

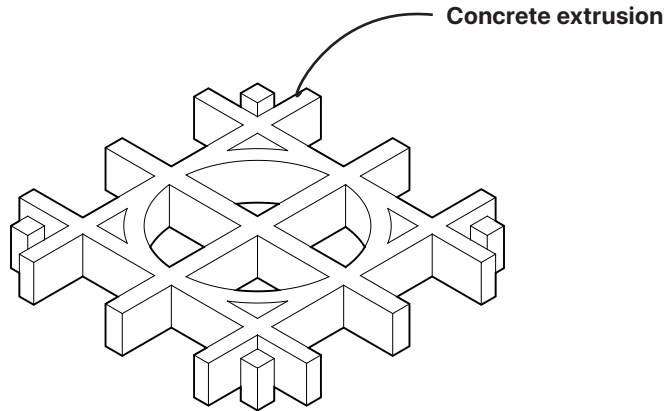
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FLOOR MODULE

GROUND

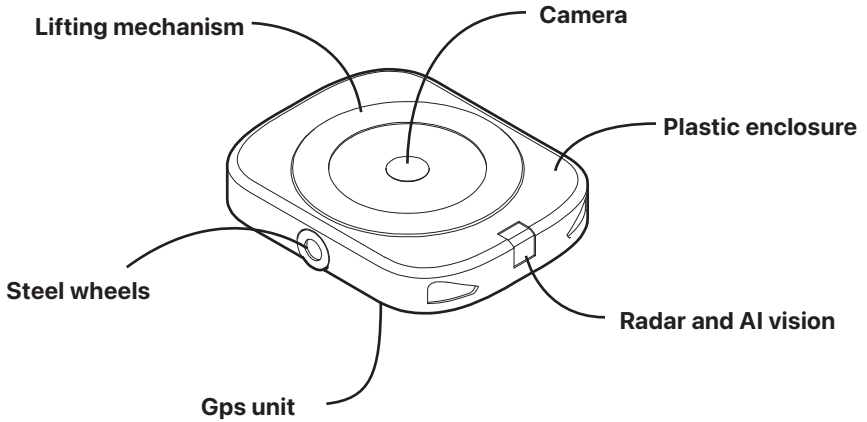
1200x1200x500mm element. Tracing the pattern of the Kiva robot to generate the minimum amount of floor needed to fulfil its algorithmic commands. Four extruded rectangular cuboid at the edge act as the footing for the storage elements.



KIVA ROBOT

AUTOMATION

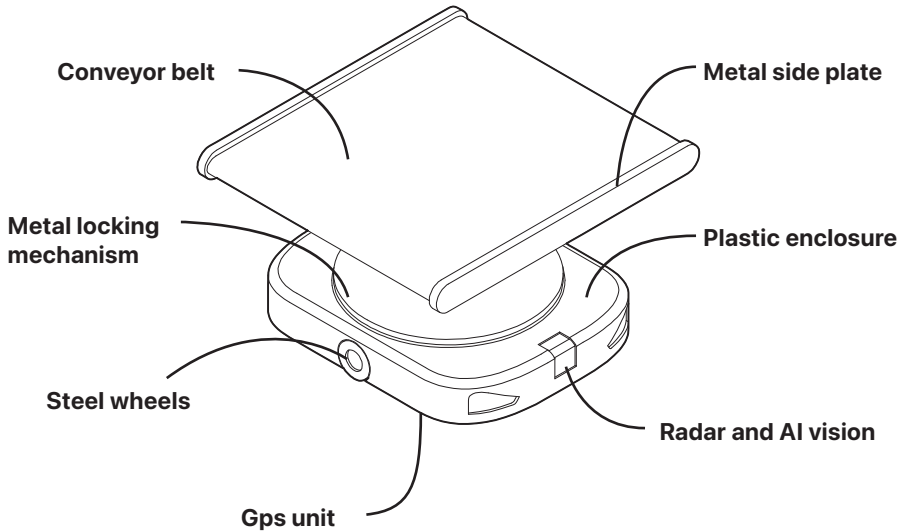
750x600x190mm autonomous robot. Can lift up to 600kg. Speed of 5km/h. A camera at the top of the unit can read barcodes placed underneath storage units, sensors at the front of the machine can read and interpret the environment, avoiding potential obstacles. Equipped with a gps it always know where it is located according to coordinates. A corkscrew mechanism lifts the central part to elevate the storage units a few centimetres from the ground in order to move them. Its reduce height allows it to navigate the floor grid underneath the shelves.



