Affordable Housing Electrification Training Series

Dates: August 29th , September 5th, 19th, & 26th

Time: 11:30am-12:30pm

- Greenhouse Gas Reduction Fund: Key Updates for Implementation in California
- Planning & Financing All-Electric New Construction
- Planning & Financing All-Electric Rehabilitations
- Understanding Electrification Technology Operations & Maintenance

California Housing Partnership

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Thank You to Our Sponsors and Program Partners

WELLS FARGO

LIWP MULTIFAMILY

LA DWP

CAMR
Comprehensive Affordable Multifamily Retrofits Program

BUILD
Building Initiative for Low-Emissions Development Program

ENERGY EFFICIENCY FOR ALL

SOMAH

Speakers

Ian Sharples
California Housing Partnership
Program Manager

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Vice President of Real Estate Development

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Senior Financial Consultant

Ari Usher
Association for Energy Affordability
Manager, Projects

BUILD

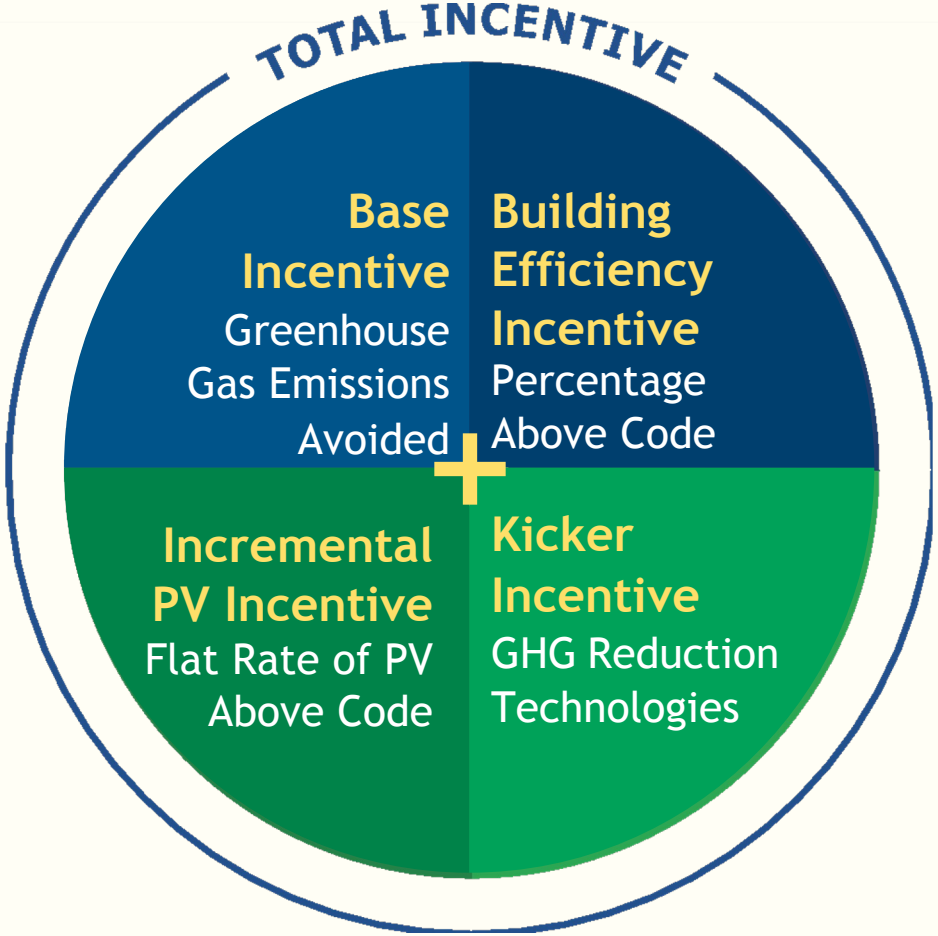
The Building Initiative for Low-Emissions Development (BUILD) Program

BUILD is a residential building decarbonization program that provides incentives and technical assistance to support the adoption of advanced building design and **all-electric** technologies in new, low-income homes.

BUILD makes **clean energy technologies** accessible to affordable housing developments to benefit low-income Californians.

Incentives Overview

BUILD provides robust incentives consisting of four components:



Free Technical Assistance Services

- Up to 300 hours of no-cost technical assistance
- Support throughout all development phases (including building design, construction, installing near-zero emission technologies) and information on local building permits
- Assistance with submission of BUILD Incentive Application package and participation support
- Educational resources on all-electric building design and technologies

The Technical Assistance team is here to support your project.

Apply for Technical Assistance and Incentive Opportunities

Technical Assistance Application

https://aeacleanenergy.tfaforms.net/f/build-application

Program Guidelines, Incentive Application and More Information

https://www.energy.ca.gov/programs-and-topics/programs/building-initiative-low-emissions-development-program

BUILD is administered by the California Energy Commission in collaboration with the California Public Utilities Commission. It is authorized by Senate Bill 1477 (2018, Stern) and funded by the four California gas corporations apportioned according to each gas corporation's percentage share of allocated Cap-and-Trade Program allowances. Reservations are approved on a first come, first served basis, and regional funding availability is based on the utilities' contribution to the program.

WAKELAND

HOUSING & DEVELOPMENT CORPORATION

BY THE NUMBERS

Wakeland's mission is to use our expertise to finance, develop and operate high-quality affordable and permanent supportive housing that meets community needs

Wakeland has developed, financed, preserved and/or rehabilitated

8,500

AFFORDABLE HOMES SINCE 1998

Overall, our efforts have led to the creation of

62

AFFORDABLE HOUSING COMMUNITIES

Wakeland has provided affordable housing and resident services for more than

43,000

PEOPLE SINCE 1998

Wakeland – Electrification and Sustainability

- Early adopter of sustainable and renewable energy features.
- Organizational goal to remedy climate change, etc. in our development work.
- Wakeland has several existing LEED Silver, Gold, and Platinum projects.
- Six all electric projects completed and in operation.
- Wakeland has participated in LIWP, SOMAH, BUILD and EPIC grant and TA programs.
- Medium sized developer without specialized in house energy expertise.

