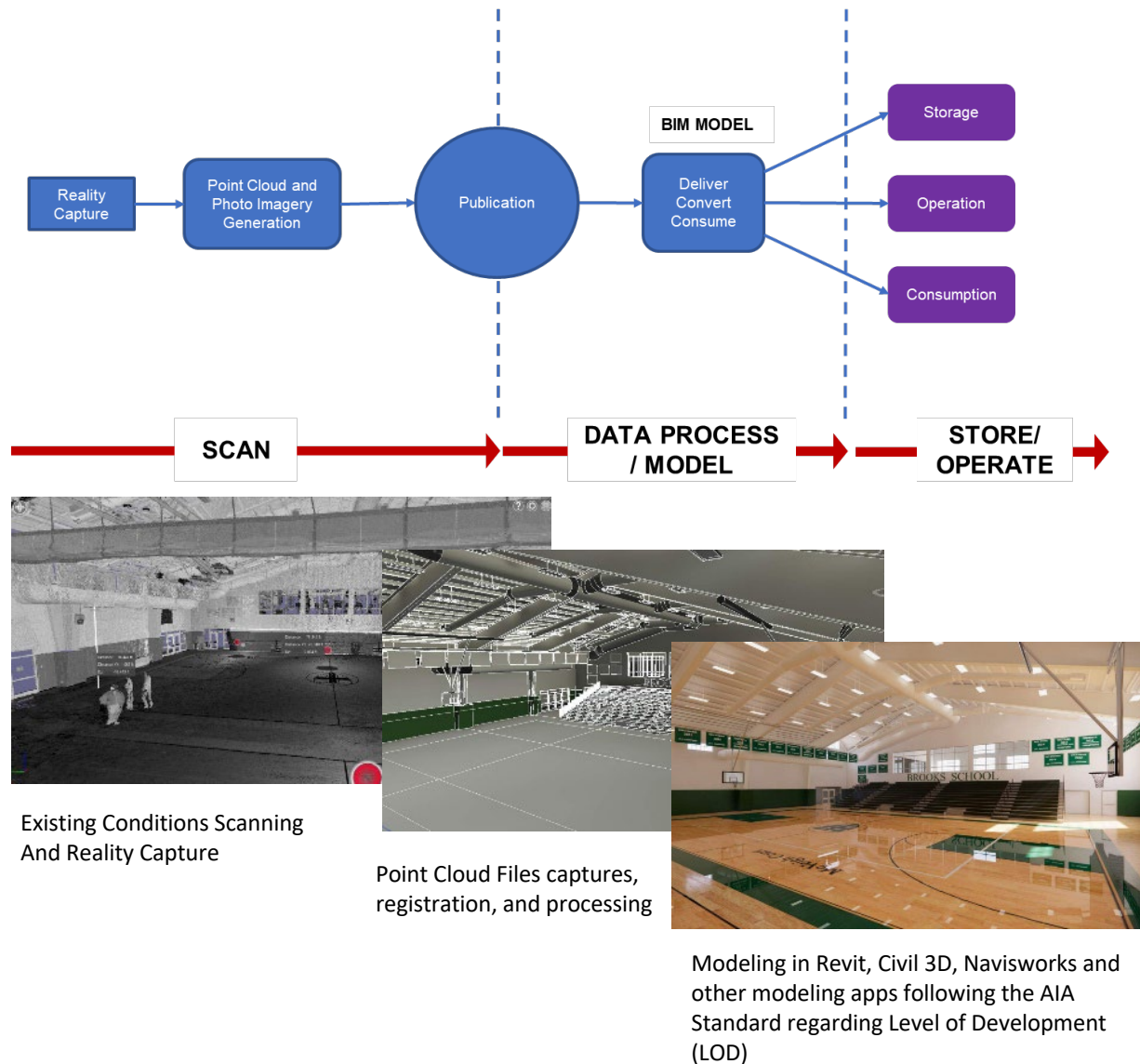


## Scan-to-BIM workflow and references

### Workflow

MicroCAD follows a detailed workflow to deliver value and the outmost quality to all our customers



## Leica technology, best in class Reality Capture

At MicroCAD we partner with Leica Geosystems laser scanners which are the best-in-class devices for capturing high-definition and precise 3D data of any objects or environments, from buildings and structures to natural landscapes and historic sites. They deliver unmatched ranges of up to 1 km, high-speed scanning of up to 2 million points per second, and versatile functionality for different scanning modes and conditions. They also offer real-time data processing and visualization through mobile apps and software solutions.



### How we do it – the MicroCAD way

#### Phase 1 - PLANNING

Our experienced professionals consult with each client to understand their project and prepare an ideal scope of work of the site or building environment.

