

SUSTAINABLE DEVELOPMENT

**ADAPTIVE
REUSE**

SUSTAINABLE DEVELOPMENT PREMIER ANNUAL SPONSOR



SUSTAINABLE DEVELOPMENT ANNUAL SPONSORS





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Skanska



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GGLO



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Unico Properties



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McKinstry

ADAPTIVE REUSE

Case Studies

04.06.2023

GGLO





COBB BUILDING CONVERSION

PROJECT HIGHLIGHTS

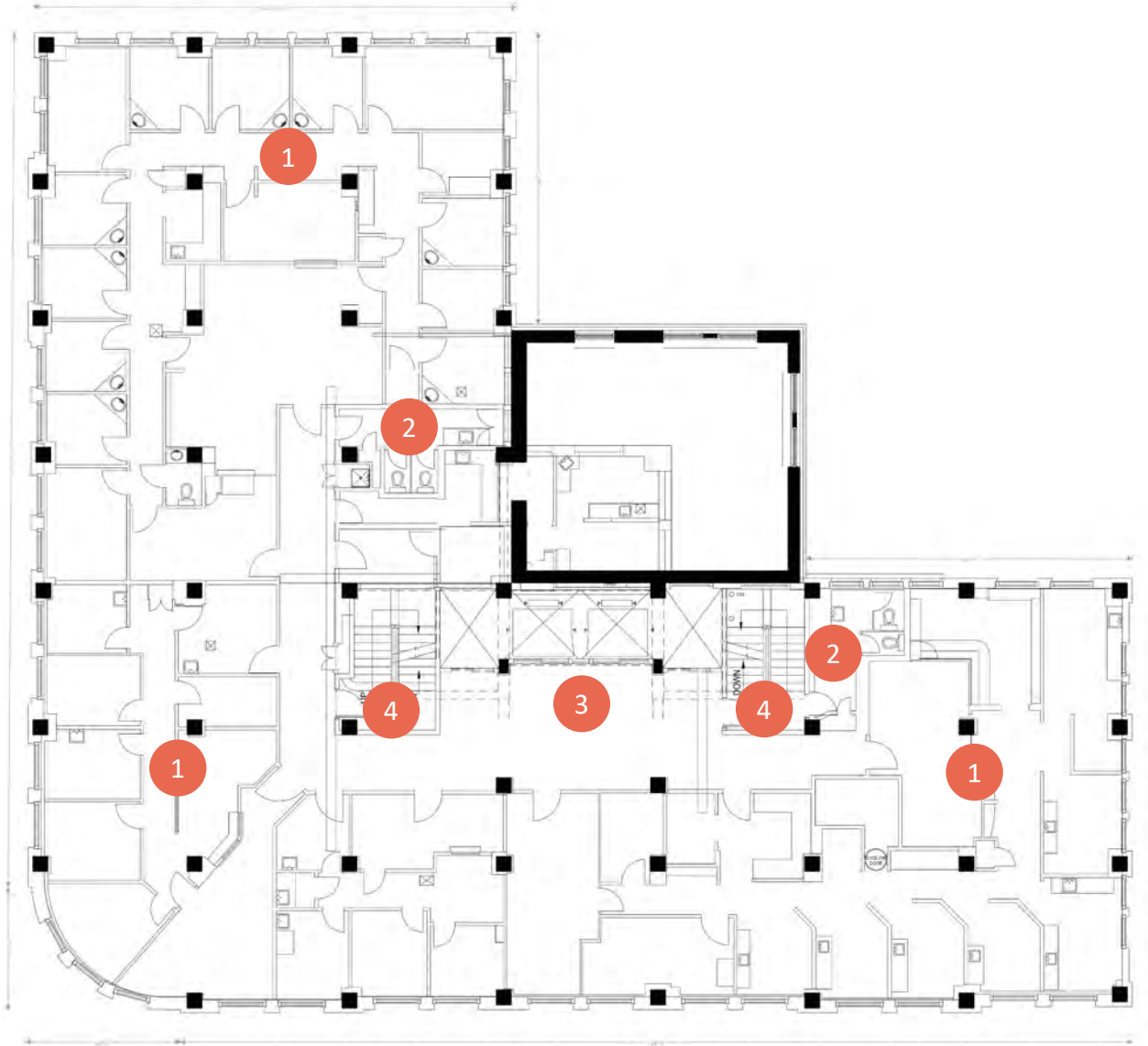
Original Structure (Before)

Property Name	Cobb Building
Submarket	Seattle, Washington
Location	Downtown Office Core
Project Size	130,000 sf Approx.
Year Built	1910
Building Use before Conversion	Commercial Office

Conversion (After)