Union Tower Apartments

- “Legacy” project with too many sources (11!), including BUILD.
- Total of 94 units in two buildings: one building is Type III modified construction; 1 building is Type V.
- Large family project with a set aside of 24 VHHP/VASH PSH units.
- Wakeland is developing Union Tower with a union-affiliated partner subject to a PLA.
- New buildings are replacing a portion of a former HUD-financed garden style apartment project (1960’s and 1970’s construction).

Union Tower Apartments

Union Tower Apartments

California Housing Partnership
California's Experts on Affordable Housing Finance, Advocacy & Policy

UNION TOWER – FINANCING AND USING BUILD FUNDS

Tony Kouot, September 5, 2024
California Housing Partnership | chpc.net

Project Schedule

- Start Construction – June 2024
- Complete Construction – May 2026
- 100% Occupancy – September 2026
- Convert to Permanent Financing – February 2027

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Project Team

- **Developer:** Wakeland Housing and Development Corporation
- **Equity Investor:** Hudson Capital
- **Construction & Perm Lender:** JP Morgan Chase
- **Soft Lenders:** HCD, National City, County of San Diego, CA Energy Commission

Ownership Structure

- Union Tower One LP
  - General Partners:
    - Managing General Partner - Union Tower LLC - 0.006% Ownership
      - Wakeland (Developer)
    - Co-General Partner - NCPA Union Tower One, LLC - 0.004% Ownership
      - San Diego County Building Trades
  - Limited Partners:
    - Special Limited Partner - Hudson-FM SLP LLC - 0.01% Ownership
      - Fannie Mae
    - Limited Partner - Hudson Union Tower LP - 99.98% Ownership
      - Hudson Housing Capital

BUILD

- Grant
  - Structured as a General Partner Loan to the Limited Partnership/Project
    - Structured this way so funds are not recognized as taxable income.
- Timing of funds
  - Released during construction
    - 75% once foundations are poured (month 7).
    - Remainder at CofO.
- Grantee drafts own loan documents

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QUESTIONS?

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THANK YOU!

Questions?

Email info@chpc.net

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All Electric Building Design Key Concepts

- For the purposes of this presentation all electric is defined as a building with no natural gas hook-ups to the building
- The transition to all-electric building from mixed fuel buildings requires support to project teams because some of the technologies are new to the industry ie heat pump water heating!
- Heat pump technology for space and water heating as opposed to electric resistance offers high efficiency
- Energy efficiency features maximized across the building first to reduce greenhouse gas emissions and keep energy costs low for residents and building owner
- Renewable generation and on-site energy storage to fill the gap

DHW Plumbing Design

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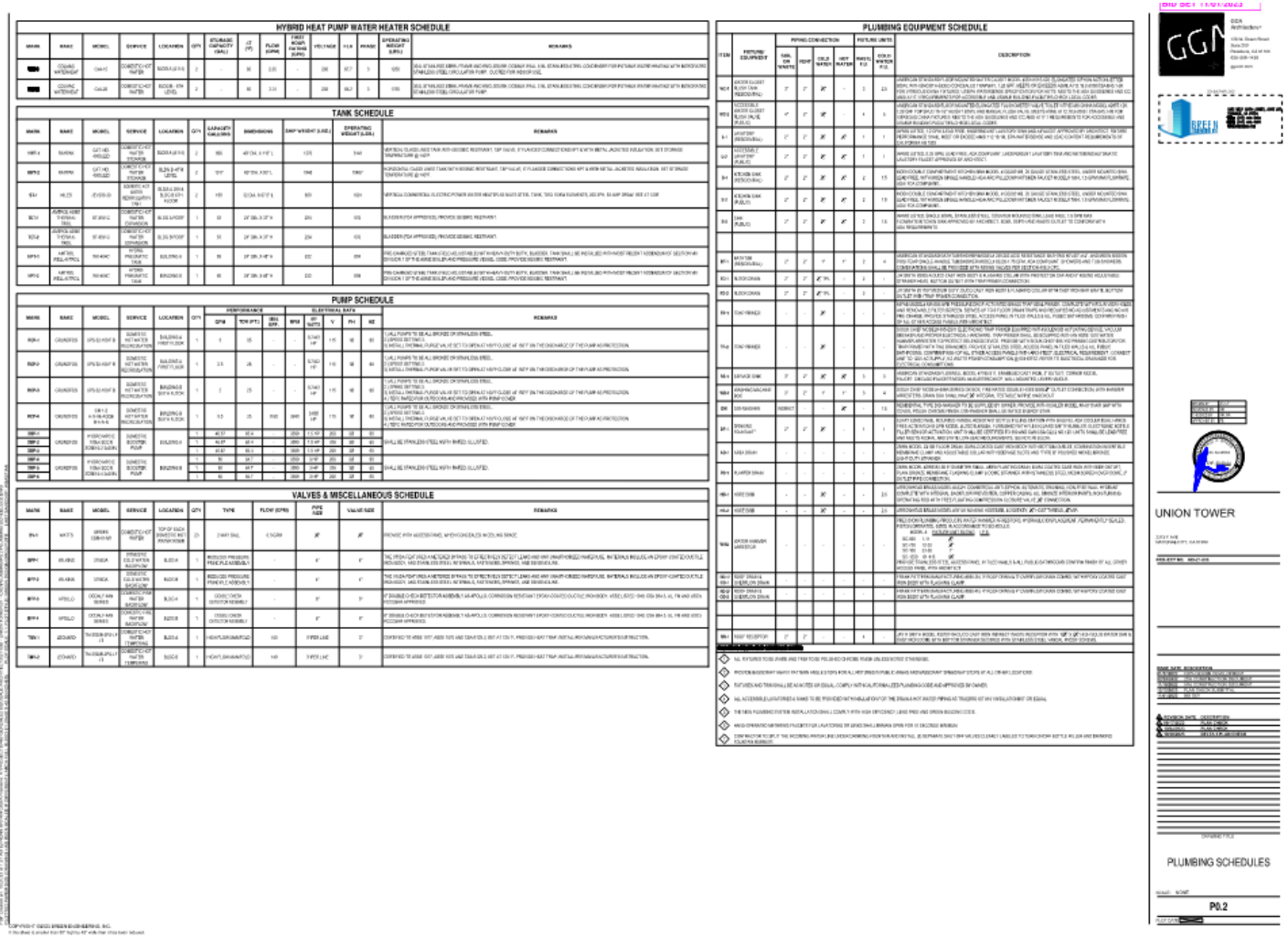
DHW Equipment Selection

