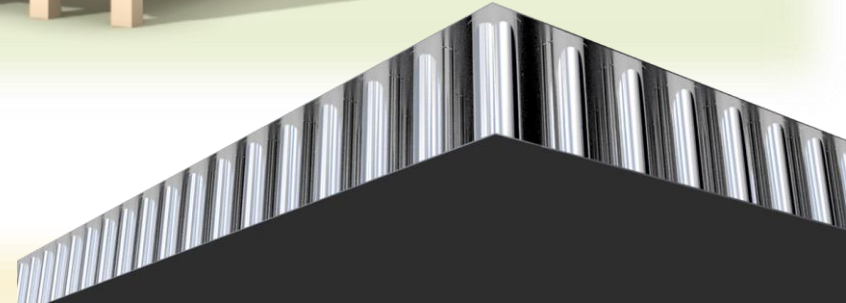




BROAD Holon Building

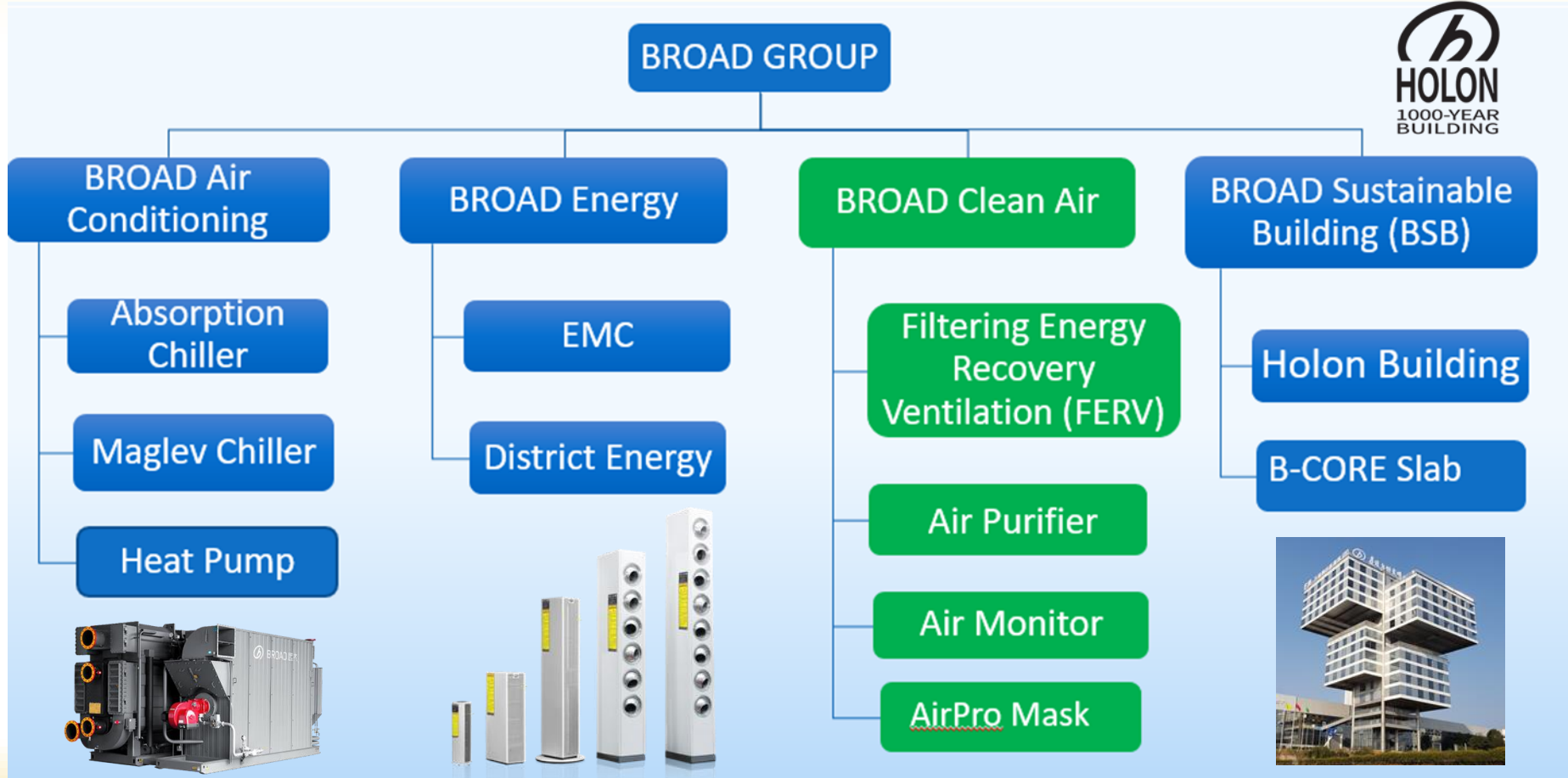
The New Era in modular construction



The BROAD Group

- Established in 1988, currently 3,000 employees
- Privately owned company
- BROAD Town: area of 1km² (~250 acres)
- BROAD holds over 400 patents
- Global Market presence: Installed base of more than 35,000 climate control systems in over 82 countries
- **BROAD U.S.A. Inc:** Established in 1997 to serve the north America market
- Product lines: HVAC, Indoor Air Quality (Ventilation/Filtration/Purification), Holon Building (Stainless Steel based mid/high rise modular buildings)





Why Offsite construction?



QUALITY



WORKFORCE



SUSTAINABILITY



SPEED TO
MARKET



AFFORDABILITY



JOBSITE
SAFETY

MODULAR CONSTRUCTION SCHEDULE



SITE BUILT CONSTRUCTION SCHEDULE



HOLON Building: B-CORE Slab

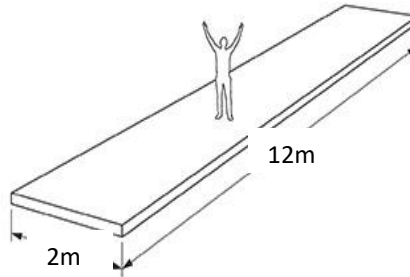
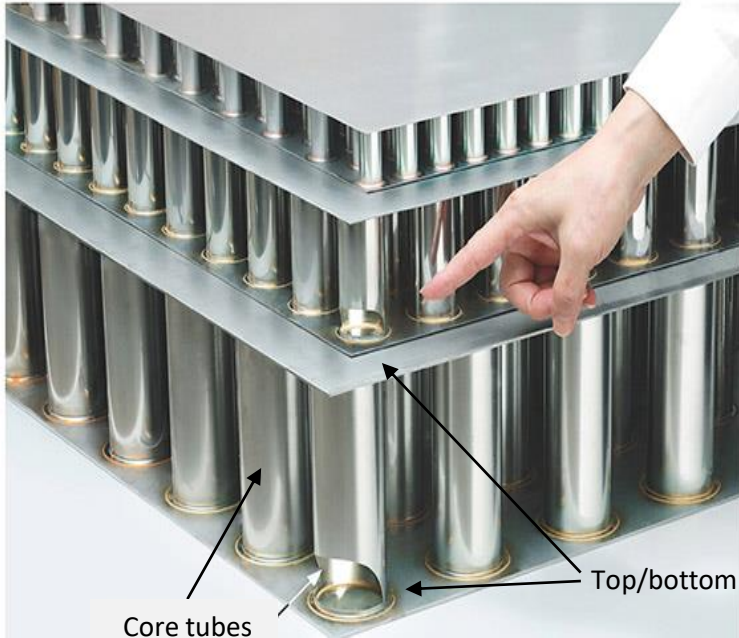


Plate Thickness: 1.5mm,2.5mm,4mm,6mm (0.6" – 0.25")
Slab Thickness: 100mm, 150mm (3.9" - 5.9")

- Two plates with array of core tubes
- Ductility: Elongation \geq 40%
- Everlasting: Corrosion rate is 0.005 g/m²/hr
- Eco-friendly: Fully recyclable
- 10 x lighter than reinforced concrete of the same design strength

High Strength Stainless Steel: Low Carbon & Recyclable Material



Material & Resources

Carbon Emissions Comparison Through Whole Building Life Cycle Assessment

	HOLON Building	Reinforced Concrete Building
Production Process (kg/sqft)	31 ¹	29 ²
Site Installation (kg/sqft)	0.2	1.5
Service Life (year)	1000	50-100
Life Cycle Assessment(kg/sqft-yr)	0.03	0.3-0.6
Emission Reduction Rate	90-95%	
Material Recycle/Recover Rate	>98%	~70% ³

1. https://www.bts.gov/archive/subject_areas/freight_transportation/faf/faf4/debris

B-CORE: The Ultimate Sustainable Structural material



What makes B-CORE *sustainable*?

