

Facility Design: Optimizing Postmortem Storage, Transport, and Processing in Medical Facilities

Partnering with specialists to customize refrigeration, carts, or autopsy recirculation improves architectural design, safety, workflow, and can cut project cost



Customizing the postmortem refrigeration unit and choosing complementary morgue equipment to develop a total systems approach is key to the morgue design.

In medical facility new construction or renovation projects, the morgue is often considered after higher profile, revenue producing areas, resulting in a need to efficiently design the layout of limited morgue real estate. Since usable space can also be restricted by building columns or other structural elements, optimizing morgue design and workflow can be particularly difficult.

“Some morgue customization is often required in new construction to improve design layout and function,” says Jennifer Cardettino, a partner in Linea 5, Inc., a Boston, MA-based full

service architecture firm. “In renovations, customization can be even more important, particularly in older buildings, where space restrictions can lead to challenging floor plans and access.”

Planning for functional workflow within the morgue and throughout the facility is vital for architects and medical equipment planners. Safe, effective transport of a patient’s remains after death, from the medical facility bed to morgue refrigeration and sometimes to a viewing room and autopsy room, is critical.

Yet most architects have no experience with designing morgues, and few will design more than one or two in their careers. Nevertheless, morgue design must be safely integrated with postmortem storage, transport, and processing. The design must also consider medical equipment as a complementary system. This is why it is important for architects to partner with medical equipment planners and other resources.

“We do a lot of work in hospitals and laboratories, but do not design morgues and autopsy rooms on a daily basis,” says Cardettino. “So we find it helpful to partner with equipment providers with morgue specific expertise.”

Fortunately, architects and medical equipment planners today are receiving expert design guidance, along with necessary equipment modification or customization, from a new breed of medical equipment provider. Partnering with the vendor to customize products such as refrigeration, autopsy carts, or cadaver carriers can improve architectural design, safety, and workflow, while reducing the project budget.

Postmortem Refrigeration

At the heart of hospital morgue design is the goal of safely maximizing refrigerated cadaver storage while allowing flexible, productive workflow.

With the morgue frequently allocated leftover facility space, the question becomes how can architects and equipment planners fit everything required – including the refrigeration system, autopsy tables, lifts, racks, trays and tools – so it can be efficiently utilized?

The key to making this work is



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customizing the postmortem refrigeration unit and choosing complementary morgue equipment to develop a total systems approach.

For instance, manufacturers such as Mopec (www.mopec.com), a medical equipment OEM that specializes in custom postmortem medical equipment solutions for hospitals, morgues, and universities in approximately 90 countries worldwide, offer a range of refrigeration configurations and options such as telescoping, conveyor, walk-in, forensic lab, and cadaver lockers that enhance workflow and safety.

Refrigeration units should be configured according to facility needs, with additional considerations that include safety and durability. To conserve space for individual cadaver refrigeration, small door end-opening modular refrigeration units can be used with telescoping or conveyor tray storage. Walk in refrigeration systems offer the most flexibility in design. Racks, which are available with up to 5 tiers, are used to maximize efficient storage within the unit. Cantilever, storage, and mortuary racks should be manufactured to complement the walk in unit design specifications. .

To maximize safe storage, the refrigeration units, racking, and trays need to accommodate a wide range of body sizes from pediatric to bariatric. For added safety, the refrigeration units



Customizing autopsy or embalming equipment can be critical for safety.

should be coated with a special antibacterial material, such as Sanisteel®, that inhibits germ growth. Many units can open to 180 degrees, offer an optional internal safety release, and come with magnetic seals and heated jambs to enhance worker safety while preserving the cadavers. High quality refrigeration systems are constructed with stainless steel, urethane foam and cam-lock fasteners to ensure prolonged use.