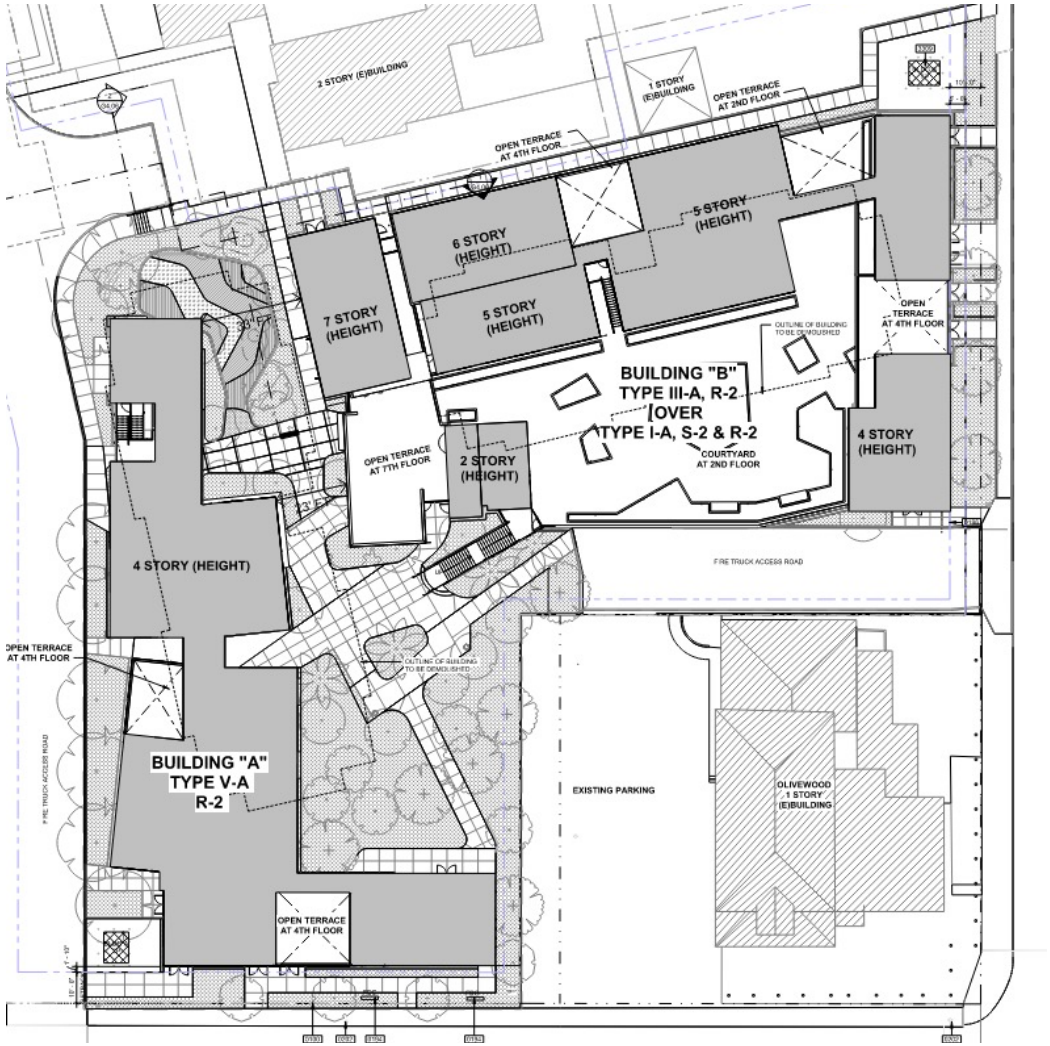


CONSIDERATIONS

- Heat pumps
- Storage tanks
- Swing tank
- DHW circulator pumps
- Mixing valve
- Balancing valve

