

# The Arctic Building



Figure 1: Aerial photo of the Arctic Building from the Southwest. Credit: City of Seattle Archives, SPU Fleets and Facilities Department "Imagebank" Collection. Item No: 120399



Figure 2: The Third Ave and Cherry Street corner of the Arctic Building. Credit: Brian Rich, 2013

- **Designed and built in 1917**
- **Originally the home of the Arctic Club**
- **Finest example of a multi-colored matte glazed decorative terra-cotta building in the Northwest**
- **Original use as offices for the Club, leasable offices, private rooms, and flexibility for the tenants**
- **Adaptively used through the mid-20<sup>th</sup> century as offices for the City of Seattle**
- **Sold to the City of Seattle in 1988**

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- Walrus heads decorate the Third Floor frieze
- Walrus tusks held in place with mild steel reinforcement
- Corrosion of the steel led to failure of the tusks in the 1970's and early 1980's

Figure 3: A walrus head at the Arctic Building, Seattle, WA. Credit: Brian Rich, 2013

# The Arctic Building

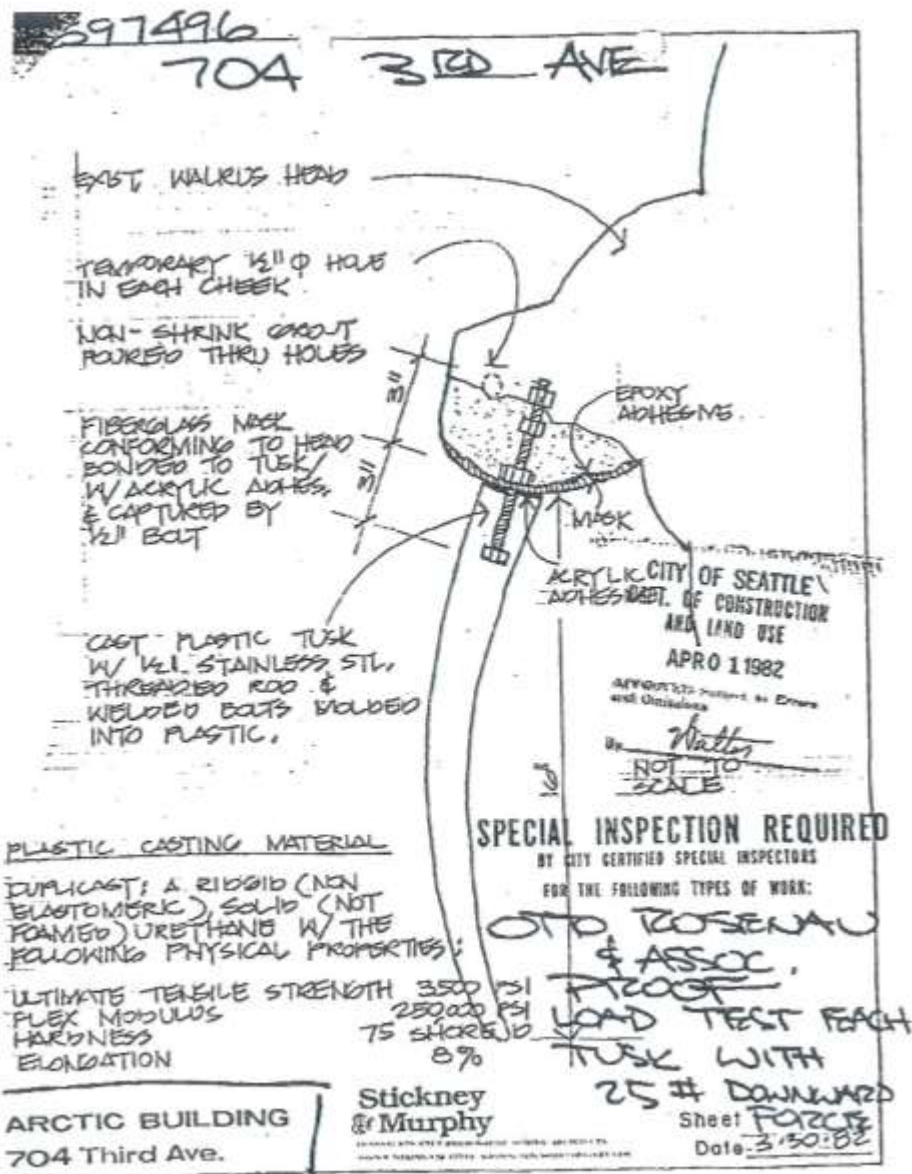


Fig. 2 - Tusk installation detail from 1982.

- Initial repairs sought to replace all of the terra cotta tusks
- New tusks were anchored into place with stainless steel threaded rods and a gypsum/Portland cement grout mix that filled the cavities of the terra cotta head
- Cracking appeared almost immediately....

Figure 2: Repair detail for the walrus tusks at the Arctic Building. Image obtained from the files of the City of Seattle Landmarks. Original Detail by Stickney Murphy Architects.

