

Brian J. Honan Apartments Deep Energy Retrofit

The Brian J. Honan Apartments (BJH) is a 50-unit rental property that welcomed its first residents in 2005. BJH is a 100% affordable 50-unit multifamily property spread across nine town-home style buildings that are home to 107 low-income residents. The Deep Energy Retrofit (DER) at this property is designed to meet the Passive House standard and will reduce energy usage by 62% and carbon emissions by 51%. This makes it one of the most green, sustainable, and climate-resilient affordable housing preservation projects in the City of Boston!

This building will be “wrapped” with a new high-performance thermal envelope and will have all existing gas-fired HVAC and domestic hot water systems replaced with new, all-electric systems. This rehab will not only drastically reduce energy usage at the property but will also improve the health and comfortability for all residents.



Mechanical Systems

All-Electric and Energy Efficient

The DER at BJH aims to **eliminate on-site fossil fuels entirely**, replacing gas-powered systems with all-electric, high-efficiency systems to power the building, including:

1. Heat pump systems for heating and cooling (HVAC) and domestic hot water (DHW)



2. Energy recovery ventilators (ERVs) providing fresh ventilated air



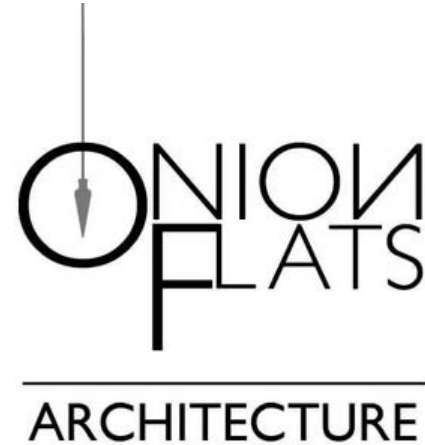
3. Electric heat pump domestic hot water (DHW) heaters (SANCO2, with exterior condensers) and hot water electric swing tank



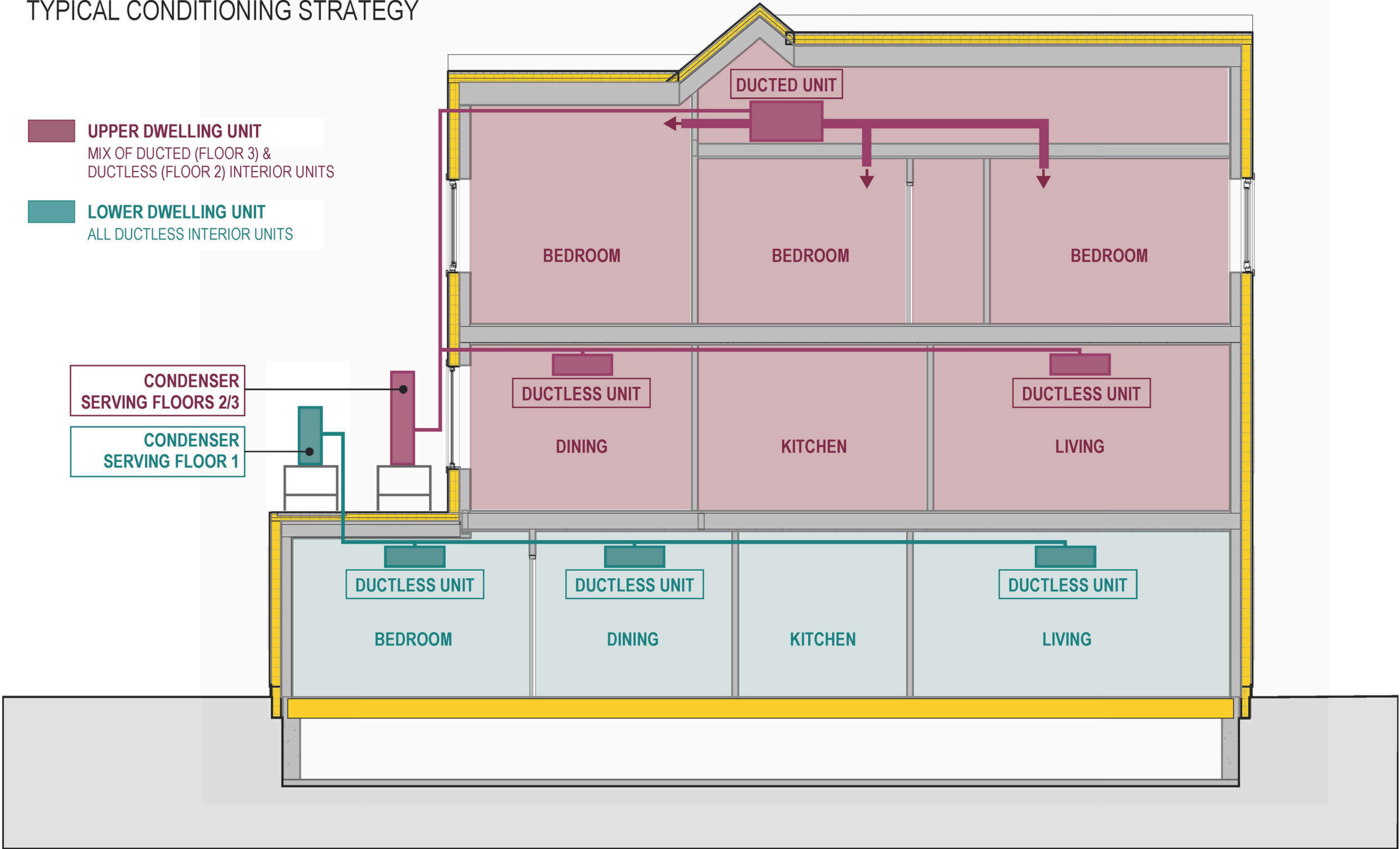
4. Indoor ductless mini-splits for direct heating and cooling (floors 1+2)



