STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Proceeding on Motion of the Commission to Implement the Requirements of the Utility Thermal Energy Network and Jobs Act	)))	Case 22-M-0429

Supplemental Information for Consolidated Edison Company of New York, Inc.'s Utility Thermal Energy Network Pilot Project Proposals

I. Introduction

In September 2022, the Public Service Commission (Commission) ordered[1] each of the State's seven largest utilities to propose at least one utility-owned thermal energy network (UTEN) pilot project as a means of implementing the State's July 2022 Thermal Energy Network Jobs Act (Thermal Networks Act).[2] Consolidated Edison Company of New York, Inc. (Con Edison or Company) is submitting this supplement to incorporate previously unavailable results from an open process that solicited impactful and executable UTEN projects. It builds on the Company's October 2022[3] and January 2023[4] proposals and provides details on pilot project selection, project descriptions, implementation timeline and cost controls, refined budgets, rate design, and labor and workforce development.

[1] Case 22-M-0429, *Proceeding to Implement the Utility Thermal Energy Network and Jobs Act* (Thermal Energy Network Proceeding), Order on Developing Thermal Energy Networks Pursuant to the Utility Thermal Energy Network and Jobs Act (issued September 15, 2022) (Thermal Energy Network Order).
[2] Laws of 2022, Chapter 375 (enacted July 5, 2022).
[3] Case 22-M-0429, Thermal Energy Network Proceeding, Summary of Consolidated Edison Company of New York, Inc.'s Proposed Utility Thermal Energy Networks Pilot Projects (filed October 7, 2022).
[4] Case 22-M-0429, Thermal Energy Network Proceeding, Consolidated Edison Company of New York, Inc.'s Updated Proposal for Utility Thermal Energy Networks Pilot Projects (filed January 9, 2023) (January UTEN Proposal).

In order to evaluate UTEN as a future utility offering and advance New York State's (NYS or State) climate and equity goals, the State should pursue a diverse portfolio of UTEN projects, including multiple projects both upstate and downstate. Utilities implementing these projects are certain to encounter both successes and obstacles that will contribute unique learnings to the policy discussion. Allowing too few projects to move forward risks leaving the Commission with too small of a data set from which to make decisions and determine future policy. The Company's portfolio of three pilots, two of which are located in disadvantaged communities, detailed in Section II, will generate benefits and maximize learnings in four areas: emissions reduction in alignment with the Climate Leadership and Community Protection Act (CLCPA);[5] reduction of electric system infrastructure investments and customer costs to electrify buildings; equity and access to clean energy solutions in disadvantaged communities; and a just transition for the gas and local workforce. The Company also proposes feasibility studies for two more projects, one of which would be located in a disadvantaged community, which the Company would be ready to implement if it pursues additional projects in the future. The Company seeks cost recovery on all pilot costs via a surcharge mechanism as described below in this filing.

[5] Laws of 2019, Chapter 106 (enacted June 18, 2019).

II. Pilot Portfolio

A. Summary

The Company solicited project proposals through a Request for Information (RFI) that closed on January 13, 2023.[6] The Company received and reviewed eight unique responses in addition to two internal pilot initiatives explored as alternatives to leak prone gas pipe replacements.[7] Con Edison selected[8] three pilot projects that scored highest, both as individual projects and when evaluated as a portfolio of projects to maximize a balance of learnings. The Company also identified two earlier-stage but promising projects that require additional feasibility assessment and development as discussed in Section III.

The proposed pilot portfolio in New York City (NYC) and Westchester engages up to 85 buildings covering 4.3 million square feet of floorspace, with approximately 570 housing units in disadvantaged communities. Taken together, these buildings represent the majority of building types in the Con Edison service territory: 1-4 family homes, low rise business, government, and community buildings, low- and mid-rise affordable multifamily apartments, and high-rise buildings (including a 70-story tower). The portfolio also encompasses a wide range of clean thermal energy sources and efficient electric heating solutions. Recycled heat from data centers, air conditioning, steam condensate, and geothermal boreholes will provide the thermal networks'

[6] Case 22-M-0429, Thermal Energy Network Proceeding, January UTEN Proposal, p. 6.

[7] The potential projects included five geothermal borehole projects and five projects proposing use of waste heat recovery from data centers, district steam condensate, sewers, and cooling towers. Of all ten projects Con Edison reviewed, five were located in disadvantaged communities in Manhattan, the Bronx, and Westchester County. The projects included a mix of commercial, multifamily, affordable housing, and residential homes. Case 19-G-0066, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Gas Service* (Gas Rate Plan Proceeding), District Energy Report (filed August 22, 2022) (District Energy Report).

[8] The Company established a project selection committee including representatives from internal departments in Customer Energy Solutions, Gas, Steam, and Research & Development (R&D). Respondents presented their concepts to the selection committee and answered clarifying questions. The Company also hired a technical consultant to review each submission in detail. The Company scored projects against RFI criteria such as alignment with UTEN objectives, cost, technical feasibility, and timeline to operation.

carbon-free thermal energy. Water to water heat pumps and water to variable refrigerant flow (VRF) equipment will deliver high efficiency electric heating and/or cooling. Building insulation and air sealing upgrades will reduce building energy consumption and improve occupant comfort. The three pilots will engage customers and resource providers with a range of rate structures,[9] and the pilots will also prioritize community engagement, the use of union labor, local job creation, and workforce development.

Con Edison's portfolio of pilot projects will provide the lessons necessary to scale UTEN solutions and benefits across the Company's service territory and statewide, including:

- Supporting achievement of CLCPA goals by reducing an estimated 39,000 metric tons of lifetime carbon emissions equivalent. It will also remove and recycle 56,000 MMBtu of NYC waste heat per year.
- Evaluating the system, societal, and customer value propositions of UTEN systems. The pilots will measure the reduction of the electric system impacts, which are estimated to be 50% compared to electrifying these buildings with air source heat pumps (ASHPs). The portfolio will also quantify the societal value and customer bill impact of electrifying buildings with high efficiency UTEN versus exclusively ASHPs.
- Testing two of three of the pilots in disadvantaged communities with the upgrading of over 500 housing units to high efficiency electric space and/or water heating equipment, and cooling where applicable, at no cost to these participants.[10] The Company will explore opportunities to engage with residents and the local community to increase awareness and interest in UTEN technology as a cutting-edge clean energy solution.
- Confirming technical feasibility of UTEN systems across a representative range of buildings, customer types, and network configurations in Con Edison's service territory. Given limited space and the high cost of geothermal boreholes in many parts of NYC, two pilots will validate the use of recycled waste heat as the UTENs' energy source. The

[9] See Section VII for details on rate design.
[10] In addition, customer bills will be equal or lower than what is currently paid for fossil fuel per Rate Design Section VII.

experience gained here will be necessary to unlock recycled waste heat capacity to heat an estimated 70,000 to 100,000 dwelling units in CECONY's territory.[11]

- Testing waste heat extraction from steam condensate with the opportunity to save the average large steam customer over 1 million gallons of water and 98% of their quenching water costs annually.[12] Based on approximately 20 potential sites, this application at scale could result in an estimated annual carbon reduction of over 160,000 metric tons CO_2e per year. Further, the portfolio will test and help quantify another potential new steam system value stream: providing reliable back up for thermal networks in Manhattan if recycled waste heat sources become unavailable during building equipment outage or periods of tenant turnover.
- Employing union labor for skilled trades work in construction and operation of Company-owned thermal energy network infrastructure and equipment. The pilots will also engage local businesses and employ local workforce in low-income communities, where possible, to prove out meaningful and scalable engagement models for union labor, local business, and local workforce development.
- Testing multiple UTEN rates for a range of customer types and business models, to develop rate classes for future scale UTEN thermal energy markets. These learnings will combine efficient engagement, usage, and fair cost allocation to balance the simultaneous consumption and contribution of thermal resources through the year, as detailed in the Rate Design Section VII.

The Company describes each pilot in detail herein.

[11] Estimate from analysis of data centers and sewer wastewater in CECONY territory; and research on other types of waste heat sources in EU (https://www.reuseheat.eu/)

[12] This is based on based on an evaluation completed on a proxy steam customer location. Customers typically dispose of their steam condensate by quenching it with city water to reduce its temperature, below the required DEP threshold of 150 F, in order to dispose of it.

B. Chelsea Project

Figure 1: Chelsea Project Participating Buildings

1. Overview

The Chelsea Project was submitted by the Zero Carbon Mile Consortium, which consists of Reshape Strategies and Related Companies (Related). This project will capture and recycle heat from a data center, located within a commercial office building in Chelsea, that would otherwise be released into the local environment. The current project scope includes providing heating, cooling, and domestic hot water services (DHW) to four nearby New York City Housing Authority (NYCHA) low-income multifamily buildings with bill protections to keep residents from paying more than what they would pay with the existing steam equipment. The Chelsea Project will provide the Company with experience harvesting excess heat from data centers, a major source of energy waste, as well as test a model for future disadvantaged community and affordable multifamily building participation in UTEN projects.

The Chelsea Project's major stakeholders include NYCHA, which owns the Fulton Houses, as well as Related and Essence Development (Essence), which manage the Fulton Houses under the Permanent Affordability Community Together (PACT) program with NYCHA. Vornado Realty Trust (Vornado) is also a stakeholder for the project, as Related and Vornado each have partial ownership of 85 10th Avenue, where the data center is located. The customer base for the Chelsea Project includes the residents of the four Fulton Houses buildings connected to the UTEN Pilot. These buildings are located within a disadvantaged community and provide housing for low-income residents in up to 336 units.

In this pilot, recycled excess heat from 85 10th Avenue will be delivered via a thermal energy main (Primary Ambient Loop) along West 16th Street to a clean heat pump facility (Energy Center) at NYCHA's Fulton Houses. Water-source VRF systems at each of the three low-rise buildings will connect to a Secondary Ambient Loop to provide both heating and cooling to the residents. Inside the Energy Center, a water-source heat pump will generate heat into a Primary DHW Loop to serve all four buildings with highly efficient all-electric heat pump-supplied DHW, also supporting space cooling. Buildings will also receive energy efficiency upgrades, where appropriate.

NYCHA is currently conducting long-term planning for Fulton Houses, presenting several scenarios to NYCHA residents for a survey that may result in either rehabilitation or rebuild of all buildings. This UTEN proposal described above has been designed with consideration and solutions which accommodate both scenarios. In the rehabilitation scenario, the proposal described above will proceed as is. In a potential future rebuild scenario, the new Energy Center will still be utilized and the UTEN will be expanded and applied to newly constructed buildings. Sequencing

of the rebuilds will allow for all upgrades to space heating, cooling, and domestic hot water systems in existing buildings to operate through near end of useful life.

2. Major Pilot Benefits & Learnings

The Chelsea Project will provide Con Edison and the State with the following benefits and learnings:

Table 1: Chelsea Project Major Benefits & Learnings

Benefits and Learnings	Details
Reduce emissions and achieve environmental goals at lower costs	• Reduce lifetime emissions an estimated 7,300 metric tons of CO_2e • Reduce impact to the electric system by an estimated 50% when compared to converting the building to ASHPs • Reduce overall building energy consumption and improve resident comfort by pursuing cost effective energy efficiency upgrades
Develop technical capabilities with opportunity at scale	• Prove out the recycling of excess heat when geothermal boreholes are costly or technically infeasible in dense urban environments • Pilot the use of excess heat from data centers, which are particularly promising UTEN thermal solutions because they are year-round resources with multiple suitable locations across the Con Edison service territory and the State
Benefit and engage customers and community	• Engage NYCHA residents and the local community to increase awareness and interest in UTEN technology as a cutting-edge clean energy solution
Match rate design with customer and system benefit	• Test rates that both keep the system in balance and are clearly understandable to multifamily building owners (detail provided in Section VII)

3. System Design

The Chelsea Project will consist of both Company-owned UTEN infrastructure and customer-owned equipment and infrastructure. Budget for the project is outlined in Section V. The construction scope of work for the project will be split as follows between the Company and the pilot participants:

Table 2: Chelsea Project Construction Scope of Work by Party

Party	Scope of Work
Con Edison	• 2,000 linear feet of distribution piping (Primary Ambient Loop supply and return piping) • Heat exchangers at 85 10th Ave and Energy Center to serve as demarcation point, hydronic isolation device and BTU metering point. • Hydronic pumping equipment and associated infrastructure for the Primary Ambient Loop • District steam maintained as backup for the loop and for on-site backup at Fulton Houses
Pilot participants	• Heat exchangers at 85 10th Avenue to collect excess heat • Development and construction of the Energy Center (central plant) at Fulton Houses • Water source heat pump and thermal storage located in the Energy Center for DHW • Water sourced VRF system at three Fulton Houses buildings • Cooling tower at Fulton Houses to reject excess system heat • Hydronic pumping equipment and associated infrastructure for the Secondary Ambient Loop • Air sealing measures, where appropriate • Electrical capacity upgrades at Fulton Houses new electrical service at the Energy Center, if required

Table 3 provides a more detailed breakdown of the participating buildings and how they will use the UTEN:

Table 3: Chelsea Project UTEN Design by Building

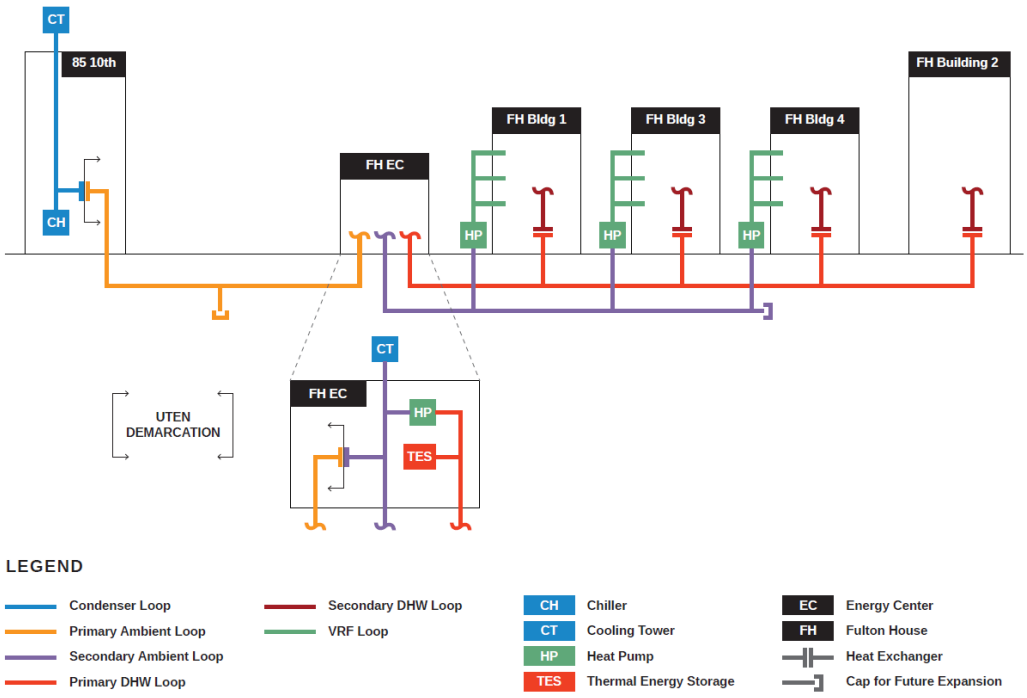
Buildings	Scope of Work
85 10th Avenue	• Primary Ambient Loop pumps and heat exchanger in 85 10th Avenue to collect excess heat • Piping to connect the UTEN system below grade and within a defined service vault area
Fulton Houses Property	• Construction and integration of Energy Center including water-source heat pump, thermal energy storage, pumps, secondary loop piping, controls, etc. • Primary DHW Loop from Energy Center to all four buildings • Secondary Ambient Loop from Energy Center to three buildings to be served with heating and cooling • Cooling tower

Fulton Houses Buildings
• 401 W 16th Street
  ○ 45,000 SF
• 418 W 16th Street
  ○ 45,000 SF
• 420 W 16th Street
  ○ 45,000 SF
	• VRF systems tied to Secondary Ambient Loop for heating and cooling
	• Air sealing at penetrations wherever possible
	• DHW Primary Loop integrated into existing DHW infrastructure within the building

Fulton Houses • 413 W 16th Street • 172,000 SF	• DHW Primary Loop integrated into existing DHW infrastructure within the building

The four selected buildings are located next to one another on 16th Street, adjacent to the run of underground UTEN piping infrastructure, and share a centralized DHW system. This UTEN configuration has the capability to serve a greater or lesser number of buildings. Selection of the identified four buildings provides a balance of customer benefit, depth of learnings, and project costs. Figure 2 is a one-line diagram for the Chelsea Project. A full-sized building one-line diagram and additional one-line diagrams can be found in Appendix B.