- **Durability = Sustainability.** B-CORE Stainless steel is over 30 x less corrosive than carbon steel. Longer lasting means less resources consumed
- **Standardized production:** Auto-streamlined production reduces material and labor costs
- 5 x more **energy efficient**
- **Recyclable:** Stainless steel is 100% recyclable and can be recycled many times without degradation in performance
- <1% construction waste: **Landfill**
- **Speed of installation:** construction at 3F/day cuts labor costs and quickens the time a building can be put to productive use.
- **Adaptable:** Floor layout, balconies, windows, interior walls can be easily adjusted, and building height can be increased after construction is completed



BROAD's architectural milestones

BROAD has rich industrial experience in the field of sustainable buildings. Many projects have been completed by BROAD in Mexico, Korea, and China.



B-CORE Building: The “F” Building



BROAD's New Administration Building - “F Building”:

16 stories, 43 days to build. 6 month cycle:
design, expert review, government approval,
prefab, installation, occupancy

Notice the small footprint! The entire structure is supported by just four B-CORE pillars, 1 m wide each.

A demonstration of BROAD's capabilities



Negative Pressure Isolation Hospital Built in 48 Hours

<https://youtu.be/jLYp7YUE9DE>



Prefabrication of Korea NPI Hospital

<https://youtu.be/l3onLxBCpNg>



J57: 57-Story Building Start to Finish in 19 Days

