Subtraction: A Construction in Reverse An Event of Metamorphosis

Sherina Zhang

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Subtraction
A Construction in Reverse
An Event of Metamorphosis

Sherina Zhang
Advisor: Jonathan Louie
Preface: Introduction

Life Span of a building does not begin at the creation of a new, instead it starts at the Subtraction of an old. Often the architectural discipline is fixed on the product of demolition and the creation process of new designs. Demolition are used to create tabula Rasa that seamlessly erase the “failures” of the precursors. The subtraction process is not acknowledged as a technique used deliberately for design. As it appear on the first page of architectural construction drawings sets, demolition is an inevitable step that every building possesses in the process of space making. Subtraction, as procedures of demolition, are events that create afterlife for build preservation. The metamorphosis of buildings can be achieved through subtractive procedures experimented on multiple building typologies.

This thesis initiates with debates between entropy of a building’s finite ending and metamorphosis of a building’s new beginning. According to Robert Smithson entropy is “an irreversible condition, where everything is gradually wearing down”. The works of Gordon Matta Clark, infused with understanding resulting in the increase of entropy, prevents architecture to pass beyond the point of irreversibility. Clark performs a set of minimalistic acts that provide architecture in obsolescence with an after life.

Each species of Subtraction presents different techniques, motives and results. The process of subtraction can be categorized into three main types: destruction, demolition, and creative subtraction. A destructive process, such as implosive demolition, aims to create absolute erasure within a short period of time. The Demolition process proposes a set of pre-planned procedures that can be applied to multiple building types. Creative Subtraction generates events, that can produce a second or third conceptual framework for a building’s performance after that of its intended usage.

Nelson Goodman’s idea of allographic art is introduced in this thesis as a media of design for the subtraction procedure. Through annotated drawing sets this thesis will create pre-planned procedures that specifically instruct a transformation process for a building’s after life.
**Topic of Research**

**Subtraction:** is a primary activity in the ecology of building and making space -- a capacity that all buildings possess. It is also a procedure that cause the metamorphosis of a building.

**Creative destruction:** is a phrase first brought up by Joseph Schumpeter as a response to Marx’s idea of economics. According to Schumpeter, creative destruction describes the “process of industrial mutation that incessantly revolutionizes the economic structure from within, constantly destroying the old one, constantly creating a new one.

**Tabula Rasa:** is a Latin phrase often translated as “blank slate” in English and originates from the Roman tabula or wax tablet used for notes, which was blanked by heating the wax and then smoothing it. Keller Easterling has noted: tabula rasa is the mode of subtraction most compatible with architectural desire.

**Metamorphosis:** a change of the form or nature of a thing or person into a completely different one, by natural or supernatural means. Metamorphosis can also be described as an evolvement of an element from one to another.

**Event:** a thing that happens, especially one of importance. According to Bernard Tschumi: “there is no space without event, no architecture without program. Architecture’s social relevance and formal invention can not be dissociated from events that happen in it.”

**Planned obsolescence:** in industrial design is a policy of planning or designing a product with an artificially limited useful life, so it will become obsolete, that is, unfashionable or no longer functional after a certain period of time.

**Entropy:** “a closed system which eventually deteriorates and starts to break apart and there’s no way that you can really piece it back together again.”
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Life Span of Architecture
Do Things Have an End?

This book will begin by asking the question of “do buildings have an end”? The current demolition phenomenon in architecture seems to suggest a finite termination for buildings. However works of Gordon Matta Clark may suggest a different alternative to the life cycle of buildings in obsolescence. A dialogue between Robert Smithson’s theory of enotropy and Gordan Matta Clark’s projection of Metamorphosis may provide a resolution for the question.
Image of Partially Buried Wood Shed From Robert Smithson Website

Images of Hotel Palenque From Robert Smithson Website
Entropy

Entropy in Science
The Second Law of Thermodynamics states that all things tend towards increased entropy – that is to say, over time everything will get more and more jumbled up, chaotic and random. Something very structured like Humpty Dumpty is said to have low entropy, thus when he falls off the wall and gets all splattered about his entropy increases. Cool

Robert Smithson
Smithson is an entropoligist whose works are based on a sense of irreversibility and the dissolution of things. Smithson’s work questions the limitation and the life span of objects and architecture. To Smithson entropy is “a closed system which eventually deteriorates and starts to break apart and there’s no way that you can really piece it back together again.” Smithson uses properties of entropy as a tool to test out and push for a the death of architecture. To Smithson, anything that are contained by this world has a linear life span. Things have a beginning, the birth, and things have an end, the death.

