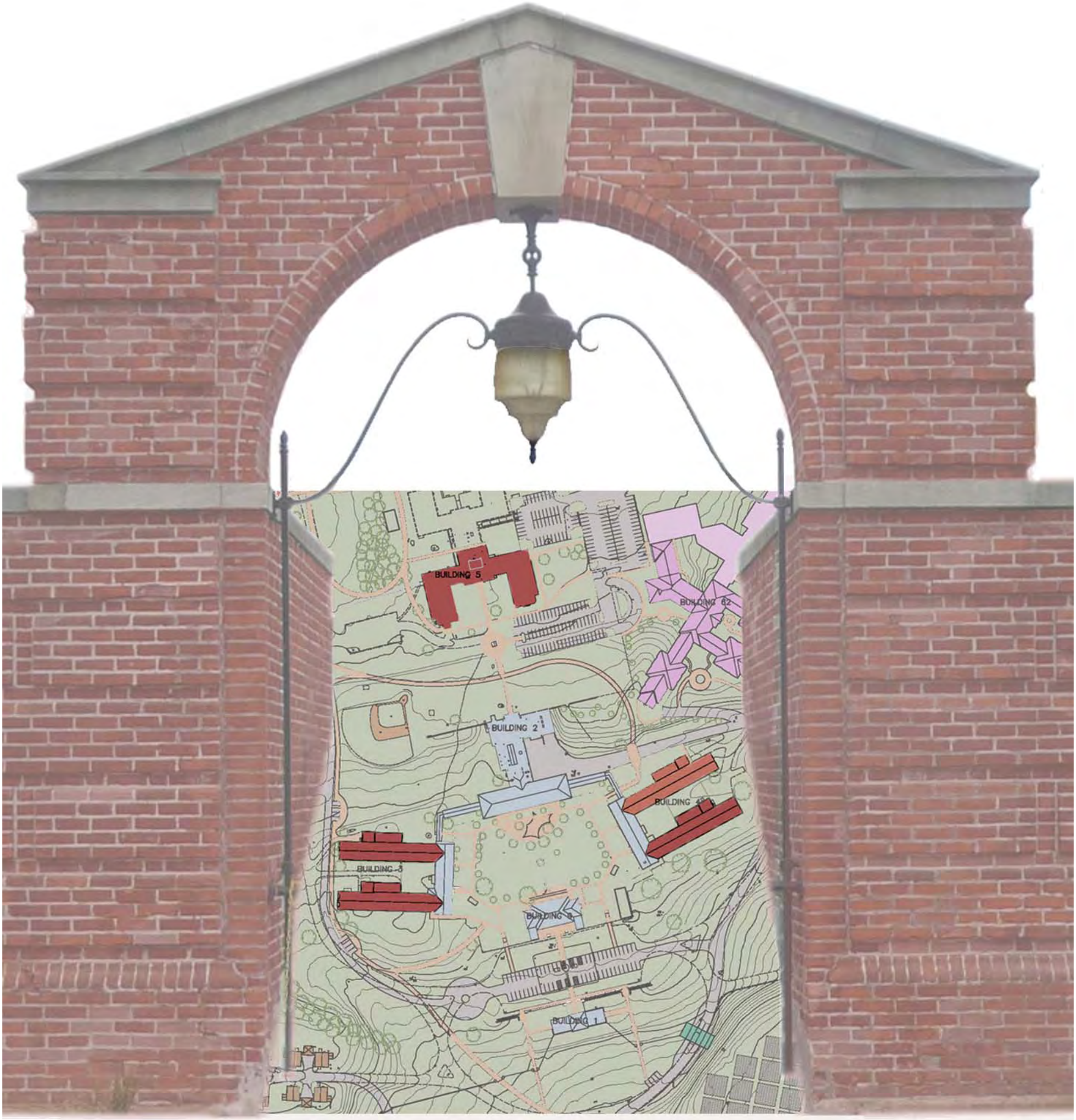
Study of DVA Campus For Additional Housing

BI-C-287

May 9, 2016



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Study of DVA Campus for Additional Housing

BI-C-287

State of Connecticut
Department of Administrative Services

Connecticut Department
of Veterans' Affairs

FINAL REPORT

Date: May 9, 2016

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Table of Contents

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Executive Summary

FINAL REPORT

Date: May 9, 2016

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EXECUTIVE SUMMARY

a. BRIEF HISTORY

The Veterans Home & Hospital moved from Darien to its present location on West Street in Rocky Hill during the late 1930’s to the early 1940's, with the construction of the present campus. It was entirely self-sufficient, complete with a central heating and power plant, quarters for both staff and veterans and gardens for food supply. In 1947, the hospital structure received a substantial addition comprising of additional beds, operating suites, support and administrative space. Over the years, construction of some minor structures took place to suit the changing needs of the facility. Then things began to change, reflecting on campus what was occurring throughout society at large. While still open 24/7/365, staff no longer lived on site. Portions of the land associated with the main campus were transferred: to the east, a large tract was donated to the Town of Rocky Hill for recreational and open space; to the west, land was transferred to the Department of Health services for their new laboratory. The 600 bed hospital began to show its age, particularly in its dated treatment and operating suites. In 2005, the campus buildings underwent a detailed assessment of their physical condition. With the construction of the Levitow Healthcare Center in 2008, most of the hospital functions were relocated to this facility. Over the last ten years, some of these deficiencies found in the 2005 report have been addressed, mostly on a triage basis - the most critical being addressed first.

b. VISION 2035

While this campus has undergone changes and modifications over the years, there has never been a reassessment of its mission to serve our Veterans into the Twenty-First Century on a campus-wide basis. The purpose of this report is to analyze the whole campus, and in conjunction with a demographic report, provide a new vision for the facility, moving from the Veterans Home & Hospital to a Veterans Center for Excellence.

While the buildings had a condition survey completed, no survey of site-wide utilities, circulation and MEP systems had been undertaken. Staff and personnel interviews gave shape to overall concerns, wants and needs: Underpinning this information is a demographic survey of what the Veteran population will look like in the coming years.

This study proposes masterplan concepts transforming the image of the campus from “Hospital” to “Home” with a particular focus on the conversion of the barrack style housing to the new Federal Community Living Center “CLC” Housing standards.

The overall concept involves:

- Creating a “Veterans First” atmosphere throughout the campus,
- Creating a more inviting “Front Door” to the Community at Large by “blurring the line”, inviting both veterans and residents statewide onto the campus.
- Creating a more “educational campus” setting by establishing a pedestrian-friendly zone in the campus center, which will allow all veterans housing, treatment, education, training and health services
- Re-evaluating and repurposing all structures to meet these future needs.
- Weaving the story of the historical contributions of Connecticut’s Veterans throughout the campus with both interior and exterior displays and features.

This vision proposes the existing campus buildings to be demolished, added to, and or renovated, along with new construction.

The following buildings are to be demolished for this new vision:

- Back half of Building 5
- Building 7
- Building 19
- Building 44 and 49 garages
- Building 52, the electrical shop will need to be relocated into one of the other maintenance buildings on the southeast corner of the site.
- Building 60
- Short water tower

The buildings that are to be renovated to new domiciliary housing:

- Building 3
- Building 4
- Front half of Building 5
- Building 50

Buildings that will have additions and new construction are the following:

- Building 62 – Levitow Healthcare Center Addition
- a new gate house
- Equipment Storage buildings in the back of site between buildings 50 and 51
- two new central boiler plants
- Future Assisted Living Center (Built by Others) on the West side of the campus
- Future Center for Excellence (Built by Others) in the area of Building No. 5

All other buildings are to remain and will need to be maintained and renovated as required.

This report lays out a Master Plan to guide the transformation of the existing Veterans Home & Hospital into the new Veterans Center for Excellence.

c. HISTORICAL SIGNIFICANCE

The entire Rocky Hill Veterans Campus is on the Connecticut State Historic Preservation List. The campus has not been nominated for national status, therefore only approvals from the Connecticut State Historic Preservation Office are required. Alan Lagocki and Sherry Petruccione from Ames and Whitaker Architects met with Todd Levine from the State Historic Preservation Office on the Rocky Hill Campus on December 3, 2015 and walked the site to discuss the preliminary report site plan.
A meeting then took place on January 27, 2016, at the SHPO office in Hartford with Sarah Tierney from State DAS, Joe Danao from DVA, Alan Lagocki and Sherry Petruccione from Ames and Whitaker Architects, Todd Levine and Jenny Scofield from the State Historic Preservation Office and came to the following conclusions:

Building 5 – back North portion of the building will be removed and front half of the building will be repurposed for domiciliary housing
Building 7 – will be removed

Building 19 – SHPO needs to make a site visit to determine this building's future – demolition or renovation
Building 50 – building will be repurposed for domiciliary housing
Building 52 – will be removed
Building 60 – will be removed
Garage Building 44 – will be removed
Garage Building 49 – will be removed

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Chapter A.1
Existing Conditions

FINAL REPORT

Date: May 9, 2016

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a. SITE/CIVIL

1. Roadway – Vehicular Circulation

   The primary means of access to this campus is through the single entry by the gate house from West Street. From this location the bituminous concrete paved roadway winds around the campus forming an irregular loop around the site ending back at the gate house. This loop is further divided by a driveway between buildings 1 and 9 that opens up to provide parking. This driveway intersects the larger loop to form a smaller loop back to the gate house. Access to the power house and the physical plant is obtained by a branch roadway that heads in an easterly direction to these buildings. A second access road further to the east allows vehicular access to the power plant and physical plant only. The residential buildings (11 through 17) obtain access through the larger outer loop that allows ingress and egress through the main access by the gate house. Some of the intersections associated with this loop roadway system are awkward and clumsy. There is no designated walkway for pedestrians; either the edge of the grass along the roadway or walking on the roadway seems to be the solution. Both of these conditions are dangerous for residents and visitors.

2. Parking

   Each building with the exception of the commissary have parking near the buildings. The parking between buildings 1 and 9 is awkward. The parking is centered in the middle of the space while vehicles travel on either sides of the parking area. There are three large parking lots adjacent to building 5 and 62 with several other smaller parking areas on the westerly side of the site.

Parking Between Building #1 & 2 (Looking East)

3. Retaining Walls

Brick masonry retaining walls provide vertical barriers between buildings. This effect is evident between buildings 3 & 9, buildings 9 & 4 on the south side and buildings 3 & 2 and buildings 2 & 4. The brick masonry is deteriorating and will require at the very least a need to be re-pointed. On the south side of building 1 a similar condition exists with masonry walls on each side of the building. These brick walls give the illusion of a "prison" like environment, which is not very inviting.

Retaining Wall West of Building #9

(Looking North)

Retaining Wall East of Building #9

(Looking Northeast)

4. Site Lighting

Site lighting is obsolete for this campus. The fixtures have a 1930's feel and are spaced at intervals that cause many areas to exist that do not receive light at night. This type of system is not resident friendly. See drawing C-4 for site lighting locations and distribution of power to support site lighting.

Typical Site Lighting

b. MEP BY BUILDING

See attached reports by building.

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Mechanical and Electrical Systems Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #1 - Administration
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
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8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Fixtures and Specialties

1. Fixtures in the building are operational but should be replaced if building is upgraded in the future.

Existing Plumbing and Piping Systems

1. Domestic cold water enters the building through the basement and is distributed to the fixtures throughout. The domestic cold water also is distributed to the electric water heaters which provides the fixtures with hot water where required.

Domestic Hot Water Systems

1. Domestic hot water is provided by an electric water heater located in the basement. The electric water heater is 208V, single phase and seems to be in operational condition.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. Currently is no fire protection system in the building. If building is upgraded, a new sprinkler system will need to be added.

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators from original build date of 1939. The majority of steam traps appear to be original, with some repaired and replaced over time.

Steam Radiator

2. Condensate for the building is removed by an electric condensate pump. The pump appears to be 10-15 years old.

Electric Condensate Pump

<u>Cooling Systems</u>

1. The majority of the building is cooled by window AC units. The first floor business office has a dedicated 3-ton DX cooling system with local control.

<u>Ventilation / Exhaust Systems</u>

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

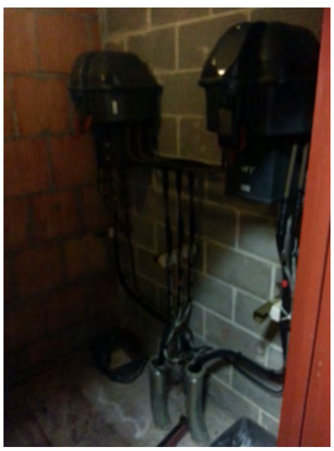
1. Heating control for this building is accomplished by a single manual steam control valve which is opened/closed per season. Several radiators have thermostatic radiation valves (TRV's) for local heating adjustment. The remainder of the spaces without TRV's control space temperature by opening/closing windows during winter.

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed from the two underground 2.4kV "Main" lines, originating at the power plant.

2. The two sets of high voltage feeders terminate at two(2) 200A, 3 phase, oil filled circuit breakers rated for 2.4kV operation. Breakers are part of the orginial building construction, and were installed around 1940. Breakers are protected by fire rated construction. Along with many other buildings on campus, one breaker is set to the "on" position and one is in the "off" position. This is to manually balance the loads on the steam and diesel generators in the case of a power failure, from a campus-wide perspective.



Two high-voltage circuit breakers

Exterior 112.5KVA transformer

3. Feeders on the load side of each circuit breaker are tapped together to form one set of service feeders, sized #4/0 AWG. These wires are run underground in conduit to a 112.5kVA, 3 phase Square D transformer located on a concrete pad outside the building. The transformer steps down the voltage from 2.4kV to 208V, 3 phase.

4. From the exterior transformer, feeders terminate at a 400A/3P MCB located in a panel located in the basement of the building.

Electrical Distribution

1. The building contains multiple branch panels, all of which are fed from the 400A main distribution panel. Most branch panels are Square D series QD load centers, and seem to be part of the original building's construction.

2. The building contains an elevator, which is fed from a 200A/3P breaker in the main panel.

3. Branch panels utilize plug-in circuit breakers. The main distribution panel uses molded-case circuit breakers. Most panels are filled to capacity, with little to no spares.

4. Convenience receptacle facilitation appeared to be adequate throughout most areas of the building.

5. This building provides power to assembly building #9. Two sets of feeders are run from the main distribution panel to the other building:

   - 200A/3P breaker feeds the main service to building #9.

   - 200A/3P breaker feeds the elevator in building #9.

Main distribution panel in basement (with 400A MCB)

Typical branch panel (load center)

Emergency/Optional Standby Power

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the on/off positions of the high voltage oil circuit breakers.

Lighting

1. Interior lighting systems are mostly comprised of recessed 2x4 fluorescent T5 fixtures with parabolic lenses.

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. Life safety lighting is achieved via a centralized Dual-Lite inverter system. Inverters provide backup power to fixtures in corridors, stairwells and other egress areas.

Technology Systems

1. The building is tied into the campus fiber network. Two strands of multi-mode fiber originating at the network distribution room in the basement of building #5 terminate at a patch panel in the main “Admin” IT room. From here, Ethernet cabling is distributed to data jacks throughout the building.

2. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

3. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

   - CCTV security cameras
   - Ethernet distribution
   - Wireless access
   - Call-for-aid buzzers in the bathrooms

Fire Alarm Systems

1. The building is equipped with a Grinnell Autocall fire alarm control panel, located in the main entrance corridor. The fire alarm system appears to have good facilitation with regard to occupant notification.

Autocall fire alarm control panel in main lobby

The FACP facilitates other buildings’ fire alarms

2. The fire alarm strobes are located at 80” above finished floor. The pullstations are located at 52” above finished floor.

3. The control panel also monitors and facilitates all fire alarm systems in buildings 11, 12, 13, 14, 15, 16, and 17. This is accomplished via a local loop using underground direct buried cable.

Mechanical and Electrical Systems Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #2 - Commissary
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

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9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Fixtures and Specialties

1. The kitchen equipment seems to be in very good shape and looks to be in good operational condition. There are multiple kettles, wash sinks, cooking ranges, etc that seems to be well maintained and used on a regular basis. The stoves and cook tops are run off of Natural Gas.

Existing Cooking Kettles

Existing Wash Sink

There are existing walk-in coolers that are being utilized. One of the walk-in coolers showed signs of having pipe freezing due to lack of insulation or in-proper installation.

Freezing Pipe in Walk-in Cooler

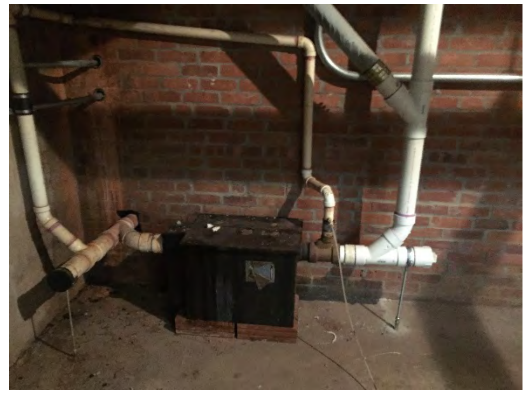
Existing Plumbing and Piping Systems

1. Domestic cold water enters into the building in a mechanical room located underneath the building. This mechanical room is accessed via the steam tunnels that run between the cafeteria and both of the dormitory wings. The domestic water for the kitchen is feed through a filtration system before it reaches the kitchen.

Domestic Water Filtration System

The grease waste from the kitchen is run into two grease interceptors which are located in the basement. The grease interceptors seem to be in good condition, but comments were made about them backing up. Enzyme treatment was added to help clean the drain system, but has been discontinued because of budget issues.

Grease Interceptor



Grease Interceptor

Existing Enzyme Treatment

<u>Domestic Hot Water Systems</u>

1. The domestic hot water for the building is feed through a Lesylie steam water heater which is located underneath the building in the same mechanical room where the domestic water and other utilites enter the building. The Leslie is original to the building and should be replaced if the building is upgraded.

Leslie Steam Water Heater

2.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. Currently there is no fire protection system serving the commissary or kitchen area. The only fire protection system located in the building is the Tyco Pyro Chem system for the cooking hood,

Ansul FP System
for Kitchen Hood

located in the kitchen. The ansul system seems to be in good condition.

MECHANICAL SYSTEMS:

Heating Systems

1. The majority of the building is heated by perimeter steam radiators from original build date of 1939. Several steam unit heaters exist in back-of-house spaces.

Steam Radiator

2. Condensate for the building is removed by a steam driven condensate pump. According to maintenance personnel, steam traps in this building are in need of service and are experiencing significant steam blow-by. The steam escaping the malfunctioning traps is damaging the condensate pump.

Cooling Systems

1. There is no mechanical cooling for the majority of the mess hall. Several ceiling fans provide minimal air movement for the mess hall area.

2. The kitchen and office area are cooled by a 20-ton DX split system which was installed within the past 3-5 years.

3. The pool hall, canteen, barber shop, and winner's circle are heated and cooled by ducted split systems of various makes and ages.

General Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

1. Heating control for this building is accomplished by a single manual steam control valve which is opened/closed per season. Occupants control space temperature by opening/closing windows during winter.

Kitchen Ventilation Systems

1. The kitchen area is exhausted by (4) exhaust fans. The condition of the fans could not be safely verified, however, all hoods appeared so be receiving exhaust airflow. Significant cross flow was experienced around the kitchen areas as there is no source of makeup air. All negative pressure in the kitchen is relieved by pulling air from adjacent spaces, causing door swing issues and infiltration of outside air. The kitchen exhaust and makeup air systems are not suitable for the current usage load.

Kitchen Hood

Kitchen Equipment Cooling

1. The kitchen area includes multiple cooling units for food storage and preparation. The heat rejecting condensers for these units are located in the basement of the kitchen. These condensers are currently being cooled by running domestic cold water thru each unit and discharging to the sewer. The system was previously cooled by an outdoor dry cooler which is no longer functional.

Domestic water for kitchen equipment cooling

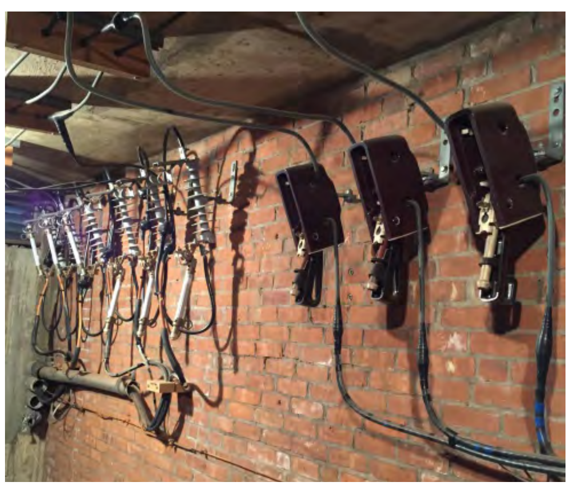
Domestic water for cooling discharges to sewer

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed from the two underground 2.4kV “MESS” lines, originating at the power plant.

2. The two sets of high voltage feeders (six cables in total) terminate at six(6) high voltage fusible cut-outs located in a dedicated electrical room in the basement. The cut-outs seem to be part of the original building’s construction (installed in approximately 1940). At any time, only three of the six cut-outs are energized (“Mess 1” or “Mess 2” lines), depending on which generator is selected to back up the building’s power. Switching is accomplished manually at the cut-outs by plugging/unplugging the fusible links into the assemblies. This manual switching of high voltage gear poses a significant risk to the maintenance staff.



Six High voltage fusible cut-outs (shown to the left of the picture)

3. Cables on the load side of the cut-outs are tapped into a single set of three high voltage feeders providing power to the building (phase A from “Mess 1” is combined with phase A from “Mess 2”, phase B from “Mess 1” is combined with phase B from “Mess 2”, and phase C from “Mess 1” is combined with phase C from “Mess 2”). The three cables are then routed to the line side of three(3) 167KVA single phase transformers located in the same room. The transformers step the voltage down from 2.4kV to 208V. One of the transformers seems to be leaking oil.

4. From the load side of the three transformers, (4) sets of 350kcmil feeders (plus neutral) travel to a 1200A/3P fused switch located in the adjacent electrical distribution room. The switch acts as the main service disconnect for the building. Additionally (2) sets of 350kcmil feeders (plus neutral) travel from the load side of the same transformers to a 600A/3P MCB distribution panel feeding all elevators in the building.

Step-down transformers

Electrical Distribution

1. The main 1200A/3P service disconnect switch feeds a two-section main distribution panel (“MDP-1” and “MDP-2”) located in the same room. This distribution panel is a 1200A, 3 phase GE Spectra Series power panelboard, which seems to be part of the original building’s construction. Section MDP-2 is fed from section MDP-1 through the use of a 600A/3P circuit breaker. Both sections distribute power to multiple branch panels located throughout the building.

Two-Section Main distribution switchboard

2. Additionally, both sections of the main distribution panel provide general and HVAC power to buildings #3 and #4 as follows:

   - 400A/3P breaker in section MDP-1 provides general power to building #3. This is labeled “MDP-W”.

   - 400A/3P breaker in section MDP-1 provides general power to building #4. This is labeled “MDP-E”.

   - (2) 225A/3P breakers in section MDP-2 provide power to the HVAC systems in building #3. These are labeled “W-1A” and “W-1B”.

   - (2) 225A/3P breakers in section MDP-2 provide power to the HVAC systems in building #4. These are labeled “E-1A” and “E-1B”.

3. The 600A/3P elevator distribution panel provides power to six(6) elevators. Two elevators are in this building, two are in building #3, and two are in building #4. Each are fed from a 225A/3P breaker.

4. Branch panelboards throughout the building seem to be a combination of older fuse boxes and newer Square D A-Series panels. The newer panels were installed during an HVAC renovation, approximately 10 years ago. A few of the branch panels were installed in stairwells, which is not compliant with applicable building codes.

Older fuse-box style panel, located in stairwell

Newer panelboard for HVAC expansion

Emergency/Optional Standby Power

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the which high voltage cut-outs are energized.

Lighting

1. Interior lighting systems are mostly comprised of surface mounted T8 fluorescent fixtures.

2. Recessed high-bay 2x4 flourescent fixtures are used in the dining hall.

3. Pendant linear fluorescent fixtures are used in the kitchen areas with higher ceilings.

Recessed fluorescent fixtures in the dining hall

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. Corridor and other egress path light fixtures have been outfitted with integral battery backups to provide life safety illumination in case of a power outage or fire alarm. These fixtures seem to have been upgraded recently (within the last 10 years).

3. No low level exit signs are located at the assembly space egress doors.

4. Older, HID fixtures are used as exterior egress lighting. These are mounted above each of the egress doors, on the exterior of the building. It is not clear if these fixtures have integral batteries.

Technology Systems

1. The building is tied into the campus fiber network. Two strands of multi-mode fiber originating at the network distribution room in the basement of building #5 terminate at a patch panel in the main "Food services" IT room. From here, Ethernet cabling is distributed to data jacks throughout the building.

2. Additional fiber runs terminate at a dedicated security rack in the "I-Wing" of this building.

3. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

4. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

   - CCTV security cameras

   - Ethernet distribution

- Wireless access
- Call-for-aid buzzers in the bathrooms

5. Some Ethernet jacks are surface mounted, with exposed wiring. This wiring is subject to severe damage.

Fire Alarm Systems

1. The building is equipped with a Simplex 4100U fire alarm control panel, located in the main entrance corridor. A battery cabinet providing emergency power to the fire alarm system is located directly below the control panel.

2. Smoke detectors are located in the corridors, spaced 30 feet on center. Additional detectors are present at the elevator lobby, with tie-ins to the elevator's recall system. Detectors are NOT located on either side of each corridor fire door.

3. Fire alarm horn strobes seem to be adequately spaced in the corridors and other required rooms. Proper audiovisual notification of the building's occupants seems to be in order. Strobes are typically mounted at 80" above finished floor.

4. Fire alarm pull stations are located at the building's egress doors, mounted at 52" above finished floor.

Simplex control panel

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Mechanical and Electrical Systems Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #3&4 - Domiciles
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
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8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Utilities

1. Domestic water enters the building through the basement through a double check backflow preventer with redundancy to feed all of the barracks. Double check valves and piping seem to be in ok condition with some leaking observed.

Domestic water system

Existing Plumbing Fixtures and Specialties

1. The fixtures in the building seem to be in good shape. Fixtures in rest rooms are in place to meet ADA requirements. No leaking was observed.

Domestic Hot Water Systems

1. Hot water is distributed throughout the building using a Leslie Steam water heater. The water heater seems to be in good conditioned and was last serviced 3/25/14.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. The fire protection system is supplied off of the fire protection campus system with its separate alarm check valve at the riser. The system is operating at 150 gpm. The wet system seems to be in good operational system with exposed fire protection piping with upright heads throughout the building.

Fire Protection Riser

MECHANICAL SYSTEMS:

Heating Systems

1. The domicile buildings underwent major renovations in the past 10 years. The existing steam main from the campus tunnel enters each building and splits to an existing steam branch under each floor. From the existing main, new piping with motorized control valve is fed upward into the perimeter steam radiators in each suite. Each suite of rooms has an interior heating thermostat which modulates the new motorized valve open/closed. All steam and condensate piping beyond the main is new. Steam mains are original to the 1939 build.

2. Community lobby rooms are heated by both steam radiators and split systems with ducted steam coils. Radiators are 5-10 years old.

3. Condensate for the building is removed by a pair of steam driven condensate pumps. Which are 5-10 years old.

New steam traps and condensate piping
connecting to existing main

Cooling Systems

1. Each suite (9-12 occupants) is cooled by a ducted split DX system with local thermostat. There are no diffusers connected to the ductwork in each room. Shared lobby entrance areas are also cooled by ducted DX split systems without diffusers. Corridors are cooled by ductless DX split systems. All systems are 5-10 years old.

Ducted DX split systems without diffusers

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are 5-10 years old. Each bank of lockers in the occupant suites also contains an exhaust duct for additional air changes.

Control Systems

1. Each suite contains a heating thermostat controlling local steam radiators, and a cooling thermostat controlling the local DX split system. This level of control is acceptable for the space usage.

ELECTRICAL SYSTEMS

Electrical Service

1. Each domicile building is fed from the main distribution switchboard in building #2. Services are as follows (typical for each building):

    - (1) 400A/3P feed for main building power.

    - (2) 225A/3P feeds, one for each elevator.

    - (2) 225A/3P feeds, one for each HVAC distribution panel. These were added as part of a major renovation within the last 10 years.

Electrical Distribution

1. Branch panelboards throughout the building seem to be a combination of older fuse boxes (part of original construction) and newer Square D A-Series panels. The newer panels were installed during an HVAC renovation, approximately 10 years ago. A few of the branch panels were installed in stairwells, which is not compliant with applicable building codes.

Typical fuse box

Emergency/Optional Standby Power

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on which high voltage cut-outs are energized in building #2.

Lighting

1. Interior lighting systems are mostly comprised of surface mounted T8 fluorescent fixtures.

2. Recessed high-bay 2x4 flourescent fixtures are used in the dining hall.

3. Pendant linear fluorescent fixtures are used in the kitchen areas with higher ceilings.

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. Corridor and other egress path light fixtures have been outfitted with integral battery backups to provide life safety illumination in case of a power outage or fire alarm. These fixtures seem to have been upgraded recently (within the last 10 years).

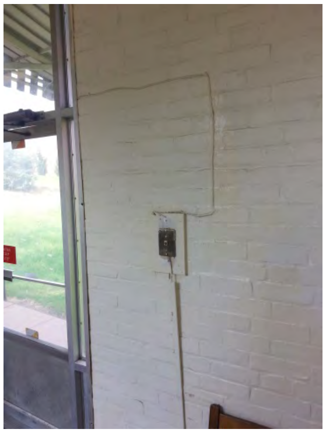
3. Older, HID fixtures are used as exterior egress lighting. These are mounted above each of the egress doors, on the exterior of the building. It is not clear if these fixtures have integral batteries.

Surface mounted fluorescent fixture

Technology Systems

1. Each building is tied into the campus fiber network. In building #3, Two strands of multi-mode fiber originating at the network distribution room in the basement of building #5 terminate at a patch panel in the “Domicile” IT room. In building #4, two additional strands of multi-mode fiber terminate at a patch panel in the “B-Clinic” IT room. From these rooms, Ethernet cabling is distributed to data jacks throughout each building.

2. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.



Ethernet jack with exposed wiring

3. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

- CCTV security cameras
- Ethernet distribution
- Wireless access

- Call-for-aid buzzers in the bathrooms

4. Some Ethernet jacks are surface mounted, with exposed wiring. This wiring is subject to severe damage.

Fire Alarm Systems

1. The building is equipped with a Simplex 4100U fire alarm control panel, located in the main entrance corridor. A battery cabinet providing emergency power to the fire alarm system is located directly below the control panel.

2. Smoke detectors are located in the corridors, spaced 30 feet on center. Additional detectors are present at the elevator lobby, with tie-ins to the elevator's recall system. Detectors are NOT located on either side of each corridor fire door.

3. Fire alarm horn strobes seem to be adequately spaced in the corridors and other required rooms. Proper audiovisual notification of the building's occupants seems to be in order. Strobes are typically mounted at 80" above finished floor.

4. Fire alarm pull stations are located at the building's egress doors, mounted at 52" above finished floor.

Simplex fire alarm control panel

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<u>Mechanical and Electrical Systems</u>
<u>Existing Conditions Narrative</u>

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #5 - Hospital
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS

Existing Plumbing Fixtures and Specialties

1. Sinks were observed to be operational during the site visit and seem to be in good condition. Piping that was observed was in fair condition with some missing insulation and some leaks in the system.

Domestic Hot Water Systems

1. Domestic hot water is distributed throughout the building through a steam powered Leslie water heater. The Leslie was heaters is still operational, but seems to be original with the building and should be replaced during the renovation.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. The building is protected by a wet system that is brought into the building through the basement. The fire protection service enters in the basement, goes through a check valve assembly and then serves the entire building with the pressure and flow provided by the fire pump system in the pump house. Currently the building has a static water pressure of 110 psi and a residual water pressure of 80 psi. The main test and drain is also located in the basement and seems to be leaking in some spots. The piping is old and seems to be in good condition, but this can only be confirmed with scoping the pipe.

Fire Protection check valve assembly

FP Pump

1. The fire protection for the hospital is served off of the campus fire pump system.

FP Distribution

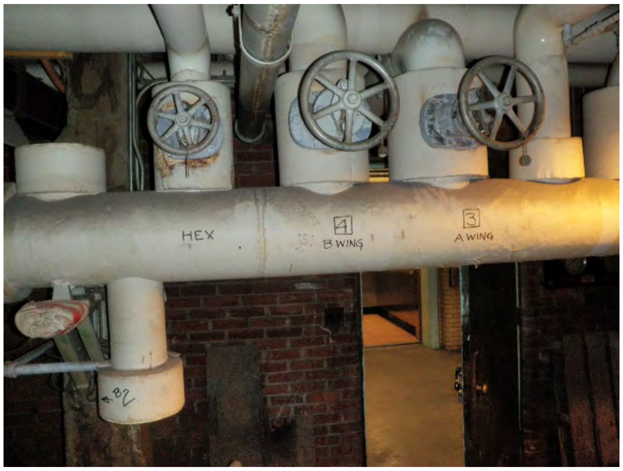
1. The fire protection system rises through the building through standpipes that are located in the stairwell. The standpipes have a connection for the fire department along with a drain valve. Each floor is monitored by a flow and tamper switch.

Standpipe Assembly in Stairwell

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators from original build date of 1939. Each wing of the building is fed from a different steam main with manual control valve in the basement. According to facility personnel, large nubers of steam pipes and traps are leaking in this building.



Steam valves for each wing

2. Condensate for the building is removed by a steam driven condensate pump. The pump appears to be 5-10 years old.

Steam driven condensate pump

Cooling Systems

1. The majority of the building is cooled by window AC units where occupied. The blood lab is cooled by a dedicated 10-ton ducted DX split system.

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

1. Heating control for this building is accomplished by a single manual steam control valve which is opened/closed per season. Several radiators have thermostatic radiation valves (TRV's) for local heating adjustment. The remainder of the spaces without TRV's control space temperature by opening/closing windows during winter.

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed from the two underground 2.4kV "MAIN" lines, originating at the power plant.

2. The two sets of high voltage feeders (six cables in total) terminate at two(2) high voltage 200A, 3 phase, oil filled circuit breakers located in a dedicated electrical room in the basement. The breakers seem to be part of the original building's construction (installed in approximately 1940). At any time, only one of the breakers is switched on ("Main 1" or "Main 2" line), depending on which generator is selected to back up the building's power. Switching is accomplished manually, which poses a significant risk to the maintenance staff.