<https://youtu.be/veNf-bz99cl>



Newark Hotel: 15 Stories in 48 Hours

<https://youtu.be/Ps0DSihggio>



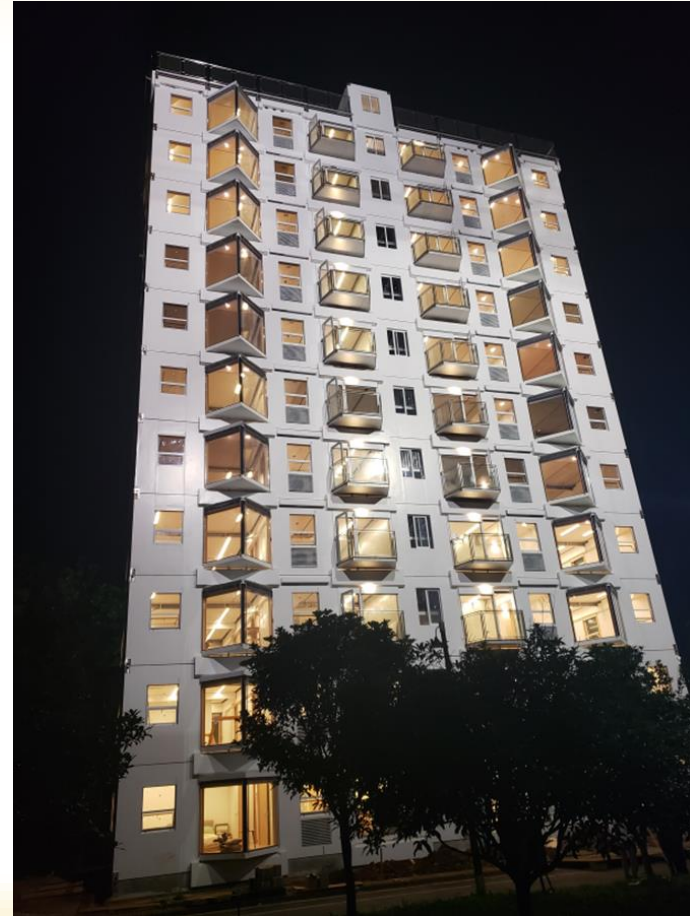
“F” Tower: All stainless-steel building

<https://youtu.be/7GHAKdHupgg>

Introducing Garden A-1, stacked on June 5, 2021

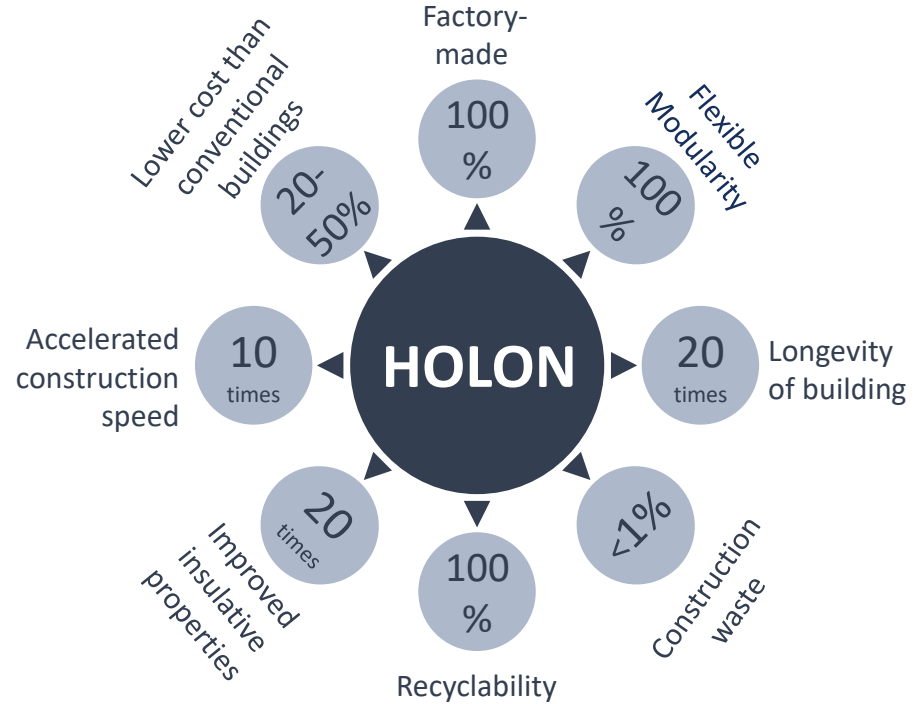


- 11 story
32,000 sf
- 56 modules
manufactured in 15
days
- Stacked onsite in
under 29 hours
- Includes all MEP and
interior fixtures, ready
to move in
- LCA: 20 x lifespan of a
conventional
reinforced concrete
building



Why do we call the HOLON Building a “Living Building?”

- B-CORE is one of the most environmentally friendly construction materials.
- B-CORE is extremely durable and earthquake resistant, and it has unprecedented longevity.
- Incorporating the BROAD’s unique Fresh Air Machine, an ERV with HEPA filtration, provides 100% fresh air, eliminates cross infection and filters PM2.5 by 99.9% to protect life.
- The floor layout and number of floors can be changed after construction is completed: ***Flexible modularity***



Garden A-1 Construction

Efficient stacking



Garden A-1 Completed



The final module of the 11th Story

*View the
stacking of the
Holon Building:*

<https://www.youtube.com/watch?v=OM3WRdS6KcQ>

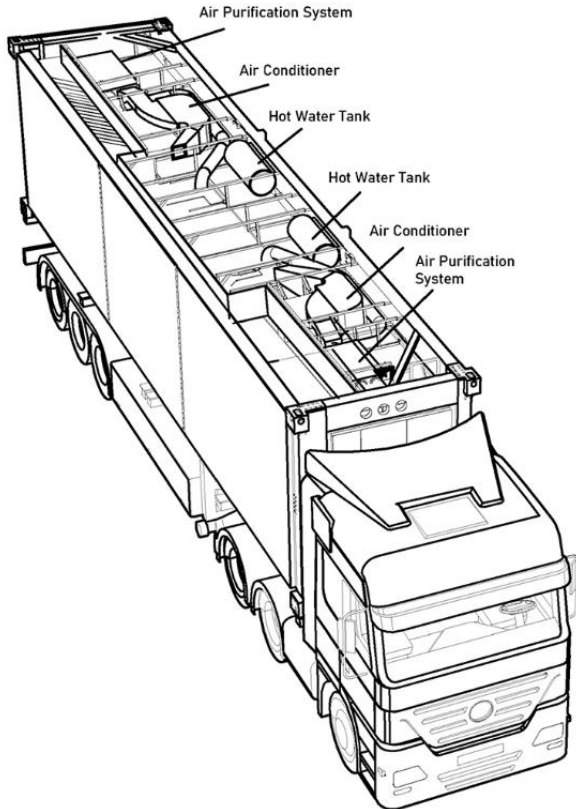


Turnkey Building stacked in 28 hours

HOLON Building is delivered move in ready



Living Buildings Illustrations



Room/Elevator Module Transport Dimensions

LxWxH: 12,190 x 2,438 x 3,000 mm

40' x 8' x 9'-10"