Diagram provided by:



BRIAN J HONAN DEEP ENERGY RETROFIT
TYPICAL CONDITIONING STRATEGY



Through energy efficiency measures and system electrification, the Brian J. Honan Apartments is expected to achieve a **62% reduction in energy consumption** and **51% carbon emissions reductions**.

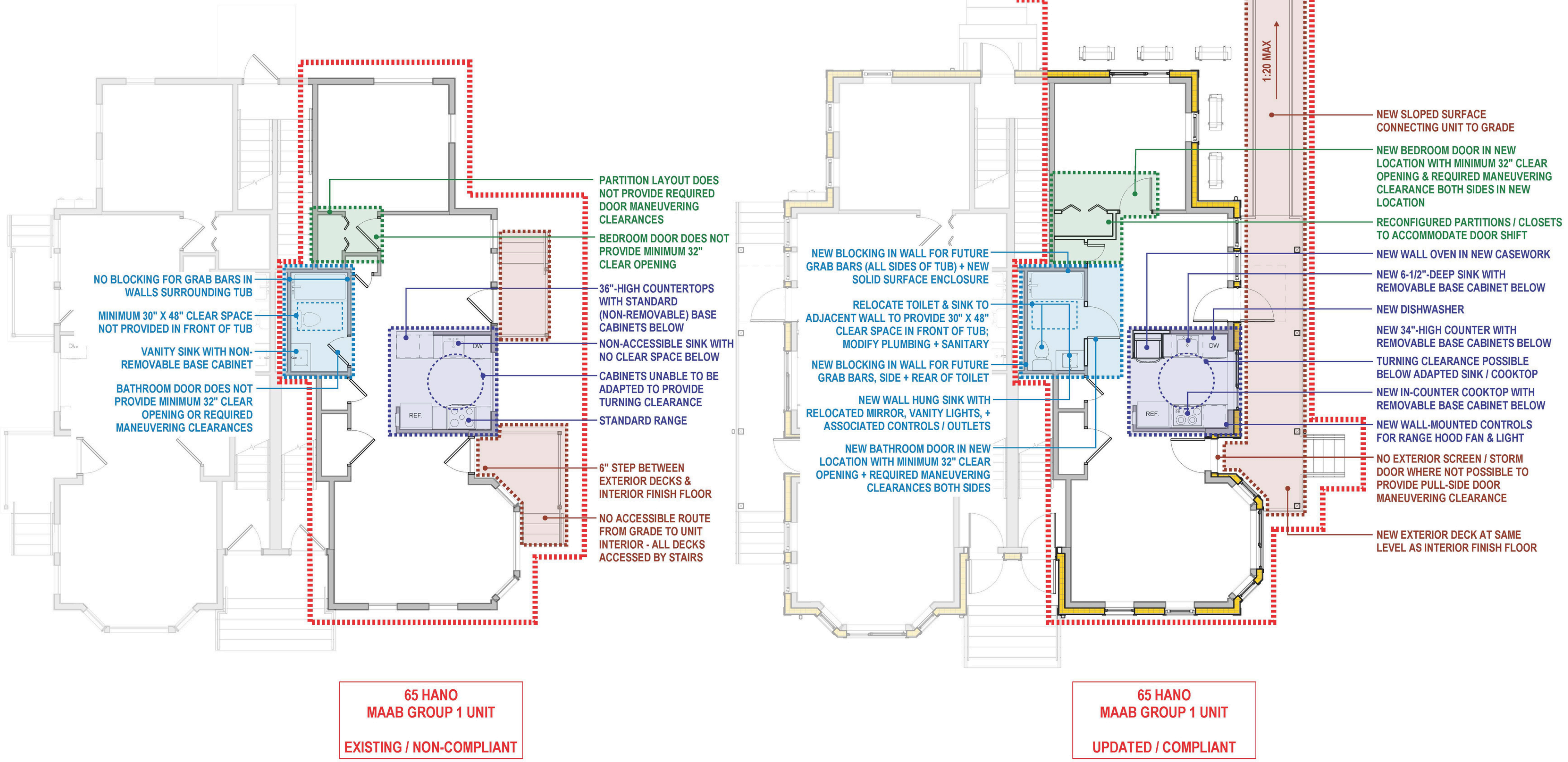
Meeting MAAB Requirements

Adapting for Accessibility



Diagram provided by: **ONION FLATS ARCHITECTURE**

BRIAN J HONAN DEEP ENERGY RETROFIT
MAAB GROUP 1 UNIT UPDATES - 65 HANO



Group 1 units: “adaptable units” with features that can be modified without structural change to meet the specific functional needs of an occupant with a disability.

Group 2 units: “accessible units” with features similar to Group 1, but have the additional feature of greater floor space to accommodate the needs of occupants who need such space.

Meeting the Group 1 standards with an existing building has required close coordination, sharp problem-solving, and meticulous attention to detail from the design and construction team.

The Massachusetts Architectural Access Board (MAAB) has required that the project update 17 units to meet Group 1 design standards and 3 units to meet Group 2 design standards. A variance received from the MAAB has allowed the project to move forward with updating 4 Group 1 units under this DER renovation scope.

Exterior Envelope

Creating an Air-tight Barrier for Energy Saving



The failing, leaky existing exterior walls have **left significant water damage**. The annual cost to repair the envelope was about \$100,000/year.

