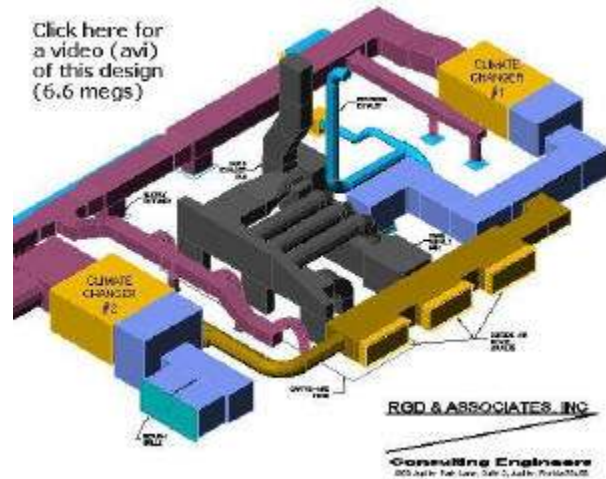


## Why 3D HVAC?

### The Benefits of Designing HVAC in Three-Dimensions

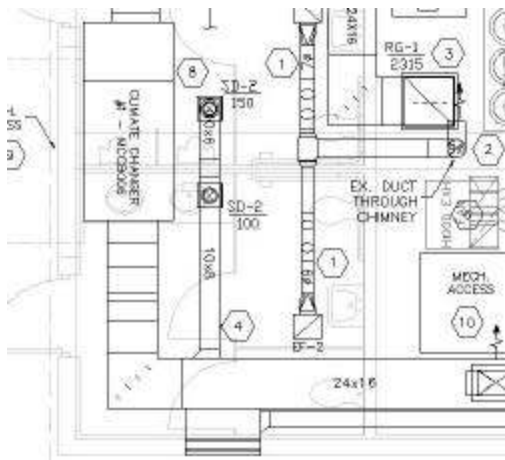
by Mike Bishop, Mechanical Engineer, RGD & Associates Inc.

In the world of M.E.P. design, the engineers' mantra is "speed, efficiency, accuracy." Without these attributes, it would be impossible to stay competitive in a growing, dynamic market. However, while speed and efficiency are rarely compromised, often on more complicated jobs it is difficult to represent complex geometries to the contractor. In a cost competitive environment, there is pressure to produce drawing packages which clearly convey the design intent. Traditionally, more complicated jobs would require the engineer to spend countless hours creating additional details and isometric views from scratch. This is no longer the case.



With the introduction of **Autodesk's Building Systems** product, M.E.P. engineers can rapidly and accurately model ductwork, plumbing, and electrical systems in three-dimensions. This feature is not an add-on requiring extra drafting, it is integral to the design work itself. From start to finish, the entire system is modeled in three-dimensions using standard and custom-made scalable parts. Once the software is mastered, the time required to draft a complete system is only marginally longer than traditional one-line Autocad drafting. However, the benefits to client, engineer, and contractor can more than offset additional drafting time.

In the example shown in the three-dimensional model above, **RGD and Associates** was contracted to produce mechanical and plumbing drawings for a new private club in Wellington, Florida. The architect had originally designed a simple snack bar for the pool area which the client expanded to a full-service kitchen and indoor seating area. The seating area had an open-truss ceiling so there were severe equipment placement limitations. Basically, all the HVAC equipment (two large air handlers, supply and return ductwork for both systems, exhaust fans and ductwork for the kitchen hood, and make-up air plenum and ductwork for the hood) would have to fit in the attic space above the kitchen. To make matters worse, the attic space was limited by the truss members and a large up-turned beam running along the concrete ceiling slab.



**RGD and Associates** coordinated their design closely with the architect and hood supplier, **Captive Aire**, to ensure that the contractor would be able to install the

system with a minimum of guesswork. They utilized the flexibility of **Building Systems 2004** to detail the geometry of every piece of equipment and ductwork and create a three-dimensional, full-color plot for the contractor to reference. During a coordination meeting with the hood representative, they were able to take dimensions from his 2-d drawings to accurately determine locations for ceiling penetrations and the exhaust and make-up air fans. Finally, in the construction phase, the contractor, **Cassidy Air Conditioning**, was able to install the system *with no significant modifications to the design as specified on the drawings.*

Recent advances in CAD technology have made it more possible to maintain speed and efficiency while actually improving accuracy. **RGD and Associates** has over twenty years of diverse experience in engineering and building construction. They have been utilizing **Building Systems 2004** for the past year and a half on a range of design applications.