AUTONOMOUS CONVEYOR

AUTOMATION

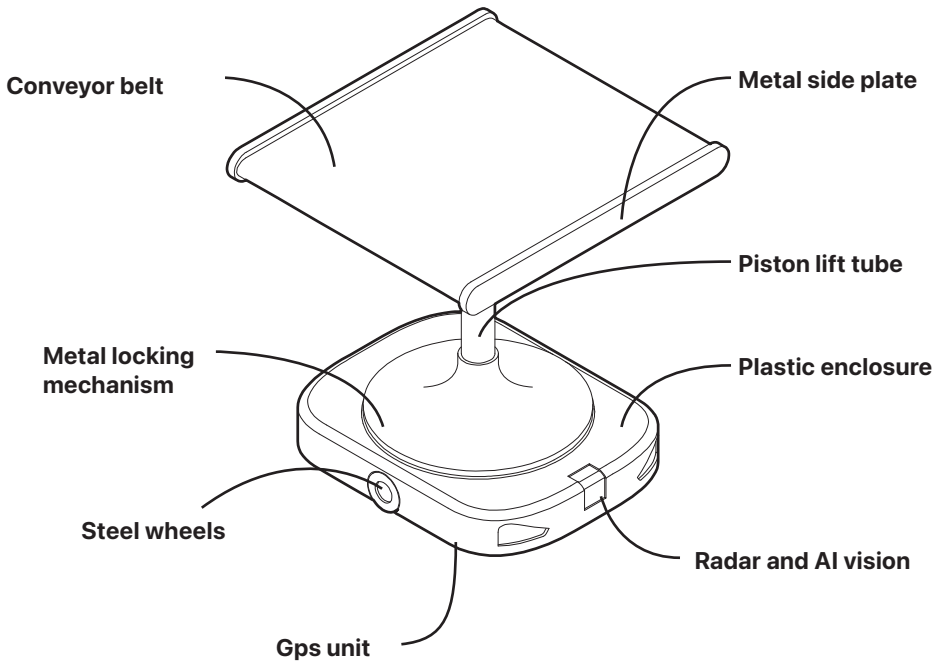
Kiva Robot equipped with a conveyor belt in order to bridge the gap between logistical actions and the nodal conveyor belt of the logistic park. It uses machine vision to navigate between the shelves. Once it reaches the destination the conveyor belt moves to push the package onto the nodal conveyor. A similar approach can be used to also retrieve totes and packages from the nodal conveyor.



HEIGH-ADJUSTABLE AUTONOMOUS CONVEYOR

Kiva Robot equipped with a heigh-adjustable conveyor belt in order to bridge the gap between logistical actions and the nodal conveyor belt of the logistic park. A piston mechanism lifts the conveyor belt to different heights depending on the requirement. This will be implemented on ad-hoc basis as the additional moving parts are more prone to breakage and therefore it should only be used when strictly necessary.

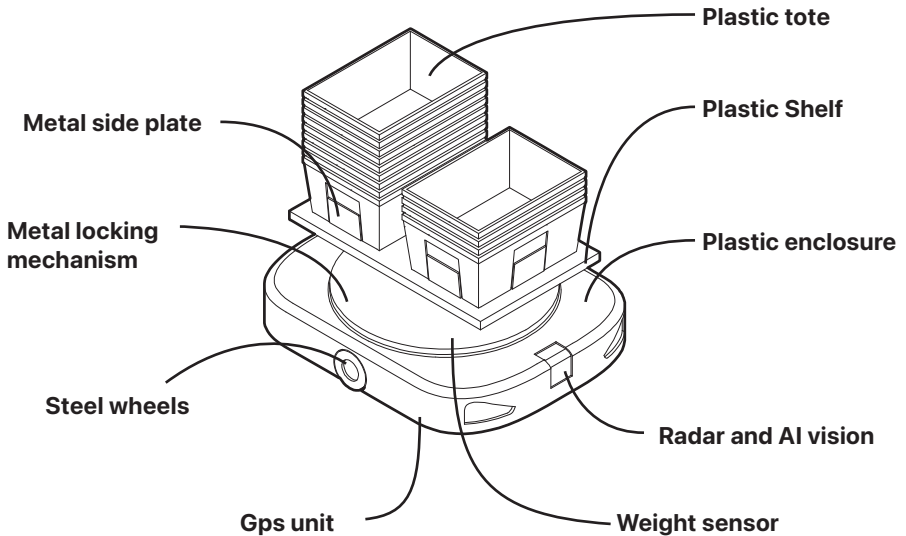
It uses machine vision to navigate between the shelves. Once it reaches the destination the conveyor belt moves to push the package onto the nodal conveyor. A similar approach can be used to also retrieve totes and packages from the nodal conveyor.