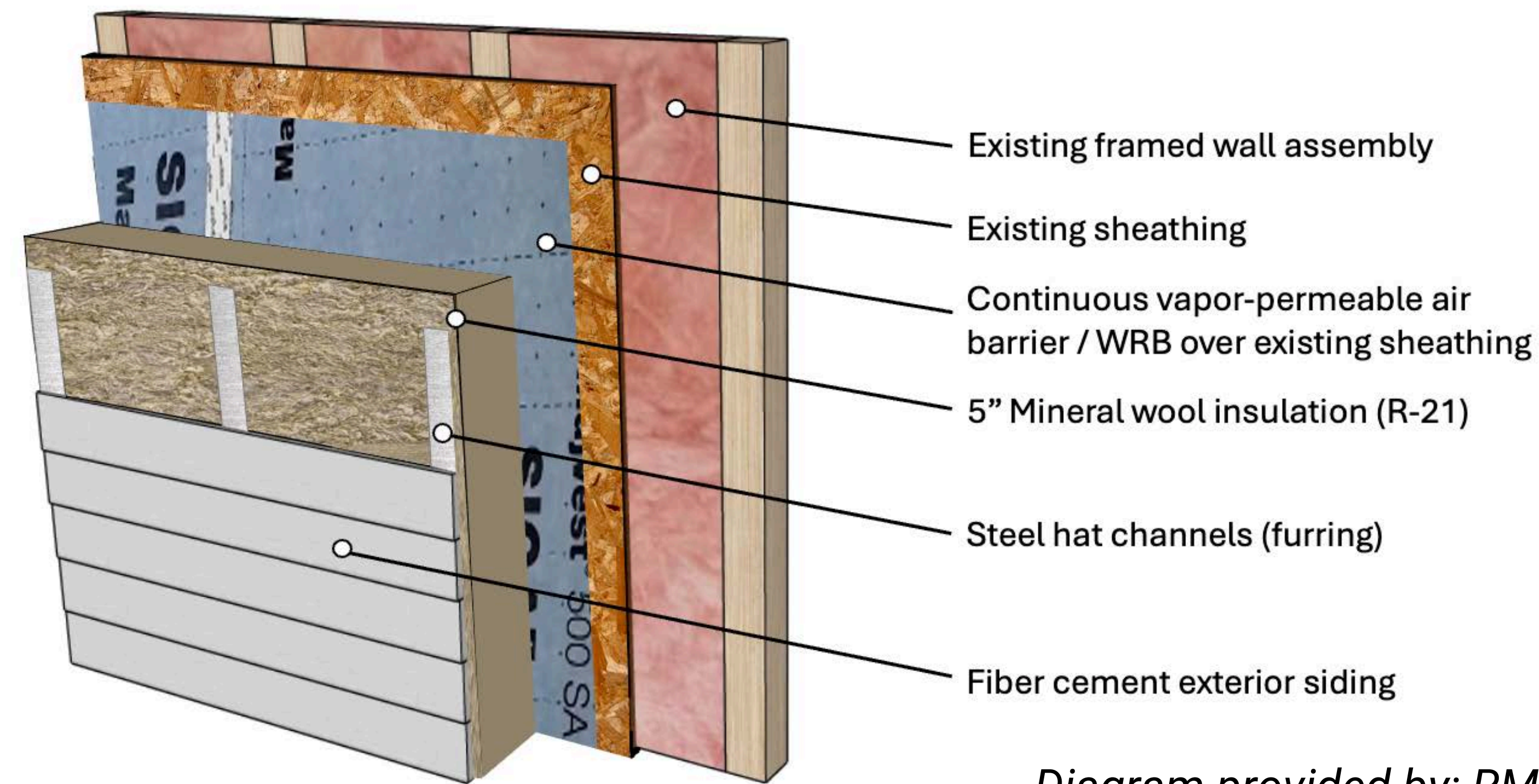
