

White Paper

PROTON THERAPY: BEST PRACTICES AND CONSTRUCTION CONSIDERATIONS FOR SINGLE AND MULTI-ROOM FACILITIES

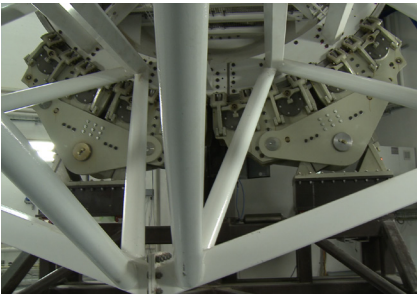
September 2014

PROTON THERAPY



Proton therapy utilizes a precisely controlled beam of protons to treat a cancerous tumor, most often in the cases of prostate cancer, brain tumors and pediatric cancers. Because the beam does not continue beyond the tumor, treatment can employ a higher dose of radiation with less damage to surrounding healthy cells.

The most common method of generating a proton beam is through the use of a cyclotron or synchrotron. The technologically advanced equipment requires the construction of a facility that meets the precise needs to safely operate the equipment. The dedicated room generating the proton beam requires a beam line in excess of 100 feet in length to help accelerate the protons, and concrete walls and ceilings that are at least 8-10 feet thick to shield the rays. Most proton centers have followed a multi-room model that consists of a combination of gantries, inclined beam and/or flat beam options downstream of the beam line for patient treatment or medical research.



Typically, the cost of a multi-room facility may be upwards of \$100-\$150 million for construction and the proton equipment. The sizeable price tag limits the number of providers and institutions who can afford to deliver this type of facility, thus minimizing the availability of proton therapy treatment.

In response to the physical and financial constraints confronting the construction of multi-room treatment centers, innovation in smaller, more compact accelerators is making proton therapy available in single treatment room installations for a fraction of the cost of a multi-room option.

It is important to consider the necessary investment when determining the addition or expansion of treatment modalities within an existing cancer therapy service. The answer to this question contributes to the decision of whether the program should utilize a single-room or multi-room solution.



Building Options:

- ▶ Multi-room treatment facilities are typically stand-alone facilities and require adequate land to be acquired and developed.
- ▶ Single room facilities may be constructed as additions/renovations to existing healthcare structures.

BEST PRACTICE: Select the proton therapy equipment manufacturer first, then design the structure around their specific requirements for shielding, building size and dimensions, mechanical and electrical utility connections and patient treatment concerns. Due to the complexity of this equipment it is best to design to a specific piece of equipment, rather than leaving some costs undefined in the bidding process.

The major building systems to be considered include:

1. Structural, to support the weight of the equipment and for shielding purposes
2. Electrical, for reliable, uninterruptable and clean power
3. Cooling and chilled water for conditioned air and the supply of chilled water to the proton therapy equipment



BEST PRACTICE: Capture the proton therapy equipment vendor's specific requirements for tolerances, dimensions, shielding, concrete embeds and utilities early in the process. Include the specific requirements within the construction bid documents.

During the design phase for a single treatment room in an existing building, the project team must review the as-built site utilities and current capacity levels of the adjacent existing surroundings to determine if they will support the added proton therapy equipment. Should upgrades be required, these costs must be included in the project budget and activities shown in the master construction schedule.



BEST PRACTICE: Define any system upgrades in the bid documents, showing connection and tie-in points to existing utilities. Include as-built underground utility drawings in the bid documents for locations of existing utilities so they may be adequately protected from the heavy loads of the proton equipment during delivery.

Proton therapy has proven to be a viable treatment alternative for a number of cancer types, as reflected in the approved reimbursement for this modality. The trend toward containing the cost of healthcare is opening a new sector for the industry through the development of smaller, lower cost equipment that can deliver this specialized treatment. As a national leader in the construction of proton therapy facilities, Gilbane is prepared to help you identify and evaluate your options with respect to cost, schedule (speed to market), and construction impact on your proposed site. We look forward to working with you to make your proton therapy and other healthcare construction projects a success.

For more information, please contact:

Brian Garbecki
 Healthcare Center of Excellence Leader
 Gilbane Building Company
 1-800-Gilbane (1-800-445-2263)
BGarbecki@Gilbaneco.com

Kevin Kriebel
 Proton Therapy Project Executive
 Gilbane Building Company
 1-800-Gilbane (1-800-445-2263)
KKriebel@Gilbaneco.com

or visit:

www.gilbaneco.com