



> **Figure 1.** Front view of an extra-heavy-duty (750 pounds) bariatric water closet support. All graphics courtesy of Jay R. Smith Mfg. Co.

Bariatric Water Closets

What Specifiers Need To Know

As obesity increases in our society, plumbing designers and manufacturers must meet the challenge of creating bariatric-friendly environments.

By William M. Smith

During the past quarter century, we have seen many changes in our industry relative to product design, product capabilities and increased flexibility as manufacturers, designers and specifiers to meet customers' need for bariatric accommodations. One area quickly changing is in the water closet carrier industry. More specifically, the bariatric water closet supports.

The growing need for more stable supports has become a concern of facilities managers within our healthcare facilities, schools, restaurants, office buildings, prisons and the like. However, within this article, we will focus directly on the healthcare arena.

Definition

By definition, the term *bariatric* is defined by *Mr. Encarta* as "the branch of medicine concerned with the treatment of obesity."

Herein lies one of the problems. According to the Department of Health and Human Services – Centers for Disease Control and Prevention (CDC), obesity percentages nationwide are increasing to epidemic proportions throughout the country.

United States Obesity Trends 1985-2007 (a CDC PowerPoint presentation) shows that during the past 20 years there has been a dramatic increase in obesity in the U.S. In 2007, only one state (Colorado) had a prevalence of obesity less than 20%. Thirty states had a prevalence equal to or greater than 25%; three of

Bariatric Water Closets

these states (Alabama, Mississippi and Tennessee) had a prevalence of obesity equal to or greater than 30%.

Information from The American Institute of Architects, Bariatric Healthcare Facilities states that, currently, more than 59 million Americans (about 31% of the population) are obese, of whom an estimated five to 10 million suffer from morbid obesity. According to an article by the Johns Hopkins Bloomberg School of Public Health, more than 40% of United States' adults will be categorized as obese by the year 2015.

Also, these kinds of numbers reflect that facility and/or product design must be able to keep up with the growing demand. Obese patients can encompass a very wide weight range; beginning at around 250–300 pounds to more than 1,200 pounds.

Design

When looking at the term “bariatric” as it relates to both commercial and healthcare design of products and facilities, the design and manufacturing industry continues to work closely with healthcare organizations to help balance the cost of care with quality staff, patient safety, morale, and accessibility. The design of products and facilities has a direct impact on each of these performance criteria with respect to proper care and must apply for all patient types, including the ever-increasing bariatric population. Healthcare settings are adapting to new bariatric care practices, procuring special products, equipment and supplies, renovating, and building new spaces to accommodate our morbidly obese populace.

In the past, we have seemed to overlook the fact that the morbidly obese patient accesses commercial buildings and healthcare facilities just like anyone else. As it relates just to the healthcare industry, obese patients, like all other patient types, become part of the healthcare delivery continuum through inpatient, ambulatory, and outpatient settings. Their physical needs and conditions, however, are highly specialized.



> **Figure 2.** Front view of a bariatric-duty (1,000 lbs.) water closet support.

The manufacturing and design community is charged with solving the request for the creation of “bariatric-friendly” healthcare environments throughout the United States.

Additional design considerations for healthcare facilities should also include areas regarding circulation, equipment, clearances, safety and privacy. However, within the remainder of this article, we will review the design of bariatric toilet bowls and their supports within the bariatric toilet room.

To begin the process of design review, we shall explore two areas from the manufacturers' viewpoint. First, we will look at the design considerations that should be given towards the actual bariatric water closet supports and toilet bowls. Second, we will review the design considerations surrounding the needs within a commercial or health facility bariatric toilet room.

Bariatric Water Closet Supports

In recent years, the manufacturers of water closet supports have begun the process of providing designers with bariatric options for use within commer-

cial buildings and healthcare facilities to accommodate the obese community when visiting public restroom facilities. In most cases, the availability of supports are usually offered in 300 lbs. (standard), 500 lbs. (heavy duty), 750 lbs. (extra heavy duty shown in **Figure 1** on page 20) and 1,000 lbs. (bariatric duty shown in **Figure 2**) to cover whatever the applicable design may require.

Each industry manufacturer of water closet supports is required to design, manufacture, third-party test and install their respective products per the strict requirements outlined within the industry consensus standard, “Floor-Affixed Supports For Off-The-Floor Plumbing Fixtures For Public Use” (ASME A112.6.1M).

It is interesting to note that the loading and deflection test criteria covered within this standard have not changed for more than 30 years. The current static load test requirements are documented as 300 lbs. The current deflection test requirements are documented as not allowing more than 0.125” deflection away from the finished wall and more than 0.375” deflection downwards from the front of the toilet bowl

Bariatric Water Closets



> **Figure 3.** Front view of an elongated bariatric-duty wall-mounted toilet bowl – rated up to 1,000 pounds.

toward the finished floor.

The truly amazing thing about the design capabilities of our industry manufacturers is simply that they have been able to create carriers capable of withstanding this increase in static load capacity and adhere to current stringent deflection allowance under such loads. Even more importantly, our industry manufacturers have taken the necessary and appropriate steps to serve all members of society regardless of their respective belt lines.

You might ask, “Why haven’t industry standard personnel sought to change the static load and deflection requirements within the applicable standards to be reflected appropriately relative to the need for an increase in the loading capacities of our water closet supports?” Actually, our challenge was based around the fact that all the wall construction materials being used haven’t changed much over the same time frame.

> **Figure 4.** Back view of an elongated bariatric-duty wall-mounted toilet bowl – rated up to 1,000 pounds.

