The old cliché, "It's easier to tear it down and start over" is no longer true.

Owners can now get far more feasible reuse of existing buildings, which allows for a more sustainable approach to managing assets. However, renovation projects are full of many unknowns making it potentially difficult to accurately budget and determine an existing asset's true ROI.

Virtual building and construction, when used in the planning process, can significantly reduce project waste and provide owners with confidence before beginning actual design and construction. Savings can be locked in before construction starts and put back into the project. By maximizing limited resources, owners can do more with less.

Before beginning your project, it is critical to understand the existing conditions. Surveying technology will help with this assessment.

1. **Laser Scanning** is useful for understanding the existing structure and above ground surrounding areas.

    Facility owners should invest early in selective demolition to get the biggest bang from this tool. 50-100 scans per day can be merged together into a dimensionally-accurate 3D point cloud. These scans can be combined with photography to create a 3D model that is also a complete visual archive. The scans can also be merged with the 3D architectural model for an accurate representation of existing conditions within the model. If you determine the cost of merging files isn't of value, the point cloud can also be used independently for clash detection.

2. **Ground Penetrating Radar** is used to locate existing underground utility lines – approximate size and depth. An entire site can be scanned relatively efficiently for utilities & buried obstructions.

    The radar information can be merged into the project's 3D model for coordination and clash detection.

Once the project moves forward, the following design and construction technologies can help with project delivery.

3. **Revit** is a tool for authoring "smart" sharable models. **Navisworks / BIM 360 Glue** are tools for sharing and coordinating those models.

    Project problems decrease as information sharing increases. The results include faster schedules, lower cost and the ability to know project savings early on.

    3D design models can be shared, imported, and exported between architect, consultants, contractors and subcontractors. These models are smart, understanding different building components and materials. The models can be used to efficiently create and coordinate with the

subcontractors' shop drawings. Clash detection is then solved during design rather than on the jobsite. As a result, elements fit to existing conditions, field labor cost is reduced and the team's need to carry contingency is nearly eliminated.

4. **Assemble** allows teams to gather accurate quantities, developing an accurate understanding of cost.

   This estimating tool pulls quantities directly from the materials and dimensions in the model. If the model changes, the team can automatically get fast recalculations. Both owner and team can make better decisions by assessing more options.

5. **Robotic Total Station** is used for more accurate field engineering.

   By taking layout coordinates directly from the model and pinpointing them in the field, field engineering becomes faster and less labor-intensive resulting in cost savings. In addition to being more accurate, complicated design geometry is easy to put in place physically resulting in greater alignment with design intent.

If you are interested in learning more about these technologies or would like a demonstration, please contact us.