#### Phase 2 - CAPTURING POINT CLOUD SURVEY

Depending on the size and complexity of the environment, the survey may consist of one to thousands of individual scans. Millions of data points are collected, all with extreme accuracy. A colored 3D spatial point cloud is produced.

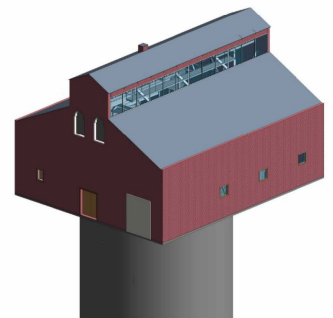
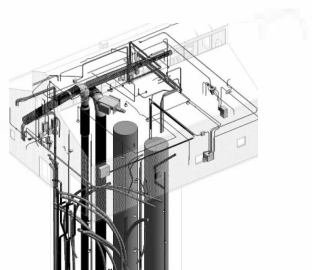
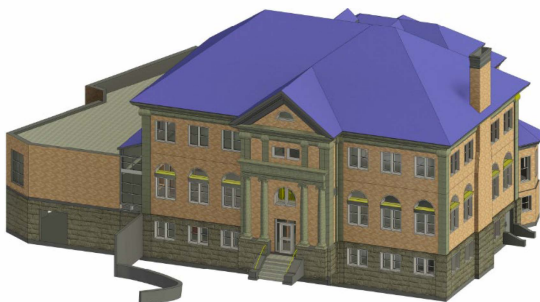
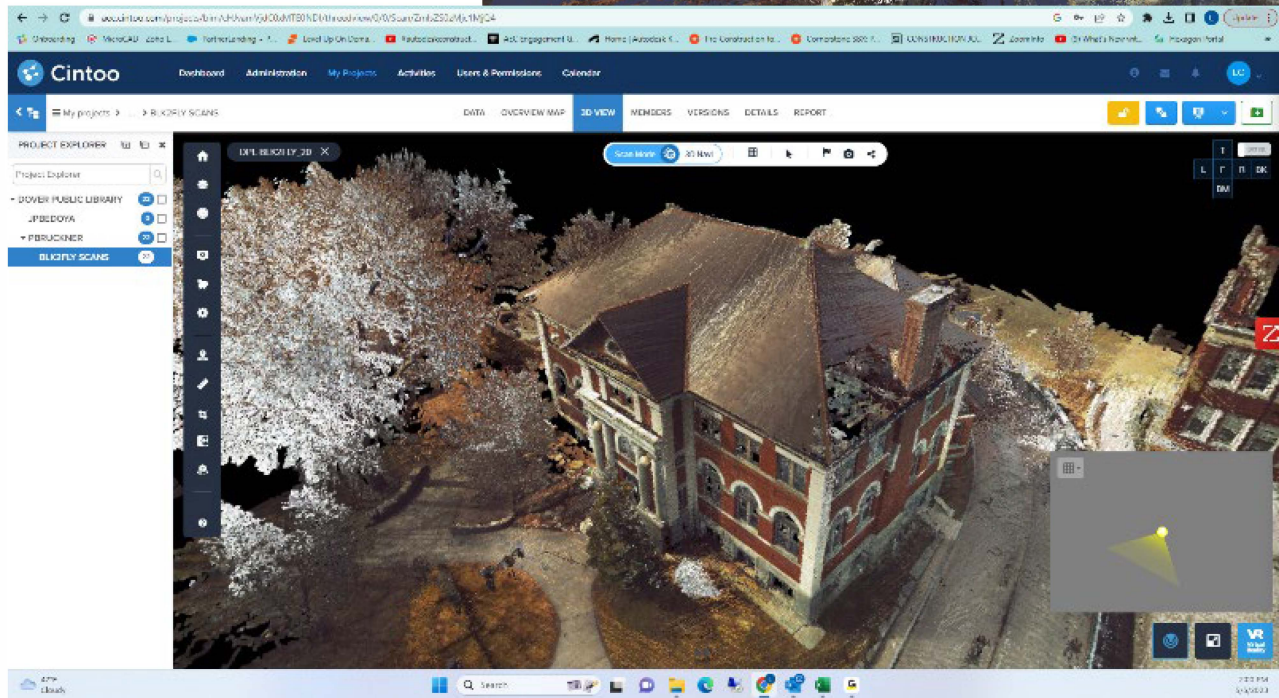
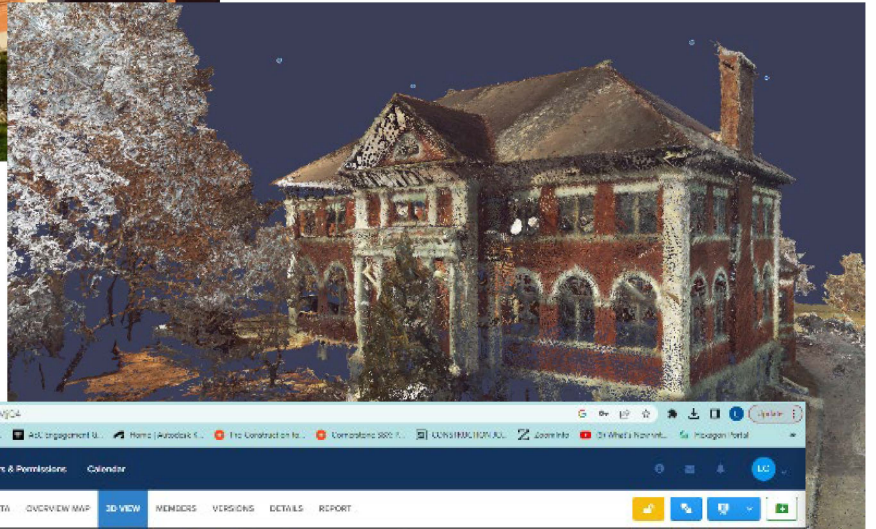
#### Phase 3 - POINT CLOUD REGISTRATION