Two high-voltage circuit breakers

(3) 167KVA transformers

3. Cables on the load side of the breakers are tapped into a single set of three high voltage feeders providing power to the building (phase A from "Mess 1" is combined with phase A from "Mess 2", phase B from "Mess 1" is combined with phase B from "Mess 2", and phase C from "Mess 1" is combined with phase C from "Mess 2"). The three cables are then routed to the line side of three(3) 167KVA single phase transformers located in the same room. The transformers step the voltage down from 2.4kV to 208V.

4. From the load side of the three transformers, (2) sets of 500kcmil feeders (plus neutral) travel to an 800A/3P fused switch located in the adjacent electrical distribution room. Additionally,

(2) sets of 500kcmil feeders (plus neutral) travel to an 800A/3P fused switch located in a remote electrical room on the other side of the building.

Electrical Distribution

1. The (2) 800A/3P switches feed (2) separate 800A/3P switchboards located in the two areas of the building (east and west). These boards consist of multiple fused distribution switches manufactured by Bull Dog, and are part of the original building's construction.

2. Each switchboard distributes power to branch panels, elevators, and HVAC equipment located in the corresponding side of the building. The electrical rooms in which the switchboards reside seem to be filled with equipment varying in age. Due to the large quantity of equipment, clearances do not meet the requirements of the NEC, and rearrangement of the gear does not seem possible.

East switchgear (800A/3P)

West switchgear (800A/3P)

3. Additionally, the switchboard in the east section of the building (adjacent to the high voltage service room) provides power to buildings #60 and #7 as follows:

- (1) 100A/3P fused switch feeds building #7. Feeder sizes were not evident.
- (1) 200A/3P fused switch feeds building #60. Feeder sizes were not evident. Building #60 is owned and operated by CT State Police, and not part of the scope of this study.

Typical fuse box

4. The majority of branch panelboards are fuse boxes, part of the original building's construction. Fuse boxes are located in the corridors, flushed into the wall. All branch panels are fed from either of the two switchboards.

Emergency/Optional Standby Power

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the position of the two oil circuit breakers.

Lighting

1. The vast majority of Interior lighting systems are comprised of recessed 2x4 T8 fluorescent fixtures. Some fixtures were in need of maintenance, and others were unoperational altogether.

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. On the first floor, corridor and other egress path light fixtures have been outfitted with integral battery backups to provide life safety illumination in case of a power outage or fire alarm. These fixtures seem to have been upgraded recently (within the last 10 years).

3. On the upper floors, life safety lighting is achieved via Dual-Lite inverters located in the main electrical rooms. Dual-Lite relays in the corridor switch certain fixtures to battery power in the event of a power failure. However, many of the relays/ battery banks have exceeded their operable life and are no longer operational. Additionally, the majority of emergency fixtures on the upper floors are located at the egress doors, highlighting the points of egress. It appears that these fixtures will not provide the required illumination levels throughout the entire length of the corridor, as required by code. Additional testing and field investigations are required.

4. Some low-level emergency fixtures are located in the patient rooms. These are tied into the Dual-Lite inverter system.

Dual-Lite relays for emergency lighting

Technology Systems

1. The main fiber distribution room for the campus is located in the basement of this building. Additionally, the main campus server room is located on the 3rd floor. Refer to "IT infrastructure" narrative for more information.

2. From the fiber distribution room, a total of four(4) sets of two-strand multi-mode fiber are routed to four separate network switches throughout the building. These are labeled as follows:

   - 1 North
   - 1 South
   - 3 North
   - 3 South

3. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

4. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

   - CCTV security cameras
   - Ethernet distribution
   - Wireless access
   - Call-for-aid buzzers in the bathrooms

<u>Fire Alarm Systems</u>

1. The building is equipped with a Grinnell Autocall fire alarm control panel, located in the main entrance corridor. A battery cabinet providing emergency power to the fire alarm system is located adjacent to the control panel. **This panel is no longer operational, and is in severe need of replacement. This poses a major threat to the building's occupants.**

2. Smoke detectors are located in the corridors, spaced 30 feet on center. Additional detectors are present at the elevator lobby, with tie-ins to the elevator's recall system. Detectors are located on either side of each corridor fire door.

3. Fire alarm horn strobes seem to be adequately spaced in the corridors and other required rooms. Proper audiovisual notification of the building's occupants seems to be in order. Strobes are typically mounted at 80" above finished floor.

4. Fire alarm pull stations are located at the building's egress doors, mounted at 52" above finished floor.

The building’s FACP is not operational

<u>Mechanical and Electrical Systems</u>
<u>Existing Conditions Narrative</u>

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #6 - Maintenance
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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CES PN 2015034.00

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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Utilities

1. Domestic water enters the building with a backflow preventer to stop water from the building from getting into the main campus line. The piping seems to be in OK conditions with no leaks, but piping seems to be original to the building and should be upgraded if building is renovated.

Existing Plumbing Fixtures and Specialties

1. There are a couple of sinks in the building with both hot and cold water hook ups. The fixtures are in working condition but should be replaced with new if the building was to get upgraded.

Domestic Hot Water Systems

1. Domestic how water for the building is provided by a steam Leslie water heater. The water heater is still operational but is corroding in different spots.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. There is currently no fire protection located inside the building. If the building were to be upgraded, a new fire protection service we would need to be installed.

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators and unit heaters. The majority of the radiators and unit heaters are from original build date of 1939. The bathroom in the warehouse contains wall mounted finned tube of newer vintage.

Steam Unit Heater

2. Condensate for the building is pitched back to the central plant below.

Cooling Systems

1. The warehouse/stock room upstairs is cooled by large 10 and 20 ton DX split systems.

DX Cooling Unit in Warehouse

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

1. Cooling control for the warehouse/stock room is accomplished by individual thermostats. Heating is controlled by a manual seasonal valve which is opened for each heating season and closed for each cooling season.

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed directly from the incoming 24kV street lines, via a 225kVA step down transformer. Voltage is stepped down to 208V, 3 phase. Primaries to the transformer are a set of feeders separate from those entering the high voltage switchgear.

2. Feeders on the load side of the transformer travel to a 600A/3P fused switch located in the power plant's low-voltage distribution room on the second floor. This switch acts as the disconnecting means for the entire building. Feeders travel via (1) 4" conduit.

225KVA, 24kV-208V transformer

Electrical Distribution

1. The 600A/3P switch in the power plant (building #6) feeds a distribution switchboard located in the same room. This board consists of multiple fused distribution switches manufactured by Arrow Hart, and are part of the original building's construction (installed in approximately 1940).

Main 600A/3P fused switch and distribution switchboard

2. The switchboard distributes power to branch panels, elevators, and HVAC equipment located in the power plant. The electrical room in which the switchboard resides is filled with electrical equipment that seems to be part of the original building’s construction. Due to the large quantity of equipment, clearances do not meet the requirements of the NEC, and rearrangement of the gear does not seem possible.

3. Additionally, the switchboard provides power to buildings #52 and #8 as follows:

   - (1) 200A/3P fused switch feeds building #8 (labeled “GARAGE”). Feeder sizes were not evident.

   - (1) 100A/3P fused switch in the switchboard feeds a 200A/3P fused switch in building #52. Feeders were not evident, and should be field investigated to make sure they are sized for at least 100A of load.

4. In the power plant (building #6), the majority of branch panelboards are fuse boxes, part of the original building’s construction. Fuse boxes are located in various utility spaces throughout the building. All fuse boxes are fed from the switchboard.

5. In the maintenance garage (building #8), all branch panelboards are fuse boxes, part of the original building’s construction. Fuse boxes are located in various utility spaces throughout the building. All branch fuse boxes are fed from a single distribution fuse box located in the main office area.

6. A panel in the storage garage (building #20) is fed from a 60A/3P fuse in building #8’s distribution box.

200A fused switch feeding building #8

Main distribution fuse box in building #8

Emergency/Optional Standby Power

1. The main 208V feed to all maintenance buildings is backed up via the diesel generator in the power plant. An automatic transfer switch is integral to the 225KVA exterior transformer.

Lighting

1. The vast majority of Interior lighting systems (in all maintenance buildings) are comprised of pendant mounted industrial T8 fluorescent fixtures. Some fixtures were in need of maintenance, and others were unoperational altogether.

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. Life safety lighting is achieved through the use of plug-in, battery backed wall packs. These fixtures are located only in the larger areas, and none are installed in the corridors. There does not appear to be adequate levels of illumination from these fixtures alone.

Typical industrial fluorescent fixtures

Plug-in emergency light

Technology Systems

1. The building is tied into the campus fiber network. Two strands of multi-mode fiber originating at the network distribution room in the basement of building #5 terminate at a patch panel in the main "Power Plant" IT room. From here, Ethernet cabling is distributed to data jacks throughout the building.

2. The main IT rack is not ventilated properly, and cooling is achieved through a plug-in fan.

I.T. rack with no ventilation

Phone wiring splicing

3. Analog phone jacks terminate in the basement. Splicing of phone cables is exposed, and not contained in a junction box or punchdown block. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

4. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

- CCTV security cameras
- Ethernet distribution
- Wireless access
- Call-for-aid buzzers in the bathrooms

Fire Alarm Systems

1. The main building is equipped with a Grinnell Autocall fire alarm control panel, located in the main entrance corridor. A battery cabinet providing emergency power to the fire alarm system is located adjacent to the control panel. **This panel is no longer operational, and is in severe need of replacement. This poses a major threat to the building's occupants.**

2. Smoke and carbon monoxide detection was not present in most areas of the buildings.

3. Fire alarm horn strobes seem to be adequately spaced in the corridors and other required rooms. Proper audiovisual notification of the building's occupants seems to be in order. Strobes are typically mounted at 80" above finished floor. In some of the larger mechanical areas, strobes are located at much higher levels.

4. Fire alarm pull stations are located at the building's egress doors, mounted at 52" above finished floor.

FACP is not operational.

Mechanical and Electrical Systems
Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #7 - VFW
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
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4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Utilities

1. The hot water distribution for each building is provided by a Bell & Gossett 1/12 HP inline pump. The pump is a single phase pump running at 1725 RPM. The pump appears to be working properly, but is old and should be replaced with building upgrade.

Hot Water Pump

Existing Plumbing Fixtures and Specialties

1. Plumbing fixtures are existing to building, and should be replaced with building upgrade.

Existing Plumbing and Piping Systems

1. Piping seems to be existing to building and should be replaced with building upgrade.

Domestic Hot Water Systems

1. Each housing building is equipped with a electric hot water heater to provide the user with their hot water. One residence is served by a 50 gallon water heater while the other one is served by a 40 gallon water heater. Both water heaters are 240V single phase.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

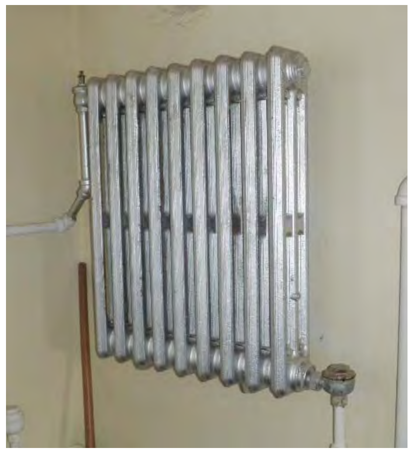
1. The building is currently being protected by a fire suppression system off of the building fire protection pump house. The building is fully sprinkled by a combination of pendant and sidewall heads. The fire protection service enters into the basement, through a double backflow preventer and then is distributed out to the building

Fire Protection Service Entrance

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators. The majority of the radiators are from original build date of 1939.



Steam Radiator

2. Condensate for the building is pumped with an electric condensate pump.

3. Significant pipe and trap leaking was reported in this building.

Cooling Systems

1. The majority of the building is cooled using window AC units. A single 3-ton DX unit serves the central office area.

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

1. Heating is controlled by a single motorized valve with a single thermostat in the building. Steam flow is modulated to all radiators equally throughout the building. The control system is greater than 30 years old.

Steam Control Valve

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed from a 100A/3P (208V) fused switch located in the main distribution switchboard of building #5 (old hospital).

2. Feeders terminate at a 100A/3P fused switch located in the main entrance vestibule. This switch is manufactured by Colt Moark, and is part of the original building's construction (installed in approximately 1940). It should be noted that the service entrance equipment is located under a staircase, with very little clearance. This is a violation of NEC requirements.

100A/3P main switch

Distribution gear located under the main staircase

Electrical Distribution

1. The main switch feeds a distribution fuse box, located in the same area. This, in turn, feeds other branch fuse boxes located throughout the building. All fuse boxes are part of the original building's construction.

2. Multiple enclosed circuit breakers serving site lighting and HVAC loads tap into the main feed to the building, on the line side of the main switch. These appear to have been added during a previous renovation to the building. Although the exact feeder sizes could not be obtained, this appears to be a violation of the NEC tap requirements. Additional field investigations are in order.

Emergency/Optional Standby Power

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the on/off positions of the high voltage oil circuit breakers in building #5.

Lighting

1. Interior lighting systems are mostly comprised of surface mounted 1x4 T5 fluorescent fixtures. Many fixtures appear to be very old and in need of lamp/ballast replacement.

Emergency Lighting

1. Exit signs are NOT self-illuminated. Small emergency fixtures are directed at the signs to accomplish life safety requirements. However, these fixtures are very old and functionality was not evident at the time of this survey.

2. Life safety lighting is achieved via a centralized Dual-Lite battery cabinet. However, the batteries did not appear to be operational at the time of this survey. Further field investigations are necessary.

Typical fluorescent lighting

Egress lighting

Technology Systems

1. The building is tied into the campus fiber network. Two strands of multi-mode fiber originating at the network distribution room in the basement of building #5 terminate at a patch panel in the main IT room. From here, Ethernet cabling is distributed to data jacks throughout the building.

2. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

3. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

- CCTV security cameras
- Ethernet distribution
- Wireless access
- Call-for-aid buzzers in the bathrooms

Fire Alarm Systems

1. The building is equipped with a Grinnell Autocall fire alarm control panel, located in the main entrance corridor. The fire alarm system appears to have good facilitation with regard to occupant notification.

2. The fire alarm strobes are located at 80” above finished floor. The pullstations are located at 54” above finished floor.

Mechanical and Electrical Systems
Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #9 – Chapel & Auditorium
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

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2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Fixtures and Specialties

1. Fixtures in building are in working condition, but should be replaced with building upgrade.

Existing Plumbing and Piping Systems

1. Domestic cold water enters the building from the basement and is distributed out to the fixtures in the building. The domestic cold water is also distributed to the dedicated water heater, which provides the hot water throughout the building.

Domestic Hot Water Systems

1. The domestic hot water for the building is provided by an electric A.O. Smith 50 gallon water heater. The water heater is 208V single phase and seems to be working correctly. Due to the age of the water heater, it should be replaced if building is upgraded.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. Currently there is no fire protection system throughout the chapel and auditorium. If renovated, a fire protection system would need to be added, along with a standpipe system to protect the stage to today's standards.

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators and several in-duct steam heating coils. The perimeter heating dates to the original build date of 1939. The in-duct steam coils have been installed or replaced in the past 20-30 years.

2. Condensate from the Administration building is pumped into the chapel basement where it is collected and combined with chapel condensate. The combined condensate flow is pumped into the tunnel with an electric condensate pump dating 10-15 years old.

Cooling Systems

1. The chapel area is served by a dedicated DX split system with ducted steam heating coil. The auditorium area is served by a dedicated 20 ton DX split system with ducted steam heating coil.

Auditorium Split System

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows for most spaces. Outside air for the auditorium is ducted into the return of the split system, however, adequate ventilation is likely not being provided as the intake appears undersized.

Auditorium Ventilation
Louver

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

1. Dedicated thermostats for the Chapel and Auditorium provide cooling and heating adjustment for each space.

ELECTRICAL SYSTEMS

Electrical Service

1. The main electrical service to the building is fed from a 200A/3P (208V) breaker in the main distribution panel of building #1. Feeders terminate at a main 200A/3P fused disconnect switch located in the basement.

2. A separate feeder for the building's elevator is fed from a separate 200A/3P (208V) breaker in the same distribution panel in building #1. Feeders terminate at a 200A/3P fused disconnect switch located in the elevator machine room.

3. Feeders travel from building #1 to building #9 via underground conduit.

Main 200A/3P disconnect switch
and distribution panel

Main 200A/3P disconnect switch
for elevator

Electrical Distribution

1. The building contains multiple branch panels, all of which are fed from the 200A main distribution panel. Most branch panels are Square D series QD load centers, and seem to be part of the original building's construction.

2. A 100A/3P breaker in the main distribution panel feeds a dedicated HVAC load center located in the basement. HVAC units fed from this load center were added as part of a previous renovation. Due to this, the load on the main panel appears to be very high, nearing 90% of the 200A disconnect switch's rating.

3. The elevator machine room contains a separate 100A/3P MLO load center, where various 120V devices in that room are powered from. The machine room and shaft are protected with fire rated CMU construction.

4. Branch panels utilize plug-in circuit breakers. The main distribution panel uses molded-case circuit breakers. Most panels are filled to capacity, with little to no spares.

5. Convenience receptacle facilitation appeared to be adequate throughout most areas of the building.

Typical branch load center

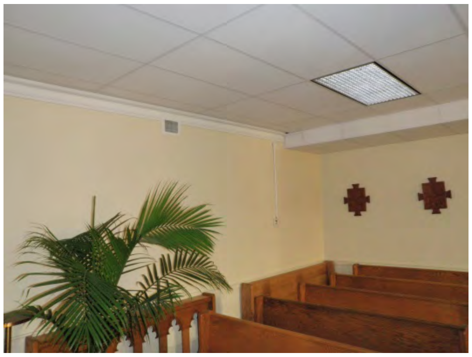
Emergency/Optional Standby Power

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the on/off positions of the high voltage oil circuit breakers in building #1.

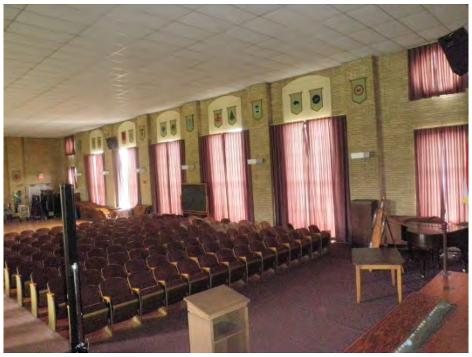
Lighting

1. Interior lighting systems are mostly comprised of recessed 2x4 fluorescent T5 fixtures with parabolic lenses.

2. The building contains a large auditorium, where lighting is achieved via wall mounted fluorescent fixtures.



Recessed 2x4 fluorescent fixture



Wall mounted fixtures in auditorium

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. Life safety lighting is achieved via a centralized Dual-Lite inverter system. Inverters provide backup power to fixtures in corridors, stairwells and other egress areas. However, it appears as if the battery arrays are beyond their operable life, and many are not functioning. Further field investigations and testing are necessary.

3. In assembly spaces, life safety lighting is achieved through battery operated wall packs located above each egress door. These fixtures do not seem to provide adequate coverage, per code requirements.

4. There are no low-level exit signs located in assembly areas.

Egress door in auditorium

Fire alarm control panel

Technology Systems

1. The building is tied into the campus fiber network. Two strands of multi-mode fiber originating at the network distribution room in the basement of building #5 terminate at a patch panel in the main “OAA” IT room. From here, Ethernet cabling is distributed to data jacks throughout the building.

2. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

3. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

   - CCTV security cameras
   - Ethernet distribution
   - Wireless access
   - Call-for-aid buzzers in the bathrooms

Fire Alarm Systems

1. The building is equipped with a Grinnell Autocall fire alarm control panel, located in the main entrance corridor. The fire alarm system appears to have good facilitation with regard to occupant notification. The FACP contains a voice evacuation microphone.

2. The fire alarm strobes are located at 80” above finished floor. The pullstations are located at 52” above finished floor.

<u>Mechanical and Electrical Systems</u>
<u>Existing Conditions Narrative</u>

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #11-17 Houses
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
811 Middle Street, Middletown, Connecticut 06457
CES PN 2015034.00

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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Fixtures and Specialties

1. Plumbing fixtures in the houses were in poor condition and were full of stagnate water and odors. This is due to the houses being abandoned and not being used on a regular basis. If the houses are to be upgraded, all of the fixtures should be upgraded as well.

Existing Plumbing and Piping Systems

1. The domestic water for each of the houses enters into the building through the basement. Each house is monitored by a separate meter which is located in the basement. The water is then distributed out to the fixtures and to the water heater which provides hot water for the building. The pipes seem to be in OK shape with noticeable leaking in some locations.

Domestic water feed into basement

Domestic Hot Water Systems

1. Each house is provided with its own electric water heater to provide the house with hot water. Most of the water heaters were in the range of 40-50 gallons and were powered off of 208V single phase connection. The water heaters seemed to be in working condition, but some leaks were noticed and rusting of the tanks. If the houses were to be upgraded, the water heaters should be upgraded as well.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. There is no fire protection system in place for any of the houses. If upgraded, a residential fire protection system would be recommended to comply with state and local codes.

MECHANICAL SYSTEMS:

Heating Systems

1. Houses 11-17 are a tyical in nature in terms of mechanical systems. Several variations exist with ages of equipment, but overall most houses are similar. Typical heating systems consist of an oil fired hot water boiler with zoned hydronic radiant heating. The majority of houses have (2) 250 gallon oil tanks in the basement for fuel storage. Several houses have underground tanks. Most boilers are 5-10 years old, with the exception of house #15 which has a 35-40 year old boiler.

Typical HW Boiler

Typical Oil Tanks

Cooling Systems

1. Cooling for houses is provided by window AC units.

Ventilation / Exhaust Systems

1. Ventilation is natural, with toilet exhaust fans.

Control Systems

1. Thermostats control each zone of the hot water radiant heating system.

ELECTRICAL SYSTEMS

Electrical Service

1. All houses are fed from the two underground 2.4kV “MAIN” lines, originating at the power plant.

2. The two sets of high voltage feeders terminate at an exterior pad mounted enclosure, consisting of a manual transfer switch and a single phase, step-down (2.4kV – 240V) transformer. Switching between the two lines is accomplished via the transfer switch. Exact KVA rating of the transformer was not evident at the time of this survey, but can be assumed to be approximately 112.5KVA.

3. Seven sets of 240V, single phase feeders travel from the load side of the transformer to main load centers in the seven houses. Feeders travel underground in conduit.

Exterior transfer switch / transformer

Electrical Distribution

1. In each house, all branch circuits are fed from a single phase, 240/120V load center located in the basement. Load centers are either MLO-type (fed from a fused switch), or MCB-type with mains varying from 100A to 150A. All load centers and fused switches are part of the original building’s construction (installed in approximately 1940).

2. Some load centers are located in very crowded storage rooms, where the NEC required clearances are not met.

3. Wiring methods consist of both MC cabling and Romex. All wiring is integral to the original building construction, but appears to be without significant damage.

4. Convenience receptacle facilitation in the residential spaces appears to be very limited. Although exhaustive measurements were not taken during this survey, it is evident that receptacle spacing does not meet residential code requirements. Additionally, a few receptacles near water sources were not GFCI type.

Typical MCB load center

Typical MLO load center

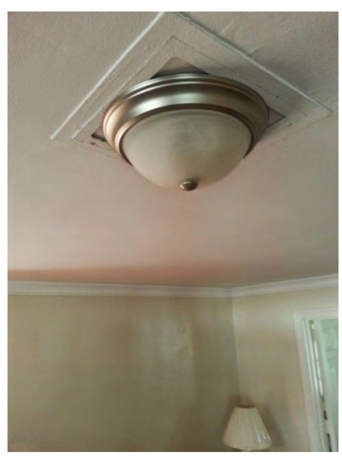
<u>Emergency/Optional Standby Power</u>

1. High voltage power to the houses is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the position of the exterior manual transfer switch.

<u>Lighting</u>

1. Lighting systems vary signficantly from house to house. Most fixtures are residential style, surface mounted, incandescent luminaires, and many are <u>not</u> part of the original building construction. It appears as if lighting has been moved, added, and re-purposed over the many

Typical fixture part of original construction



Typical renovated fixture

years of building use.

2. Exterior wall mounted fixtures are located outside the egress doors. These are typically controlled via wall switches located in the building.

Emergency Lighting

1. No emergency lighting is present in the residences.

Technology Systems

1. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

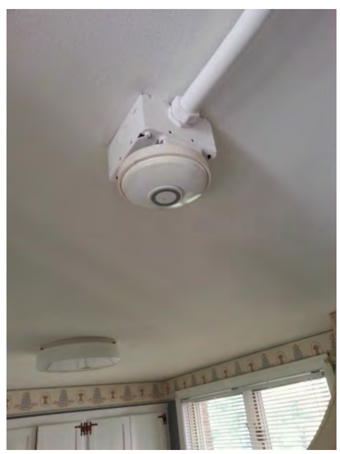
2. Residences do not utilize fiber systems.

Fire Alarm Systems

1. Fire alarm systems for each house dial out to the control panel located in building #1.

2. As is typical of most residential applications, the houses are protected via smoke and heat detectors. Typical smoke detectors are located outside the bedrooms and living rooms, per residential codes. Heat detectors are located in the kitchens.

3. Each house is equipped with carbon monoxide detectors on each floor.



Heat detectors in the kitchen

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Mechanical and Electrical Systems
Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #50 - VRC
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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CES PN 2015034.00

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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

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2. 2005 Connecticut State Fire Safety Code with 2009 supplements
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7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Fixtures and Specialties

1. The fixtures in the building seem to be all operating normally. It would be recommended to upgrade fixture to low flow fixtures if building was to be renovated.

Existing Plumbing and Piping Systems

1. Plumbing piping in the building seems to be in OK condition with some minor leaks spotted. Connections at fixtures seem to be leaking in some spots as well with some corrosion noticed.

Domestic Hot Water Systems

1. The hot water for the building is currently being provided by a steam Leslie water heater. The water heater is still operational but seems to be past its useful life and is original with the building. Water heater should be upgraded to new if building is renovated in the future.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. The building is currently not protected by a fire protection system.

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators. The majority of the radiators are from original build date of 1939. The meeting room is served by a dedicated fan coil unit with a steam heating coil.

Meeting Room FCU

2. Condensate for the building is pumped with a steam driven condensate pump.

3. Significant pipe and trap leaking was reported in this building.

Cooling Systems

1. The majority of the building is cooled using window AC units.

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

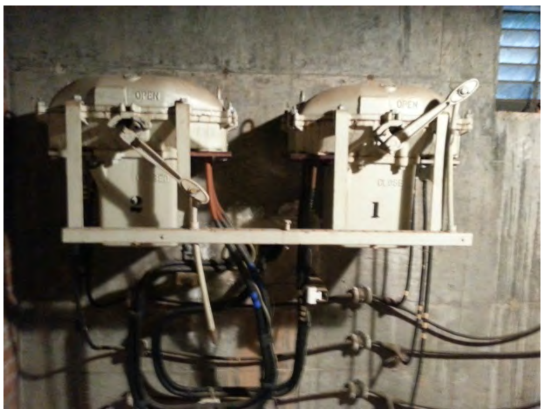
1. Heating control for this building is accomplished by a single manual steam control valve which is opened/closed per season. Occupants control space temperature by opening/closing windows during winter.

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed from the two underground 2.4kV “MAIN” lines, originating at the power plant.

2. The two sets of high voltage feeders terminate at two(2) 200A, 3 phase, oil filled circuit breakers rated for 2.4kV operation. Breakers are part of the orginial building construction, and were installed around 1940. Breakers are protected by fire rated construction. Along with many other buildings on campus, one breaker is set to the “on” position and one is in the “off” position. This is to manually balance the loads on the steam and diesel generators in the case of a power failure, from a campus-wide perspective.



Two high-voltage circuit breakers

Exterior 225KVA transformer

3. Feeders on the load side of each circuit breaker are tapped together to form one set of service feeders. These wires are run underground in conduit to a 225kVA, 3 phase Square D transformer located on a concrete pad outside the building. The transformer steps down the voltage from 2.4kV to 208V, 3 phase.

4. From the exterior transformer, feeders terminate at a 800A/3P MCB located in a panel in the basement of the building.

Electrical Distribution

1. The building contains multiple branch panels, all of which are fed from the 800A main distribution panel. Most branch panels are Square D series QD load centers, and seem to be part of the original building’s construction.

2. Branch panels utilize plug-in circuit breakers. The main distribution panel uses molded-case circuit breakers. Most panels are filled to capacity, with little to no spares.

3. Convenience receptacle facilitation appeared to be adequate throughout most areas of the building.

Emergency/Optional Standby Power

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the on/off positions of the high voltage oil circuit breakers.

Lighting

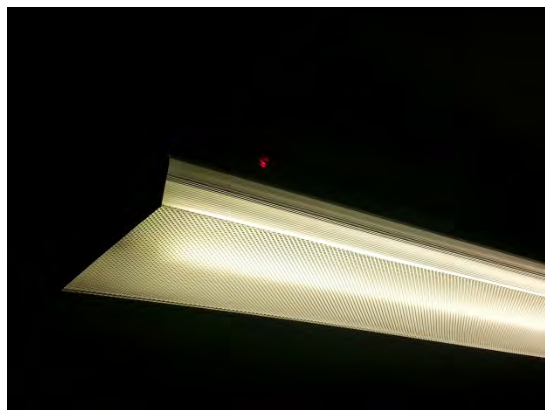
1. Interior lighting systems are mostly comprised of surface mounted linear T8 fluorescent fixtures.

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. Corridor and other egress path light fixtures have been outfitted with integral battery backups to provide life safety illumination in case of a power outage or fire alarm. These fixtures seem to have been upgraded recently (within the last 10 years).

Typical fluorescent fixture



Fixture outfitted with emergency ballast

Technology Systems

1. The building is tied into the campus fiber network. Two strands of multi-mode fiber originating at the network distribution room in the basement of building #5 terminate at a patch panel in the main "VRC" IT room. From here, Ethernet cabling is distributed to data jacks throughout the building.

2. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

3. The building utilizes many technology systems, although exact age and manufacturers were not made evident at the time of this survey. Such systems include, but not limited to the following:

   - CCTV security cameras
   - Ethernet distribution

- Wireless access
- Call-for-aid buzzers in the bathrooms

Fire Alarm Systems

1. The building is equipped with a Grinnell Autocall fire alarm control panel, located in the main entrance corridor. The fire alarm system appears to have good facilitation with regard to occupant notification.

2. The fire alarm strobes are located at 80” above finished floor. The pullstations are located at 52” above finished floor.

Fire alarm control panel
located in main corridor

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Mechanical and Electrical Systems Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #51 - Apartments
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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CES PN 2015034.00

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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

The mechanical, electrical, plumbing, and fire protection systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
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3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Utilities

1. Domestic water enters into the apartments through the basement and is distributed throughout the building. The piping seems to be in good condition with no leaks seen during walk-through.

Existing Plumbing Fixtures and Specialties

1. Fixtures in the apartments are very old and should be upgraded to high efficiency fixtures if a renovation takes place.

Domestic Hot Water Systems

1. Domestic hot water for the apartments is provided through a 50 gallon electric water heaters. Most of the water heaters seem to be either A.O. Smith or Brandford White models. Water heaters are in good condition with minor wear reported on them.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. There is currently no fire protection in the apartment buildings. If the buildings were to be renovated, a fire protection system would need to be implemented.

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators. A single steam main enters the basement area and splits to serve each half of the complex. The majority of the radiators are from original build date of 1939.

Steam Radiator

2. Condensate for each half of the complex is pumped from a separate electric condensate pump.

Electric Condensate Pump

Cooling Systems

1. The majority of the building is cooled using window AC units.

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

1. Heating is controlled by a single motorized valve with a single thermostat in the building. Steam flow is modulated to all radiators equally throughout the building. The control system is greater than 30 years old.

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed from the two underground 2.4kV "MAIN" lines, originating at the power plant.

2. The two sets of high voltage feeders terminate at two(2) 200A, 3 phase, oil filled circuit breakers rated for 2.4kV operation. Breakers are part of the orginial building construction, and were installed around 1940. Breakers are protected by fire rated construction. Along with many other buildings on campus, one breaker is set to the "on" position and one is in the "off" position. This is to manually balance the loads on the steam and diesel generators in the case of a power failure, from a campus-wide perspective.

Two high-voltage circuit breakers

Three 45KVA transformers

3. Feeders on the load side of each circuit breaker are tapped together to form one set of service feeders. These wires are run to three(3) single phase, 45KVA transformers located in the same room. These transformers are part of the original building's construction. Transformers step the building voltage down to 208V (3 phase).

4. From the transformers, feeders terminate at a 200A/3P fused switch located in the adjacent electrical distribution room.

Electrical Distribution

1. The 200A/3P main switch feeds an adjacent 200A fuse box. This provides power to multiple branch panels within the building. Most branch panels are Square D series QD load centers, some of which appear to be part of the original building's construction. Some panels have been added as the building was expanded.

2. Wiring methods consist of both MC cabling and Romex. All wiring is integral to the original building construction, but appears to be without significant damage.

3. Convenience receptacle facilitation in the residential spaces appears to be very limited. Although exhaustive measurements were not taken during this survey, it is evident that receptacle spacing does not meet residential code requirements. Additionally, a few receptacles near water sources were not GFCI type.

Main distribution fuse box

Typical recessed branch panel

<u>Emergency/Optional Standby Power</u>

1. High voltage power to this building is backed up by the steam and diesel generators located at the power plant. In the event of a power failure, one of these generators will provide power to the entire building, depending on the on/off positions of the high voltage oil circuit breakers.

<u>Lighting</u>

1. A wide variety of lighting systems exist within the dorms. Most fixtures are residential style, surface mounted, incandescent luminaires. Many fixtures are not part of the orginial building construction, and it appears as if lighting has been moved, added, and re-purposed over the many years of building use.

2. Exterior wall mounted fixtures are located outside the egress doors. These are typically controlled via wall switches located in the building.

Lighting fixture NOT original to building

Lighting fixture NOT original to building

Emergency Lighting

1. No emergency lighting is present in the residences.

Technology Systems

1. Analog phone jacks are fed from a punchdown block in the basement. All phone cabling is routed back to the main distribution punchdown blocks in the basement of building #5.

