



----- ARHITEK TURAJUR EKOTNIK -----

Zelena tranzicija
in krožna
ekonomija na
področju
uporabe
rabljenih
ladijskih
kontejnerjev

1991



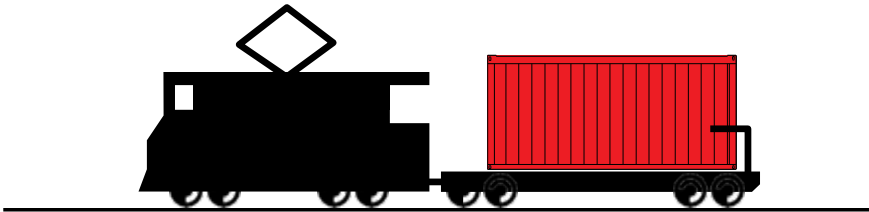
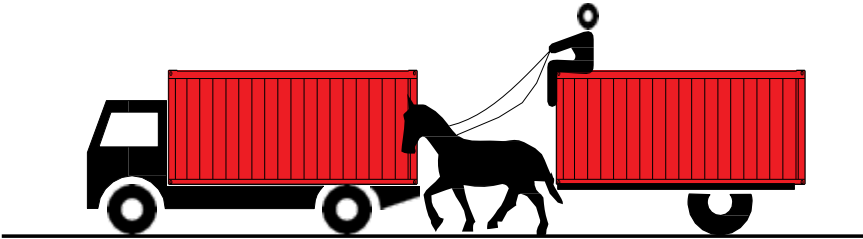
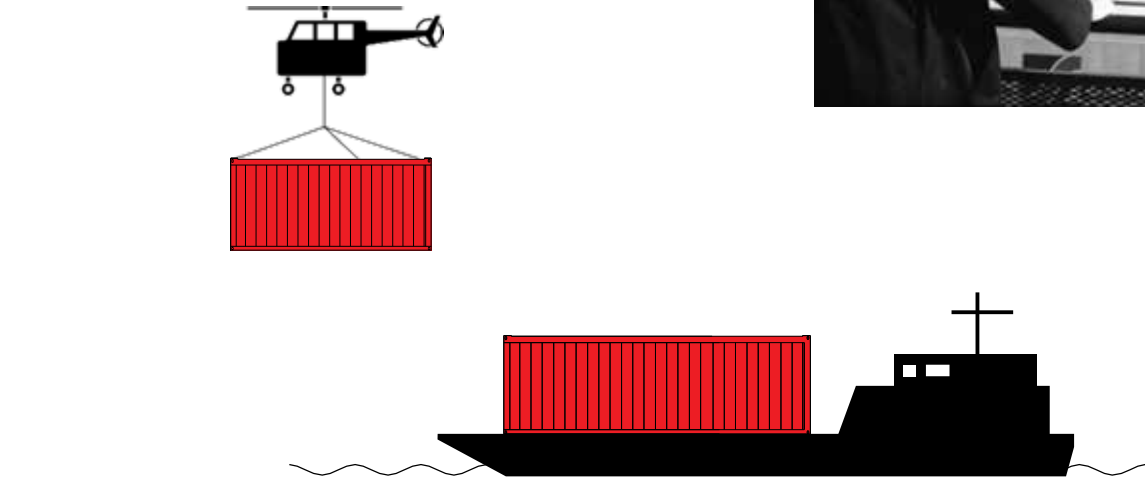
vs.



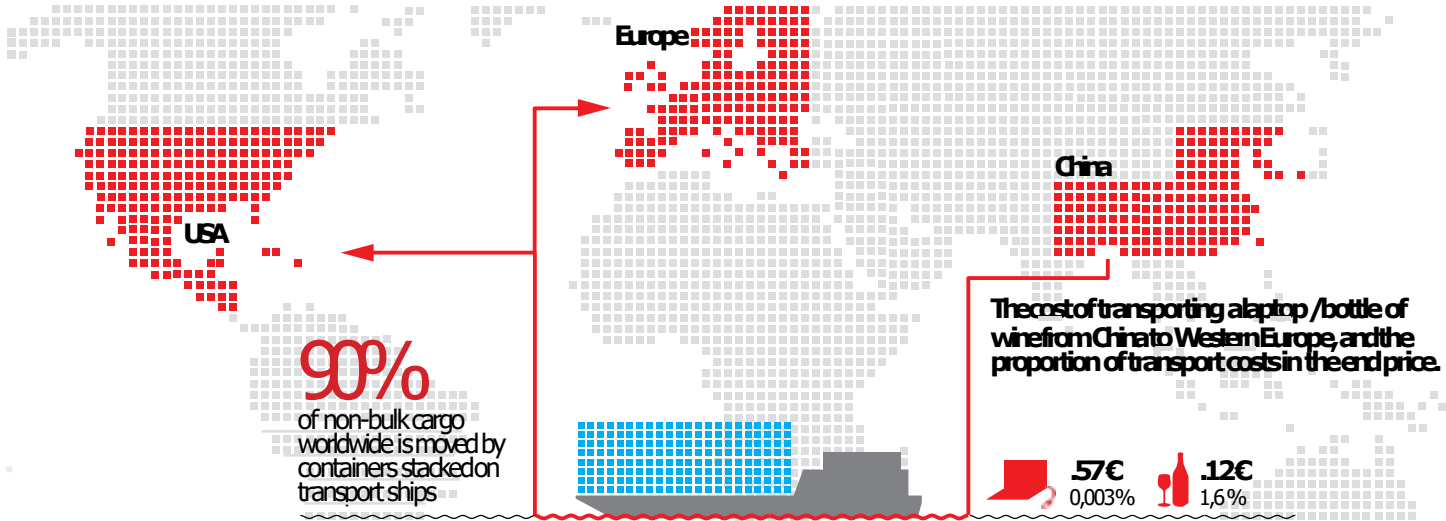
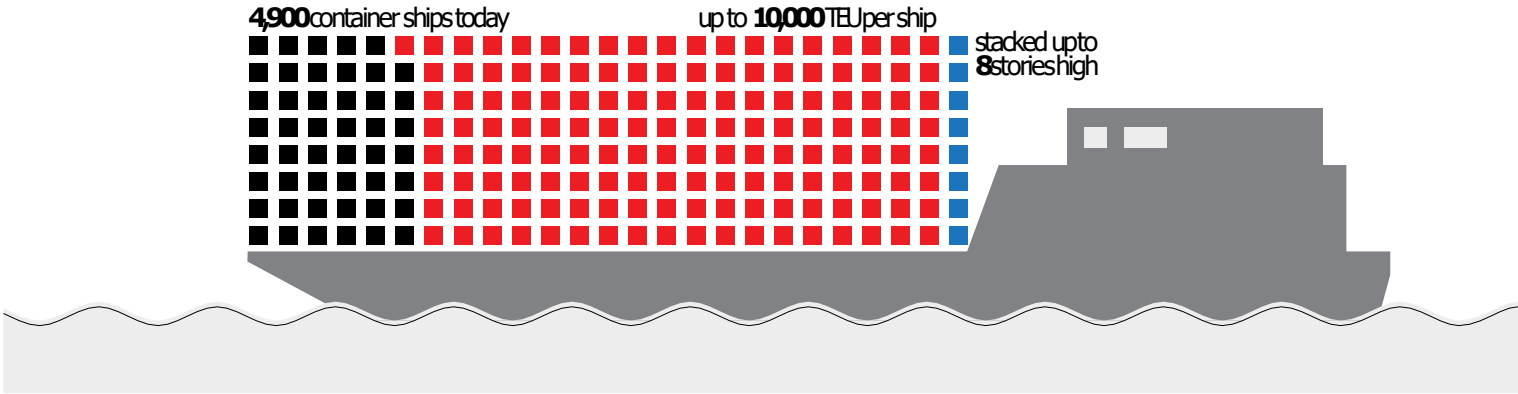
HISTORY



Malcolm
P. McLean,



SYMBOL AND CO-CREATOR
OF GLOBALIZATION



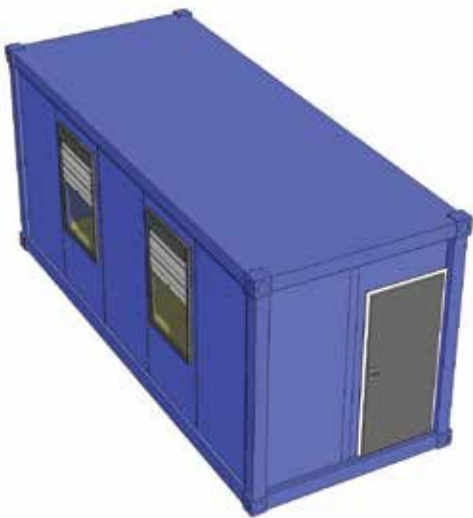
SIZES AND TYPES



tank container



flat-rack container



building container



cargo shipping container

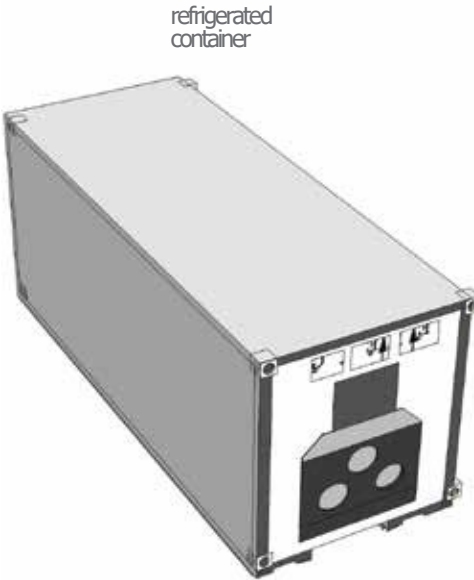
		20' container		40' container		45' high-cube container	
		imperial	metric	imperial	metric	imperial	metric
external dimensions	length	19' 10"	6.058 m	40' 0"	12.192 m	45' 0"	13.716 m
	width	8' 0"	2.438 m	8' 0"	2.438 m	8' 0"	2.438 m
	height	8' 6"	2.591 m	8' 6"	2.591 m	9' 6"	2.896 m
interior dimensions	length	18' 10 5/16"	5.758 m	39' 5 45/64"	12.032 m	44' 4"	13.556 m
	width	7' 8 19/32"	2.352 m	7' 8 19/32"	2.352 m	7' 8 19/32"	2.352 m
volume		1,169 ft³	33.1 m³	2,385 ft³	67.5 m³	3,040 ft³	86.1 m³
maximum gross mass		52,910 lb	24,000 kg	67,200 lb	30,480 kg	67,200 lb	30,480 kg
net load		48,060 lb	21,800 kg	58,820 lb	26,680 kg	56,620 lb	25,680 kg
area	exterior	158,972 sq ft	14,769 m²	339,041 sq ft	31,498 m²	359,934 sq ft	33,439 m²
	interior	145,764 sq ft	13,542 m²	304,607 sq ft	28,299 m²	343,185 sq ft	31,883 m²