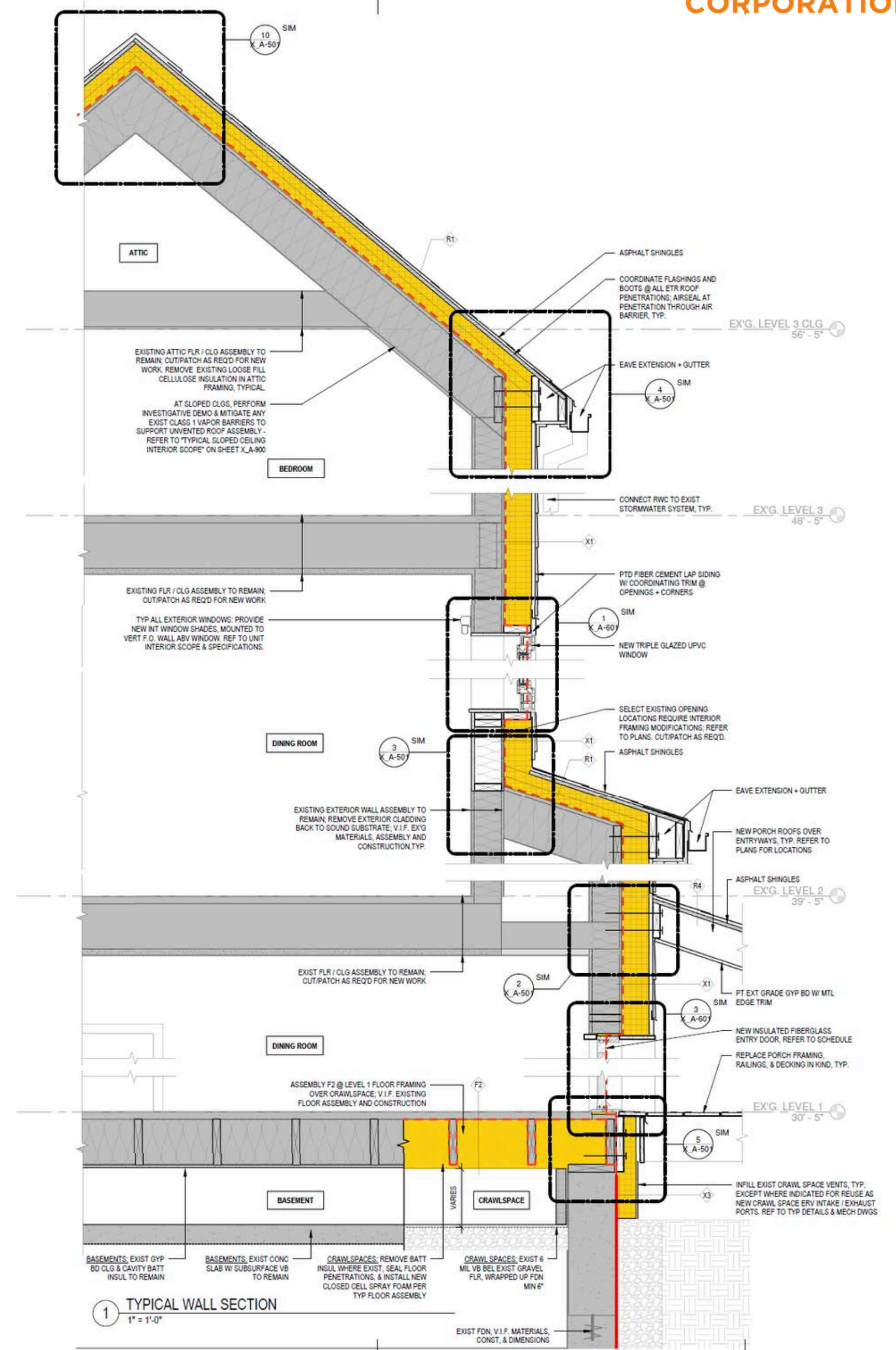