Partially Buried Woodshed
This work is practiced on a woodshed in Ohio. The work was constituted by him ordering a bulldozer, and burying the woodshed with mounds of earth, until the moment when the central beam of the shed had cracked. This can be regarded as the point at which the structure had disintegrated, which was the defining moment when the work was complete.

Hotel Palenque
Smithson had been invited to Yucatan perhaps with the expectation that he would make a work about the mine ruins there, since his interest in the ruins was well documented. But he actually made his work about the Hotel Palenque, the hotel where he was staying, which fascinated him because it seemed to him the embodiment of entropy. The hotel was still being built at one end, and yet was already dissolving, being encroached by nature, and crumbling at the other end; a perfect juxtaposition of construction and deconstruction, or of form and decomposition.
Study for “Office Baroque” by Gordon Matta-Clark, Guggenheim Collection
Gordon Matta Clark

**After for Buildings**
Works of Gordon Matta Clark are infused with understanding of process resulting in the increase of entropy. His operation on buildings explores the structure and does not allow the structure to pass beyond the point of irreversibility.

“Matta-Clark was obsessed with producing spatial shortcuts, seeking the simplest way to create complexity...without having to make or build anything”. He aims to recreate events, space and effects for buildings that are slated to be demolished. Clark’s work are sometimes seen as a social revolution, however most importantly his work completes the metamorphosis of a building’s transformation from death to rebirth.

**The Split**
The line that he cut through the abandoned house in Edgewood, New Jersey, produced a continuous ribbon of light through interior rooms and destabilized the image of suburban domesticity on the exterior. The project split utilizes a few minimalistic act of subtraction to achieve the metamorphosis from a building’s obsolescence to a work of art to exhibit.

**Conical Intersect**
His telescopic cone in Conical Intersect sliced multiple interior walls into one shape and pointed the eye towards the Pompidou Center rising beyond, collapsing old and new construction. Clark seeks for the simplest way to create complexity, and transforms values of architecture with a process of subtraction instead of addition.
Taking Benard Tschumi’s theory of events and spaces, these set of diagrams aims to dissect Gordon Matta Clark’s splitting as an event of subtraction for space making. Instead of creating the narrative of event with movements of the inhabitant, this thesis proposes the methods and process of subtraction as the subject of event.
The Split
The construction and demolition of a building can viewed as two sides of one process. This chapter uses ideologies behind “Things come part” by McLellan and “911 St Cyril” by Dan Haffman, to dissect the correlations between assembly, disassembly, and repair.
YOUR STUFF IS DESIGNED TO BREAK DOWN!!

Images From Google Search
Planned Obsolescence

The concept of “planned obsolescence” is not a new one: Its coinage goes all the way back to 1932, when it was used to identify a simple scheme by which the government would impose a limited shelf life on products in an attempt to help the world emerge from the Great Depression.

The term re-emerged in 1954, when industrial designer Brooks Stevens—who, among many other things, designed the famous Oscar Mayer Wienermobile—used it to refer to the practice of continuously improving and reinventing products in an attempt to influence consumers into replacing their purchases more often.

Job’s take on planned obsolescence is a fundamental force in modern economies, and has been adopted by pretty much every manufacturer—including, of course, Apple; it’s the reason why the iPhone is on a two-year release cycle, with major cosmetic differences in the handset’s design between each iteration and the next. In the end, it’s an attempt to thwart market saturation and convince existing customers to replace their hardware on a regular basis.

iPhone several times in the last couple years, notably by New York Times columnist Catherine Rampell, who calls it “The Apple Trap.”
Bike Disassembly From *Things Come Apart* by Todd Mclellan.
Things Come Apart

General Theory
In Things Come Apart, McLellan exposes the inner working of 50 objects and 21,959 individual components as he reflects on the permanence of vintage machines built several decades ago—sturdy gadgets meant to be broken and repaired—versus today’s manufacturing trend of limited use followed by quick obsolescence.