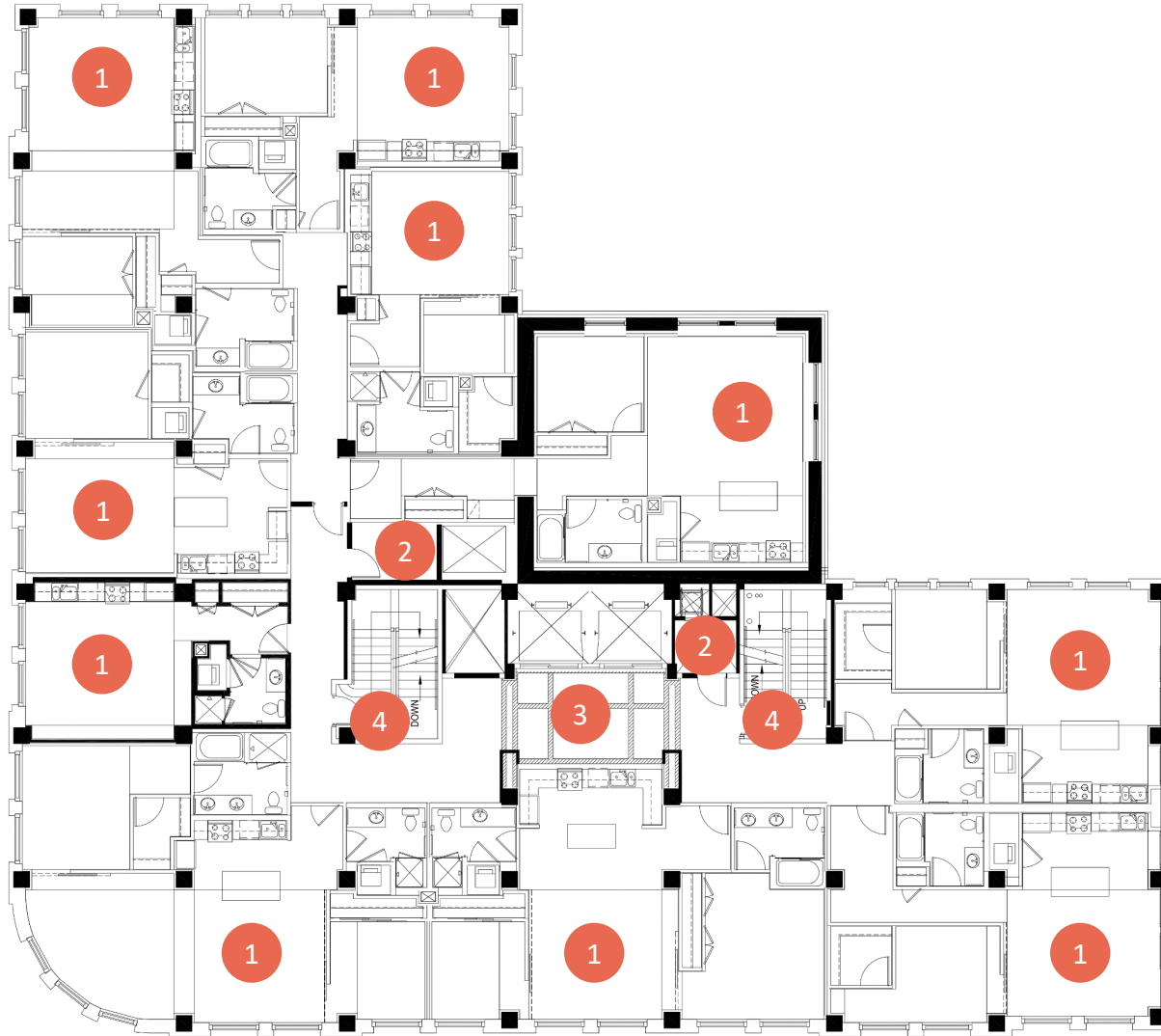
New Type	Multi-family Residential
Project Name	The Cobb Apartments
Status	Complete
Date Opened	2007
# of Units	91 Residential 2 Penthouse
Developer	Unico





Original Building Layout – Level 7

- 1 Office Space | Suite
- 2 Public Restroom
- 3 Elevator Lobby
- 4 Fire | Exit Stair



New Building Layout – Level 7

- 1 Unit
- 2 Building Utility Room | Closet
- 3 Elevator Lobby
- 4 Fire | Exit Stair



Structure

- A narrow floor plate, large operable windows and a prime location in downtown's shopping and cultural district all suggested adaptive reuse to apartments.
- Removeable low-e film was applied to the existing large operable windows to improve thermal performance and comply with state energy code.
- Upgrades to structural elements were made to ensure the building's health and safety.

Systems

- MEP consultant determined a hybrid heat pump system was installed to provide heating and cooling.

Facade

- The bricks and terra-cotta that comprise the historic exterior facade remained untouched during the renovations.

Aesthetics

- Preserving the historical integrity of one of the city's most beautiful landmarks was key.
- Maintained original interior elements – such as the original art deco style elevators.





ALLOY MIDTOWN

PROJECT HIGHLIGHTS

Original Structure (Before)

Property Name	Alloy Midtown
Submarket	Phoenix, AZ
Location	Midtown
Project Size	59,749 sf
Year Built	1986
Building Use before Conversion	Commercial Office

Conversion (After)

New Type	Multi-family Residential
Project Name	Alloy Midtown
Status	Under Construction
Date Opened	Q3 2023
# of Units	57
Developer	Blueprint Capital





Original Building Layout – Level 2

- 1 Office Space | Suite
- 2 Public Restroom
- 3 Elevator Lobby
- 4 Fire | Exit Stair



New Building Layout – Level 2

- 1 Unit
- 2 Building Utility Room | Closet
- 3 Elevator Lobby
- 4 Fire | Exit Stair



Structure

- Steel and concrete building.
- Units are long and narrow due to existing floor plate dimensions.
- Additional elevator was required. Existing elevators did not accommodate gurney requirements and existing location of elevators were not suitable for move-in / move-out access.

Systems

- Existing chillers on roof – initially assumed reuse of water-source VAV's for cooling and conditioning the apartments. Biggest variant is Mechanical and how/if can reuse any of it.