Union Tower Equipment

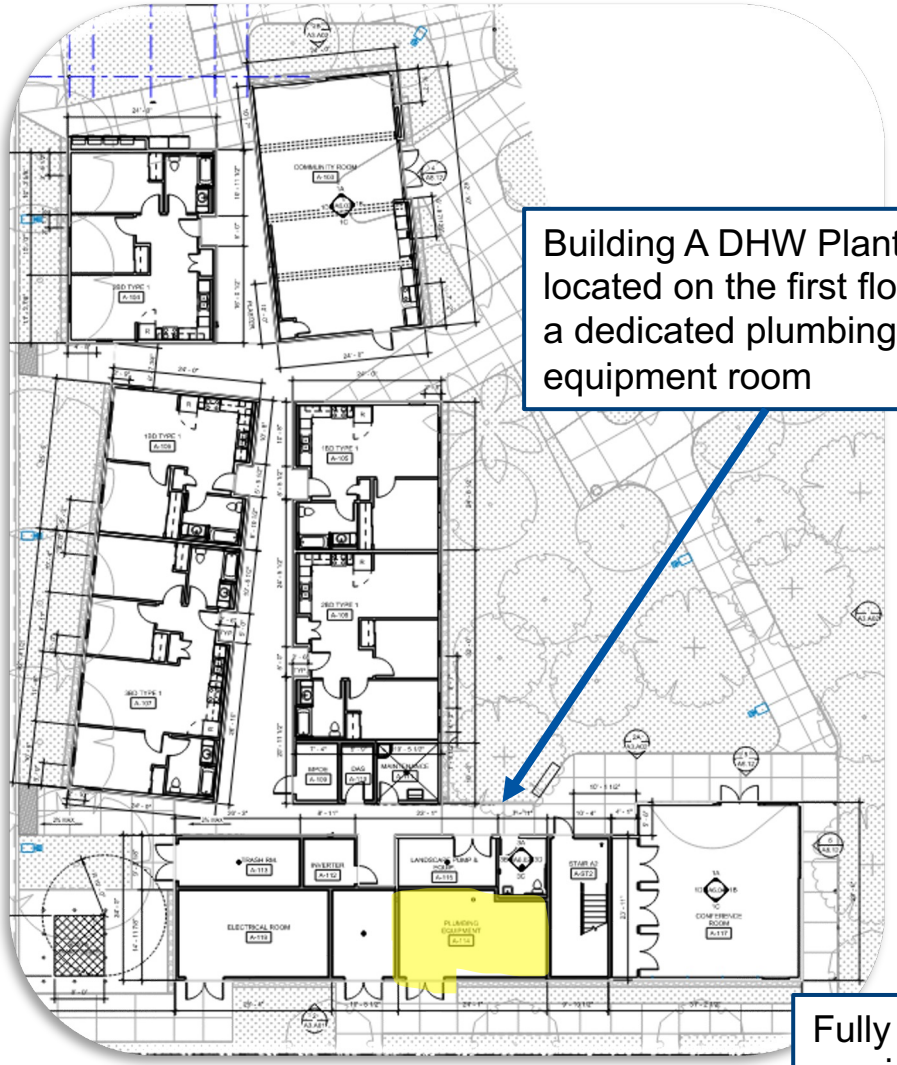
DHW Space Planning



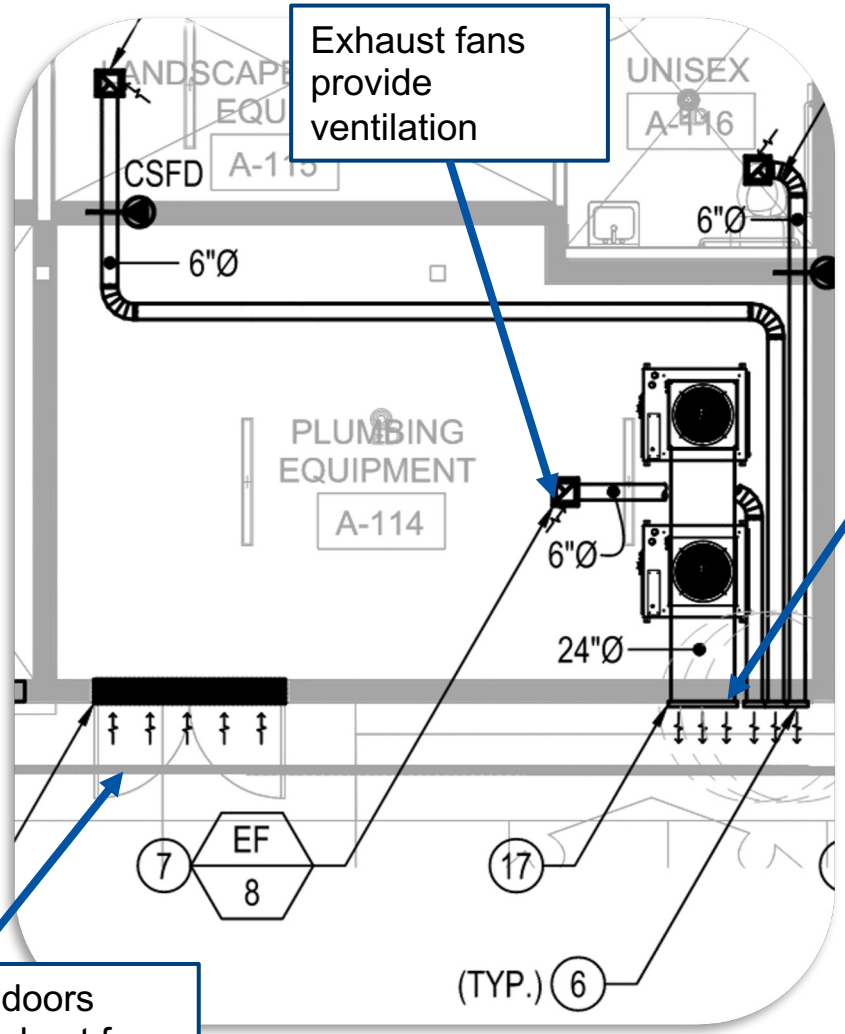
CONSIDERATIONS

- Ambient air temperature
- Ventilation needs
- Sound rating
- Structural
- Weather proofing
- Site lines

Union Tower Building A



Building A DHW Plant located on the first floor in a dedicated plumbing equipment room