Captured in figure 5.1 are myriad parts laid flat and organized by function, creating recontextualized images of a bike. Figure 5-2 is a high-speed photo of carefully orchestrated drops where pieces are shot in midair as they come crashing down. These two images can be viewed as separate artifacts that presents two methods of deconstruction, or they can be viewed as two frozen moments in a designed disassembly procedure.

Reuse Value:
McLellan views things come apart as a critique of construction and manufacturing process of the 1900s. These products are produced to be repaired instead of replaced. The reuse value of these things, not only depends on the quality of manufacture, but also the procedure of assembly. If repaired can be per-planned with a designed construction process, then can obsolescence be predicted the same way?

Disassembly vs Assembly
Disassembly and assembly can be viewed as two sides of the same process. The tearing down informs the engineer of assembly. For instance, polymers and alloys are being developed so that, when cooled, they harden and fasten together an assembly. When reheated the material liquefies and became easily removed from component.
De-constructed Parts of A Film Camera From Things Come Apart by Todd Mclellan.
De-constructed Parts of A Film Camera From *Things Come Apart* by Todd Mclellan.
Images From Enduring Innocence By Kelly Easterling
**Haffman’s theory**
The architects dismantled the house by carefully undoing the work each trade in reverse order. As Dan Hoffman describes: “The piles of material were weighted against the body of memories that once made the house a home. The erasure of the evidence of this memory was the subject of this work.”

**911 St Cyril**
After purchasing the house on St. Cyril for a dollar, he meticulously disassembled, sorted, and inventoried its component parts, writing that it was the “reversal, or unmaking of the assumptions of architectural practice” that were important to the project.

For the group project “9119 St. Cyril,” students meticulously dismantled a house in Detroit, and its component parts, including building materials and even old photographs and letters, became a gallery exhibit; James Cathcart’s “Virtual Opticon” examines the unresolved differences between ideal architectural representations and actual human vision.

**Schedules**
In addition, schedules and specs are created for the deconstruction of 911 St Cyril, just as schedules created for construction drawing sets. This experiment not only proved that demolition is a construction in reverse, but also presents the reuse values of waste building materials.
The Economics of Construction and Destruction

This book will begin with the devices that are used in the process of demolition. Demolition had been interpreted as a preface of architectural design. These devices are not considered as a tool for design. The devices of demolition have changed significantly as the technologies of machines advances and the scale of construction expand. Various devices of demolition sets out different procedures for the process of demolition. Each device has several specific building types to act upon. Each device has hazards and advantages that creates an unique narrative for the demolition process. The four main type of demolition device introduced here are: hand/tools, Upper Armer, Wrecking balls, Implosives and cables.
Devices of Demolition

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Figure 1.1 Images via Dayton In Manhattan of 1850s Building Demolition in Manhattan
Figure 1.2 Tiling method of Hand Demolition in South America
Hand Demolition

Hand demolition is not a quick method, because only hand tools are used. However, cranes and shear legs may be used to hold or lower beams during cutting. Chutes, or crane-and-skip are usually used to get debris safely from the upper stories to the ground.

Demolish only one story at a time. It is usually safest to demolish the building in the reverse order to building it, so the roof should go first. Next, part of each floor is taken out so that the debris can fall through.

Debris must be removed regularly and not allowed to pile up on floors. An overloaded floor could collapse onto the floor below, which in turn, could collapse on the floor below it. Without propping from the floors, the walls of the building could collapse. Walls could also collapse if debris is piled against them.

**Time Frame:**
slow
usually the time frame of construction process

**Hazards:**
low damage level to surroundings and workers

**Advantages:**
low damage
high material reuse value

**Suitable Building type:**
Housing
two to three story buildings
Figure 2.1 Google Image Wrecking ball demolition of Rockwell Gardens
Figure 2.2 Demolition photograph of Fouts Field in Denton from Denton Chronical
Wrecking Ball Demolition

Most structures can be demolished by balling. The Wrecking ball is a tool that are very commonly used for buildings which suffers structural decay and deficiency. This technique was invented by Henry Bath and Co in 1888 during the demolition process of SS Great Eastern building.