Diagram provided by: RMI

The new high-performance envelope has **enhanced airtightness and insulation**. Initial blower door testing throughout construction is showing high air-sealing testing results.



Given the varying design across 9 distinct buildings and high surface-to-volume ratio, the envelope design includes complex wall section assemblies and details.

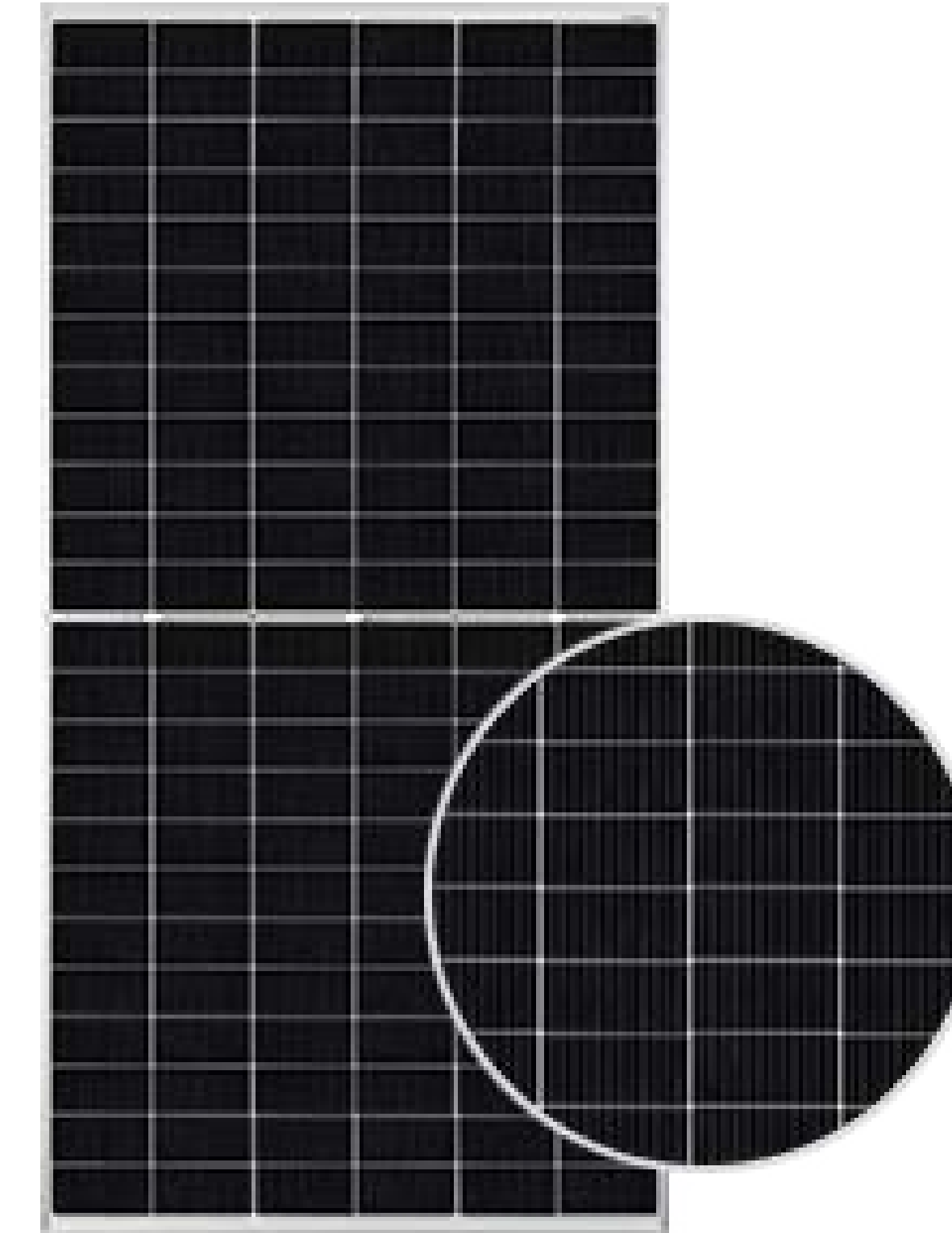
On-Site Solar PV

Harnessing the Sun to Offset Electricity Use



The rooftop solar arrays are a **94.8 kW DC** system size and will generate over **100,000 kWh of energy per year**. Solar panels will be installed on 7 of the 9 buildings. Early coordination across teams increased the total solar array size by 25%.