TOTE AUTONOMOUS DRIVER

AUTOMATION

Kiva Robot equipped with plastic shelf component that can hold two stacks of plastic totes. It will wait by the sortment and picking station to provide new totes or a location to place empty totes. Weight sensors will inform when it is almost full and will alert another Kiva robot to approach. Once full it will drive to the closest facility to be emptied. It uses machine vision to navigate between the shelves.



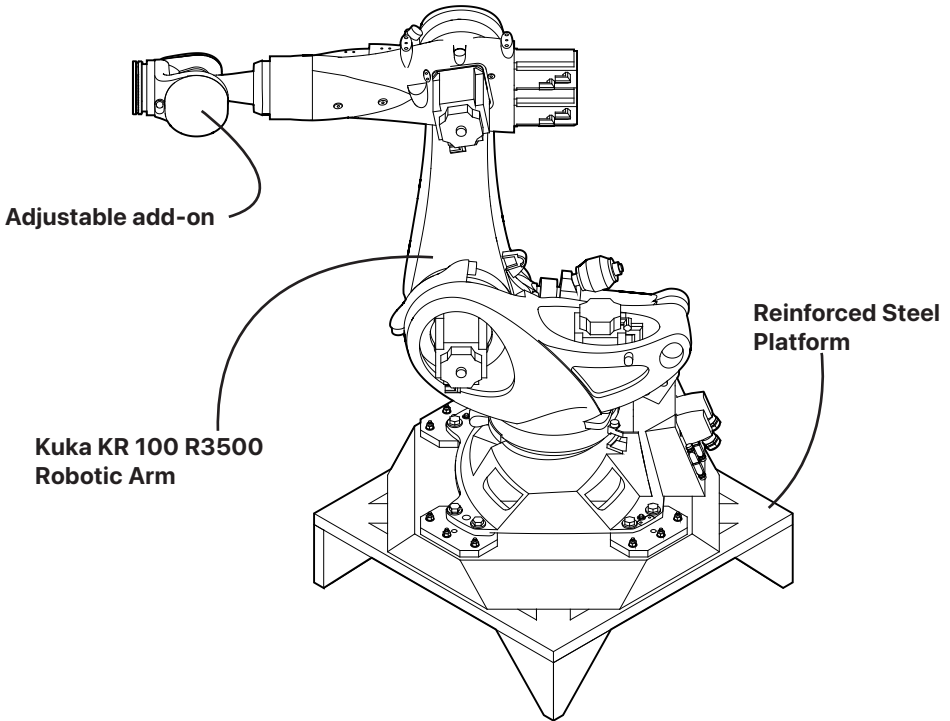
ROBOTIC MANIPULATOR

AUTOMATION

Robotic arms or manipulators can be used to perform different functions throughout the site. Model used: Kuka KR 100 R3500 press, maximum reach 2501 mm, maximum payload 250kg.

With different accessories it can execute different tasks. As a robot it becomes a typical articulated robot used to lift pallets or boxes around. With grippers it becomes a palletiser, able to identify and grab totes from conveyor belts and stack them on pallets for shipping or storing. With a small hand-like device it can hold small trees from their trunk in order to plant them.

It is bolted on top of a reinforced 1000x1000mm platform and it relies on the Kiva robots to move around the logistical landscape.