open top container

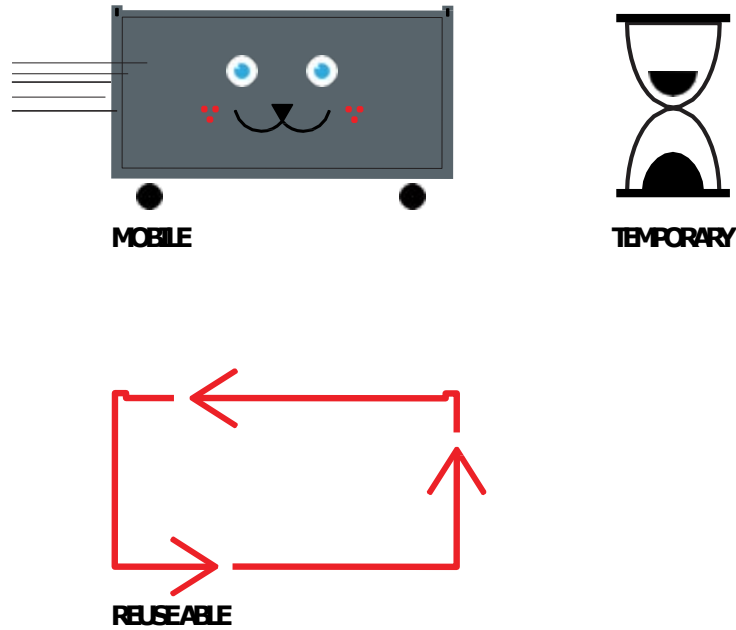


open side container

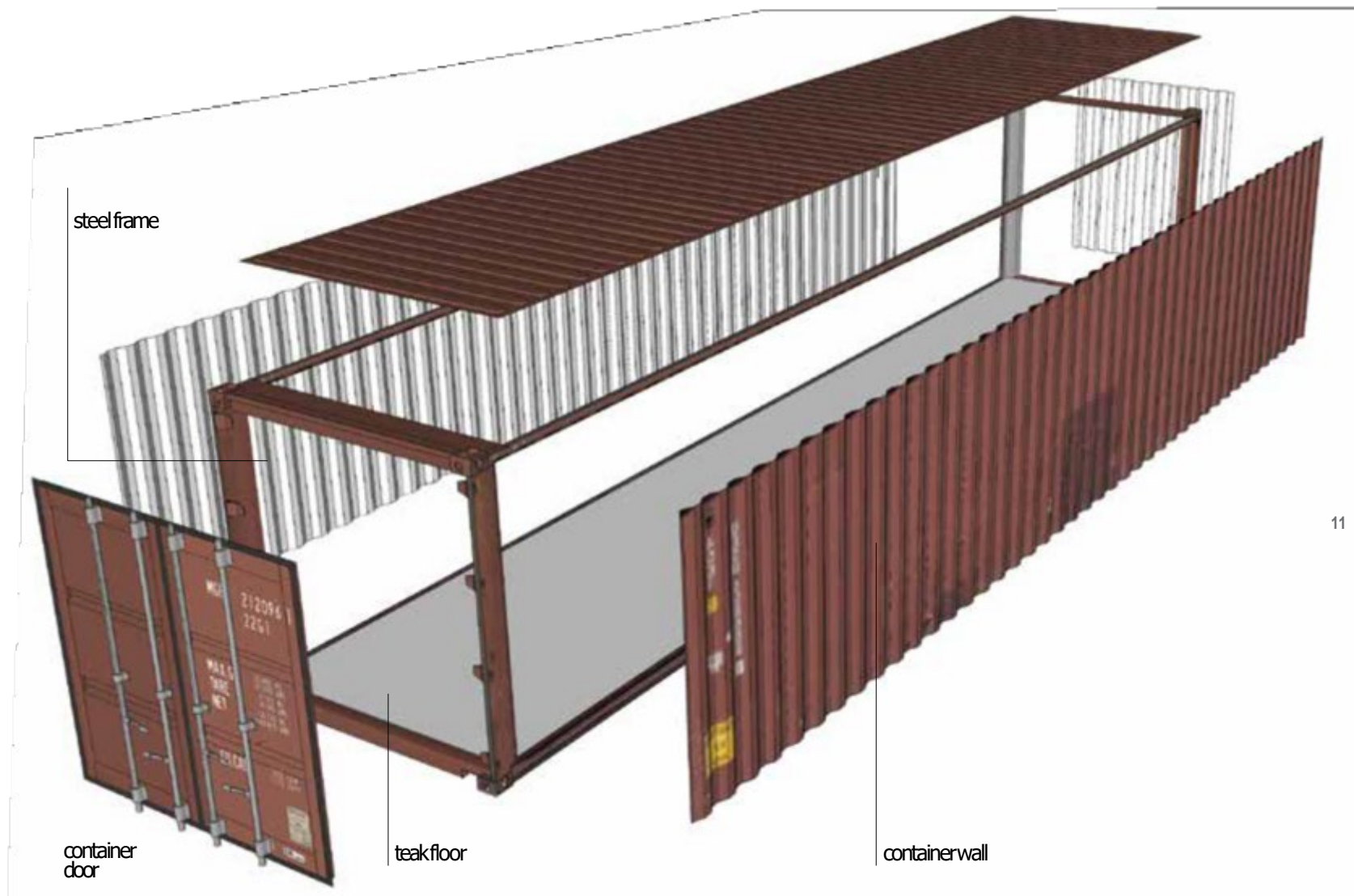


refrigerated container

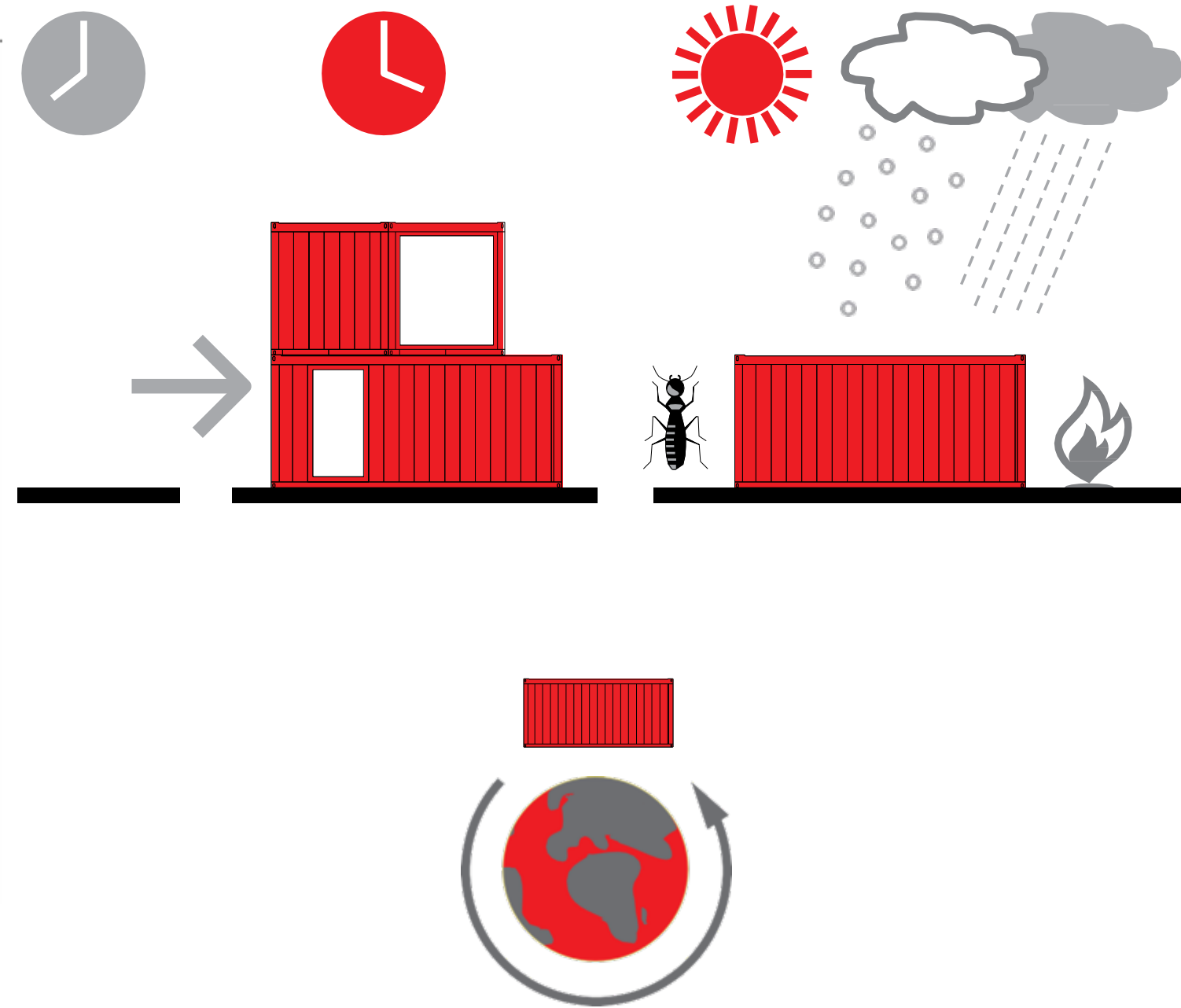
**BUILDING
CONTAINERS**



SHIPPING CONTAINER - THE BUILDING
BLOCK OF CONTAINER ARCHITECTURE



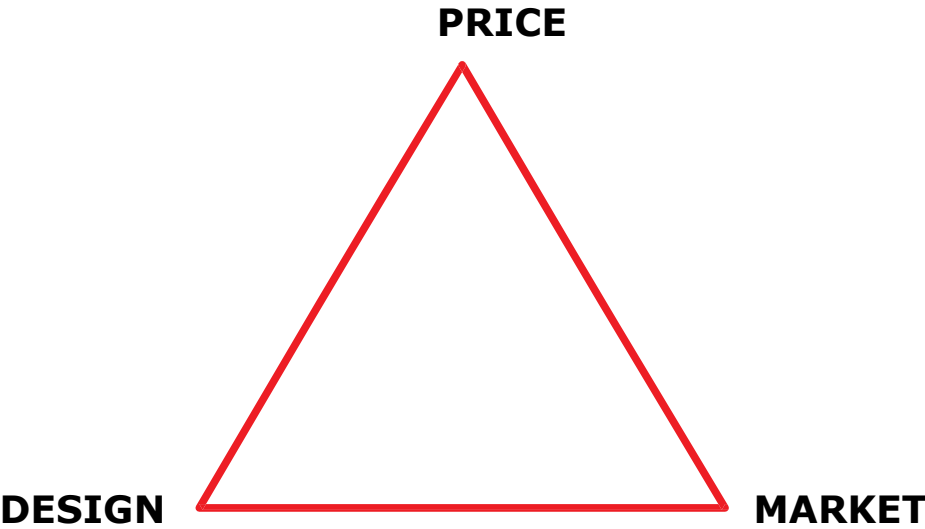
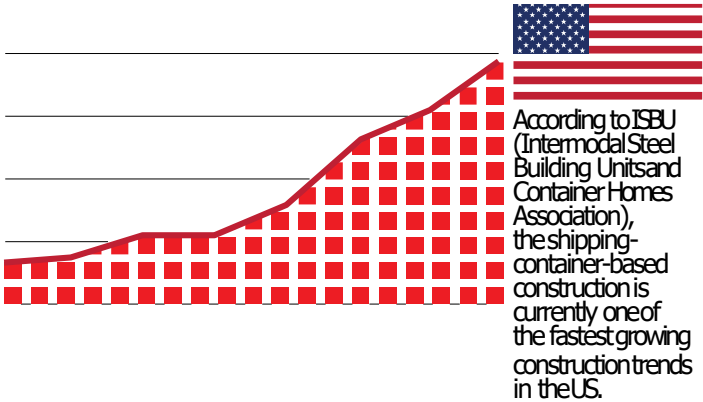
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**OPTIMIZING THE
SYSTEM-EVOLUTION
OF CONTAINER**



THE RISE OF CONTAINER ARCHITECTURE



SUPERSTAR ARCHITECTS
AND SUPERSTAR CLIENTS



EVOLUTION OF CONTAINER ARCHITECTURE



1. conceptual use



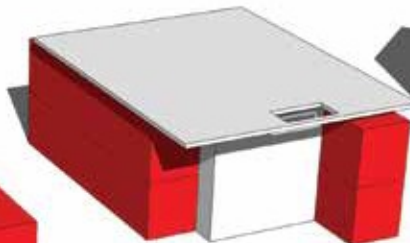
2. expanding space (hydraulics)



3. larger projects



4. in combination with other materials



5. standard prefab approach



In the past twenty years container architecture witnessed several stages of development.