Figure 2: Chelsea Project Building One-Line Diagram



4. Customer Protections

The Chelsea Project will include system reliability backup options for two types of outages: (1) if the clean thermal energy supply from the 85 10th Avenue data center were to go offline; and (2) if the entire Primary Ambient Loop were to become temporarily unavailable (*e.g.*, unrelated street work accidentally damages pipes or mains). In either type of outage, a Con Edison steam shell and tube heat exchanger installed at the Energy Center would provide emergency backup heat to the Secondary Ambient Loop. In the event the Primary Ambient Loop becomes temporarily unavailable, Fulton Houses may isolate itself off the loop via valving and the Con Edison steam shell and tube heat exchanger will supply heat to the Fulton Houses side of the loop. If either outage scenario occurs during cooling season, the cooling tower will continue to extract and reject excess heat from the Secondary Ambient Loop.

There will be several options available to protect customers if the Chelsea Project needs to be unwound at the end of the pilot period. The Company could sell[13] the Company owned UTEN equipment to a third party or to one of the major customers on the system to continue providing the system service.[14] Alternatively, the Company could decommission the UTEN infrastructure in the public right of way. In this case, the 85 10th Avenue heat exchanger equipment would be removed and existing building cooling tower and chiller systems would provide full cooling capacity. Fulton Houses would continue to own the equipment within its property boundary and return to the existing district steam service via a heat exchanger. This would allow both the domestic hot water and VRF systems to remain operational as designed.

The Company is proposing customer financial protections in the Cost Recovery and Accounting Treatment (Section VI) and Rate Design (Section VII) portions of this filing.

5. Future Scalability

There are opportunities to scale this project over time. Seven additional buildings at the Fulton Houses site that are not currently included in this project could be retrofitted with a similar design under either the rehabilitation or rebuild scenario. The Company will continue to work directly with the NYCHA, Essence, and Related to integrate the UTEN pilot project into the buildings' rehabilitation or rebuild plans. There are a multitude of diverse customers within close proximity to the current project footprint who may be interconnected to allow for a major expansion of thermal energy resources in the UTEN system with existing excess heat sources.

[13] As described in the Cost Recovery and Accounting Treatment Section VI, benefits from the sale of this or the other pilots would accrue to ratepayers.
[14] For this and the other pilots, existing customer protections would need to be maintained as part of the sale.

C. Mount Vernon Project

Figure 3: Mount Vernon Project Participating Buildings

1. Overview

The Mount Vernon Project originated from a study the Company performed as part of its Gas Rate Plan District Energy Initiative, which identified sections of leak prone pipe in the Company's service territory.[15] The original project scope was limited to the area around the leak prone pipe section which was just one block. However, the Company retained the engineering consultants that were used on the original project, CDM Smith, and their subcontractor ZBF Geothermal, to expand upon that original scope for this UTEN proposed project. This UTEN project is designed to serve up to 76 buildings in a disadvantaged community, with approximately 75% residential customer participation, across seven blocks by building two ambient loops

[15] In accordance with its 2019 Gas Rate Plan, Con Edison pursued a District Energy Initiative and has already completed some feasibility and engineering efforts which have culminated in the selection of two potential geothermal close loop project sites. Both sites are in a disadvantaged community. Neither site, however, met the conditions established in the Company's rate plan to move forward independently because both exceed the cost of the traditional infrastructure solution. Case 19-G-0066, Gas Rate Plan Proceeding, District Energy Report.

connected via a balancing station and supplied with a constant energy source from newly drilled geothermal borehole fields.

The Mount Vernon Project will use existing parking lots and greenspace to install borehole fields, which will supply two ambient loops with a constant temperature source. The geothermal borehole fields, which will be drilled to approximately 500 feet, will be spread across two or more sites in the network to allow for diverse energy loading. The project configuration of two separate ambient loops will allow construction to be completed in a sequential manner and will enable learnings about system expansion for future scaling of the UTEN. The ambient loops will be connected via a balancing station which will allow for sharing of thermal energy between the districts. As a result, the Company will gain important experience operating a centralized UTEN balancing station as part of a district geothermal network in a more suburban disadvantaged community. Additionally, this interconnection will provide valuable experience in how future systems can be interconnected and expanded. Homes, apartment buildings, businesses, and government and community buildings will connect to the system via heat exchangers. The pilot will install UTEN-tied heat pumps and heating distribution, with the option for electrified cooling and domestic hot water based on the participating building configurations and customer preferences. The work will include electrical upgrades as needed and building air sealing and insulation to improve occupant comfort.

As shown in Figure 4, a portion of the Mount Vernon Project area contains a section of eight-inch cast iron leak prone gas main, located on S 9th Avenue between W 2nd Street and W 3rd Street. This 500-foot section of leak prone pipe supplies gas to nine 1-3 family home buildings. Customers connected to the leak prone portion of the gas main will be targeted for full building electrification, which will include electrification of space heating and cooling, domestic hot water,

and appliances such as stoves, ovens, and dryers. By fully electrifying these customers, the Company will be able to retire this leak prone pipe and take it out of service, avoiding a gas capital replacement project. The Company will not fully electrify other participants to manage change for customers who will be transitioning to a new technology and to manage pilot costs.

Figure 4: Leak Prone Pipe Section of Mount Vernon Project

The Mount Vernon Project's major stakeholders include owners of neighborhood establishments that will be connected to the UTEN loop. These include the Mount Vernon Neighborhood Health Center and the City of Mount Vernon, which owns the fire station and the Doles Recreation Center. Related will also be a stakeholder, as it owns Ebony Gardens, a 144-unit affordable housing community in Mount Vernon that will be connected to the UTEN loop. As such, this project will be directly serving low-income customers and the disadvantaged community in which the project is located. Residents of 1-3 family homes who connect to the UTEN loop will be important stakeholders for the project as well. Several religious buildings will be connecting to

the UTEN loop. Church involvement in the project can help increase community awareness and engagement throughout the process.

2. Major Pilot Benefits & Learnings

The Mount Vernon project will provide Con Edison and the State with the following benefits and learnings:

Table 4: Mount Vernon Project Major Benefits & Learnings

Benefits and Learnings	Details
Reduce emissions and achieve environmental goals at lower costs	• Reduce lifetime emissions an estimated 16,400 metric tons of CO_2e • Reduce impact to the summer electric system peak by an estimated 50% when compared to converting the building to ASHPs • Retire 500 feet of leak prone gas pipe • Reduce overall building energy consumption and improve customer comfort by pursuing cost effective energy efficiency upgrades, such as weatherization measures • Evaluate savings realized by pairing UTENs with energy efficient building air sealing and insulation
Develop technical capabilities with opportunity at scale	• Serve as a model for future projects in the NYC outer boroughs, Westchester, and across New York State in medium density and disadvantaged neighborhoods • Provide learnings on the installation of geothermal boreholes on private property as well as evaluate the feasibility of installing boreholes in public right of way • Test a statewide project model that isn't tethered to location specific resources like bodies of water or a large cooling-dominate loads • Revitalize an existing property as a Company-owned, centralized thermal balancing station to test operations of two distinct yet interconnected loops; develop learnings to operate a scalable station to expand district geothermal networks with positive community impact
Benefit and engage customers and community	• Test community engagement approaches to enroll customers and build cross-stakeholder support for UTENs in disadvantaged communities where residents may be less likely to engage with new utility offerings

	• Pursue educational programs for local students and residents to learn about the community's cutting-edge clean energy solution and increase awareness and interest in the technologies • Partner with Mount Vernon government, community, and labor leadership to maximize the engagement of local labor and minority and women owned business enterprises where possible in the construction and support of the pilots • Prove out local community engagement and workforce development models that could be applied across disadvantaged communities statewide
Match rate design with customer and system benefit	• Test residential and small commercial rates that are effective, fair, and understandable to participants while fairly reflecting geothermal system cost drivers (more detail provided in Section VII)

3. System Design

The Mount Vernon Project will consist of both Company-owned UTEN infrastructure and customer-owned equipment. Budget for the project is outlined in Section V. The construction scope of work for the project will be split as follows between the Company and pilot participants:

Table 5: Mount Vernon Project Construction Scope of Work by Party

Party	Scope of Work
Con Edison	• 6,000 linear feet of distribution piping • Installation of 3 borehole fields totaling over 100 boreholes • UTEN balancing station (hydronic pumps and loop heating/cooling capabilities for balancing) • Heat exchanger installations at each customer building to serve as demarcation point, hydronic isolation device and BTU metering point
Pilot participants	• Installation of new UTEN connected heat pump for heating with the option for cooling and domestic hot water • Air sealing and insulation to reduce heating and cooling loads and improve occupant comfort • Upgrades to existing electrical equipment where necessary

	• For customers associated with the section of leak prone pipe (9 homes) upgrades will include full-electrification including electric stoves, ovens and dryers as

Table 6 provides a more detailed breakdown of the participating buildings and how they will use the UTEN:

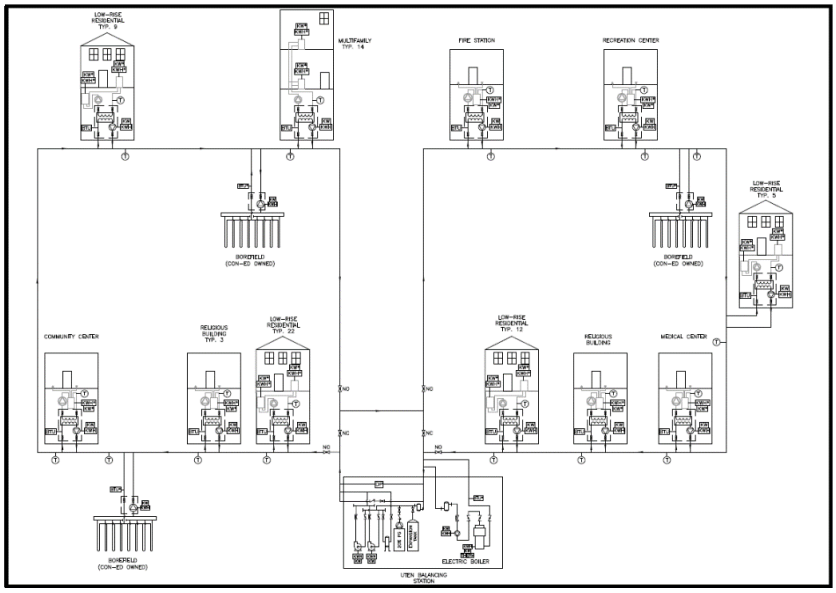
Table 6: Mount Vernon Project UTEN Design by Building Type

Buildings	**Scope of Work**
1-3 Family Homes	• Installation of heat pumps capable of heating and cooling[16] • Electrical upgrades if required to support new equipment
• Ebony Gardens • Mount Vernon Fire Station • Religious Buildings	• Installation of UTEN connected VRF system for heating and cooling • Electrical upgrades if required to support new equipment • Geothermal boreholes in parking lots/green spaces
• Mount Vernon Neighborhood Health Center • Doles Recreation Center	• Installation of UTEN connected rooftop heat pump air handling equipment for heating and cooling • Electrical upgrades if required to support new equipment • Geothermal boreholes in parking lots/green spaces

Figure 5 is a one-line diagram for the Mount Vernon project. A full-sized one-line diagram can be found in Appendix B.

[16] Nine of the 1-3 family homes, connected to the leak prone portion of the gas main, will be targeted for full building electrification including electric space heating and cooling, domestic hot water, and appliances.

Figure 5: Mount Vernon Project One-Line Diagram



4. Customer Protections

The Mount Vernon Project will include system reliability backup options for heating and cooling. The UTEN balancing station will house pumping equipment and backup heating and cooling capabilities, such as cooling towers and boilers, for the loop as additional redundancy, should the geothermal wells run into unexpected problems. Further, by having two interconnected loops as the UTEN configuration, energy can be shared between the loops to balance uneven loading. In addition, customer-owned equipment installed by Company contractors will be supported for the duration of the pilot.

Should the Mount Vernon Project be unwound at the end of the pilot period, the Company has the option to sell the complete UTEN system to a third-party or one of the major customers on the system. Another option would be to restore buildings to an alternative HVAC resource, returning to their original energy equipment or converting to air-sourced heat pumps. For buildings

located near a borehole field, the boreholes closest to that building can be isolated to that building so that the building can maintain its existing geothermal HVAC systems.

The Company is proposing customer financial protections in the Cost Recovery and Accounting Treatment (Section VI) and Rate Design (Section VII) portions of this filing.

5. Future Scalability

Within Mount Vernon, there will be opportunities to scale this UTEN Pilot. As shown in Figure A.1 in Appendix A, this project is in close proximity to another possible UTEN pilot, the Endurant Energy (Endurant) Mount Vernon project, being proposed as a feasibility study in Section III. This presents the possibility of connecting both Mount Vernon projects in the future to form a much larger interconnected UTEN in this area. The Feasibility Study discussion below in Section III contains additional detail. Also, although the Mount Vernon project is located in a suburban area, the community consists of similar homes and buildings in the surrounding 4-mile area of Mount Vernon, which can be added and connected to the loop at a future time.

D. Rockefeller Center Project

Figure 6: Rockefeller Center Project Participating Buildings

1. Overview

The Rockefeller Center Project was jointly proposed by Tishman-Speyer, AKF Engineering, and Ecosystem. It will consist of three large commercial buildings in midtown Manhattan that convert from steam heating to UTEN-connected heat pumps. The UTEN will utilize clean recycled waste heat from a variety of sources (multiple building systems, steam condensate) in the Rockefeller Center network of buildings, which span three full city blocks. This will provide year-round heating in two of the three buildings and meet year-round heating needs for multiple loads in the remaining building. Integration of the loop and the building cooling systems will also provide the option to use the loop to provide cooling. Because the customers using the system in this pilot are commercial buildings, the customers will share in the cost of the

pilot with their own capital contributions, given the project continues to generate reasonable returns.