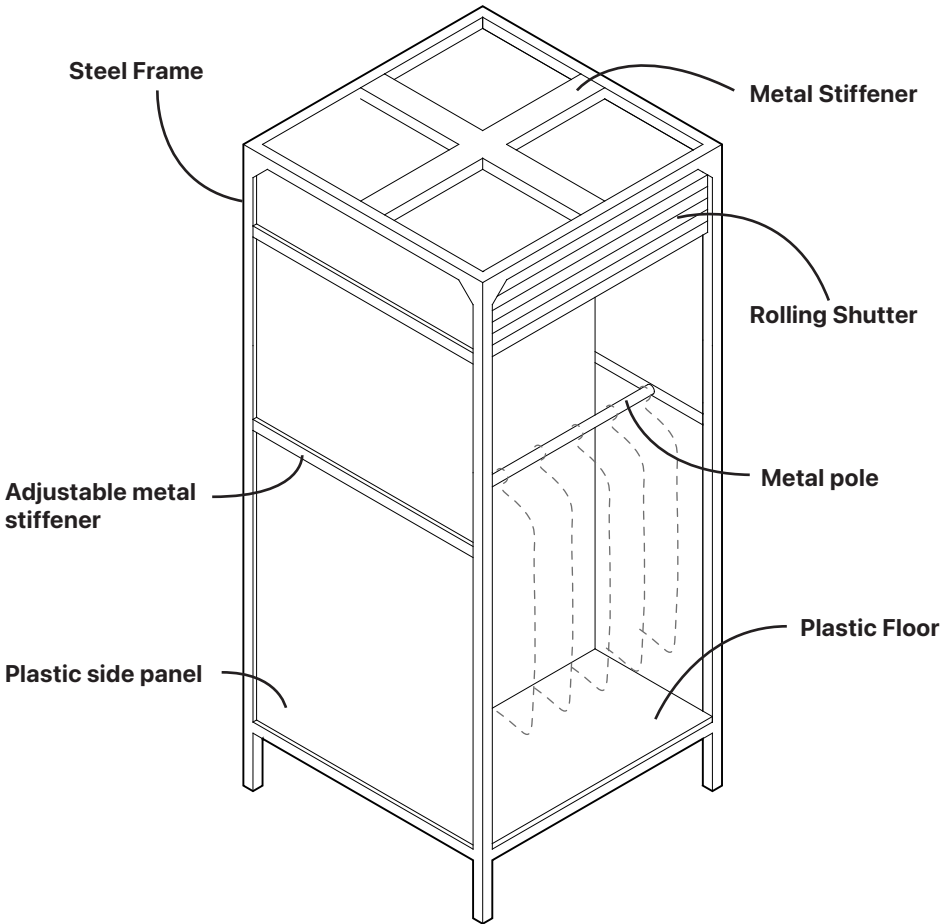


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HANGER CAPSULE

STORAGE

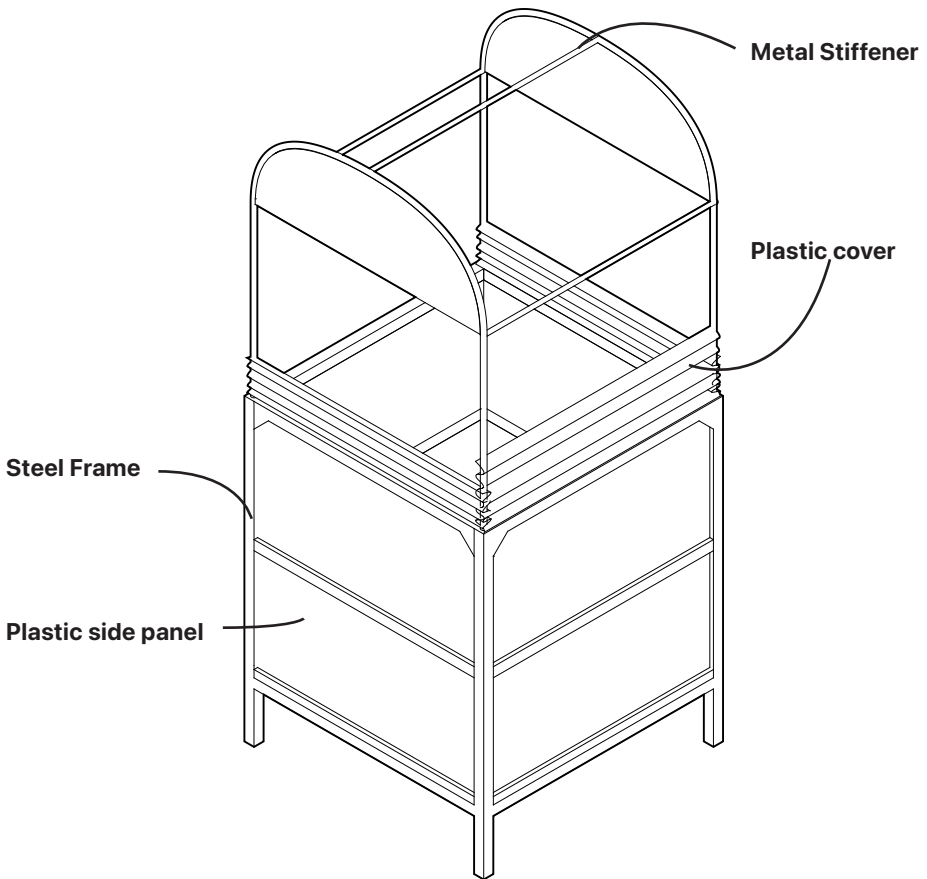
1000x1000x2100mm steel element equipped with 4 horizontal poles, 2 on each side, to hang clothes from. An adjustable metal stiffener allows for variation in height of where the pole is secured. A rolling shutter on both sides ensures protection from the elements when necessary.