Balling is a viable and effective method of demolition when demolishing multi-story structures that have suffered structural damage, where all other methods have been considered, and a hazard assessment has determined that this method is the most appropriate.

Balling is hard on the machine: not all cranes can swing and control a demolition ball safely. Converted drag lines are the best machines for this work as they are robust and stable. Cranes with hydraulic rams must not be used for balling.

**Time Frame:**
Fairly quick, A month for a three story building

**Hazards:**
Noise, Dust, Vibration to adjoining structures/building, Flying debris, Uncontrolled unintentional collapse, Limited waste minimization.

**Advantages:**
Strong force

**Suitable Building type:**
Multi-story buildings with initial decay or deficiency
Figure 3.1 Upper armer operation
Figure 3.2 High reach Excavator
Upper Armer Demolition

Hydraulically-operated excavators and loaders can be fitted with various attachments for demolition work. Excavator buckets, boom-mounted hydraulic percussion breakers and pusher arm equipment have been successfully used with these machines.

**Normal Excavators**
The main advantages of such machines are that they are extremely mobile, have a high output, and are able to work on vertical faces and floors above standing level. Their disadvantages are that the machines need adequate access, a firm and relatively flat base to work from, and can only work within the reach of their booms. To operate these machines efficiently, the length of boom when fully extended should be at least 1.5 metres above the height of the building being demolished.

**The High-reach Excavators**
A high-reach excavator is defined as one that has a particularly long boom, allowing controlled deconstruction of multi-story or high structures to a safe height where conventional excavators can continue. Boom lengths can vary in size from 19 to over 50 meters and come with a variety of specialist attachments to allow the operator precision and accuracy during the demolition process.

**Time Frame:** Fairly quick, Similar speed as wrecking ball demolition

**Hazards:** Dust, Flying debris, machine height limitation, Limited waste minimization, debris accumulation, transferring debris off site

**Advantages:** easy to operate, fairly quick, less labor needed

**Suitable Building type:** large buildings on confined sites,
Figure 4.1 Implosive Demolition
Figure 4.2 Wire Rope Pulling Demolition
Forced Collapse

Implosive Demolition
Implosion or explosion deconstruction is an effective and efficient method of deconstruction, and can reduce both cost and time to bring dangerous multi-storey structures to ground in comparison to conventional demolition methods. This method was first used on demolition of Pruit Ilgeo residential complex. The CDI is an institution that specializes on implosive demolition and claims it is the “art of demolition”

Time Frame: Very Quick, collapse happen over the course of a few minutes to one hour.

Hazards: Noise, Flying debris, explosive chemicals, potential damage to neighboring buildings, debris accumulation, transferring debris off site

Advantages: Very quick, very little labor force, less costly

Suitable Building type: large buildings and infrastructures on confined sites

Wire Rope Pulling
This method is a form of deliberate collapse. Cables and wire ropes are fixed to key structural members, then pulled down by tractors or winches. It is suitable for detached buildings where there is plenty of surrounding room. The method can be used for timber-framed buildings, bridges, brick, masonry or steel chimneys, and for spires and masts.

Suitable Building type: large buildings and infrastructures on confined sites
Event of Subtraction
Art of Assembly and Disassembly

The construction and demolition of a building can viewed as two sides of one process. This chapter uses ideologies behind “Things come part” by McLellan and “911 St Cyril” by Dan Haffman, to dissect the correlations between assembly, disassembly, and repair.
Images from Manhattan Transcript by Benard Tschumi
Event of Subtraction:

“There is no space without event, no architecture without program.”

architecture’s social relevance and formal invention can not be disassociated from events that happen in it.
Tschumi critiques: 1970’s exacerbation of stylistic concerns at the expense of programmatic one and a reduction of architecture as a form of knowledge to architecture as knowledge of form.
history had became a recordance of style
the focus on form had lead to developer in planning large buildings, encouraging many architects to become mere decorators. and on the other, the tendency of many architectural critics to concentrate on surface readings, signs, metaphors, and other modes of presentation, often the exclusion of spatial or programmatic concerns.