2. Residences do not utilize fiber systems.

Fire Alarm Systems

1. The building is equipped with a Grinnell Autocall fire alarm control panel, located in the main entrance corridor. The fire alarm system appears to have good facilitation with regard to occupant notification.

2. The fire alarm strobes are located at 80” above finished floor. The pullstations are located at 52” above finished floor.

3. As is typical of most residential applications, the houses are protected via smoke and heat detectors. Typical smoke detectors are located outside the bedrooms and living rooms, per residential codes. Heat detectors are located in the kitchens.

Autocall fire alarm control panel

Typical smoke detector

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Mechanical and Electrical Systems
Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #52 – Maintenance Building
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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CES PN 2015034.00

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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

APPLICABLE CODES AND STANDARDS

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7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Utilities

1. Domestic water enters building through the steam tunnel. The domestic water supply then enters the maintenance building and is mounted against the back wall where there is a check valve assembly. The piping seems to be in good condition and no leaks reported.

Existing Plumbing Fixtures and Specialties

1. There are a couple of sinks located in the maintenance building. All fixtures are operational and no leaks were seen during walk through. The fixtures are old though and should be upgraded during the renovation.

Domestic Hot Water Systems

1. Hot water for the building is provided through a Leslie water heater. The water heater is operational but seems original with the building. It should be upgraded if a renovation takes place.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. The maintenance building is currently protected off of the wet system that is being provided by the main fire pump house. The sprinkler piping is run exposed in the space with a combination of sidewall and upright sprinkler heads. All sprinkler piping seems to be in good condition.

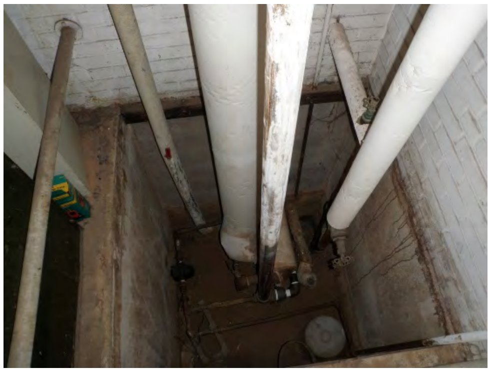
MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by perimeter steam radiators. The majority of the radiators are from original build date of 1939.

Steam Radiator

2. Condensate for the building is pitched back to the central plant underground.



Condensate Piping

Cooling Systems

1. A portion of the building is cooled using window AC units.

Ventilation / Exhaust Systems

1. Outside air for the building enters through operable windows.

2. Exhaust air for toilet rooms is removed by local exhaust fans and ductwork which are original to the building.

Control Systems

1. Heating control for this building is accomplished by a single manual steam control valve which is opened/closed per season. Occupants control space temperature by opening/closing windows during winter. Several thermostatic control valves exist for minor local adjustment.

ELECTRICAL SYSTEMS

Electrical Service

1. The building is fed from a 100A/3P (208V) fused switch located in the main distribution switchboard of building #6 (power plant).

2. Feeders terminate at a 200A/3P fused switch located in the main office area.

100A fused switch feeding building #52
(located in building #6)

200A main disconnect switch in building #52

Electrical Distribution

1. All branch panelboards are fuse boxes, part of the original building's construction. Fuse boxes are located in various utility spaces throughout the building. All branch fuse boxes are fed from a distribution fuse box located in the main office area. This is fed from the main 200A/3P fused switch. It should be noted that the main switch and main fuse box are located in a very crowded area, where NEC required clearances are not met.

Main fuse box

2. A panel in the storage garage (building #20) is fed from a 60A/3P fuse in building #8's distribution box.

Emergency/Optional Standby Power

1. The main 208V feed to all maintenance buildings is backed up via the diesel generator in the power plant. An automatic transfer switch is integral to the 225KVA exterior transformer.

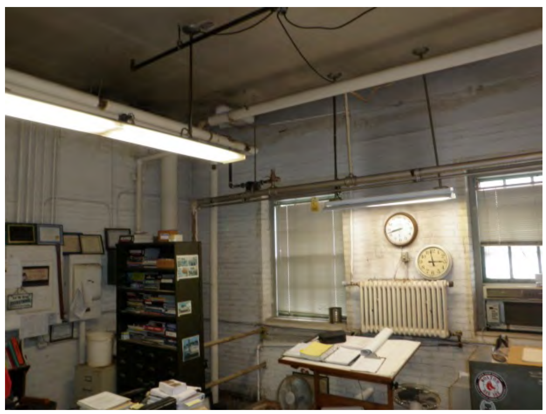
Lighting

1. The vast majority of Interior lighting systems is comprised of pendant mounted industrial T8 fluorescent fixtures. Some fixtures were in need of maintenance, and others were unoperational altogether.

Emergency Lighting

1. Illuminated exit signs with internal battery backups are mounted above each egress door.

2. Life safety lighting is achieved through the use of plug-in, battery backed wall packs. These fixtures are located only in the larger areas, and none are installed in the corridors. There does not appear to be adequate levels of illumination from these fixtures alone.



Typical T8 fluorescent fixtures

Technology Systems

1. The building receives all fiber and copper communication cabling from the basement of building #6 “Power plant”.

2. The building utilizes many technology systems, including but not limited to the following:

- CCTV security cameras
- Ethernet distribution
- Wireless access
- Call-for-aid buzzers in the bathrooms

Fire Alarm Systems

1. Fire alarm feeds terminate at the Autocall panel in building #6. **This panel is no longer operational, and is in severe need of replacement. This poses a major threat to the building's occupants.**

2. Smoke and carbon monoxide detection was not present in most areas of the buildings.

3. Fire alarm horn strobes seem to be adequately spaced in the corridors and other required rooms. Proper audiovisual notification of the building's occupants seems to be in order. Strobes are typically mounted at 80" above finished floor.

4. Fire alarm pull stations are located at the building's egress doors, mounted at 52" above finished floor.

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Mechanical and Electrical Systems Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #62 – Levitow Healthcare Center
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
811 Middle Street, Middletown, Connecticut 06457
CES PN 2015034.00

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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

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8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

PLUMBING SYSTEMS:

Existing Plumbing Fixtures and Specialties

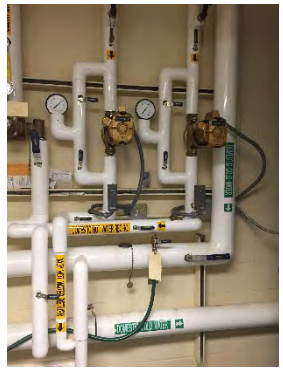
1. All plumbing fixtures are new and are in good condition.

Existing Plumbing and Piping Systems

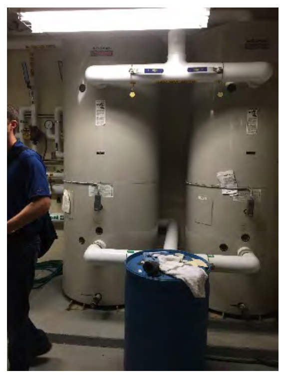
1. All piping is new and is in good condition. Insulation is provided on all hot water and cold water piping and is clearly labeled.

Domestic Hot Water Systems

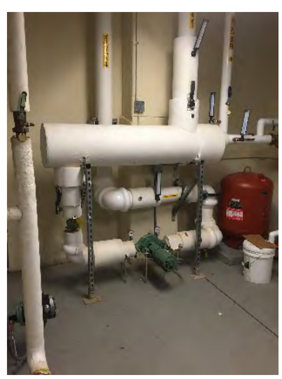
1. Domestic hot water for the building is fed off of the natural gas boiler system located in the mechanical room. The hot water from the boilers is feed into a heat exchanger which brings the domestic water up to temperature. The hot water off of the heat exchanger is then placed into (2) 400 gallon storage tanks that are used for the potable hot water for the building. Hot water recirculation pumps (2 for redundancy) ensure that hot water is available at the fixtures when needed. The hot water (140°F) and the domestic cold water are run through a mixing valve which provide the building with 110°F water). The entire hot water distribution system is in like- new condition and seems to have no issues.



Domestic hot water distribution system



Domestic hot water storage tanks



Hot water heat exchanger

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. Fire Protection service for the New Hospital is provided off of the domestic water service. There is both a wet system and dry system for the facility. The fire protection is in good condition with maintenance tags filled out regularly. The fire protection system is equipped with a double check backflow preventer to allow for no water from the fire protection to get back into the potable water system.

FP Wet System

FP Dry System

MECHANICAL SYSTEMS:

Heating Systems

1. Building is heated by (4) hot water boilers dedicated to the building. The boilers run on natural gas and #2 fuel depending on the season and temperature.

Hot Water Boilers

2. Fuel oil is stored underground in a 6,000 gallon tank, with local day tank and circulation pumps inside the building.

3. Hot water circulates throughout the building through base mounted hot water pumps.

4. 4-pipe can coil units (FCU's) are located in each space. Each FCU has both heating and cooling coils to allow for specific conditioning each space. Local temperature sensors transmit the space conditions to the Building Management System (BMS) which in turn modulates the FCU accordingly.

5. Vestibules, stairwells, and mechanical spaces are heated by individual unit heaters.

Cooling Systems

1. An outdoor air cooled chiller provides chilled water to the cehntral plant where it is then pumped to the entire building for space cooling. 4-pipe can coil units (FCU's) are located in each space and provide cooling to each room.

2. The chiller was installed as a 200-ton unit with twin chiller barrels. It has been discovered that the unit has a damaged barrel and is only capable of operating at half cooling load. During hot days the building is unable to maintain both cooling and dehumidification of outside air. Therefore, the outside air ventilation system is occasionally turned off to maintain the space cooling system. Eliminating ventilation to the occupied spaces is considered a major issue as it's required to be operating 24/7 by code. The damaged chiller should be investigated further.

Ventilation / Exhaust Systems

1. Ventilation air originates from one of (4) energy recovery ventilators (ERV's) and is ducted into each space individually.

2. The ERV also contains an exhaust system which transfers energy to the outside air stream while also exhausting general areas and patient rooms.

3. Additional exhaust is removed from the building by individual exhaust fans serving unclean areas like soiled rooms, kitchens, holding room, etc.

Control Systems

1. This building is controlled by a central building management system (BMS) which is accessible from anywhere over the internet. The BMS is capable of modulating, viewing, starting, and stopping all mechanical equipment in the building. The system is relatively new and considered the modern standard.

ELECTRICAL SYSTEMS

Electrical Service

1. Main electric service to the hospital is separate from all other campus services. The building is fed directly from 24kV underground lines originating at the street. High voltage feeders terminate at a 750KVA, 3 phase exterior transformer, which steps the building voltage down to 208V.

2. From the load side of the transformer, 208V feeders travel underground to a 3000A/3P main circuit breaker within the building's main switchgear.

750KVA transformer

3000A/3P MCB

Electrical Distribution

1. Multiple branch panels throughout the building are fed from the main 3000A/3P switchgear. Branch panels are located in dedicated electrical rooms, and are part of the original building's construction (approximately 7 years old).

2. Throughout the building, convenience receptacle facilitation is adequate for the spaces served.

Emergency/Optional Standby Power

1. Emergency power to the building is supplied via a 300KW diesel generator located directly outside the building. The generator's fuel is stored in a 1000 gallon tank, located under the genset. An emergency shut-off for the generator is located on the exterior of the building with none being located on the generator itself.

300KW diesel generator

Critical power and life safety ATS's

2. Critical power within the building is backed up via an 800A/3P ATS located in the main electrical room. This ATS receives feeds from an 800A/3P breaker in the main switchgear, and an 800A/3P breaker in the generator. The load side of the ATS supplies power to a critical power distribution panel.

3. Critical power feeds the following items:

   - Receptacles within the patient rooms, per code.
   - Boilers and heat pumps in the mechanical rooms. Note that fan coil units are NOT on emergency power.
   - Building IT infrastructure.

4. Life safety within the building is backed up via an 800A/3P ATS located in the main electrical room. This ATS receives feeds from an 225A/3P breaker in the main switchgear, and an 225A/3P breaker in the generator. The load side of the ATS supplies power to a life safety distribution panel.

5. The building does not contain an optional standby transfer switch.

Lighting

1. Interior lighting systems are mostly comprised of recessed 2x4 T8 fluorescent fixtures. All lighting fixtures seem to be in acceptable condition

2. The main lobby of the building contained multiple architectural fixtures, highlighting various architectural features.

Emergency Lighting

1. Illuminated exit signs with internal battery backup are mounted above each egress door. Additionally, low level exit signs are located at the end of each corridor.

2. Corridor and other egress path lighting is backed up via the life safety ATS, and power is supplied via the building's generator in the event of a power failure. Emergency lighting circuits operate via UL924 listed relays.

Technology Systems

1. The building is connected to the campus fiber network, and is fed from a dedicated fiber patch panel in the distribution room of building #5.

2. 6 strands of single mode fiber and 12 strands of multi-mode fiber run underground from building #5 to this building's MDF. Fiber strands terminate at a patch panel in the MDF, from which they are routed to Ethernet distribution switches in IT rooms throughout the building. Ethernet cabling (mostly cat.5) is run from the distribution switches to data jacks.

Fiber strands in building
#5 feeding the ACF

3. The building utilizes many technology systems, including but not limited to the following:

- CCTV security cameras
- Ethernet distribution
- Wireless access
- Call-for-aid buzzers in the bathrooms

4. Exact details of the technology systems (manufacturer, age, etc.) were not made evident at the time of this survey.

Fire Alarm Systems

1. The building is equipped with a Simplex fire alarm control panel, located in the first floor corridor. A battery cabinet providing emergency power to the fire alarm system is located adjacent to the control panel.

2. Smoke detectors are located in the corridors, spaced 30 feet on center. Additional detectors are present at the elevator lobby, with tie-ins to the elevator's recall system. Detectors are also located on either side of each fire door.

3. Fire alarm horn strobes seem to be adequately spaced in the corridors and other required rooms. Proper audiovisual notification of the building's occupants seems to be in order. Strobes are typically mounted at 80" above finished floor.

4. Fire alarm pull stations are located at the building's egress doors, mounted at 48" above finished floor.

Simplex FACP

<u>Mechanical and Electrical Systems</u>
<u>Existing Conditions Narrative</u>

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #6 – Central Utility Plant
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

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PLUMBING SYSTEMS:

Existing Plumbing and Piping Systems

1. Domestic water piping is fed throughout the building to serve the fixtures that are located in the space. The piping seems to be in OK condition with minor leaks noticed. Insulation was noticed to be in not good condition in many areas where it was either not present or deteriorating off of the piping. This should be replaced with new during a renovation.

Domestic Hot Water Systems

1. Domestic hot water for the building is provided by a Leslie steam water heater. The water seems to be in OK condition and is currently operational. The water heater is old and should be replaced during renovation.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. The building is currently not protected by the campus fire protection system.

MECHANICAL SYSTEMS:

Steam Boilers

1. The central steam plant consists of (4) steam boilers which operate year round. The boilers are piped together to produce 175 psi steam inside the plant. From the 175 psi main are two reducing stations producing 7 psi low pressure for building heating and 50 psi medium pressure steam for

domestic water heating. Currently no equipment on the campus operates at above 50 psi, making the elevated 175 psi steam pressure unnecessary for normal operation. The original plant was built to maintain elevated pressure for equipment which has since been removed from service. In addition to elevated discharge pressure, the boiler feedwater system is also operating at elevated 200 psi pressure to match the steam discharge. The performance, age, and condition of each boiler is as follows:

- B-1 is a 1992 Johnson firetube boiler producing 30,000 pounds steam per hour (Lb/Hr). The unit operates on natural gas only. The unit has several plugged tubes and is showing age consistent with a 23 year old boiler nearing the end of its useful life.

- B-2 and B-3 are 1939 Bigelow watertube boilers producing 20,000 Lb/Hr each. The units operate on either natural gas or #6 bunker oil. The units were retrofitted from their original function as coal fired boilers. The units are beyond their useful lives.

- B-4 is a 1954 Bigelow watertube boiler producing 25,000 Lb/Hr. The unit operates on either natural gas or #6 bunker oil. The unit is beyond its useful life.

Steam Boilers

2. Steam condensate from the campus is pumped and pitched back to the central plant for reuse. Duty/standby condensate pumps discharge into the main condensate tank which is approximately 20 years old and in fair condition.

Condensate Tank

3. The steam water treatment system appears to be well maintained and operational. The makeup water system draws approximately 6,800 gallons of domestic water per day.

4. Boiler breeching is in poor condition. The stacks exterior to the building are rotted and need replacement.

5. Backup #6 bunker oil is stored outside the building in (2) 30,000 gallon tanks. The tanks are approximately 25 years old and are currently red flagged by the DEEP and cannot be used.

#6 Oil Tanks

ELECTRICAL SYSTEMS

Main Campus Distribution

1. Main electric service to the campus enters as three(3) 24kV aerial lines from the street – one feeder for each phase. High voltage feeders terminate at three(3) separate 333kVA single phase transformers located in a fenced off area behind the power plant (building #6). The transformers step the line voltage down to 2.4kV.

24kV Power Lines from street

(3) 333kVA 24kV-2.4kV transformers

2. Emergency power for most areas of the campus is achieved via two(2) generators located inside the power plant. One generator is diesel-fired, rated for 500kW / 625kVA @ 2.4kV, 3 phase. This unit is manufactured by General Electric, Custom 6000 series, and seems to have been installed as the campus was expanded to accommodate an increased load. The diesel fuel

tank is located on the exterior of the building, and as shown in the above photo. The second generator is steam-powered, rated for 250kW / 312kVA @ 2.3kV, 3 phase. This unit is manufactured by Allis-Chalmers, and seems to be part of the original campus construction (installed in approximately 1940).

500KW, 3Ø Diesel Generator

250KW, 3Ø Steam Generator

3. Normal and emergency power meet in a high voltage, six-section, free standing exterior switchgear located adjacent to the main transformers outside the power plant. The six sections are as follows:

- Section #1 – Normal power feed from transformers.
- Section #2 – Emergency power feed from 500KW diesel generator.
- Section #3 – 600A/3P automatic transfer switch, taking inputs from sections 1 & 2.
- Section #4 – Normal power feed from transformers (run parallel to section 1 feed).

- Section #5 – Emergency power feed from 250KW steam generator.
- Section #6 – 600A/3P manual transfer switch, taking inputs from sections 4 & 5.

Campus distribution switchgear

4. Three (3) outputs each from sections 3 & 6 enter into the power plant, via 4” conduits. Feeders then enter a main distribution room within the plant, where they are protected by high voltage fuses, and distributed to three separate 2.4kV campus lines via underground conduits. Each line consists of two sets of feeders: one from the ATS (backed up by the diesel generator), and one from the MTS (backed up by the steam generator).

5. Campus distribution lines are as follows:

   - “Main 1” – Distributes power to the older buildings on the north side of campus and to the houses on either side of West Street. Backed up by diesel generator.

Fused feed-throughs for six distribution lines

- “Main 2” – Distributes power to the older buildings on the north side of campus and to the houses on either side of West Street. Backed up by steam generator.

- “Mess 1” – Distributes power to the central commissary and adjacent dorms. Backed up by diesel generator.

- “Mess 2” – Distributes power to the central commissary and adjacent dorms. Backed up by steam generator.

- “Pump 1” – Distributes power to the domestic water and fire pump houses. Backed up by diesel generator.

- “Pump 2” – Distributes power to the domestic water and fire pump houses. Backed up by steam generator.

6. A high voltage, multi-section switchgear integral to the building’s original construction is located in the same room as the generators. This gear distributes a small amount of additional load to the campus. Of the eight(8) distribution sections, only one is operational. This ties into the “Main 1”, “Mess 1”, and “Pump 1” lines. Exact means of electrical connectivity were unclear at the time of this survey. It appears as if this switchgear is kept in place for mostly historical / exhibit purposes.

The campus’ original high-voltage switchgear

7. An isolated 225KVA, 3 phase utility transformer located adjacent to the exterior switchgear steps the 24kV street voltage down to 208V for use in the power plant and other nearby maintenance buildings.

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<u>Mechanical and Electrical Systems</u>
<u>Existing Conditions Narrative</u>

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Central Utility Tunnel
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
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CES PN 2015034.00

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MECHANICAL SYSTEMS:

Steam Piping in Tunnel

1. The central steam plant supplies 50 psi medium pressure and 7 psi low pressure steam into the central campus tunnel with a third steam condensate line pitching back to the plant. The medium pressure steam feeds domestic water heaters in each building and kitchen kettles, while the low pressure steam provides heating to each building. Medium pressure steam operates year round, while low pressure steam operates only during the heating season.

Steam Entering Tunnel

2. Expansion joints exist throughout the tunnel to compensate for thermal expansion and contraction of the steam mains. The expansion joints are of various ages and conditions, requiring significant routine maintenance and replacement.

3. Several sections of the steam system distribute via underground buried pipes which are not visible for survey. At least one section has been replaced in the past several years.

ELECTRICAL SYSTEMS

Cabling in tunnels

1. The underground tunnels connect many of the central campus buildings together. From an electrical standpoint, these tunnels contain long runs of power and data cabling, acting as an interconnect between buildings.

2. Cabling appears to be supported properly via Unistrut.

3. It should be noted that ALL cables are located in the same group of supports, and power cabling is run alongside data/fire alarm cabling. This may be a violation of NEC requirements.

Cabling in tunnels

Existing Leaking Expansion Joint

Electrical Systems in tunnels

1. Lighting systems in the tunnels consist of surface mounted, industrial style T8 fluorescent fixtures.

2. Life safety lighting is achieved via the use of wall mounted emergency fixtures with built-in battery packs.

3. Audiovisual fire alarm notification devices are located in the tunnels, and appear to be spaced adequately.

4. Feeders to all devices appear to terminate at adjacent buildings, although exact routing of power/data feeds was not evident at the time of this survey.

Mechanical and Electrical Systems Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Domestic Water Building
Rocky Hill, CT

Date: May 9, 2016

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PLUMBING SYSTEMS:

Existing Plumbing Fixtures and Specialties

1. Next to the pump house is a water tower which has a capacity of 156,000 gallons. This water tank seems to be in good condition from the outside but would need an inside inspection test to confirm.

Existing Plumbing and Piping Systems

1. The current domestic water distribution system is brought up from underground into a “hot box”, which is located next to the domestic water pump house and water storage tank. The water service comes in through a 10” WATTS 70s double check backflow preventer before entering into the domestic water pump house. The pump has is comprised of three VFD inline pumps which feed the buildings on campus with the needed flow and pressure required. There are also three storage tanks located in the pump house that are used for water loading during the off peak hours. All tanks and piping seem to be in good condition.

Domestic Water System

Incoming Water Service through “Hot Box”

Domestic Hot Water Systems

1. There is no domestic hot water inside of the domestic water pump house. All hot water for each building is provided by its own steam, gas or electric water heater.

FIRE PROTECTION SYSTEMS:

FP Utilities / Water Service

1. There is currently no fire protection service in the domestic booster pump house.

MECHANICAL SYSTEMS:

Heating Systems

1. Heating for the domestic water building is provided by underground piping from the boilers in the adjacent fire protection building. Unit heaters in the domestic water building provide space heating with dedicated thermostats.

Unit Heater

ELECTRICAL SYSTEMS

Electrical Service

1. The domestic water pump house is fed from the two underground 2.4kV “PUMP” lines, originating at the power plant. The two sets of high voltage feeders terminate at an exterior manual transfer switch, where the electrical service can be switched between “PUMP 1” and “PUMP 2” lines.

2. Feeders on the load side of the transfer switch are routed underground in conduit to an adjacent 3 phase transformer, which steps the voltage down to 480V. This transformer feeds both the domestic water pump house and the fire pump house.

MTS (right) and transformer (left)

Diesel generator

Emergency Power

1. Emergency power to the pump house is achieved through an exterior 150KW, 3 phase, 480V Cummins diesel generator. This generator acts as a standalone system- the pump houses are not backed up via the diesel/steam generators at the power plant.

2. Along with normal-power feeders from the transformer, feeders on the load side of the generator terminate at a 225A/3P ATS in the domestic pump house. In the event of a power failure, the ATS turns on the generator and re-routes power to the emergency system.

Electrical Distribution

1. Feeders on the load side of the 225A/3P ATS terminate at a 480V, 3 phase distribution panel in the domestic pump house. This panel feeds the following items:

   - Three(3) 15HP domestic water pumps.

   - Two(2) 2HP hot water circulation pumps for the boilers in the fire pump house.

2. Additionally, the 480V panel feeds a 45KVA, 3 phase transformer, which steps the voltage down to 208V. In turn, this feeds a 208V/3P panel in the domestic pump house. This panel provides power to the following items:

- 120V feed to the fire pump controller in the adjacent building. The fire pump is diesel-fueled, and this feed powers the engine battery/alternator.

- Jockey pump in the adjacent fire pump building.

- Burners for the boilers in the adjacent fire pump building.

- Miscellaneous receptacle and lighting circuits.

- Other smaller recirculation pumps associated with the domestic water and fire protection systems.

From left to right: 208V distribution panel, 45KVA TX,
480V distribution panel, 225A/3P ATS

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Mechanical and Electrical Systems Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Fire Protection Building
Rocky Hill, CT

Date: May 9, 2016

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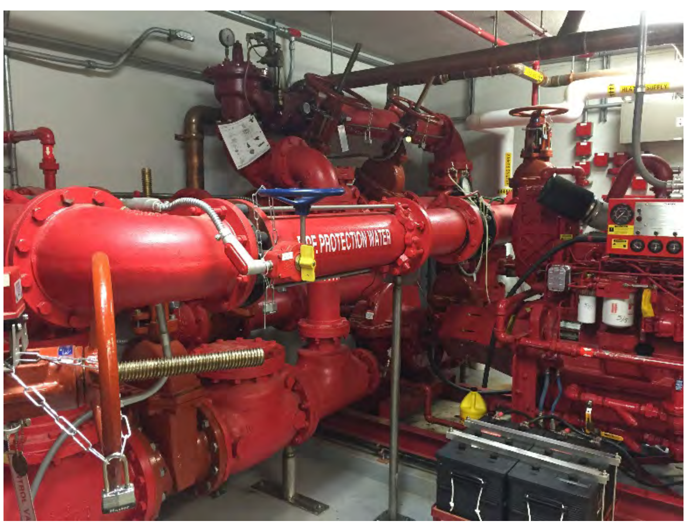
FP Pump:

The fire pump provides flow and pressure for all of the buildings that currently utilize a fire protection system. The fire pump and piping in the room are in excellent shape and there seems to be no leaking or any issues. There is an 8 in fire protection line which enters into the inlet pump side and then reduces to a 6" which is used to distribute to all of the buildings under protection. The fire pump is manufactured by Allis Chambers (A-C) Fire Pump Systems and is a ITT industries centrifugal split case fire pump. The fire pump delivers 1500 GPM at 370 ft of head and 160 PSI. The serial number for the pump is: 06-047189-01-01/KC242P. The fire pump is diesel and uses a CLARKE engine. The fuel for the fire pump is located inside of the pump house and seems to be in good condition. The jockey pump for the fire pump is a Grundfos (Model # A96083224-P20641043) which is rated at 3 HP, and delivers 15.4 GPM at 352.7 ft of head. The pump seems to be in good condition and no leaks were present. The fire pump system seems to be inspected fully once a year and is exercised once a week.



Fire Pump

FP Distribution

1. The fire protection system leaves the building as a 6” main which is then distributed underground to all areas on campus that are utilizing a fire protection system.

MECHANICAL SYSTEMS:

Heating Systems

1. The heating plant for the fire protection building consists of two gas fired hot water boilers circulating hot water to unit heaters, the water tower, and adjacent domestic water building. The boilers and associated piping and pumps are approximately 8-10 years old.

Hot Water Boilers

2. Audible and visual alarms are used to signal boiler failure and low room temperature.

ELECTRICAL SYSTEMS

Electrical Service

1. The fire pump house is fed from the two underground 2.4kV “PUMP” lines, originating at the power plant. The two sets of high voltage feeders terminate at an exterior manual transfer switch, where the electrical service can be switched between “PUMP 1” and “PUMP 2” lines.

2. Feeders on the load side of the transfer switch are routed underground in conduit to an adjacent 3 phase transformer, which steps the voltage down to 480V. This transformer feeds both the domestic water pump house and the fire pump house.


MTS (right) and transformer (left)


Diesel generator

Emergency Power

1. Emergency power to the fire pump house is achieved through an exterior 150KW, 3 phase, 480V Cummins diesel generator. This generator acts as a standalone system- the pump houses are not backed up via the diesel/steam generators at the power plant.

2. Along with normal-power feeders from the transformer, feeders on the load side of the generator terminate at a 225A/3P ATS in the domestic pump house. In the event of a power failure, the ATS turns on the generator and re-routes power to the emergency system.

Electrical Distribution

1. Feeders on the load side of the 225A/3P ATS terminate at a 480V, 3 phase distribution panel in the domestic pump house. This panel feeds the following items:

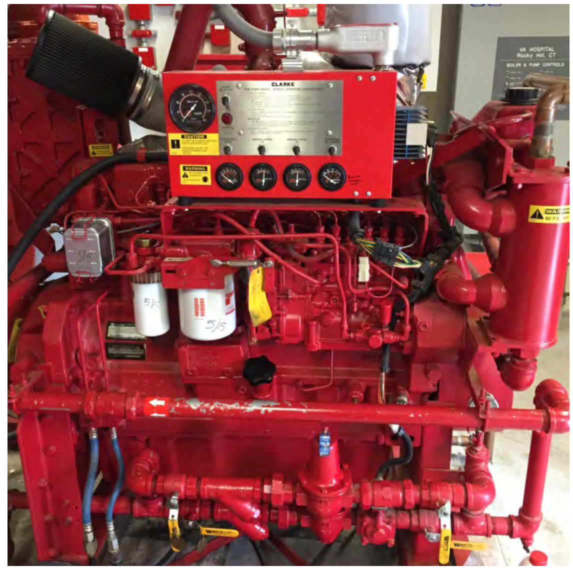
   - Three(3) 15HP domestic water pumps.
   - Two(2) 2HP hot water circulation pumps for the boilers in the fire pump house.

2. Additionally, the 480V panel feeds a 45KVA, 3 phase transformer, which steps the voltage down to 208V. In turn, this feeds a 208V/3P panel in the domestic pump house. This panel provides power to the following items:

   - 120V feed to the fire pump controller in the adjacent building. The fire pump is diesel-fueled, and this feed powers the engine battery/alternator.
   - Jockey pump in the adjacent fire pump building.
   - Burners for the boilers in the adjacent fire pump building.
   - Miscellaneous receptacle and lighting circuits.

- Other smaller recirculation pumps associated with the domestic water and fire protection systems.

Fire pump controller and VFD's for hot water circulation pumps



Fire pump engine

Information Technology Systems
Existing Conditions Narrative

FINAL REPORT

BI-C-287 – Study of DVA Campus for Additional Housing
Building #5 – Data Center
Rocky Hill, CT

Date: May 9, 2016

Prepared by:
Consulting Engineering Services, Inc.
811 Middle Street, Middletown, Connecticut 06457
CES PN 2015034.00

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INFORMATION TECHNOLOGY NARRATIVE

Internet Distribution

1. Fiber WAN lines are routed from the street to the distribution room in the basement of building #5 via underground conduits. WAN lines are owned and managed by the utility company. WAN lines are "handed off" to the customer in the distribution room, where fiber patch cables are routed to the owner equipment.

Head-end rack in basement of building #5

2. Head-end switching and routing equipment is mounted on a 4-post rack in the basement distribution room. WAN fiber terminates at a Cisco 3800 router in this rack, which acts as the main internet router for the campus.

3. From the router, two(2) Ethernet patch cables terminate at the WAN side of an IBM GX4004 firewall device in the same rack. The firewall actively protects the network, and transitions from WAN to LAN.

Main campus firewall (Top) and router (bottom)

4. From the LAN side of the firewall, two(2) Ethernet patch cables terminate at two separate Cisco core switches in the same rack. In turn, the switches output multiple fiber LAN lines to Corning patch panels in a second, adjacent rack.

Two Cisco core switches

5. There exist a total of three(3) Corning patch panels, which distribute fiber to the campus as follows:

- 1U patch panel distributes 12 strands of multi-mode fiber to a security suite in building #2 (labeled “I-wing”).

- 2U patch panel distributes 12 strands of multi-mode fiber and 6 strands of single mode fiber to the Adult Care Facility (Building #62).

- 4U patch panel distributes 48 strands of multi-mode fiber to Ethernet switches in this

4U patch panel distributing
fiber to campus

building and all other buildings utilizing fiber internet. Such buildings include:

- B-2: Commissary/Food Service
- B-3: Domicile
- B-4: Clinic
- B-9: Administration
- B-50: VRC
- B-6: Power Plant
- B-7: VFW Offices

6. Distribution equipment is powered via Two(2) 3KVA uninterruptible power supplies housed in the 4-post rack. UPS's are hardwired back to a 125A panel in the same room. All feeders to IT equipment utilize isolated ground.

125A-1Ø panel feeding head-end equipment

Telephone Distribution

1. Copper telephone lines are routed from the street to the distribution room in the basement of building #5 via underground conduits. Lines terminate at a set of punchdown blocks on the wall of the distribution room.

2. From the punchdown blocks, copper pairs are split, managed, and labeled. They are then routed out the back side of the wall to all other buildings throughout the campus. Lines are routed underground in conduit.

3. Telephone distribution equipment is powered via both NEMA 5-20 receptacles and hardwired Altronix power supplies. All power supplies utilize isolated ground.

Telephone punchdown blocks

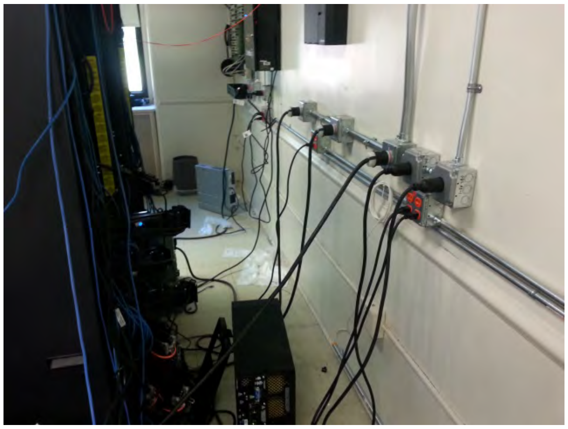
Server Room

1. The main server room for the campus is located on the third floor of building #5. This room consists of four(4) free standing 4-post racks, which house servers, hard drives, KVM switches, and other service equipment. Three of the four racks are tied into the building's network via dedicated Ethernet switches, each of which takes in two strands of multi-mode fiber from the Corning patch panel in the basement. Equipment in the fourth rack is fed from the adjacent rack's distribution switch.