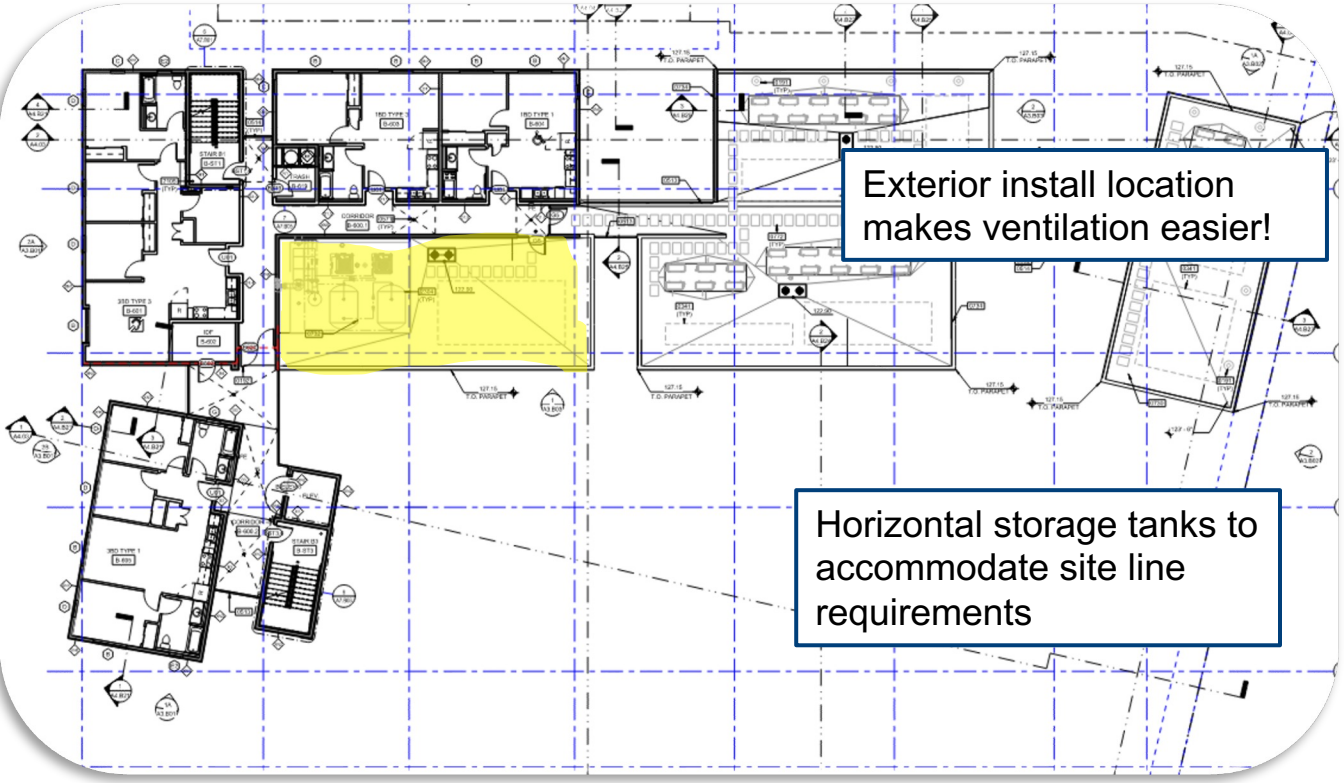
Exhaust fans provide ventilation

Heat pump exhaust is ducted directly to the exterior. Internal heat pump fan must be able to handle static pressure from ducting

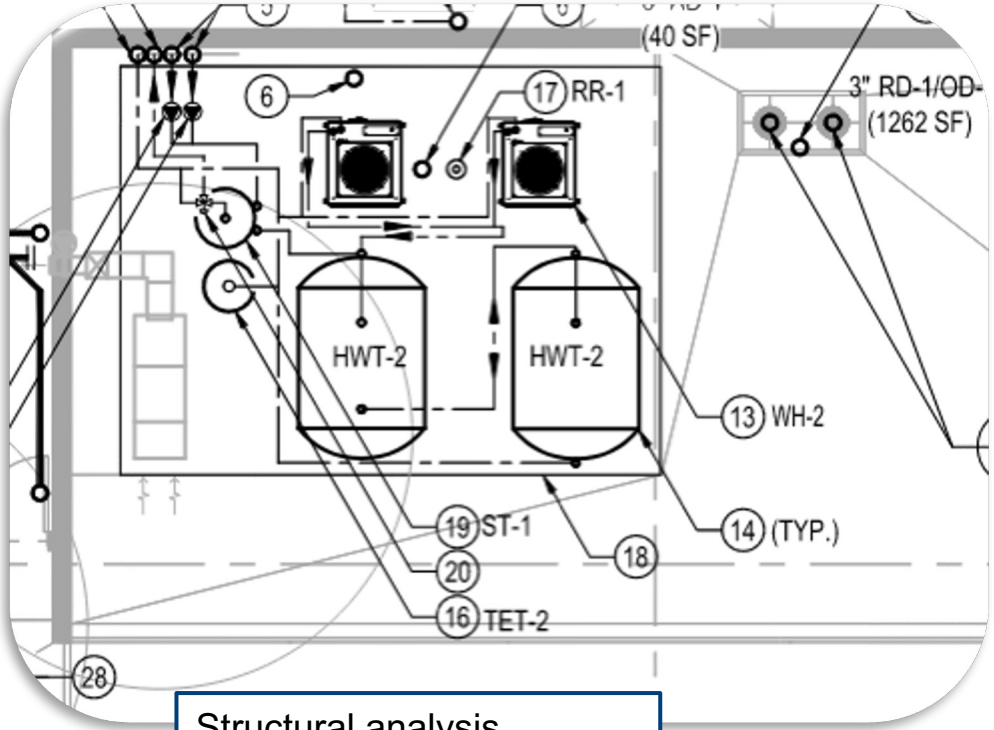
Fully louvered doors provide required net free area for make-up air