Facade

- Curtain wall façade. Project goal to have a very light touch on the existing façade.
- One panel per unit was removed from the facade to accommodate residential venting and MEP needs.
- Unit layouts aligned with existing curtain wall mullions.
- Change of use forced a change in zoning. Zoning did not allow reflective glass. No exception for existing conditions. A vinyl graphic was required to be applied to the existing curtain wall to eliminate reflectivity.

Aesthetics

- Exposed structure intentionally part of design aesthetic.
- Unique product offering in this market and location.





CHINOOK CENTER

PROJECT HIGHLIGHTS

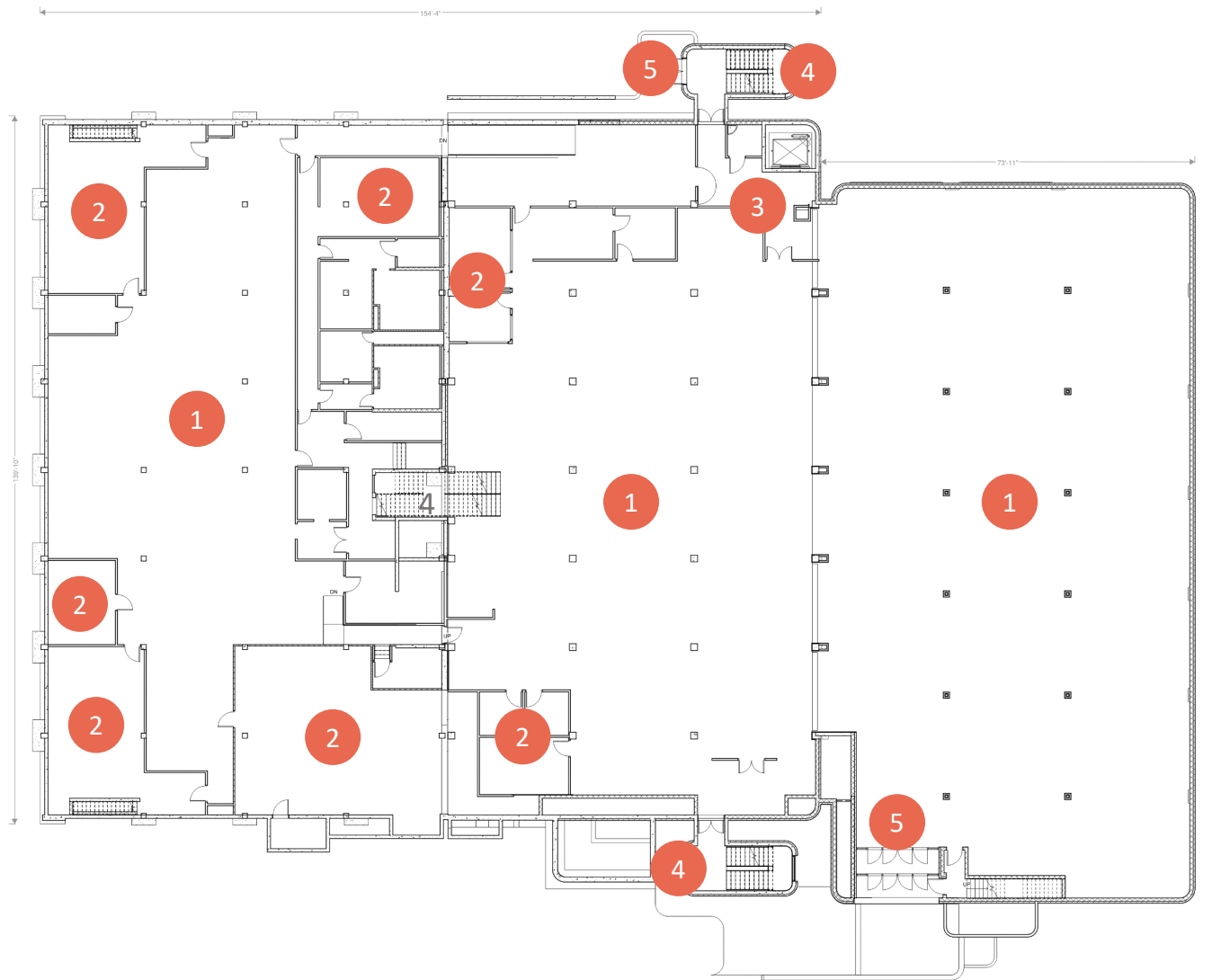
Original Structure (Before)

Property Name	Chinook Center
Submarket	WSU Campus
Location	Pullman, WA
Project Size	69,000 sf
Year Built	1954
Building Use before Conversion	Campus Bookstore

Conversion (After)

New Type	Student Center
Project Name	Chinook Center
Status	Complete
Date Opened	2017
# of Units	N/A
Developer	Washington State University





Original Building Layout – Ground Floor

- 1** Open Retail and Common Space
- 2** BOH | Accessory Space
- 3** Elevator Lobby
- 4** Fire | Exit Stair
- 5** Main Entry Point

A7 GROUND LEVEL FLOOR PLAN - EXISTING
1/8" = 1'-0" PLAN NORTH



New Building Layout – Ground Floor

- 1** Open and Common Space
- 2** Elevator Lobby
- 3** Fire | Exit Stair
- 4** Public Restroom
- 5** Main Entry Point
- 6** Building Utility Room | Closet



Structure

- The design introduced a curved wall, slicing through the entire structure, that splits the building in half, opening the room and allowing daylight to stream into the building center.
- This wall also helped achieve harmony between spaces for quiet study and collaboration spaces.
- Additional site work included demolition, abatement, clearing, mass excavation, landscape, and irrigation.

