



Floyd E. Kellam High School - Virginia, VA

ON SITE AND ON TARGET

With BIM on the rebound, Phil Simon of SB Ballard swears by his GoBOXX mobile workstation
By John Vondrak

“You know what would really be useful is a BOXX notebook, something like an iPad, but interoperable with Autodesk, displaying models and working with 360. It would obviously have less capability, but to do what a field machine does as well as this laptop does. . .that would be something,” says Phil Simon, as he muses on the ideal “field portable machine.” For the time being, however, he’ll have to settle for that “laptop” he refers to (and greatly admires), his GoBOXX 2725 mobile workstation. Philip K. Simon is the virtual construction manager for SB Ballard, the Virginia-based construction company that provides pre-construction services, general contracting, construction management, design build and concrete contracting services to an impressive list of clients throughout the mid-Atlantic and southeastern United States. From healthcare, government, and education industries to arts, entertainment and sports, SB Ballard has grown to become one of the largest general contractors in Virginia.

A veteran of the United States Army, Simon served as a plans officer, diagramming planning, coordinating relations, and the like. Upon his honorable discharge, Simon labored in the trades as a carpenter, heavy equipment operator, and pipe layer, steadily working his way through the ranks until he became the chief operating officer for a Colorado civil construction company focused on land development. When he relocated to Virginia, he began his career with SB Ballard first as a quality control manager, then as a project manager. After awhile though, he requested a move to project controls, which evolved into BIM. “I don’t really see scheduling and other controls as anything different,” he says. “They’re all part of the same process.”

Twenty-five years ago, Simon took college courses at night “just to keep myself entertained,” he says, and when he saw Autodesk AutoCAD in the university bookstore for only \$200, he bought it and taught himself to use it. He’s been using AutoCAD ever since—first as a junior estimator for a subcontractor where he was required to do shop drawings for all projects. In civil construction and land development, he also used LDD (Land Development Desktop) a great deal, as well as AGTEK. So upon his arrival at SB Ballard, Simon already possessed the basics of 3D modeling. “I just didn’t know Revit,” he admits. “But this is a very technology forward company with all the tools, so I took some classes on it and learned. And being interested in project coordination, BIM was a natural for me.”

Norfolk State University Library, Norfolk, VA

THE APPLICATIONS

Simon is unabashed in his love of Autodesk Revit, using it for all of his architectural modeling. "There are lots of things we can do with Revit," he says. "We do many of them, but like every contractor, we have these tools, but don't always have the time or manpower to use them in every way they can be used." Simon also relies on Autodesk 3ds Max for visualization animation. "When we do the marketing models, we usually create animations to show some of the viewpoints," he says. "We'll present the owner with walk-throughs so they can see things from different points of view, how things flow. We'll demonstrate what they can do to improve lighting or day lighting for LEED certification. 3ds Max is really useful for daylight studies and a lot of interior lighting studies as well. You may think of it as software for making cartoons, but it has a very powerful lighting package. Using photometric lighting, we can get very good ideas of how rooms are actually going to look."

In addition to Revit and 3ds Max, Simon relies on the entire Autodesk and Adobe CS suites. In Adobe, it's primarily Photoshop, Lightroom, and Premiere Pro for post processing and when a polished, overall movie-level look is desired. Animations are created in 3ds Max or Autodesk Navisworks, rendered out, sound is added, and the entire piece is cut together with captioning included. "Premiere is really flexible and you can lay down as many tracks as you'd like," says Simon. Animation also comes into play when the team works on their proposed schedule. They use Autodesk Navisworks to create timeline animations. "We do that in the field as well," says Simon. "With our monthly updates, we actualize the Navisworks Timeliner so that we can compare our baseline schedule work with the actual project and then learn what we're doing right or wrong."



THE PROCESS

"I start in Revit," says Simon. "It's the tool I know." SB Ballard's most common delivery method is "CM at risk" where they work very early with the architects and engineers who are still under contract with the owner and not with SB Ballard. Usually, SB Ballard gets involved at the schematic stage so the program requirements are already designed into the building. However, there are a lot of specifics that aren't completed like structural work and other specifications, so the construction company begins with a value engineering constructability review which improves the way the building is designed, therefore making it easier to build.