2. Each rack contains one or more 3KVA uninterruptible power supplies, which are powered via a total of seven(7) wall mounted NEMA L6-30R dedicated twistlock receptacles (with isolated ground). All service equipment is backed up via these UPS's. Additional non-critical equipment is fed directly from NEMA 5-20R quad receptacles on the wall (also with isolated ground).

3. S2 security/access control equipment for building #5 is also located in this room.

Server racks on third floor



L6-30R receptacles

c. BUILDING UPDATES – BASED ON 2005 REPORT

Building 1 – Administration

Building 2 – Commissary

November 2009 – Renovation of Bathrooms and Ramps

Building 3 – West Domicile

November 2009 – Renovation of Bathrooms and Ramps

November 2009 – HVAC Upgrade

Building 4 – East Domicile

November 2009 – Renovation of Bathrooms and Ramps

November 2009 – HVAC Upgrade

Building 5 - Hospital

Building 6 – Power Plant

December 2014 – Emergency Generator

Building 7 – Physical Plant

Building 8 - Veterans' Services

Building 9 – Assembly

Building 10 – Security

Building 11 – Residence, Sugar Hill

Building 12 - Residence, Sugar Hill

Building 13 - Residence, Sugar Hill

Building 14 & 16 - Residence, Sugar Hill

Building 15 & 17 – Residence, Sugar Hill

Building 18 – ESGR – Across the Street

Building 19 – Group Home 1 – Farmhouse - Across the Street

Building 20 – Maintenance Garage

Building 40 – Pump House

Building 44 & 49 – Garages

Building 50 – Recovery Center

June 2014 – New Roof

Building 51 – Apartments

Building 52 – Transitional Living Residence

Building 53 – Residence, Patriots Landing

Building 54 – Residence, Patriots Landing

Building 55 – Residence, Patriots Landing

Building 56 – Residence, Patriots Landing

Building 57 – Residence, Patriots Landing

Building 58 – Cemetery Storage

Building 60 – Police Corps

Building 61 – Incinerator

Building 62 – Levitow Healthcare Center

2008 – New Construction

d. SITE UTILITIES

1. Domestic Water and Fire Protection

The water supply distribution system for this site, both domestic and fire protection, went through a major upgrade in 2007. As part of that upgrade, a new water storage tank was added to the water distribution system. The location of the new storage facility is along the northeasterly sector of the site. In order to maintain proper water pressures for both domestic and fire protection water two pump stations were added to the system; one for the domestic water and the other for fire protection water. This water distribution facility is served by two separate water supply mains that originate from two different sources. An 8-inch ductile iron pipe domestic water line originates from West Street and runs along the southeasterly side of the power house. Then turns in a northerly direction to the new pump stations. The second water supply source originates from the water main in Elm Street, which is several thousand feet to the north of the site. A 10-inch ductile iron pipe is tapped from the water main in Elm Street and runs in a southerly direction to the storage tower and pump stations. A water distribution loop circles the entire campus providing domestic water and fire protection water to every building. This water distribution loop is made up of two parallel running ductile iron pipes; the domestic water is 6-inches and the fire protection is 8-inches. Each building on campus is now supported by both distribution lines. No further upgrades will be required for the campus wide renovation project. See drawing C-1 for information regarding water supply of site.

2. Sanitary

The Veteran's Affairs Campus is served by a sanitary sewer trunk line that is running in West Street (AKA Route #411). Based on information available this sanitary sewer trunk line flows under gravity across the entire front of this site. Three separate laterals serve the site (see drawing C-2). At the southwesterly corner of the property is a cluster of seven residential buildings (noted as buildings 11 through 17) that are served by a single gravity sewer lateral that connects to the trunk line in West Street. The majority of the buildings are served by a sewer lateral that runs from the most northerly part of the site picking up residential buildings 51 and 60. The sewer line wraps around the easterly side of building 5 where sewer laterals from building's 7 and 50 connect to the main sewer lateral. The sewer main passes in between buildings 2 and 4 and along the easterly side of buildings 1 and 9 where the sewer lateral from building 3 connects to the sewer main. The sewer main continues in a southerly direction passing by the easterly side of the gate house and connecting to the sewer trunk line in West Street. At the southeasterly corner of the property the remaining sewer main is located, which serves buildings 6, 8, 20 and 52. This sewer line runs from West Street in a northerly direction and turns in a northwesterly direction near buildings 8 and 52 where it originally terminated. In 2008, the Levitow Healthcare Center (building 62) was constructed. The existing sewer main was extended in a northerly direction to provide a sanitary connection for the new building. There is little information regarding the construction of the original sewer main that supports the campus. It is reasonable to assume that this critical infrastructure was constructed during the initial building construction phase of the campus during the 1930s. Generally sewer mains of that era were commonly constructed using vitrified clay pipe (VCP). It should be noted that this sewer main is 70 years old and the joints between pipe sections may have deteriorated with time; potentially allowing the infiltration of water and/or infiltration of roots from plants and trees. The natural elevation difference (approximately 100 feet) from the back of the property to the front of the property provides for adequate slopes on the sewer main. This degree of slopes allow for efficient travel of effluent that avoids the potential for blockages that may occur with a system that is operating under minimum slopes, especially with the age of the system.

3. Storm

The development of a storm drainage infrastructure for this campus follows the path of site development for each building. A majority of the storm drainage was installed during a period spanning between the 1930's through the 1950's (see drawing C-3). In 2008 the Levitow Healthcare Center (building 62) was constructed on the campus that required modification to the existing drainage system. The site generally slopes from a northwesterly to a southeasterly direction with the existing drainage network being separated into four distinct drainage areas or watersheds (see attached storm water drainage drawing). The largest watershed area is A-1, which spreads across 30 acres of the campus and provide site drainage for 6 ½ buildings that include; building 51(apartments), buildings 44 and 49 (garages), building 60 (apartments), building 50 (VRC), building 5 (hospital), and building 62 (Levitow Healthcare Center) and the northerly side of building 2 (commissary). The outlet for this watershed area is along the northeasterly side of the campus which abuts a wetlands area. The next drainage area is A-2, which is south of drainage area A-1 and is slightly less than 30 acres in area. This watershed provides site drainage for 6 ½ buildings that include; building 7 (VSC), building 3 (west domicile), the southerly side of building 2 (commissary), building 4 (east domicile), building 9 (assembly), building 1 (administration) and building 52 (transitional living center). This watershed drainage discharges to the southeasterly corner of the campus into a wetlands area. Watershed area A-3 is located to the east of both watershed areas A-1 and A-2. The size of this watershed is slightly larger than 10 acres and provides site drainage for three buildings; building 8 (physical plant), building 6 (power plant) and building 20 (grounds shop). The remaining watershed A-4 is located on the southwesterly side of the campus and occupies an area of less than 10 acres. This drainage network provides site drainage for seven building that are cluster together on the southwesterly corner of the campus; buildings 11 through 17 (residences). This drainage system discharges onto West Street (AKA Route 411).

4. Electrical – Building Power Distribution and Site Lighting

It appears that electrical power is provided to the site by overhead electrical lines that originate from West Street at the southeasterly corner of the site. This line runs in a northeasterly direction where the line connects to the power house. On the north side of the power house the electrical distribution is fed underground where it radiates out in three direction to serve the campus (see drawing C-4). One branch runs in a northerly direction toward Elm Street. Another branch runs in a southwesterly direction where it splits into two branches one directed toward the gate house and the other runs north of building 1 and continues in a southwesterly direction until it terminates at the residential buildings (11 through 17). The third branch runs in a northwesterly direction passing to the north of building 4 and terminating at building 2. Before terminating at building 2 the branch splits into another electrical distribution branch that runs in a northerly direction. This underground electrical distribution splits one more time providing a branch line to serve building 5. The remaining power feed runs in a northwesterly and then again in a northerly direction where it terminates at building 51. This electrical distribution feed passes to the east of building 50, which was served by this electrical distribution line. From building 5 electrical power is provided to building 7 and building 60. Also from building 5 electrical power is provided to the water towers. The location of all these underground electrical distribution lines is compiled from other sources and may not accurately depict the true location.

In addition to the electrical distribution lines that serve power for all the buildings, there is a network of underground electrical lines providing power to the site lighting system. These lines are generally found along edge of pavements, sidewalks and adjacent to buildings. A general layout of the site lighting lines is depicted on the electrical distribution drawing.

5. Natural Gas

Natural gas is available to the campus through a 4-inch steel gas main in the southerly side of West Street. As part of the construction for the Levitow Healthcare Center in 2008 a new gas service line was extended to serve the new facility. Later in 2008, another construction project included a second natural gas service. This second project upgraded the water distribution system for the campus. As part of that upgrade a new water tower and two pump stations were incorporated into the new water distribution system. The new pump stations were powered by natural gas. Therefore, a second gas service line was brought onto the site (see drawing C-5). This gas service runs in a northerly direction paralleling the service road that leads to the physical plant. The gas service then runs parallel and on the southeasterly side of the physical plant and power house. The gas service then runs along the northeasterly side of the power plant and continues in a northerly direction to the pump stations adjacent to the new water tower.

6. Tunnels

When the campus was originally planned in the early 1930’s, a network of tunnels was included in that design for providing utility access between buildings (see drawing C-6). The power house needed to be connected to all the buildings in order to supply heat and hot water. The power house is located at the southeasterly corner of the campus. A tunnel from the power house runs in westerly direction to the southwesterly corner of building 4. From that location the tunnel system makes a trapezoidal shaped loop through buildings 3 and 2 and then back to building 4. A branch off of this loop provides service to building 9. Another branch on the southerly side of building 2 extends through building 2 in a northerly direction and connects with building 5. At the northwesterly corner of building 5 the tunnel system then runs in a northwesterly direction to building 50. With the construction of the Levitow Healthcare Center in 2008, a new section of tunnel was inter-connected with the tunnel section between buildings 2 and 5. The new building was constructed with its own heating system, therefore the tunnel was provided for access between buildings and not for providing steam. The overall vision for this campus is to eliminate the central power plant and the use of steam for heating and hot water.

Currently there are several sections in need of repair. We do not recommend installing anything new in the tunnels until they are repaired.

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Chapter A.2
Existing Conditions Site Plans

FINAL REPORT

Date: May 9, 2016

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51. APARTMENTS
BASEMENT — STAFF RESIDENCE 2,110 SF
1 — STAFF RESIDENCE 8,200 SF
2 — STAFF RESIDENCE 8,200 SF
18,510 SF

44. APARTMENTS GARAGE
GROUND — GARAGE 2,345 SF

49. APARTMENTS GARAGE
GROUND — GARAGE 2,345 SF

60.APARTMENTS
BASEMENT — NOT IN USE 2,240 SF
BASEMENT — GARAGE- STORAGE 467 SF
BASEMENT — GARAGE- STORAGE 1,071 SF
BASEMENT — GARAGE- STORAGE 903 SF
1 — NOT IN USE 4,810 SF
2 — NOT IN USE 3,470 SF
12,961 SF

5. HOSPITAL
BASEMENT — BUILDING SERVICES/ STORAGE 16,260 SF
1 — OFFICES/ MAILROOM/ STORE/ STORAGE 39,900 SF
2 — STORAGE 39,900 SF
3-HALF IN USE — INFOR TEC./ CENTRAL SUPPLY/ STORAGE 39,900 SF
4 — STORAGE 39,900 SF
5 — STORAGE 23,300 SF
199,160 SF

62. ADULT CARE FACILITY

50. VRC
BASEMENT — RECREATION/ LAUNDRY/ STORAGE 7,255 SF
1 — OFFICES/ DORMITORY 12,890 SF
2 — DORMITORY 11,300 SF
3 — DORMITORY 11,300 SF
42,745 SF

7. VETERANS SERVICE COMPLEX
BASEMENT — OFFICES 2,360 SF
GROUND — GARAGE 1,377 SF
1 — OFFICES 12,830 SF
2 — OFFICES 2,450 SF
19,017 SF

2. COMMISSARY
B — UTILITY/ REC./ BLDG SERVICES 6,920 SF
1 — KITCHEN/ DINING 24,330 SF
2 — EDUCATIONAL - NOT USED 6,640 SF
3 — DORMITORY -NOT USED 4,260 SF
59,730 SF

3. DOMICILE
BASEMENT — UTILITY/ STORAGE 6,920 SF
1 — DORMITORY 28,500 SF
2 — DORMITORY 27,300 SF
62,720 SF

16. RESIDENCE
BASEMENT — STAFF RESIDENCE 895 SF
GROUND — GARAGE 208 SF
1 — STAFF RESIDENCE HOSPICE 925 SF
2 — STAFF RESIDENCE 925 SF
2,953 SF

14. RESIDENCE
BASEMENT — STAFF RESIDENCE NOT USED 895 SF
GROUND — GARAGE 208 SF
1 — STAFF RESIDENCE NOT USED 925 SF
2 — STAFF RESIDENCE NOT USED 925 SF
2,953 SF

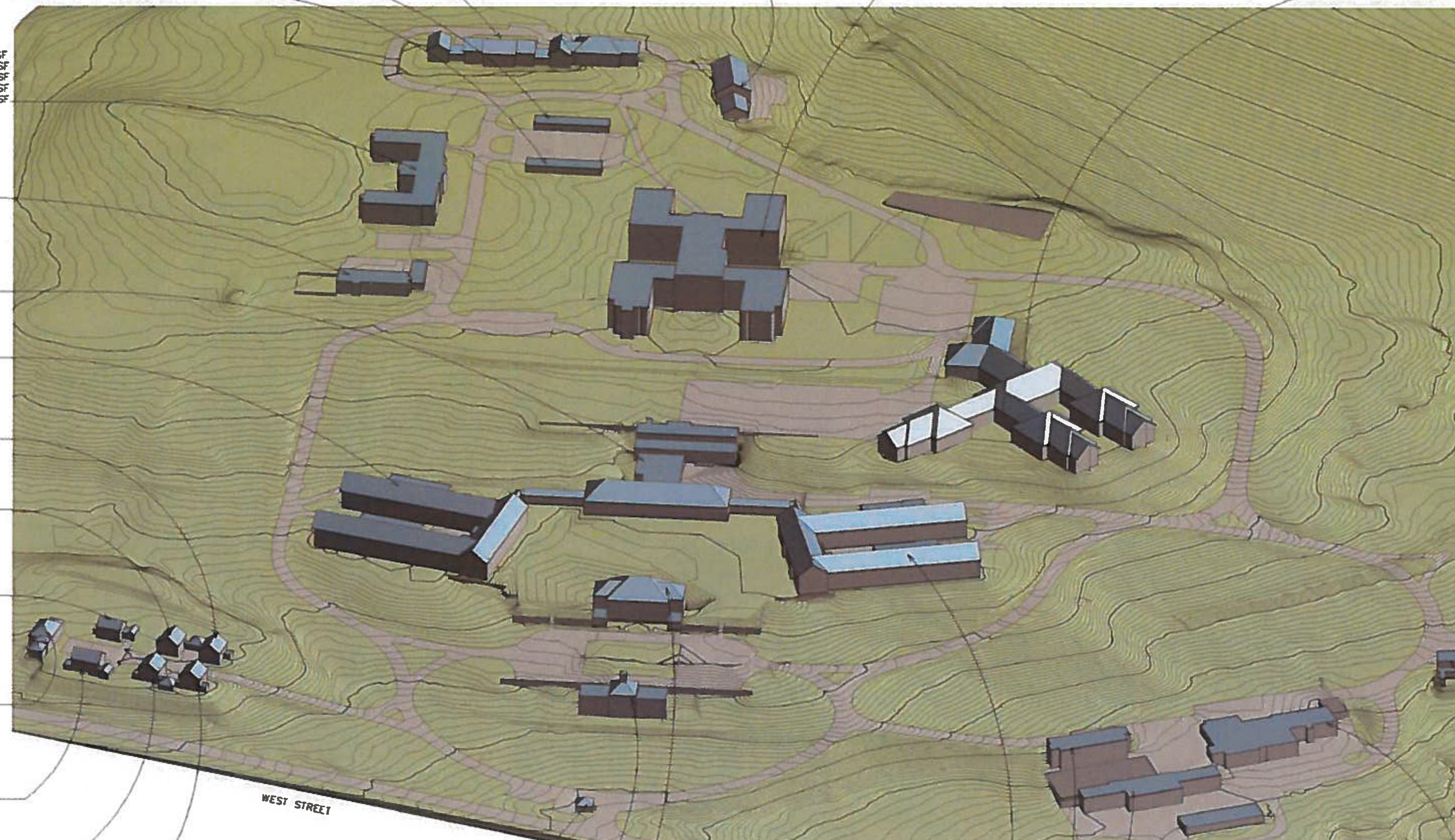
12. RESIDENCE
BASEMENT — STAFF RESIDENCE NOT USED 800 SF
GROUND — GARAGE 200 SF
1 — STAFF RESIDENCE NOT USED 900 SF
2 — STAFF RESIDENCE NOT USED 825 SF
2,725 SF

11. RESIDENCE
BASEMENT — STAFF RESIDENCE NOT USED 1,485 SF
GROUND — GARAGE 363 SF
1 — STAFF RESIDENCE NOT USED 1,580 SF
2 — STAFF RESIDENCE NOT USED 2,130 SF
5,558 SF

13. RESIDENCE
BASEMENT — STAFF RESIDENCE NOT USED 1,050 SF
GROUND — GARAGE 190 SF
1 — STAFF RESIDENCE NOT USED 1,080 SF
2 — STAFF RESIDENCE NOT USED 1,080 SF
3,400 SF

15. RESIDENCE
BASEMENT — STAFF RESIDENCE NOT USED 895 SF
1 — STAFF RESIDENCE NOT USED 925 SF
2 — STAFF RESIDENCE NOT USED 925 SF
2,745 SF

17. RESIDENCE
BASEMENT — STAFF RESIDENCE NOT USED 895 SF
GROUND — GARAGE 208 SF
1 — STAFF RESIDENCE HOSPICE 925 SF
2 — STAFF RESIDENCE 925 SF
2,953 SF



10. GATE HOUSE
BASEMENT — STORAGE 520 SF
2 — OFFICE 520 SF
1,040 SF

1. ADMINISTRATION
BASEMENT — OFFICE 4,250 SF
1 — OFFICE 4,220 SF
2 — OFFICE 1,310 SF
9,780 SF

9. ASSEMBLY
BASEMENT — CHAPEL & EMERG. PREP. 8,050 SF
1 — AUDITORIUM 6,970 SF
2 — PROJECTION BOOTH 330 SF
15,030 SF

4. DOMICILE
BASEMENT — UTILITY/ STORAGE 18,100 SF
1 — DORMITORY 28,800 SF
2 — DORMITORY 27,800 SF
74,700 SF

52. TRANSITIONAL LIVING
BASEMENT — GARAGE/ ELECTRICAL SHOP 4,110 SF
1 — DORMITORY NOT IN USE 4,020 SF
2 — DORMITORY NOT IN USE 4,020 SF
12,150 SF

8. MAINTENANCE
BASEMENT — CRAFT SHOPS 6,670 SF
1 — AUTOMOTIVE SHOPS 6,630 SF
2 — OFFICES 2,260 SF
15,560 SF

20. GROUNDS SHOP
1 — GROUNDS SHOP 4,110 SF

6. POWER HOUSE
BASEMENT — BLOWER ROOM 1,230 SF
1 — LAUNDRY & BOILERS 14,230 SF
2 — GENERATORS 2,240 SF
3 — OFFICE/ WAREHOUSE 7,080 SF
24,780 SF

61. INCINERATOR
BASEMENT — TRASH DISPOSAL 572 SF
1 — TRASH DISPOSAL 848 SF
1,420 SF

AMES & WHITAKER

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drawing title BUILDINGS INFORMATION	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES	
REVISIONS	drawing prepared by AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489	date 05/09/16
mark / date / description		scale AS NOTED
	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by CA
		approved by AL
	CAD no. / project no. BI-C-287	drawing no. A.1

TOPOGRAPHIC KEY

- 0-5% SLOPE
- 5-10% SLOPE
- +10% SLOPE

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drawing title: TOPOGRAPHIC ANALYSIS	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES	
REVISIONS	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489	date: 05/09/16 scale: AS NOTED
mark / date / description	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by: CA approved by: AL
	CAD no: / project no: BI-C-287	drawing no: A.2

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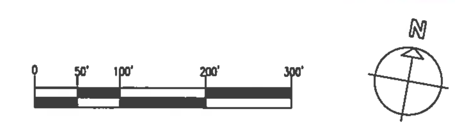

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	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no.
	project no. BI-C-287

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scale	AS NOTED
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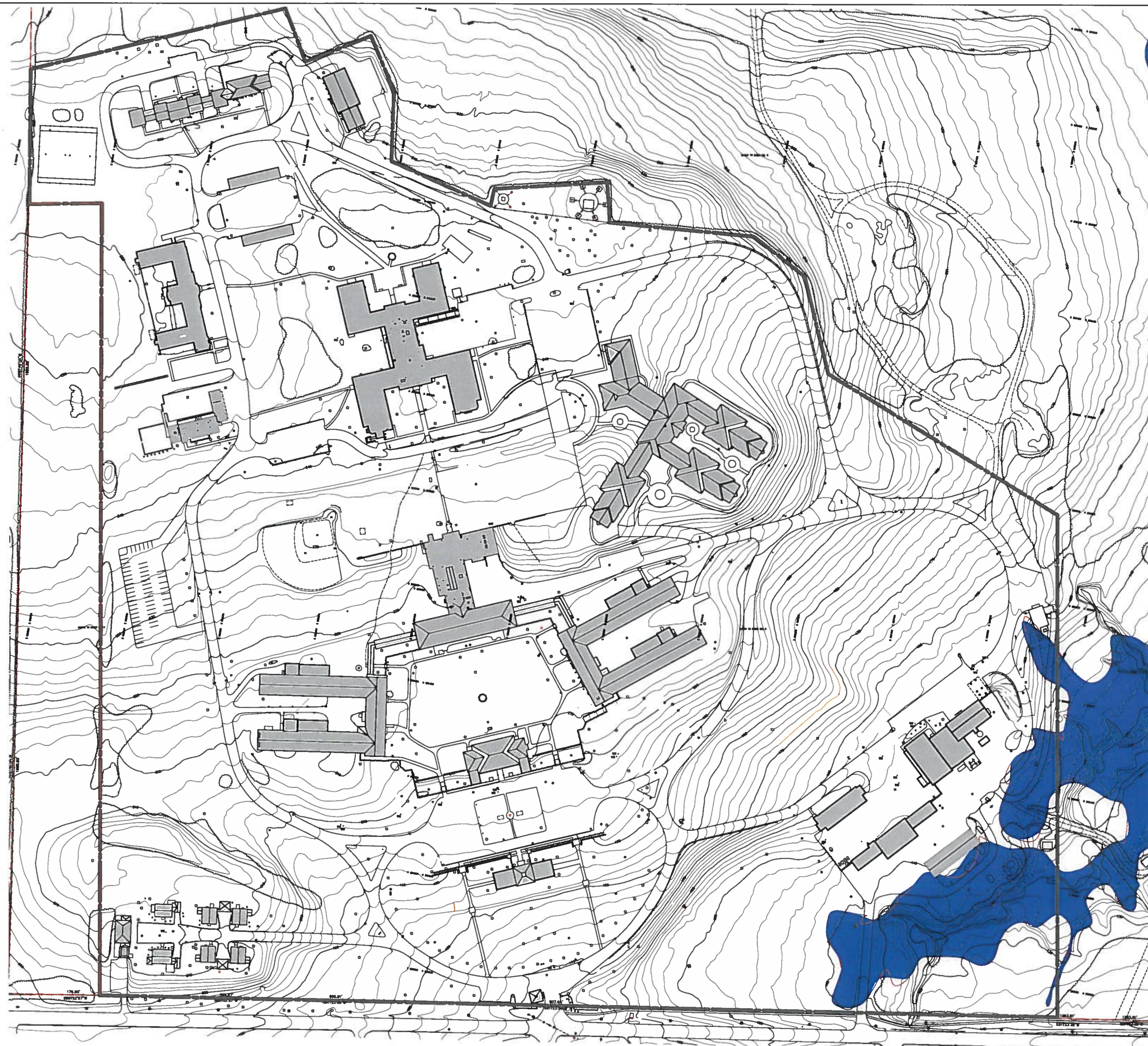
approved by	AL
drawing no	A.3



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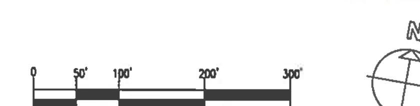

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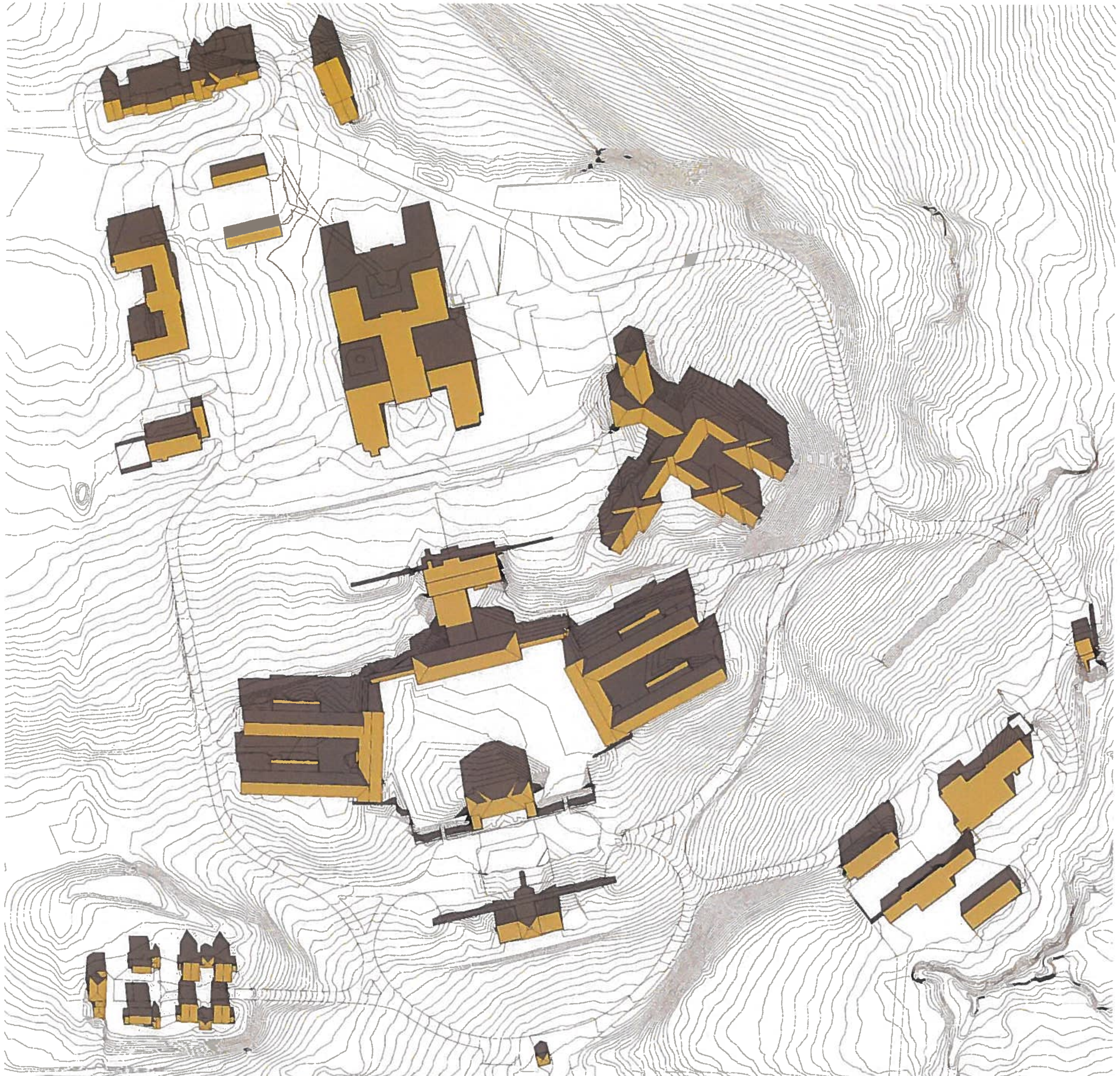
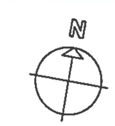
	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by CA approved by AL
	CAD no / project no. BI-C-287	drawing no. A.4





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drawing title SUN SHADOW ANALYSIS WINTER SOLSTICE	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
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	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no / project no. BI-C-287

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drawing no	A.5

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drawing title SUN SHADOW ANALYSIS SUMMER SOLSTICE	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
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date	05/09/16
scale	AS NOTED
project	STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
drawn by	CA
approved by	AL
CAD no.	
project no.	BI-C-287
drawing no	A.6

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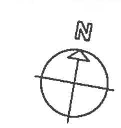

FINAL REPORT - MAY 9, 2016

drawing title
SUN SHADOW ANALYSIS
SPRING EQUINOX

REVISIONS

mark	date	description

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

drawing prepared by
AMES & WHITAKER ARCHITECTS
31 LIBERTY STREET, SUITE 208
SOUTHINGTON, CT 06489

project
STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

CAD no

project no.
BI-C-287

date
05/09/16

scale
AS NOTED

drawn by
CA

approved by
AL

drawing no
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WHITAKER

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drawing title SUN SHADOW ANALYSIS FALL EQUINOX	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS	
mark | date | description	drawing prepared by AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 206 SOUTHINGTON, CT 06489
	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
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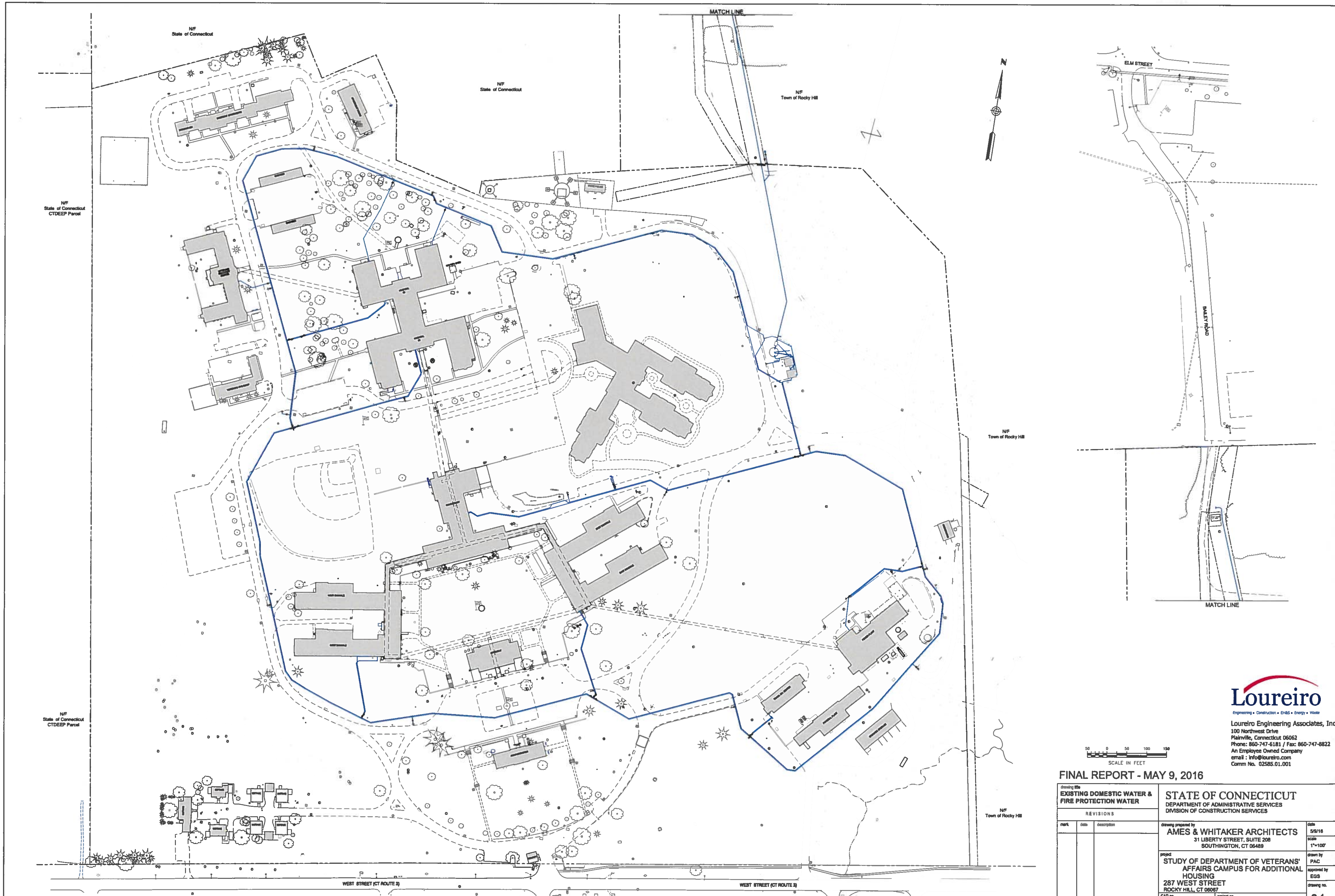

Loureiro

Engineering • Construction • EH&S • Energy • Waste

Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062
Phone: 860-747-6181 / Fax: 860-747-8822
An Employee Owned Company
email : info@loureiro.com
Comm No. 02SB5.01.001

FINAL REPORT - MAY 9, 2016

drawing title
EXISTING DOMESTIC WATER & FIRE PROTECTION WATER

REVISIONS

mark	date	description

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

drawing prepared by
AMES & WHITAKER ARCHITECTS
31 LIBERTY STREET, SUITE 208
SOUTHINGTON, CT 06489

project
STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

CAD no.

project no.
BI-C-287

date
5/9/16

scale
1"=100'

drawn by
PAC

approved by
EGS

drawing no.
C-1

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FINAL REPORT - MAY 9, 2016

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DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

REVISIONS

mark	date	description

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SOUTHINGTON, CT 06489

project
STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

CAD no.

