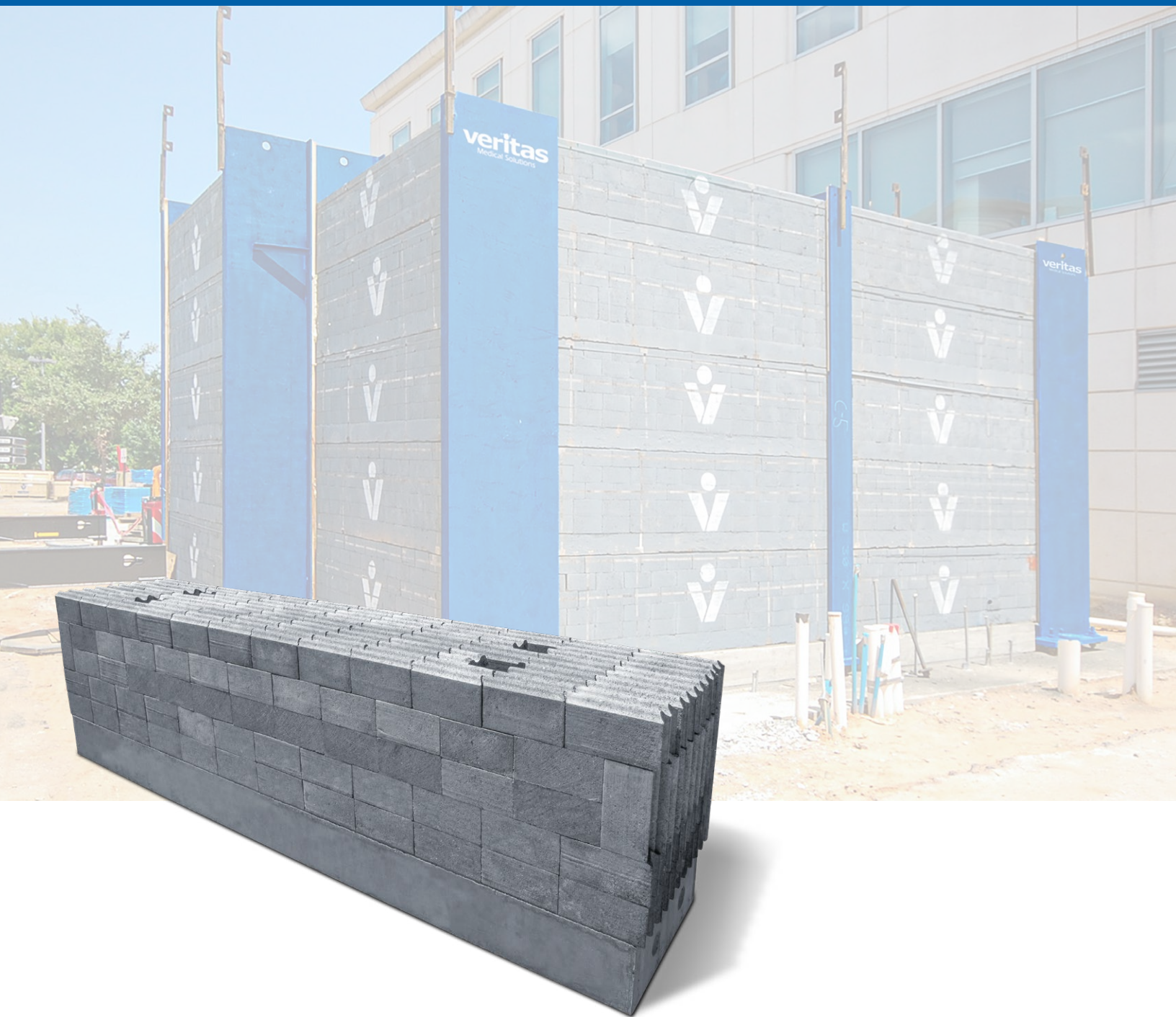


Veritas VPAC® Installation Guide



Veritas VPAC® Installation of
Typical Radiotherapy Treatment Room

veritas
Medical Solutions

Erection/Construction Requirements

Veritas or its designated subcontractor is responsible for providing all necessary tools to complete the room installation. VPAC shielding packs are pre-manufactured assemblies of VeriShield blocks supplied in various lengths and thicknesses. Weight will vary depending upon pack dimensions and shielding composition. Typical weights will range from 4,535 to 6,803 kgs. (10,000 to 15,000 lbs.).

A mobile crane of sufficient capacity will be required to offload and place the VPACs into position as specified on the Veritas drawings.

A 30,000 lb. capacity forklift/all-terrain lift is recommended for ease of handling individual VPAC units.

Veritas will provide all necessary engineering drawings and data for the proper design of the foundation and slab that will be supplied by others. Embedments will be required for the attachment of support columns and service modules and shall be placed prior to the concrete pour.



Foundations and Columns Embedments

Prior to pouring of concrete, Veritas will inspect all embedments to ensure accurate placement and alignment. Once slab has been poured (by others) and properly cured, Veritas' installation team will layout the isocenter marks, elevations and setting out points for the installation of leveling plates, preassembled shielding packs and associated column members. The vertical support columns will be erected using a 70T mobile crane (capacity will be determined based on site logistics) and secured by anchor bolts to the leveling plate embedments. Columns for both treatment room vaults will be erected.

To create the shielded walls, VPAC shielding packs will be craned between the column supports and constructed to a height of 3 m.



Erection of Support Steel

Columns are craned into position and affixed to the appropriate mounting bolts as specified in the Veritas drawings.