"In value engineering, we're obviously looking for things we can remove from the building to save money in the budget without impacting the functionality of the program requirements," says Simon. "The architect will give us a model and at that point, our big interest is using the model to develop a schedule and to look at the details that we're going to need." Simon and his team work directly out of Revit and in their constructability review, the project estimators and in-house consultants receive PDF and hard copy plans. Based on their particular areas of expertise, they provide comments which are then assembled by a coordinator. A series of collaborative constructability workshops (including the architect and owner) follow. Over the course of a few days and using the model, all comments are considered. "We'll sketch things up in the model that we think will make good details and make the project more feasible," says Simon.

Discussing the collaborative progress of a project, Simon points to a recent convocation center where the steel subcontractor was extremely critical to the design process, so he was brought on board as soon as possible. The subcontractor's early steel model was created in Tekla, so Simon converted that into Revit and has been working with that in coordination ever since. "It was very critical that we had that model and got him involved early because once we get the contract for construction, we buy it out, get all of subcontractors on board, and write into our contract that they will provide us with an IFC compliant model management of any required shop regulations. From that point on, piece-by-piece, we strip out those things that the architects and engineers have given us and replace them with the subcontractor-provided shop drawings. Then we're looking at actual coordination. If there is a VAV or an air handler, we know what brand, exactly what size, and exactly where the connections are. We're looking for those mating surfaces and that spatial coordination. By the time we're in construction, we have a model that is completely customized to what the subcontractors are going to provide."

Following this, the model is converted to Navisworks, becoming the "as built model," i.e., what SB Ballard provides to the owner at the end of the project for facilities management. It includes all RFIs and has all aspects tagged so the owner will know exactly what it is. "We'll link it," says Simon, "so they can click on something and it will pop up a spreadsheet that will show them what filter it needs, what light bulb it needs, who to call for maintenance." At this point, the model is then pushed out to the field. SB Ballard requires all subcontract superintendents with coordination issues (steel and mechanical, for example) to carry iPads and use Autodesk BIM 360 Glue, the cloud-based BIM management and collaboration tool, so they don't have to carry sheaves of paper around while performing their checks. "It's great for substrate," says Simon. "If you're going to hang ductwork, the electrician has already been through. You want to know if he's taken up any of your space and you can see that right away just by walking down that hallway with your iPad and 360 glue—incredible technology."

Tidewater Community College, Chesapeake, VA



Another portion of Simon's time is devoted to marketing, where he provides customer presentations. "Most of the jobs we do are construction at risk or design build," says Simon, "so we want to show the owner that we can visualize, as well as help them visualize and coordinate with what they want to build." In nearly every bid, this involves the construction of a three-dimensional project model which also helps Simon and his team better understand the project when it is presented to the estimators.

WORKFLOW CHALLENGES

"In the pre construction workflow," says Simon, "the challenge is interoperability. You have architects that use ArchiCAD and architects using CAD are a problem." Simon bemoans the fact that IFC models do not "transfer necessarily as advertised" into Revit which results in a substantial loss of information. "I think there's still a lot of work to be done from the IFC side and I'm not sure whether these are software manufacturer problems or whether these are IFC standards problems," says Simon. "I think it's a little bit of both." Another challenge Simon and his team face occurs during the construction phase when subcontractors are slow to review the models and provide input. Another is when, out in the field, an old fashioned superintendent objects to using BIM and Simon must insist that they do. "I'm pretty rigid about it," he chuckles, "but it saves everybody a lot of time and money if you can get them all on board. Getting buy-in is key and it really helps if the owner is into BIM. If an owner is aware of the BIM process and really wants to see it used, that makes all the difference in the world."

Based on experience, Simon believes that the percentage of owners insisting on BIM is about fifty percent. "Some care very deeply while others think it's a waste of time," he says. According to Simon, there is also a fair amount that remain indifferent. Among subcontractors, Simon believes that it depends on the size of the company. Large subs are always on board, while for smaller outfits, there remains a financial barrier to entry. Simon points to the cost of his GoBOXX, professional desktop workstations, and the necessary software applications as proof. "You can get away with less especially if you're only using Navisworks," he says, "but as a GC, if you really want to get in the door, it's going to cost you some money and some dedicated people. If you don't have the workload to justify it, it can be difficult to find consultants who are good at BIM. We tried very hard and we have one or two consultants we go to for certain projects, but most of them are either incredibly expensive or they are on a steeper learning curve than we are. That's a challenge. A small general contractor is going to have difficulty finding someone to provide service because there just aren't that many of them out there."