The major stakeholders for the Rockefeller Center Project are the building owners that will be participating in the implementation of the project, as well as the community and additional customers that will be served by the UTEN. Buildings connected to the UTEN are owned by two major stakeholders: Tishman Speyer and Rockefeller Group. Tishman Speyer owns the 30 Rockefeller Plaza central plant, 1230 6th Avenue, and 600 5th Avenue. Rockefeller Group owns 1221 Avenue of the Americas. The portion of Rockefeller Center that will connect to this UTEN project hosts millions of visitors per year, including numerous seasonal community events that are free and open to the public. The commercial tenants of these buildings include financial services, non-profit organizations, childcare, legal, retail, and food and beverage companies.

2. Pilot Benefits and Major Learnings

The Rockefeller Center Project will provide Con Edison and the State with the following benefits and learnings:

Table 7: Rockefeller Center Project Major Benefits & Learnings

Benefits and Learnings	Details
Reduce emissions and achieve environmental goals at lower costs	• Reduce lifetime emissions an estimated 15,300 metric tons of CO_2e • Reduce impact to the summer electric system peak by an estimated 50% when compared to converting the building to ASHPs

Develop technical capabilities with opportunity at scale	• Test how to adapt UTEN to large high-rise buildings common to NYC in high density urban environments where geothermal boreholes are costly and can be technically infeasible • Validate the design, operation and balancing of a UTEN system using a wide range of recycled waste heat sources, including: o An ice plant o Heat recovery from Rockefeller Center o Data centers o Condensate heat recovery o Central plant heat pumps • Generate learnings necessary for future animated UTEN markets that dynamically balance clean thermal resources such as recycled waste heat generation with building heating and cooling needs • Leverage district steam condensate to act as a backup heating source for the ambient loop in the winter months
Benefit and engage customers and community	• Educate millions of annual visitors to Rockefeller Center, through free community events, with educational materials on clean energy benefits and Tishman Speyer's corporate commitment to be operationally net zero carbon by 2050
Match rate design with customer and system benefit	• Test rates that both keep the system in balance and are clearly understandable to building owners (detail provided in Section VII)

3. System Design

The Rockefeller Center Project will consist of both Company-owned UTEN infrastructure and customer-owned equipment. In order to help increase project viability, the Company will share the costs for required customer-sided upgrades. The budget for the project is outlined in Section V. The construction scope of work for the project will be split as follows between the Company and the pilot participants:

Table 8: Rockefeller Center Project Construction Scope of Work by Party

Party	Scope of Work
Con Edison	• 1,000 linear feet of UTEN distribution piping • Heat exchanger installations at each customer building to serve as demarcation point, hydronic isolation device and BTU metering point • Hydronic pumping equipment and associated infrastructure • Steam heat exchanger for UTEN outage backup
Pilot participants	• Piping and equipment at 30 Rockefeller Center for injection of waste heat (exhaust heat recovery coils, pumping stations, ice plant condenser water valving, chiller plant) • Installation of water source heat pumps tied to UTEN loop at: o 1221 Avenue of Americas o 1230 6th Avenue, and o 600 5th Avenue

Table 9 provides a more detailed breakdown of the participating buildings and how they will use the UTEN:

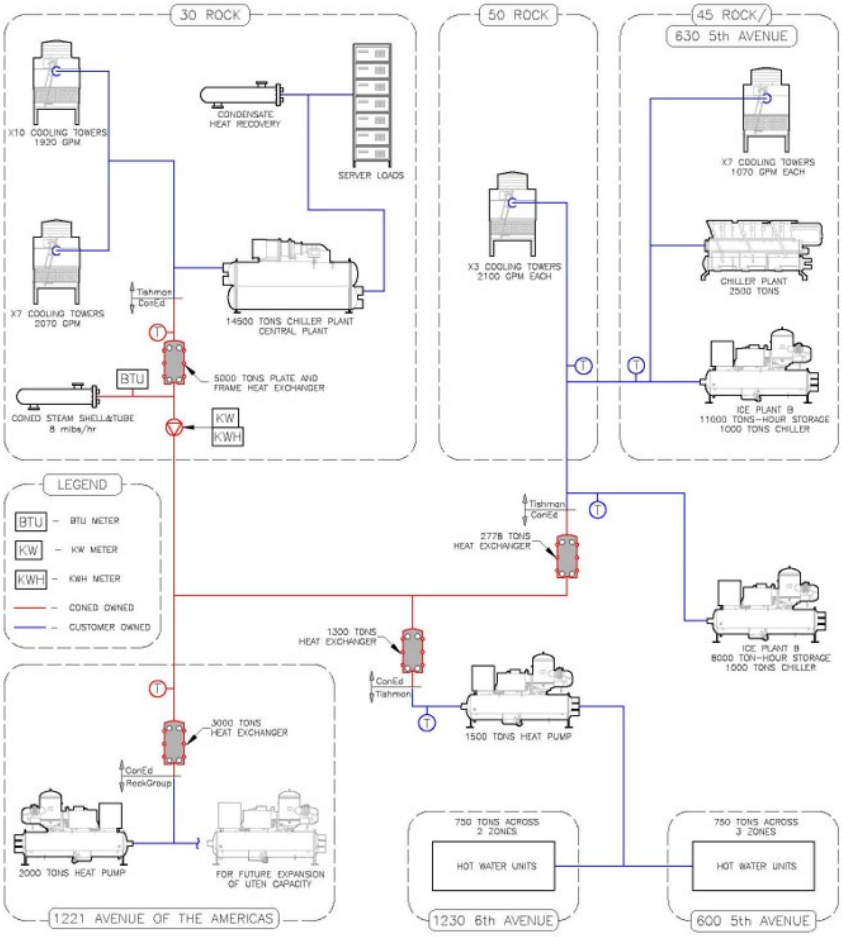
Table 9: Rockefeller Center Project UTEN Design by Building

Building	Scope of Work
30 Rockefeller Plaza and Central Plant	• Will mainly utilize the UTEN system to share waste heat from central plant (cooling) to the other buildings, but the system will have the capability for heating support
1230 6th Avenue	• UTEN system to be connected to the building's central plant system via heat exchanger • Large heat pump(s) to be installed for building heating • Installation of necessary hydronic pumping equipment • Integration into building cooling systems to allow for UTEN cooling contributions
600 5th Avenue	• UTEN system to be connected to the building's central plant system via heat exchanger

	• Large heat pump(s) to be installed for building heating • Installation of necessary hydronic pumping equipment • Integration into building cooling systems to allow for UTEN cooling contributions
1221 Avenue of the Americas	• UTEN system to be connected to the building's central plant system via heat exchanger • Large heat pump(s) to be installed for building heating • Installation of necessary hydronic pumping equipment • Integration into building cooling systems to allow for UTEN cooling contributions

Figure 7 is a one-line diagram for the Rockefeller Center project UTEN. A larger one-line diagram can be found in Appendix B.

Figure 7: Rockefeller Center Project One-Line Diagram



4. Customer Protections

While the Company and participants have designed the UTEN to meet building heating needs with clean recycled waste heat year-round, the pilot includes redundancy to protect against contingencies. The Rockefeller Center Project will include system reliability backup options for two types of outages: if the clean thermal energy supply were to go offline (*e.g.*, an equipment outage in a contributing building) and if the entire UTEN distribution system were to become temporarily unavailable (*e.g.*, unrelated street work accidentally damages UTEN pipes). To manage any temporary outage of recycled waste heat, a Con Edison steam shell and tube heat exchanger will be installed and connected to the UTEN loop. Should the UTEN infrastructure become temporarily unavailable, wherever possible, the buildings are maintaining their existing steam and electric energy building systems to provide heat and cooling as back up until the UTEN network is restored.

There are several options available so that pilot participants continue to have heating should the UTEN pilot be unwound at the end of the pilot period. The Company would have the option to sell the complete UTEN system to a third-party or to one of the major customers on the system which would continue to provide the UTEN service. Another option would be for the Company to decommission the UTEN infrastructure in the public right of way and sell the loops on Tishman Speyer owned property to Tishman Speyer, who would continue to deliver waste heat just to Tishman Speyer's 1230 6th Avenue and 600 5th Avenue. Rockefeller Group's building, 1221 Avenue of the Americas, would replace the water source heat pumps with a steam driven chiller.

The Company is proposing customer financial protections in the Cost Recovery and Accounting Treatment (Section VI) and Rate Design (Section VII) portions of this filing.

5. Future Scalability

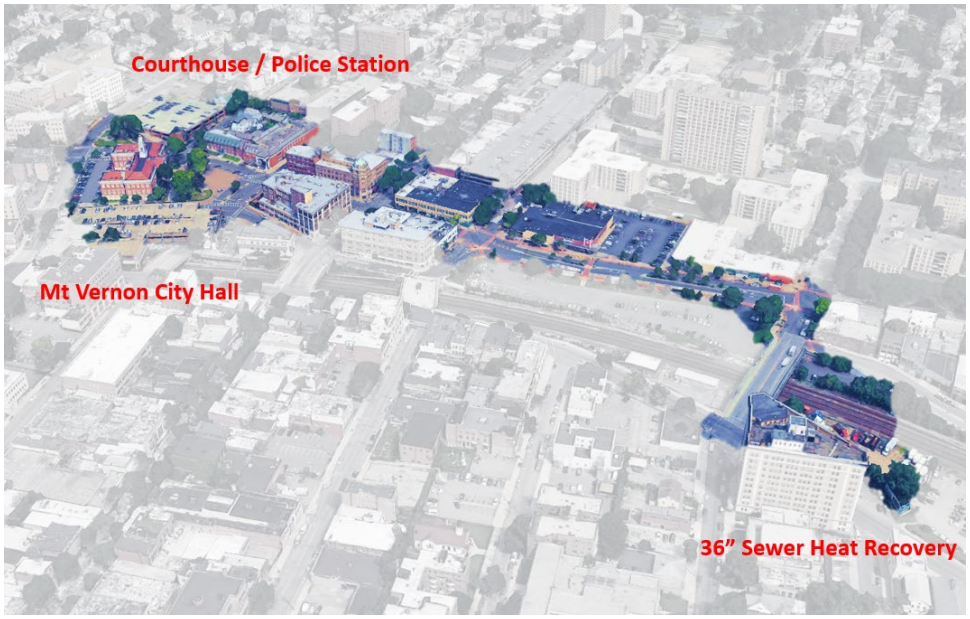
In the future, there will be opportunities to further scale this project. The project is surrounded by large high-rise buildings with varying energy usage profiles on all sides. Once the UTEN has been constructed, additional buildings can be added into the loop to provide and consume clean recycled waste heat.

III. Feasibility Studies

In addition to the three pilot projects described above, Con Edison identified two pilot project concepts with innovative solutions that required additional development before verifying pilot feasibility: the Endurant Mount Vernon project and the SUNY Purchase project. While the Company did not select them because they required more time and resources to build into full UTEN proposals, they are likely to be feasible and impactful opportunities once this additional work is complete. The Company requests an additional one million dollars in funding[17] for the Company to work with Endurant and SUNY Purchase to conduct this work. These feasibility studies will grow the pipeline of viable UTEN pilots without needing to release another market solicitation. With this approach, the State will have additional viable projects ready if a pilot fails and/or if additional UTEN projects are needed in the future.

A. Endurant Sewer Heat Recovery Project in Downtown Mount Vernon, NY

Figure 8: Endurant Mount Vernon Project Participating Buildings



[17] See Section VI for details on cost recovery.

Endurant submitted a project through the RFI for an ambient water loop connecting two identified city-owned buildings and acquiring additional customers in partnership with the City of Mount Vernon. The project proposes to recover sewer waste heat as the heating source for the loop with an optional second phase to connect adjacent buildings and drill geothermal boreholes for added capacity. This innovative sewer heat recovery system taps into an aging 36-inch underground sanitary sewer main to recover heat using a series of pumps to circulate the sewage water into a holding tank and through a heat exchanger. Both the city hall and the courthouse (connected to the police station) currently use natural gas and will require an energy assessment to determine scope of weatherization upgrades. The location is about a mile from Con Edison's proposed site location and is also designated as a disadvantaged community. There is a third site in Mount Vernon that is undergoing a feasibility study through funding provided by NYSERDA's PON 4614.[18]

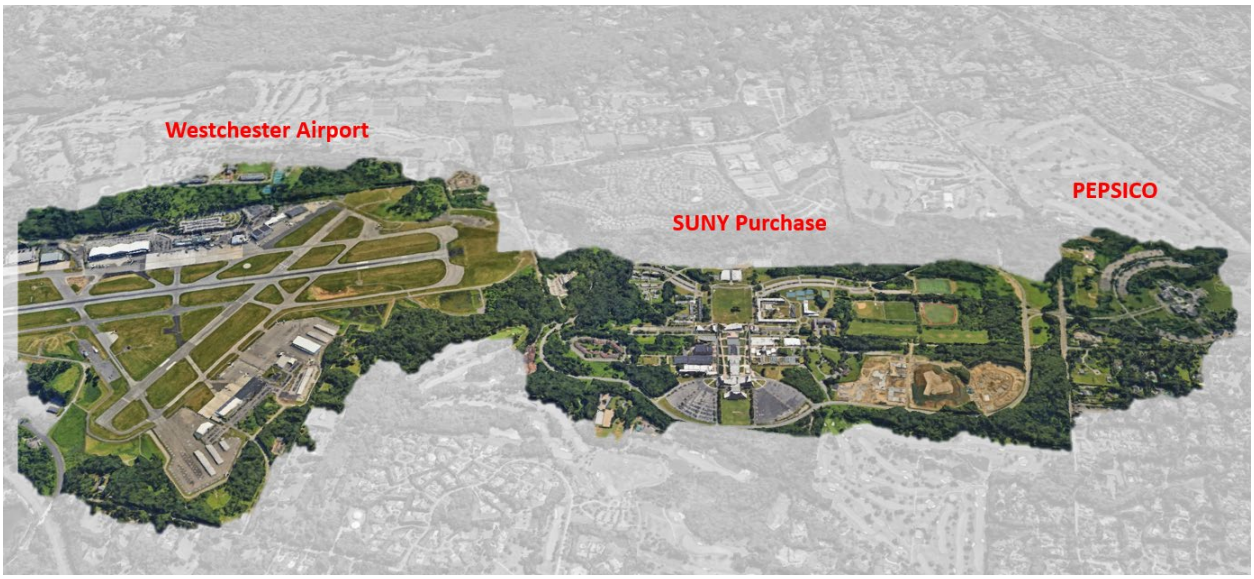
The project is a strong candidate for a feasibility study and project buildout to benefit the City of Mount Vernon in alignment with current sustainability goals, test an innovative sewer heat recovery technology, potentially expand this network and interconnect with Con Edison's Mount Vernon Project and any longer-term development arising from the PON 4614 to become an ambient loop UTEN system at scale. The feasibility study funding would help remove previously identified execution risks including coordination with ongoing sewer replacement work in Mount Vernon with project timing and associated costs, location of the building to house sewer exchange system equipment, environmental and health regulations affecting handling of sewage, weatherization and other upgrades required in city buildings, additional customer acquisition to

[18] See Appendix A for map of Mount Vernon projects.

connect additional non-commercial buildings for increased load diversity, and future proofing to interconnect with the Con Edison pilot.

