, a fire department expects a building with a minimum 50-year lifespan constructed from good commercial-quality materials and systems that are durable, low-maintenance and energy-efficient. Fortunately, there are many ways to design functional yet aesthetically pleasing apparatus bays.

The structural systems of the apparatus bay and related support spaces can be either load-bearing masonry or structural steel with exterior infill masonry. Masonry can be architectural concrete masonry units as the total finished wall or plain CMU with brick as an exterior material. A pre-engineered structural steel frame also may be considered. Each system has its pros and cons, and associated costs and labor should be explored with your architect for the best solution.

Both architectural concrete masonry units and brick come in numerous shapes, sizes, colors and textures; concrete masonry units can even be sealed or stained. Generally, the roof structure will be either wood/steel trusses or bar joists with deck. Roof shapes such as peaked roofs should be designed to prevent dumping snow or shedding rain water directly over the bay doors. This requires some creative solutions in roof and building shape. Exterior roofing materials vary widely with steel or aluminum raised metal, shingles, rubber or others.

It's what's on the inside

Interior bay support spaces generally are fabricated of common concrete masonry units. All bay and bay support spaces should be highly durable materials with easy-to-clean finishes. Epoxy or semi-gloss masonry paints are recommended on concrete masonry units. Ceilings may be left as exposed structure or can be finished with paint, ceiling tile, sound baffling materials or sheetrock over wood trusses. Personnel doors should be hollow metal doors or fiberglass-reinforced plastic and metal frames with very good commercial-grade hardware.

Bay configuration should encompass current and future response, site layout, building size, and the ability to house all equipment in most or all bays. An exception may be made for smaller apparatus such as ambulances in dedicated bays. Single-deep bays should be a minimum of 50 feet, preferably 60 feet deep. Double-deep bays should be at least 80 feet deep and may be more depending on specific apparatus. Bays should be 18 feet clear height to the bottom of structure. There are as many configurations of drive-through, double-deep, single-deep, back-in and every conceivable combination as there are fire

departments. Specific requirements should be well-explored and documented with the architect to design the best possible configuration.

For the ever-increasing size of fire apparatus, 14- by 14-foot doors may be necessary. Smaller doors such as 12- by 12-foot for ambulance, cars or trailers can be used as well as double-wide doors where site or building constraints dictate. Overhead doors should be well-insulated, have a minimum of 50,000-cycle springs, galvanized heavy-duty track, weather stripping all around, and a pneumatic safety strip at the bottom. If cost permits or wind loads or other conditions prevail, one may consider high-quality bi-fold doors.

With continuous trench drains running under each piece of apparatus and the floor sloped to each drain, the apparatus sit level in the bay. An alternative to trench drains can be strategically located catch basins. In either case, they should drain to an oil/water separator that runs to the sanitary sewer.

The apparatus bay floor slabs are 7- to 8-inch thick, high-strength, reinforced concrete with a sub-base of engineered fill to handle the concentrated loads of modern apparatus. A bare concrete surface with textured finish and "salt guard" sealer or special epoxy floor coatings for slip-resistance also may be used.

The heating system is generally in-floor radiant using a hot water boiler. Potable water with no additives runs through the system. The tubing in the floor runs at continuous lengths, terminating at a control manifold.

High levels of insulation placed at the roof, perimeter insulation around the foundation and insulation within the cores of the CMU will help control heat loss. Design measures to control air infiltration and moisture penetration are standard throughout.

Windows, skylights and door lights should be carefully placed to provide natural light but protect the apparatus and gear from harmful UV radiation. Bays should be furnished with lighting such as fluorescent tube fixtures, metal halide or high-output fluorescent. Night lighting also should be placed near egress doors and at regular intervals throughout the bays.

To reduce square footage and save costs, use wash-in-place rather than dedicated wash bays. Hose reels for wash down are placed at the front and/or rear of the bays depending on bay depth and hose size and length. Their number depends on the total number of bays. One or more may even have a mixing valve for hot water. Hose reels themselves should be very durable and may be retractable or manual rewind. Overhead reels can be installed; however, the structural engineer must be alerted to increase the structural capacity at connection points.

Electrical drops, air drops for brakes and tools; ceiling fans; overhead or wall-mounted truck fills; room exhaust fans; a vehicle exhaust extrication system; durable, easy-to-maintain finishes; wall space for gear and hose racks; and plenty of space around the vehicles necessary for a properly designed bay. Decontamination facilities such as sinks, showers, counter tops and hook-ups must be included. [FC]

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