BIG ITEMS BASKET

STORAGE

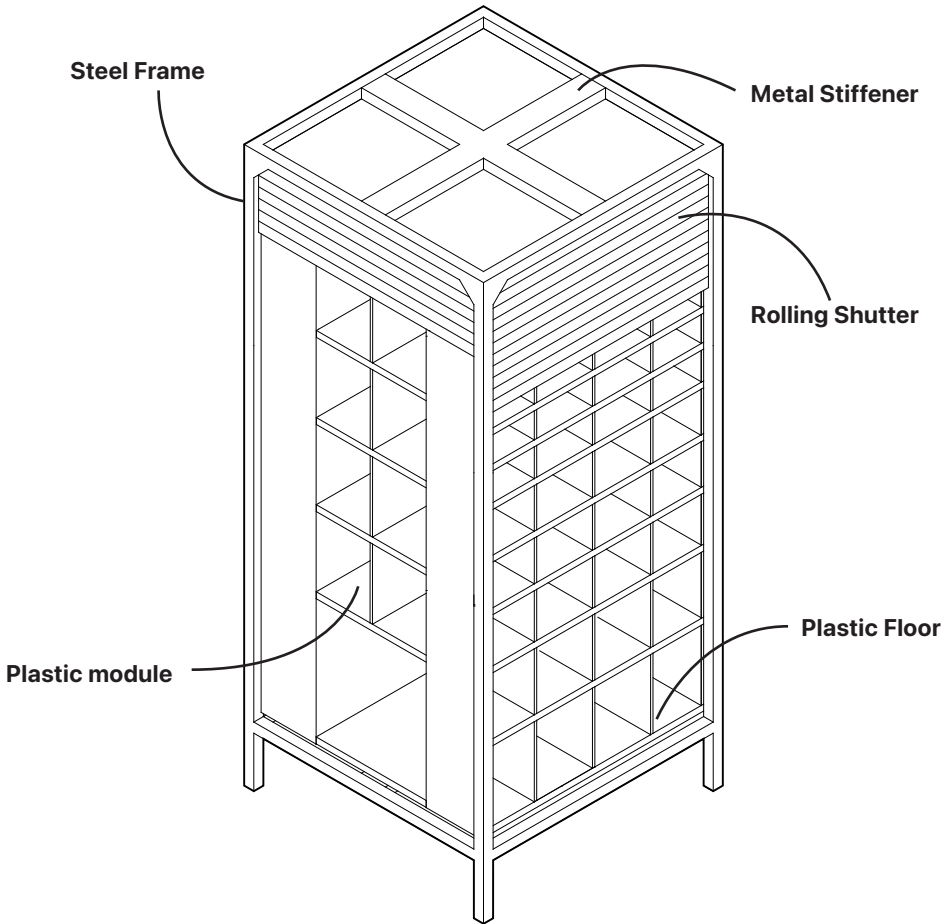
1000x1000x1100mm steel element with additional metal rails. Used primarily for big items that can be stacked or placed next to each other such as umbrellas, brooms, tvs, etc. A plastic cover on rail ensures protection from the elements when needed.