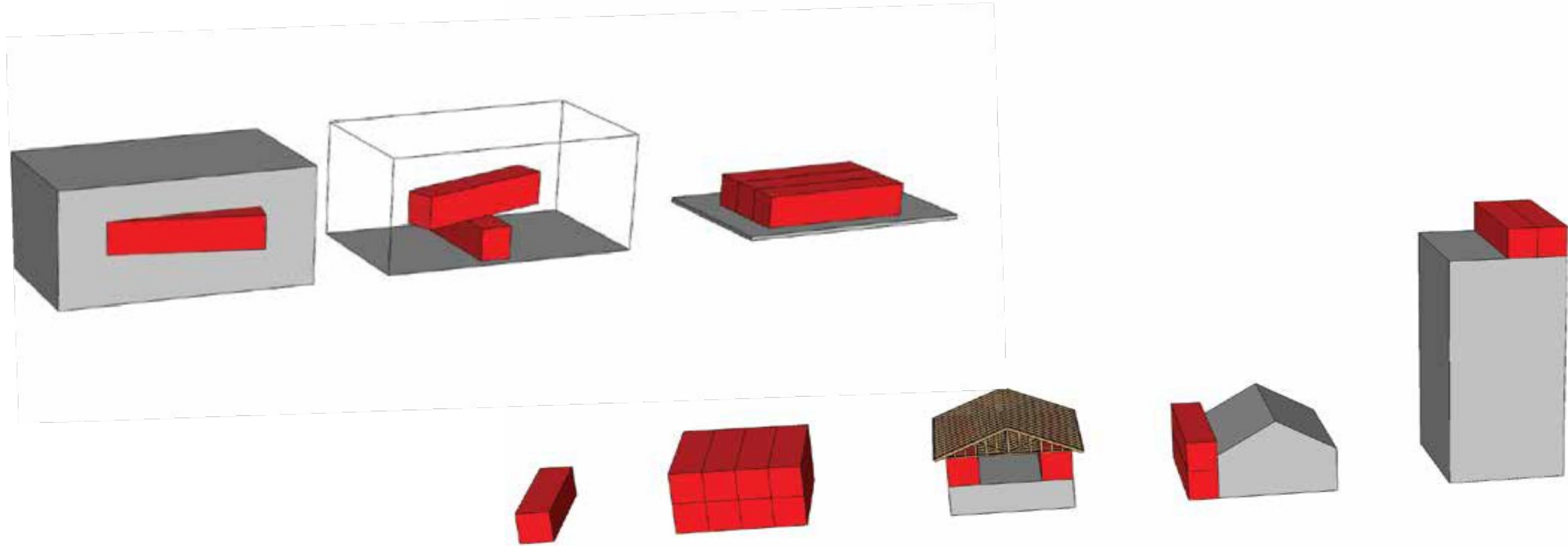


Photo: Andre Movsesyan

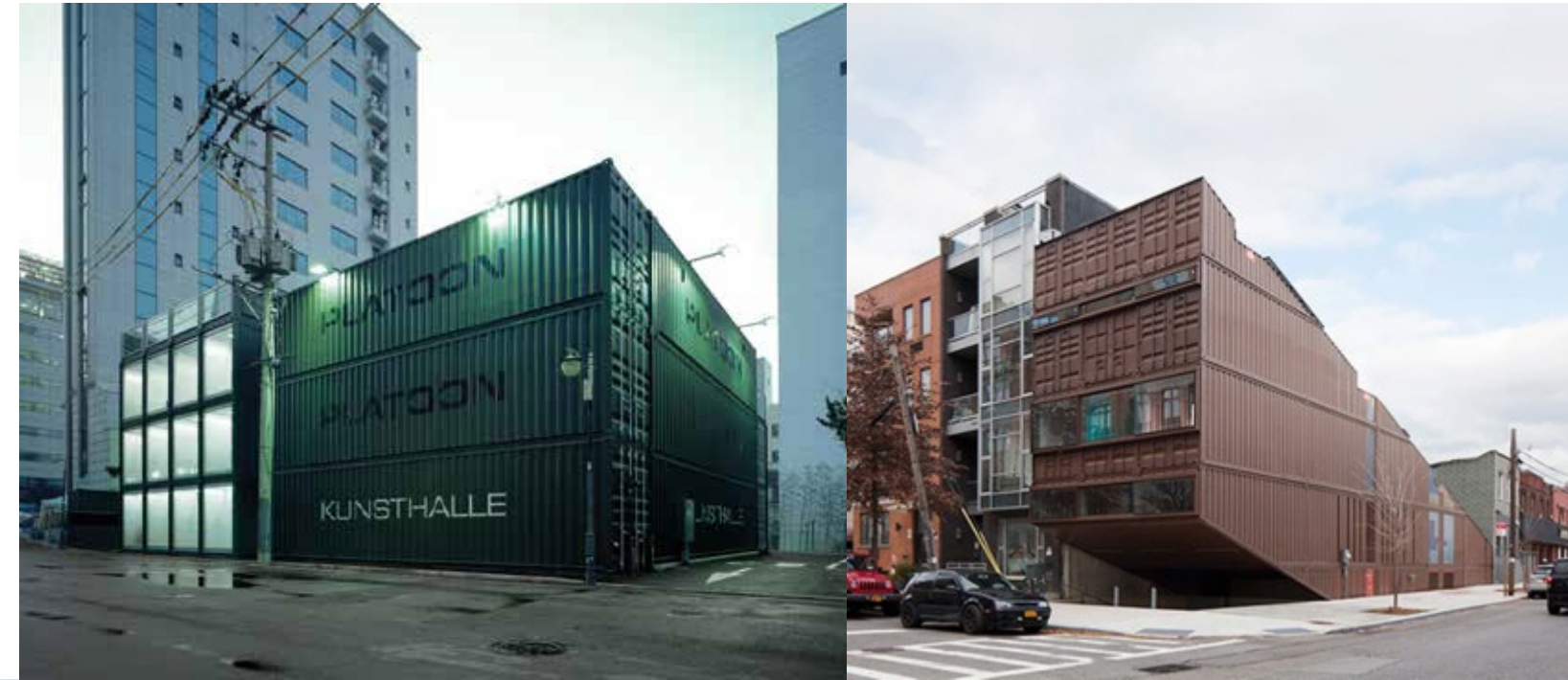


Photo: batiloc.fr

CONTAINER ARCHITECTURE TYPOLOGY



A SINGLE CONTAINER



CONTAINER COMPOUNDS

EXTENSIONS



**MIXED
CONSTRUCTIONS
AND
SPICE-UPS**



ROOFTOPS



**FLOATING
CONTAINERS**

INTERIORS WITH CONTAINERS



PUBLIC BUILDINGS



HOUSING PROJECTS



EVENT ARCHITECTURE



tradition

+



containers
transport

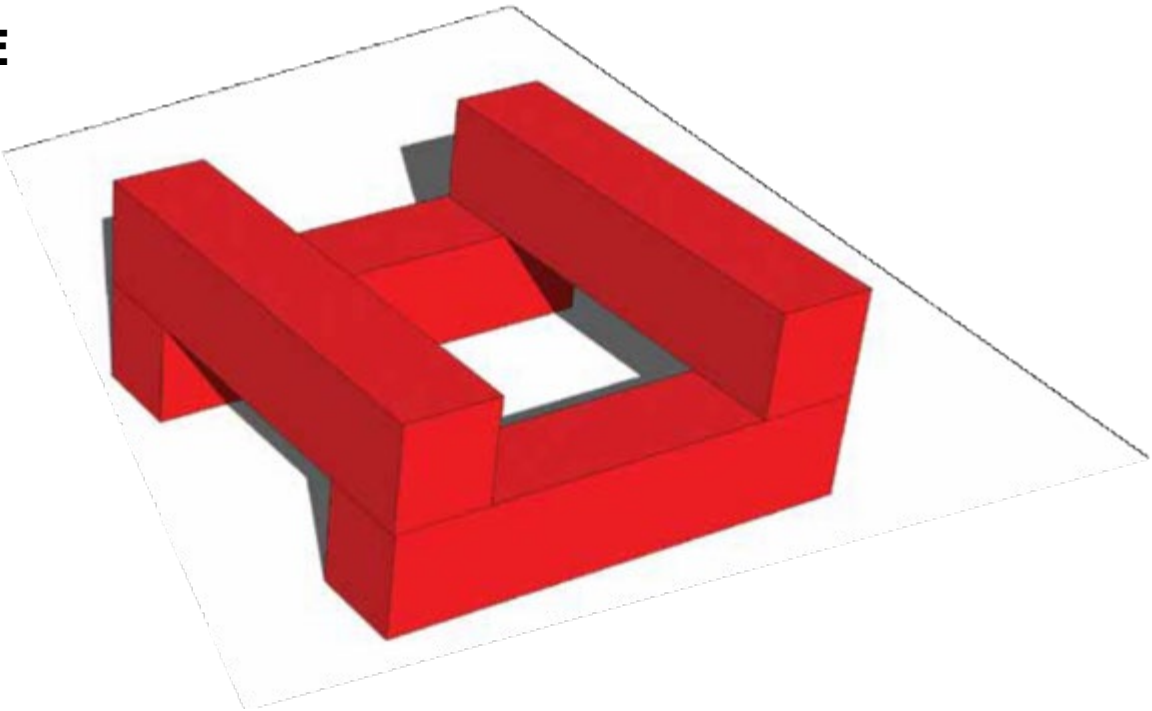
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transportable
lighthouse

