

The bridge to somewhere:

Real Life Engineering with Second Life Tools

by Surfdaddy Orca

Legislative earmarks, the topic of much recent national debate, are congressional provisions directing approved funds to be spent on specific projects. Perhaps one of the most well-known earmarks is the Gravina Island Bridge, dubbed the "Bridge to Nowhere" by Ketchikan resident Charlie Arteaga.

Criticized by both the right and the left, this proposed bridge became the butt of late-night jokes and comedy routines as the white elephant of needless, wasteful spending.

Unlike Gravina Island, the Public Works Island in Second Life (SL) hosts an entirely different kind of bridge. Created for mere Linden dollars, Avatar TEEEX Clary's virtual bridge symbolizes a bridge that is going somewhere — perhaps the future of civil engineering — using 3D tools in SL for visualization.

The Public Works Island is the brainchild of avatar Pam Renior. In real life, Pam Renior's alter ego Pam Broviak is a registered, professional engineer in Illinois. According to Pam, Public Works Island "...has been developed to introduce general citizens to public works and show them what we do—educate them—then it is also a place for those of us in related fields to build community."

She also sees the island as an on-the-job resource for members of the American Public Works Association and others, "... to train here and develop things we can use in real life on our jobs."

TEEX is short for Texas Engineering Extension Service <http://www.teex.org/>

a real-life organization that offers a wide range of technical skills and training programs aimed at employed workers and those entering the labor force. In SL, TEEEX Clary, like his namesake, offers "training, technical assistance and emergency response in Fire Services, Homeland Security, Public Works, Public Safety and Security, Professional Regulator Training, and Economic Development."

According to the TEEEX website, in 2007, the real-life TEEEX provided training and technical assistance to more than 204,000 people from all 50 states, five U.S. territories, the District of Co-

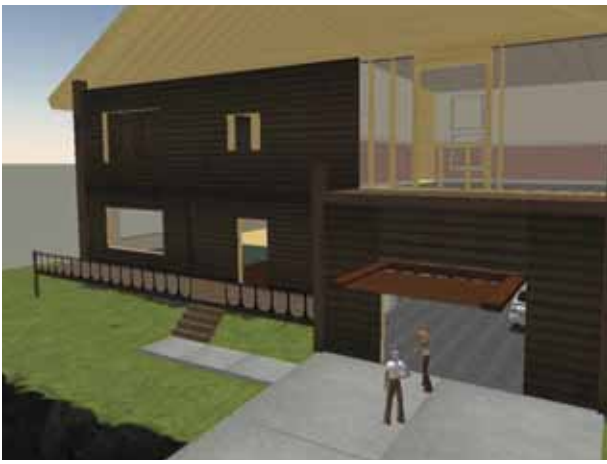
lumbia and 54 countries in over 8,300 deliveries across the nation and world.

Civil engineers typically apply the principles of structural engineering, environmental engineering, transportation engineering and construction engineering to public works projects of all sizes and levels of construction. Pam sees "public works" in the virtual world as more than civil engineering. Her vision covers education and tools for "building and code enforcement, planning, architecture, construction, and municipal government."

One of the innovative tools she is developing is model house, "... a home



Pam Renior and TEEEX Clary at the bridge tour of Public Works Island



When finished, this model house will be a 3D representation of the International Building Code.

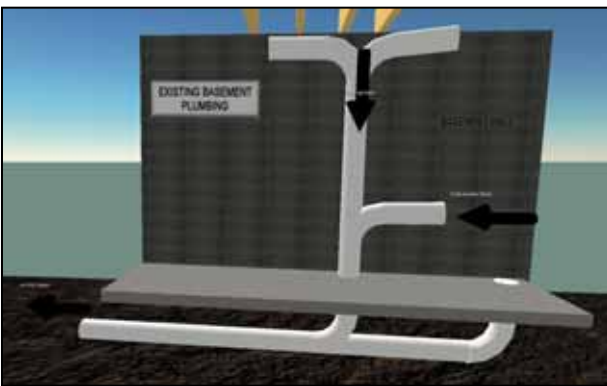
that is fairly close to 'scale' – it will be a code house – a 3D representation of the building code." This will be a working house representing the 2003 International Building Code that you, as your avatar, can walk inside. Pam continues, "I am going to script it and put links and notecards and displays to show the code so people don't have to read it in a book."

Pam takes me to another building. Hearing the low drone of an engine, I see a message flash across the bottom of my viewer, "Dumpster-1.4 whispers: Surfdaddy Orca looks at the dumpster and suddenly feels an insane desire to harvest it!"