Systems

- The building significantly reduces indoor water use, lowering its impact on the watershed.

Aesthetics

- Though visually distinct from the former 'Bookie' bookstore, the Chinook Center demonstrates remarkable resiliency of the existing building as it enters its fifth life, while pushing further to integrate itself within WSU's rich campus life.





MONTE CRISTO

PROJECT HIGHLIGHTS

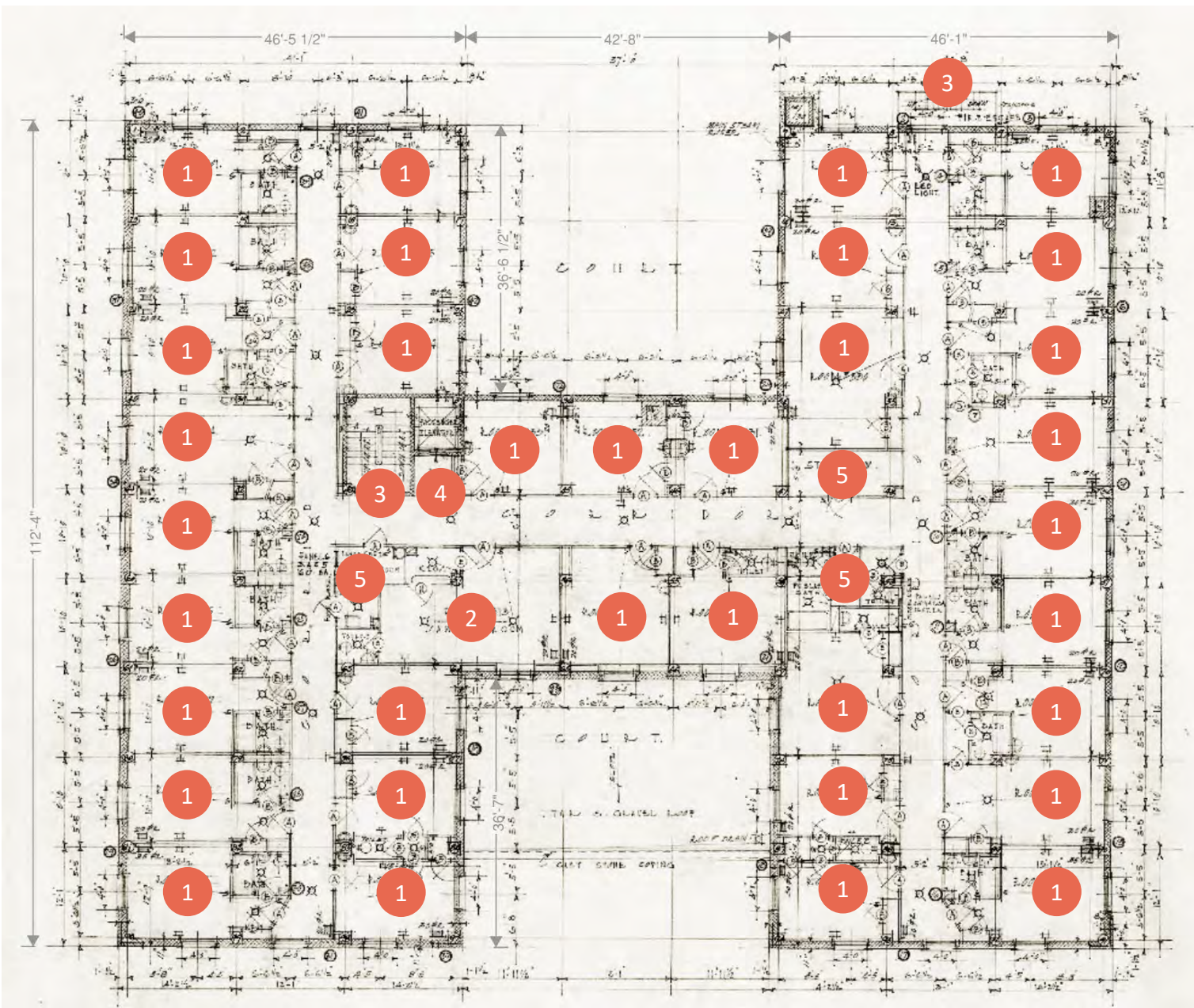
Original Structure (Before)

Property Name	Monte Cristo
Submarket	Hospitality - Hotel
Location	Everett, WA
Project Size	60,000 sf
Year Built	1925
Building Use before Conversion	Hotel

Conversion (After)

New Type	Multi-family Housing (low-income)
Project Name	Monte Cristo
Status	Complete
Date Opened	1994
# of Units	69
Developer	Lojis Corp.





Original Building Layout – Level 3

- 1 Typical Guest Room
- 2 Typical Suite
- 3 Fire | Exit Stair
- 4 Elevator Lobby
- 5 Building Utility Room | Closet



New Building Layout – Level 3

- 1 Unit
- 2 Building Utility Room | Closet
- 3 Elevator Lobby
- 4 Fire | Exit Stair

Structure

- The building was re-roofed, new sidewalks poured, and new interior stairs were built.
- Exterior restoration to preserve the existing façade took place in November of 1993.

Aesthetics

- Great skill was utilized in preserving the historical qualities of the building's exterior and common spaces.