Exploration of formal elaboration of spaces and the invention of programs, between the abstraction of architecture though and the representation of events.
architecture is a place that confronts space and action
The notion of photography and representation: “Any new attitude to architecture had to question its mode of representation.”
Transforming words and theory into space, form and event
“words and spaces, these events underlined the importance of a certain kind of relationship between abstraction and narrative-- a complex juxtaposition of abstract concepts and immediate experiences, contradictions, superimpositions of mutually exclusive sensibilities. “ the unfolding events in a literary context inevitably suggested parallels to the unfolding of events in architecture
Tschumi’s research is an exploration of the disjunction between expected form and expected use.
Destruction: Erasure of Information

**Destruction:** the action or process of causing so much damage to something that it no longer exists or cannot be repaired.

Destruction has an inherit connotation of damage and erasure. The destruction of a building aims to erase every trace mark of the building and provide blankness for latter buildings to occupy. Some of these destructive methods of erasure are carried out in the form of implosion.

The CDI or Controlled Demolition Inc was established in the 1950s for its great invention of demolition method of Pruitt Ilgeo. The Loizeaux family, founders of CDI, claims this explosive demolition methods has “saved property owners and contractors hundreds of millions of dollars worldwide.”

That leadership and unparalleled experience gives CDI clients access to a full range of services and capabilities through a global network of offices and agents, all dedicated to the precision application of our technology.

And behind each successful project stands the CDI team - a talent-ed group of professionals with decades of experience dedicated to absolute perfection on each new project.
Demolition:
Standardized Process of Demolition

A high-rise construction boom in Japan during the 1960s and 1970s has resulted in a large amount of aging towers. Building owners have an interest in demolishing the old structures to replace them with more modern, safe, and work-friendly buildings, but there are several issues to address in this process.

The work is being carried out by a joint venture between Taisei Corporation and Seibu Construction using the ‘Taisei Ecological Reproduction System’ (Teco-Rep System). By installing scaffolding that conceals the roof and mimics the windows of the existing building, the demolition site is less conspicuous, thus preserving the image of the hotel as it gradually shrinks.

Suspended scaffolding around the exterior was first set up to install the soundproofing panels, and a cover was placed over the top of the building to prevent dust from escaping. The 1,500 ton scaffolding and temporary rooftop is supported by 15 20m-long temporary pillars.

By keeping a cover over the top of the building, noise is reduced by 15 decibels, and dust dispersal is reduced by 90%.

The removal of the interiors, along with asbestos, began in June 2012, and scaffolding went up in August. It takes approximately 10 days to demolish 2 floor
Subtraction
DESTRUCTION WEARS A CAP

As the Alaska Prince Hotel is being demolished, the work is hidden from view by a scaffold that helps from the roof. The structure is supported by 13 temporary columns and is lowered by computer-controlled jacks.

The SCAFFOLD is a lightweight structure and is covered with panels that mimic the facade so the building looks normal.

STRAND JACK - Each temporary column has a strand jack.

The strand jack works by gripping and ungrasping cables that run through it. This allows both the columns and the jack itself to move.

The SCAFFOLD is a lightweight structure and is covered with panels that mimic the facade so the building looks normal.

UPPER SUPPORT: move with the jack and brace the columns as the cap is lowered.

CRANES generate electricity for the lighting as debris is lowered.

DESTRUCTION and other heavy equipment cut steel and break up concrete.

Diagram by Fujimoto Cooperation
Diagram by Fujimoto Cooperation
Photography From New York Times
Subtraction
PROCEEDURE/EVENT