B. SUNY Purchase Campus Project in Purchase, NY

Figure 9: SUNY Purchase Project Participating Buildings



SUNY Purchase, in partnership with Centrica and CHA Consulting, submitted a project through the RFI process proposing an ambient loop system that would connect four on-site academic buildings with thermal heat provided by geothermal boreholes. The Performing Arts Center, Visual Arts Building and Museum currently use natural gas for heating. The Administration Building currently uses a stand-alone fuel oil system. The university is committed to New York State's sustainability goals. SUNY Purchase hired a consultant to perform a test borehole in advance of submission to confirm ground soil conductivity would be suitable for bore fields located on the campus. While a compelling project submission, the proposed pilot only included academic buildings with limited load diversity and did not include alternative clean heat sources, mixed-use residences or off campus buildings owned and operated by other customers.

Con Edison worked with SUNY Purchase and their consultants to further develop an expanded scope in closer alignment with the UTEN goals and objectives. The new scope seeking feasibility study funding now includes SUNY Purchase's dormitory buildings and two sites located off the main university campus, Westchester County Airport and Pepsi Co. headquarters office buildings. The system will be designed as one centralized geothermal system with opportunity to test customer acquisition, routing of ambient loop under roadways, and innovative rate design across a variety of customers. This system has strong opportunities to scale within Purchase and will contribute important learnings in developing campus UTEN systems across several large diverse customers. In addition, this project would create a repeatable model that all utilities in the State could implement at other SUNY locations and other higher education campuses.

C. Feasibility Process and Timeline

Upon the Commission's approval of funding to pursue these feasibility studies, the Company will develop and scope a feasibility study for each of the two projects to refine estimated project construction costs, mitigate project risk and solve logistical design challenges. The scope will include a timeline and phasing of the project, if selected to be designed and implemented in the future. Funding for each study will be paid upon receipt of the final feasibility report and each study is expected to take 2-4 months to complete. Ongoing progress will be part of UTEN pilot reporting, and key findings can be made available when the studies are complete.

IV. Implementation Timeline and Cost Controls

Con Edison appreciates the complexity of these novel thermal energy network pilot projects and will structure implementation with gates and controls to manage costs and limit risk at each stage. The Company has developed an itemized project scope and cost estimate for each proposed project. Full engineering design studies will be the first step in the Company's process for each approved project, followed by developing detailed construction scopes of work, issuing procurements, and contracting work. The Company will initiate system and customer construction work once contracts are in place. Table 10 provides detail on this approach, including share of total spend against each phase of work.

Table 10: UTEN Portfolio Implementation Timeline

UTEN Stage Gates	Duration	Share of Total Costs	Activities
Preparation of pilot project proposals	Q4 2022 – Q2 2023	<1%	• Conceptual design • Cost estimation • Building walkthroughs • Street survey • Initial stakeholder engagement
Public Service Commission approves pilots			
Procure and complete design of pilot projects	6 months	5%	• Procure contracts for final design of projects • Complete final design • Finalize cost estimates • Finalize stakeholder and customer commitments • Comparison of original construction estimate
Evaluation of finalized design and prepare for construction procurement	2 months		
Design completed			

Commence construction of UTEN and customer-sided work	12-18 months	85%	• UTEN infrastructure • Customer-sided upgrades
Construction completed			
Pilot operation	5 years	10%	• Operate pilots and collect data
Pilot project phase completed			

V. Budget

The Company has refined project scopes and the respective budgets since the January UTEN Proposal, quantifying costs that had previously been identified but not calculated,[19] and adding contingency. As shown in Table 11, the Company estimates $209 MM plus $53 MM of contingency funding to develop and complete three thermal energy network pilot projects.

A. Project and Portfolio Budgets

Table 11: Summary of Total Project Costs ($MM)

Category	Chelsea	Mount Vernon	Rockefeller Center	Total
UTEN construction	10.3	16.6	17.5	44.5
Customer construction (Company contribution)	40.2	16.9	17.0	74.0
Engineering design, implementation, and operational costs	14.4	14.7	20.1	49.2
Utility capital overheads and sales tax	3.2	3.2	3.7	10.2
Estimated project costs	**68.1**	**51.4**	**58.4**	**177.9**
Portfolio administration costs				31.5
Estimated portfolio costs				**209.4**
Contingency (30% of estimated project costs)				53.4
Total				**262.7**

Construction costs include UTEN construction (*e.g.*, ambient loop distribution piping system, balancing station) and Company contribution for customer equipment (*e.g.*, building

[19] *E.g.*, utility overhead and sales tax, support services, and data collection and management.

upgrades, heat pumps). For the project at Rockefeller Center, the Company intends to share the cost for required customer-side equipment in order to make these projects viable for the participating customers. Engineering design, implementation, and operational costs include engineering and construction management services, commissioning, and UTEN system maintenance. Overarching portfolio administration costs, such as support services, program management, and data management will be distributed proportionally across the three pilot projects.

As discussed in Section IV, these cost estimates were based upon conceptual designs of the projects. The Company collaborated with an engineering consulting firm that has experience in installing thermal network systems to estimate project costs. Where uncertain, the Company utilized historical cost data and best practices from traditional utility projects. Given that these projects are in early stages of design, the Company has applied contingency to cover unexpected developments in project requirements.

B. Budget Flexibility

Given the novelty of these pilots as laid out in Section IV, the Company must be empowered to quickly adapt the projects to the inevitable challenges and opportunities that will arise during design and implementation.

To achieve this, the Company seeks budget flexibility among capital and non-capital work. For example, as the Company finalizes the design of the Mount Vernon Project, the Company may determine that investing greater dollars in customer building insulation upgrades (non-capital) to reduce the required number of boreholes (capital) to meet the heating load would lead to lower overall project costs.

The Company also proposes the ability to shift funds between pilot projects, in consultation with DPS Staff. The goal is to be cost-efficient with the construction of the UTEN systems and, should they realize cost savings, such flexibility would enable additional scope that would benefit pilot customers and increase learnings. For instance, redeploying already authorized funding could allow the Company to pursue additional customer-sided upgrades that were not part of the initial scope, further increasing building efficiency and comfort and creating added learnings.

VI. Cost Recovery and Accounting Treatment

The Company proposes to recover all costs for all projects. The Company will treat all capital investments owned by the Company as capital expenditures recovered over the useful lifetime of the assets. Given that this technology will be newly integrated at utility-scale, a generally accepted useful life for UTEN equipment does not currently exist that would enable the Company to assign a particular number of retirement units. As such, the Company will propose average service lives and capitalization requirements for the potential retirement units at a future date.

The Company proposes recording costs that are not typical Company capital expenditures[20] as regulatory assets and amortizing these expenses over fifteen years. This generally aligns with the useful life of the customer-sided equipment that would also be partially funded via these pilots.

The Company proposes to recover costs from electric customers to align costs with those customers who will be directly benefitting from the UTEN investment.[21] Potential customers currently heat with many different fuel sources including district steam, oil, and gas. Electricity is

[20] *E.g.,* Company labor and buy-downs of customer equipment costs

[21] As proposed in the January UTEN Proposal, the Company proposes to recover costs from electric customers through the Monthly Adjustment Clause for Company customers and through a surcharge for New York Power Authority customers. Case 22-M-0429, Thermal Energy Network Proceeding, January UTEN Proposal, P.p. 17-18.

the common energy source for all potential pilot customers. Additionally, wider adoption of thermal energy networks in an electrified future would reduce the peak electric system demand when compared to electrification by air-source heat pumps, helping to manage electric infrastructure needs and benefiting electric customers. Finally, as shown in Table 12 below, recovering the cost of the proposed UTEN pilots would have a lower bill impact than if the pilots were recovered from gas customers.[22]

Table 12: Comparison of Estimated Customer Bill Impact[23]

If UTEN Recovered Exclusively From:	Average Bill Impact [%]	Residential Bill Impact [%]
Electric customers	0.30%	0.22%
Firm gas customers	1.12%	1.09%

While the Company intends for each of the pilots to be successful and operate its full useful life, these are first-of-their kind projects in New York State and in Con Edison's densely populated service territory. If the project terminates, the Company will recover all undepreciated balances as regulatory assets over a 15-year period.[24]

Pilot portfolio customers have expressed that they cannot participate in the pilots unless alternatives to the pilot's ongoing operation are available to meet their heating and cooling needs should the pilot cease operations. Customer costs in this scenario would include the cost to restore

[22] The rate impact for the pilots and UTENs will, in the longer term, be lower when recovered across the larger electric rate base than the gas rate base and paired with the offsetting impact of increased electricity usage. Case 22-M-0429, Thermal Energy Network Proceeding, CECONY and O&R Reply to Party Comments on UTEN Proposals (filed April 24, 2023).
[23] Based upon current estimate of project costs.
[24] For instance, the Company could be forced to end a pilot because of unique construction issues, unforeseen operational problems, or future decisions made in the UTEN proceeding.

heating and cooling after loss of UTEN infrastructure[25] and the write-off of building upgrade investments made specifically for the UTEN. On the utility side, the Company would decommission the UTEN system (*e.g.*, restore facility/property to suitable conditions, dispose of site infrastructure). To enable pilot participation and address this contingency, the Company shall record these expenses as regulatory assets and recover them using a 15-year amortization period.[26]

If it were required that the Company exit a pilot by selling UTEN infrastructure to a customer or third party, the Company proposes that any such proceeds accrue to the benefit of electric customers.

The Company will pursue the Geothermal and/or R&D Investment Tax Credits (ITCs), as provided in the Inflation Reduction Act, for each project where eligible.[27] If eligible, the Company will claim the credit(s) in accordance with IRS Normalization rules and provide the benefit to electric customers, when realized.[28]

VII. Rate Design

The Company designed three unique UTEN rate structures to be tested for each of the three proposed pilot projects. The rate design process was guided by core principles that were used to develop efficient pricing signals that would be easily understood by customers. By offering multiple rate designs, the Company seeks to learn which rate model(s) will work best across a variety of customer and system design types with opportunities to be replicable at scale. Successful rates tested in the pilot phase will result in fair cost allocation across participating customer types

[25] The Company is mitigating this potential impact by keeping existing customer heating and cooling equipment in its pilot design. The Pilot Portfolio Section II above provides additional detail.
[26] The Company currently estimates the cost to close down all three pilots at $35-$45MM.
[27] The Rockefeller and Chelsea projects are unlikely to qualify for the Geothermal ITC because they do not have geothermal wells.
[28] The Company notes that the ITC is applicable for systems that are in service for five years. In the event that the assets are deemed no longer used or useful within five years of being in service, the Company would be subject to investment recapture. The Company proposes to recover all costs associated with recapture as a regulatory asset.

and determine how customer behavior is influenced by price signals to maintain UTEN system heating and cooling efficiency and thermal balance. The proposed rate designs align with each customer's role within the network as a consumer and/or waste heat provider as well as the customer's capability to respond to dynamic rates. For example, some commercial customers operate highly sophisticated buildings with multiple waste heating sources while other customers will be less sophisticated users acting exclusively as energy consumers on the UTEN system. These learnings will enable efficient engagement and fair cost allocation for different customer segments to balance the simultaneous consumption and contribution of thermal resources through the year.

To enable customer participation in these first projects and generate the learnings necessary to scale up UTEN systems beyond the pilot stage, pilot rates will be structured such that customers' future energy bills on the low carbon UTEN network are lower than on their existing fossil fuel-based systems. As a consequence of these pilot protections, customers participating in the pilot will not cover the entire pilot-related revenue requirement. For these pilots, electric ratepayers will contribute the revenue requirement with the UTEN rates offsetting some but not all (described in Cost Recovery and Accounting Treatment Section VI).

A. Structure to Drive Participation

As introduced above, the Company will establish UTEN pilot rates which create a financial benefit for customers to participate in the pilots. The Company will design rates that result in expected customer heating and cooling bills that are lower on UTENs than they would have been if the customer had maintained their existing equipment.

The approach to setting this financial incentive will vary based on customer type and rate structure. For example, the Company will aim to provide residential customers participating in the

Mount Vernon pilot with consistent bill savings in addition to their new, efficient UTEN equipment, air sealing, and insulation. For commercial customers that are investing their own capital into UTEN enabling building upgrades, the Company will aim to establish rates that enable a return on investment consistent with that achieved in other long-lived building energy efficiency upgrades in commercial office buildings.

B. UTEN Bill Cap

For residential and small commercial customers participating in the Mount Vernon Pilot and Chelsea Pilot, the Company will introduce bill protections to keep those customers from paying more for heating and cooling on UTEN than they would have if they maintained their existing fossil fuel equipment. These customers may be concerned that adopting a new heating technology and adding a new energy service will increase their costs. They also likely lack the technical knowledge and resources to evaluate the risk of participation. Providing bill protections will be necessary to overcome customer concern and to convince these customer segments to participate at this pilot stage.

Under these bill protections, the Company will set a heating and cooling bill cap when the customer enrolls in the pilot. This bill cap will reflect the expected heating and cooling bills for the customer if they had remained on fossil fuel equipment. After a predetermined period, the Company will calculate the customer's realized bills for heating and cooling, including an estimate of the share of the customer's electric bill attributable to heating and cooling, and compare that cost to the bill cap. If the realized bills are higher than the bill cap, the Company will refund the incremental cost to the customer.[29]

[29] Such refunds would be considered costs to be recovered as described in Section VI above.

C. Project Rate Design Per Pilot

1. Chelsea: Contracted Waste Heat Network

The Company's proposed Chelsea rate design prioritizes customer experience and simplicity. It includes a commodity rate and a network rate. The rate provides cost-stability to Fulton Houses and revenue-stability to 85 10th Avenue. The rate is scalable to incorporate additional waste heat suppliers or to be applied to other similar UTENs in which network roles are clearly demarcated and suppliers have excess waste heat in all or at seasonal times of the year. This rate design could serve as a template for future networks with waste heat and residential and commercial consumers without advanced energy management capabilities.

The proposed design of the commodity rate is a flat volumetric (per kBTU of exchange) rate for both heating and cooling. These rates will be based on the service being demanded (heating or cooling) and not based on the season. The level of these rates will be set based on the relative avoided costs of heating and cooling. This concept satisfies two key goals of rate design for the pilot: (a) that Fulton Houses receive commodity cost savings relative to their current fuels, and (b) that commodity rates are cost-reflective since they are based on avoided costs.

Because network cost is driven by capacity requirements, the Company proposes recovering a portion of the network cost and its regulated return though a contract demand charge. This contract demand charge will be a fixed monthly charge based on a customer's peak (contracted) capacity. Both the supplier (85 10th Avenue) and the consumer (Fulton House) will pay the network charge.

2. Mount Vernon: Shared Geothermal Neighborhood

The Company proposes that the rates for the Mount Vernon pilot be simple, transparent, and broken into rate classes based on customer type – Residential, Small Non-Residential, and Large Non-Residential.