An intuitive field software application is utilized to compile the scans and produce a high-quality, "registered" 3D model rich in detail.

#### Phase 4 - POST-PROCESSING and MODELING

Modeling CAD to BIM is the process of converting existing CAD drawings into BIM models using software tools such as Autodesk Revit or Navisworks. Modeling CAD to BIM enables better coordination, visualization, and analysis of building projects, as well as improved efficiency and accuracy of design and construction.

Further data analysis and QC checks are performed in-house, removing unnecessary points, and setting the coordinate system using specialized software.

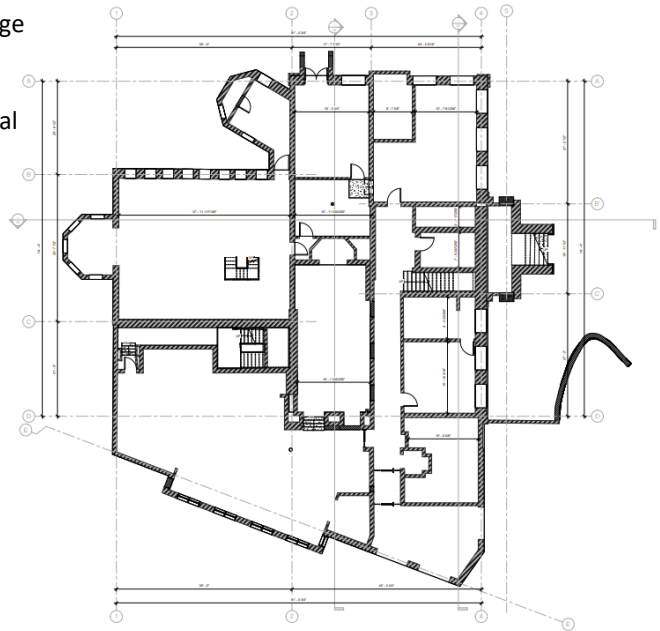




## Some of the elements that are included in the BIM model.

### A - Interior architectural floor plan drawings to include

- Stairs, elevators, ramps, and any other vertical circulation
- Floors with overall slope averaged.
- Exterior perimeter wall
- Interior demising wall between retail spaces and garage on ground floor
- Doors
- Windows
- Exposed columns (location and size only not structural analysis)
- Vertical height information in text (bottom of deck/beam, head/sill)

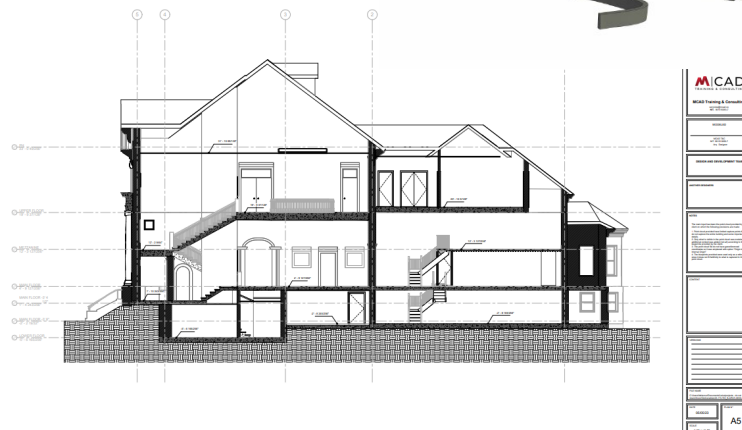
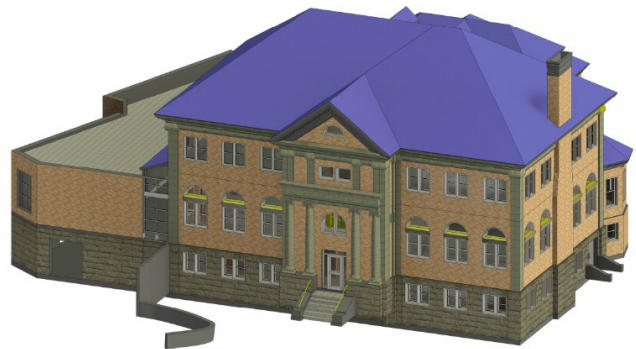