EFFECT

SPACE
conical intersect Photography from Gordaon Matta Clark
In architecture and urbanism, the uprising revealed new agencies of power in the users of buildings and the everyday inhabitants of the city. It also challenged conventional assumptions about the relation of program and building form; students turned streets into battlegrounds, university buildings into shanty towns, and street corners into parks, leading architects such as Bernard Tschumi to propose “dis-programming” and for Rem Koolhaas to state in his competition entry for Parc la Villette: “Finally, we insist that at no time have we presumed to have produced a designed landscape. We have confined ourselves to devising a framework capable of absorbing an endless series of further meanings, extensions, or intentions, without entailing compromises, redundancies or contradictions.” (xxi) (Fig. 38) 38. OMA’s 1982 entry for the Parc La Villete competition was a framework, not a designed landscape 39. The 1970 master plan abandoned the formalism of the 1964 plan 37. The events of May, 1968, temporarily shifted the power relationships in the city, and changed the perceived relationship between program and building form THE Evolution of open systems Since the 1970’s: The Field Condition A quarter-century later, the new design philosophy embodied in the 1972 plan for La Défense, and in iconic work by Bernard Tschumi and Rem Koolhaas such as Parc la Villette and Euralille, found its theoretical manifestation in a 1999 text by Stan Allen. “Infrastructural Urbanism,” is, as Allen says in an article of the same name, “the production of directed fields in which program, event and activity can play themselves out.” It is part of material practice, which is “concerned with the large-scale behavior of large-scale assemblages over time, less concerned with what things look like and more concerned with what they can do.” (xxii)
Cronocaos of Preservation
Skyscrapers in Obsolescence

The construction and demolition of a building can viewed as two sides of one process. This chapter uses ideologies behind “Things come part” by McLellan and “911 St Cyril” by Dan Haffman, to dissect the correlations between assembly, disassembly, and repair.
The exhibition by OMA at 2010 Venice biennale is titled Cronocaos. Cronocaos shows “the wrenching simultaneity of preservation and destruction that is destroying any sense of a linear evolution of time. Through 60 historical sites around the world the exhibition shows “the current moment has no idea how to negotiate the coexistence of radical change and radical stasis that is our future. The current definition and regulations of demolition and preservation are critically challenged by Rem Koolhaas. The regime on the correlation between preservation and demolition is a key factor in the selection of skyscrapers as the typology for the actualization of subtractive acts.

Demolition is not merely an act of erasure of a building, however it is also an erasure of a building typology. Pruitt Igoe was slated for demolition in 1972. The event broadcasted on television was the demolition of a dysfunctional residential building as well as the destruction of a modernist ideology and typology.
Ghostscrapers

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Kowloon Walled City

Kowloon is a legal and social anomaly found just outside the city limits of Hong Kong, China. The original 6 acre plot of land was established in the year 960 by the Song Dynasty to be used as an outpost to regulate the trade of salt.

With little to no government enforcement from either Great Britain or China, the walled city became a refuge for those who wished to live outside the law. The city became a haven for crime and drugs, and by 1959 Kowloon was almost completely governed by the organized crime ring known as the Triads. The Triads had complete control of all the brothels, drug dens, and gambling operations inside Kowloon. Using the profits of such businesses, construction took off in the 1960s and 1970s to expand to new enterprises. By the early

The architecture of the city itself during this time is what gave it the name the City of Darkness. The buildings could not expand outward past the natural wall borders, so the new construction was built upwards. The buildings themselves were not to exceed 14 stories so that planes could land at the Hong Kong airport, less than a mile away. A labyrinth of 250 sq. ft. apartments and 10x10 rooms used for businesses went up, one on top of the other, until natural sunlight was seen no more. Fluorescent lighting and fans were found throughout the structure to try to compensate for the lack of fresh air and sunlight.
The street-level shops were a mix of unlicensed dealers and doctors, market stalls and cafes that often included dog on the menu. Fish balls, barbecue and moist meat and other foodstuffs were manufactured in premises with little or no sanitation.

Residents carried umbrellas to shield themselves from constantly dripping water pipes above the narrow alleys.

Authorities installed eight fire escape standpipes—one inside the city and the other outside its perimeter.

From fortress to park
The Walled City underwent a dramatic transformation in the final decades of the 20th century.

Population den
per square kilometre
KWC
1,620,000

Without municipal services, there was no rubbish collection. Old television sets, broken furniture, discarded mattresses, and other bulky items were hauled to the roof and abandoned.

Other rooftops were used for exercise, playground, relaxing and even piggery taking.
The construction and demolition of a building can viewed as two sides of one process. This chapter uses ideologies behind “Things come part” by McLellan and “911 St Cyril” by Dan Haffman, to dissect the correlations between assembly, disassembly, and repair.
For the past eight years, the Tower of David – a half-built skyscraper in downtown Caracas – has been home to thousands of squatters who transformed the abandoned block into a vertical slum complete with grocery shops, tattoo parlours, internet cafes and a hair salon.