40'HQ container size

No additional container needed for shipping

During transportation

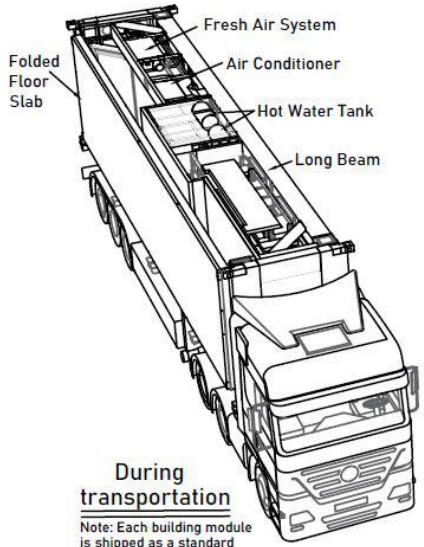
Note: Transported at the size of international standard 40 ft. high-cube container (no container needed for shipping)

HOLON Building: Unfold, bolt and stack

Building module is 100% prefabricated in the factory before delivery. For clarity, this drawing does not showcase the wall, door & window, fire-protection, MEP and finishes

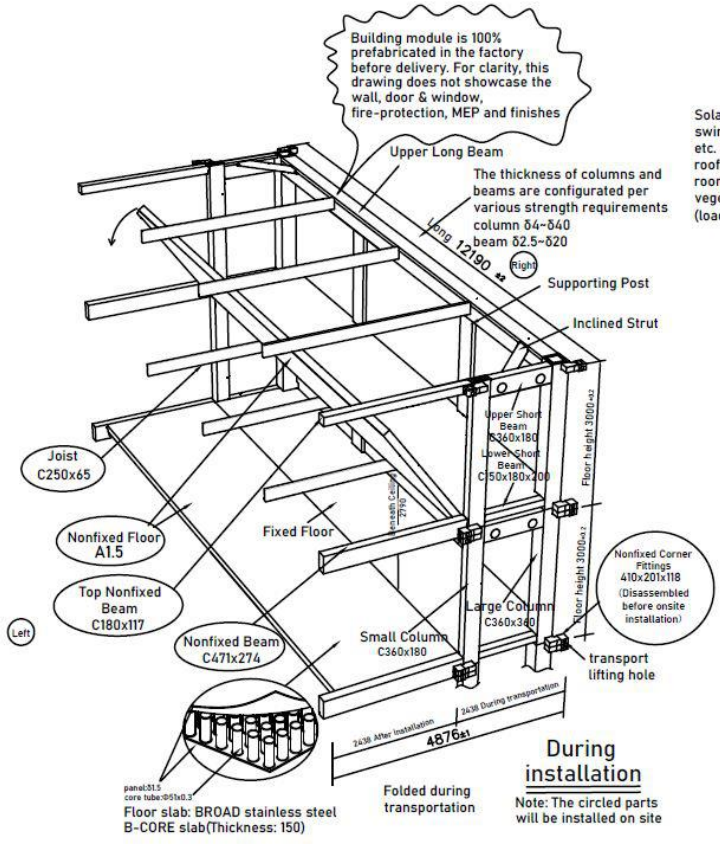
The thickness of columns and beams are configured per various strength requirements
 column $\phi 4-\phi 40$
 beam $\phi 2.5-\phi 20$

Solar energy facilities, swimming pool, water tank etc. can be set up on the roof. There is also plenty of room for planting vegetables, recreation etc (load: $0.7t/m^2$)