Union Tower Building B

DHW Plant located on fifth floor roof



Weatherproof enclosure “dog house” likely needed



Structural analysis completed so roof can accommodate additional weight

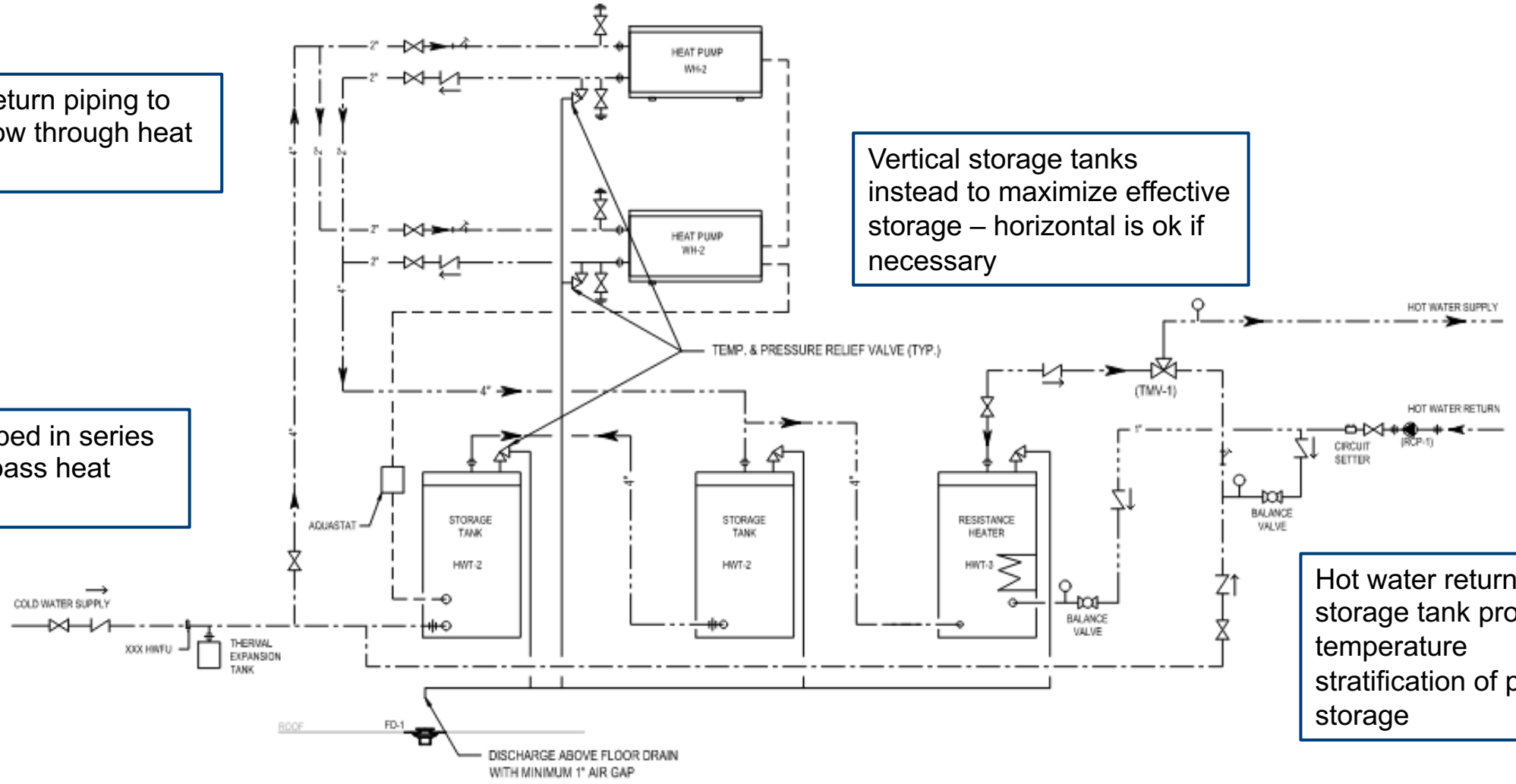
Union Tower Piping Diagram

Reverse return piping to balance flow through heat pumps

Storage piped in series for single pass heat pumps

Vertical storage tanks instead to maximize effective storage – horizontal is ok if necessary

Hot water return to storage tank protects temperature stratification of primary storage



DHW Additional Best Practices

- Heat pump efficiency
  - CO2 (R-714) based DHW heaters provide high efficiency ratings
- Thermal balancing valves (TBVs)
  - Distribution is balanced through the riser based on a temperature signal rather than a specific flow rate. This can reduce circulator pump energy use
- Variable speed circulator pump(s)
  - A variable speed circulator pump will ramp up or down to provide for circulation needs in response to signals from the TBVs
- Electronic mixing valve
  - Mixing valve is balanced automatically by the equipment rather than via manual balancing