Rates should reflect the structure of the incurred costs,[30] so the Company proposes recovering a portion of all embedded costs of the network, including the boreholes, loop piping, customer-sited equipment, and operating costs through fixed charges. Boreholes are the primary thermal energy source in the Mount Vernon pilot and are expected to be sufficient for all the heating and cooling demand for the entire system. The Company will also build and operate a centralized UTEN balancing station to house water pumps. The cost to operate the balancing station and loop are relatively constant and can be considered fixed costs.

The Company proposes two different designs for these fixed charges: a contract demand charge for Large Non-Residential customers (over 500 kBTUh) and a monthly fixed charge for Residential and Small Non-Residential customers (less than 500 kBTUh). The Large Non-Residential customers are classified as having a peak heating load. For the Residential and Small Non-Residential classes, the fixed charge will be set based on the average heating demand of all customers with the rate class.

This rate design is both cost-reflective and customer-friendly – it reflects the fact that most of the cost of this network is fixed, and the fixed price also provides a relatively simple rate design. Additionally, for Large Non-Residential customers, the contract demand charge sends a price signal which encourages building improvements that lower annual peak demand.

[30] Case 22-M-0429, Thermal Energy Network Proceeding, January UTEN Proposal, p. 13.

The pilot will include engagement with smaller customer participants to educate them on their customer bill protections and how their energy bills will change after connecting to the UTEN system.

3. Rockefeller Center: Transactive Thermal Energy Market

The Rockefeller Center project is designed to allow for the sharing of thermal energy between commercial buildings in Midtown Manhattan with highly sophisticated energy plant operations. The sophistication of the customers' operations and the variety of supply options allows the Company to design and test a highly dynamic commodity rate in this pilot. This rate design requires customers be able to receive and automatically respond to real-time pricing to optimize energy usage. While this rate is currently only suitable for sophisticated large commercial customers, it also holds promise for greater participation in the future. As smart, connected heating and cooling systems become the norm, even smaller customers could have the capability to respond to real-time pricing using automated systems.

In order to incentivize efficient dispatch of the various available thermal resources, the Company proposes a novel "temperature-of-use" commodity rate. Under this design, the price of the thermal energy commodity (measured in dollars-per-MMBTU) varies based on the average temperature of the loop. The rate would operate as follows:

- Within a predetermined "temperature deadband", there is no temperature-of-use charge for use of loop (exchange of BTUs)
- As loop temperature drops, customers get paid to inject heat to loop and pay to remove heat
- As loop temperature increases, customers get paid to extract heat and pay to inject heat
- Price signals increase as temperature moves away from ideal operating range

- A price ceiling is tied to the cost of district steam such that customers will not pay more for extracting waste heat than they would on steam and suppliers will not be paid more than it would cost to balance the loop with steam
- If the loop temperature rises above a reasonable threshold, the price signal will incentivize customers to use their own equipment (cooling towers or ice storage) instead of injecting additional heat

The Company will test the extent to which the temperature-of-use price signal will result in a loop which requires minimal central balancing and enables efficient compensation of different types of thermal resources, including waste heat in an animated market. It is applicable across a wide variety of network designs. It can be used in a network with any number of consumers, suppliers, or prosumers, any type of thermal source, and any type of services (heating, cooling, DHW).

Because network cost is driven by capacity requirements, the Company proposes recovering the network cost and its regulated return though a contract demand charge, which is a monthly charge based on a customer's peak (contracted) capacity.

VIII. Labor

A major objective of the Thermal Networks Act is the engagement of union workforce, including workers in trades impacted by future changes to the gas system. Successful rollout and implementation of UTENs requires a trained and qualified workforce that can install, operate, and maintain the required infrastructure. The Company has identified two major workstreams for the transition of skilled labor towards UTEN systems: third-party contractor workforce and internal Company workforce. Both workstreams are important to not only the success of the pilot projects, but also towards the scaling of thermal energy networks in the future.

A. Third-Party Contractors

The Company will procure third-party contractors for work on both customer-sided equipment as well as Company-owned UTEN infrastructure. Examples of customer-side work are plumbing and HVAC installations in customer buildings to connect to the UTEN. Company-owned UTEN infrastructure includes installation of UTEN distribution piping, installation of geothermal boreholes and excavation and street restoration. The Company will require that all skilled trade work on the thermal energy network infrastructure and equipment which it procures for these pilots be completed by a union workforce. In addition, the Company will collaborate with local community organizations and trade groups to educate and share information regarding the potential UTEN work opportunities and seek vendors that will incorporate and develop local workforces. Throughout the project, the Company will also pursue opportunities for apprenticeships aligned with the Thermal Networks Act.

B. Company Workforce

The Company will enter into a Labor Peace agreement with UWUA Local 1-2 for the internal workforce. The Company will also design a short-term and long-term workforce plan to train employees with the skills, knowledge, and abilities to meet the strategic objectives of the Thermal Networks Act. This effort will proceed across three stages: 1) Workforce Development Plan; 2) Training and Implementation; and 3) Workforce Integration.

1. Workforce Development Plan

a. Establishing the Workforce Development Committee

The Company will first establish a UTEN Workforce Development Committee (WDC) which will focus on Company labor, consisting of key internal stakeholders from across the Company. The mission of the WDC will be to develop a Company workforce plan that will deliver the right mix of employees to install, operate and maintain the new UTEN infrastructure. The WDC will consist of key stakeholders from Company organizations such as Gas Operations, Gas Engineering, Human Resources, Union Labor Representatives, and the Learning Center. The WDC will provide oversight over all components necessary to integrate and transition existing company employees to perform UTEN work functions, including determining the right skill sets required, the number of individuals needed for each job category; content and schedule of training programs; and decide what other areas of the organization will be part of the mix of staffing for the projects.

b. Workforce Needs and Available Talent

The WDC will focus first on understanding all aspects of the nature and scope of the work related to the provision of thermal energy for heating and cooling. This clarification of work objectives is intended to aid in the development of an improved outline of the duties and tasks

associated with the project and is expected to provide insights into the amount and type of roles needed to meet project deliverables.

The next step is to determine available talent within the Company. Based on the similarities of the infrastructure piping used for thermal energy networks and Con Edison's natural gas system, existing gas personnel within Con Edison will play a central role in staffing the UTEN project. The unique experience of current gas operations employees gained through working on the gas system over time, positions the company to upgrade the skills of this group more rapidly, and therefore quicken the learning curve required to meet any special skills associated with the UTEN systems. In addition to the gas workforce, additional employees from other departments will be evaluated for their suitability to support the needs of the UTEN pilot projects, including employees in Customer Operations, Environmental Health & Safety, Construction, Call Center, the Learning Center, and the Control Centers.

c. Skills Assessment and Identifying Gaps

A skills assessment will be a necessary part of the Company workforce planning process to properly match current employees against the specific knowledge and skill requirements of UTEN. The WDC will select those candidates with the right knowledge and talents for the project after conducting this skills assessment.

To staff the project with a sufficient number of people and with the right skills and experience to successfully complete the project goals and objectives, the WDC must also address skill gaps. After undertaking a skills inventory, the WDC will best understand what skill gaps exists within the company and will create a training and development plan to close those gaps. The role of the WDC will entail creating an outline of training activities to raise the levels of skills required for UTEN pilot execution.

2. Training and Implementation

The WDC, working closely with the Con Edison Learning Center, will create new curriculum and/or leverage existing training and development programs to reskill and or upskill existing gas employees and other Company personnel, as needed. Training programs will consist of entry-level and career path Company-led programs and will include a variety of methods, such as classroom training of field employees to effectively operate and maintain thermal energy systems; on-the-job hands-on experience; digital learning; job aids and mentorship to support the transition to new UTEN systems. Providing retraining opportunities and support for employees is consistent with the Company's culture of building on existing technical skills and serves to motivate the workforce.

Throughout the transition, it is important that field operating departments and personnel establish basic work principles and procedures to be able to maintain and operate the pilot projects. In addition, all other functions outside of operations will be trained and prepared to supplement the needs of the UTEN pilot projects. These include but are not limited to, Billing Department, Call Center Representatives, Energy Services, and the Learning Center.

3. Workforce Integration

In addition to preparing internal organizations and personnel for the workforce transformation, the WDC will also partner with union leaders and representatives to facilitate a smooth transition of work activities. This involves sharing the Company's clean energy priorities and how this move fits into Con Edison's overall business strategy. Partnering with the union at every stage of the process will increase support for building a workforce to successfully implement this project.

IX. Metrics

The January UTEN Proposal included a Metrics section with three categories (technical, financial and customer) that will be used to track and measure the pilot projects successes. As detailed below, the Company has added metrics within the three categories and added a fourth category, safety.[31]

Table 13: UTEN Portfolio Metrics

Metrics Category	Metrics
Technical	• System and customer electricity consumption, normal operation vs. peak • Geothermal bore field temperature tracking • Asset tracking of UTEN infrastructure (i.e., pipe sizes, materials, age, commodity) • Utility-owned thermal balancing system operation
Financial	• Operating costs • Cost comparisons o Cost estimate of the customer electrifying with ASHP system o Cost estimate of UTEN systems with no customer-sided EE upgrades o Cost estimate of the customer installing a private independent geothermal GSHP
Customer	• Call center queries (number, concern, resolution, and time to resolution) • Customers exiting or entering the pilot after construction complete
Safety	• OSHA Incident Rate – UTEN Related Work • Contractor Damages • Rules We Live By (RWLB) Violations

[31] Only new metrics not included in the January UTEN Proposal are listed in this filing.

X. Conclusion

Con Edison and its pilot partners have developed a portfolio consisting of three unique pilot projects aligned with the Thermal Networks Act's objectives, providing meaningful benefits and driving the diverse set of learnings for the Company and NYS. Con Edison requests that the Commission approve the three pilot projects, the two feasibility studies, and the cost recovery and surcharge mechanism proposed herein. Approval of these pilots is a necessary step to validate UTENs and will enable UTENs to scale as a core clean energy solution towards achieving CLCPA targets, reducing the total costs of the clean energy transition, creating equity and access to clean energy solutions in disadvantaged communities, and providing a just transition for the gas and local workforce.

Dated: May 19, 2023

Respectfully submitted,

Consolidated Edison Company of New York, Inc.

