

Factory Layout Draft v1 (Based on Current Equipment List)

Assumption Set

- Facility basis: **46,200 sqft** (280' × 165')
- Two parallel production lines: **Line A** and **Line B**
- 14 stations per line (7 robotic + 7 human/hybrid)
- Flow direction: **West Inbound | East Outbound**

High-Level Zoning

- **North side:** Line A stations
- **South side:** Line B stations
- **Center spine:** Material transfer corridor + module transfer conveyor + QA crossings
- **West edge:** Raw material intake + steel/lumber staging
- **East edge:** Final wrap, staging, and outbound load prep

Station-by-Station Layout (Applies to both lines)

1. **CNC Chassis & Subfloor Framing**
 - Hypertherm plasma cutter
 - Lincoln robotic welder
2. **Automated Wall Panel Fabrication**
 - FrameCAD F150i
3. **Robotic Wall Erection & Roof Truss Setting**
4. **Robotic Spray Foam Insulation**
 - Graco Reactor E-30 + AI thickness scanner
5. **Robotic Drywall Installation**
 - Hilti Jaibot + overhead gantry
6. **Robotic Texture & Paint**
 - Automated texture/paint system
7. **Automated Exterior Siding & Window Frame**
 - Automated exterior panel system
8. **Plumbing & HVAC Rough-In**
9. **Electrical Rough-In & Panel**
10. **Flooring & Tile**
11. **Kitchen & Bath Fixtures**
12. **QC & Punch List**
 - AI Vision QC + Laser/BIM verification checkpoints
13. **CNC Cabinet Install (Hybrid)**
 - CNC cabinet line
14. **Final Wrap & Load Prep**

Core Shared Equipment Placement

- **Module Transfer Conveyor System (\$1.8M):** center spine, serving both lines at stations 3–10
- **AI Vision QC System (\$300K):** inline at station 12 and end-of-line gate
- **Laser/BIM Verification (\$220K):** station 12 + outbound gate
- **CNC Cabinet Line (\$900K):** between stations 12–13 with dual-line feed

Phase Overlay (Capital + ROI)

- **Phase 1 (Fast Payback):** Stations 1, 2, 3, 4, 5, 12 + transfer conveyor

- **Phase 2 (Medium Payback):** Stations 6, 7, 13 + line-balance automation
- **Scale (Strategic):** second-shift optimization, additional robotic cells, replication pack for licensing

Workforce Anchor (91 total)

- Robotic tech/operators: 16
- Plumbing/HVAC: 10
- Electrical: 10
- Finishing/flooring: 8
- QC/inspection: 6
- Supervision/management: 18
- Material handling/logistics: 10
- Maintenance/support: 13

Throughput and ROI Notes

- Designed for ~40% faster module speed vs all-human baseline
- Defect/rework reduction target: ~65%
- Equipment payback target: ~2.1 years
- Full facility payback target: ~3.8 years

Next Design Inputs Needed for v2

1. Confirm if final facility basis should be **46,200 sqft** or **70,000 sqft**
2. Confirm dock door count and exact locations (inbound/outbound)
3. Confirm fire lane, egress, and maintenance bay clearances
4. Confirm utility zones (electrical room, compressor room, paint ventilation)