project no.
BI-C-287

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5/9/16

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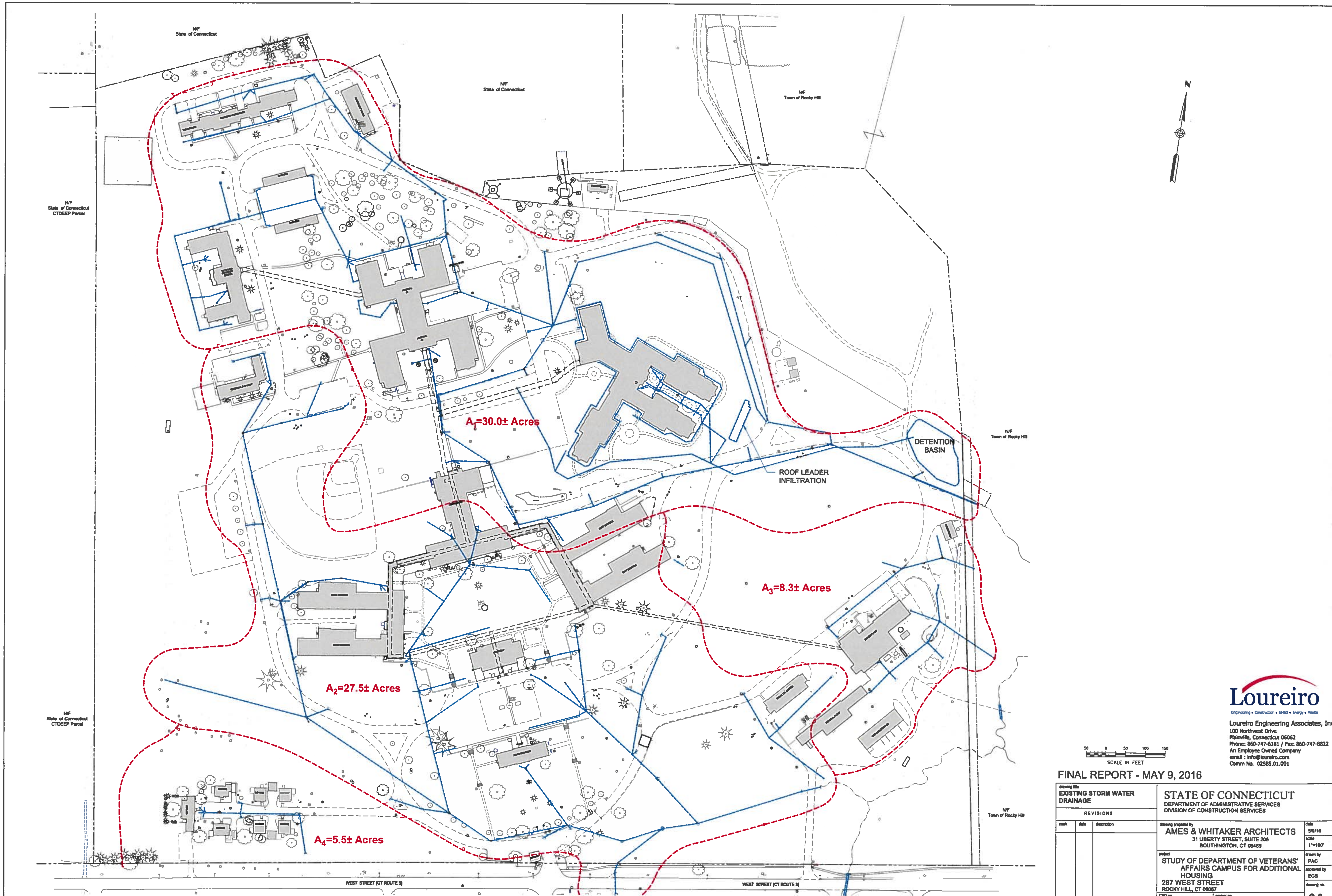
C-2



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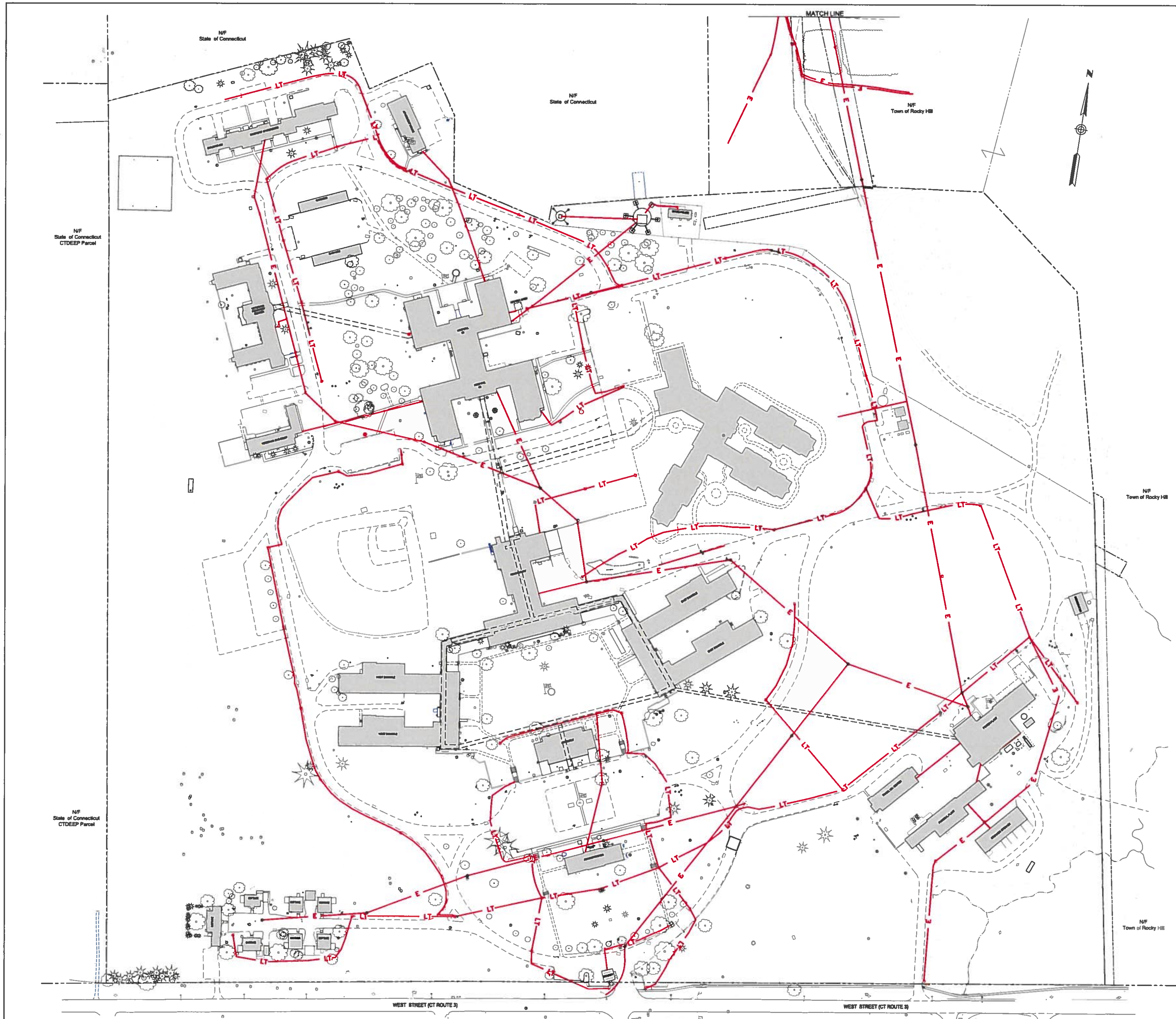

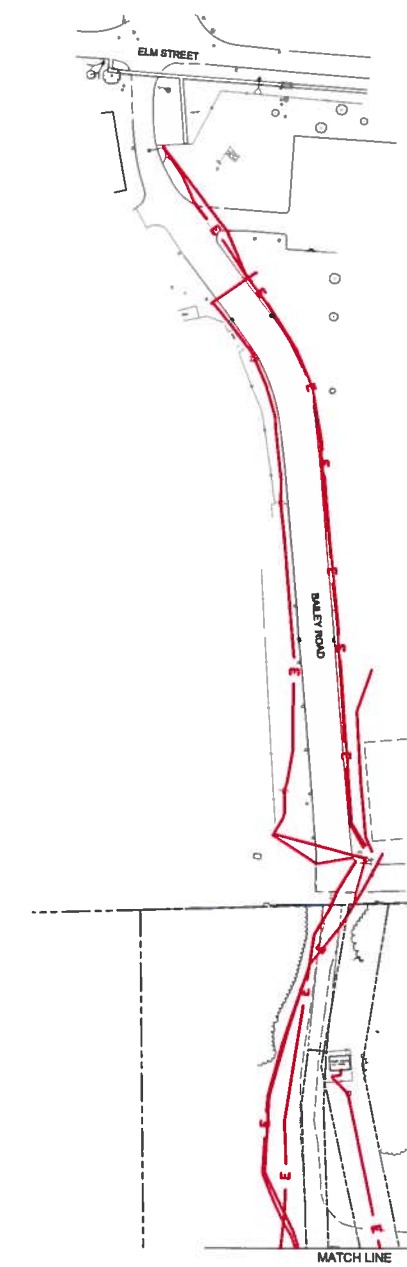

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STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

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287 WEST STREET
ROCKY HILL, CT 06067

CAD no.

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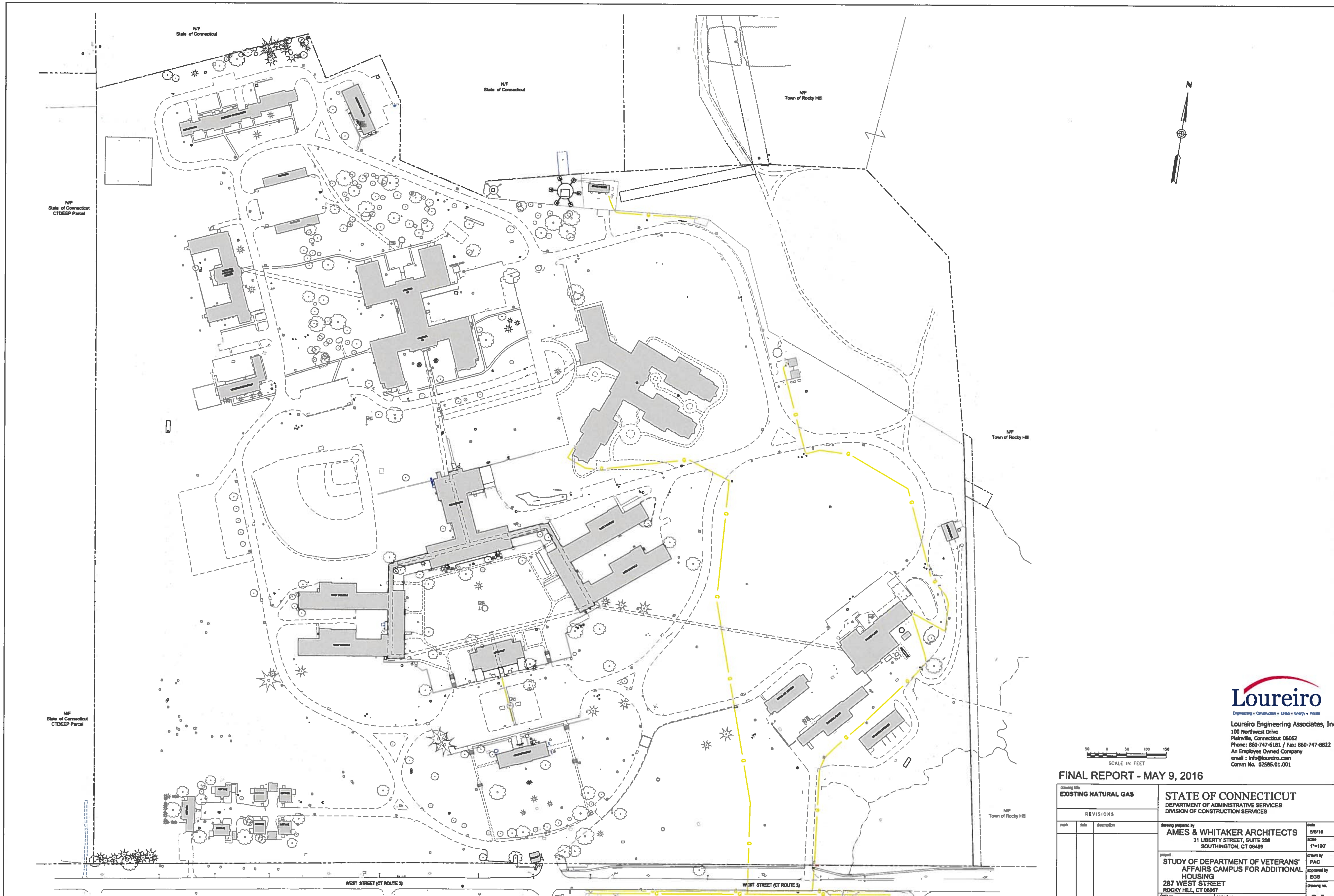

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	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by PAC approved by EGS
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DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

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SOUTHINGTON, CT 06489

project
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287 WEST STREET
ROCKY HILL, CT 06067

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Chapter B.1
Demographic Study

FINAL REPORT

Date: May 9, 2016

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Study of DVA Campus for Additional Housing

DEMOGRAPHIC STUDY REPORT

Rena Cheskis-Gold and Alexandra Danahy
Demographic Perspectives, LLC
29 February 2016

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TABLE OF CONTENTS

PART 1. EXECUTIVE SUMMARY

SECTION 1.A. PROJECT BACKGROUND

- *Objective*: To provide background population data to support Ames and Whitaker Architects as they undergo a multi-disciplinary study of campus buildings for additional veterans housing
- *Demographic Perspectives Scope*:
    - Review various data sources, including the Home's own data, the national VA's veteran datasets, the U.S. Census, and other research that has been done on the veteran population
    - Analyze State population projections considering age groups of veterans, gender, and marital status, if available
    - Develop hypotheses and models appropriate to the Rocky Hill Veteran's Home
- *Major Hypothesis*: While the Veteran population in Connecticut will be declining within the next 20 years, there will continue to be a need for several types of Veteran housing, including transitional housing, permanent housing, assisted living, and family housing. The Home should continue to provide a reasonable and modest amount of housing, but should consider altering the bed types and amount of housing it offers to match the population composition and needs of the future Veteran population. (Family housing should only be considered if it falls within the desired scope and mission of the Rocky Hill Home, and the challenges in developing and administering family housing can be addressed.)
- *Guiding Research Principle*: There are three separate populations to be considered by the Home for future housing: (1) The population size, and age, gender, and marital status composition of the veteran population in CT; (2) the number of veterans in CT needing housing, and (3) the number of veterans choosing Rocky Hill Home housing. Each may vary in the future depending on political, economic, and programmatic forces.

SECTION 1.B. STATE OF CONNECTICUT PROJECT TEAM

Department of Veteran's Affairs

- Sean Connolly, Commissioner
- Joseph Danao, Director of Projects and Operations
- Michael Clark, Veteran's Home, Fiscal Administrative Manager
- Maria Cheney, Veteran's Home, Director of Residential Programs and Services
- Peter Negrini, Plant Facilities

CT DAS / Division of Construction Services

- Donald Ouillette, Assistant Director of Project Management, Risk Manager
- Sarah Tierney, Project Manager

SECTION 1.C. CONSULTANT PROJECT TEAM

Demographic Perspectives

- Rena Cheskis-Gold, Principal
- Alexandra Danahy, Senior Associate

Ames and Whitaker Architects

- Stephen Whitaker
- Alan Lagocki
- Sherry Petruccione

SECTION 1.D. RESEARCH CONDUCTED

- Interview with Maria Cheney, Director of Residential Programs and Services, Rocky Hill Veterans Home, and staff
- Interview with Babatunde Green, Director of Planning, Department of Veterans Affairs
- Interviews with Laurie Harkness, VA Connecticut Errera Community Care Center, and Maureen Pasko, Director of VA Connecticut Homeless Program
- Interview with Ronald Gantick, Property Manager of Victory Gardens housing
- Overview of previous studies, available data on U.S. and Connecticut Veterans, non-Veterans, and homeless populations

SECTION 1.E. CONNECTICUT VETERAN 20 YEAR POPULATION FORECAST[1]

- **Overall Connecticut Veteran Population**
    - *2014*: estimated 213,420 Veterans
    - *2024*: estimated 155, 158 Veterans, a decline of about one-quarter
    - *2034*: estimated 114,469 Veterans, a decline of about one-half
- **Gender Balance in 2034**
    - Men will still be the majority of the population, but will constitute a smaller proportion
    - Women will continue to comprise only a small proportion of the population, but their proportion will increase
    - In the population age 65 and older, the number of men will decline, but the number of women will increase
- **Age Groups in 2034**
    - Veterans age 55+ will constitute a smaller proportion of the population
        - Older adults, age 55 to 74 will constitute a *smaller* proportion of the population
        - Elderly adults, age 75+, will constitute a *larger* proportion of the population
    - Younger Vets, age 20 to 34, will continue to comprise only a small portion of the population
    - Using a wider definition, younger Vets, age 20 to 44 will grow as a proportion of the Vet population, but only modestly
- Projections may quickly change if there is an increase in the numbers serving in the armed forces, for any reason
- Data stem from the U.S. Department of Veteran Affairs actuarial model, “Veteran Population Projection Model (VPPM) 2014”

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[1] All data sources are referenced in Part 2. Research and Future Scenarios.

SECTION 1.F. IMPLICATIONS FOR ROCKY HILL HOME[2]

- Reorganize type of beds and program:
    - 2/3 short-term and transitional beds
    - 1/3 longer term beds
    - Assisted Living Unit
    - If appropriate, analyze and consider providing family housing
- Anticipate higher proportion of residents age 20 to 39, and lower proportion age 65+
- Anticipate and prepare for more female residents
- Number of beds could vary from 133 to 256
- Future Scenario #1: Current Beds Reorganized by Type

Short term transitional:	128 beds
Longer term housing:	63 beds
Assisted Living housing:	25 beds
Total:	216 beds

    - OPTIONAL: Connecticut demand currently exists for more housing; with renovated facility, could possibly anticipate another 40 beds *but only in the next few years*, total beds = 256

- Future Scenario #2: Incorporating Demographic Change

Men 20 to 44 in short-term transitional and longer-term programs	24 men
Men 45+ in short-term transitional and longer-term programs	64 men
Women in short-term transitional and longer-term programs	20 women
Men in Assisted Living programs	25 men
Total	133 beds

[2] Data and Scenarios explained in detail in Part 2. Research and Future Scenarios

SECTION 1.G. IMPLICATIONS FOR SPACE PROGRAMMING

- Guiding principle: different populations require different housing spaces
- Consider unit types and amenity spaces needed, by gender, age, and disability status, (and family status, only if family housing is feasible for the Rocky Hill Home to provide)
- Parking need may increase as short-term Domicile residents increase in proportion
- As Connecticut Veteran population declines in the future, partnerships will become important opportunities for use of beds, for example, possible coordination with U.S. VA for short-term PTSD or other unit

PART 2. RESEARCH AND FUTURE SCENARIOS

SECTION 2.A. Research Framework

- Major Hypothesis:
  - While the Veteran population in Connecticut will be declining within the next 20 years, there will continue to be a need for several types of Veteran housing, including transitional housing, permanent housing, and assisted living. The Home should continue to provide a reasonable and modest amount of housing, but should consider altering the types and amount of housing it offers to match the population composition and needs of the future Veteran population.
- Detailed Guiding Research Principles
  - The official Connecticut population projections stem from the U.S. Department of Veteran Affairs (Veteran Population Projection Model (VPPM) 2014). This is an actuarial model that is based on the current snapshot of Connecticut Veterans.
  - There are three separate populations to be considered by the Home for future housing: (1) The population size, and age, gender, and marital status composition of the veteran population in CT; (2) the number of veterans in CT needing housing, and (3) the number of veterans choosing Rocky Hill Home housing. Each may vary in the future depending on the following forces:
    - The population size and composition of veterans in CT may deviate in the future from the VPPM If the number of people entering into the U.S. Armed Forces should change, for example, if the U.S. were to enter into another war.
    - The number of veterans in CT needing housing may vary in the future depending on the national and state economies, and the market availability of housing in CT.

The number of veterans choosing Rocky Hill Home housing may vary in the future depending on the units and ambiance that the Home offers, the specific populations that can be served, and the availability of other types of housing or housing services for veterans available throughout the state.

SECTION 2.B. CURRENT NATIONAL AND CONNECTICUT VETERAN POPULATION

Period of Service

For both the national and Connecticut Veteran population, the biggest single group by period of service is the Vietnam War service period (% of the Veteran population; National: 35%; Connecticut: 35%).

Combining the two Gulf War periods at the national level approaches the size of the Vietnam War cohort, (National: 29%), but is a much smaller proportion of the Connecticut Veteran population (18%).

TABLE 1: U.S. AND CONNECTICUT VETERAN POPULATION, BY SERVICE PERIOD, 2013

Service Period	U.S. Estimate	%	CT Estimate	%
Gulf War 2001 and Later	2,445,335	12%	16,128	7%
Gulf War 1990 to 2001	3,529,787	17%	23,756	11%
Vietnam War	7,463,586	35%	75,628	35%
Korean War	2,445,335	12%	29,423	14%
WW II	1,828,685	9%	27,461	13%
Other (Between Wars, Before WW II)	3,551,051	17%	45,769	21%
Total	21,263,779	100%	217,947	100%

Source: American Community Survey, 2013, Table S2101

Age

At the national level, the two largest 10-year cohorts are ages 55 to 64, and 65 to 74; the two together make up 44% of the Veteran population. Adding in the oldest cohort of ages 75+, two-thirds of the Vets are middle aged or older. Conversely, one-third of the national Veteran population is under the age of 55.

Compared to the national Veteran population, Connecticut has a similar population of 55 to 64 and 65 to 74 year olds (National: 44%; Connecticut: 45%), but Connecticut has significantly *fewer* below age 55 (National: 33%; Connecticut: 26%), and significantly *more* in the oldest cohort of ages 75+ (National: 23%; Connecticut: 29%).

TABLE 2: U.S. AND CONNECTICUT VETERAN POPULATION, BY AGE, 2013

Age	U.S. Estimate	%	CT Estimate	%
18-34	1,722,366	8%	11,333	5%
35-54	5,337,209	25%	44,679	21%
55-64	4,911,933	23%	47,294	22%
65-74	4,507,921	21%	51,000	23%
75+	4,784,350	23%	63,641	29%
Total	21,263,779	100%	217,947	100%

Source: American Community Survey, 2013, Table S2101

Service-Connected Disability

The majority of Veterans do not have a service-connected disability. Nationally, 16% have a service-connected disability, and, in Connecticut, 11%.

(See also Table 5, which compares Vets and non-Vets on *general* disability status that is service or non-service connected.)

TABLE 3: U.S. AND CONNECTICUT VETERAN POPULATION, BY SERVICE-CONNECTED DISABILITY STATUS AND LEVEL OF DISABILITY, 2013

Disability Status, and Level	U.S. Estimate	%	CT Estimate	%
No Disability	17,784,887	84%	194,518	89%
Disability	3,478,892	16%	23,429	11%
Total	21,263,779	100%	217,947	100%
0% Disability	225,813	1%	1,923	1%
10% or 20%	1,195,300	6%	9,382	4%
30% or 40%	599,065	3%	3,577	2%
50% or 60%	381,728	2%	2,190	1%
70% +	802,278	4%	4,368	2%
Not available	274,708	1%	1,969	1%

Source: American Community Survey, 2013, Table B21100

Note: Will not add to 100% due to rounding.

Gender and Race

Nationally, and in Connecticut, only a small proportion of Veterans are women. It is notable that Connecticut currently has a somewhat *lower* proportion of Veterans who are women (National: 7%; Connecticut: 5%).

Connecticut also has a different racial/ethnic composition of its Veteran population. Compared to the national Veteran population, Connecticut's Vets are *less likely* to be Black or Hispanic.

TABLE 4: U.S. AND CONNECTICUT VETERAN POPULATION, BY GENDER AND SELECTED RACE AND ETHNICITY CATEGORIES*, 2013

Gender and Race/Ethnicity	U.S. Estimate	%	CT Estimate	%
Men	17,784,887	93%	194,518	95%
Women	3,478,892	7%	23,429	5%
Total	21,263,779	100%	217,947	100%
White *	17,882,838	84%	197,024	90%
Black *	2,360,279	11%	14,385	7%
Hispanic (of any Race) *	1,190,772	6%	8,500	4%

** Race categories will not to 100% due to omission of race categories. Hispanic persons can be of any race.*

Source: American Community Survey, 2013, Table B21100

Veterans vs. Non-Veterans: Financial Health, Disabilities, and Homelessness

Financial Health. Nationally, and in Connecticut, Veterans have higher average incomes than non-Veterans, and are also less likely to be at or below the poverty level. However, the percentages of Veterans at or below the poverty level still translates to about 1.5 million nationally, and 11,000 in Connecticut.

It is notable that Veterans in Connecticut have significantly higher incomes than Veterans throughout the United States, and Connecticut Veterans are less likely to be at or below the poverty level.

While Veterans, in general, are less likely to be unemployed than non-Veterans, data from the Bureau of Labor Statistics indicate that unemployment is a particular problem for younger Vets. In 2013, 6.6% of Veterans nationally were unemployed, but 21% of Veterans ages 18 to 24 were unemployed, and 10% of Veterans ages 24 to 35.[3]

Disabilities. Table 3 showed that 16% of national Veterans and 11% of Connecticut Veterans had *service-related* disabilities. When all disabilities are considered, the proportion of Veterans who are disabled is much higher: 26% nationally, and 24% in Connecticut. Moreover, nationally and in Connecticut, Veterans are much *more* likely to have a disability compared to non-Veterans.

There is a poverty gap that relates to the disability status of the Veteran population. In Connecticut, 13% of the Vets age 18 to 64 with a disability are living in poverty, compared to 7% of Vets age 18 to 64 with no disability.

Homelessness. Unemployment, poverty, and disability status are all factors related to homelessness, and it is estimated that one-third of homeless adults nationally are Veterans. Due to many initiatives recently put into place, the number of homeless Veterans had declined by 24 percent since 2010, yet were still about 58,000 homeless Veterans nationally in 2013.[4] In Connecticut, in 2014, one organization estimated that there were about 300 Veterans who were homeless.[5] As recent as 2010, however, there were Point-in-Time survey estimates of 800 to 3,000 homeless Veterans in Connecticut.[6]

As of Spring 2015, Connecticut has become the first state to eradicate chronic Veteran homelessness.[7] A Point-in-Time count on February 18, 2015 found only 80 veterans in

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[3] *Half in Ten: Veterans, National Coalition for Homeless Veterans, May 2014.*
[4] *Ibid*.
[5] *ABRI (Applied Behavioral Rehabilitation Institute, Inc.), Homes for the Brave, 2014 Annual Report*
[6] CT Coalition to End Homelessness Point in Time survey cited in *Kenney, Lawrence, "Market Study, Proposed Rental Housing Development," Newington, CT, Women's Institute for Housing and Economic Development, March 2010.*
[7] *Press Release: Thursday, August 27, 2015: "Gov. Malloy Announces that Connecticut is First State in America to End Chronic Veteran Homelessness."*

emergency shelters.[8] To reach this point, the state made significant investments in affordable housing, and developed a strategy to collaborate among numerous organizations to provide rental assistance vouchers, case management and clinical services, and skill training. The governor has made it a major goal to maintain and improve the current situation.

TABLE 5: COMPARISON OF VETERAN AND NON-VETERAN FINANCIAL HEALTH AND DISABILITIES,[9] U.S. AND CONNECTICUT, 2013

	U.S. Estimate	CT Estimate
Median Income		
Veteran	$37,346	$42,984
Non-Veteran	$25,968	$32,592
Poverty Status past 12 months		
Veteran	7%	5%
Non-Veteran	14%	10%
Disability Status		
Veteran	26%	24%
Non-Veteran	14%	12%

Source: American Community Survey, 2013, Table S2101

[8] *CT Coalition to End Homelessness, "2015 Count Finds Homelessness Down 10 Percent Across Connecticut," 2015*

[9] Civilians age 18 and older.

SECTION 2.C. CONNECTICUT VETERAN 20-YEAR POPULATION FORECAST

2014 Snapshot: *213,420 Veterans*

- 93% are male**
- 69% are age 55+***
- Female Veterans are younger, overall, than male Veterans

2034 Snapshot: 114,469 Veterans Projected - a significantly smaller population*

- **CT Veteran Numbers**
  - In 2034, the overall population will decline to about *half* of the 2014 population*
  - The *number* of Veterans in every age group will decline***
  - In the population age 65 and older, the number of men will decline, but the number of women will increase *(***,****)*
- **Proportion of the CT Veteran Population**
  - Men will still be the majority of the Veteran population, but will constitute a somewhat smaller proportion**
  - Women will continue to comprise only a small proportion of the Veteran population, but their proportion will increase**
  - Veterans age 55+ will constitute a smaller proportion of the Veteran population***
    - Older adults, age 55-74 will constitute a *smaller* proportion of the population
    - Elderly adults, age 75+, will constitute a *larger* proportion of the population (although the number of elderly will decline strongly)
  - Younger Vets, age 20-34, will continue to comprise only a small portion of the population***
  - Using a wider definition, younger Vets, age 20 to *44* will grow as a proportion of the Vet population, but only modestly***
- Projections may quickly change if there is an increase in the numbers serving in the armed forces, for any reason

* Figure 1 and supporting data
** Figure 2 and supporting data
*** Figure 3 and supporting data

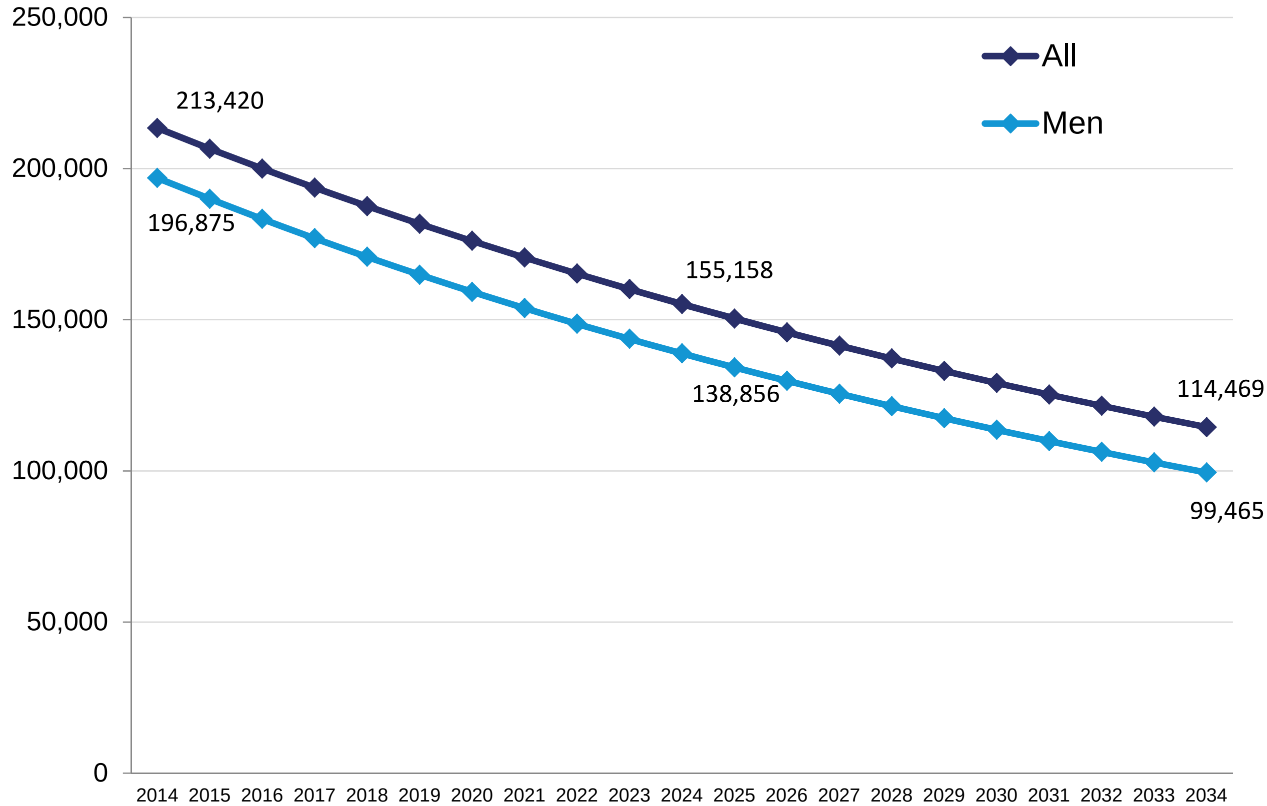
Detailed Supporting Data for Connecticut

- **Veteran Numbers**
  - Overall CT Veteran population decline from 2014 to 2034 of 46%, from 213,420 to 114,469*
  - Decline in next ten years (2014 to 2024) of 27%, from 213,420 to 155,158
  - Number of men, aged 65+; **2014**: 113,833; **2034**: 57, 603 (*Decline* of 49%)***
  - Number of women, aged 65+; **2014**: 3,781; **2034**: 6,260 (*Increase* of 51%)****
- **Proportion of the Veteran Population**
  - % male declines, from 93% of population in 2014, to 87% of population in 2034**
  - % female still small, but increases, from 7% of population in 2014, to 13% in 2034**
  - In 2014, women are younger than men; the current peak age group for women is 50 to 54, compared to 65 to 69 for men. (*** , ****)
  - Going forward, the number of men in the elderly adult population 75+ will decline by 34%, while the number of women will *increase* by 46% (*** and ****)

  - Smaller % are age 55+, from 69% to 64% of population***
    - Declining % Older adults: % age 55-74, from 43% to 32% of population
    - Increasing % Elderly: % age 75+, from 26% to 32% of population
  - Younger Vets age 20-34 do not comprise a significant portion of the population in either 2014 or 2034***
    - Increase only from 8% to 10% of population
  - Using a wider definition of younger Vets, age 20 to *44*, will grow as a proportion of the population, but only very modestly (% 20 to 44; 2014: 17%; 2034: 21%)***

