

Seating for Performance: Collaborative working with the Great Britain Women's Wheelchair Basketball Squad.



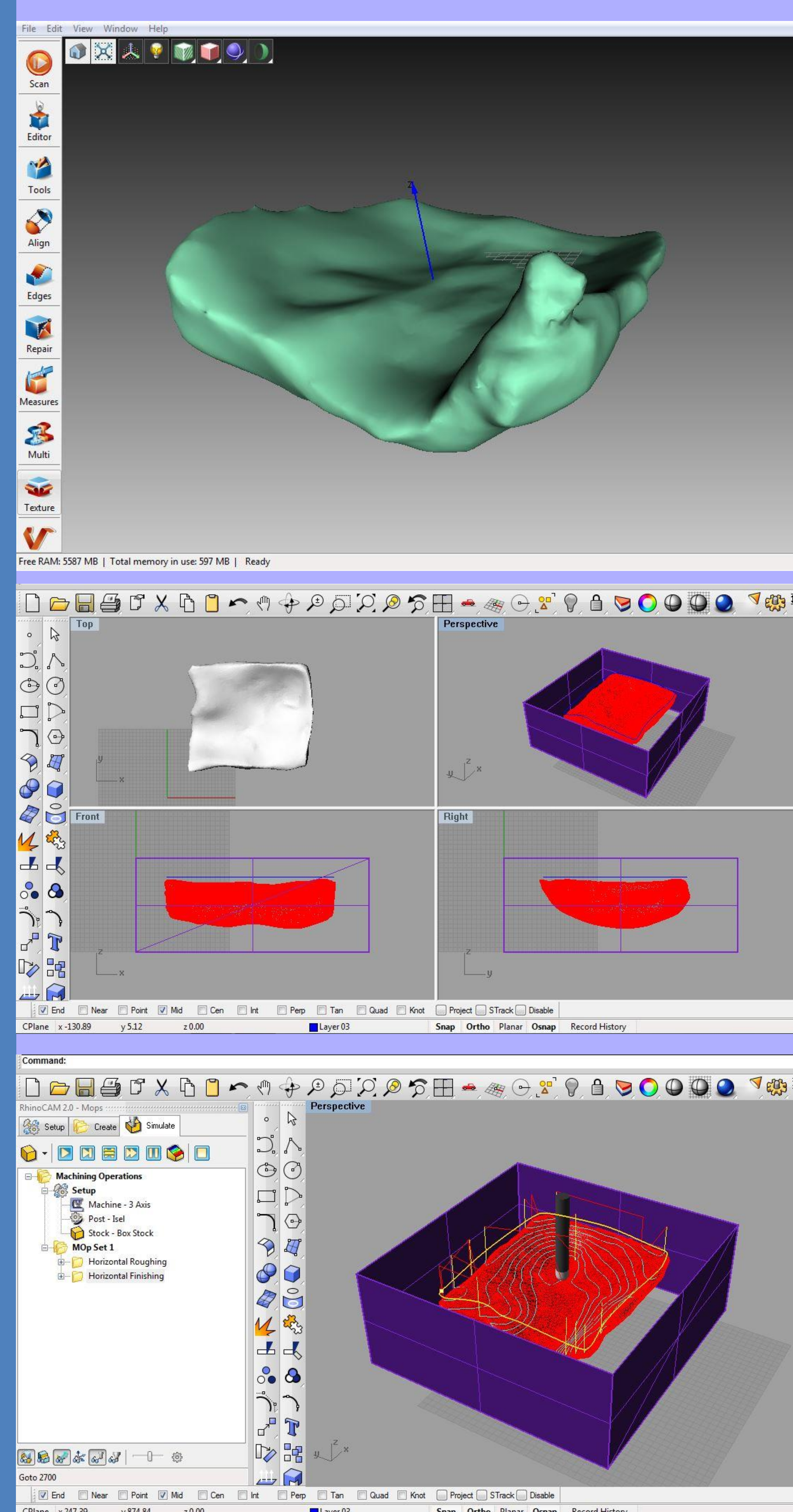
Bex Oakes, Specialist Occupational Therapist, Specialist Disability Service and Rick Houghton, Clinical Scientist, Rehabilitation Engineering.



The Specialist Disability Service at the Oxford Centre for Enablement has collaborated with the Great Britain wheelchair Basketball Team to provide players with custom contoured seat cushions. They were initially asked to find a solution for a player who had a pressure sore and could not train. The resulting cushion was uniquely shaped to fit into the wheelchair canvas and accommodate the player's pelvic asymmetry, with a thin layer of pressure relieving foam. It proved effective and the pressure sore healed. It also gave the player improved stability, better shooting range and quicker turns.



Coach Miles Thompson was impressed by the result and asked for a further eight players to be assessed. Clinical Scientist, Rick Houghton and Specialist Occupational Therapist, Bex Oakes travelled to the team camp at Worcester University. Each player underwent a postural assessment and had a cast taken using an evacuated bead bag. 3D scans of the top and bottom surfaces were used to carve out a foam cushion on the Rehabilitation Engineering Department's CNC milling machine. In-house upholstery technician Alex Trueman tailor-made the covers with embroidered GB logos.



A 360 degree scan was taken of the casting bag with an Xbox Kinect. The resulting mesh was exported from Artec Studio 9.2 as a .stl file.

The mesh was imported into Rhino 3D, orientated and positioned centrally in a 500mm * 500mm * 200mm block. Once a machining path was established for the sitting surface the block and mesh were rotated about the midpoint in the front portal so that the underside of the cushion could be machined.

Feedback from the squad about the cushions:

'In my basketball chair it provided the pressure protection I needed while meeting my performance needs and providing postural support at the same time,' (Clare Griffiths, Senior member of the squad and four time Paralympic athlete).

'The specialized cushions that Bex and Rick have made for the team are superior. Athletes are sitting on a proper, contoured cushion improving body positioning and performance.'(Miles Thompson, Head Coach of GB women's wheelchair basketball team).

Following provision of cushions for the playing chairs one of the squad members was referred from their local wheelchair service for a custom contoured seat for her day chair. The cast process was the same but with additional shaping to reflect more specific postural support required due to the length of time spent in the day chair. This included increased quality of pressure relief to protect vulnerable bony prominences and a midline abduction guide to reduce the tendency for her legs to spasm into adduction. The feedback from provision of the cushion for her day chair has been positive.

'In my day chair my pressure and postural needs have now been met. I can sit straighter and longer in my chair with less back issues' (Clare Griffiths, Senior member of the squad and four time Paralympic athlete).