Tidewater Community College Student Center, Norfolk, VA



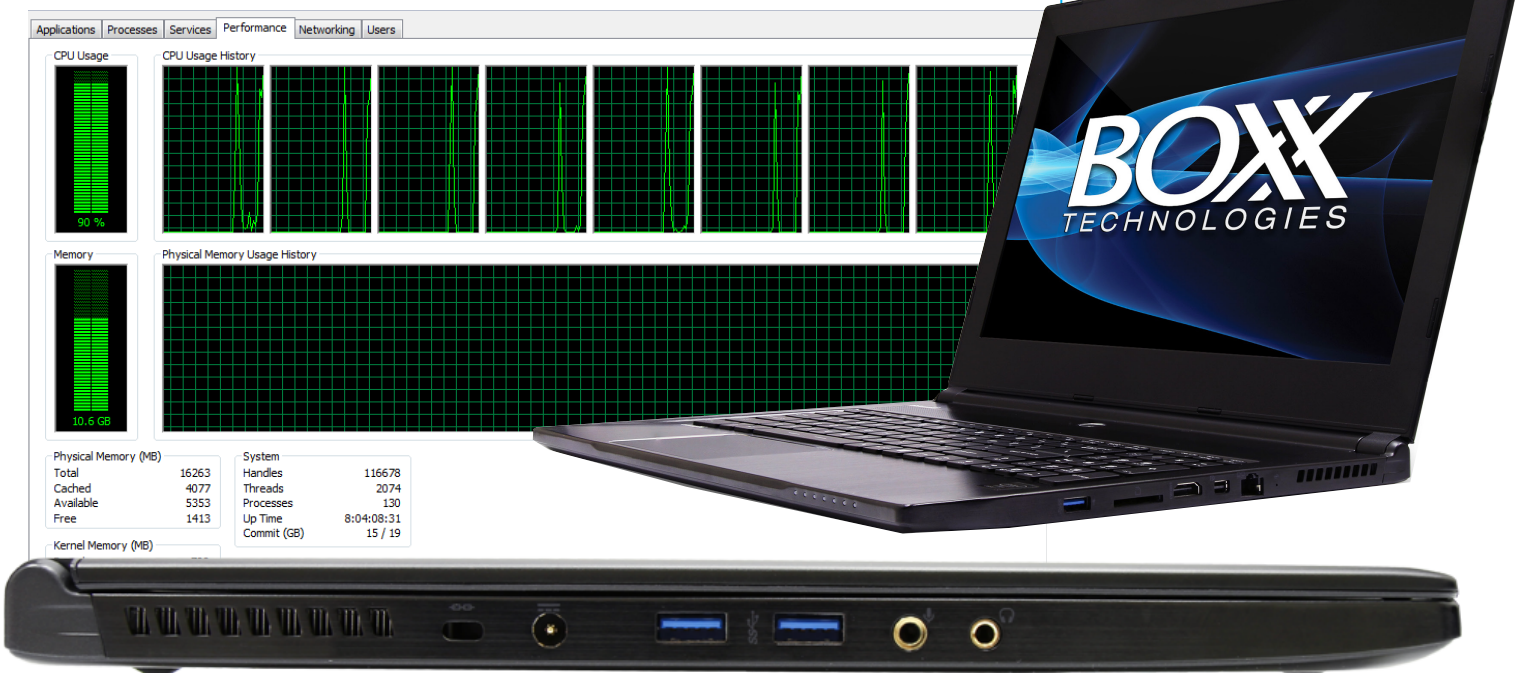
WE'RE GOING WITH BOXX

Prior to his GoBOXX mobile workstation, Simon relied on a top-of-the-line Dell laptop primarily because at that time, he simply wasn't aware of BOXX. "Dell was extremely well-rated with an aluminum case, good speed, and power for graphics," he recalls, "but it was nothing like this GoBOXX." Simon discovered BOXX during a trip to Autodesk University in 2012 where he actually shuffled his Dell laptop around, looking for a comparable model. "I had just got it, so it was still brand new," he recalls. "We didn't know too much about the available machines. Lenovo was there, HP too, and I asked them all, 'What do you have that compares to this machine?' They all said nothing. They didn't have anything like it. So I went to the BOXX booth and their reply was 'What do you need?' We made the resolution then that when it was time to get another machine, we were going with BOXX."