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- A 1995 investigation found that the gypsum reacted to water penetration forming ettringate.
- Ettringate expanded uniformly and put pressure on the terra cotta.
- Flaws in the 1982 repair also included drilling the grout hole on top of the head rather than on the vertical face of the snout

Figure 2: Fractured terra cotta walrus head. Note the degree to which the grout fills the terra cotta void. Credit: Wiss, Janney, Elstner, 1995

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- 15 of the 27 walrus heads were replicated and replaced
- 7 additional heads were anchored together using helical pins
- Terra cotta repairs were crucial to maintaining the building envelope and historic appeal of the building for future investors
- The building was eventually sold to private investors and converted to a boutique hotel

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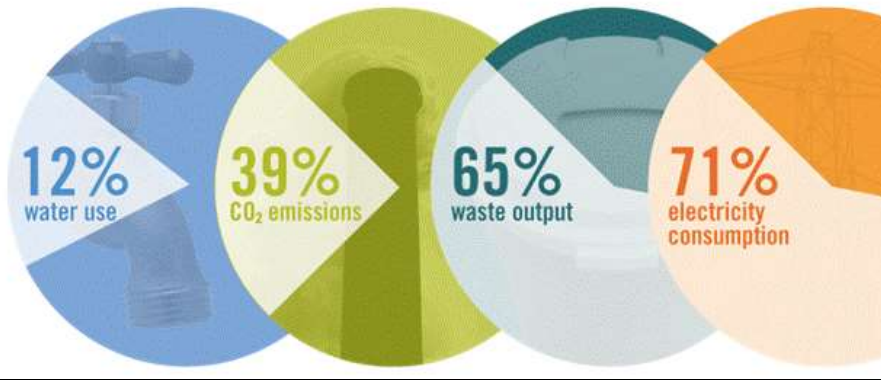


Figure 5: Environmental impacts of buildings on the environment. (Western Village)

# The Problem

- Existing Building stock = most valuable human asset
- Buildings consume vast amounts of earth's resources
- New construction is worse for the environment than adaptive re-use, renovation, or preservation of existing buildings

This study finds that it takes between 10 to 80 years for a new building that is 50 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to the construction process. This table illustrates the numbers of years required for new, energy efficient new buildings to overcome impacts.

Building Type	Chicago	Portland
Urban Village Mixed Use	42 years	80 years
Single-Family Residential	38 years	50 years
Commercial Office	25 years	42 years
Warehouse-to-Office Conversion	12 years	19 years
Multifamily Residential	16 years	20 years
Elementary School	10 years	16 years
Warehouse-to-Residential Conversion*	Never	Never

Figure 6: Years Of Carbon Equivalency For Existing Building Reuse Versus New Construction. (Frey)

# Future-Proof – The Concept



**Future-proofing:** The process of anticipating the future and developing methods of minimizing the effects of shocks and stresses of future events.

Figure 14: The Belvedere Castle by Calvert Vaux, 1869. Central Park, New York City, NY. Credit: Brian Rich, 2013

# Future-Proofing is....



## Real Estate - Obsolescence:

- Physical, Functional, Aesthetic, Sustainable?

## Utility Systems:

- Forward planning for increased demands

## Climate Change:

- ability to withstand impacts from future shortages in energy and resources, increasing world population, and environmental issues

## Electronics:

- “flexible distribution systems”
- Telecommunications: system designers focus heavily on the ability of a system to be reused and to be flexible
- Teleradiology: open modular architecture and interoperability

## Industrial Design:

- Characteristics include: a timeless nature, high durability, aesthetic appearances that capture and hold the interest of buyers

Figure 2: The collapsed I-5 bridge at the Skagit River was “functionally obsolete.” Credit: [http://en.wikipedia.org/wiki/File:05-23-13\\_Skagit\\_Bridge\\_Collapse.jpg](http://en.wikipedia.org/wiki/File:05-23-13_Skagit_Bridge_Collapse.jpg)



# Resiliency is....

MAFF laboratories at York, England were described in an article as “future-proof” by being flexible enough to adapt to developing rather than static scientific research

A *resilient* built environment includes:

- Local materials, parts and labor
- Low energy input
- High capacity for future flexibility and adaptability of use
- High durability and redundancy of building systems
- Environmentally responsive design
- Sensitivity and responsiveness to changes in constituent parts and environment
- High level of diversity in component systems and features



Figure 11: The resilient culture of South East Asia: Rain inundates the area and it is used to their benefit. Credit: <http://blog.cifor.org>

# Historic Structures



Careful consideration of how interventions affect historic buildings - do no harm to the historic fabric

Historic buildings are particularly good candidates for future-proofing due to high durability: 50 to 100 year life prior to renovation is typical

On going use of historic buildings has a high degree of sustainability:

- reduces energy consumption
- decreases material waste
- retains embodied energy
- promotes a long term relationship with our built environment

Figure 12: The historic Brooklyn Bridge in New York. Credit: Brian Rich, 2013

# 10 Principles of Future-Proofing Historic Buildings



1. Promote prevention of deterioration of our built environment.
2. Allow understanding of the built environment and its place in our heritage.
3. Stimulate flexibility and adaptability of our built environment and our attitudes toward it
4. Extend service life of our built environment
5. Fortify our built environment against climate change, extreme weather and shortages of materials and energy
6. Increase durability and redundancy of our built environment
7. Reduce the likelihood of obsolescence
8. Consider long term life-cycle benefits of interventions in our built environment
9. Incorporate non-toxic, renewable, local materials, parts and labor into our built environment
10. Comply with applicable cultural heritage policy documents

Figure 13: The sarsen trilithons of Stonehenge (ca. 2500 BC): A Future-Proof structure? Credit: <http://hdw.eweb4.com>

End

**Thanks!**