

## Rafael Josh - ICON Portfolio

Here is a sample of my contributions to ICON's BuildOS Construction Suite. This is a set of applications that my team designed and built for internal employees to streamline their processes and let them focus on more important roles. It comprises two apps, Studio and Blueprint, which formed the construction wing of BuildOS.

Studio is a CAD-like design application in which one can draw, place, and arrange printable projects. These connect to an in-field application for print operators to print. Studio is made for architects and print engineers to make changing a design faster and easier. We succeeded in creating a product which they regularly used and relied on for their daily operations.

Blueprint is a pre-construction and project management application for viewing all pieces needed on a print, and data on materials and cost. End users were our finance team, project management team, and pre-construction team who were in charge of ordering all parts necessary on a print. This was a success as well as tested by all of those roles listed.

Our apps were heavily influenced by those roles' current processes and mimicking the software they already used in a more opinionated way that worked with a concrete 3D printer. Ourselves, our users, and our managers were all happy with the apps we produced and they will continue to benefit ICON for years to come. Below are more detailed screenshots of our designs, their purposes, and my contributions to them. I unfortunately did not save any of the media I produced of these working products, but the designs are exact to the finished application.

The screenshot shows the Kōn Studio application interface. On the left, there's a sidebar with sections for 'Workspaces' (containing 'Wolf Ranch' with a star icon), 'FAVORITES' (with 'Cato', 'Dyce', 'Ezra', 'Klay', 'Nola', 'Rune'), and groups like 'GLO', 'CFV', 'Camp Mabry', and 'Fort Bliss'. At the bottom left is an account icon with 'Spruce Springclean' and a dropdown arrow. The main area is titled 'WORKSPACES Wolf Ranch ★' and contains a search bar ('Name: A - Z') and a 'Search projects' field. Below is a table with columns 'Name', 'Location', 'Last updated', and 'Status'. The first section, 'Cato', has three rows: 'CATO-A-R' (Location Lot 1, Last updated 2 days ago, Status Phase 3), 'CATO-C-L' (highlighted in light blue, Location Lot 2, Last updated Yesterday, Status Phase 2), and 'CATO-C-R' (Location Lot 4, Last updated 5 minutes ago, Status Phase 3). A small circular icon with a hand and a question mark is next to the last row. The second section, 'Dyce', has five rows: 'DYCE-A-R' (Location Lot 7, Last updated 2 days ago, Status Phase 3), 'DYCE-B-R' (Location Lot 8, Last updated Yesterday, Status Phase 2), 'DYCE-A-L' (Location Lot 10, Last updated Dec 19, 2022, Status Phase 3), 'DYCE-B-L' (Location Lot 11, Last updated Just now, Status Phase 2), and 'DYCE-C-R' (Location Lot 12, Last updated 1 hour ago, Status Phase 3). The third section, 'Ezra', has four rows: 'EZRA-A-R' (Location Lot 7, Last updated 2 days ago, Status Phase 3), 'EZRA-B-R' (Location Lot 8, Last updated Yesterday, Status Phase 2), 'EZRA-A-L' (Location Lot 10, Last updated Dec 19, 2022, Status Phase 3), and 'EZRA-B-L' (Location Lot 11, Last updated Just now, Status Phase 2).

This is the entry point and menu to Studio. I was responsible for and built nearly every component on this page. The most complex features here are:

- Drag and drop projects from one group to another.
- Drag and drop projects and groups into other workspaces on the left.
- Adding new workspaces, groups, and projects. Top right.
- Searching and sorting projects.
- Account options and info in the bottom left.