Therefore, we should strive to design and produce our products under those constraints regardless of the increased load capacity needs. Obviously, we feel the manufacturing design industry has accomplished their goals relative to bariatric water closet support design, based on available testing results.

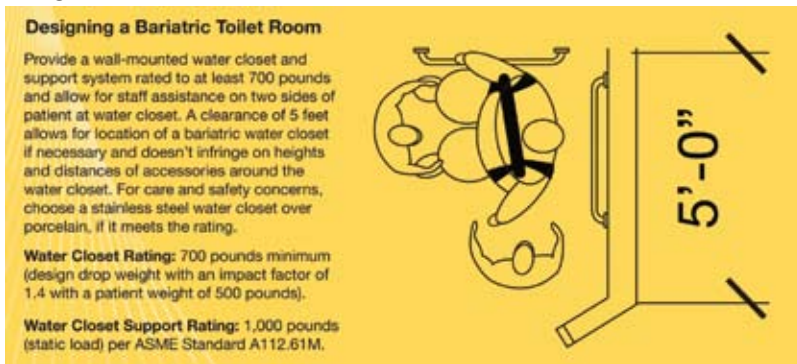
Realizing that the traditional-type water closet supports for wall-mounted toilet bowls are designed for installations behind the finished walls, there have also been many improvements in the design and manufacturing of wall-mounted toilet bowl supports to be installed on the finished wall side of bathroom facilities. Companies are providing new universal type supports that are placed underneath the wall-mounted toilet bowl.

For the ultimate in wall-mounted toilet bowl support, there is absolutely nothing wrong with installing both the bariatric water closet support



Bariatric Water Closets

> **Figure 5.**



behind the finished wall, as well as using in combination a universal-type toilet bowl support on the finished wall side of the facility.

Either way, the manufacturing industry's design professionals have provided the specifying design engineer with more than adequate options to consider when designing facilities with the obese populace in mind.

Bariatric Toilet Bowls

Because the commercial and health-care bathroom facilities have to be very concerned with more thorough and efficient cleaning methods, wall-mounted toilet bowls are most often specified in these types of facilities.

For the most part, over the years, wall-mounted toilet bowl manufacturers have provided bowls in a material known as vitreous china, an extremely strong material choice. As we have mentioned, these toilet bowls are tremendously durable, as the industry standard ASME A112.19.2 requires that all wall-mounted toilet bowls pass a 500-lb. static load test. When weight is applied onto a wall-mounted toilet bowl, however, a sheering force is transmitted to the interface of the toilet bowl and the water closet support installed behind the finished wall. Due to the increased stresses provided by our obese populace, toilet bowl manufacturers are responding to the bariatric issue with new, more robust vitreous china designs.

More recently, stainless steel versions are being designed and manufactured to ASME A112.19.2 requirements

and specified as an extremely strong and beneficial option as a material in wall-mounted toilet bowl design. When dealing with the bariatric field and the possibility of weights exceeding 1,000 pounds, the use of stainless steel can be beneficial to assure performance, rigidity and sanitary conditions, and to safe-guard against catastrophic failure. **Figures 3** and **4** (pages 22 and 23) show a couple views depicting one manufacturer's design offering for a bariatric wall-mounted toilet bowl.

Just as outlined in our above discussion of the bariatric water closet support designs, working in combination, both behind and in front of the finished wall to support our bariatric populace is of utmost concern.

Bariatric Toilet Rooms

While researching helpful information from The American Institute of Architects, Bariatric Healthcare Facilities, as well as www.hospitalconnect.com, I reviewed an article written by architects James W. Harrell and Bill Miller [March 2004 issue of *Health Facilities Management Magazine*] that served to explain just how detailed we must be in our considerations to the design of the bariatric patient toilet room. As the article states, increased size is but one design factor.

When we look at the bariatric patient room itself, one of the first areas to review would be clearance requirements. The door just to enter the toilet room must be a minimum of 60 inches in width, where in a normal application one would find an opening from 32-48

inches. Once in the toilet room, clearance on either side of the wall-mounted toilet bowl should allow for placing a bariatric toilet seat cover over the water closet for the comfort of bariatric patients. The water closet should be mounted with a minimum distance to a flanking wall of 21 inches.

Other areas of design concern within the bariatric toilet room would be items and/or areas such as grab bar location and size, toilet paper dispenser location, patient hygiene equipment, sink or countertop structural stability, and a larger non-curbed shower that would allow for the patient to be assisted by two caregivers (see **Figure 5**).

We have covered the industry introduction of new designs for bariatric water closet supports that can handle 1,000-pound static load testing. We have looked at the continued design improvements in toilet bowls offered for bariatric facilities. Finally, we have attempted to convey the vastness of the design elements that must be considered as we continue to build new and/or retro-fit existing commercial and healthcare facilities to welcome, serve and especially care for our growing bariatric populace.

It is plain to see that amid the manufacturing, design and specifying industries, a unified effort has been taking place for some time now to begin offering every possible opportunity for the ultimate in commercial and healthcare facilities as it relates to patient safety, morale, and accessibility. **pme**

William M. Smith is engineering manager for Jay R. Smith Mfg. Co., based in Montgomery, AL. He has been with Jay R. Smith since Nov. 1981. He currently serves on the ASME A112 Standards Main Committee, ASPE Board of Directors, IAPMO Main Standards Committee, IAPMO Industry Advisory Committee, ASTM Materials Committees and many other various plumbing industry-related committees. Smith may be contacted at billy.smith@jrsmith.com.