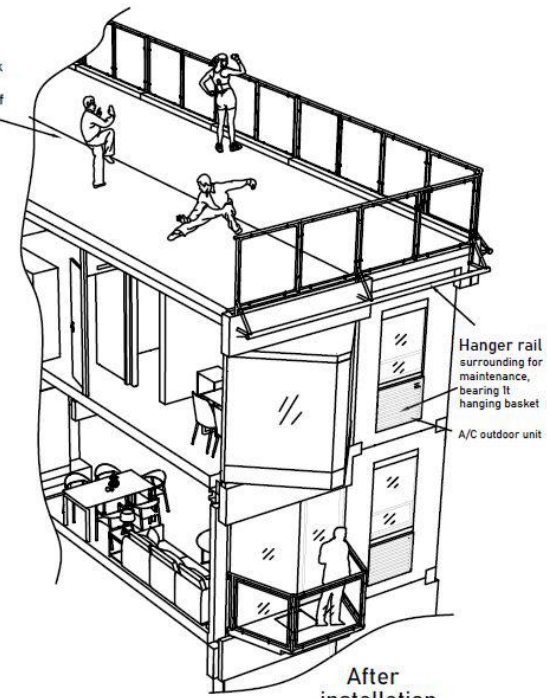
During transportation

Note: Each building module is shipped as a standard 40ft container (actually no container is needed),



During installation

Note: The circled parts will be installed on site



After installation

Note: construction, finishes and MEP all done, turnkey project

The steps of stacking a Holon Building



Step 1: Bolting & Riveting

Once the modules are delivered on site, they are connected by bolts.

Step 2: Unfolding

Unfold the flexible floor and balcony.

Step 3: Install Nonfixed Beam, Joist.

Joists will be installed every 4 to 6m for load bearing.
Walls are non-load bearing.

Step 4: Sealing

Sealing with structural adhesive.

High Insulation & AI Control



HOLON building is highly insulated with a superior energy efficiency system which consumes 80%-90% less energy than conventional buildings.

	HOLON Insulation Material	R Value	ASHRAE 90.1 Zone 5A Min. R-Value
Roof	rock wool	32	R-30
Exterior Wall	8.6" rock wool	28	R-19
Windows	Triple/quadruple pane, argon-filled	3/4	2.2-2.6



BBA AI Control: Virtualization control for sunshade, lighting, IAQ, energy consumption, etc.

HOLON Building: Superior Indoor Air Quality

➤ BROAD Fresh Air ERV

- 100% fresh air with no recycled air
- Unique 3 stage filtration: filters 99.9% PM2.5
- Electrostatic Cleaner: kills pathogens, neutralizes allergens
- Air-to-air energy exchanger: 80% energy recovery efficiency

➤ Great Acoustic Performance:

Location	Sound Insulation	Location	Sound Insulation
Exterior Wall	50dB(A)	Between Units	45dB(A)
Between Floors	55dB(A)	Between Rooms	35dB(A)
Window & Door	40dB(A)		



Indoor Environment Quality



BROAD Fresh Air ERV

Standard delivery of HOLON Buildings

Item	Content
Main structure	Stainless-steel structural framing members (load-bearing columns and beams)
Floors	B-CORE stainless-steel panel packed with 8.5" of rockwool insulation
Exterior window	Exterior window system: Environmentally friendly high-strength framing; triple-layer window panes
Interior	Partition walls: Steel frame and B-CORE panel, insulated, surfaced with drywall to code
	Floor: Artificial or wood flooring
	Ceiling: Stainless-steel B-CORE ceiling, surfaced with drywall for code compliance
BBI (BROAD Building Automation)	Automated control for temp, lighting, exterior sunshades, interior thermal shades
Standard fixtures (stair/lift module)	Code-compliant steel fire doors, fire hose with piping and extinguisher cabinet, wall and ceiling surfaced with drywall to code
Electrical	Lighting, switches, outlets, power panel, in-wall conduit compliant with local codes
Water supply and waste	In-wall piping for cold and hot water, water heater, DWV vertical, local standard fittings
HVAC	Air conditioning and heating unit
Fresh air	BROAD Air™ Energy recovery ventilation (ERV) and air-purification system



HOLON: The new era in modular construction

BROAD U.S.A.
401 Hackensack Ave, Suite 503
Hackensack, NJ 07601

(201) 678-3010
www.broadusa.com

A 3D architectural rendering of a building's corner, showing a dark grey base and a top edge with a series of vertical, reflective metallic columns.

THANK YOU