**PRINCIPLES OF
CONTAINER ARCHITECTURE**

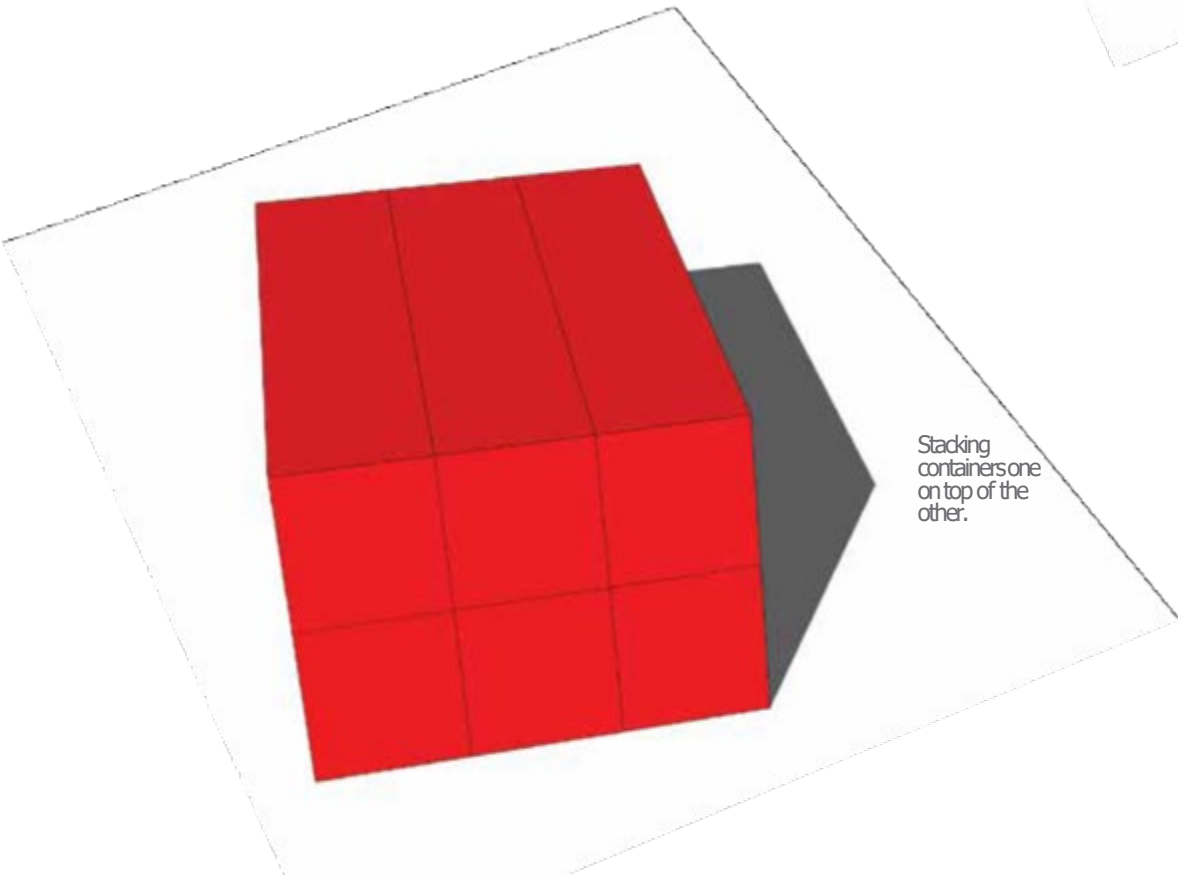
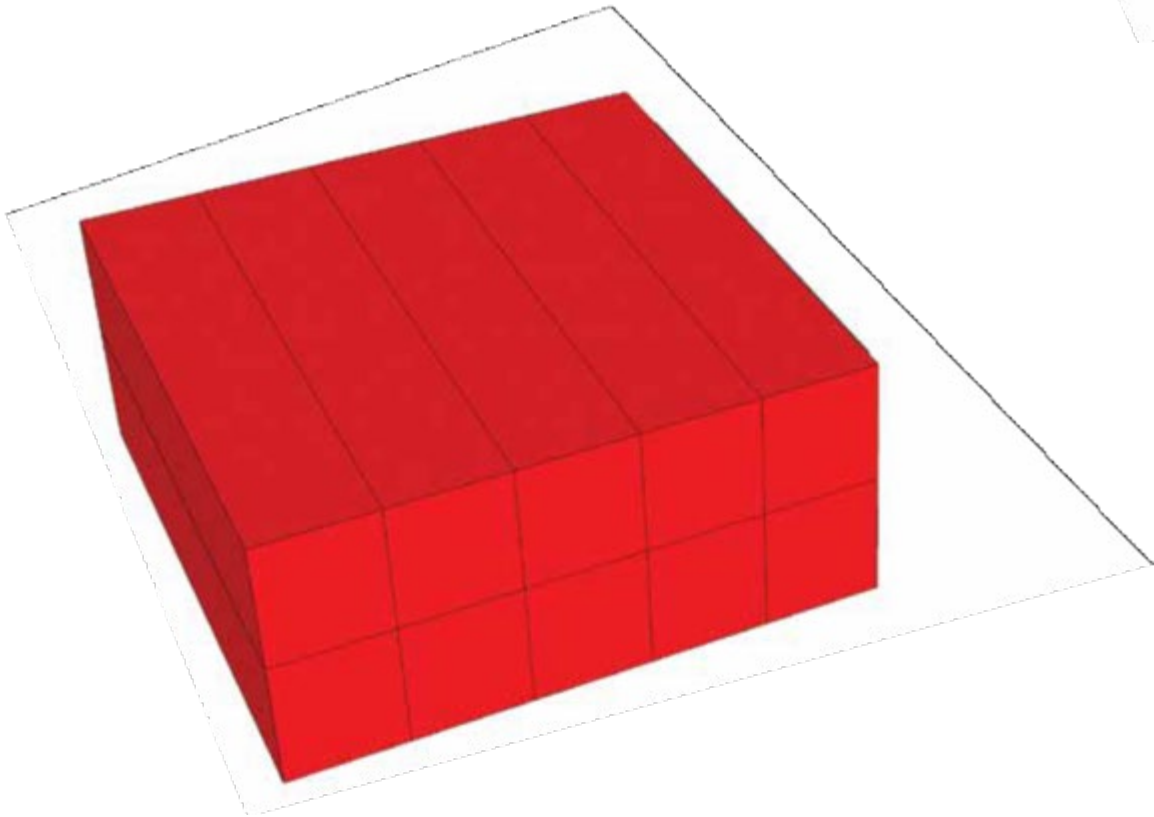
FORMING SPACES



STACKING



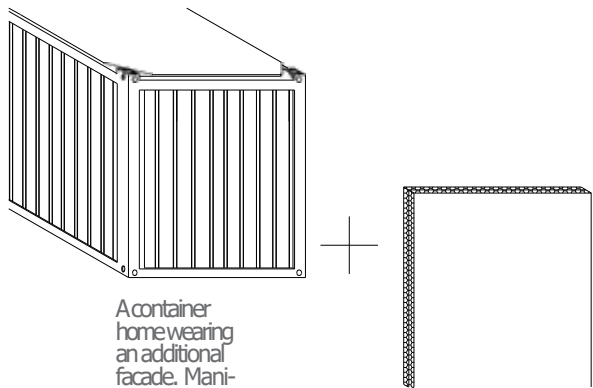
Containers stacked in dynamic composition is eye catching but usually needs additional static reinforcement.



Stacking containers one on top of the other.

PRINCIPLES OF THE OUTLOOK

Container look or secondary facade cover



A container home wearing an additional facade. Manifesto House by James & Mau Architecture.

Photo: Antonio Corcuera





Sturdy and durable

Shipping containers are ideal for building in many ways. They are designed to carry heavy loads and be stacked high up: their frame structure is therefore very strong. They are designed to resist outside inconveniences, such as high winds and waves on ocean-going vessels, or road salt: they are therefore weather-resistant. They are practically unbreakable: their life span is very long.

Modularity

All shipping containers are made to standard measurements and as such they provide modular elements that can easily be combined into larger structures. This simplifies design, planning and transport.

Easy to transport

Containers are intermodal, which means they comply with stringent ISO standards regarding size, weight and capacity. This makes them perfectly compatible with all kinds of transport, such as ship, truck or rail, so they can be loaded onto as well as unloaded from the various segments of the transport chain easily and efficiently.

Lightweight

Container-based buildings weigh less than stone or concrete structures, which makes them earthquake-safer and requires less groundwork.

Availability

Used shipping containers are available or can be delivered anywhere around the world.

Cost

Used containers are available at a relatively low cost, especially compared to buildings constructed with labour-intensive methods. Costs are additionally driven down due to less groundwork required. Used shipping containers, which require simple modifications for conversion into housing/office units, can be purchased from major transport companies for as little as 1,200\$ each. Brand new ones seldom cost more than 6,000\$.

Sustainability

Containers are recyclable and reusable. Also, if buildings are constructed from containers, the use of other construction materials can be significantly reduced. All this makes container architecture comply with the 3R design concept: reuse, recycle, reduce.

Trendy

Container architecture that uses old shipping containers has been receiving a lot of encouraging attention from the world of design as well as the media for being a trendy green alternative to conventional buildings.

Temperature

Steel compounds overheat easily; container buildings will normally require better insulation than most brick, concrete or wooden structures. Untreated metal wrap on containers absorbs heat, but treated with the proper blend of non-toxic ceramic spheres or protected with a ventilated secondary roof the overheating can be prevented.

Waste

Transforming shipping containers into home/office units requires modifications, which results in waste.

Limited space

A single container makes for a very awkward living/working space, especially after it has been additionally insulated: it is a long narrow box with less than 8 feet (2.4 m) in height. To create spaces suitable for living and working, several containers need to be put together. Since they are meant for simple stacking one on top of the other, this can limit the architectural expression.

Manipulation

As opposed to the conventional construction materials, such as brick, concrete block and lumber, containers are too big and too heavy to be manipulated manually. You therefore need a crane or forklift at the construction site.

Building permits

The use of steel for construction, while prevalent in industrial construction, is not widely used for residential structures. Obtaining building permits may be troublesome in some regions due to municipalities not having seen this application before.

Pesticide-treated floors

Some shipping containers have pesticide-treated floors (arsenic, chromium, copper), which is a health hazard for humans. Such floors need to be disposed of and replaced before habitable.