This week, however, looks like the beginning of the end for the ramshackle community, as city authorities started to move the first of the tower’s inhabitants to a new social housing complex in Ciudad Zamora, more than an hour’s drive from the Venezuelan capital.

The relocation comes after three months of negotiations between government officials and representatives from the tower, and will entail moving the inhabitants out three floors at a time until the 27 inhabited storeys of the 52-storey skyscraper are emptied out.
A-7: Host of Subtraction

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Mosque Ibrahim Ibn Abdul Aziz Al-Brahim

Commercial Center

Mercantil Bank

BBVA Provincial Bank

Avila Commercial Center

Exterior Bank

Parque Central

Comptoller

Fondo Comun Bank

Torre David

Sambil Commercial Center

Experimental School

UEN

Merceantil Bank

Dr. JM Children Hospital

Caracas Electrical Center

BBVA Provincial Bank

Religious Government Banks Commercial Health Residential
A high-rise construction boom in Japan during the 1960s and 1970s has resulted in a large amount of aging towers. Building owners have an interest in demolishing the old structures to replace them with more modern, safe, and work-friendly buildings, but there are several issues to address in this process.

The Kajima "Cut and Take Down Method" was developed to satisfy both safety and environmental concerns. In April 2007, Kajima started to develop this new demolition method to demolish its aging office headquarters buildings, which were 76 meters tall and 65 meters tall.

Buildings are usually demolished by placing heavy equipment and workers on the top floor and then lowering the waste material down to ground level. The "Cut and Take Down Method" alternatively allows the workers to start at the base and work their way up. By starting at the bottom, gutting one floor, and then lowering the entire building on jacks one floor at a time, all work can be performed safely at ground level.

On the 85 by 60 meter site, the two towers were situated quite close to another office building and a residential building, emphasizing the need for a clean, quiet demolition process. To accomplish this, temporary columns are used around the structural column grid, the existing columns are replaced, and then hydraulic jacks are placed where the existing columns were and the building can be lowered to the next floor plate where the process is repeated.

The hydraulic jacks each had a capacity of 1,200 tons, and supported the structure through each cycle of lowering. A cycle would lower the whole building by 675 mm, which meant that five cycles were required for each floor (total of 3.375 meters). The total time to demolish a whole floor was six days: 2.5 days for lowering and the remaining time to demolish the rest of the structure.
For the past eight years, the Tower of David – a half-built skyscraper in downtown Caracas – has been home to thousands of squatters who transformed the abandoned block into a vertical slum complete with grocery shops, tattoo parlours, internet cafes and a hair salon.

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Subtraction
Imgest from Urban Think Tank
Electricity Distribution

1. Building Breakers
2. Floor Breakers
3. Apartment Breakers
4. Consumption Board
5. City Electrical Grid
Subtraction

Subtraction

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Water Distribution

1. Main Water Tank
2. Water Pumps
3. Apartment Tanks
4. City Water Main
Images From Urban Think Tank
A-8:
Subtraction To Absorb
Formal Strategy of Experiment

The construction and demolition of a building can viewed as two sides of one process. This chapter uses ideologies behind “Things come part” by McLellan and “911 St Cyril” by Dan Haffman, to dissect the correlations between assembly, disassembly, and repair.
**Micheal Asher**

One of Michael Asher intervention of the Claire Copley Gallery in Los Angeles slightly demonstrates preservation of architecture with subtraction. In 1974 Asher simply demolished a wall between the gallery space and the administrative office, making the scene of working employees as the merely content of display. The re-purpose or the reprogram of a building can be achieved with re-imagination of a new program, yet it can also be accomplished by adaptation of an adjacent program. The absorption of one space by another can be achieved with the act of removal of structure, division and partitions. Subtraction can also create void and more spacious space for places that are too dense or claustrphobic.

**Application**

This strategy can be applied to claustrphobic spaces that are organic formed. Instead of completely demolish or erase places like the Kowloon walled city, we can apply regulation with phased subtraction. The dense clustered city host many programs in
Subtraction
Bibliography

Books


Web Sources