HVAC Design

Union Tower Space Conditioning

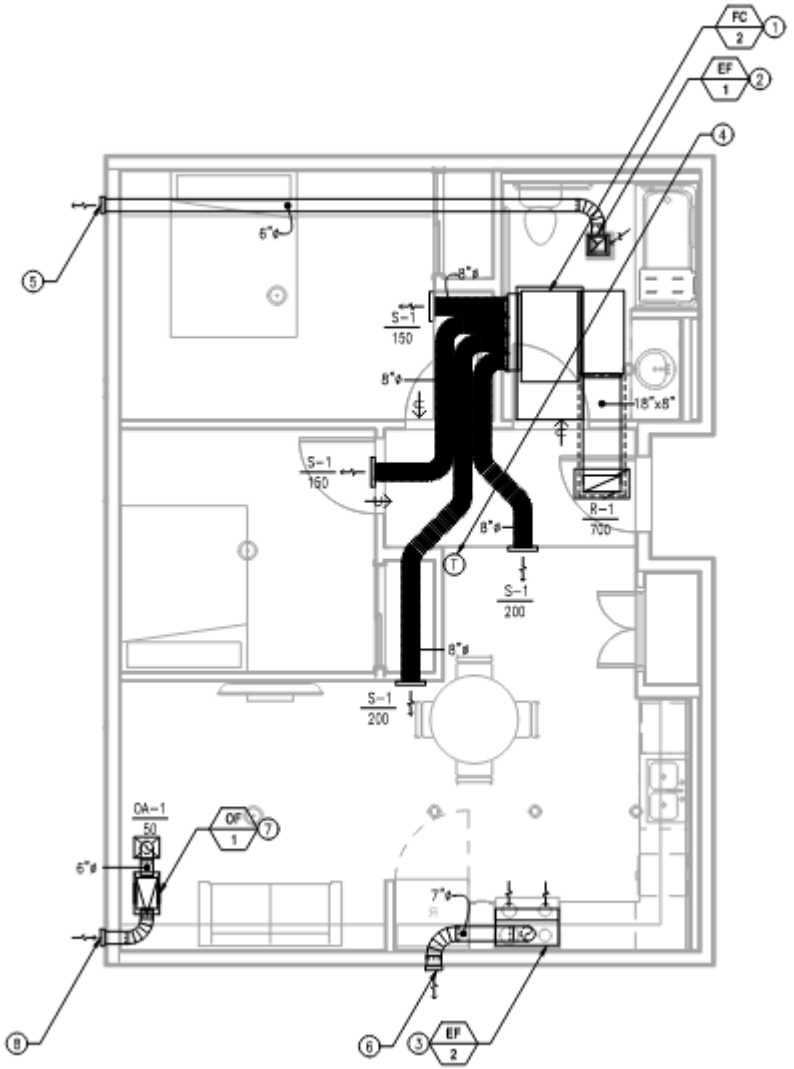
MARK	QTY.	MAKE	MODEL	COOLING CAPACITY			HEATING CAPACITY BTUH
				NOMINAL BTUH	SENSIBLE BTUH	SEER/EER	
FC-1	45	SAMSUNG	AC018BNHDCH/AA	18,000	13,500	19.6/12.5	20,000
FC-2	25	SAMSUNG	AC024BNHDCH/AA	24,000	18,000	20.5/12.6	27,000
FC-3	24	SAMSUNG	AC030BNHDCH/AA	30,000	22,500	17.7/10.3	32,000

MARK	QTY.	MAKE	MODEL	NOMINAL CAPACITY		
				COOLING BTUH	HEATING BTUH	HSPF
CU-1	45	SAMSUNG	AC018BXADCH/AA	18,000	20,000	10.6
CU-2	25	SAMSUNG	AC024BXADCH/AA	24,000	27,000	11.0
CU-3	24	SAMSUNG	AC030BXADCH/AA	30,000	32,000	11.0

Split heat pumps with an outdoor compressor and an indoor fan coil unit

Inverter-driven compressor rather than a single-stage compressor to increase space SEER and HSPF efficiency

Union Tower Ventilation and Distribution



Ducted distribution provides conditioned supply air to every bedroom and living space with a single fan coil unit

Outside air fan + exhaust fan provides balanced ventilation for excellent indoor air quality

HVAC Other Considerations

- ERV for energy efficiency and to temper incoming fresh air
- Packaged space conditioning for smaller unit types – may be more applicable for retrofit applications

Envelope Design

Energy Efficient Envelope

CONSIDERATIONS

- CA Energy Code Title 24 Part 6 provides a high standard for envelope efficiency
- Some opportunities exisit above and beyond code

Envelope Best Practices

- Build to QII standards, even if not required by code or green certification programs
  - Continuous air barrier prevents infiltration and exfiltration
  - Insulation installation free from gaps, compression, and buckles prevents conductive loss
  - Filling all cavities even at headers and knee walls prevents convective loop loss
- Perform air leakage testing, even if not required by code or green certification programs
- Insulate all surfaces between conditioned and unconditioned spaces, even under podium slab
- Utilize advanced framing techniques where possible to minimize lumber and thermal bridging

Renewable Energy and Storage

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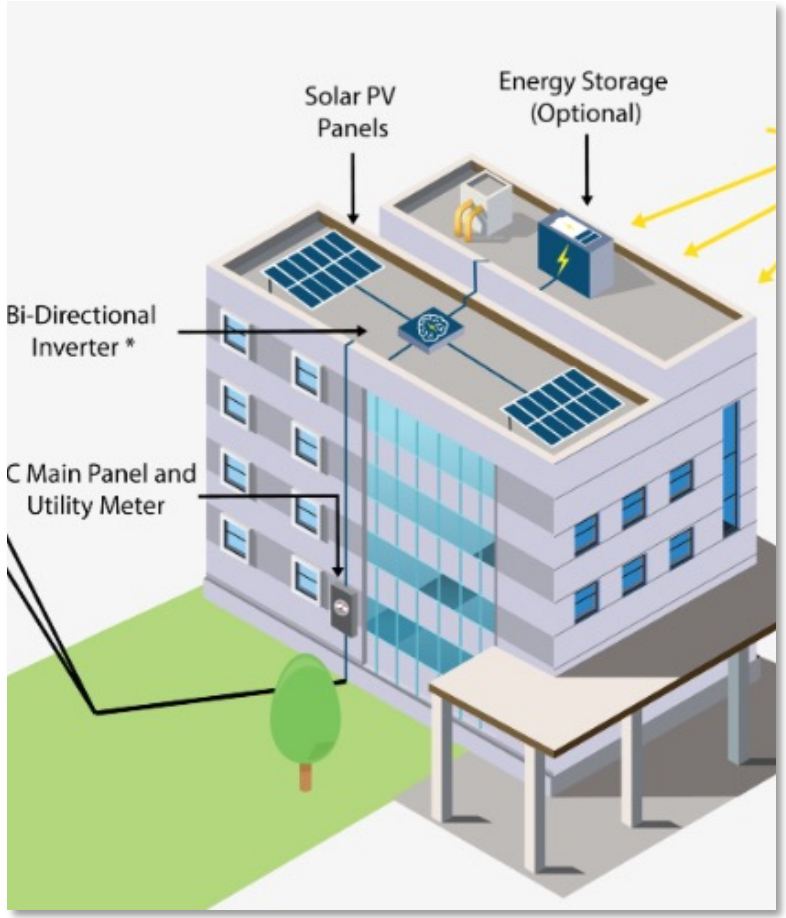
Renewable Energy and Storage Planning