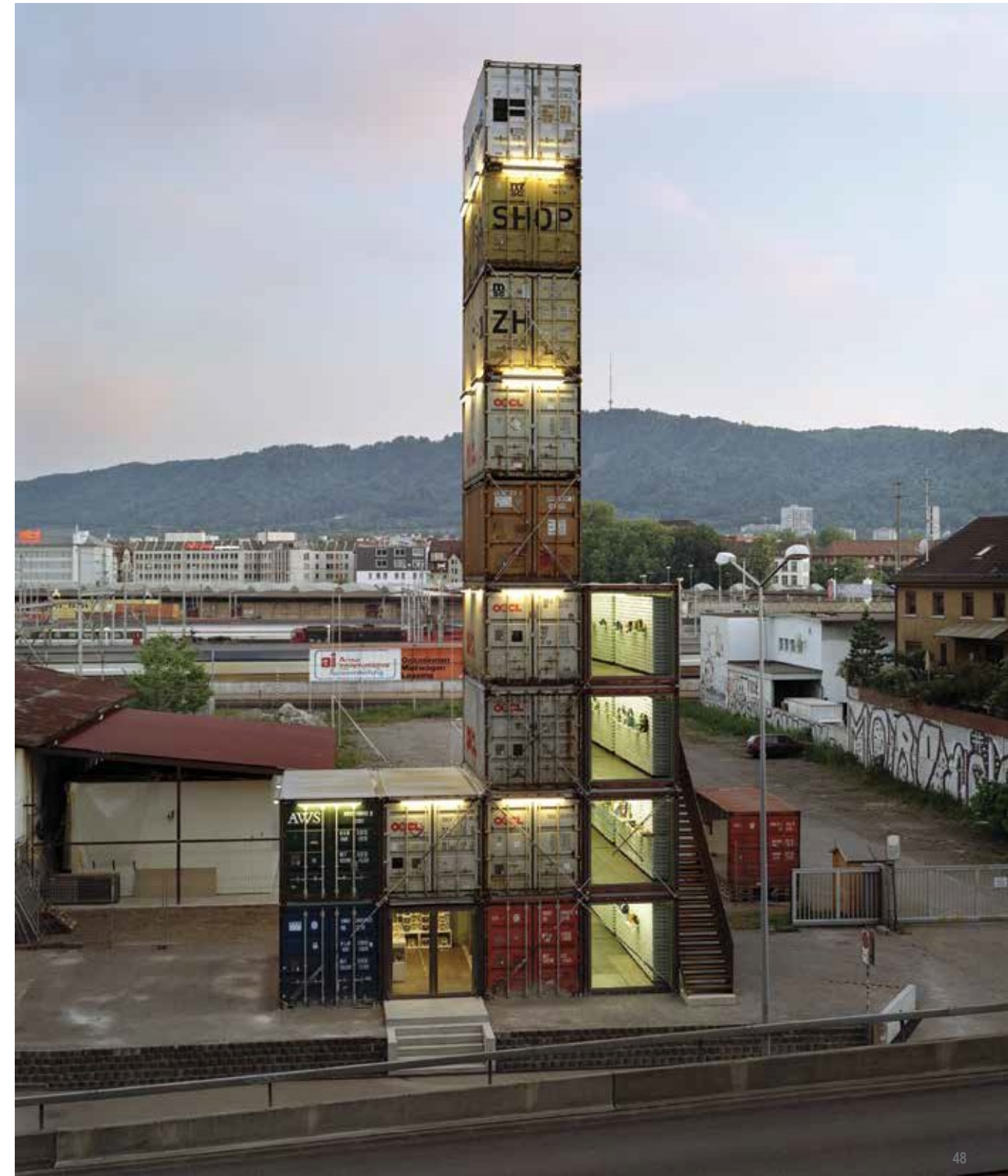
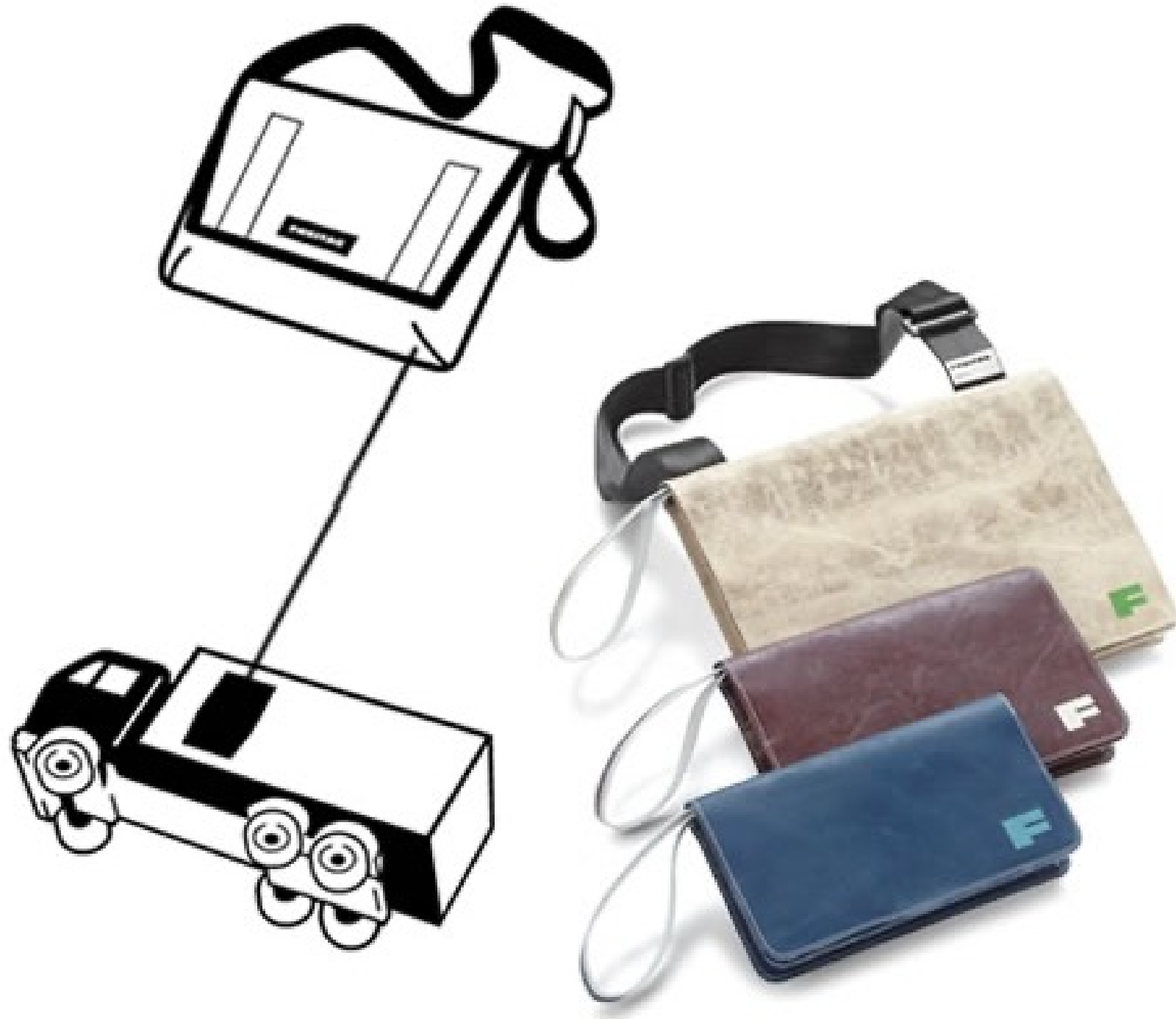
Cargo spillages

A container can carry a wide variety of cargo during its working life. Spillages or contamination may have occurred on the inside surfaces and may have to be cleaned before habitable. Ideally all internal surfaces should be abrasive blasted to bare metal, and re-painted with a non toxic paint system.

Prejudice

People often still consider container architecture as suited only for workers, third world countries and the homeless, and don't recognise their added value in architecture.

KNOWING WHEN TO USE CONTAINERS.