SMALL ITEMS CAPSULE

STORAGE

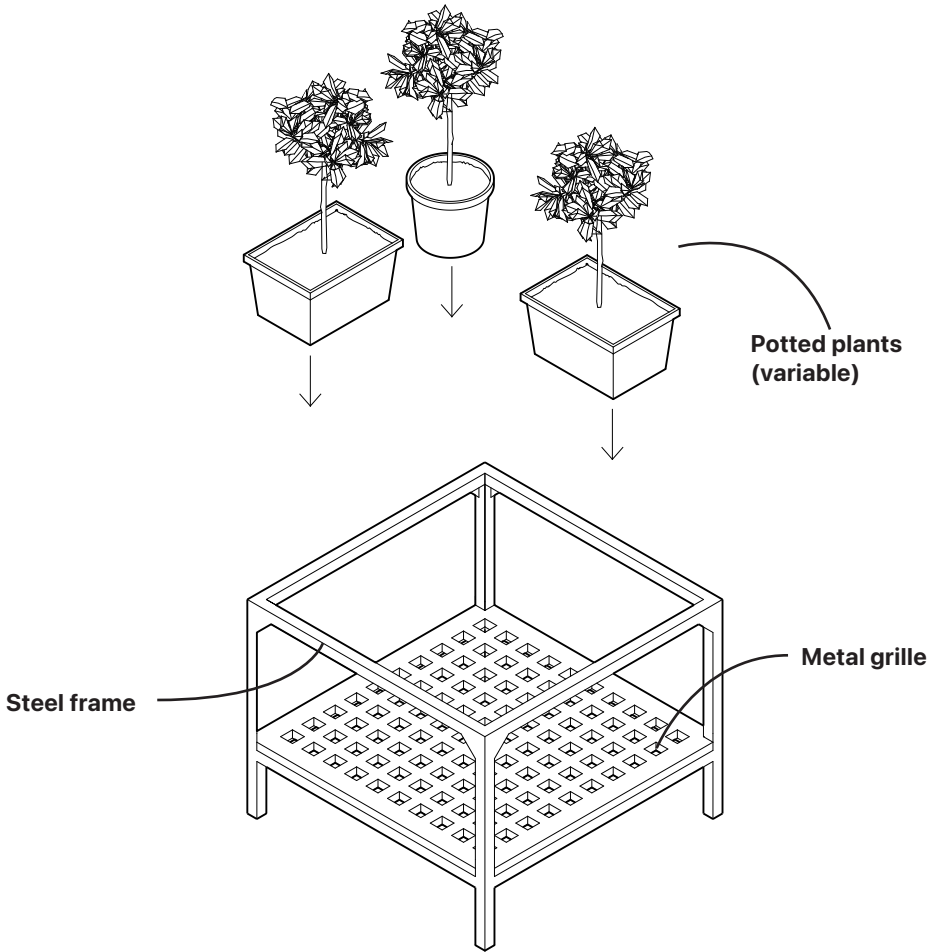
1000x1000x2100mm steel element equipped with four modular plastic separator symmetrical on each side. Used to store lightweight small items. A rolling shutter on both sides ensures protection from the elements when necessary.



ECOLOGY PLATFORM

STORAGE

1000x1000x700mm steel element with a metal grill floor to allow water to pass through. Used to store small trees which will be planted throughout the site.

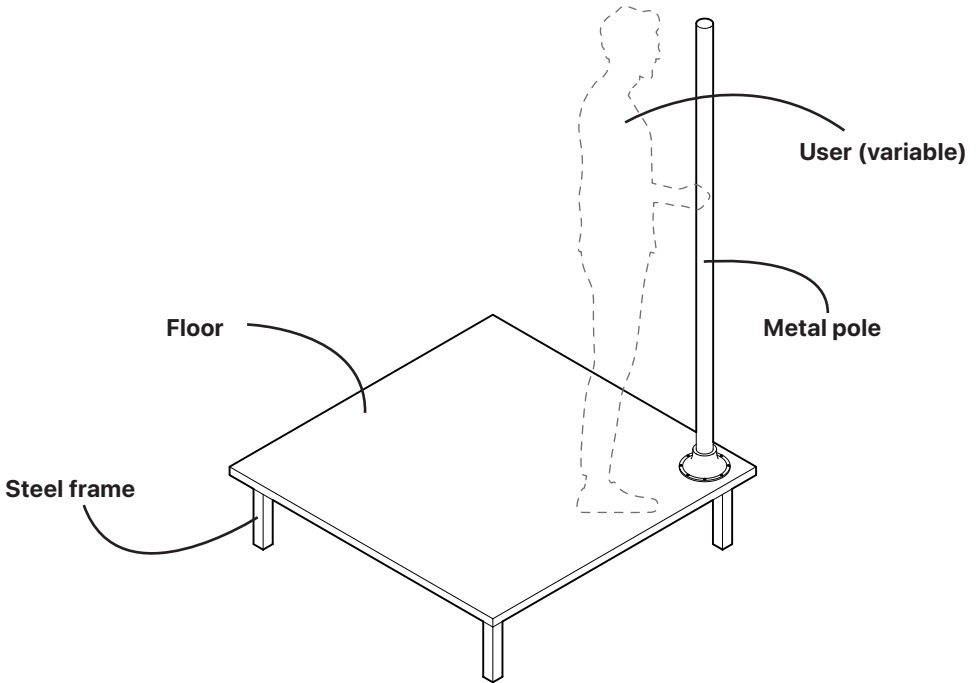


AUTOMATED SUMMER HUMAN TRANSPORT

LOGISTICS

Human transport device and associated system to transport a user within an active workspace. The human transport device include a platform to support a user and a metal pole to offer a hold while the platform is in movement. It relies on the Kiva Robot to be lifted and moved throughout the logistical landscape.