By: /s/ Nikolai Albert T. M. Wolfe
Staff Attorney
Email: wolfen@coned.com

Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, NY 10003

Appendix A: Project Maps

Figure A.1: Mount Vernon Project Locations

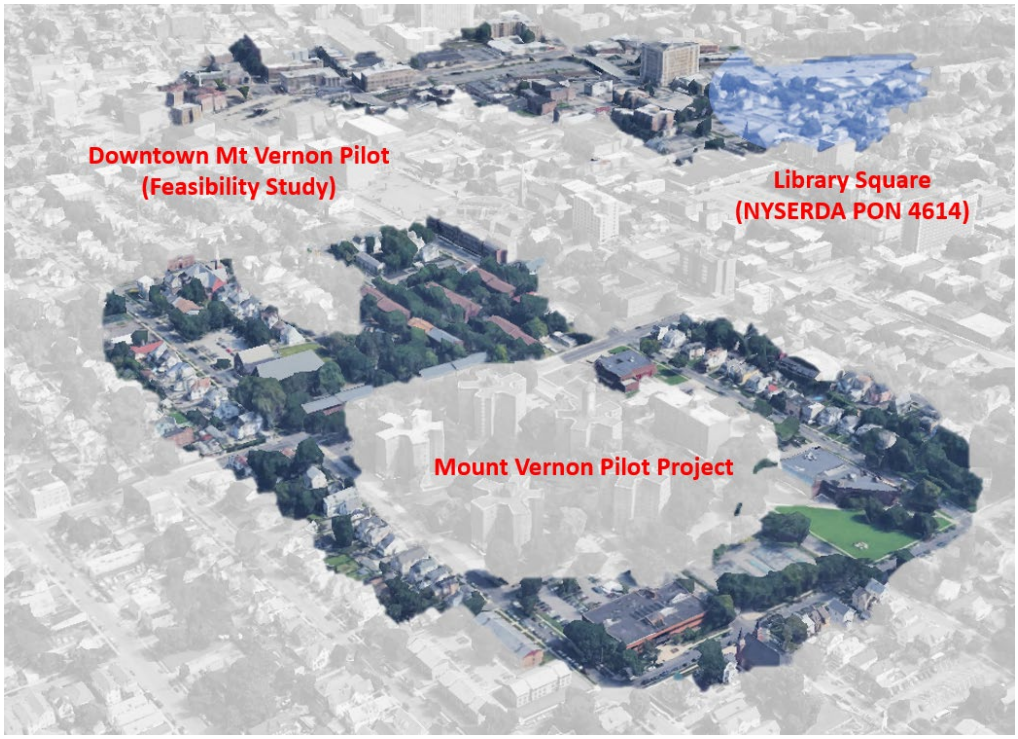


Figure A.2: Manhattan Project Locations

Appendix B: One-Line Diagrams

B.1 Chelsea Project One-Line Diagrams

Figure B.1.1: Chelsea Project – Street One-Line Diagram

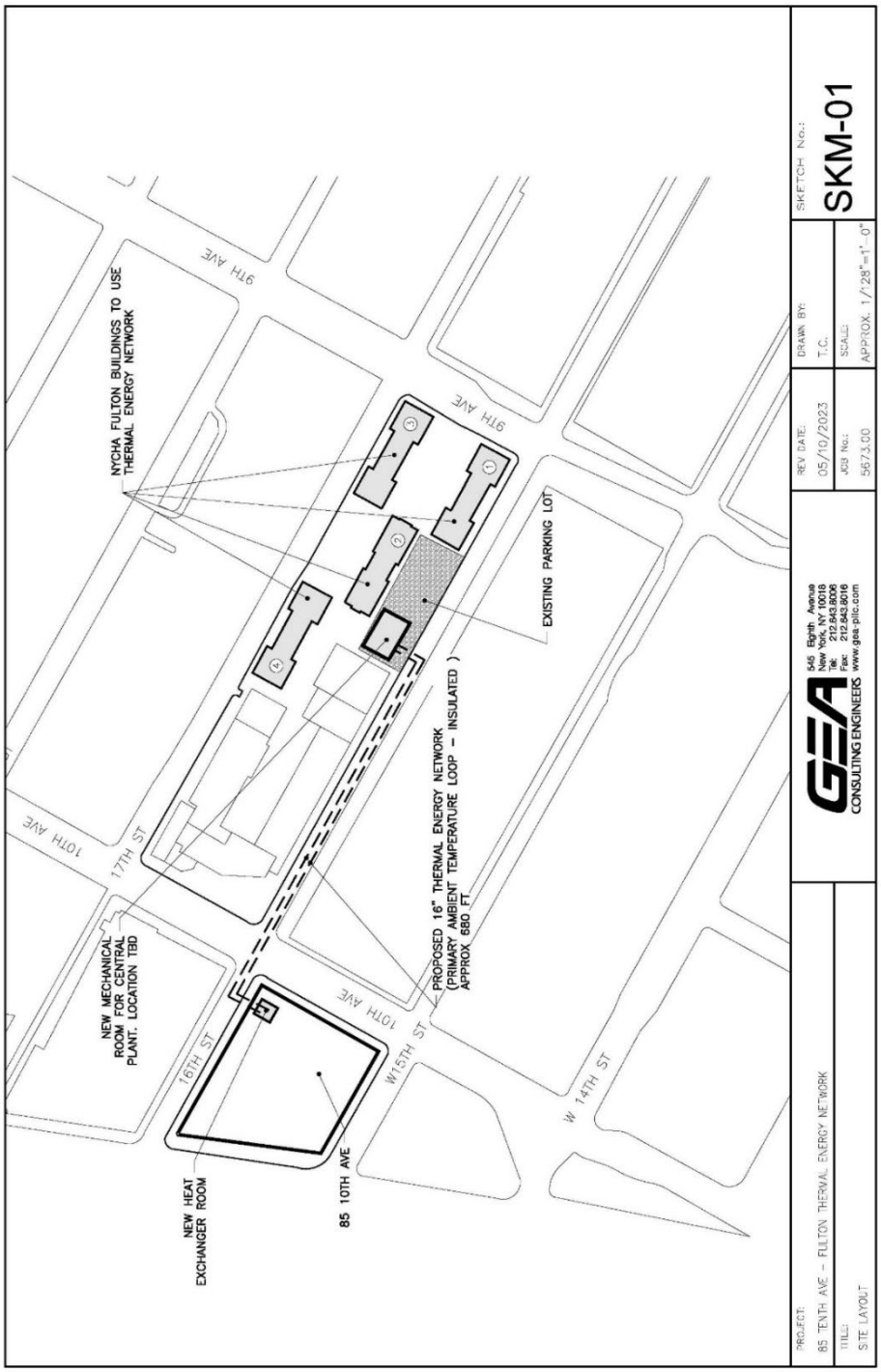


Figure B.1.2: Chelsea Project – Fulton Houses Street One-Line Diagram

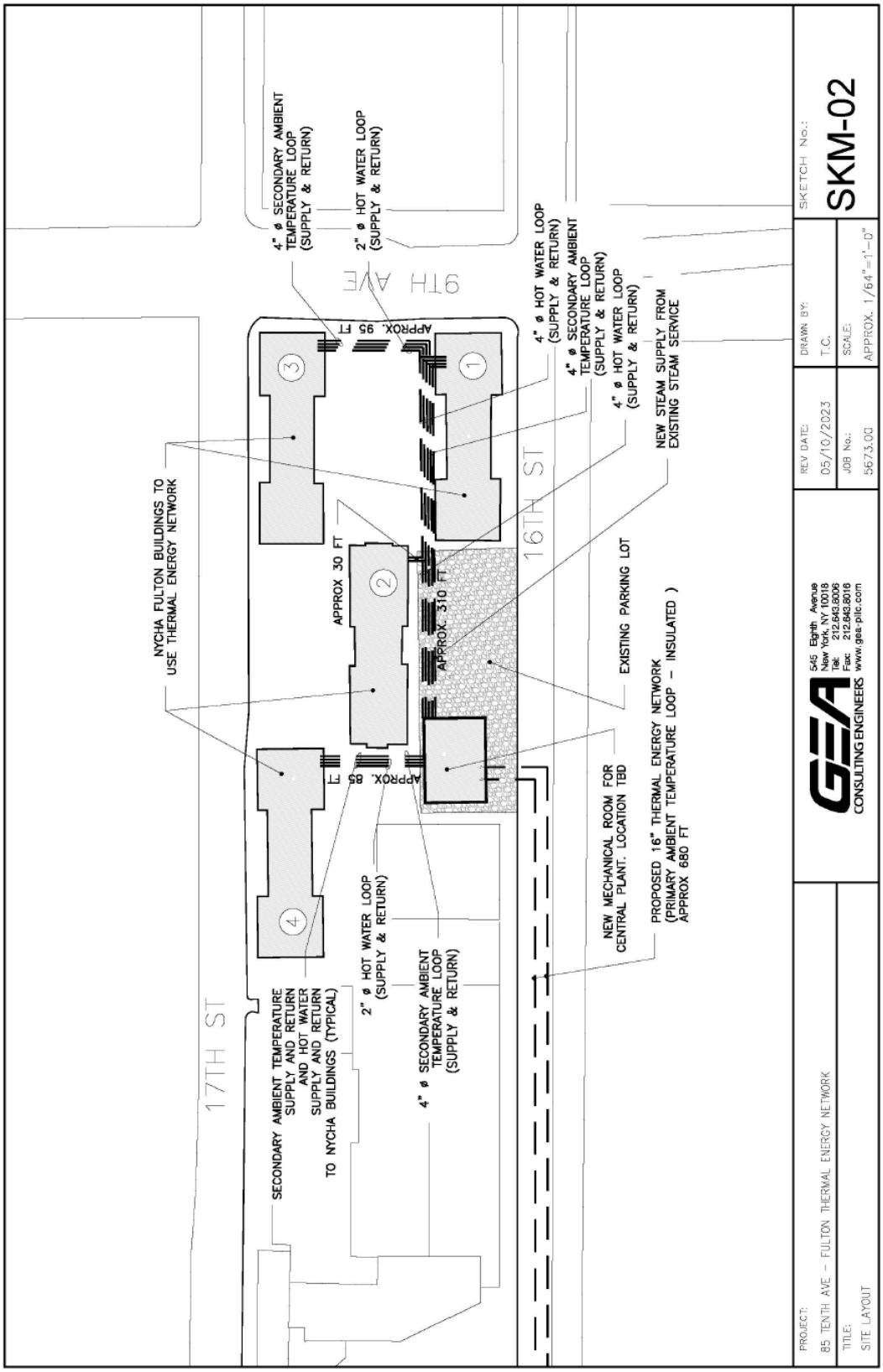


Figure B.1.3: Chelsea Project – Building One-Line Diagram

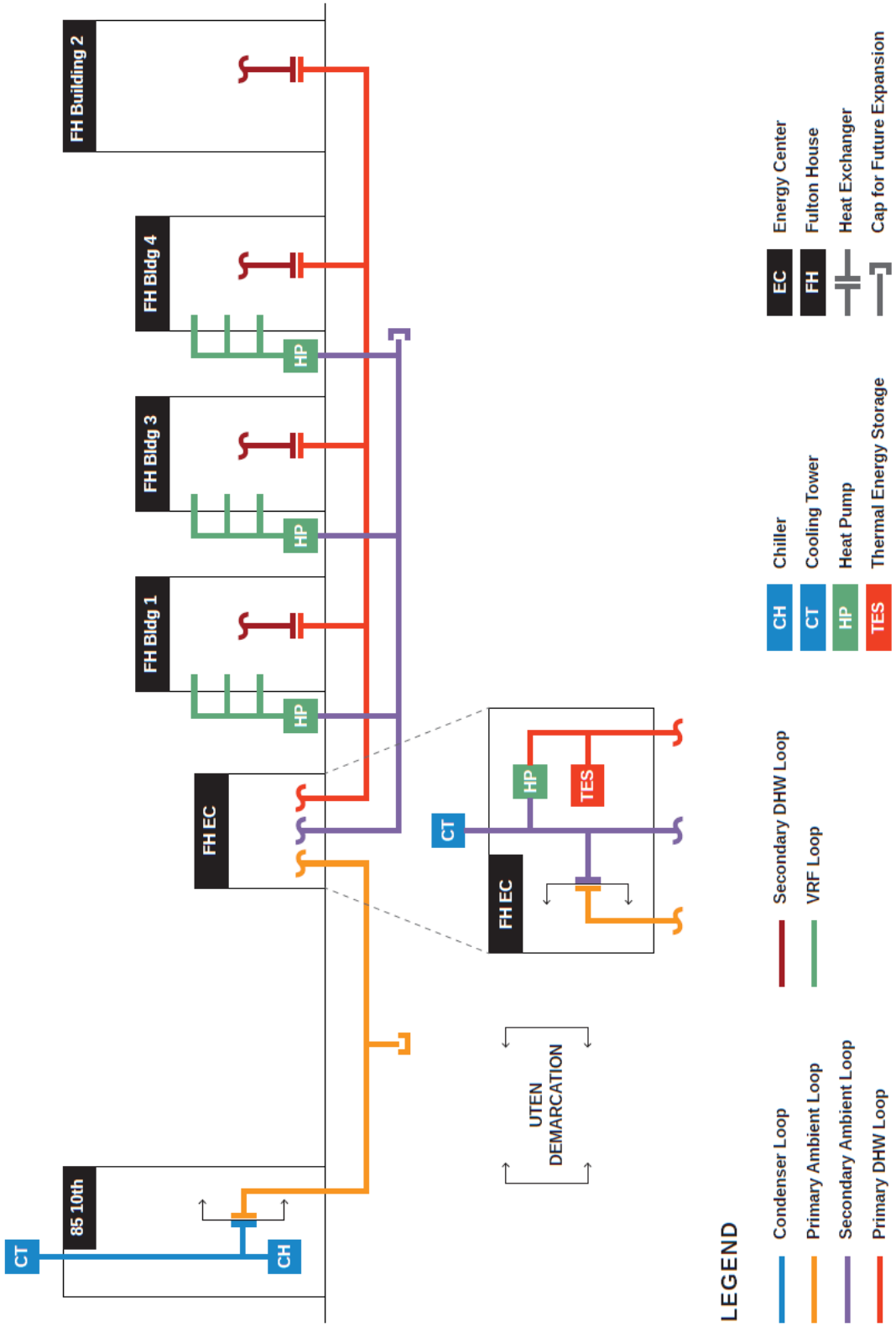


Figure B.1.4: Chelsea Project – Detailed Building One-Line Diagram