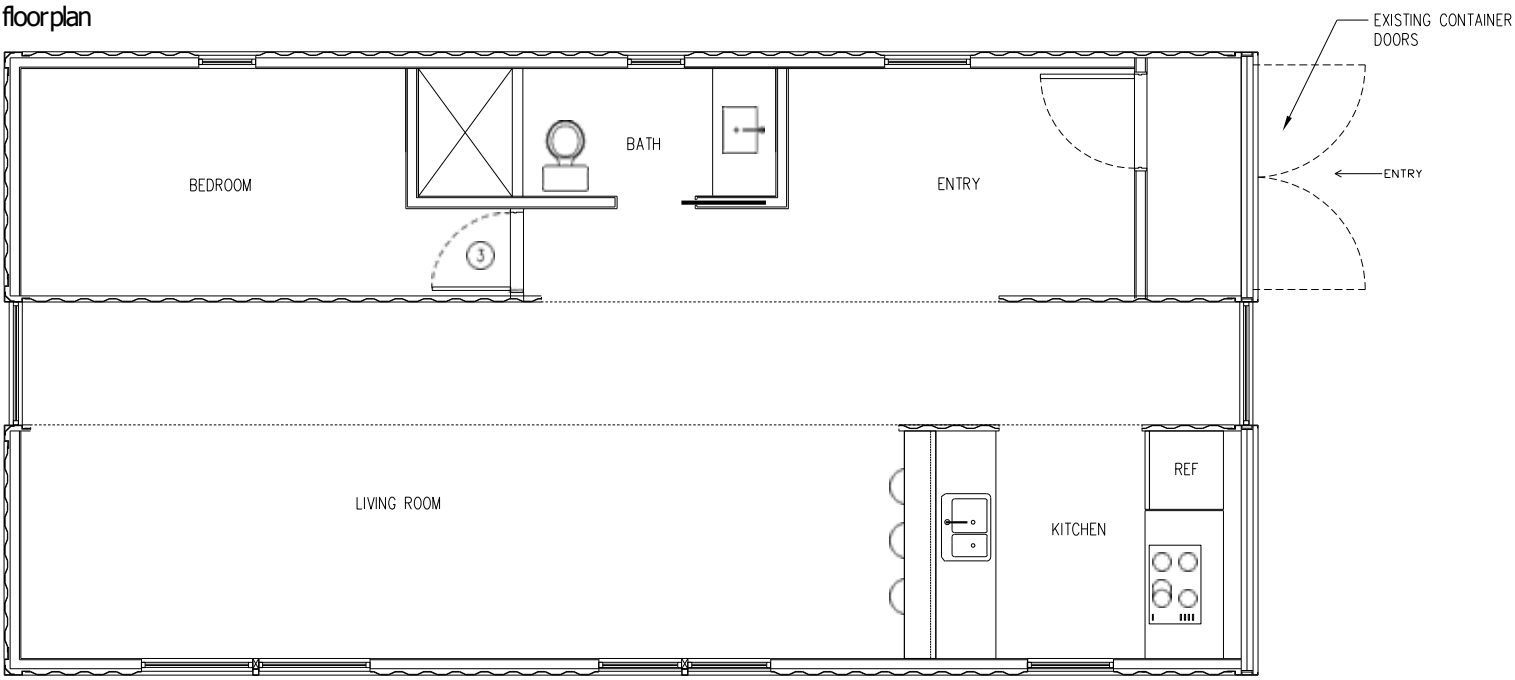
TRANSFORMATION
PROCESS



1. selecting appropriate containers



floorplan



BEST PRACTICES





Ogrydziak Prillinger architects Triskelion

location: San Francisco, California

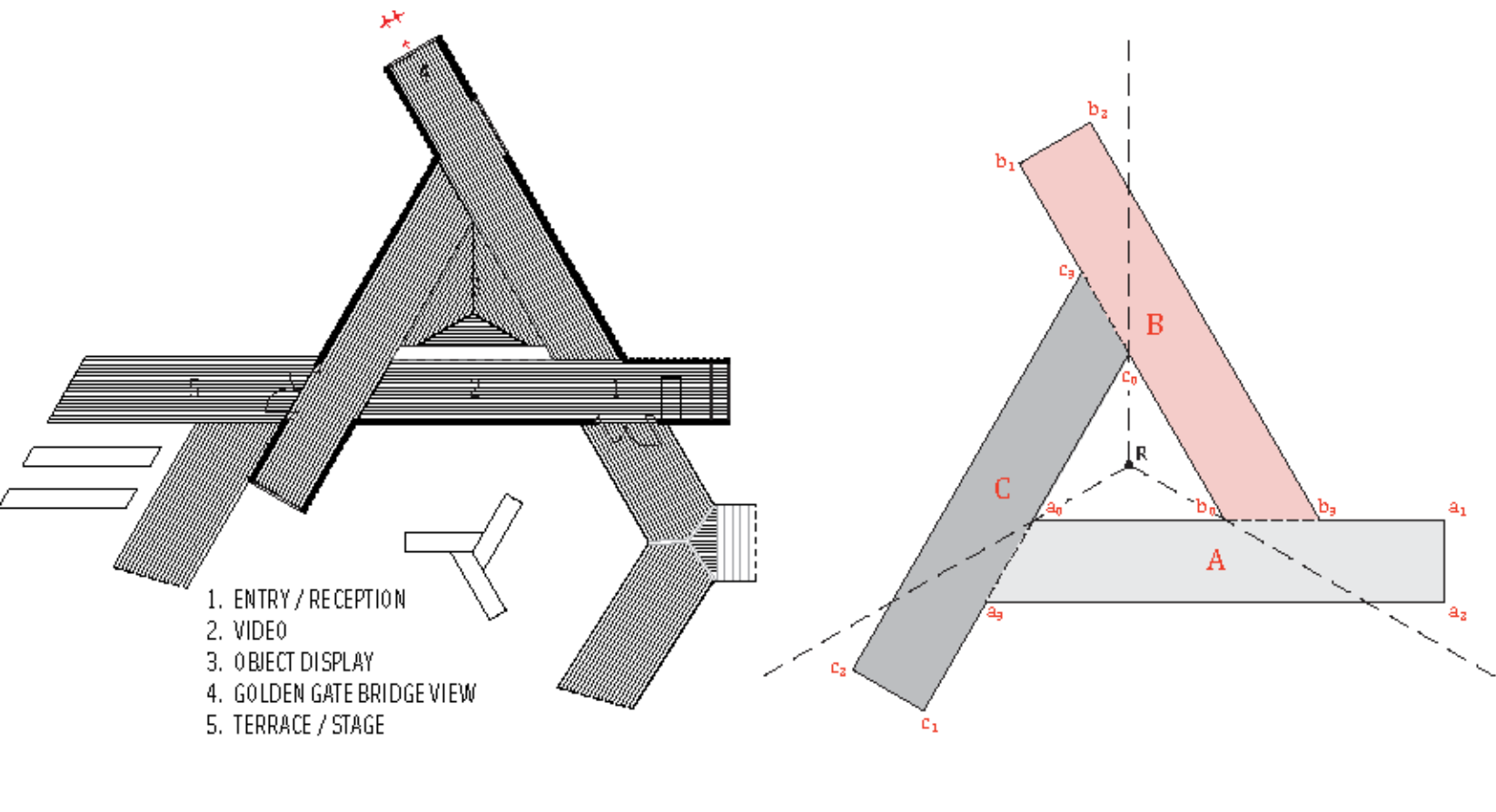
use: Art gallery

year of completion: 2010

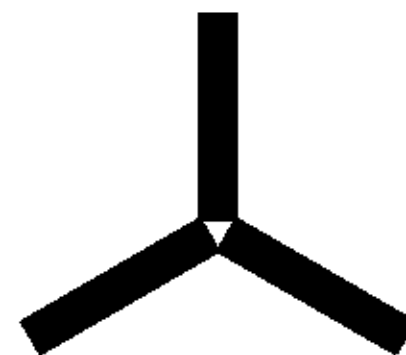
photography: Tim Griffith

no. of containers: 3

The triangular composition of three containers and a space in between hides behind its steel façade a fabulous spacious and well illuminated gallery.



GRID



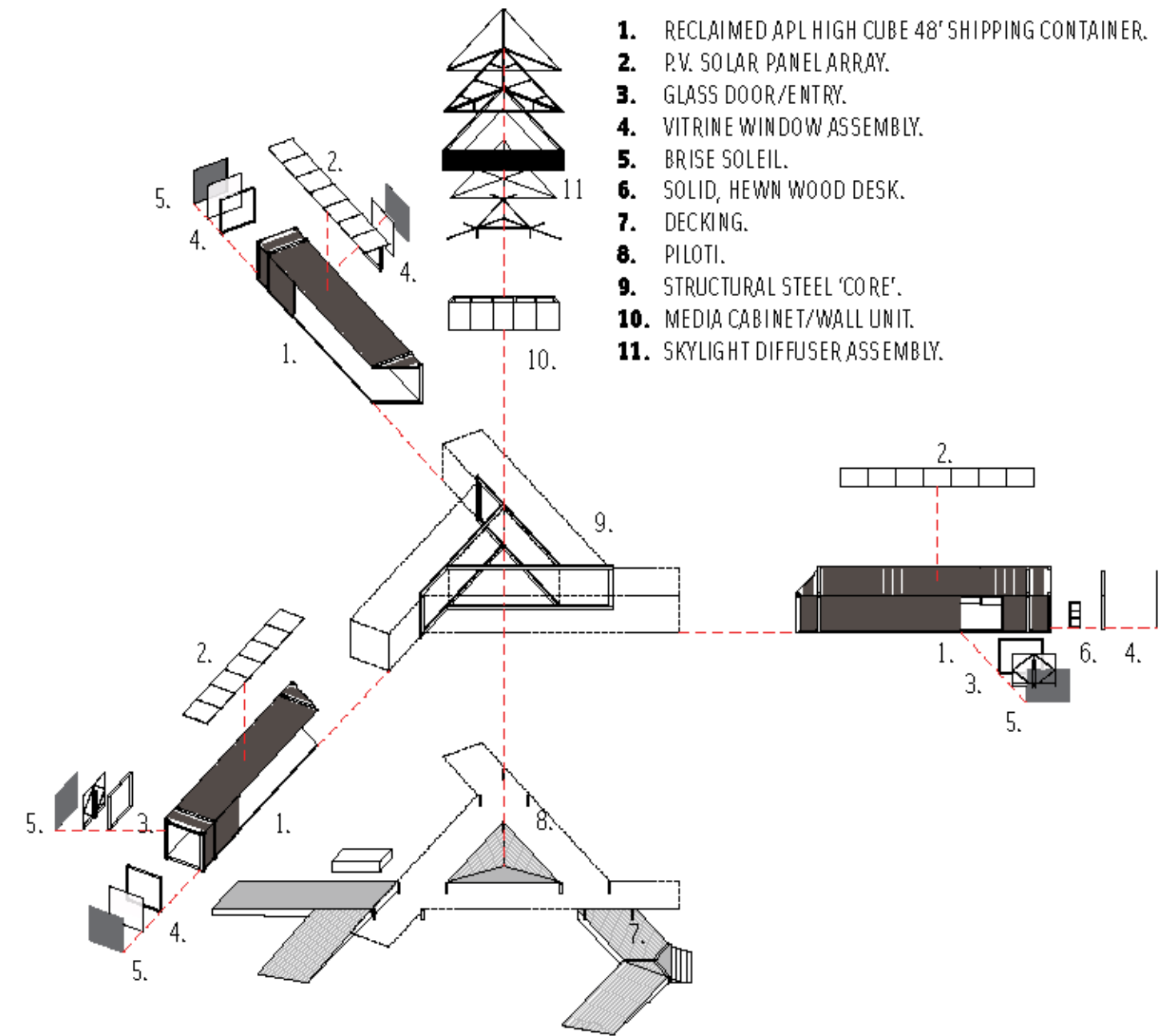
STAR

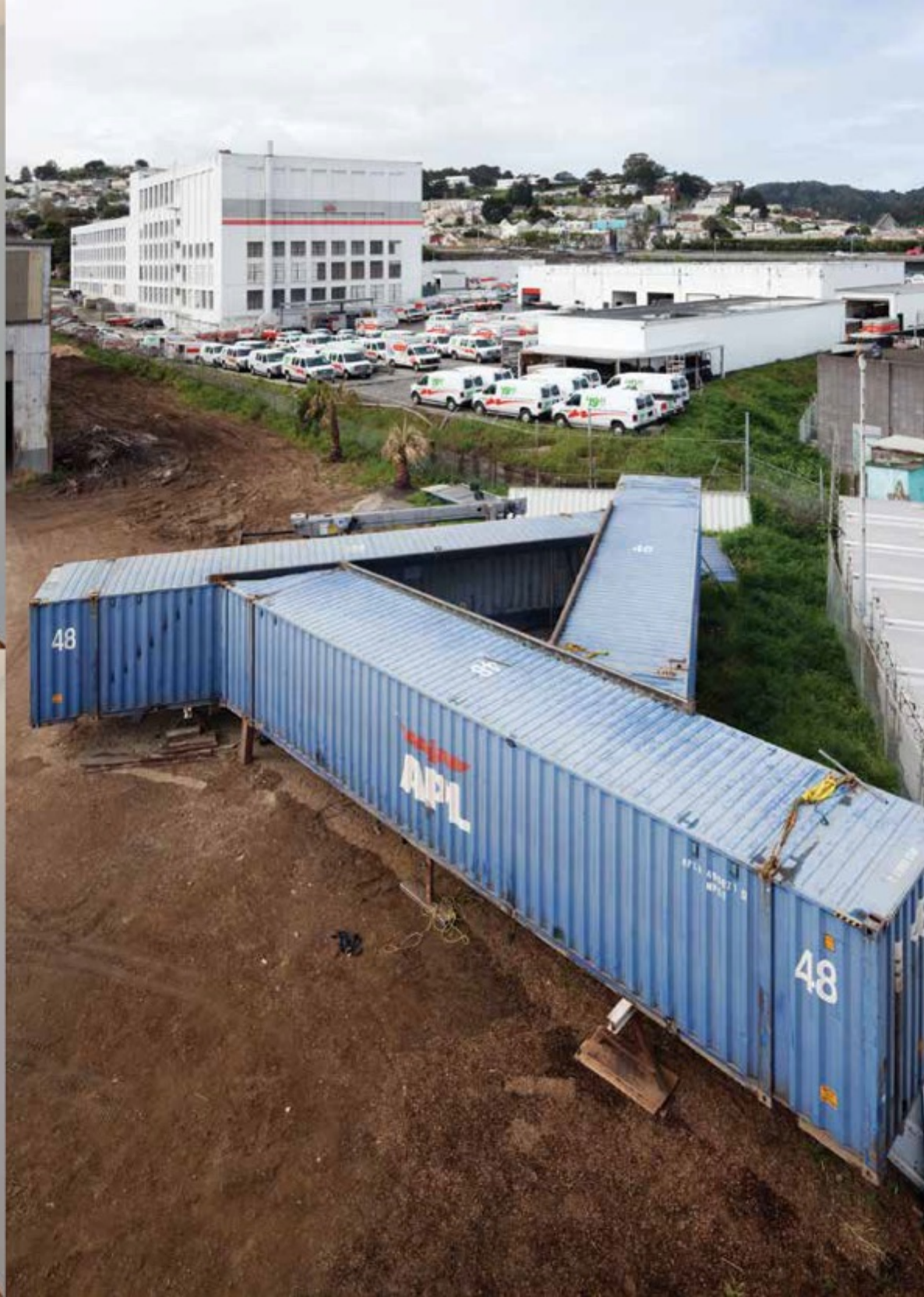


SIMPLEX



TRISKELION







Shigeru Ban Architects Nomadic Museum

location: New York, USA, and other

use: Museum

year of completion: 2005

photography: Michael Moran

no. of containers: 148

The atmosphere created by the paper tubes colonnade, stacks of steel containers and carefully directed light give the visitor the impression they are in a cathedral – a cathedral honouring art.