Project Facts

- Hotel opened on May 29, 1925 with 140 rooms, a ballroom and conference room areas.
- It ceased functioning as a hotel in 1972.
- It is currently listed on the National Registry of History Places (June 3, 1976).
- It opened as low-income housing in 1994 following the extensive restoration and redevelopment.
- The site includes community event space and retail spaces on the ground floor.





FRESNO BLACKSTONE

PROJECT HIGHLIGHTS

Original Structure (Before)

Property Name	Fresno Blackstone
Submarket	Retail
Location	Fresno, CA
Project Size	31,900 sf
Year Built	1973
Building Use before Conversion	Toy Store

Conversion (After)

New Type	Multi-family Housing (low-income)
Project Name	Arthur's @ Blackstone
Status	Under Construction
Date Opened	2023
# of Units	69
Developer	Fresno Housing Authority





Original Building Layout – Level 2

- 1 Open Retail Space
- 2 BOH Accessory Space
- 3 Public Restroom
- 4 Fire | Exit Stair

New Addition



New Building Layout – Level 2

- 1 Unit
- 2 Elevator Lobby
- 3 Building Utility Room | Closet
- 4 Fire | Exit Stair
- 5 Building Amenity

Structure

- Vacant 1960's era toy store and adjacent asphalt surface parking lot w/ direct connection to transit corridor.
- 2-story structure to house 14 units, office tenant space, retail tenant space and residential amenity space.
- New 3-story addition to house 27 units.
- Remaining surface parking reduced to open up exterior residential amenity spaces and pedestrian-scale landscaping.
- Reuse existing building structure – masonry walls, steel columns | beams, wood floor framing, most of the roof framing.

Embodied Carbon Savings

209 CO₂eq/m²
versus 306
CO₂eq/m²

32% Savings

compared to new ground-up construction





Historic Renovation of the Year

Presented By:



Project Overview

Property Name:	The Astor at Washington Building
Address:	1019 Pacific Ave, Tacoma, WA
Neighborhood:	Downtown Tacoma (CBD)
Year Built:	1925
Square Feet:	123,687
Floors:	18
Construction Start Date:	October 2020
C of O Date:	March 2022
Budget:	\$65 Million
Residential Units:	156



Deal Formulation And Execution

Historic Tax Credits &
Opportunity Zone

Multi-Family Tax Exempt
Program for 8 year Cap

Use of Existing City of Tacoma
Parking Garage Lease

No added Municipal
Development Fees

No Lease Termination Expenses



The Existing Building

Building was Class B space

Steel Framed with Hollow Clay
Tile made seismic upgrade
straight forward

Floor Plate Layout is conducive
to residential

Opportunities Leveraged:

- Bank Vault
- Terracotta ILO Carpet
- Penthouse in place



BEFORE



AFTER

Municipal Support

Direct Access to City Officials during concept development

Designated Code Official to resolve design issues quickly. Solutions oriented approach as building moved from 1925 Built Code condition to current Code for systems as modifications.

All City Departments participated in resolution of code issues. Fire Department to Parking.

City Inspectors and project team were proactive, not just enforcement.

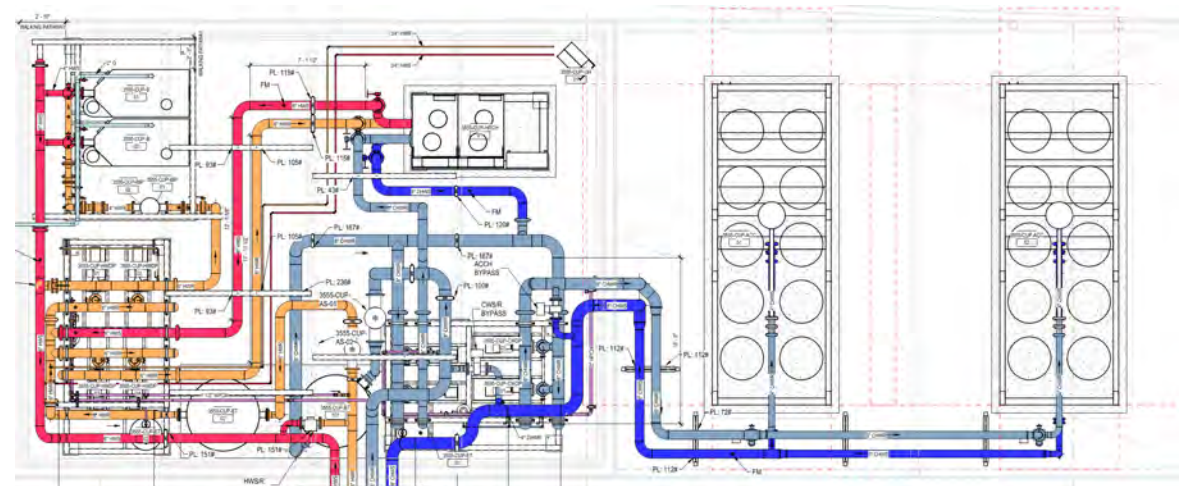


Breakout Session 1:

- How do these projects compare to what you've seen?
- What questions do you have to our panel?
- What are common obstacles?