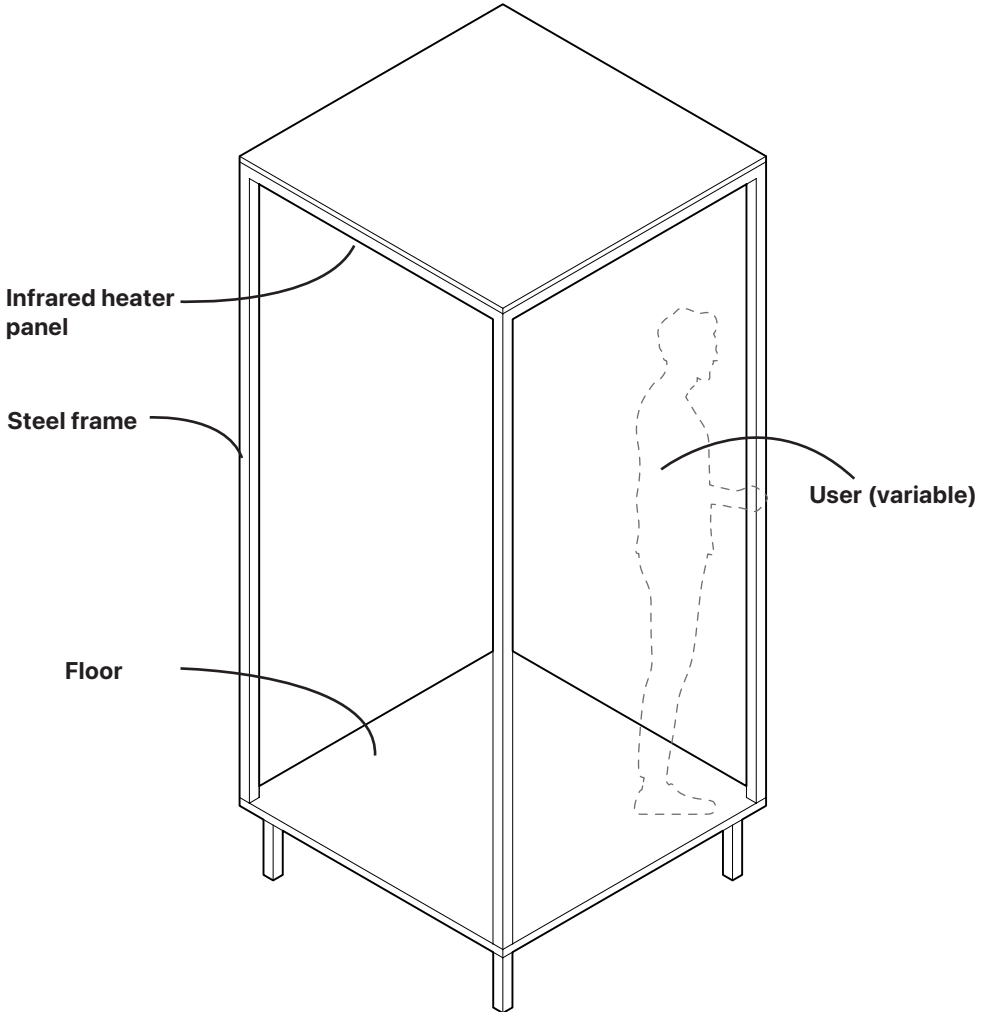
Unauthorized humans may be prohibited from entering the protected areas alone, the automated worker transport would allow the human user within the protected areas.



AUTOMATED WINTER HUMAN TRANSPORT

LOGISTICS

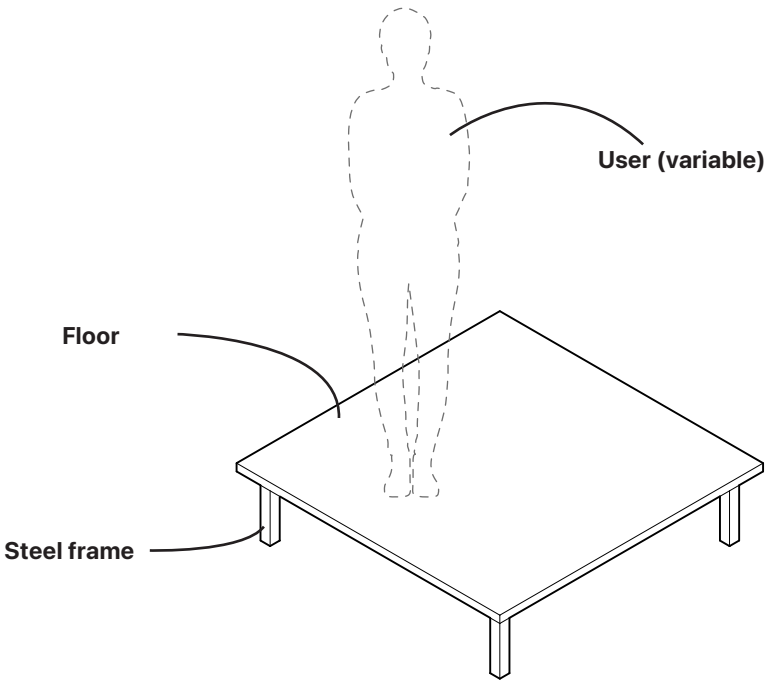
Human transport device and associated system to transport a user within an active workspace. The human transport device include a platform to support a user and a metal frame hosting an infrared heater panel to provide local climate condition to the user during colder conditions. Multiple Automated Winter Human Transport can be combined to create a bigger climatic bubble within the logistical landscape. It relies on the Kiva Robot to be lifted and moved throughout the logistical landscape.