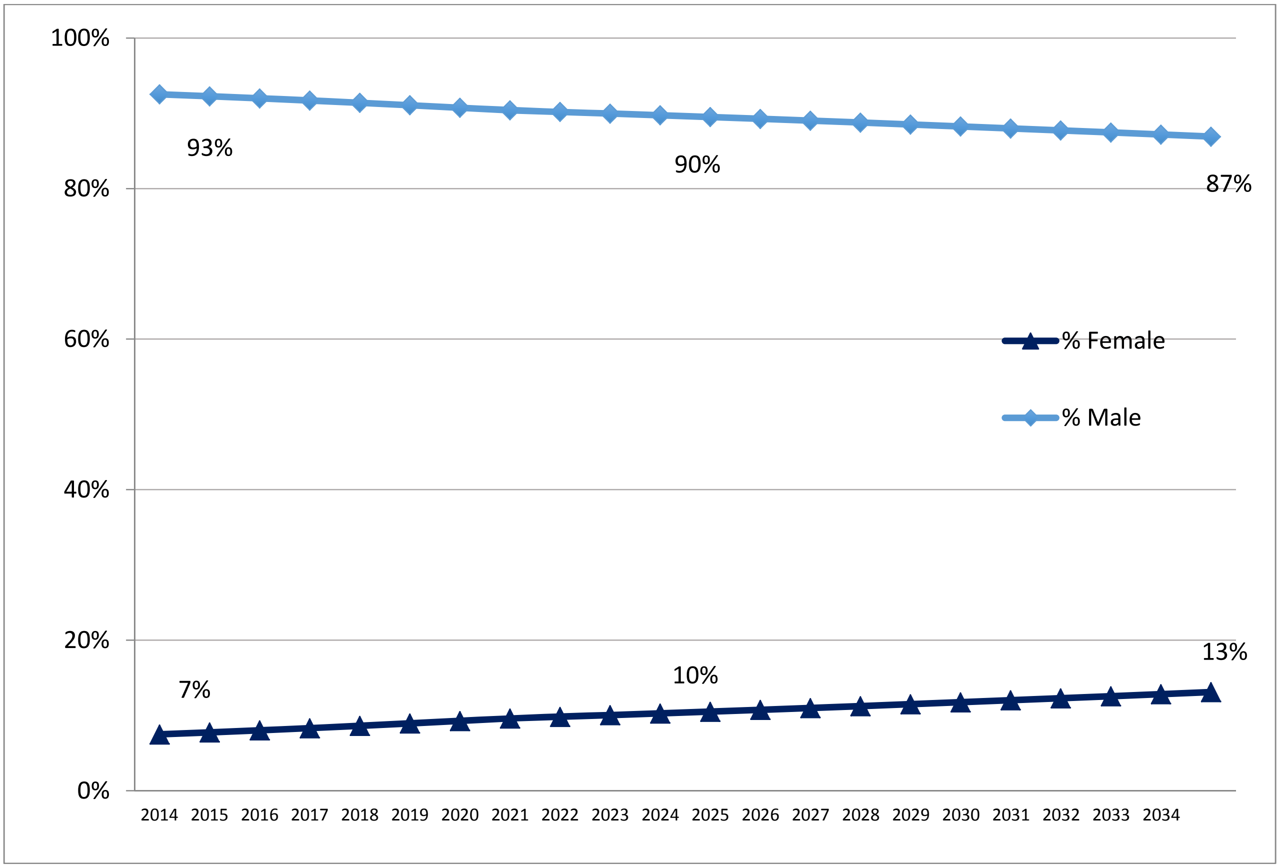
**** Figure 4 and supporting data

Figure 1: Projected Veteran Population, Connecticut, 2014 to 2034



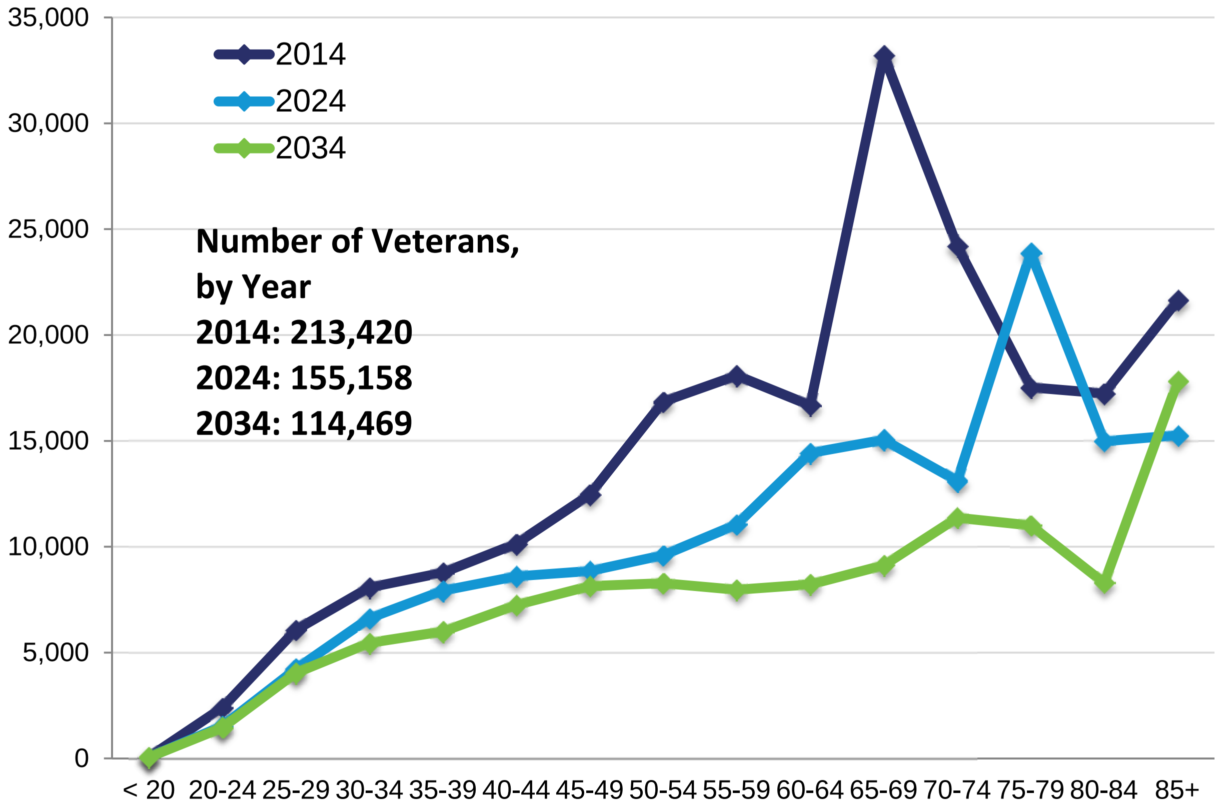
Source: http://va.gov/vetdata (9L_VetPop2014)

Figure 2: Projected Veteran Population, % Male and Female, Connecticut, 2014-2034



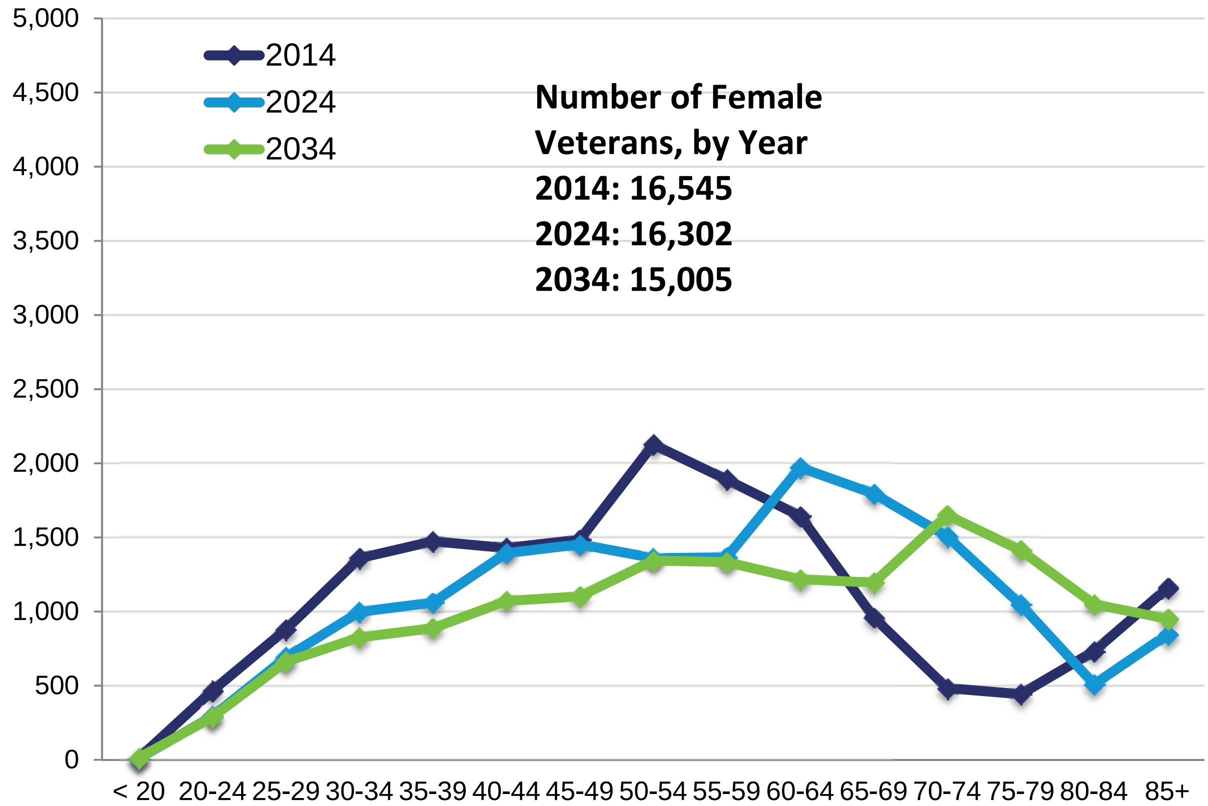
Source: http://va.gov/vetdata (9L_VetPop2014)

Figure 3: Projected Veteran Population, Connecticut, by Age, 2014 to 2034



Source: http://va.gov/vetdata (6L_VetPop2014)

Figure 4: Projected Female Veteran Population, by Age, Connecticut, 2014-2034



Source: http://va.gov/vetdata (6L_VetPop2014)

SECTION 2.D. CONNECTICUT VETERAN HOUSING DEMOGRAPHICS

Rocky Hill Home

As of June 2015, the Rocky Hill Home had 216 domiciliary residents. The resident population is almost entirely age 50 and older, and includes only 4 single women. (See Table 6.) About three-quarters have some indications of heart disease, about half have diabetes, and almost one-third have cognitive impairments. More than half of the residents have a psychiatric and or substance use diagnosis.[10]

80% of current domiciliary residents have remained for more than one year, and 60% for three or more years. (See Table 7.)

According to Rocky Hill Home staff, young Veterans only come to the Rocky Hill Home after they have exhausted other options. The majority of young Veterans are seeking short-term housing options and the opportunity to prepare for life on their own; other younger Veterans with deep problems may require more structure and seek out a longer term option at the Rocky Hill Home or elsewhere.

Much of the Rocky Hill program is geared towards its older residents. Approximately 9 to 12 residents are receiving help with activities of daily living.

In addition, the Rocky Hill Home currently has 3 families in residence and is preparing to potentially add an additional family.

Going forward, the Rocky Hill Home seeks to differentiate its populations by program type and length of stay: (1) transitional housing for younger and healthier single Veterans, both female and male (about 2/3 of beds); (2) somewhat longer term housing for less healthy single Veterans, both female and male who can live independently (about 1/3 of beds); (3) assisted living housing for Veterans needing a higher level of assistance and hands-on care (current demand for about 25 beds).

There are many space and programmatic challenges to providing family care, and the challenges to providing a quality program must be carefully considered. If the challenges of developing and administering family housing are determined to be within the mission and scope of the Rocky Hill Home, an additional program type that could be considered is temporary family housing.

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[10] *Beisel, Brian, and Janelle Stevens, Veterans' Home at Rocky Hill: Residential Services, Legislative Program Review and Investigations Committee, December 2014.*

TABLE 6. AGE OF RESIDENTS, ROCKY HILL HOME, FALL 2014

Age of Residents	%
Under 40	1%
40 to 49	7%
50 to 59	34%
60 to 69	42%
70 to 79	11%
80 or older	5%
Total	100%

Source: "Veterans' Home at Rocky Hill: Residential Services," Legislative Program Review and Investigations Committee, December 2014

TABLE 7: LENGTH OF STAY OF RESIDENTS, ROCKY HILL HOME, FALL 2014

Length of Stay	%
< 1 year	20%
1 to 3 years	20%
3 to 5 years	7%
5 to 10 years	36%
10 to 20 years	15%
> 20 years	2%
Total	100%

Source: Beisel, Brian, and Janelle Stevens, Veterans' Home at Rocky Hill: Residential Services, Legislative Program Review and Investigations Committee, December 2014, p.27.

Note: Data lack precision as the endpoints of the time categories for length of stay are overlapping, e.g., 5 to 10, and 10 to 20.

Rocky Hill Home, and Other Connecticut Veteran Demographics

Young Veterans in Housing. Only 1% of the Rocky Hill Home Veteran population is under the age of 40, compared to 19% of the VA CT Intakes for HCHV and GPD, and 15% of those housed at Homes for the Brave. These data from other programs indicated that there is current demand for housing by young Veterans. An earlier section mentioned the national phenomenon that younger Veterans under the age of 35 are more likely to be unemployed, which is a factor related to poverty and homelessness. Note also that, going forward, younger Veterans will grow modestly as a proportion of the total Veteran population. Given that the Home desires to implement a transitional housing program and the supporting spaces for it, and that this program will appeal to and be appropriate for younger men, it is projected that younger men will be a bigger proportion of the Rocky Hill housing in the future. (See Table 8.)

Women in Housing. Going forward, in 2034, the proportion of women Veterans in Connecticut will be increasing to 13% of the Veteran population. Other Connecticut organizations that provide Veteran housing already indicate a higher proportion of women in housing than in the Rocky Hill Home.[11] Additionally, staff at the Rocky Hill Home feel that, with proper advertising and communication to Veterans and organizations that refer them to housing options, the Rocky Hill Home can accommodate more women and build a supportive program for them. A reasonable proportion of housing for single women is projected to be about 10% to 11% of housing at the Rocky Hill Home.

[11] For example, VA CT HCHV and GPD programs, Victory Gardens, Homes for the Brave.

TABLE 8: AGE OF RESIDENTS, ROCKY HILL HOME FALL 2014, VA CT HCHV AND GPD (ON INTAKE) FY 2014, AND HOMESFORTHEBRAVE

Age	Home %	VA CT Intake % (HCHV, GPD *)	Homesfor the brave.org
20 to 29	0%	8%	7%
30 to 39	1%	11%	8%
40 to 49	7%	18%	3%
50 to 59	34%	33%	23%
60 to 69	42%	25%	39%
70 +	16%	6%	20%
Total	100%	100%	100%

* Healthcare for Homeless Veterans, and Grant Per Diem programs

Sources: State of Connecticut Residential Facility Data, NEPEC Annual Report for FY 2014 for VA Connecticut Intake, Homes for the Brave 2014 Annual Report

SECTION 2.E. ROCKY HILL HOME SCENARIO MODELING

There is currently unmet demand for Veteran housing in the State, although some of it relates to Veterans not finding the types of housing that they seek. If the Home were to reorganize its bed types, renovate its spaces, and integrate its marketing, it has the potential to receive a greater share of the Connecticut Veteran population needing housing.

Scenario #1 is based on current resident numbers, reorganized by type of beds and type of program.

Scenario #1: Current Beds Reorganized by Type

Short term transitional:	128 beds
Longer term housing:	63 beds
Assisted Living housing:	25 beds
Total:	216 beds

Scenario #2 also considers the increase in proportion of the number of younger Veterans (both male and female, age 20 to 44) at the same time as the 32% decline over the next 20 years; the demand for housing by women and the proportions of women being housed in other Connecticut programs; and the 49% decline anticipated in the older Veteran population, age 45+, over the next 20 years.

- OPTIONAL: Connecticut demand currently exists for more housing; with renovated facility, could possibly anticipate another 40 beds *but only in the next few years*, total men 256

Scenario #2: Incorporating Demographic Change

Men 20 to 44 in short-term transitional and longer-term programs	24 men
Men 45+ in short-term transitional and longer-term programs	64 men
Women in short-term transitional and longer-term programs	20 women
Men in Assisted Living programs	25 men
Total	133 beds

SECTION 2.F. IMPLICATIONS FOR ROCKY HILL HOME

- Age groups for future (Rocky Hill Home) housing
    - Anticipate higher % age 20 to 39 (up from 1% currently, to 19% in future)[12]
    - Anticipate lower % age 65+ (down from 35% currently, to 12% in future) in the Domicile area
    - Approximately 25-30 long-term residents now in Domicile to be transferred to and accommodated in proposed Assisted Living area. (Currently, 12 are receiving assisted care, and there is demand for additional 15 to 17.)
- Male beds in future Domicile housing (excluding Assisted Living)
    - Currently about 210, and about 60% in long-term (3 years or more)
    - Anticipate men to be approximately 89% of the population
    - Based on *current* resident numbers, anticipate about 165 beds
    - Anticipate higher % short term transitional (2/3), and lower % (healthy) long term (1/3)
    - OPTION: Connecticut demand currently exists for more housing; with renovated facility, could possibly anticipate another 40 beds *but only in the next few years*, total men 205
- Female beds for future housing
    - Anticipate women to be about 11% of total population
    - Suggested community maximum of 20 to 25
    - Population will be younger than men due to more recent periods of service
- Family homes for future housing
    - Currently 5 family homes are managed by outside contract, 4 are occupied
    - Home has recently received 3 new referrals
    - CT demand exists for permanent Veteran family housing[13]
    - If space and programmatic challenges to providing family housing are addressed and within the mission and scope of the Rocky Hill Home, a community of 10 to 20 units could be considered

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[12] See Table 8 and related discussion.
[13] Interview with Victory Gardens Property Manager, Ron Gantick: Victory Gardens has 34 current resident families and a waitlist of 25 to 30 families.

SECTION 2.G. POPULATION INFORMATION FOR PROGRAMMING

- Recommended room and bathroom types
  - Women: private rooms with private bathrooms, or, at minimum, 2 private rooms joined by 1 shared bathroom
  - Men: private or semi-private rooms; for short-term residents, provide group bathroom type in hall; for long term residents - could provide group bathrooms in hall, but should also include at least 1 single-use hall bathroom as privacy option
  - Family: require 2 to 3 bedroom affordable options
- Amenity spaces needed
  - Spaces to entertain visitors
  - Outdoor recreation spaces, including walking trail, pavilion and grill
  - Indoor fitness and recreation spaces
  - Services - examples: laundry, hair salon/barber, computer room
- Questions on Amenity Sharing
  - Determine which spaces can be shared by different groups within the Domicile (e.g., women, short-term men, long-term men), or within all populations at the CT Home, vs. which spaces need to be unique
  - Determine which spaces will be shared with the proposed Veteran Center for Excellence and open to veterans living in the community
  - Determine what amenities and services should be offered on the Home campus vs. in the community
- Family homes
  - If provided, would need to be physically separate from Domicile population
  - Requires own amenity spaces, including unique spaces for children and for group gatherings (for community-building purposes, and for safety)
- Handicap accessibility
  - Re-analyze proportion of Domicile rooms and indoor and outdoor amenity spaces required to be ADA-approved handicapped accessible if long-term handicapped are transferred from the Domicile to proposed Assisted Living unit
- Parking
  - Need may increase as short-term Domicile residents increase in proportion
- Other Residential Programs on Campus
  - Maintain Fellowship House at Home for foreseeable future

- As Connecticut Vet population declines in the future, partnerships will become important opportunities for use of beds, for example, possible coordination with U.S. VA for short-term PTSD or other unit

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Chapter B.2
Site Utilities and Access

FINAL REPORT

Date: May 9, 2016

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a. SITE UTILITIES

1. Sanitary Sewers

No significant upgrade of the sanitary sewer system is contemplated at this time. However, there may be isolated locations where the sanitary sewer system will require relocation in order to accomplish a building addition or renovation project. This may be the condition around building 5, which is scheduled under this program to undergo a major renovation.

2. Storm Drainage

As the campus is revitalized the storm drainage infrastructure can be improved along with incorporating storm water management practices to the site. The construction of the Levitow Healthcare Center in 2008 ushered in the beginning of storm water management practices for the campus. The primary purpose for these measures was to maintain or decrease the amount of storm water that the site is discharging. When impervious surfaces are added to a site, additional storm water is generated. This additional storm water discharge is treated on site by use of detention or infiltration. These practices were used on the new facility to treat the additional storm water discharge by using a combined technique; infiltration basins/bio-filters and building roof rain water infiltration systems. By adding the energy dissipation system at the end of the storm water discharge piping along with the bio-filtration basin the water quality will be improved by removing suspended solids. At present it does not appear that the overall campus vision will significantly add impervious areas to the site. It is more likely that there will be a reduction in impervious areas due to loss of paved areas and in some cases reduction in building footprints. The locations of the existing catch basins may require modification as the roadway network is modified. This will afford an opportunity to upgrade the drainage system at locations where a disruption may occur. This approach was used when the adult care facility was constructed nearly ten years ago.

3. Electrical

As part of the project to renovate the campus, additional infrastructure upgrades should be considered. Even though at some point in the future the power house will no longer produce steam, the campus electrical supply system will originate from the power house. The power house will provide daily electrical power along with generated backup electrical power when the normal electrical power is interrupted. Similar to the water distribution system that is currently in place, an electrical network campus loop would be critical. This loop would supply daily power and backup generated electrical when needed. This would require the installation of a duct back network loop circling the campus buildings.

4. Natural Gas

As part of the campus renovation project, natural gas should be supplied to every building. A gas main loop should be provided so that all the buildings can take advantage of the benefits of gas. This will be important for the elimination of the use of steam for a source of heating.

b. SECURITY

Building 10 is the existing security gate house. The building itself is in fair condition, but the function of the security department has outgrown the size of the building along with the functions of entering and exiting the site. The existing building was built in 1938 and is on the State's historic register. The building at this time does not meet ADA code.

This building is the first building that you interact with upon entering the site. Right now when one car stops at the gate, any other cars back up onto West Street. The buildings operations should be relocated to a more desirable location where a backup of cars will not impact West Street. The building itself should be able to hold the CPTV equipment. Also, the gate should mimic the entrance to the Department of Health Services Laboratory facility on the adjacent parcel of land to the west of the VA Campus. This gate setup has two entrance and exit gates. This allows residents and employees to be able to access the gate with a key card, while visitors can go up to the gate window directly and obtain access. The same would be available on the exit gate.

Department of Health Services Laboratory Gate Entrance

The new gate house will differ from the gate setup at the Department of Health Services Laboratory since this one will be covered. The gate house shall house a minimum of two staff. The primary purpose of these guards is to control access to all buildings on the campus and to protect the residents and employees from any threats. Along with the staff the following systems shall be installed in the guard house: S2 system, radio system camera system and phone system. The gate house shall accommodate two-way traffic with an inspection lane and a parking area.

A new surveillance camera system shall be installed, a 24 hour security alarm system, security lighting throughout the complex, and security ID access cards and all locks keyed with one Lock Company with several master keys for quick entry.

There is a need for two levels of security on the campus. The first level of security is the gate house entrance. The second will be key cards that will allow access into residential areas and the Dining Hall.

Office space for the Security team is now located in Building 2 and shall remain in the existing space.

c. PEDESTRIAN CIRCULATION

The existing pedestrian circulation on the site is very limited. Most of the pedestrians must walk in the roadway system to move between buildings on the site. Limited existing sidewalks from the various buildings lead directly to this roadway system forcing this unwanted interaction. Additionally many residents use battery-powered scooters to get around, adding another level of vehicular/pedestrian conflict. As a stop-gap mitigation of this occurrence, staff is constantly monitoring the installation of flags on these scooters to increase their visibility.

The proposed separate pedestrian circulation system is planned to be located within the vehicular ring road. This would make the interior space a walking campus that provides safe areas to walk. There will be several terraces, sitting areas, gardens, charging stations, gazebos, bike racks and picnic tables spaced throughout the campus to provide mini destinations and to encourage interactions between all residents, visitors and staff. Where possible, this system shall be graded and designed to provide an accessible route throughout the campus without the need to rely on automobile transport. The possibility exists to provide a dedicated jitney service linking the various facilities on campus that would further encourage interaction among campus inhabitants.

Pedestrian circulation needs to provide wider sidewalks for the extensive use of electric scooters on the campus. We will also be locating charging stations throughout the site for residents and visitors to charge their scooters or other electronic devices while they are enjoying the scenic outdoors. All existing and new exterior staircases shall be refurbished or constructed to provide ADA-compliant elements including handrails for the campus population.

The site needs to make the residents feel safe. By making the following improvements: installing emergency call boxes, improving the paved surfaces, increasing the accessibility and providing new site lighting so there are no dark areas on the campus are all elements which contribute to the establishment of a safe environment.

A pedestrian access to Elm Ridge Park from the campus is desired by the current residents. This gate access will need to be secured by the resident key card access.

d. VEHICULAR CIRCULATION

The existing vehicular circulation will remain along the outskirts of the site with minor changes. The interior vehicular circulation will be provided for maintenance accessibility and the Levitow healthcare center. All other vehicular circulation that will be needed for maintenance will be green pavers that the maintenance crew can drive on. All of the existing paved areas will need to be repaved.

New parking areas will be located along the main loop on the outskirts of the site. Parking will be provided as close as possible to residential areas and for employees to all buildings.

e. VISITOR AND RESIDENT ACCESS

As mentioned above, there will be two levels of security on the site. All residents and visitors will need to go through the gate house at the main entrance off of West Street. All residents will have their own key cards for site access. This card will also allow the residents access into the residential living spaces. All visitors will need to be provided entrance into buildings by the Administration.

f. PUBLIC TRANSPORTATION

There is a CT Transit bus that comes to the entrance of the VA on West Street. We are proposing to turn Building #10 into a bus shelter for the veterans to wait. This enclosed space will keep the residents out of the elements while waiting for the bus.

g. WELCOMING OF SITE

The site is unwelcoming from West Street at the current time. The fence line that runs directly along West Street should be pushed back to soften this line. Also, the brick retaining walls have experienced extensive deterioration and do not provide a welcoming atmosphere. We are proposing these be removed in some areas where the topography will allow regrading to create an accessible route.

The security gate house right at the West Street entrance is very intimidating to any visitors and we are proposing moving this location up the hill. This existing gate house can be renovated into a bus shelter for connection to the public transportation system.

Chapter B.3
MEP Infrastructure

FINAL REPORT

Date: May 9, 2016

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MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION NARRATIVE

<u>Applicable Codes And Standards</u>

All building systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

a. <u>Mechanical Systems</u>

1. Steam Plant

a. Existing Steam Plant

The existing campus steam system is operating beyond its useful life and exhibiting signs of potential failure. Since the campus heating and domestic hot water is run entirely from the central steam plant, all buildings (excluding Levitow Healthcare Center) are dependent on the steam plant which must remain operational until new heating sources are provided. Due to the potential lengthy upgrade timeline for all buildings, the central steam plant ("Lower Plant") will need to remain in service for the foreseeable future. Therefore, modifications to existing boilers and/or new boilers will be recommended and described in the following narrative. The size of the revised boiler plant will be significantly reduced as much of the campus steam services (laundry, hospital, generator, etc.) have been eliminated over time. The total heat output of the steam plant is approximately 95,000 pounds per hour. Based on historical data and estimated loads, the actual demand on the steam plant is approximately 20,000 pounds per hour. The steam system consists of the following boilers:

a. B-1 is a 1992 Johnson firetube boiler producing 30,000 pounds steam per hour (Lb/Hr). The unit operates on natural gas only. The unit has several plugged tubes and is showing age consistent with a 23 year old boiler. The original control system is operating and replacement parts are available.

b. B-2 and B-3 are 1939 Bigelow watertube boilers producing 20,000 Lb/Hr each. The units operate on either natural gas or #6 bunker oil. The units were retrofitted from their original function as coal fired boilers. The control system for these units is from the 1970's and replacement parts are not available.

c. B-4 is a 1954 Bigelow watertube boiler producing 25,000 Lb/Hr. The unit operates on either natural gas or #6 bunker oil. The unit is beyond its useful life. The control system for this unit is from the 1970’s and replacement parts are not available.

b. Steam Plant Renovation Option #1

This option is the least costly method of maintaining the steam plant until all buildings are upgraded and no longer steam dependent. Since boiler B-1 is currently the newest and most reliable boiler, this unit will undergo full tube inspection and refurbishment where required. As the primary steam source of the plant, it must be upgraded to full working order. Boilers #2, 3, 4 will undergo inspection and receive any replacement parts which are needed and available. There is potential that one of the (3) boilers will need to be “cannibalized” for parts to maintain the remaining units. As a means for mitigation of potential failure, new piping connections will be added for the connection of a mobile boiler system during plant failure. The new piping system will include steam piping, fuel piping, and power wiring with terminals for connection to a trailer mounted unit which will be contracted with a local supplier. Should all boilers in the plant fail, the mobile unit will be connected to the plant to provide all steam needed while repairs are made.

c. Steam Plant Renovation Option #2

This option provides a more reliable steam plant with a higher initial cost. Similar to option #1, the purpose of this steam plant is to maintain service to existing buildings until all have been upgraded and are no longer steam dependent. Boiler B-1 will undergo full tube inspection and refurbishment where required. Boilers #2, 3, 4 will be removed and replaced with a single new boiler of significantly smaller size. The new boiler will be a modulating firetube unit of approximately 600 boiler horsepower.

In addition to the boiler work, the steam system will be recalibrated to operate at 70 psi, instead of the current pressure of 175 psi. Since much of the campus has been reconfigured over the years, elevated pressure is no longer needed and is putting additional wear and cost on the boiler system. New boiler feed pumps with smaller motors will be provided to operate at the reduced pressure. Significant energy savings will be made by reducing the overall steam pressure.

2. Middle Plant (Serving Buildings 2,3,4,9 and located in Domicile Basement)

a. Option #1 – Geothermal Plant

This option includes the most sustainable option which is a geothermal heating and cooling plant.

An electric chiller/heater system will be provided. System will consist of (4) 165 ton Multistack chiller heaters and will be capable of providing simultaneous hot and chilled water with heat recovery. In addition, (2) geothermal pumps, (2) chilled water pumps, and (2) hot water pumps will be provided. An array of approximately 250-300 closed loop geothermal bores, 400 ft deep, 6” diameter will be provided underneath the existing baseball field and surrounding areas. A backup boiler system will be provided for emergency heating required during periods of power outage when only the emergency generator operates. The backup boiler system will include (2) 5,000 MBH cast iron natural gas boilers.

b. Option #2 – Dual Fuel High Efficiency Plant

This option provides high efficiency and also the potential for dual fuel switchover for utility cost reduction.

For heating, (4) 2,500 MBh dual fuel gas/propane fired condensing boilers will be provided along with (2) hot water pumps. Hot water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The boiler and pumps will be located in an indoor mechanical room.

For cooling, (1) gas driven 350 ton centrifugal water chiller system similar to Tecochill model DTx will be provided. (1) Electric driven 350 ton oil-less water chiller system similar to Trane CentraVac will be provided. In addition, a 650 ton cooling tower, (2) chilled water pumps, and (2) condenser water pumps will be connected to the chilled water system. Chilled water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The chillers and pumps will be located within an indoor mechanical room, while the cooling tower will be located on adjacent grounds.

c. Option #3 – High Efficiency Conventional Plant

This option includes conventional systems which are high efficiency.

For heating, (4) 2,500 MBh gas fired condensing boilers will be provided along with (2) hot water pumps. Hot water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The boiler and pumps will be located in an indoor mechanical room.

For cooling, (2) electric driven 350 ton water chillers similar to Trane CentraVac will be provided. In addition, a 650 ton cooling tower, (2) chilled water pumps, and (2) condenser water pumps will be connected to the chilled water system. Chilled water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The chillers and pumps will be located within an indoor mechanical room, while the cooling tower will be located on adjacent grounds.

3. Upper Plant (Serving Buildings 5,50)

a. Option #1 – Geothermal Plant

This option includes the most sustainable option which is a geothermal heating and cooling plant.

An electric chiller/heater system will be provided. System will consist of (4) 145 ton Multistack chiller heaters and will be capable of providing simultaneous hot and chilled water with heat recovery. In addition, (2) geothermal pumps, (2) chilled water pumps, and (2) hot water pumps will be provided. An array of approximately 200-250 closed loop geothermal bores, 400 ft deep, 6” diameter will be provided underneath the existing baseball field and surrounding areas. A backup boiler system will be provided for emergency heating required during periods of power outage when only the emergency generator operates.

b. Option #2 – Dual Fuel High Efficiency Plant

This option provides high efficiency and also the potential for dual fuel switchover for utility cost reduction.

For heating, (4) 2,000 MBh dual fuel gas/propane fired condensing boilers will be provided along with (2) hot water pumps. Hot water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The boiler and pumps will be located in an indoor mechanical room.

For cooling, (1) gas driven 300 ton centrifugal water chiller system similar to Tecochill model DTx will be provided. (1) Electric driven 300 ton oil-less water chiller system similar to Trane CentraVac will be provided. In addition, a 600 ton cooling tower, (2) chilled water pumps, and (2) condenser water pumps will be connected to the chilled water system. Chilled water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The chillers and pumps will be located within an indoor mechanical room, while the cooling tower will be located on adjacent grounds.

c. Option #3 – High Efficiency Conventional Plant
This option includes conventional systems which are high efficiency.

For heating, (4) 2,000 MBh gas fired condensing boilers will be provided along with (2) hot water pumps. Hot water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The boiler and pumps will be located in an indoor mechanical room.

For cooling, (2) electric driven 300 ton water chillers similar to Trane CentraVac will be provided. In addition, a 600 ton cooling tower, (2) chilled water pumps, and (2) condenser water pumps will be connected to the chilled water system. Chilled water piping within the existing tunnel system will be provided to each of the buildings served by this plant. The chillers and pumps will be located within an indoor mechanical room, while the cooling tower will be located on adjacent grounds.