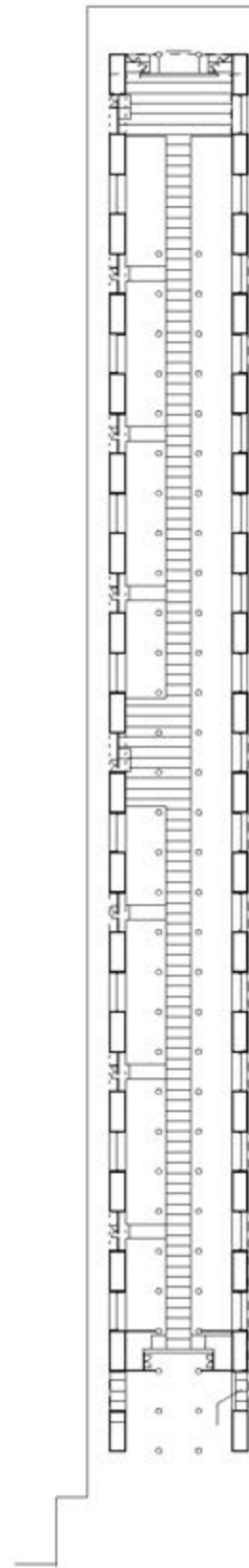
Gregory Colbert is the creator of *Ashes and Snow*, an exhibition of photographic artworks and films, who wanted his exhibition to tour the world in a mobile gallery or museum. He wanted something sustainable and innovative, something fresh. Colbert wanted a cathedral for the 21st century and he got one – the Nomadic Museum.

This building's journey started on the abandoned Pier 54 of New York's Hudson River. Shigeru Ban created it from 148 borrowed cargo containers, stacked into a four-level self-supported grid. The open spaces between containers are secured with a diagonal tent-like fabric, creating the typical checkerboard pattern over the entire facade. The interior construction consists of triangular trusses of paper tubes resting on a colonnade of 11 m (36') high paper tube columns. A wooden walkway runs the length of the colonnade and is bordered on both sides by bays full of white-washed river stones, surrounding each column. Above these bays, large unframed photo artworks printed on hand-made Japanese paper are hung on thin cables, installed between the paper columns. This establishes a visual boundary between the physical space of the public walkway and the mystical domain of the images. The fact that shipping containers were used to make this monumental structure does not diminish the awe-inspiring experience of its interior.

Containers were chosen for the building because they are available everywhere the museum goes. Rather than having to ship the entire exhibit, only 37 containers have to be transported each time, to pack the fabric and materials for the structure. The remaining containers are borrowed on site. The Museum was so far erected in New York City, Santa Monica California and Tokyo, each time in a slightly different cast of containers, always adapting somewhat to its current environment.

Project video







Adam Kalkin **12 Container House**

location: Brooklin, Maine, USA

use: Vacation Home

year of completion: 2002

photography: Peter Aaron (esto)

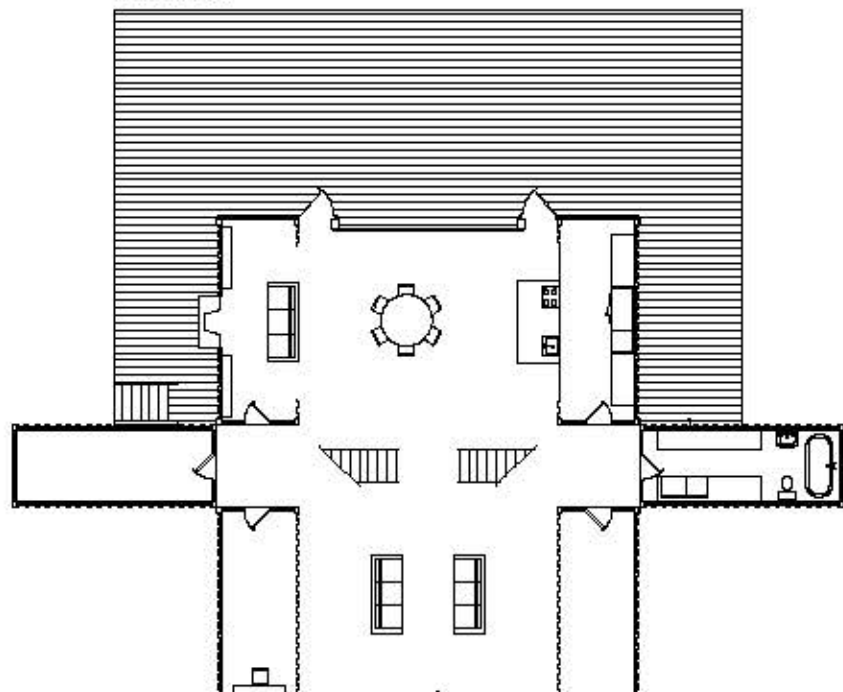
no. of containers: 12

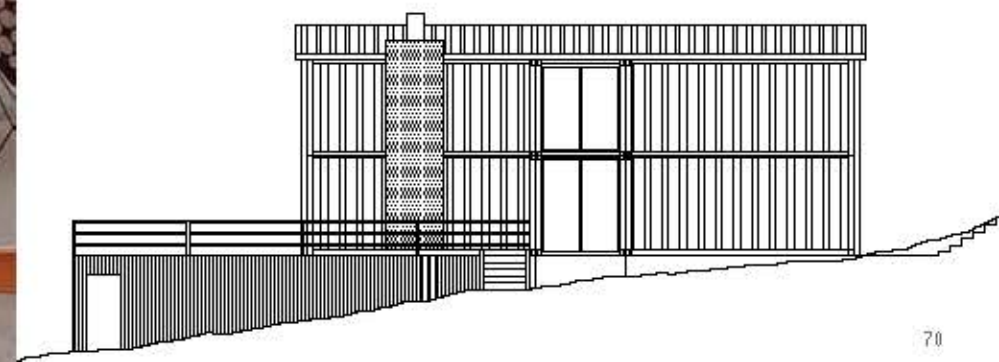
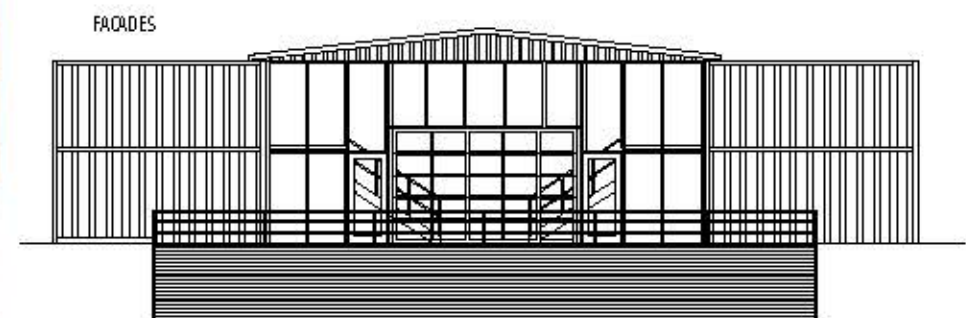
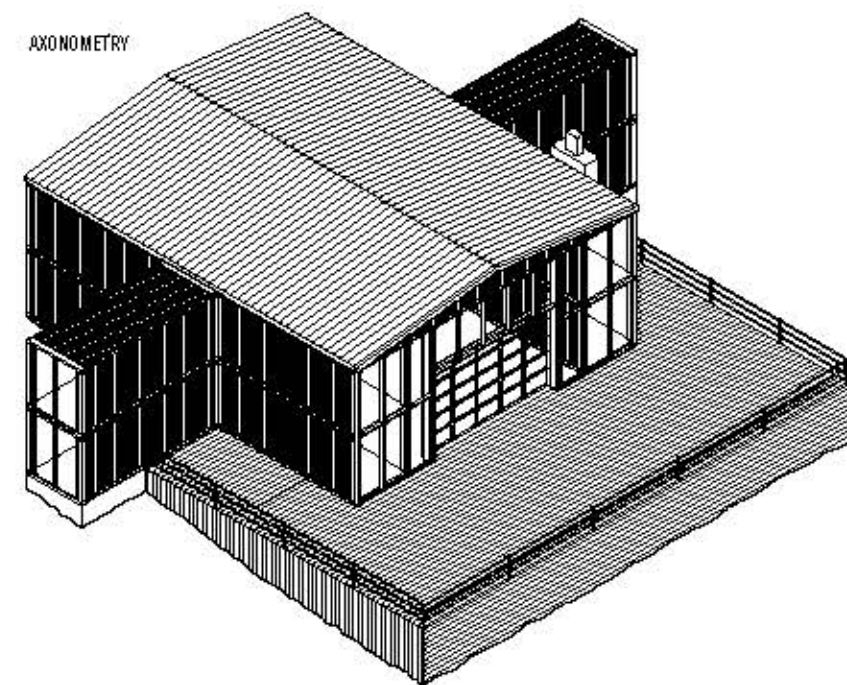
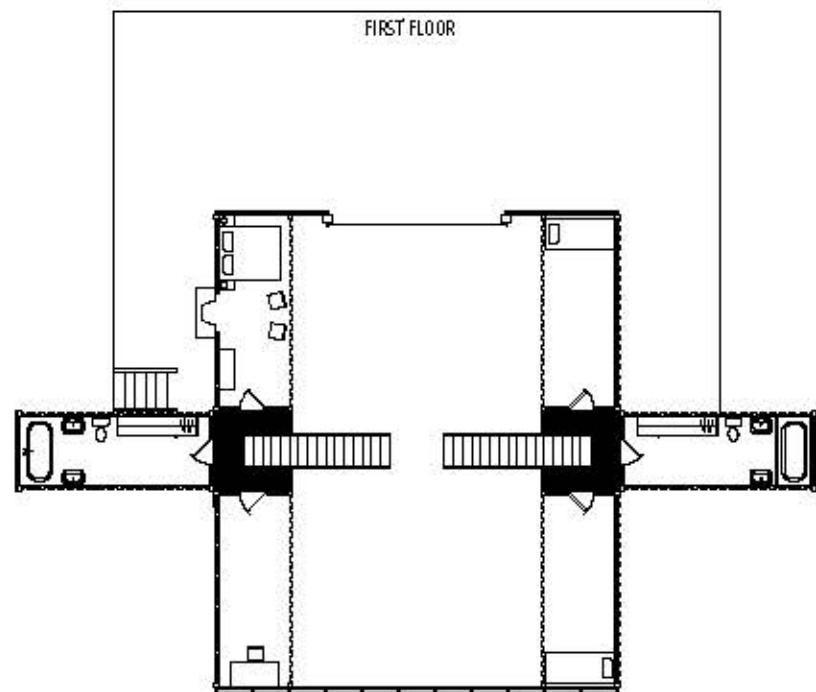
A gently sloping metal roof connects two orange six-container wings that are set apart to create a spectacular double-height fully-glazed living area in between them.