STATIONARY PLATFORM

LOGISTICS

The stationary platform is designed in conjunction to the packing and picking stations, offering a wider floor area for the human to move around. The Stationary Platform can be combined with multiple copies of itself to create bigger floor extensions. It relies on the Kiva Robot to be lifted and moved throughout the logistical landscape and just like a Storage Capsule it is then placed in a specific spot.

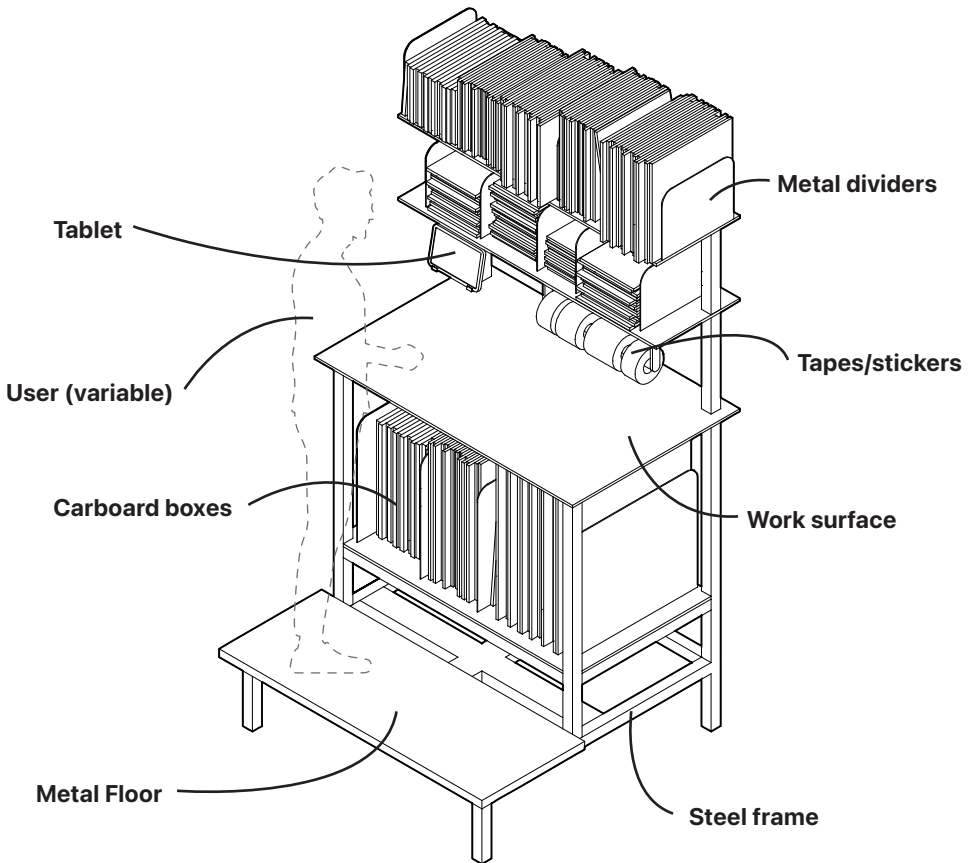


PACKING STATION

LOGISTICS

The packing station is designed to host one human. It is designed to allow the packing of items.

All items that have been picked and put into totes end-up here. There is single item order and multiple item order. The scans the item into the system, the computer will tell exactly what size box is necessary and it will give them a length of tape that is necessary. Little white barcode is applied. The human will then place the packaged box on top of an autonomous conveyor.



STOWING/PICKING STATION

LOGISTICS

The stowing/picking station is designed to host one human. A tilted work surface allow for an ergonomic placement of the totes. If the human is picking products they will place the empty totes on the work surface and start placing the items from the storage units to the tote. Once a tote is full the human will press the button and move it to the conveyor belt and when an autonomous conveyor is available it will arrive and automatically pick up the tote.