When discussing the speed and performance of his mobile workstation, Simon mentions the Intel processor and ten cores, but is also quick to credit the machine's cooling ability. "It has four good size fans underneath it, so it doesn't get hot. If you put my old Dell machine in your lap, you'd get blisters," he says with a laugh. "I had to keep a chill pad under it. Other machines tend to bog down when they get hot, but this GoBOXX doesn't and that's the big difference—failure rate. I think the ability to run cool makes a big difference in the life of the machine. Our IT guys check the logs of when things break down and my other machines have always broken down because of heat." When I ask Simon if machine failure ever occurred during a presentation, he replies, "Yes—especially during animation when you're processing a lot of graphics. Animation is where it really makes a difference. That's where that heat will get you. I think the combination of a lot of processing power, which makes it very fast, also generates a lot of heat."

You can't mention 3D applications these days without discussing rendering, so I ask Simon about rendering on the GoBOXX. He replies that heavy rendering with 3ds Max is offloaded to a renderPRO, the BOXX personal, desktide rendering module. "We only do that with 3ds Max, so I work in it ten percent of the time. These are typically animations where I'm rendering thousands of images—six images a second in a four to five minute animation. That gets to be a large rendering project. If I have something I need to do quick and dirty and don't have time to get it into 3ds Max, clean it up, get the lighting right, and all that, I can still do renderings out of Revit on the GoBOXX and clean them up in Adobe Photoshop pretty quickly."

GoBOXX 15 SLM



He adds that SB Ballard does very little rendering in Revit, but insists that his GoBOXX is significantly faster (twice as fast, in fact) as any other machine he's ever used. As for calculating rendering times on the GoBOXX, Simon acknowledges that there is no average—it simply depends on the detail of the model. "Yesterday I did an exterior stairway with a water feature next to it," he says. "Not an incredibly complicated model and I did it at a high resolution. It took four minutes to render. Best quality took twelve minutes. It was very fast. Doing a big model rendering with custom lighting and 3ds Max, you have a lot less control over what is rendered in Revit, so you can't turn things on and off. You pretty much have to render the whole model. It was intense— probably took twenty-five to thirty minutes. It would have taken several hours on the old machine. If the GoBOXX is not four times as fast, it's at least twice as fast. Waiting twenty to thirty minutes for a rendering like that is nothing."

When I ask Simon to explain the most substantial differences between the GoBOXX and his previous mobile, he pauses for a moment. "When you're actually navigating around the machine, the differences are subtle, but significant. The action on orbiting and panning is smoother so that you're less likely to catch and select the wrong thing—and that can be very irritating when you're modeling. If a machine is lagging just a little bit behind, you'll select and then you'll find you actually selected the last thing that you thought you were hovering over. I can't estimate how much time it saves you because of that. What I can say is that this thing "light screens" a lot less. Revit used to crash on me several times a day on the Dell, but I have very few crashes now. Since I've had this machine, I've only had two Revit crashes which is incredible."

As for being a solution to previous workflow problems, Simon also cites the machine's easy and uncanny compatibility with AV projection systems. According to him, this third aspect is critical since he is often required to present a model on a moment's notice. "Having a very fast, portable machine is extremely important in that regard," he says. "Working at my desk I used to hate it when someone said 'Can you come to the conference room and show us the model?' My answer was always, 'I may be able to. Let me see if I can get this thing fired up. Not anymore."

In our field offices we have large screen televisions and projection screens for presentation meetings, so I have to be able to link in and get hooked up on that particular system." As the only laptop he uses, Simon spends about twenty percent of his time out of the office. At least one day a week he's either in the conference room presenting something to someone, or at a client presentation, or out in the field running some type of meeting where he must show the model on the screen.