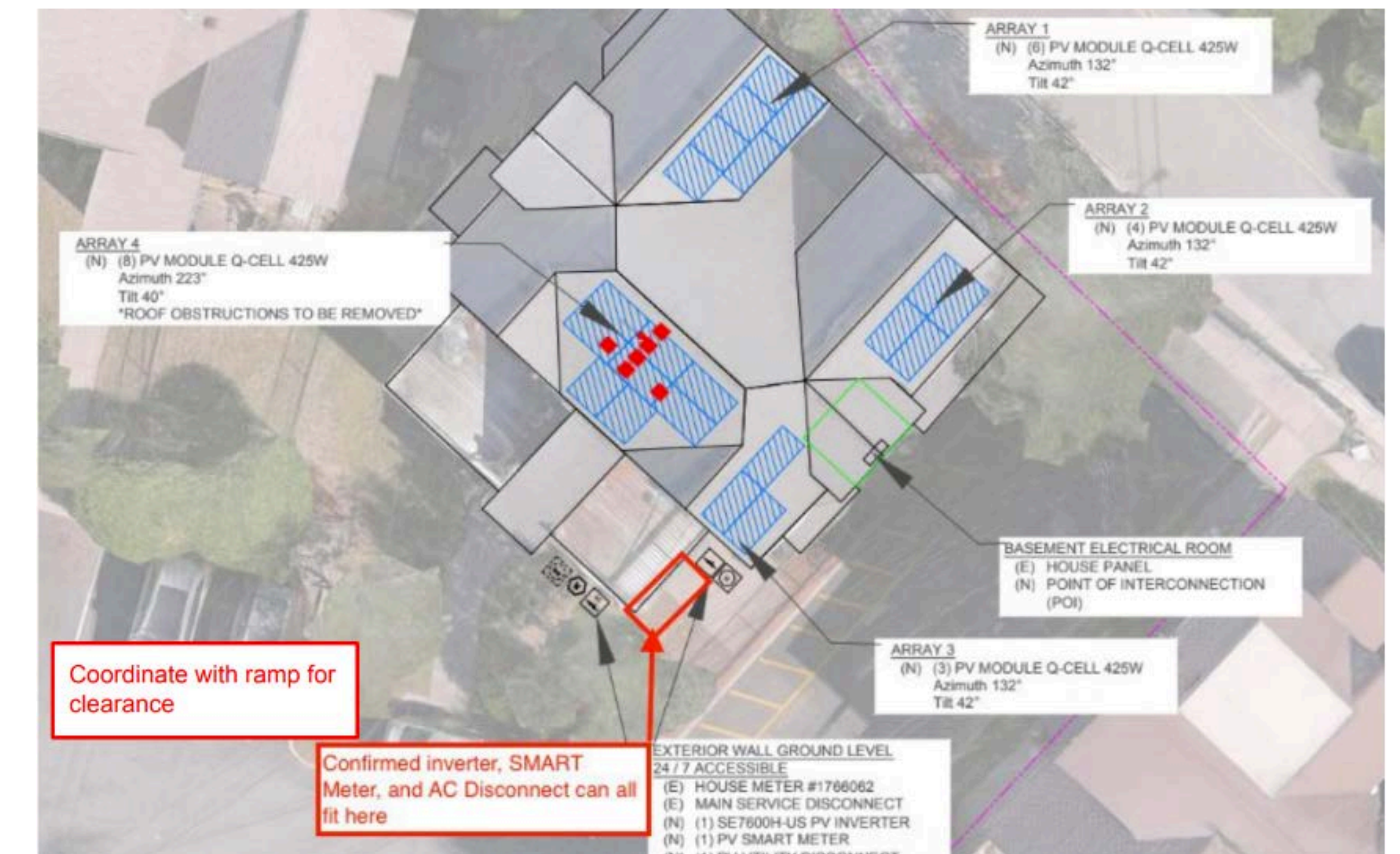
The solar system at Brian J. Honan Apartments taps into several solar incentives, including the SMART program and Environmental Justice adders to the federal Investment Tax Credit.



PV Module Q-cell 425W

The solar design maximizes panel installation, even given the site shade, pitched roofs, and existing venting on buildings.

Diagram provided by: Resonant Energy



Building F Solar Design and Coordination