When Dutchess County, New York outgrew its old morgue, for instance, a new standalone facility was built. Medical Examiners needed a customized solution that could increase capacity, while improving cadaver handling processes and efficiency. The Dutchess County Medical Examiner Office partnered with Mopec to customize a refrigeration unit that could accommodate up to 12 cadavers.

“The new morgue was designed to increase our workload and improve workflow,” says Dennis Chute, MD, Dutchess County Chief Medical Examiner. “The office wanted simple access for bringing the remains from outside into the walk-in cooler and then into the morgue suite itself.”

To achieve the design objectives, Mopec created a custom stainless steel cooler with a dual door design that fit

within the desired architectural footprint.

“Now remains are brought from outside into a reception area, then through a door into the cooler,” explains Dutchess County Deputy Chief Medical Examiner Kia Newman, M.D. “When we’re ready for autopsy, there’s direct access to bring the remains from the cooler into the morgue through the second door.”

Postmortem Transport

While refrigeration is the main concern when designing and building morgue facilities, the refrigeration unit’s compatibility with transport carriers, lifts, trays and racks is also fundamental.

Due to the obesity epidemic, many facilities have no-lift policies for safety and are even moving towards no-push policies. Consequently, the proper size cadaver lifts and carts must be capable of ergonomic lifting, tilting, and movement for safe loading, transport, and unloading. Proper sized trays and racks must also be available.

For Macomb County, Michigan’s Medical Examiner Office, postmortem cart customization was required to improve workflow of its new morgue. Daniel Spitz, M.D., the County’s Chief Medical Examiner, wanted to eliminate the hassle of having to maneuver a body from one cart to the next for x-rays during the autopsy process, so Mopec equipped each moveable cart with a specially designed fiberglass top. Since there is no longer a need to put x-ray film beneath the body, Dr. Spitz can perform an x-ray through the body on the cart with his equipment. The dull muted gray surface on the fiberglass top is also lighter, easier to clean, and excellent for photography.

To further increase workflow efficiencies, Dr. Spitz requested a

procedure that allowed a body to remain on a single cart for its entire duration at the morgue, eliminating additional transportation and handling. Mopec was able to meet those requests so that now cadavers are brought into the rear of the morgue, placed on a cart, wheeled onto the scale to be weighed, brought into the autopsy room for examination, and wheeled back to the cooler until the funeral home comes to retrieve the body.

Postmortem Autopsy or Embalming

When autopsy or embalming is required, the cadaver is moved out of refrigeration and into a work area where the autopsy table, trays, carts, and sinks must be compatible for proper transfer and processing.

As part of a morgue renovation for a hospital on the East Coast, customization was required when Linea 5 designed a full autopsy room and pathology lab space.

“One of the rooms had a customized teaching lab requiring stainless steel counter systems, integrated tables with downdraft ventilation, and ventilated storage cabinets,” says Cardettino. “The most efficient way of doing this was to have a completely customized layout, so we worked with Mopec to create one that worked.”

Customizing autopsy or

embalming equipment can be critical for safety. Now that the preservative formalin is recognized as a carcinogen, control over inhaling its vapors is necessary around autopsy or embalming equipment. Proper ventilation or air recirculation can be built into equipment or customized to suit facility airflow management needs.

For instance, understanding and customizing recirculating autopsy tables can be essential to architects and equipment planners.

“Without ventilation access, project cost can double or triple if ventilation has to be brought to the unit,” says Miguel Bermeo, CEO of Scimedico, a medical equipment distributor. “If the autopsy table is in the middle of a room, how do you ventilate? Where do you get the air from and how do you get it to the unit?”

“When we look for custom recirculation or ventilation design, such as back draft, down draft, or even front ventilation that effectively creates an air pocket that keeps fumes away from the worker, we look to Mopec,” concludes Bermeo.

For more info, call Mopec in the U.S. at 800-362-8491; email: info@mopec.com; visit www.mopec.com; or write to Mopec at 21750 Coolidge Highway, Oak Park, MI 48237 USA.