The 12 Container House is a custom-made prefabricated summer home, which architect Adam Kalkin created for the Adriance family from 12 recycled shipping containers. Kalkin designed a spacious residence with an extraordinary and even unusual appearance: it offers some 372 m² (4,000 ft²) of interior surfaces and remains to this day probably the largest container residence ever. It is situated on a private plot outside the city of Brooklin in Maine, surrounded by trees and only footsteps from the sea shore. Constructed back in 2002 when private homes made from containers were still very rare, it attracted a lot of attention. It remains, however, one of the quintessential container architecture projects to this day.

Twelve orange containers are placed on a concrete base. Stacked into two levels they make two letters T, which are set at a distance to each other and have a large glazed area between them. This central two-level space lies at the heart of the symmetrical house and hosts a spacious living area, dining room and two staircases leading upstairs, each into its own T-winged part of the house. Containers on the ground floor house the kitchen, library, office, playground and guest bedroom. Because of the floor-to-ceiling windows and the glazed containers' shorter sides the house is very bright. The containers' glass sides in the interior allow good visual communication between the family members. The containers' longer sides function as the exterior wall on the outside but were fully removed on the inside in some parts (like the kitchen or the library) to make the interior more fluid and better connected to the central open space. The upstairs programme is more intimate, housing baths, bedrooms and office. The side of the house facing the sea has a large terrace with an outdoor fireplace.

GROUND FLOOR







Group 8 Cargo

location: Geneva, Switzerland

use: Office Building

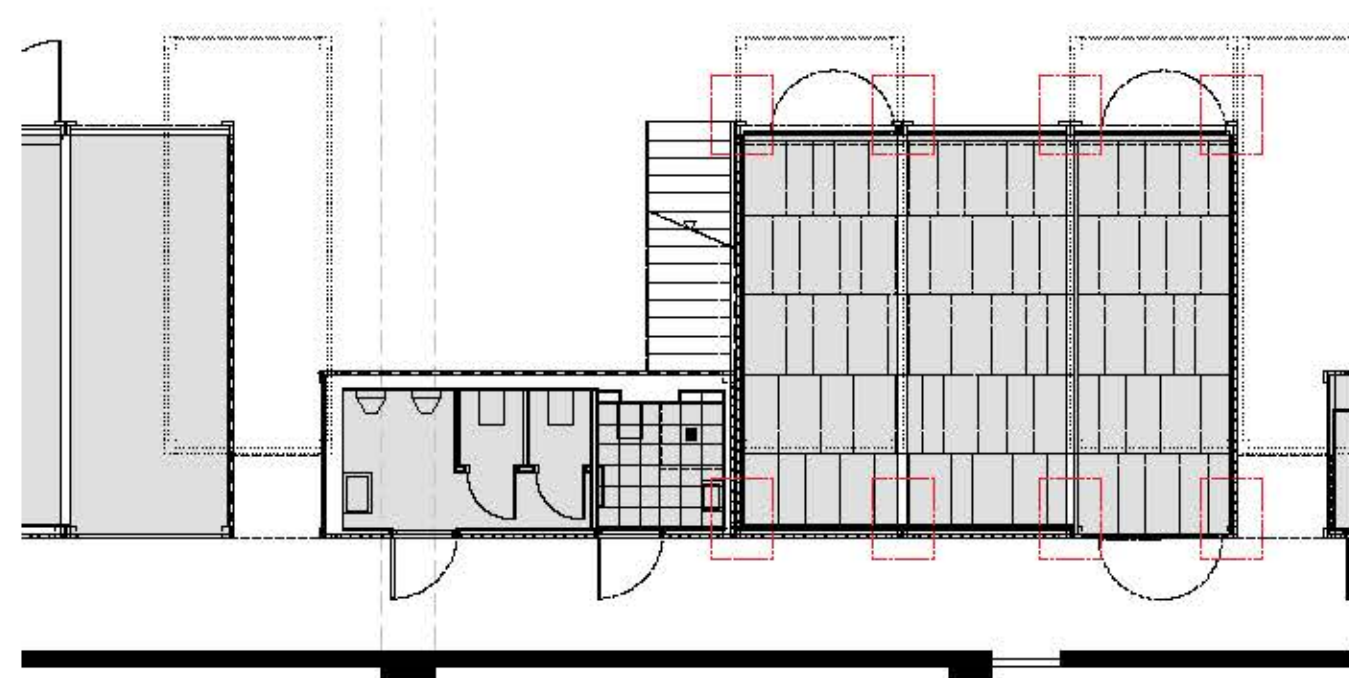
collaborators: /

year of completion: 2010

photography: Régis Golay, Federal Studio, Geneva

no. of containers: 16

Colourful and rugged containers, taken out of the transport chain as-they-were, stand out in stark contrast to the white minimalistic office environment. As opposed to the overall open landscape of the interior, containers congest specific programmes and services.

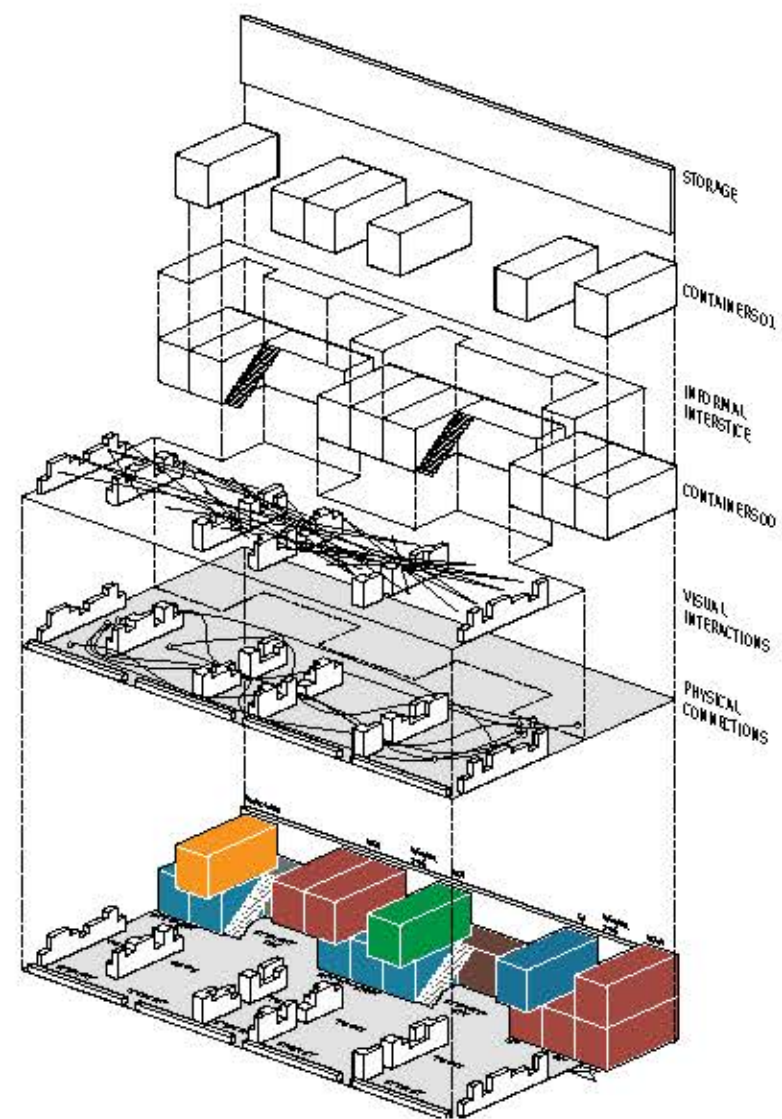


When moving to larger premises, Swiss-based architects group8 found a perfect location in a former industrial hall close to downtown Geneva. To make the best use of the 780 m² (8,400 ft²) hall with ceilings 9 m (29.5') high, group8 arranged the interior into two zones: a spacious central space composed of informal meeting spaces for group work, and a two-level gallery along the rims of the hall constructed from 16 recycled shipping containers, which house various specific programmes.

The central common areas are bright and minimalist, and give shape to a neutral environment, necessary for creative work. They constitute informal working spaces where employees can gather for group work, generating a strong exchange of ideas and powerful work flow. In this impeccable environment, the radiant containers symbolise the firm's global orientation. Into the white open space they bring a colourful cosmopolitan feel that was imprinted into them during their travels over the world's seas. They communicate with the staff and stimulate creative thinking.

This stark contrast between the overall white interior on the one hand and colourful containers dotted inside the hall on the other is Cargo's signature design feature. Containers were preserved "as found", i.e. without any outside cosmetic transformation, and look like they have been washed ashore directly out of the transport chain. The stark white background makes them stand out and catch your eye, which is in line with their function: as opposed to the more general function of the open space offices, containers accommodate specific and more private programmes such as relaxation rooms, model workshop, conference room, brainstorming room, eating lounge, and waiting room, which serve the entire hall. Colourful and rugged containers stacked against the perfectly white background fill the interior with a lively rhythm and create an inner skyline, a kind of miniature landscape, far away from traditional rigid office environments.





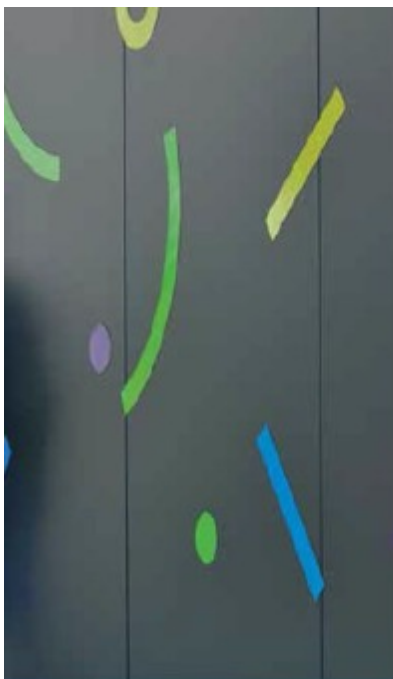
**REGIONAL EXAMPLES.
OWN PRACTICE.**











MAGNETS















**UTILITAS.
FIRMITAS.
VENUSTAS.**

HVALA.