

# ANDY COLBORN

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[andycolborn.com](http://andycolborn.com)



## SKILLS

Design for Manufacture

Embedded Systems

Rapid Prototyping

Lean Manufacturing

Modular Design

## EDUCATION

George Washington University  
Mechanical Engineering  
Aerospace Option  
Washington, DC  
2007 -2010

Theta Tau Professional  
Engineering Fraternity  
Regent (President)

Engineer-In-Training  
California Board for Professional  
Engineers, Land Surveyors, and  
Geologists

PE Mechanical - Passed  
Machine Design and Materials

## ACTIVITIES

**Learn to Solder Kits**  
April 2013 – Present

After unintentionally winning a hackathon with an app-controlled cereal dispensing machine, some friends and I were awarded a lawyer and incorporated a company. Together we built a variety of custom installations, worked with Uber, PBS and the Sacramento Kings and spun out our own line of educational electronics kits - [learntosolderkits.com](http://learntosolderkits.com) which now supports 2 employees and ships around 20k kits per year.

## PROFESSIONAL EXPERIENCE

**Aro Homes – Director of Engineering – MEP + R&D**  
Sacramento, CA September 2021 – February 2023

*Founding member leading the design of a modular, carbon-negative, single-family home from concept and initial investigations through the securing of Series A funding and early stage growth*

- Established a company commitment to decarbonization, leading efforts to design to, and achieve Passive House certification
- Created energy models to inform design decisions including the choice of appliances, use of balanced mechanical ventilation (ERV), heat pumps, water reclamation and low embodied carbon materials
- Led modeling, shop drawing production and development of company BIM/CAD standards, overseeing work of internal team and 3<sup>rd</sup> party consultants
- Led design of and obtained permit approval for electrical, plumbing, HVAC, solar, Title 24 compliance and oversaw design, integration and permitting of fire suppression systems
- Built relationships with a variety of suppliers and creators of emerging technology
- Shaped architectural design to condense mechanical, electrical and plumbing systems in order to minimize field connections and material use (notably using >60% less copper wire than a comparable home)
- Designed the initial layout of factory assembly lines and toured various facilities to determine the location of our first plant
- Interviewed and hired all members of the factory team (production, quality, health & safety and plant leadership)
- Developed a suite of internal modeling (semi-)automation tools (Onshape) which sped up routing of pipe, cable and duct by 20-30x and allowed for extraction of a variety of metadata

**KATERRA – R&D Design Engineer**  
Sacramento, CA July 2019 – June 2021

*Led the design of multiple targeted time saving manufactured assemblies and modular MEP products calculated at labor savings of \$4.3mil/year*

- Managed multiple products through concept, costing, requirements, FMEAs, design, prototyping, factory and field pilots, and new product integration
- Listed as an inventor on patent filings for several different products including a novel snap together MEP system and several modular electrical assemblies
- Collaborated with Quality team to prepare several products for UL and IAPMO testing and certification
- Developed a companywide drawing standard used across multiple teams as a model to create manufacturable shop drawings from architectural models

**Clearwater Lights – Mechanical Design**  
Rancho Cordova, CA August 2013 – June 2019

*Designed and manufactured ferociously bright LED lights for motorcycles, racetracks, and helicopters*

- Guided several products through their entire lifecycle including a speed-sensitive brake light and the brightest motorcycle light in the world
- Drove improvements in testing and quality control including the introduction of vibration, ultraviolet and IP67 water testing
- Worked to develop new products by designing and improving PCBs, aluminum casts, CNC machined parts, injection molds, sheet metal brackets, harnesses, and watertight enclosures
- Examined and repaired defective items to determine the root cause of failure; pushed design and material improvements which reduced failures from vibration and moisture by >90%