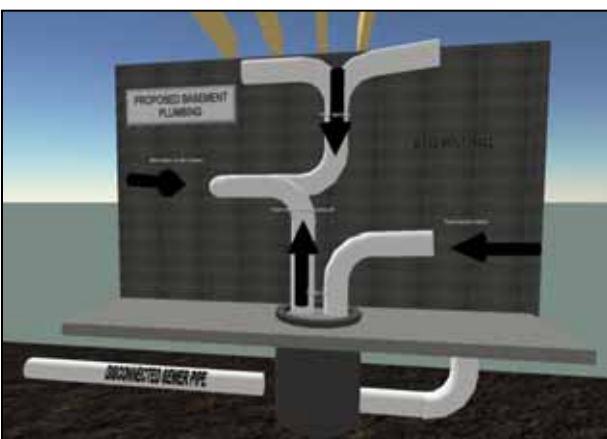
Pam laughs as I quickly move out of the way, "In this garage I am temporarily storing something I made for my real-life job to show citizens with flooded basements how to replumb their home." She talks about a complete 3D library of plumbing solutions accessible to engineers visiting Second Life.

"What takes it further than conventional 3D drafting tools is the level of interaction. Once you build something, you can pick it up or walk through it; it's immersive, like the object is really there. You can't do that with CAD [Computer-Aided Design]," says Pam in a recent Design News article.

On my tour of the island, Pam shows me her latest SL creation, a manhole de-



Existing basement plumbing



Proposed solution

Plumbing is easy to visualize using Second Life as a design medium

sign kit, "It is all to scale to help size manholes for a project." I ask if it can be used to scale real-life projects. Pam replies, "Definitely—we all do it usually on paper or try to use CAD but this was so much faster, better, and more life-like. Now that I have the kit ready, it is really fast."

Pam also contributes to an in-world Second Life magazine called *The SLEngineer*, published by MarcusSRB Rayment and CIVIL Writer and helps coordinate the SL Civil Engineering Group. This is one of four groups that Pam says provide "a medium in which civil engineers from all over the world can meet, communicate, and share resources and ideas."

Real-life engineers learn drafting using a standard Leroy lettering set consisting of a set of templates, a scribe, and a set of pens. "Perhaps I am just too sentimental but I had to bring my old Leroy Lettering set into Second Life — my SL drafting table doesn't look right without one. I have attached the set as a gift for group members," writes Pam in a recent group notice.

Pam is not the only one to see the potential of 3D immersive technology for engineering applications. The January edition of *The SLEngineer* describes some other major players "setting up shop" in Second Life. These include no less than SolidWorks and Autodesk. Autodesk, the author of the industry-standard AutoCAD familiar to several generations of college students and professional engineers, opened an island in Second Life early in 2007.

And TEEX's bridge? "I have been fascinated with how this new software tool [SL] can be used to make my job easier, and maybe a little more fun and cool," says Pam. TEEX's self-guided 3D bridge tour is a great use of SL as an educational resource. Each informational "podium" on the tour provides a different vantage point. Click a numbered podium, and you get a note card describing some aspect of bridge maintenance. Number 5, for example, talks about drainage:

"Thank you for your interest in the Texas Engineering Extension Service (TEEX) Bridge Maintenance Tour! You have reached the fifth of six podiums."

What's the Problem?

Bridges are usually designed with specific ways for water to flow and drain from them.

As you walked the length of the bridge, you may have noticed a number of drain openings along the edge. These drains are installed to provide the best direction for rainfall runoff to drain from the bridge without causing issues or damage. But debris can accumulate in these areas, blocking the flow of drainage. As you can see, water often ponds, creating a driving hazard, and eventually drains elsewhere — and that creates additional issues. Whether the flow is redirected to another drain (possibly overloading that drain), or drains to another unintended location, it potentially will cause a maintenance issue.

What's the Maintenance?

Simple: Keep the debris removed.

This should be a routine maintenance task. And the cost is usually much less than the eventual repair that might be required if damage occurred.

Where do I go next?

Walk to the end of the bridge and take a right. The next podium should be just around that corner.

You're almost done!

TEEX's bridge is a metaphor for what could be a killer app for virtual worlds — bridging the gap between real-world problems and the instantaneous modeling and scaling of solutions in 3D immersive space. Whether plumbing, building codes, bridges, manhole covers, or even sewers (yes, there is a virtual sewer on Public Works Island), the potential to visualize solutions will likely attract a new generation of engineers raised on AutoCAD and Google SketchUp to Second Life to try out the "fun and cool" tools.

For more information, visit PublicWorks Island or the Public Works website www.publicworksgroup.com ☼