Columns are leveled and trued by turning the appropriate bolts and tightening to the specified torque. It is recommended that after leveling and tightening, the bolts be welded in place to avoid loosening.



Following column placement, the bases of the columns are grouted to fully cover the attachment bolts. Column areas fully surrounded by the concrete slab can be simply filled with grout. Other areas should be formed up as necessary.

Should VPACs be placed prior to final grouting, metal sheet is bent and placed over the column base to prevent loose grout, which is placed between the VPAC and the column, from spilling into the void and preventing the placement of the high-strength grout.

Column placement will continue until all vertical steel is erected, correctly leveled, and plumbed.



Starting on a primary wall side, the main horizontal support beam is bolted as specified onto the columns. Care should be taken to torque the bolts as specified in the drawings.



Additional horizontal support beams are attached to the secondary wall columns.



The second primary wall support beam is attached opposite the first beam. These two beams will carry the majority of the ceiling shielding weight.





Once the outer ring of horizontal support beams is set, the additional horizontal support beams can be craned into position. Place and connect the horizontal beams to each pair of columns first.



Then, fill in between with the balance of the horizontal support beams.



All beams are welded as specified to the columns and main support beams.



Following the placement of all support steel, metal decking is placed on top of the full ceiling area.

It is recommended that the metal decking be tack welded to the support steel to prevent any movement during block placement.



VPAC Placement

After the erection of all steel and the placement of all decking material, the VPAC modules can start to be craned into position between the support columns.



VPACs are staged, lifted and placed into position.



It is typical to place the first layer of VPACs and then work upwards. This is not a requirement though. Individual installers may adjust the placement as desired, depending on crew size, skill sets and experience.





Each VPAC is transported via four lifting lugs. Once in position the lifting lugs must be removed for reuse. This will leave an opening in the VPAC approx. 5" x 5" x 5", which must be filled prior to the placement of the next layer of VPACs.



For permanent installations, a wet mixture of VeriShield grout and cement can be prepared and poured into the lifting lug voids as well as any gaps between the VPAC and the support column.

For temporary installations, dry VeriShield grout without any cement is utilized to fill any voids. This allows the grout to be removed and recovered upon disassembly of the shielding.



A simple method of retaining the grout (either wet or dry) is to nail lengths of 2" x 4" wooded studs directly to the face of the VPACs, taking care to push tightly against the side of the columns. In permanent installations and when using a wet mixture of VeriShield grout, these studs can be removed after the grout sets. For temporary facilities, these studs must remain in place to prevent the loose grout from escaping from between the VPACs and columns.

There is a specific location for each VPAC within the shielding design. Care must be taken to ensure that the numbered, or otherwise identified VPACs, are placed as specified in the Veritas drawings.



The process is repeated, and continues until all VPACs are properly placed and reach the roof level.





Care must be taken to ensure that each VPAC is lifted and placed into its specified position as indicated on the Veritas drawings.



There are various sizes of VPACs and some VPACs with precast conduit runs installed, so it's important to make sure each VPAC is placed as designed.



After all wall VPACs have been placed, the structure is ready for the attachment of exterior horizontal support plates.



Though not always necessary, these plates serve to lock the top edges of the VPAC walls firmly into the steel structure. Veritas drawings will specify plate configuration, sizes and mounting methods.

Following the attachment of the horizontal support steel, the placement of the ceiling shielding may commence.



Roof Shielding Placement

Starting at one corner of the decking and working out towards the opposite sides, standard sized VeriShield blocks are placed on their sides and laid in a running bond pattern making sure to overlap the seams.



Blocks are placed firmly into position and butted against the top layer of VPACs, and laid to the thicknesses specified in the Veritas drawings.



As the ceiling shielding approaches the opposing VPACs, the last row of VeriShield blocks will probably not precisely butt up to the placed VPACs. This will leave a gap that must be filled with VeriShield grout.





It is important to prevent any grout from slipping through any cracks down into the room below. A simple fix is to place thin strips of sheet steel over the gaps and then place the VeriShield block and grout. This will result in a clean transition between the blocks and the VPACs.



The VeriShield block is continuously laid to the thicknesses and coverage as specified in the drawings. VeriShield grout is used as necessary to fill any voids or gaps.



Supplemental Shielding Installation

Some installations may call for the installation of additional shielding outside the column areas of the primary barriers. This is typically accomplished by stacking layers of individual VeriShield blocks next to the columns.



The additional blocks are held in position through the use of steel straps, which are welded onto the columns at various intervals. This will provide full support and containment of the loose stacked block.





At this stage, the roof shielding would be complete and ready for the installation of any required weatherproofing (if part of the Veritas Scope of Work).



Door Installation

If part of the design, the Veritas SmartDoor Bi-Parting door system can be installed, starting with the steel support columns and overhead support beam. These are placed and anchored according to the Veritas door installation drawings supplied with the doors.



Once the support structure is anchored, the individual door leaves are attached to the support beam, front cover plates removed, and readied for installation of the door shielding materials.



Individual VeriShield blocks are inserted into the door shells and all voids are fully grouted prior to the re-installation of the cover plates.

Following the door shielding installation, the doors are ready for the attachment of the door drive mechanisms and related components.



Once the mechanical drive system is installed, it is critical to protect the components from the elements. Protective wrapping should be placed over the drive as soon as it is installed.



Following the installation of the door system, a final shielding review should be conducted to ensure there are no voids in the shielding, and that all elements of the shielding design have been fully and properly installed.



Once the final review is complete, the room is ready for enclosure or the attachment of premanufactured service modules (Veritas VROC facilities).



Notes:



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