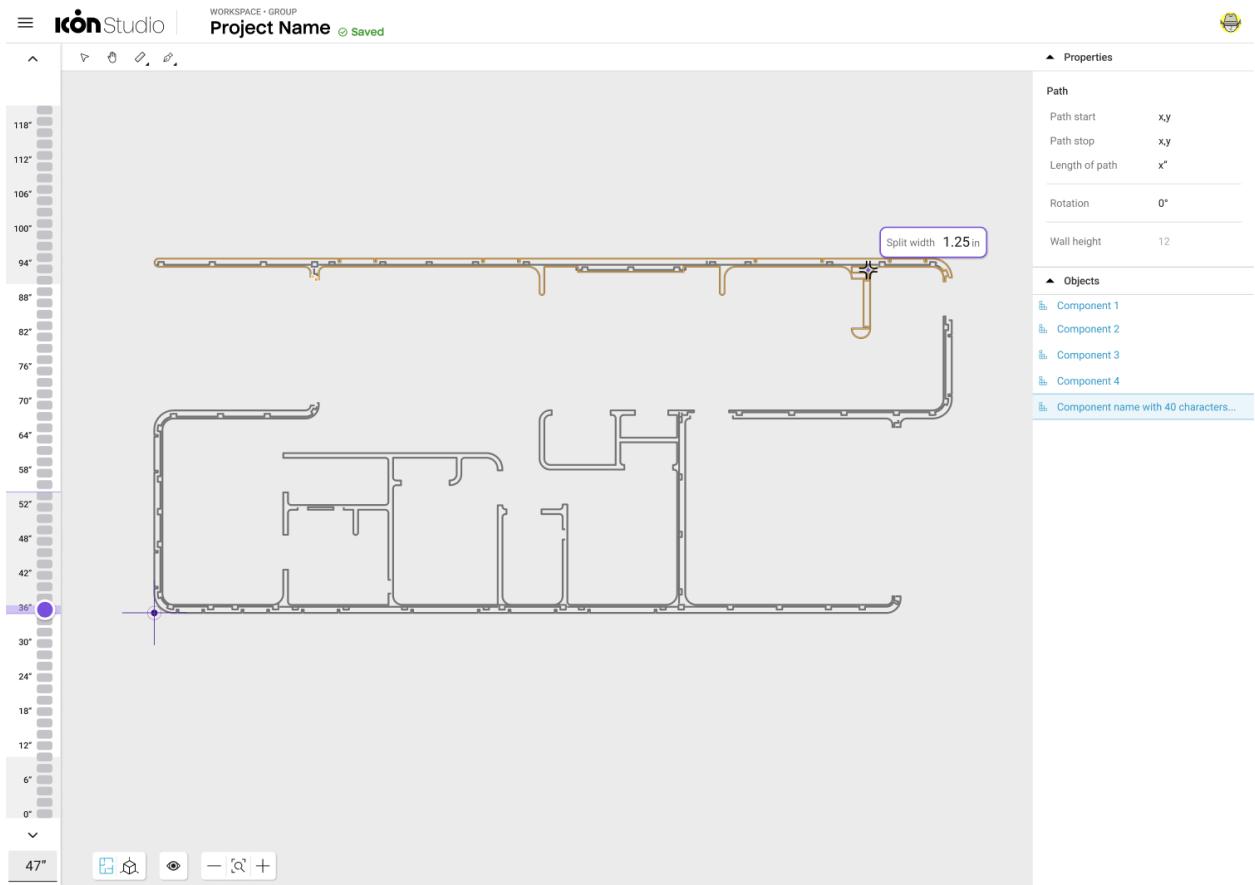
## Workspaces

## FAVORITES

Wolf Ranch

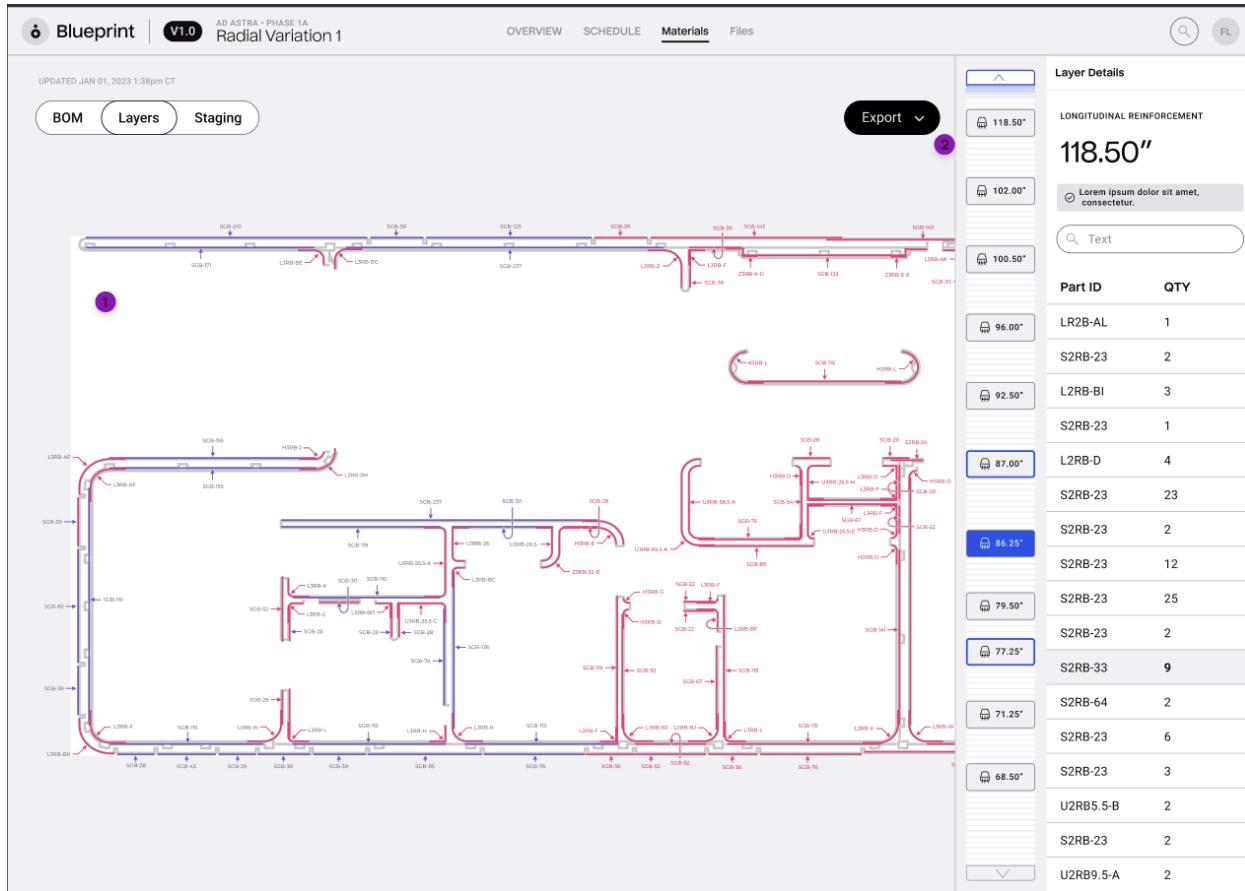
	Name: A - Z	Search components
	Wolf Ranch CATO-B-L Updated August 21, 2022 2:35pm   Layers 7   Usage 10 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch CATO-C-L Updated August 21, 2022 2:35pm   Layers 7   Usage 0 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch - Cato CATO-A-R Updated August 21, 2022 2:35pm   Layers 7   Usage 0 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch - Cato CATO-B-R Updated August 21, 2022 2:35pm   Layers 7   Usage 10 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch - Cato CATO-A-L Updated August 21, 2022 2:35pm   Layers 7   Usage 10 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch - dyee D Component Name Updated August 21, 2022 2:35pm   Layers 7   Usage 10 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch - dyee E Component Name Updated August 21, 2022 2:35pm   Layers 7   Usage 10 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch - dyee F Component Name Updated August 21, 2022 2:35pm   Layers 7   Usage 10 Projects   Produced from Import	<a href="#">View &gt;</a>
	Wolf Ranch - dyee G Component Name Updated August 21, 2022 2:35pm   Layers 7   Usage 10 Projects   Produced from Import	<a href="#">View &gt;</a>

This is a subpage of the last one and shows all components, which go into projects. I wrote this list view and components. This has an enlarge view feature on each print SVG.



This is the main project view for Studio. I wrote the code and worked on most components and features on this page. My most complex features here are:

- The layer navigation on the left side as it was responsible for layer and level changes, needed custom scrolling and scroll-to, and a dynamic text input with multiple ways to write the same values. All of which needed to be synced together.