4. Control System

a. A central Building Management System (BMS) will be provided for the building. The BMS will monitor and control all items within the mechanical systems of the building and will also tie into the campus BMS system for remote interface.

b. Mechanical systems may be used as a potential learning and rehabilitation tools for residents interested in future careers in the building industry. Therefore, viewing areas and energy dashboards are being recommended where appropriate. Viewing areas with glass separation into mechanical rooms and informational placards may provide an engaging display to residents. Energy dashboards may provide information regarding equipment status, energy consumption, reduction measures, and other interesting information.

b. Electrical Systems

1. Existing Electrical Infrastructure

a. The existing electrical infrastructure system is operating beyond its useful life and exhibiting signs of potential failure. It also consists of many rooms within buildings that house open 2.4KV switches, which could be a potential safety threat. Since the campus electrical system powers all buildings, and the proposed changes to the campus is expected to be a multi-year phased construction, the existing electrical system must remain operational until a new electrical distribution system is installed.

b. We understand there is a generator replacement project being considered. We recommend that updates and repairs to the existing systems such as replacing the original steam generator is worth pursuing considering the length of time the phased construction may take.

c. For reliability and safety reasons we recommend that the following proposed electrical infrastructure changes be implemented and replace the existing as a priority. Existing buildings which will not be renovated soon will still benefit by the increased reliability of a new electrical infrastructure project. In this manner the existing electrical distribution system may be decommissioned on a building by building process.

2. Proposed Electrical Infrastructure Upgrade

a. The main electrical service to the campus will be fed from a 24kV aerial feeders from the street. Feeders will terminate at transformers located at the power plant, which will step the voltage down to 13.8kV. From the transformer secondaries, feeders will connect to an exterior service switchgear, where they will be distributed to the normal side of an exterior automatic transfer switch (ATS). This ATS will be used for optional standby power throughout campus. All service gear (including the ATS) will be located outside the proposed power plant, mounted on concrete pads.

b. Optional standby power will be accomplished via an array of 13.8kV diesel generators located at the power plant. Quantity and size of generators will be determined based on campus load requirements. The generators will be arranged as N+1, where there will be one additional back-up generator. In the case of a failure of any one generator, the back-up generator will start. 13.8KV Feeders from the generators will terminate at a synchronizing switchgear where they will be distributed to the emergency side of the exterior ATS. This synchronizing gear will have a control system that will monitor the campus load and decide how many and which generators operate on the loss of power at any one building. This system will include a communication and monitoring system at each building's electrical service that will communicate with the synchronizing gear.

c. Feeders originating from the load side of the 13.8KV ATS will be distributed throughout campus via one medium-voltage loop. Feeders will travel underground via an array of manholes strategically located in the roads and parking lots around campus. At each building (or group of smaller buildings), feeders will travel from the nearest manhole to an exterior switch, where they can be manually switched to receive power from either "direction" of the respective loop. In other words, campus staff will have the ability to isolate specific parts of either loop when there is a fault anywhere within the loop. From each switch, feeders will travel underground to a pad mounted transformer located on the building's site. The transformer will step the medium voltage down to either 208V or 480V (3-phase) depending on the building's size and load.

d. From a phasing perspective, conduits and manholes for the medium voltage distribution loop will be installed prior to all building construction. Once a building is renovated, existing power lines will be removed and feeders will be run within these conduits to the building's exterior switch.

3. Proposed Solar Electric (Photovoltaic) Power System

a. The campus has plenty of space to accommodate a ground mounted photovoltaic system in the south east portion of the site. Given the topography with a south facing slope to the campus, this area is particularly accommodating to a solar array.

b. We estimate that a solar array with a size of up to 2MW can be accommodated on the site. This system will provide power for a significant portion of the entire campus's electrical needs.

c. The system would consist of an aluminum framework mounted off of pile driven steel posts. On this framework, photovoltaic modules will be mounted, typically with a 10 to 15 degree tilt. The modules are typically 250 watts each and we would anticipate several 100KW string inverters mounted on pads throughout, connecting the modules and converting the DC power to AC.

d. From each string inverter, a 480V, 3 phase, AC power feed will be brought to a common electrical switchgear (there will be up to 4 of these). This switchgear will in turn be connected to pad mounted transformer that will step up the voltage to 13.8kv. The four transformers will be collected into a common 13.8kv switchgear and connected into the 13.8kv system at the main electrical service.

e. An interconnection agreement will need to be made with the local utility and the proper metering devices, protective electrical relays and gear provided in accordance with Eversource requirements.

4. Optional Power Systems

a. Given the nature of the campus electrical, HVAC and water heating needs, we feel a cogeneration plant should be considered.

b. Cogeneration plant should be considered in each of the main Mechanical plants. The Cogeneration System would consist of high efficiency gas fired electrical generating equipment. The heat generated by this equipment would be captured and used to either heat domestic water or supplement the HVAC heating plant. Additionally, cogeneration plants work well with a pool installation that requires year round heating.

c. The Cogeneration facility would require an interconnection agreement with the utility company much the same as the photovoltaic system as this system can theoretically feed back into the utility grid by design.

d. Cogeneration facilities can make financial sense when the generated heat can be used year round. Further analysis is required in order to understand life cycle costs and payback periods. Further development of the proposed HVAC design is needed prior to offering further payback figures.

c. **Plumbing Systems**

1. **Existing Systems**

a. Currently the hot water for the buildings on campus is either provided by an electric or gas type water heater or a steam powered water heater. Since the steam plant is past its useful life, all new water heating systems will be based on natural gas which is currently located on site. Having a central hot water plant for the entire campus will be beneficial for many reasons. Having one central plant keeps all maintenance and equipment in one area as to have many separate systems for each building. The domestic water will be provided from the city water supply and will enter the central plant to feed into the hot water heating system. The domestic water will be provided with a double check valve backflow preventer to ensure no water from the campus can get into the city water supply.

2. Hot Water Generation - Gas Fired Water Heaters

a. (4) 2,000 MBh water heaters will provide the domestic hot water load for the entire campus. The water heaters will run in a lead lag configuration which will extended the longevity of the water heaters so that one is not running 100% of the time. Each water heater will have 300 gallons of storage capacity. The hot water will be distributed throughout the campus via three hot water re-circ pumps which will be sized for about 60% of the load for redundancy. The domestic water for the campus will also be provided through a domestic water booster system to provide adequate pressure to all of the buildings on campus.

3. Rainwater Collection

a. Rainwater can be potentially collected from roofs, through the storm system and collected into an underground storage tank. This water could be used for a potential irrigation system for the baseball fields, plant watering for the greenhouse and be used to supply the water closets and urinals with flushable water. This system could off-set the domestic water usage by the campus and is a sustainable way to re-use water. If there was not enough rain water, the systems would simply run off of the domestic water service for the campus.

d. Fire Protection Systems

1. Currently the VA campus is protected by a central fire protection loop which serves the buildings that have currently have a sprinkler system installed in them. The new hospital has a separate water main that serves the building, which also serves the fire protection system for that building. During the renovation the new hospital will stay on its own system. It is recommended by the site civil engineer that maintaining the fire protection loop currently in place would be a difficult task since most of the buildings would need a sprinkler system added and most buildings that are being renovated would need the sprinkler system brought up to current standards. This addition of sprinkler systems would most likely require the upsizing of the main fire pump system and a lot of site work of running fire protection piping all over campus.

The best option for the addition of fire protection systems is to take the fire protection loop off line entirely and have a dedicated fire protection system in each building. Each building being renovated could tap off of the domestic water line that would need to be run to the building for its fire protection service. Depending on the incoming pressure and flow from the street, each building may need a small fire pump to provide adequate pressure for the sprinkler system. The fire protection system would be located in the mechanical space. No extra water storage would be required since the systems would be directly off of the main water service from the city.

e. Information Technology Systems

1. Each building on campus currently receives IT services from a distribution room located in the basement of building #5. Here, utility fiber terminates at the campus head-end firewall/router, is localized via two core switches, and is distributed via an array of patch panels. Copper telephone and cable TV services terminate at multiple punchdown blocks located on backboards within the same room. From here, fiber and copper service cabling travels underground in conduit (and through cable trays in the campus tunnel network) to termination points in each building. The local network is managed via a server farm located in the third floor of building #5.

2. Upon renovation, each building will receive new fiber and copper service cabling from the campus distribution room using existing pathways. The existing distribution room will need to remain in its current location due to phasing concerns. All service cabling will be sized based on the building it is serving, and all connection types will be coordinated with the owner's IT staff.

Chapter B.4
Housing

FINAL REPORT

Date: May 9, 2016

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APPLICABLE CODES AND STANDARDS

All building systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

a. DOMICILIARY HOUSING

The domiciliary housing will encompass buildings 3, 4, 5, and 50. We are using the Department of Veterans Affairs Office of Construction and Facilities Management Design Guide from June 2011 Community Living Center "CLC" as the basis for the housing. Each wing/pod will have a maximum of 12 residents, each with their own private bedroom and bathroom. Serving these 12 bedrooms will be community living room and kitchen/dining room. Each building will be provided their own laundry room. All of the furnishings needed to take into consideration the bariatric needs of the veterans, larger furnishings, assisted chair lifts and lift track are proposed to be provided throughout the domiciliary housing.

Buildings 3 and 4

Structural

Building #3 is a residential building located on the westerly side of the campus and is shaped in "U" configuration having both parallel legs facing in a westerly direction and the bottom of the "U" facing in an easterly direction. Its sister building, Building #4 is on the opposite side of the large grass commons that separates these two structures. Building #4 is shaped in a "U" configuration with its parallel legs facing in an easterly direction and the bottom of the "U" facing in a westerly direction toward Building #3. Both buildings were constructed in 1936 and both have received elevator upgrades in 1979. In 2010, both buildings received new roofs. The buildings have three stories that include a basement. However, the basement area in building #3 is smaller than the basement in building #4. The total building area for building #3 is approximately 67,840 square feet, while in building #4 the total area is 78,700 square feet. The difference in area between the two buildings is the larger basement area in building #4. The general space "alley way" between parallel wings of the buildings provides general access to the basement level of the buildings to allow maintenance and some vehicular parking.


Westerly Wing of Building – Looking into Alleyway between Buildings


Southwesterly Wing of Building #3

Both buildings were constructed using a superstructure of structural steel. A column grid was developed that located columns along the exterior walls and at a single row of columns along the center of the footprint. The steel columns support a network of steel girders that support light weight steel beams that span between the girders. A one way slab system spans between the beams that forms the floor. The exterior and interior walls according to available information are not load bearing and should allow a great deal of flexibility for any future renovation project being considered. The exterior wall system is constructed of brick masonry. Viewing the building from the outside does not reveal any significant areas of damage to the brick masonry exterior. The windows appear to be in generally good condition. Some windows do not appear to be the original windows; however, no documentation was discovered that would confirm this condition.


Northeasterly Wing of Building #4


Westerly End of Building #4

<u>Architectural</u>

Buildings 3 and 4, Domiciles ("Doms"), were built in 1936 and are part of the State Historic Commission campus listing. The original design, which is still in place, creates barracks-like quarters with 12 people in each room. These barracks are laid out in a series of wings with the residential areas facing to the south, and service areas facing to the north. Privacy between the residents of the barracks rooms is provided by banks of lockers, which do not reach the ceiling. There is no privacy between residents of these areas. There are shared gang toilet areas to the north of the sleeping quarters in each of the wings. These buildings are the main residential facility on the site. The buildings are able to hold a capacity of 336 residents. According to the 2011 Strategic Restoration Plan for the Department of Veterans Affairs by Joseph Perkins, in June 2012, Buildings 2, 3 and 4, had life-safety upgrades completed which included new roofs, bathroom and ADA Ramps, HVAC and Sprinklers.

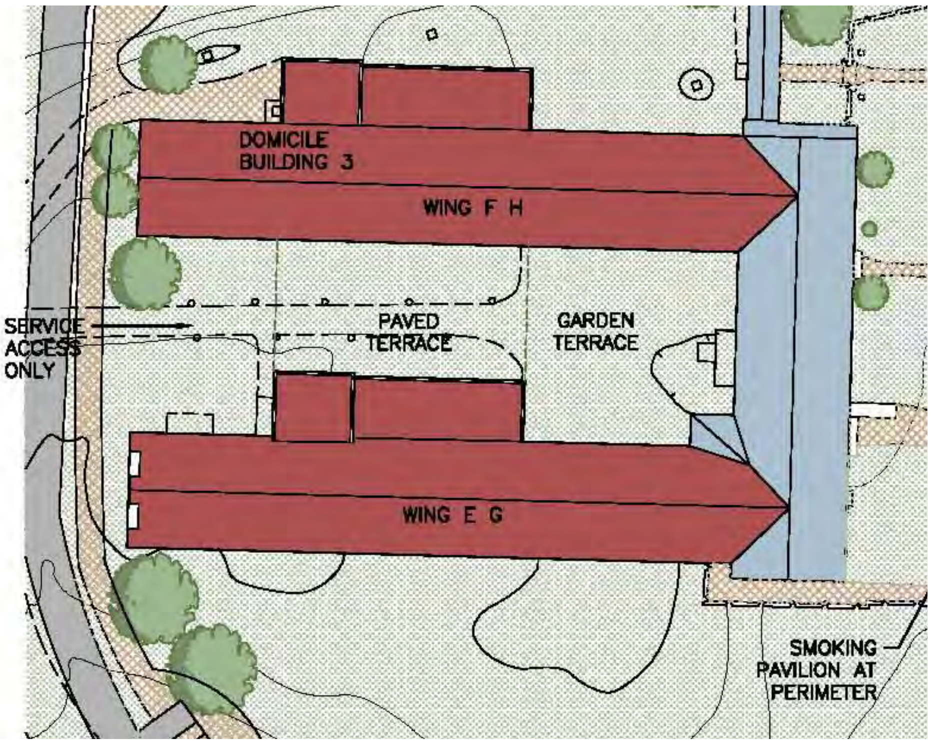
Currently the Doms are set up to hold 20 women in wing E, wing B is a clinic and the rest of the wings are for men. There is an existing courtyard between each wing of the two domiciles that have become parking courts. The residents have started to take back some of these spaces by adding picnic tables and benches to be able to sit outside of the domiciles.

An ADA study was completed in June 2015 by Geddis Architects. This study included signage, updating stair handrails with extensions, water fountains, mirrors and grab bars in toilet rooms, new doors with lever handles, exit devices and automatic openers, and a new ramp to the exterior on Building 3 and 4. The estimated cost of these improvements is $752,770.

In addition to the ADA requirements discussed above, Building 3 improvements will also include new energy efficient windows, insulating exterior walls to meet the State's High-Performance Building Standard, and exterior brick repair. A new roof was put on a few years ago and will remain.

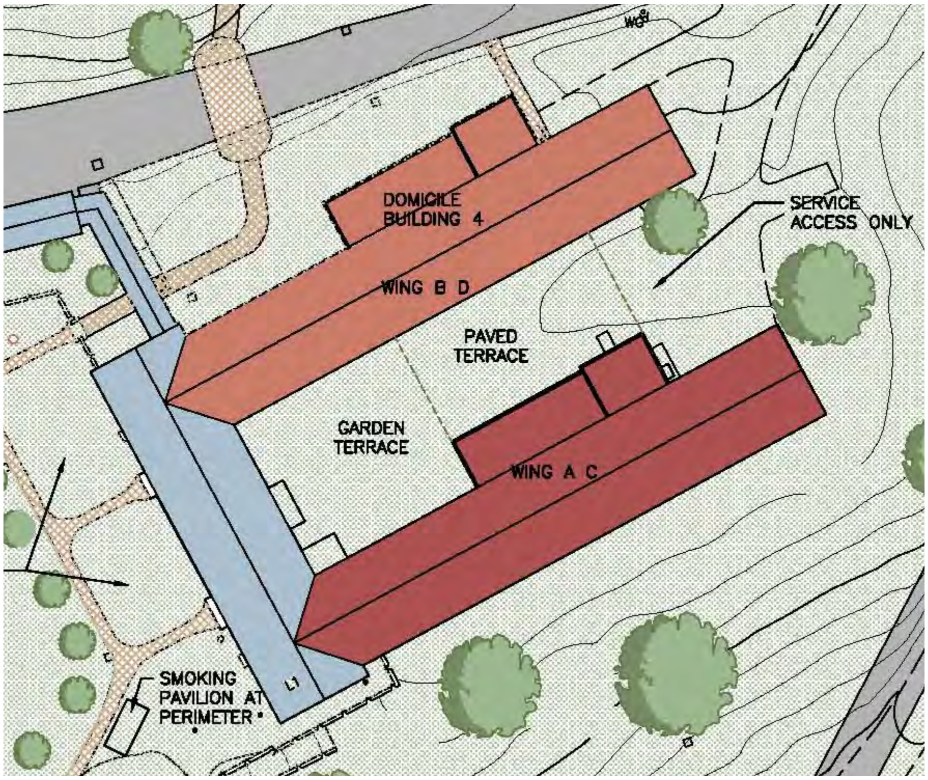
This study has redesigned wings A, C, D, E, F, G, and H to hold 12 veterans per wing with their own private bedrooms on the south side of the wing, with community living spaces on the north side of the wing. These spaces are being renovated to the Federal VA standard for private bedroom and bathroom. Wing B shall remain the B Clinic and is discussed in Chapter B.5.

Building 3 would hold 48 veterans with the new layout. While, Building 4, would hold 36 with the new layout.



See sheet A.13 for full size Masterplan Drawing

See sheet A.21 for full size Building 3 First Floor Plan



See sheet A.13 for full size Masterplan Drawing

See sheet A.24 for full size Building 4 First Floor Plan

See sheet A.23 for full size Building 3 and 4 - Typical “CLC” Unit Plan

Building 5

Structural

This building was constructed in two phases; the southerly half of the building was constructed in approximately 1935 and then in approximately 1945 a somewhat similar mirror image of the original building was constructed to the northerly end of the initial building. The combined area of the building after the 1945 addition was approximately 226,600 square feet. The initial building was constructed with a central core that was placed in the middle of two “L shaped” wings that were on the easterly and westerly sides of the core. There is a basement under the core space and the wings. The winged shaped areas extend four floors above the basement, while the central core is constructed with five floor levels above the basement. The addition was constructed with five floor levels above the basement throughout. This included the “L shaped” wings as well. The materials handling area is located on the easterly side of the building tucked in the corner of the core and wing intersection of the original building.

Southwestern Wing &
Central Core – Built 1935

Northwesterly Wing of
Five Story – Built 1945

At some point after the last major construction in 1945, stair towers were added to both southerly ends of the original wings. The construction documents for this project could not be found, but it is very likely that additional means of egress were required from a life safety point of view.
The combined building was constructed using a superstructure of structural steel. A column grid was developed that located columns along the exterior walls and in walls on either side of the corridors. The steel columns support a network of steel beams and girders that form the basic structure of the building. A concrete slab spans between the beams to provide a floor support structure. The interior and exterior walls according to the existing drawings are non-load bearing in nature. Therefore, any future plans for renovating this building would allow freedom to configure the space as necessary. The exterior wall system is made up of brick masonry. Viewing the building from the outside does not reveal damage to the exterior brick masonry. In some cases window replacements may help wind and moisture infiltration, but there is no area that especially stands out. The condition of the existing roof is poor.

Easterly Wing of Four Story – Original Building

Southwesterly Wing of Four Story Building – Northwesterly Wing of Five story Building

Architectural

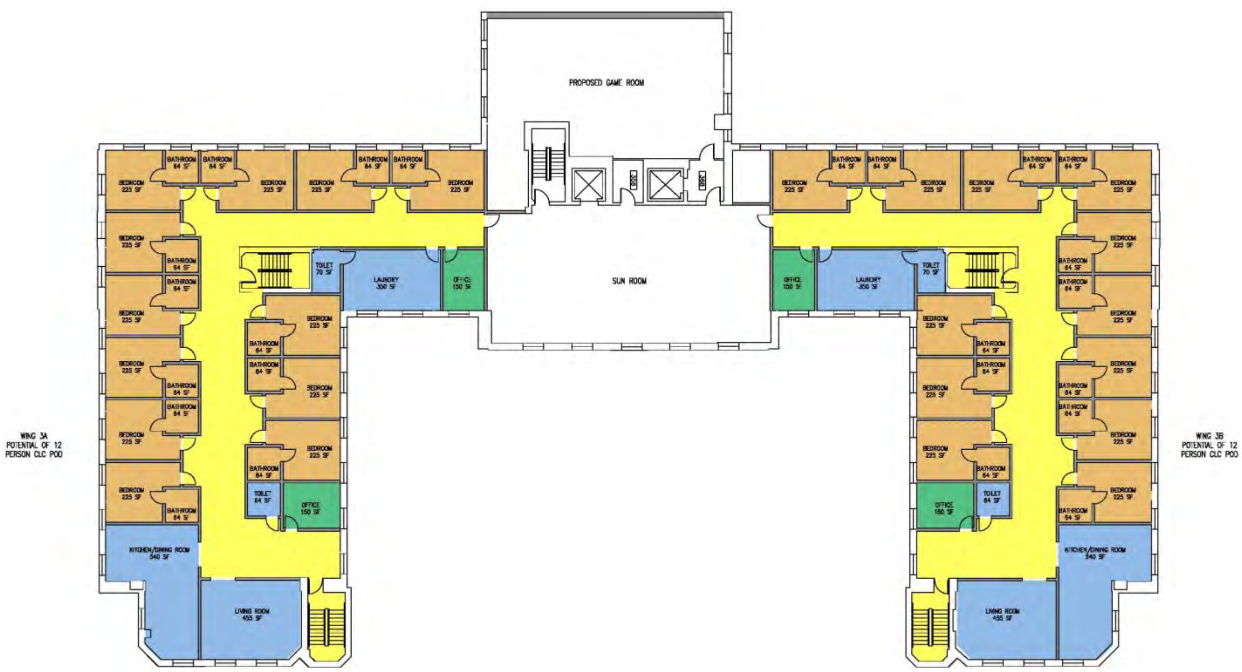
Building 5, the former hospital, was built in 1935, and was four stories high, comprised of wings A and B. A five-story addition built in 1945, which included the north wings C and D along with support areas joining the four wings, bringing total occupancy to 600 beds. With the completion of the Levitow Healthcare Center in 2008, the hospital functions of Building 5 were transferred to that facility. Physical improvements to Building 5 that will need to be made to this building are a new roof, new energy efficient windows, insulating the exterior walls, exterior brick repair, elevator upgrades, and ADA upgrades.

The top two floors, floors 4 and 5, of Building #5 have not been used for at least 5 years due to roof leaks. Extensive damage to the finishes on those floors is evident, along with the migration of water down to the floors below. The bottom 3 floors are still partially occupied by office spaces. The third floor and a room in the basement have an IT server. The third floor equipment can be relocated, but the equipment in the basement needs to remain in place. Portions of the Second Floor are currently occupied by the State Parole Division. Wings 2a and 2b are currently used as swing space while other buildings are being renovated. The First floor contains many different occupants. There is an unused dental clinic abandoned in place, while the rest of the spaces are occupied by lab facilities, a mail room, janitorial services, sterile supplies, medical records and volunteer services.

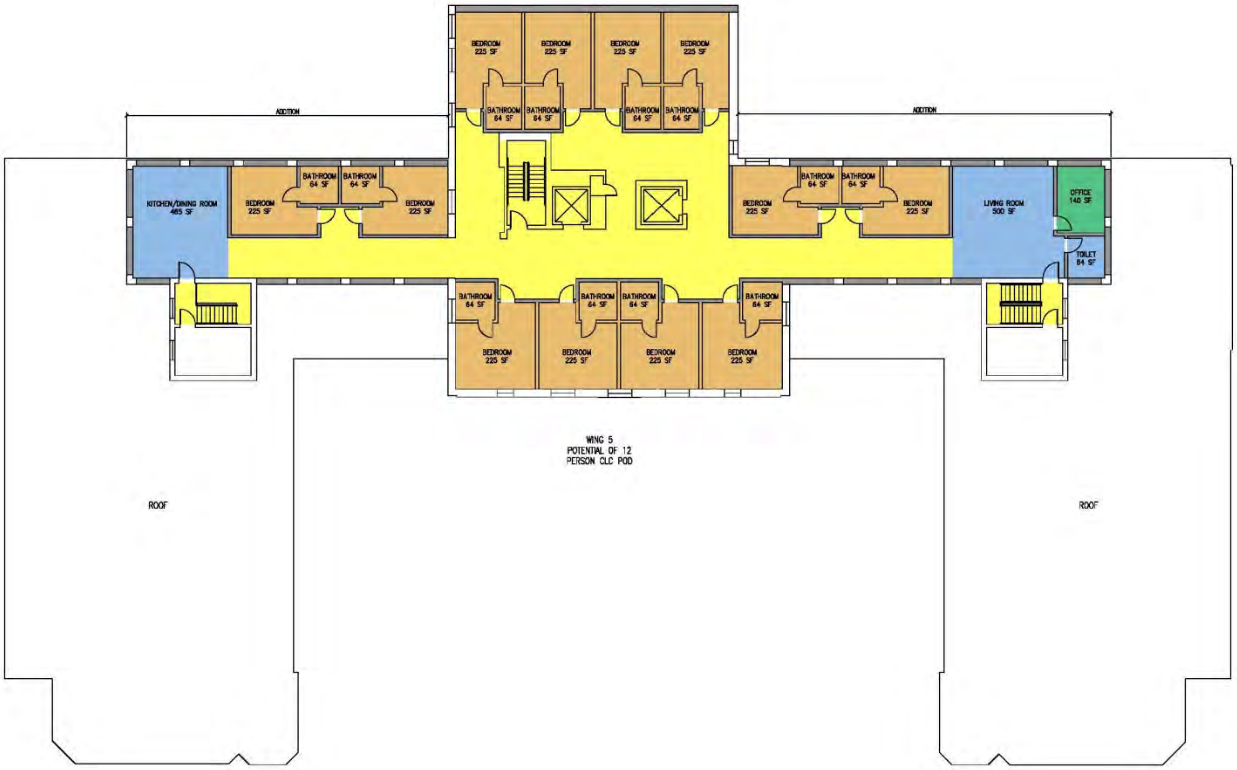
The original Hospital was designed by Robert Orr. This portion of the structure will be retained and renovated to provide resident bedrooms and community spaces for the domiciliary housing. The 1945 addition will be demolished.

Our proposed design has the back half of Building 5 being demolished. The front half of Building 5 has wings A and B redesigned to hold 12 veterans per wing with their own private bedrooms and community living spaces. These spaces are being renovated to the Federal VA standard for private bedroom and bathroom. A new addition and renovation to the fifth floor, would allow another group of 12 veterans housing with community space.

See sheet A.14 for full Masterplan Drawing



See sheet A.29 for full size Building 5 Third Floor Plan



See sheet A.31 for full size Building 5 Fifth Floor Plan

See sheet A.32 for full size Building 5 - Typical “CLC” Unit Plan

Building 50

Structural

Also known as the Veterans Recovery Center, this residential structure was originally constructed in 1944. In 1993, stair tower additions were placed at the end of the two parallel building wings that run in a westerly direction. These wings form the legs of a “U” shaped building. This structure is located on the northwesterly quadrant of the Veterans Affairs Campus in Rocky Hill. This is a three story building plus the basement that has a total building area of 52,700 square feet. Some of the original construction documentation was discovered, however, the structural drawings for this building were not located. It is very likely that the structural framing methods used in the other buildings of this era were also used to frame this building. The basic structural system is a network of steel columns with girders and beams. A poured in place concrete slab completes the structural system for this building. In the future, further investigation of how this building is framed will be required before any type of renovation work can be planned. The exterior wall system is constructed of brick masonry that appears in reasonably good condition. Any future renovation projects for this building should consider window replacements once these have been thoroughly investigated.

Southeasterly Corner of Building #50

Northerly Side of Building #50

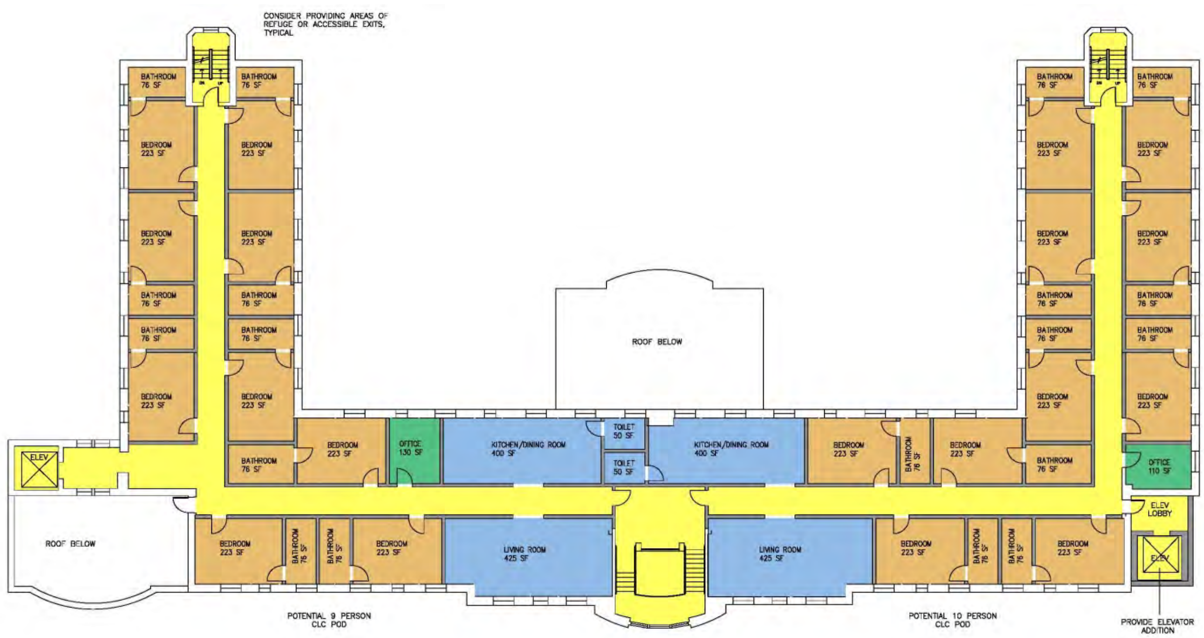
Architectural

The existing Building 50 is currently Fellowship House, the substance abuse facility, which can house 75 veterans, according to the December 2014 CT Legislative PRI Committee, noted on page 16. The original building was built in 1944 with an elevator addition in 1993. For every two patients there is a shared bathroom between their private bedrooms. Only the toilet and sink are allowed to be used in these bathrooms, as the existing tubs are non-functional due to plumbing leaks. Shared shower rooms are available at the end of corridor, approximately 4 per floor. There are common lounge areas, a laundry room and group therapy rooms. The first floor has staff offices located on the north end.

The roof was replaced in 2014, which stopped interior damage due to leaks, improving the condition of the building.

The building at this time does not meet ADA code. An ADA study was completed in June 2015. This study included signage, updating stair handrails with extensions, water fountains, new doors with lever handles, exit devices and closers, audible signal and tactile signal on interior of elevator cab, fire extinguishers, and modify toilet rooms. The total cost of these improvements is $1,408,574.

Our proposed design has the building split into two halves with 9 or 10 person pods in each wing. These spaces are being renovated to the Federal VA standard for private bedroom and bathroom. A new elevator addition to the north east corner of the building will allow both sides of the pods to gain accessibility to the full building.



See sheet A.34 for full size Building 50 Second Floor Plan

Mechanical, Electrical, Plumbing and Fire Protection for Buildings 3, 4, 5 and 50

1. Fire Protection Service

The entire building will be protected by a NFPA 13 sprinkler system to ensure that the entire building is sprinkled. A wet sprinkler system will serve all of the heated spaces while any un-heated areas (attics, outside overhangs, un-conditioned basements, etc) will be protected using a dry system. Sprinkler heads will be either be recessed ceiling pendants or recessed side wall heads. Cover plates will be used to reduce the visual aspect of the sprinkler heads. Depending on the height of the building, standpipes will be installed in stairwells with fire department connections. The fire protection service will enter through the basement or designated mechanical space with either enough pressure from the central system or a small fire pump will be used to provide the building with the proper flow and pressure to provide an operational system. Outside of where the fire protection system enters the building there will be an alarm bell, fire department connection and sprinkler drain. The fire department connection will be located on the building towards the access road to give the fire department quick access to the system in case of a fire.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the domiciliary housing by the central hot water heating plant. Domestic water cold and hot water re-circulation lines will be provided to ensure stagnation of water does not occur. Domestic water entering the building will be provided with a check valve and a water meter which will be connected to the campus building management system for the owner to be able to monitor water consumption at the building. A tempering valve will be provided in the mechanical room to provide the building with the correct temperature water at each fixture. The bathrooms in the space will be equipped with new, low- flow fixtures, with ADA accessible fixtures where required. Hose bibs and floor drains will be located in areas deemed necessary for ease of cleaning. Sanitary system for the building will combine underslab in one central location and then be distributed out to the main sanitary line.

3. **HVAC Ventilation**

Ventilation will be provided to each space using dedicated outside air (DOA) units. Several DOA units will be located on the roof or in the mechanical rooms where outside air and exhaust air will be exchanged thru an energy recovery wheel. Outside air from the DOA will be ducted downstairs into each space, while exhaust air from resident rooms and bathrooms will be ducted into the DOA unit for energy recovery prior to discharge or removal.

4. HVAC Terminal Devices

Residential Rooms – Valence or chilled beam units provide heating and cooling for each residential room. Each valence or chilled beam unit will be mounted above the exterior windows and will contain coils for both heating and cooling. Local thermostats and control valves will modulate the flow of hot or chilled water through each unit to provide space conditioning as required.

Community Spaces **-** Active chilled beams and/or fan coil units will be provided for cooling of the community spaces. Units will be located within the ceiling grid and will provide cooling and ventilation to each individual community area. Windows for rooms with chilled beams will be fixed (non-operable) to prevent condensation at the beam. Perimeter finned tube heating will be provided for additional heat at the exposures.

5. HVAC Control System

A central Building Management System (BMS) will be provided for each building. The BMS will monitor and control all items within the mechanical systems of the buildings and will also tie into the campus BMS system for remote interface. Where possible, occupancy sensors will be provided for system setback during periods of non-use.

6. Electrical Service

Each building will be powered via two separate pad-mounted, three phase transformers located outside the associated building. Transformer primaries will be connected to the campus medium voltage distribution loop.