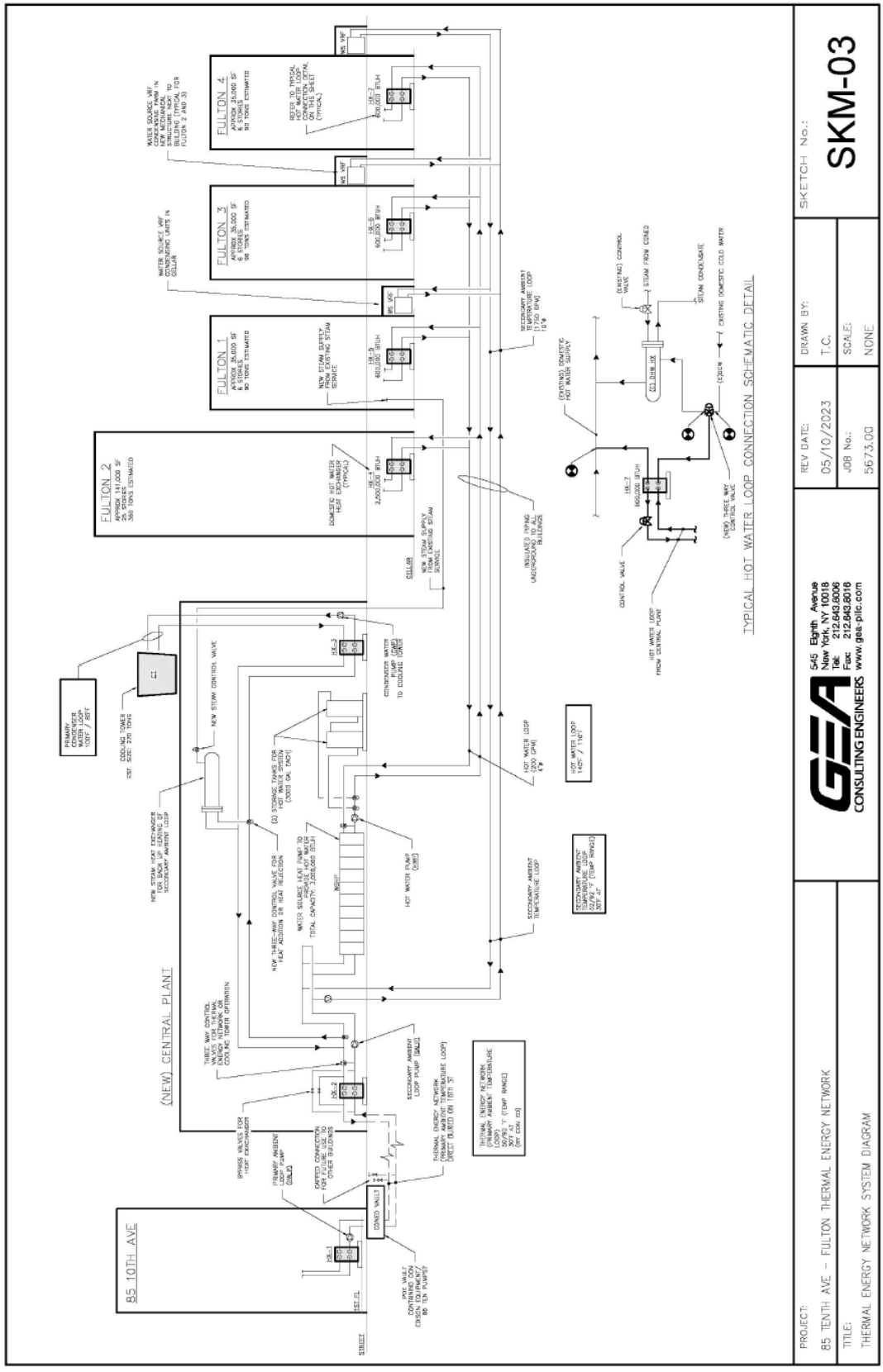


Figure B.1.5: Chelsea Project – Central Plant One-Line Diagram

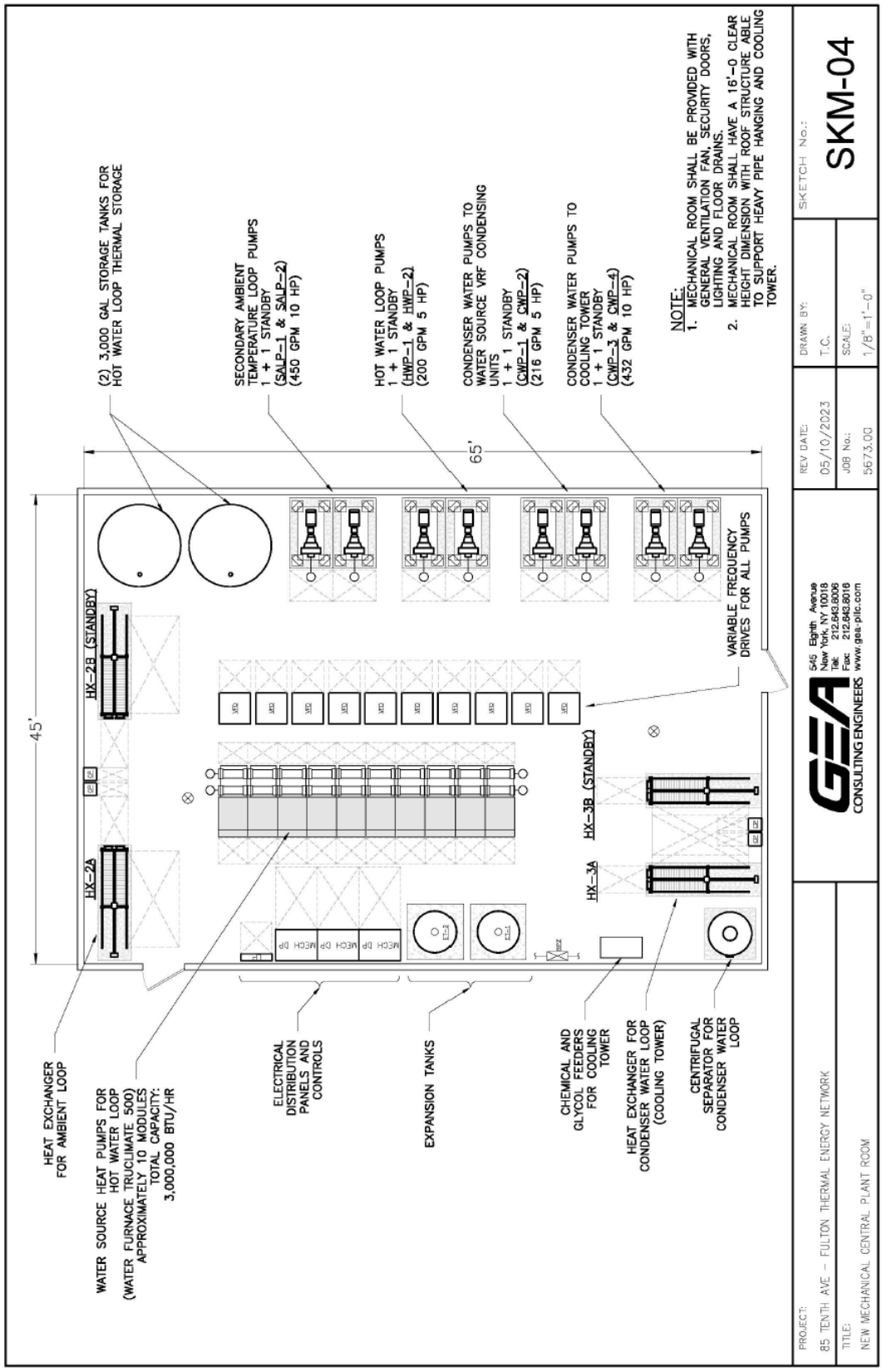
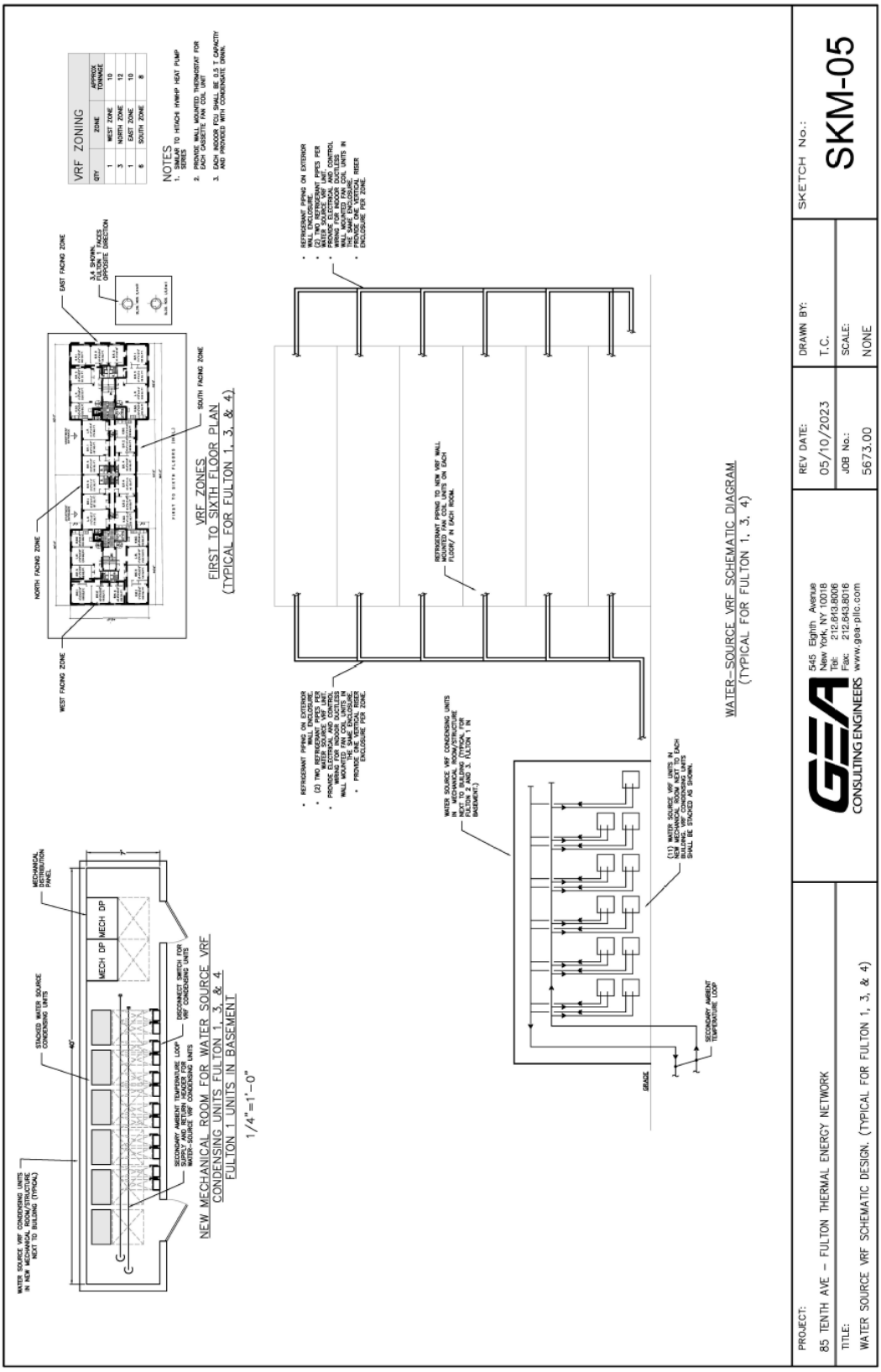


Figure B.1.6: Chelsea Project – VRF System One-Line Diagram



B.2 Mount Vernon Project One-Line Diagrams

Figure B.2.1: Mount Vernon Project – Building One-Line Diagram

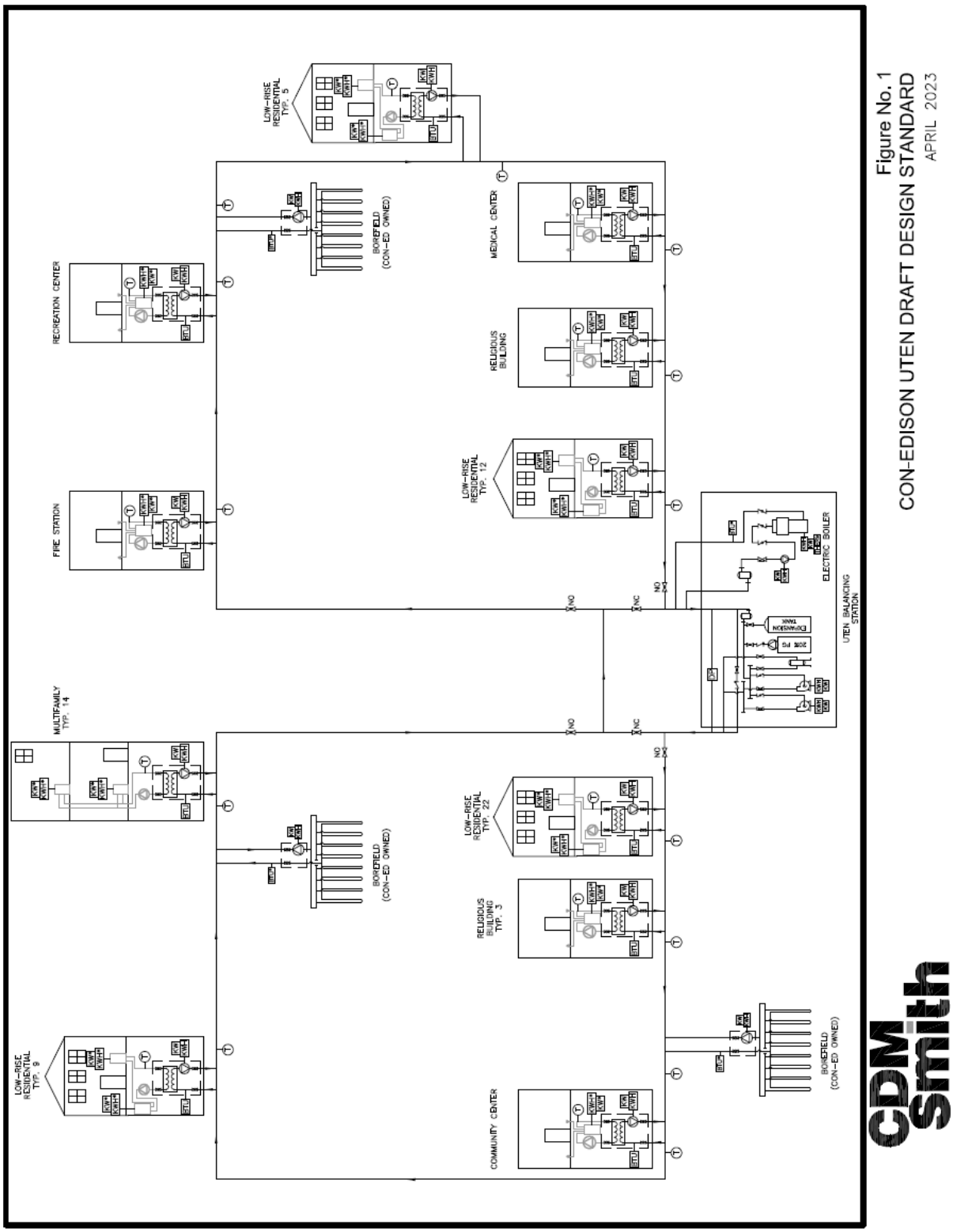


Figure No. 1
CON-EDISON UTEN DRAFT DESIGN STANDARD
APRIL 2023

Figure B.2.2: Mount Vernon Project – Street One-Line Diagram

B.3 Rockefeller Center Project One-Line Diagrams

Figure B.3.1: Rockefeller Center Project – Building One-Line Diagram

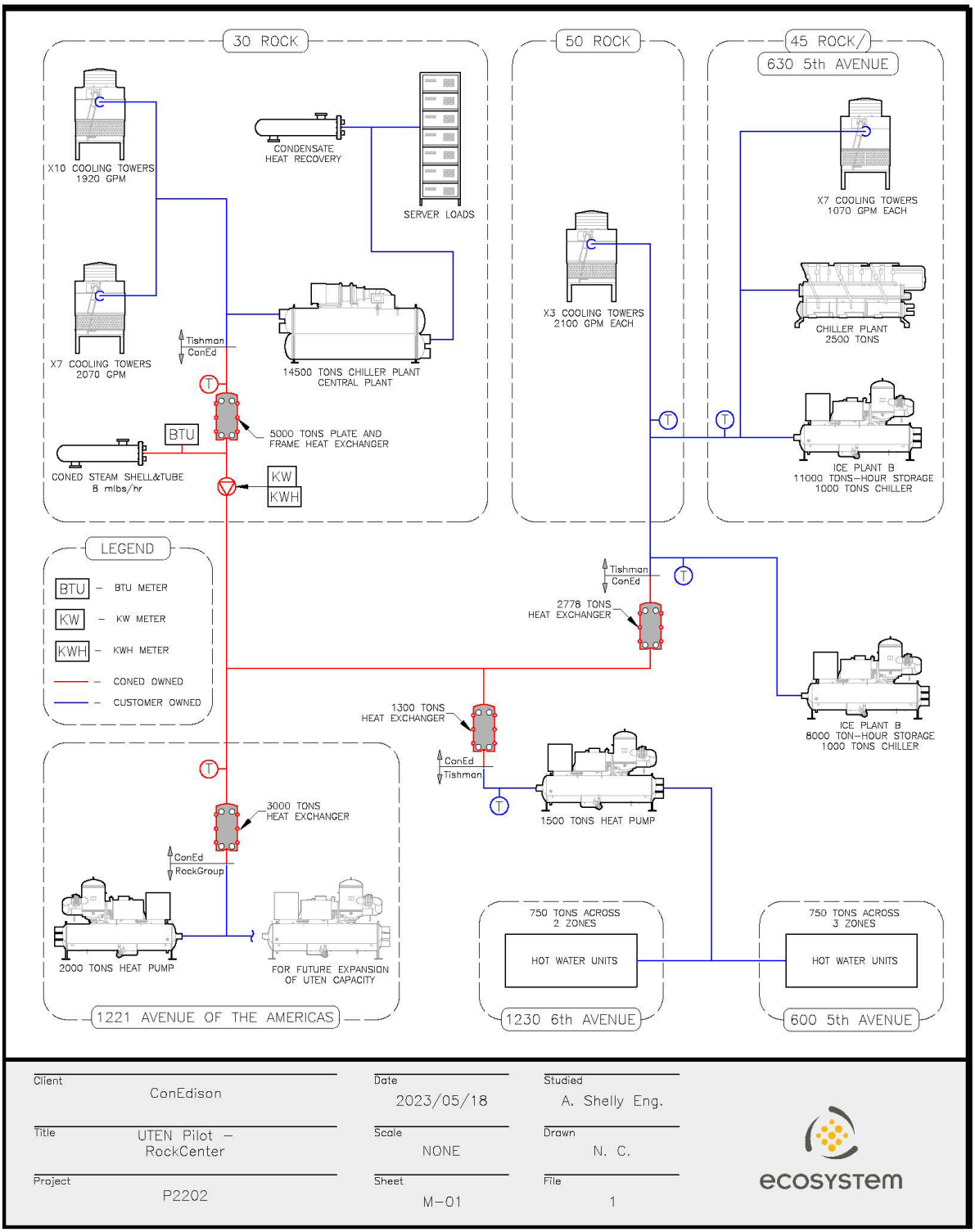
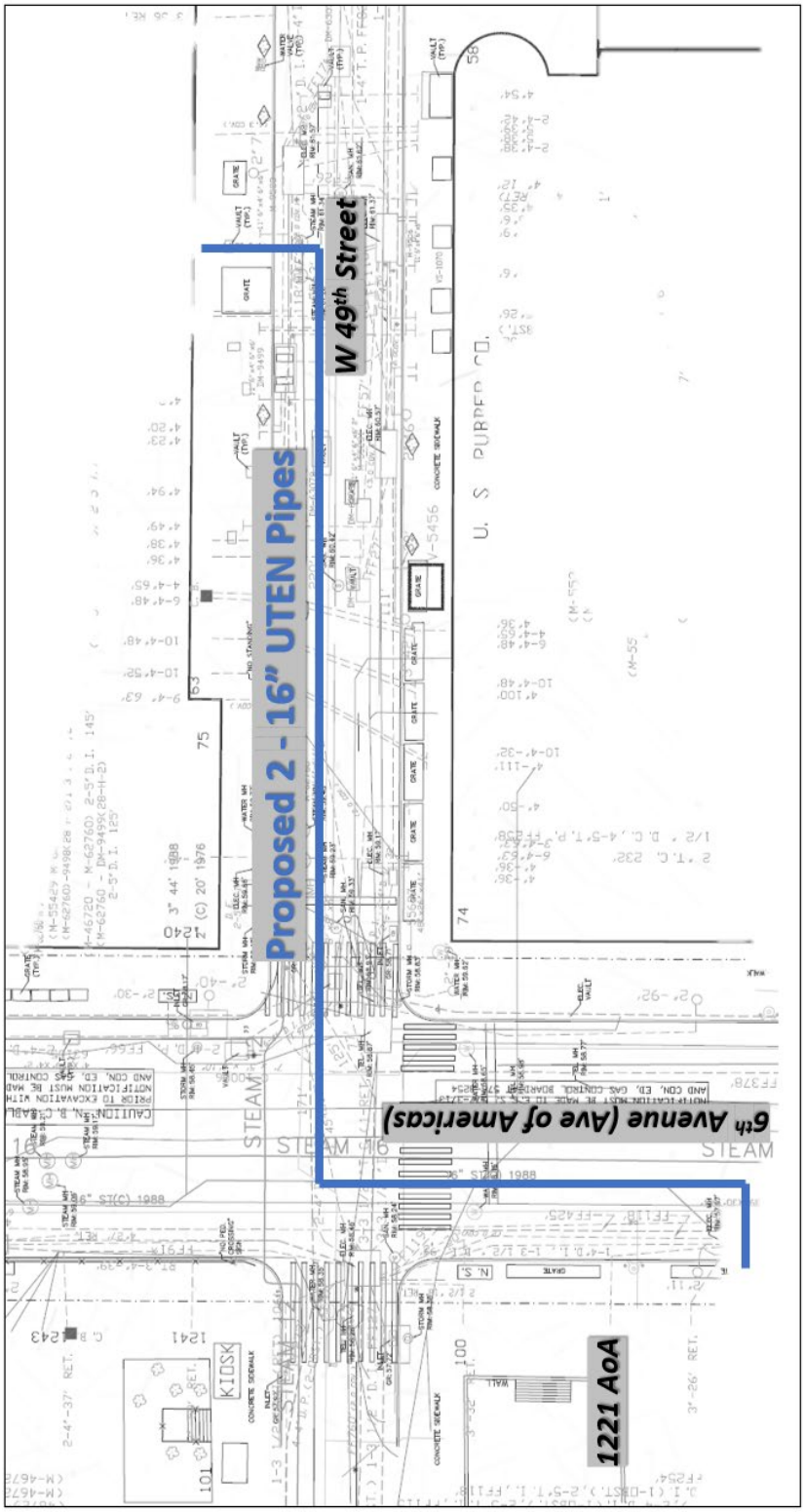