### B - Interior architecture RCP taken at finished level, drawings to include

- a. Ceilings set at correct height and correct material.
  - b. Exposed deck
  - c. Exposed beams (location and size only not structural analysis)
- a. MEP equipment blocked out at correct location and size, not details such as bolts, runs, function etc.)

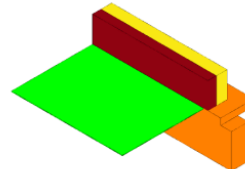
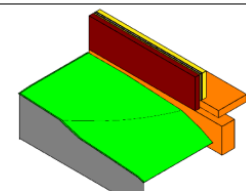
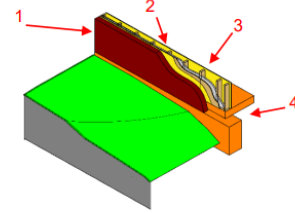
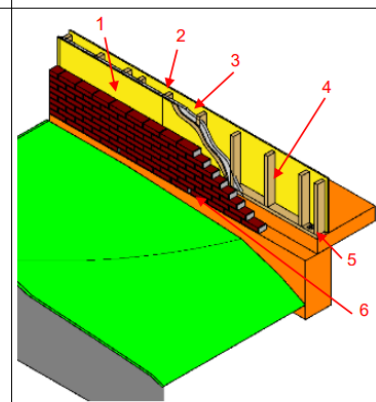
### C - Interior architectural elevation

- Walls
- Doors
- Windows
- Base/ crown molding
- Wainscot
- Millwork



## A word about LOD

There are different levels of LOD that indicate the degree of reliability and usability of the model elements at different stages of the project. The most common levels of LOD are:

<b>B2010.10</b> <b>21-02 20 10 10</b> <b>Exterior Wall Veneer</b> <i>Includes: Nonstructural outside face elements of exterior walls. Includes precast concrete, unit masonry, EIFS, manufactured siding, and stucco. Includes water repellents, coatings, and painting.</i> Associated Masterformat Sections: 03 40 00 / 04 20 00 / 04 26 13 / 04 42 00 / 04 43 13 04 70 00 / 05 19 13 / 06 20 13 / 06 61 00 / 07 19 00 / 07 24 00 / 07 42 00 / 07 44 00 07 46 00 / 09 24 00 / 09 24 23 / 09 90 00		
100	N/A	
200	<p>Generic wall objects separated by type of material (e.g. brick wall vs. terracotta).</p> <p>Approximate thickness of layer represented by a single assembly.</p> <p>Layouts and locations still flexible.</p>	 <p>63 B2010.10-LOD-200 Exterior Wall Veneer, From <a href="http://kerd.com">kerd.com</a></p>
300	<p>Exterior wall veneer modeled as a separate element.</p> <p>Specific wall modeled to actual dimensions.</p> <p>Penetrations are modeled to nominal dimensions for major wall openings such as windows, doors, and large mechanical elements.</p>	 <p>64 B2010.10-LOD-300 Exterior Wall Veneer From <a href="http://kerd.com">kerd.com</a></p>
350	<p>Exterior wall veneer modeled as a separate element.</p> <p>All penetrations are modeled at actual rough-opening dimensions.</p> <p>Precast concrete panels are individually modeled. Connection points are specified.</p> <p>Connection to interfacing systems</p> <p><i>Images notes:</i></p> <ul style="list-style-type: none"> <li>• Wall veneer element</li> <li>• Skin layers including but not limited to waterproofing membrane</li> <li>• Core framing</li> <li>• Concrete slab edge</li> </ul>	 <p>65 B2010.10-LOD-350 Exterior Wall Veneer From <a href="http://kerd.com">kerd.com</a></p>
400	<p>Element modeling includes:</p> <p><i>Image notes:</i></p> <ul style="list-style-type: none"> <li>• Individual masonry units</li> <li>• Skin layers including</li> <li>• Moisture barrier, sheathing, and insulation</li> <li>• Core framing</li> <li>• Bolt</li> <li>• Concrete slab edge</li> <li>• Weep holes</li> </ul>	 <p>66 B2010.10-LOD-400 Exterior Wall Veneer From <a href="http://kerd.com">kerd.com</a></p>

Source: BIM Forum, Level of Development Specification. Tuesday, June 28, 2022

<https://bimforum.org/resource/level-of-development-specification/>