MEPF Considerations

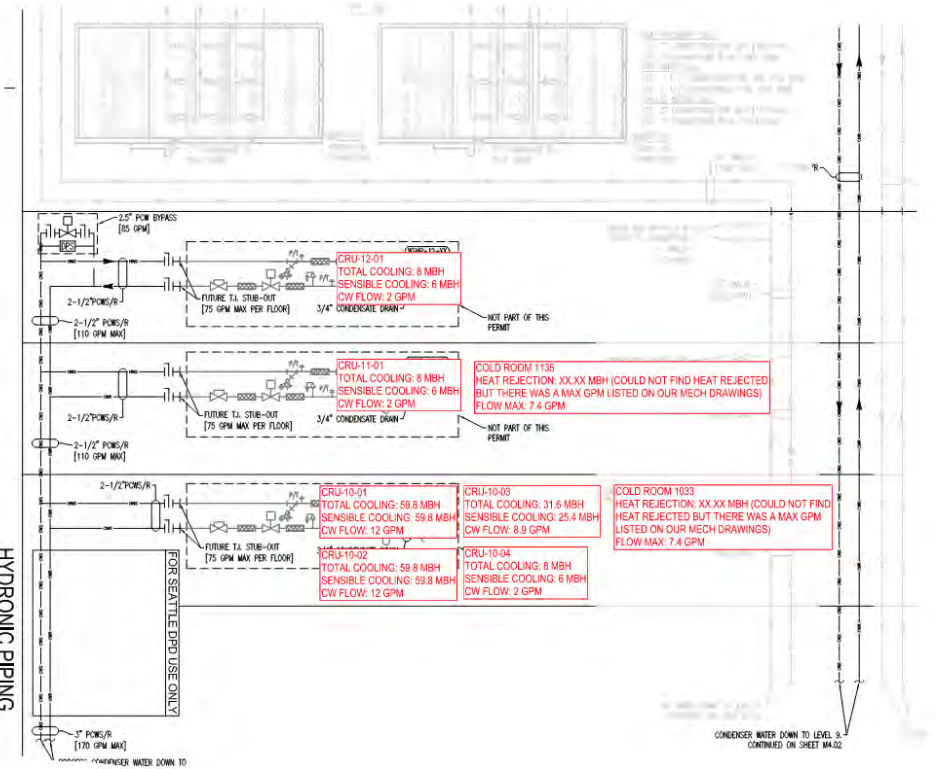


MEPF

- Evaluate existing capacity
 - Mechanical: Heating & Cooling Equipment
 - Mechanical: Ventilation Systems
 - Electrical: Service and distribution
 - Electrical: Emergency & Standby power
 - Plumbing: Hot Water Plant
 - Plumbing: Service size
 - Fire Protection: Sprinkler sizing for occupancy

M4.01

HYDRONIC PIPING
RISER DIAGRAM



MEPF

- Review Energy Code
 - Envelope upgrades?
 - Natural Gas Ban/Electrification

2018 Seattle Energy Code

2018 International Energy Code® as Amended by the City of Seattle



Published by
 Seattle Department of
Construction & Inspections

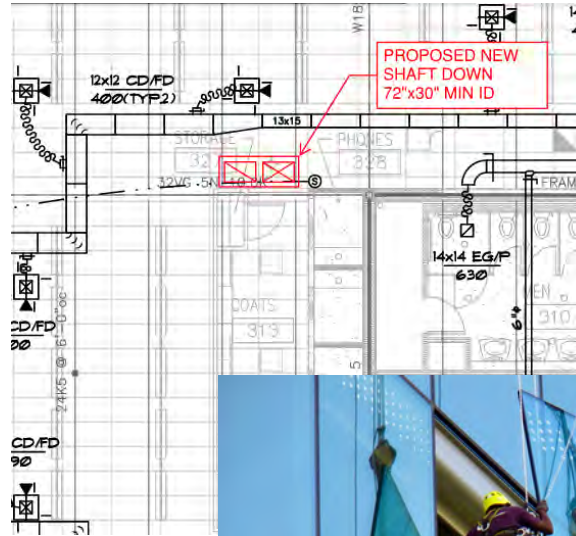
C403.1.4 Use of electric resistance and fossil fuel-fired HVAC heating equipment. HVAC heating energy shall not be provided by electric resistance or fossil fuel combustion appliances. For the purposes of this section, electric resistance HVAC heating appliances include but are not limited to electric baseboard, electric resistance fan coil and VAV electric resistance terminal reheat units and electric resistance boilers. For the purposes of this section, fossil fuel combustion HVAC heating appliances include but are not limited to appliances burning natural gas, heating oil, propane, or other fossil fuels.

Exceptions:

1. **Effective date.** Permits applied for prior to June 1, 2021.
2. **Low heating capacity.** Buildings or areas of buildings, other than dwelling units or sleeping units, that meet the interior temperature requirements of IMC Chapter 12 with a total installed HVAC heating capacity no greater than 8.5 BTU/h (2.5 watts) per square foot of conditioned space are permitted to be heated using electric resistance appliances. For the purposes of this exception, overhead or wall-mounted radiant heating panels installed in an unheated or semi-heated space, insulated in compliance with Section C402.2.5 and controlled by occupant sensing devices in compliance with Section C403.11.1 need not be included as part of the HVAC heating energy calculation.
3. **Dwelling and sleeping units.** Dwelling or sleeping units having an installed HVAC heating capacity no greater than 750 watts in any separate habitable room with exterior fenestration are permitted to be heated using electric resistance appliances.
 - a. **Corner rooms.** A room within a dwelling or sleeping unit that has two primary walls facing different cardinal directions, each with exterior fenestration, is permitted to have an installed HVAC heating capacity no greater than 1000 watts. Bay windows and other minor offsets are not considered primary walls.
4. **Small buildings.** Buildings with less than 2,500 square feet of conditioned floor area are permitted to be heated using electric resistance appliances.
5. **Defrost.** Heat pumps are permitted to utilize electric resistance as the first stage of heating when a heat pump defrost cycle is required and is in operation.
6. **Air-to-air heat pumps.** Buildings are permitted to utilize internal electric resistance heaters to supplement heat pump heating for air-to-air heat pumps that meet all of the following conditions:
 - a. Internal electric resistance heaters have controls that prevent supplemental heater operation when the heating load can be met by the heat pump alone during both steady-state operation and setback recovery.
 - b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower.
 - c. The heat pump complies with one of the following:
 1. Controlled by a digital or electronic thermostat designed for heat pump use that energizes the supplemental heat only when the heat pump has insufficient capacity to maintain set point or to warm up the space at a sufficient rate.
 2. Controlled by a multistage space thermostat and an outdoor air thermostat wired to energize supplemental heat only on the last stage of the space thermostat and when outdoor air temperature is less than 32°F.
 3. The minimum efficiency of the heat pump is regulated by NAECA, its rating meets the requirements shown in Table C403.1.2(7), and its rating includes all usage of internal electric resistance heating.
 - d. The heat pump rated heating capacity is sized to meet the heating load at an outdoor air temperature of 32°F or lower and has a rated heating capacity at 47°F no less than 2 times greater than supplemental internal electric resistance heating capacity, or utilizes the smallest available factory-available internal electric resistance heater.
7. **Air-to-water heat pumps, up to 2,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity no greater than 2000 kBTU/hr at 47°F, and that meet all of the following conditions:
 - a. Controls for the auxiliary electric resistance heating are configured to lock out the supplemental heat when the outside air temperature is above 32°F, unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.
 - b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.
 - c. The heat pump rated heating capacity at 47°F is no less than 2 times greater than supplemental electric resistance heating capacity.
8. **Air-to-water heat pumps, up to 3,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity greater than 2000 kBTU/hr and no greater than 3000 kBTU/hr at 47°F, and that meet all of the following conditions.

MEPF

- Architectural coordination –
 - adequate floor to floor?
 - equip/room locations
 - new shafts
 - piping penetration
 - façade penetrations



MEPF



- Structural coordination –
 - Does new weight trigger substantial alternation?
 - Local strengthening limits?