Figure B.3.2: Rockefeller Center Project – Street One-Line Diagram



Appendix C: Letters of Interest

C.1 Chelsea Project Letters of Interest

C.1.1 Related Chelsea Project Letter of Interest

RELATED

Louis Yauri
Sr. Procurement Lead
Consolidated Edison Company of New York, Inc.
4 Irving Pl, New York NY, 10003

January 13, 2022

Re: Letter of Support for Con Edison Thermal Energy Networks Pilot Project

Mr. Louis Yauri,

The intent of this letter is to express our preliminary interest and support of the Zero Carbon Mile proposed thermal energy network pilot project along the west side of Manhattan. It is a compelling initiative that aligns with the Related Companies commitment to decarbonization of the built environment and energy infrastructure systems.

Related is one of the largest commercial and multifamily real estate firms in North America. The company owns, manages and develops the Hudson Yards megaproject on Manhattan's far West Side. As such, the firm is a veteran developer of large, complex projects requiring public-private partnerships.

Hudson Yards is at the north terminus of the High Line and a potential anchor for the Zero Carbon Mile. While there is strong conceptual alignment between our organizations and the Zero Carbon Mile team, additional technical and financial due diligence is required before we can fully commit to supporting thermal energy network infrastructure at or near the Hudson Yards.

If the Zero Carbon Mile team is successful in being selected as one of the thermal energy network pilot projects, the Related Companies would be pleased to further consider participation in supporting the Zero Carbon Mile effort to develop a neighborhood thermal energy network as a partner in the venture. We look forward to further exploring this opportunity with the Zero Carbon Mile team and Con Edison.

Sincerely,

Jeff T. Blau
Chief Executive Officer
Related Companies
30 Hudson Yards, 73rd Floor
New York, NY 10001

Related Companies | 30 Hudson Yards | 73rd Floor | New York, NY | 10001

C.1.2 Essence Chelsea Project Letter of Interest

ESSENCE DEVELOPMENT

Gregory Koumoullos
Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, NY 10003

February 8, 2023

Re: Letter of Support for Con Edison Utility Thermal Energy Networks (UTEN) Pilot Project

Mr. Koumoullos,

The intent of this letter is to express our preliminary interest and support of the Zero Carbon Mile (ZCM) proposed thermal energy network pilot project along and in the vicinity of the High Line in the neighborhood of Chelsea in Manhattan. The ZCM is a compelling initiative that aligns with New York City Housing Authority's (NYCHA) commitment to decarbonization of the built environment and energy infrastructure systems.

NYCHA is one of the largest owners and managers of public housing in the United States. NYCHA properties exist throughout New York City and in particular are located within proximity of the Zero Carbon Mile target UTEN zone along the High Line. Specifically, the Fulton Houses NYCHA property is located across the street from 111 Eighth Avenue, a critical source of renewable heat for the proposed Zero Carbon Mile concept. Fulton Houses is somewhat in the middle of the High Line corridor and serves as a potential thermal energy customer anchor for the Zero Carbon Mile. Fulton Houses falls under the management framework of the Permanent Affordability Commitment Together (PACT) program, whereby a partnership between Essence Development and the Related Companies was formed to manage and rehabilitate the property. This represents a great opportunity to align the Zero Carbon Mile approach with in-building reinvestment planned via the PACT agreement. While there is strong conceptual alignment between our organizations and the Zero Carbon Mile team, additional technical and financial due diligence is required before we can fully commit to supporting thermal energy network infrastructure at or near Fulton Houses.

Essence Development is a social impact development company that builds sustainable, energy-efficient affordable and workforce housing as well as mixed-use developments in urban areas that include health and nutritional solutions, nonprofit partners and services, and workforce development opportunities. A 100% minority-owned firm, Essence Development was founded on the idea that providing top quality housing, while offering social, economical, and healthy living opportunities is fundamental to creating real change.

If the Zero Carbon Mile team is successful in being selected as one of the thermal energy network pilot projects, Essence and Related would be pleased to support Zero Carbon Mile efforts to develop and expand a neighborhood thermal energy network in Chelsea. We look forward to learning more about this opportunity with the Zero Carbon Mile team and Con Edison.

Sincerely,

Jamar Adams
Founder and Managing Principal
Essence Development

C.1.3 Vornado Chelsea Project Letter of Interest

Mr. Louis Yauri
Sr. Procurement Lead
Consolidated Edison Company of New York, Inc.
4 Irving Pl, New York NY, 10003

January 12, 2022

Re: Letter of Support for Con Edison Thermal Energy Networks Pilot Project

Mr. Yauri,

The intent of this letter is to express our preliminary interest and support of the Zero Carbon Mile proposed thermal energy network pilot project along the west side of Manhattan. It is a compelling initiative that aligns with Vornado Realty Trust's commitment to decarbonization of the built environment and energy infrastructure systems.

Vornado Realty Trust is an owner, manager and developer of office and retail assets. Our portfolio is highly concentrated in New York City, with commitments to energy efficiency and carbon emissions reductions to positively impact our communities. Vornado owns and manages over 23 million square feet of LEED certified buildings and received the Energy Star Partner of the Year Award, Sustained Excellence 2022.

We have real estate assets near the High Line that could serve as potential energy consumers, or waste heat sources. In the very long term there may be potential integration with the Zero Carbon Mile and some of our assets in the Penn District.

While there is strong conceptual alignment between our organizations and the Zero Carbon Mile team, additional technical and financial due diligence is required before we can commit to connecting to the Zero Carbon Mile as a waste heat provider and/or a heat user. If the Zero Carbon Mile team is selected as one of the thermal energy network pilot projects, Vornado Realty Trust would be pleased to further consider the concept as a pathway to decarbonize our building(s).

We look forward to further exploring this opportunity with the Zero Carbon Mile team and Con Edison.

Sincerely,

Lauren Moss
Senior Vice President
Chief Sustainability Officer

C.1.4 NYCHA Chelsea Project Letter of Interest

NEW YORK CITY HOUSING AUTHORITY
23-02 49th AVENUE • LONG ISLAND CITY, NY 11101
TEL: (212) 306-3000 • http://nyc.gov/nycha

February 15, 2023

Gregory Koumoullos
Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, NY 10003

SUBJECT: Letter of Support for Con Edison Utility Thermal Energy Networks (UTEN) Pilot Project

Mr. Koumoullos,

The intent of this letter is to express our preliminary interest and support of the Zero Carbon Mile (ZCM) proposed thermal energy network pilot project along and in the vicinity of the High Line in the neighborhood of Chelsea in Manhattan. The ZCM is a compelling initiative that aligns with New York City Housing Authority's (NYCHA) commitment to decarbonization of the built environment and energy infrastructure systems.

NYCHA is one of the largest owners and managers of public housing in the United States. NYCHA properties exist throughout New York City and in particular are located within proximity of the Zero Carbon Mile target UTEN zone along the High Line. Specifically, the Fulton Houses NYCHA property is located across the street from 111 Eighth Avenue, a critical source of renewable heat for the proposed Zero Carbon Mile concept.

Fulton Houses is somewhat in the middle of the High Line corridor and serves as a potential thermal energy customer anchor for the Zero Carbon Mile. Fulton Houses falls under the management framework of the Permanent Affordability Commitment Together (PACT) program, whereby a partnership between Essence Development and the Related Companies was formed to manage and rehabilitate the property. This represents a great opportunity to align the Zero Carbon Mile approach with in-building reinvestment planned via the PACT agreement. While there is strong conceptual alignment between our organizations and the Zero Carbon Mile team, additional technical and financial due diligence is required before we can fully commit to supporting thermal energy network infrastructure at or near Fulton Houses.

If the Zero Carbon Mile team is successful in being selected as one of the thermal energy network pilot projects, NYCHA would be pleased to support Zero Carbon Mile efforts to develop and expand a neighborhood thermal energy network in Chelsea. We look forward to learning more about this opportunity with the Zero Carbon Mile team and Con Edison.

Sincerely,

Vlada Kenniff
Senior Vice President of Sustainability | Asset & Capital Management Division

C.2 Mount Vernon Project Letter of Interest

CITY OF MOUNT VERNON, N.Y.
Mayor Office

SHAWYN PATTERSON-HOWARD, MPA
Mayor

City Hall, One Roosevelt Square
Mount Vernon, NY, 10550
(914) 665-2362 – Fax: (914) 665-6173

KRISTYN BRIEZ REED
Chief of Staff

May 8th, 2023

Consolidated Edison
4 Irving Place,
New York, NY 10003

Subject: Letter of Support on Behalf of City of Mount Vernon
Con Edison Mount Vernon UTEN Pilot Project

Consolidated Edison:

The City of Mount Vernon appreciates the opportunity to support Con Edison's proposal for a Utility Thermal Energy Network Pilot Project in Mt. Vernon. We fully support their thermal energy network concept that would connect several buildings including affordable housing, 1-3 family homes, health facility, fire station, religious buildings and the recreation center.

The proposed project will support Mount Vernon's carbon reduction goals for decarbonization. The project will provide essential information for Mount Vernon in evaluating our options and making decisions about our community's infrastructure, to understand energy burden for Mount Vernon residents, and to contribute to meeting New York State's decarbonization mandates.

We are delighted to team with Con Edison to create an innovative renewable energy solution that will act as a beacon for other cities across the nation.

On behalf of City of Mount Vernon, I am pleased to provide our support and cooperation to their proposed thermal energy network pilot proposal. Any legal or financial commitment by the City of Mount Vernon remains subject to City review and approval.

Sincerely,

Shawyn Patterson-Howard, MPA
Mayor, City of Mount Vernon

"The Jewel of Westchester"

C.3 Rockefeller Center Project Letter of Interest

C.3.1 Tishman Speyer Rockefeller Center Project Letter of Interest

RCPI Landmark Properties, L.L.C.

45 Rockefeller Plaza, 7th Floor
New York, NY 10111

ROCKEFELLER CENTER®

January 13, 2023

Dear Con Edison,

Rockefeller Center would like to provide this letter as a statement of support for Tishman Speyer's submission for the Utility Thermal Energy Network Pilot Project. We see this as a great opportunity to reduce greenhouse gas emissions in New York City and increase the value of our operating assets.

Our staff operates and maintains a district energy network that cools 11 buildings and hundreds of tenants. The center operates 24/7 with preventative maintenance scheduled to avoid any down time in providing year-round cooling. Our tenants have extremely critical file servers, broadcast equipment, and events often attended by heads of state. With multiple chiller plants and ice storage plants in operation, dispatch must be carefully coordinated to ensure maximum efficiency and mechanically sound operation.

NYSERDA is also working with us to implement the largest Real Time Energy Management program in the state. With our recent BMS upgrade, we have the ability to trend and analyze over 10,000 data points, and are happy to cooperate and help on any measurement and verification the Con Edison may deem necessary.

We look forward for the opportunity to expand our operation to include the export of heat to our neighbors.

Thank you,

Matthew Sheridan – Energy Manger for Rockefeller Center

917-975-7032

C.3.2 Rockefeller Group Rockefeller Center Project Letter of Interest

ROCKEFELLER
GROUP

May 16, 2023

Greg Koumoullos
Project Manager – Thermal Energy Networks
Con Edison
4 Irving Pl, NY, NY

Dear Mr Koumoullos,

Rockefeller Group would like to provide this letter as a statement of support for the Utility Thermal Energy Network Pilot Project proposed for Rockefeller Center and the Avenue of the Americas corridor. We see this as a great opportunity to reduce greenhouse gas emissions in New York City, and more specifically at our building 1221 Avenue of the Americas.

Rockefeller Group studied decarbonization strategies for our Rockefeller Center properties along Avenue of the Americas, consisting of over 4.5M SF multi-tenant office space. These evaluations were to determine operational and capital strategies to meet our carbon reduction goals as well as the goals of our tenants which include White & Case, Deloitte, NBCU, SiriusXM.

We see great potential for utilizing the Con Edison Thermal Energy Network to help us decarbonize 1221 Avenue of the America's heating system and help overcome barriers related to installing air-sourced heat pumps on our building. If the pilot is successful and the network expands, we would be interested in learning how we could also potentially become a heat injection contributor for the Con Edison Thermal Energy Network.

We envision next steps after NYS PSC approval will include further evaluation of the program specifics to confirm the mutual benefits of the program. This could then lead to contract review and negotiation, public relations coordination, and our mutual commitment to capital required for our portion of the pilot project.

We are very hopeful this monumental project will be approved shortly so we can maintain momentum to accelerate decarbonization for 1221 Avenue of the Americas.

Sincerely,

Ryan P. Malin, PE, LEED AP

Vice President Design & Construction Core Holdings

Rockefeller Group

1271 Avenue of the Americas, 24th Floor, New York, NY 10020 | RockefellerGroup.com