- Dimensioning tool (ruler) that can take linear, angular, and arc length measurements between any two points or lines. I wrote the original components for each of those, but it was later re-written when we put it into Studio.
- Drag and drop on the right side list of components on the page to decide print order.
- Bottom view toggles that can change to the 3D view of the print, set overlays on the paths, or zoom on the canvas.



This switches gears to our other app, Blueprint. I had fewer contributions to this UI, though the parts I did do were important. Here I built:

- The header navigation features and styles.
- The level scroll on the right side. This switched to unique levels showing Rebar placements (current level view), electrical installations, and plumbing installations
- The pointer component there in the canvas, which had to be draggable, selectable, and rotatable. Also had different ways to point, such as the u-turn pointer and angle pointer.
- There is a left side overlay menu for navigating our project structure. It was a condensed version of the studio navigation page.



Worked with architects to create this wall, in which they showed me the model of what they wanted and I developed the 3D `asin()` function to offset these points from the centerline. It took some iterations with the architect to replicate and fine tune it in Grasshopper for Rhino. I also tested the print path on our printer dry and was able to solve problems that were happening in the field. In the end, we got what's here pictured at Camp Mabry in Austin. There is also another rounded version of this at a base in Florida.

<https://www.usa.org/texas-capital-area-chapter/photo-galleries/22-may-2023-photos-3d-printed-building-camp-mabry>