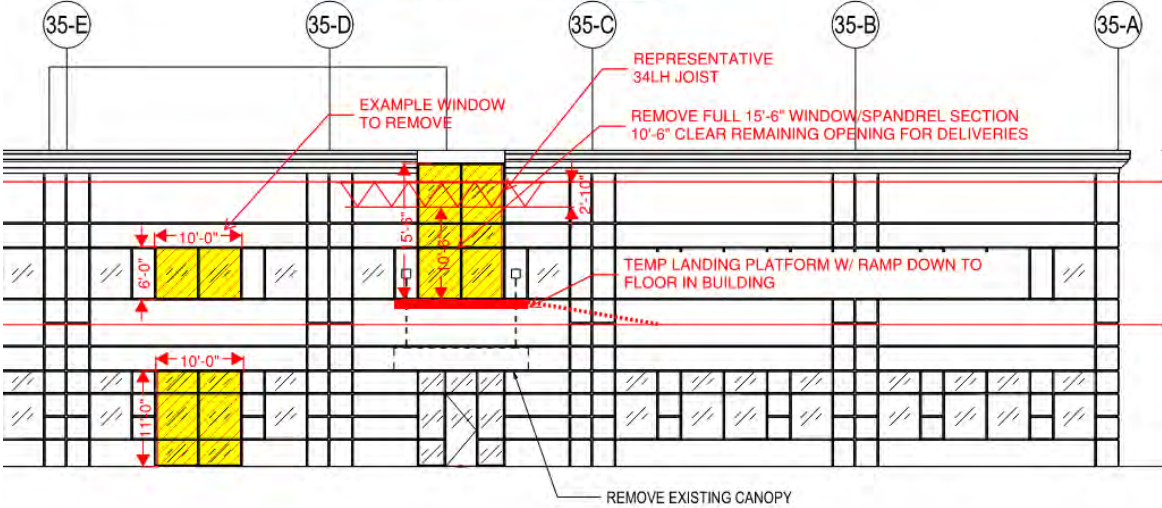
MEPF

- Electrical coordination –
 - Generators
 - Transformers
 - Electrical service



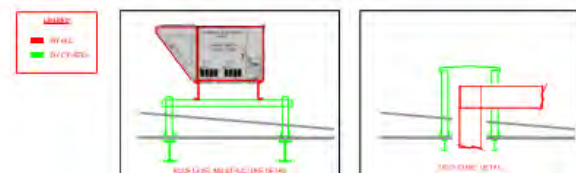
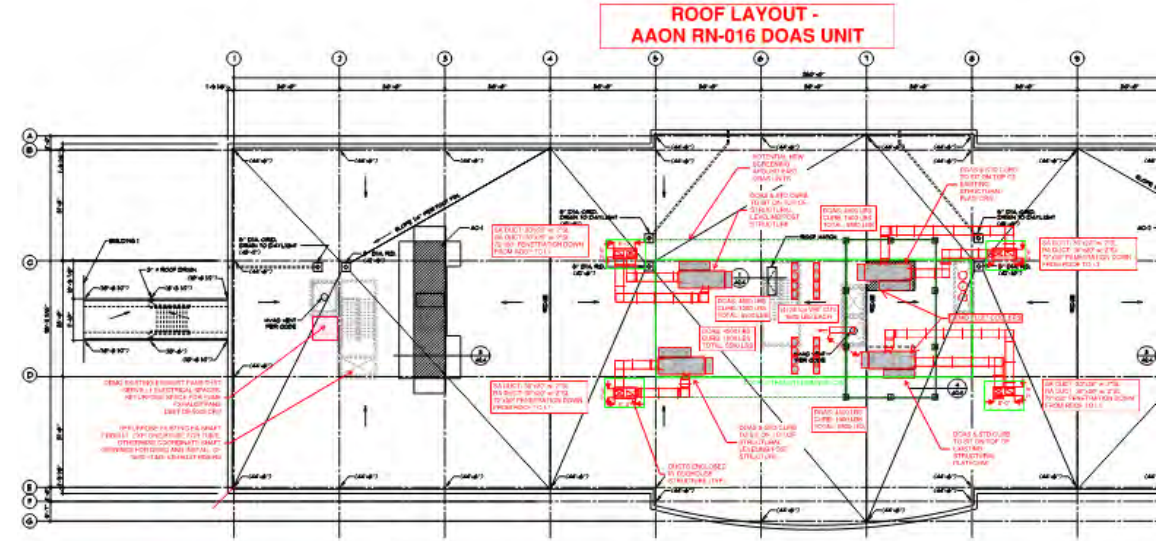
MEPF

- Logistics –
 - partially occupied
 - pathway into building
 - lead times



Office to Lab Example

- Avoid structural substantial alternation
- Identify local strengthening limitations for qty/size of equip
- Prelim coordination list for structural and electrical



ROOF PLAN
Aeon RN-016

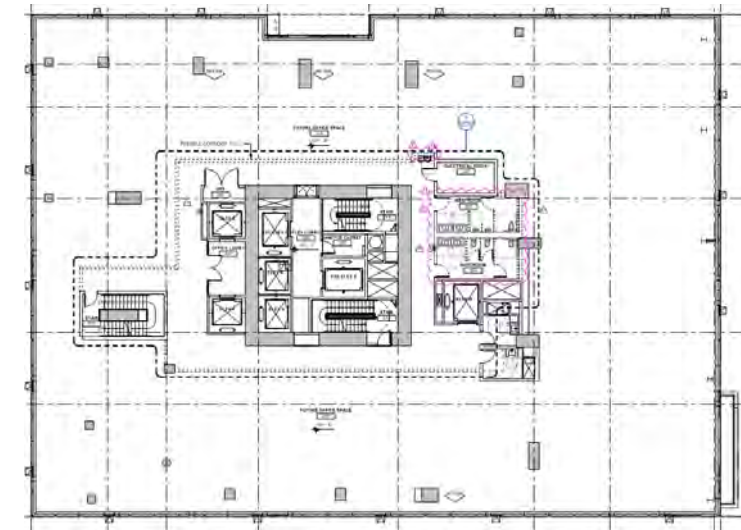
3755 Meriville - Level 1 Lab 11
Roofing Equipment Coordination
5/29/2022

Equipment Tag	Equipment	Location	Make	Model	Heating	Cooling	Free Area	Volts/Ph	#
AC-1 (Unit 1)	RoofTop Air Conditioning Unit	Roof	Mitsubishi	RT-1000-10		45000	4000	480V/3	1
AC-2 (Unit 2)	RoofTop Air Conditioning Unit	Roof	Mitsubishi	RT-1000-10		45000	4000	480V/3	1
AC-3 (Unit 3)	RoofTop Air Conditioning Unit	Roof	Mitsubishi	RT-1000-10		45000	4000	480V/3	1
AC-4 (Unit 4)	RoofTop Air Conditioning Unit	Roof	Mitsubishi	RT-1000-10		45000	4000	480V/3	1
DOAS-1	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-2	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-3	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-4	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-5	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-6	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-7	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-8	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-9	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-10	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-11	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-12	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-13	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-14	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-15	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-16	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-17	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-18	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-19	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1
DOAS-20	DOAS Unit	Roof	Carrier	3000-303		4500	4000	480V/3	1

DOAS Weight Note: **DOAS** = Weight of Fluid Cooled Units, as noted by DOAS # and DOAS & CU combined weight. **DOAS** = Weight of Fluid Cooled Units, as noted by DOAS # and DOAS & CU combined weight.

Office to Resi Example

- Is existing capacity adequate?
- Is envelope sufficient?
- Scan existing structure for plumbing/piping risers to inform wall locations/room layouts
- Can facade be modified for range exhaust, dryer exhaust, ERV terminations, equipment intakes?



Breakout Session 2:

- What else?
- How does this compare with your experiences?
- Questions for panel?

Jurisdictional and Owner/Developer Issues



Owner/Developer Issues

Jurisdictional Hurdles

- Clarity on Permit Process
- PREDICTABILITY – Cost and Schedule
- What are triggers for substantial alterations?
- No specific process

Jurisdictional Opportunities

- Tax incentive programs
- Internal review teams to create consistency
- Land use discussions to allow for easier change of use

Other Issues

- In place leases and/or occupancy
- PREDICTABILITY – Cost and Schedule
- MHA fee in the City of Seattle (paid on every square foot in change of use)
- Unknown market demand
- Energy code vs embodied carbon?
- Replacement costs

Breakout Session 3:

- Why do this?
- How to make it easier?
- Questions for panel?

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MONTHLY BREAKFASTS



CONSTRUCTION DISRUPTION

APR 19 | 8 AM