NICE TO DO STUFF

Although he's not privy to any actual benchmarking data, Simon insists that in terms of productivity, he's getting a lot more "nice to do stuff" accomplished. He defines "nice to do" as either detailing in models or finishing. "You're never really done with a model," he laughs. "You simply run out of time and have to go with it. With the GoBOXX, my models are more detailed and more corrected. I have more time to go back and fix things." He also says that he has more time to grant the constant requests ("Could you sketch this up for me please?") that come his way.

When discussing GoBOXX performance, Simon relays a story about a recent SB Ballard project where they faced some challenges obtaining IFC models from the ductwork and sprinkler system subcontractors. "Their shot drawings were on paper," says Simon, "and with the GoBOXX, it was easy to model those things. With the Dell laptop, it would have been very difficult because the model was extremely large, very specific." Simon points out that SB Ballard will actually model detail items that architects don't. As an example, he refers to glass connections where they (SB Ballard) actually build a 3D model of the connection. "Architects won't do that because they're trying to show design intent—not specifications," says Simon. "We want to look at the specific part and make sure it will fit." Simon adds that often, the mechanical contractor has previously chosen equipment from a manufacturer that doesn't have Revit models, therefore requiring SB Ballard to create them. In these instances, his Dell laptop would quickly bog down under the weight of such large scale models, while his GoBOXX handles them with ease.



Norfolk State University Nursing , Norfolk, VA

“WHEN YOU’RE TRYING TO GET THE JOB, IT’S VERY CUTTHROAT”

Because SB Ballard has earned a reputation as a builder of large scale, high profile projects, Simon’s project presentations come with a certain degree of expectation. “In some ways, I think we sort of built a trap for ourselves,” he admits. “If we don’t walk in with all the bells and whistles, then the client thinks we’re giving him short shrift and that we don’t really want the job. The level of expectation has definitely increased. Where Timelander video was once sufficient, we now have to have a lot more. We used to go in with simple power point presentations of pdf slides. That just doesn’t work anymore. It must be very highly orchestrated. In the bidding process when you’re trying to get the job, it’s very cutthroat. All those contractors out there have the capability to CM at risk or design build work, and they’re competing for these jobs. The majority of contractors are going after these hard bid jobs and we can’t differentiate ourselves in those because it’s all about price. Ideally, we need to have a best value environment where we can demonstrate to the owner what we can do and let them know that they’re going to get a better product and then they’ll want to use us again. That’s not something we can communicate in a hard bid. Most quality general contractors are in that quandary.”

As for the future of BIM, Simon believes it’s firmly on the way back following a period where it seemed to be in somewhat of a decline. He refers to a competitor, a “quality general contractor” that at one time employed a BIM staff of eight, went through layoffs, and is down to one. “A few years ago, BIM’s stock was way down,” he admits, “but now it’s coming back. Owners demand it and it saves money.”

Because of all the information it provides in terms of long term maintenance, I compare BIM to “service after the sale,” and Simon agrees. “When we give it to most owners, they ask, ‘Do we really need this?’” he says. “But some demand it. In another two years, they’ll all want it and institutional owners are going to want to tie it into the facilities management systems they’re buying. That’s sort of the next thing were looking at—going to the 6D lifecycle integrating with facilities management. We just don’t have many owners that are terribly interested in that right now, but they’re starting to come around and we’re ready for them. The biggest factor for us, in order to produce a facilities management solution, is what facilities management software they’re going to use. It’s still sort of an emerging thing so the standards aren’t as strong as they should be.

As our conversation winds down, I ask Phil Simon if SB Ballard considers BOXX a part of their future and he quickly replies that they already need more and as their current machines reach their expiration date, will likely purchase additional GoBOXX systems. “I asked IT for a GoBOXX 2720 and they got me (a top of the line) 2725 because they wanted to give it a try,” says Simon. “I’m glad they did. It’s a great machine. The performance is absolutely jaw-dropping and I couldn’t be happier with it.”

For more information on GoBOXX visit:
www.boxxtech.com/products/mobile-workstations

BOXX