CONSIDERATIONS

- Future Proofing: NEM3, PV, and battery storage
- April 15, 2023: CPUC published a new solar PV interconnection tariff
- Net Billing Tariff (NBT) also knows as NEM3
- Affects customers served by electric IOUs
- Take-away: reduced export credit under NEM3 incentivizes self utilization and battery storage

Battery Ready Considerations

- Isolate critical loads
- Identify location for future battery
- Provide for required setbacks
- Provide for fireproofing and weatherproofing
- Provide conduit to solar PV (roof) and electrical room
- Provide for required ventilation
- Provide sub panel in electrical room
- Plan and isolate critical loads

Thank You!

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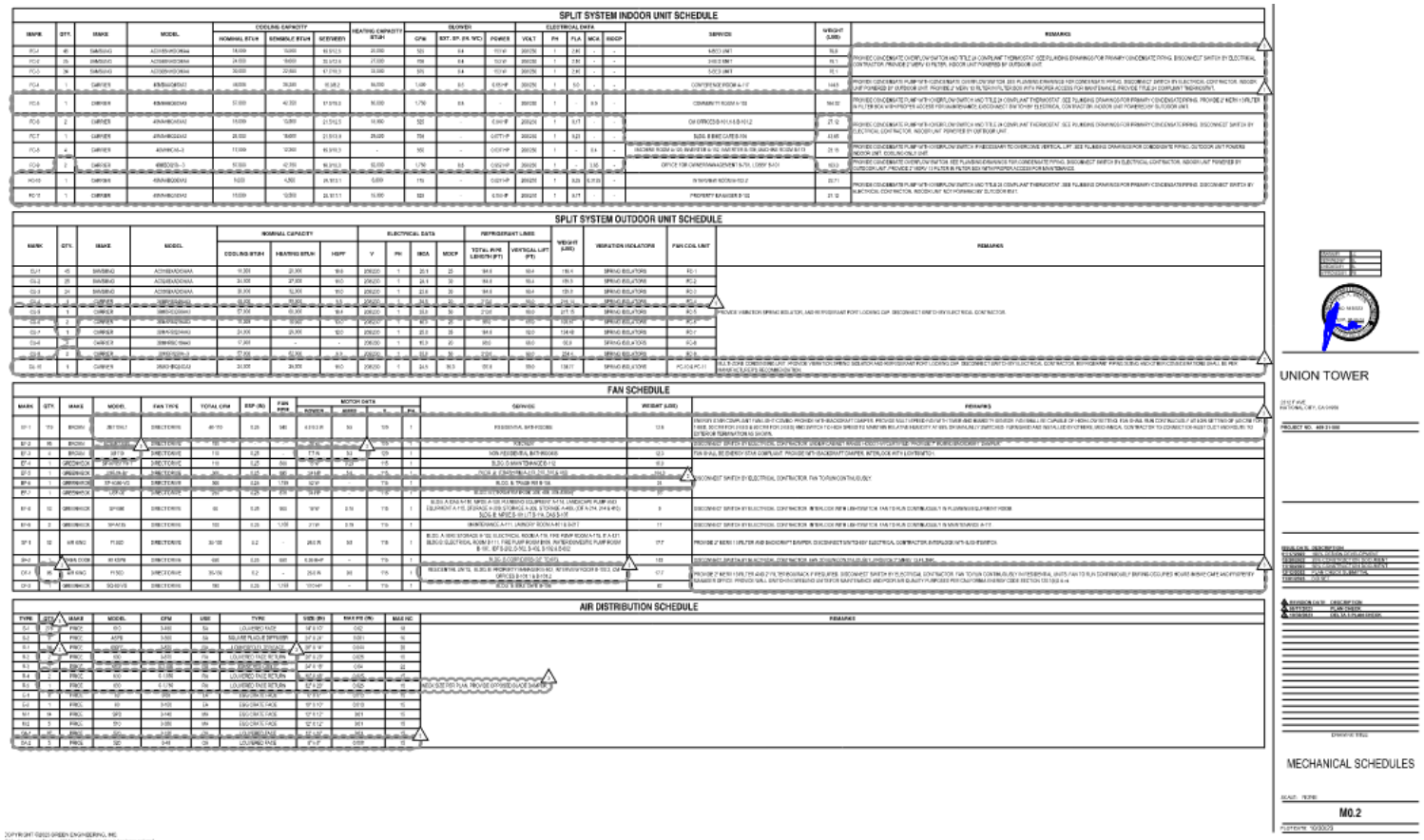
Heating, Ventilation and Air Conditioning



SPLIT SYSTEM INDOOR UNIT SCHEDULE

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE

FAN SCHEDULE

AIR DISTRIBUTION SCHEDULE

UNION TOWER

MECHANICAL SCHEDULES

M0.2

CONSIDERATIONS

- Equipment selection and efficiency
- Ventilation strategy
- Distribution ducting

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