7. Electrical Distribution

From the transformer secondaries, feeders will be run underground (in conduit) to each building’s main electrical room. Normal power will directly feed a normal distribution switchboard. A dedicated breaker in this switchboard will feed the normal side of an automatic transfer switch located in the respective building, with the emergency side being fed directly from the emergency transformer. Emergency power for each building will run from the load side of the transfer switch to a separate distribution switchboard. Each switchboard will feed various branch panels located throughout the respective building. Convenience receptacles will be located based on furniture layouts and other basic requirements.

Dedicated branch panels will be provided for commercial HVAC units, and larger units will be powered directly from the main (normal power) switchboard.

Currently, the proposed domiciliary housing spaces are fed from a single switchgear in the centralized food service wing. Although the existing equipment will need to be replaced, this system would be a viable option, only requiring one switchgear and transformer to be provided.

8. Emergency/Optional Standby Power

The two main services will be backed up via generators located at the campus power plant. One service will be dedicated for life safety systems and the other will provide optional standby power to the remainder of each building's load.

9. Lighting

Each building will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility spaces, wall mounted fixtures will be provided in stairwells, and architectural fixtures will be provided in specialty areas requiring accent lighting. Large areas with high ceilings will utilize high output LED pendant fixtures.

10. Emergency Lighting

Fixtures in corridors, stairwells and other paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

11. Telecommunication Services

Each building will be fed from the campus fiber distribution system, originating in the basement of Building #5. New single mode fiber optic cabling will be run in existing underground pathways to patch panels located in each building's main IT room. All required copper telephone cabling will be routed alongside fiber in existing pathways and will terminate at punchdown blocks on the wall of the main IT room. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner's representatives at time of design.

In larger buildings, such as Buildings 3 and 4, fiber and copper service hardware will need to be housed in a free standing equipment rack. In lieu of this, a room dedicated for IT services shall be included as part of design. This room will be provided with a dedicated ventilation system.

Network accessibility will be accomplished via wall jacks and wireless access points located throughout each building. Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

12. Security Systems

Video surveillance will be accomplished via exterior cameras only. Cameras will be strategically located throughout the site to provide coverage of all building entrances, parking lots and walkways. Building interiors will not be equipped with cameras due to privacy concerns. All cameras will be IP and connected to the campus network.

An access control system will be provided at each building. Card readers will be provided at each building entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. Additionally, access to each wing will be controlled via card reader (individual rooms will be protected by mechanical lock only). All card readers will be tied into system nodes located in each building's IT room. Nodes will be networked together to provide system monitoring from security locations throughout the campus.

An intrusion detection system will not be provided in these areas, as the buildings are manned 24/7.

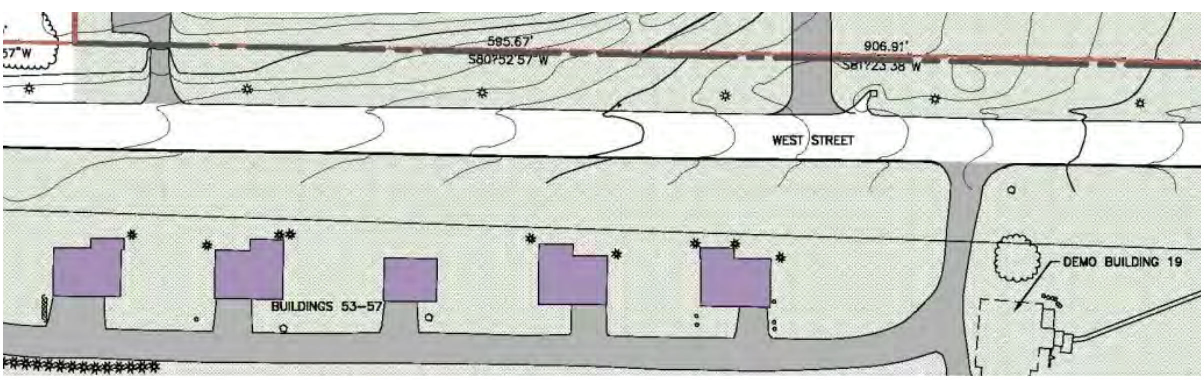
13. **Fire Alarm Systems**

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices (i.e. smoke detectors, manual pull stations, monitoring modules) and notification devices (i.e. speakers, strobes, elevator tie-ins) as required by applicable codes.

b. FAMILY HOUSING

Architectural

According to the 2005 Conditions Survey, the original Patriots Landing buildings were built in 1938. These buildings were originally residences for the campus. We will not be changing the function of these buildings but will need to renovate each building to accommodate any Fair Housing Act upgrades, new roofs, and new energy efficient windows and doors. These homes are located across West Street from the main DVA Campus. There are 5 single-family homes to accommodate 5 families. This area is typically a two year program. This area is proposed to remain as family housing. Additionally, there is an existing building, the Farm House, Building 19, that was also a part of the original campus. It had been converted to apartment-type units at some point in the past, but is currently unoccupied. There is a relatively new steel exterior exit stair on the south side of this structure. The roof has been leaking for some time, and has not been repaired; the Security Staff had used this facility for training up until recently, when their trainer deemed the interior stairways unsafe for training purposes. Building 19 should be demolished and construct 4 new units. This, along with the five detached homes, would provide a "critical mass" of family housing that would strengthen its identity with the overall campus. .The existing driveway would be upgraded with an entrance feature identifying it as Patriots Landing.



See sheet A.16 for full size Masterplan Drawing

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service

The entire building will be protected by a NFPA 13R sprinkler system to ensure that the entire building is sprinkled. A wet sprinkler system will serve all of the heated spaces while any un-heated areas (attics, outside overhangs, un-conditioned basements, etc) will be protected using a dry system. Sprinkler heads will be either be recessed ceiling pendants or recessed side wall heads. Cover plates will be used to reduce the visual aspect of the sprinkler heads. The fire protection service will enter through the basement or designated mechanical space with either enough pressure from the central system or a small fire pump will be used to provide the building with the proper flow and pressure to provide an operational system. Outside of where the fire protection system enters the building there will be an alarm bell, fire department connection and sprinkler drain. The fire department connection will be located on the building towards the access road to give the fire department quick access to the system in case of a fire.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the single family housing by the central hot water heating plant. Domestic water cold and hot water re-circulation lines will be provided to ensure stagnation of water does not occur. Domestic water entering the building will be provided with a check valve and a water meter which will be connected to the campus building management system for the owner to be able to monitor water consumption at the building. A tempering valve will be provided in the mechanical room to provide the building with the correct temperature water at each fixture. The bathrooms in the space will be equipped with new, low- flow fixtures, with ADA accessible fixtures where required. Hose bibs and floor drains will be located in areas deemed necessary for ease of cleaning. Sanitary system for the building will combine underslab in one central location and then be distributed out to the main sanitary line.

3. HVAC Option #1 - Geothermal Heating & Cooling System

Local geothermal systems will be provided for each single family style residence. Each home will use 2-4 closed loop geothermal wells to reject and extract heat from the ground. Coupled with the geothermal loop will be an indoor ducted heat pump system which will provide conditioned air for both heating and cooling.

4. HVAC Option #2 - Split Heating & Cooling System

Conventional residential split heating and cooling systems will be provided for each condo style residence. Each condo will use an indirect gas fired 95% efficient air handler with outdoor split DX condenser. The system can be setback during extended periods of non-use to reduce energy consumption.

5. HVAC Control System

Each single family residence will be equipped with remove monitoring capabilities for maintenance staff to view and override setpoints for heating and cooling. In addition, an alarm will be provided to alert maintenance staff when the temperature of an unoccupied building falls into freezing range.

6. Electrical Service

A single phase, pad-mounted transformer will feed multiple houses. Transformer primaries will be connected to the campus medium voltage distribution loop.

7. Electrical Distribution

From the transformer secondary, feeders will be run underground (in conduit) to a wall mounted load center located on a backboard in each house’s basement. This load center will feed lighting, HVAC and receptacle loads located throughout the building. Convenience receptacles will be laid out throughout each house per residential code requirements.

8. **Emergency/Optional Standby Power**

The main campus service loop will be backed up via optional standby generators located at the power plant. As each of these buildings is connected to the service loop, the full load of each building will be carried by said generators in the event of a power failure.

9. **Lighting**

Each building will be outfitted with residential style LED lighting fixtures. Exact type and location will be coordinated with architectural requirements.

10. **Emergency Lighting**

These buildings are residential units and life safety lighting is not required.

11. **Telecommunication Services**

Analog telephone and cable TV cables for each building will be fed from the campus telecommunication distribution system, originating in the basement of Building #5. Cabling will terminate at enclosed punchdown blocks and amplifiers located in the basement of each house, adjacent to the powered load center.

Network accessibility will be accomplished via phone jacks located throughout each building. Horizontal analog cabling will be routed back to the building's telephone punchdown block.

12. **Security Systems**

A "portable" intrusion detection system will be provided for the campus to be used when the houses are unoccupied. This system will consist of a motion detector that will wirelessly report to the security gate in the event of a break-in.

The larger house (currently building #12) will be equipped with a standalone card access system located at the main entrance.

13. **Fire Alarm Systems**

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices and notification devices as required by applicable codes.

c. LEVITOW HEALTHCARE CENTER

Architectural

The existing Levitow Healthcare Center, Building 62, is the replacement for Building 5 the original hospital. The building houses 125 beds and was constructed in 2008.

When the original building was designed, there were an additional 2 residential wings that were eliminated early on in the design due to budget constraints. If these wings are designed and built, they would add another 125 beds. Similarly, due to the original budget constraints, the full-service kitchen was eliminated and replaced with the Warming Kitchen. All food preparation is currently performed in

Building 2, connected by a tunnel to Building 62. The new addition to the Levitow Healthcare Center would include a full functioning kitchen, providing redundancy should the kitchen in Building 2 be out-of-service for any reason.

According to Staff interview, these additional beds in the addition would be available for patients with mental and behavioral issues, such as Dementia, Schizophrenia or as a psychology unit. If any of these mental and behavioral issues are moved into the new addition, the wings will need to be specifically designed with security and safety of the patients, residents and staff. The Federal VA has also indicated a need for more hospital beds in the State to serve veterans, and this capacity could be utilized to fulfill that need. This would require further coordination between the State DVA and its Federal counterpart.

See sheet A.14 for full size Masterplan Drawing

Mechanical, Electrical, Plumbing and Fire Protection

The existing HVAC chiller has a damaged barrel and is only capable of operating at half cooling load. During hot days the building is unable to maintain both cooling and dehumidification of outside air. Therefore, the outside air ventilation system is occasionally turned off to maintain the space cooling system. Eliminating ventilation to the occupied spaces is considered a major issue as it’s required to be operating 24/7 by code. The damaged chiller should be repaired.

d. PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS

Structural

This residential apartment complex is located on the most northerly part of the campus. Constructed in 1945, these units were originally built to support on site medical staff. Today they support residents that need little daily support. The buildings are two stories plus basements that are used to support the units mechanical and electrical systems. These buildings are constructed using wood framed construction. It appears that the brick masonry on the exterior of the buildings is only a veneer. Viewing these buildings from the outside does not reveal any significant damage to the exterior brick masonry or the asphalt shingle roofing. Under most of the windows a faint white stain can be seen. This suggests possible moisture infiltration at the windows. Further investigation would be required. Not including the basement space these units represent a total area of approximately 24,500 square feet.

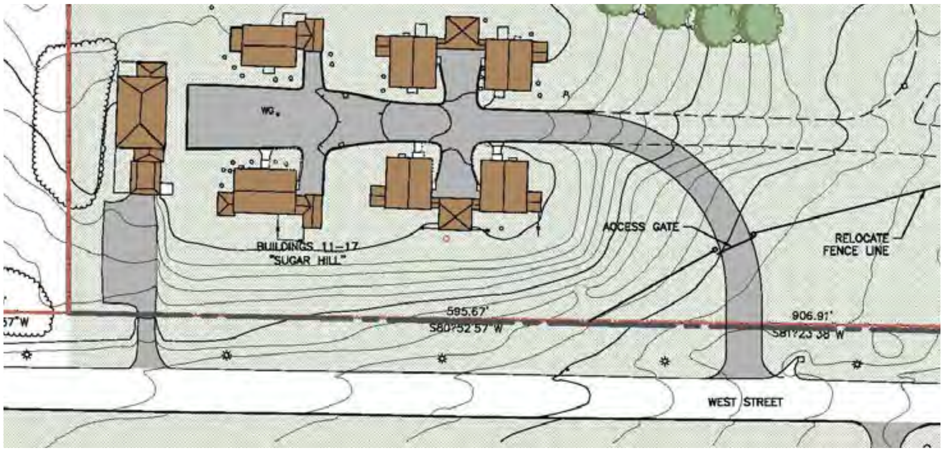

Southerly Face of Building #51


Northwesterly Corner of Building #51

Architectural

Building 51 was originally built in 1945. These apartment buildings originally housed the doctors from the hospital. The apartment house consists of 18 bedrooms in 6 apartments, along with single bedrooms with shared bathrooms totaling 16 bedrooms and 8 bathrooms on the east side of the STAR Housing. This building, in the North End of the main campus is proposed to be converted into overnight accommodations. This would allow Connecticut residents coming to the campus for treatment or services have the ability stay over rather than driving back home on the same day. Even though Connecticut is a relatively small state, there are some areas that are quite remote from the campus, and having the option to make the trip over two days would be a tangible benefit to segments of the Veteran population. The building needs a new roof, new energy efficient windows and doors, insulating exterior walls, envelope repair and Fair Housing accommodation upgrades.

Buildings 11-17 which are named “Sugar Hill” were built in 1938. These buildings are historically significant and will not have any exterior changes. These buildings were originally residences for the campus. These buildings should be renovated to be accessible for permanent supportive housing / overnight accommodations. Each of the buildings will also need new roofs, new energy efficient windows and doors, and brick repairs.



See sheet A.16 for full size Masterplan Drawing

See sheet A.15 for full size Masterplan Drawing

<u>Mechanical, Electrical, Plumbing and Fire Protection</u>

1. Fire Protection Service

The entire building will be protected by a NFPA 13 sprinkler system to ensure that the entire building is sprinkled. A wet sprinkler system will serve all of the heated spaces while any un-heated areas (attics, outside overhangs, un-conditioned basements, etc) will be protected using a dry system. Sprinkler heads will be either be recessed ceiling pendants or recessed side wall heads. Cover plates will be used to reduce the visual aspect of the sprinkler heads. Depending on the height of the building, standpipes will be installed in stairwells with fire department connections. The fire protection service will enter through the basement or designated mechanical space with either enough pressure from the central system or a small fire pump will be used to provide the building with the proper flow and pressure to provide an operational system. Outside of where the fire protection system enters the building there will be an alarm bell, fire department connection and sprinkler drain. The fire department connection will be located on the building towards the access road to give the fire department quick access to the system in case of a fire.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the overnight accommodation style housing by the central hot water heating plant. Domestic water cold and hot water re-circulation lines will be provided to ensure stagnation of water does not occur. Domestic water entering the building will be provided with a check valve and a water meter which will be connected to the campus building management system for the owner to be able to monitor water consumption at the building. A tempering valve will be provided in the mechanical room to provide the building with the correct temperature water at each fixture. The bathrooms in the space will be equipped with new, low- flow fixtures, with ADA accessible fixtures where required. Hose bibs and floor drains will be located in areas deemed necessary for ease of cleaning. Sanitary system for the building will combine underslab in one central location and then be distributed out to the main sanitary line.

3. HVAC Option #1 - Geothermal Heating & Cooling System

Local geothermal systems will be provided for each single family style residence. Each home will use 2-4 closed loop geothermal wells to reject and extract heat from the ground. Coupled with the geothermal loop will be an indoor ducted heat pump system which will provide conditioned air for both heating and cooling.

4. HVAC Option #2 - Split Heating & Cooling System

Conventional residential split heating and cooling systems will be provided for each condo style residence. Each condo will use an indirect gas fired 95% efficient air handler with outdoor split DX condenser. The system can be setback during extended periods of non-use to reduce energy consumption.

5. Electrical Service

The overnight housing unit will be powered via two pad-mounted, three phase transformers located outside the building. The transformers will be connected to the campus normal and emergency power distribution.

6. Electrical Distribution

From the transformer secondaries, feeders will be run underground (in conduit) to the building’s main electrical room. Normal power will directly feed a normal distribution switchboard. A dedicated breaker in this switchboard will feed the normal side of an automatic transfer switch located in the building, with the emergency side being fed directly from the emergency transformer. Emergency power for the building will run from the load side of the transfer switch to a separate distribution switchboard. Each switchboard will feed various branch panels located throughout the building. Convenience receptacles will be located based on furniture layouts and other basic requirements.

Dedicated branch panels will be provided for commercial HVAC units, and larger units will be powered directly from the main (normal power) switchboard.

7. **Emergency/Optional Standby Power**

The two main services to the building will be backed up via generators located at the campus power plant. One service will be dedicated for life safety systems and the other will provide optional standby power to the remainder of the building.

8. **Lighting**

The building will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility spaces, wall mounted fixtures will be provided in stairwells, and architectural fixtures will be provided in specialty areas requiring accent lighting.

9. **Emergency Lighting**

Fixtures in corridors, stairwells and other paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

10. **Telecommunication Services**

This building will be fed from the campus fiber distribution system, originating in the basement of Building #5. New single mode fiber optic cabling will be run in existing underground pathways to patch panels located in the building's main IT room. All required copper telephone cabling will be routed alongside fiber in existing pathways and will terminate at punchdown blocks on the wall of the main IT room. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner's representatives at time of design.

Network accessibility will be accomplished via wall jacks and wireless access points located throughout the building. Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

11. **Security Systems**

Video surveillance will be accomplished via exterior cameras only. Cameras will be strategically located throughout the site to provide coverage of all building entrances, parking lots and walkways. Building interiors will not be equipped with cameras due to privacy concerns. All cameras will be IP and connected to the campus network.

An access control system will be provided in this building. Card readers will be provided at each building entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. Additionally, access to each individual living space will be controlled via card reader. All card readers will be tied into system nodes located in each building's IT room. Nodes will be networked together to provide system monitoring from security locations throughout the campus.

An intrusion detection system will not be provided in this building, as it is manned 24/7.

A nurse call system will be provided in this building. This system will allow staff to report to individual living spaces in the event of a medical emergency.

12. **Fire Alarm Systems**

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices (i.e. smoke detectors, manual pull stations, monitoring modules) and notification devices (i.e. speakers, strobes, elevator tie-ins) as required by applicable codes.

e. <u>RESIDENT NEEDS AND WANTS</u>

<u>Architectural</u>

The existing amenity spaces in Buildings 3 and 4 include recreation rooms, day rooms and open porches. There is one washer and one dryer located in each of the large community bathrooms. Many of these spaces are located in the basement of Building 2, and while there are some windows, the spaces are generally dark and uninviting. The residents will have a full service laundry room located within each of the domiciliary housing units. Additionally, club rooms and multi-purpose spaces would enhance the living environment for all residents. In fact, some of these spaces could have appeal beyond the borders of the campus, bringing Veterans living off-site to the campus for their recreational, occupational, counselling and supportive needs.

Cable and internet are large sources of entertainment for the residents and should be provided in areas throughout the campus.

With the creation of a "Pedestrian Only" zone in the central part of the Campus, exterior spaces would be created to provide a series of outdoor living spaces. Some of these spaces would be covered table shelters, exterior basketball, tennis and baseball spaces, walking trails, exterior fitness center, and designated smoking areas.

f. <u>ASSISTED LIVING HOUSING (Built, maintained and sustained by others – no use of State funds to build nor operate this facility)</u>

<u>Architectural</u>

Dedicated Assisted Living Housing would be a new housing type added to the Rocky Hill campus. Currently Wings A and B in the Doms are being used as a *de facto* assisted living accommodations without being called an assisted living facility. According to the Demographic Survey located elsewhere in this report, and with Staff interviews, there is a large need for assisted living housing and services to be provided on the campus. The population within the Doms right now has 66% of the population over the age of 60 and 5% of that number is over 80. With these numbers on the rise, a dedicated assisted living facility is required. These veterans need help with their Activities of Daily Living (ADL).

Chapter B.5
Community

FINAL REPORT

Date: May 9, 2016

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APPLICABLE CODES AND STANDARDS

All building systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

a. RECREATION SPACES

Architectural

The exterior recreational spaces will be relocated to the center of the site. The existing basketball and tennis courts will be relocated to the center of the future housing development. We are also proposing an exterior fitness center along the walking trails.

An area devoted to gardening is desired by the current residents. They would like to be able to grow their own fruits and vegetables. This is a great way to encourage healthy eating habits.

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service
There will be no fire protection services for the outside recreation spaces.

2. Plumbing Water Service
Domestic water outside yard hydrant will be provided for potable drinking water source for the outside recreation spaces.

3. HVAC
No HVAC services will be provided for outdoor recreation spaces.

4. Electrical Service
Recreation areas will be fed from dedicated exterior pad-mounted transformers (one per site). Transformer primaries will be connected to the campus normal power distribution loop.

5. Electrical Distribution
From the transformer secondaries, feeders will be run underground (in conduit) to a main disconnect switch and panelboard located in an exterior rated enclosure on site. This panel will feed lighting, receptacle and other loads required for the recreational space.

6. Emergency/Optional Standby Power

The main service will be backed up via generators located at the campus power plant. Generators will provide optional standby power to the site.

7. Lighting

Pole mounted LED site lighting will be provided in all recreational areas commonly used at night. In areas not used at night, no lighting will be provided.

8. Emergency Lighting

No emergency lighting will be provided in outdoor recreational areas.

9. Telecommunication Services

No dedicated telecommunication services will be provided for outdoor recreational areas. Any required network drops for press boxes, telephones, etc. will be fed from the closest building's IT room via underground conduits.

10. Security Systems

Video surveillance will be accomplished via exterior cameras only. Cameras will be strategically located throughout the site to provide coverage of all exterior public areas. All cameras will be IP and connected to the campus network via the closest building's IT room (cables will be run underground in conduit).

11. Fire Alarm Systems

No fire alarm system will be provided for outdoor recreational areas.

b. ADMINISTRATION

Architectural

Building 1 was originally built in 1935. There have been no additions made to Building 1, however an elevator was installed to provide ADA access. Unfortunately this elevator fails to comply with current regulations and its location is not readily apparent to visitors to this building. The administration function in this building is to remain. The building will need to be reconfigured to provide ADA access from the main entrance, along with reconfiguring the office spaces and provide an accessible route to all primary function areas of the building. The toilet rooms will need to comply with ADA regulations, along with providing new energy efficient windows and doors, brick repair, and a new roof.

Building 9 was originally built in 1938. The building has not received any additions. The building now houses an assembly hall, chapel, conference rooms and the cemetery services office. These functions will remain in this building and will need to be renovated. An addition to the north would incorporate terraces and platforms relating to the courtyard, and would be available for use in various commemorative gatherings and events

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service

Administrative spaces will be protected by a NFPA 13 light hazard sprinkler system. The sprinkler heads will be concealed.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the administrative spaces by the buildings domestic water distribution system from the central hot water heating plant.

3. HVAC Ventilation

Ventilation will be provided to each space using dedicated outside air (DOA) units. Several DOA units will be located in the roof where outside air and exhaust air will be exchanged thru an energy recovery wheel. Outside air from the DOA will be ducted downstairs into each space, while exhaust air from bathrooms will be ducted into the DOA unit for removal.

4. HVAC Terminal Devices

Active chilled beams and/or fan coil units will be provided for cooling of the public spaces. Units will be located within the ceiling grid and will provide cooling and ventilation to each individual office area. Windows for rooms with chilled beams will be fixed (non-operable) to prevent condensation at the beam. Perimeter finned tube heating will be provided for additional heat at the exposures.

5. HVAC Control System

A central Building Management System (BMS) will be provided for each building. The BMS will monitor and control all items within the mechanical systems of the buildings and will also tie into the campus BMS system for remote interface. Where possible, occupancy sensors will be provided for system setback during periods of non-use.

6. Electrical Service

Two pad-mounted, three phase exterior transformers will feed all administrative buildings. The transformers will be connected to the campus normal and emergency power distribution loops.

7. Electrical Distribution

From the transformer secondaries, feeders will be run underground (in conduit) to each building’s main electrical room. Normal power will directly feed a normal distribution switchboard. A dedicated breaker in this switchboard will feed the normal side of an automatic transfer switch located in the respective building, with the emergency side being fed directly from the emergency transformer. Emergency power for each building will run from the load side of the transfer switch to a separate distribution switchboard. Each switchboard will feed various branch panels located throughout the respective building. Convenience receptacles will be located based on furniture layouts and other basic requirements.

Dedicated branch panels will be provided for commercial HVAC units, and larger units will be powered directly from the corresponding building’s main (normal power) switchboard.

8. Emergency/Optional Standby Power

The two main services will be backed up via generators located at the campus power plant. One service will be dedicated for life safety systems and the other will provide optional standby power to the remainder of each building’s load.

9. Lighting

Buildings will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility spaces, wall mounted fixtures will be provided in stairwells, and architectural fixtures will be provided in specialty areas requiring accent lighting.

10. Emergency Lighting

Fixtures in corridors, stairwells and other paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

11. Telecommunication Services

Administrative buildings will be fed from the campus fiber distribution system, originating in the basement of Building #5. New single mode fiber optic cabling will be run in existing underground pathways to patch panels located in the each building’s main IT room. All required copper telephone cabling will be routed alongside fiber in existing pathways and will terminate at punchdown blocks on the wall of the main IT room. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner’s representatives at time of design.

Network accessibility within each building will be accomplished via wall jacks and wireless access points. Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

12. Security Systems

Video surveillance will be accomplished via exterior cameras only. Cameras will be strategically located throughout the site to provide coverage of all building entrances, parking lots and walkways. Additionally, each building entrance will be equipped with a short-range camera. Building interiors will not be equipped with cameras.. All cameras will be IP and connected to the campus network.

An access control system will be provided in these buildings. Card readers will be provided at each building entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. All card readers will be tied into system nodes located in each building’s IT room. Nodes will be networked together to provide system monitoring from security locations throughout the campus.

An intrusion detection system will be provided in these buildings. Magnetic door contacts and ceiling-mounted motion sensors will act as building burglar alarms when the building is unoccupied and armed. A keypad will be located at each main building entrance, allowing staff to arm and disarm the system.

13. Fire Alarm Systems

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices (i.e. smoke detectors, manual pull stations, monitoring modules) and notification devices (i.e. speakers, strobes, elevator tie-ins) as required by applicable codes.

c. B CLINIC

Architectural

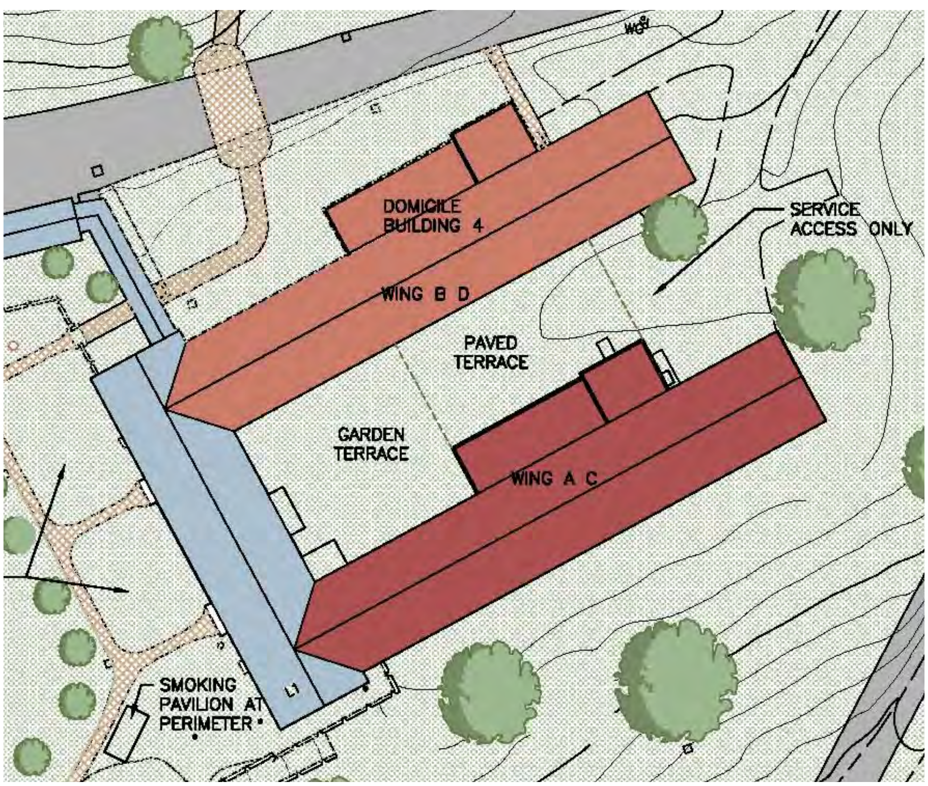
The existing B Clinic is located in Building 4 and is proposed to remain there.

Buildings 3 and 4, Domiciles, were built in 1936 and are part of the historic commission listing. The original design, which still exists, is configured into barrack-like sleeping quarters with 12 beds in each room, with a shared gang toilet area to the north, across the corridor. These buildings are currently the main residential facility on the site. The buildings technically have a capacity of 336 residents, based upon the barracks model. Currently the Doms are set up to hold 20 women in wing E, wing B is a clinic, and the rest of the wings are occupied by men. There is an existing courtyard between each wing of the two domiciles that have become parking courts. The residents have started to take back some of these spaces by adding picnic tables and benches to be able to sit outside of the domiciles.

Building 4 wing B will remain in the same area but will be reconfigured. The clinic now does not have enough space. The existing spaces will be reconfigured to optimize efficiency and accommodate the office and exam spaces needed.

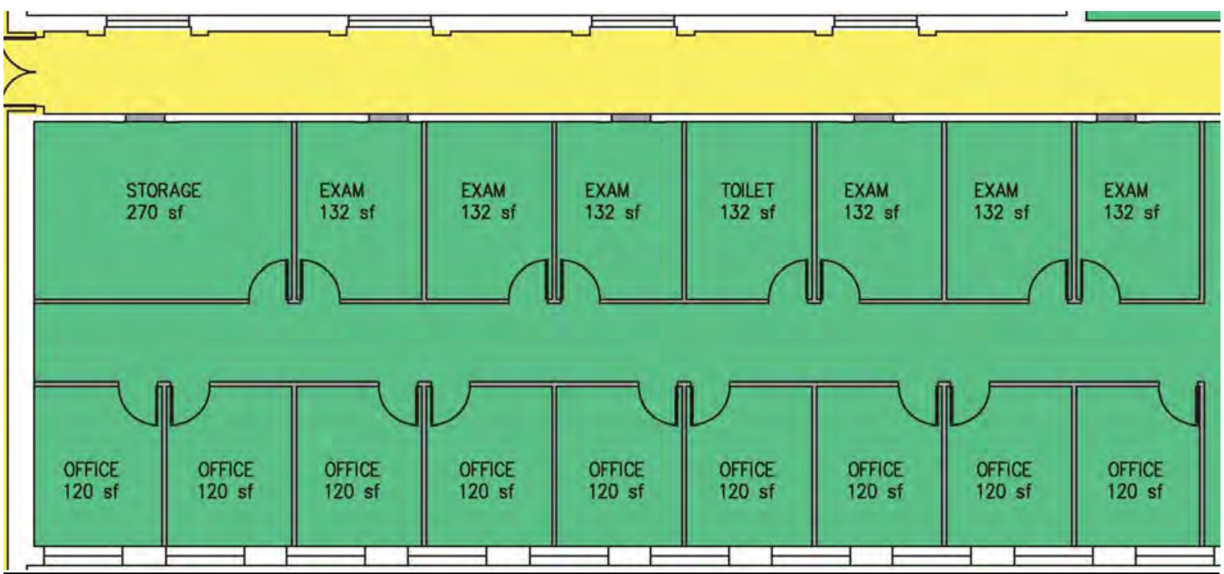
An ADA study was completed in June 2015 by Geddis Architects. This study includes new signage, updating stair handrails with extensions, water fountains, mirrors and grab bars in toilet rooms, new doors with lever handles, exit devices and automatic openers, and a new ramp to the exterior on Buildings 3 & 4.

Other improvements that will have to be made to Building 4, are all of the ADA requirements above, new energy efficient windows, insulating exterior walls, and exterior brick repair. A new roof was put on a few years ago and will remain.



See sheet A.13 for full size Masterplan Drawing

See sheet A.24 for full size Building 4 First Floor Plan



<u>B Clinic – One Half of Floor Plan</u>
9 Offices – 18 Total
6 Exam Rooms – 12 Total
1 Storage Rooms – 2 Total
1 Private Toilet Rooms – 2 Total

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service
B-Clinic spaces will be protected by a NFPA 13 light hazard sprinkler system. The sprinkler heads will be concealed.

2. Plumbing Water Service
Domestic cold and hot water will be provided to the B-Clinic by the buildings domestic water distribution system from the central hot water heating plant.

3. HVAC Ventilation
Ventilation will be provided to each space using dedicated outside air (DOA) units. Several DOA units will be located in the roof where outside air and exhaust air will be exchanged thru an energy recovery wheel. Outside air from the DOA will be ducted downstairs into each space, while exhaust air from bathrooms will be ducted into the DOA unit for removal.

4. HVAC Terminal Devices
Four-pipe fan coil units will be provided for cooling of the B-Clinic. Units will be located within the ceiling grid and will provide cooling and ventilation to each individual exam area. All code required ventilation rates for outpatient areas will be met. Perimeter finned tube heating will be provided for additional heat at the exposures.

5. HVAC Control System
A central Building Management System (BMS) will be provided for each building. The BMS will monitor and control all items within the mechanical systems of the buildings and will also tie into the campus BMS system for remote interface. Where possible, occupancy sensors will be provided for system setback during periods of non-use.

6. Electrical Service
B-Clinic will be fed from the normal and emergency switchboards located in the main electrical room.

7. Electrical Distribution
Each switchboard will feed various branch panels located throughout this wing of the building. Convenience receptacles will be located based on furniture layouts and other basic requirements.

Dedicated branch panels will be provided for commercial HVAC units, and larger units will be powered directly from the main (normal power) switchboard.

8. Emergency/Optional Standby Power

The two main services to the building will be backed up via generators located at the campus power plant. One service will be dedicated for life safety systems and the other will provide optional standby power to the remainder of the building.

9. Lighting

The building will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility spaces, wall mounted fixtures will be provided in stairwells, and architectural fixtures will be provided in specialty areas requiring accent lighting.

10. Emergency Lighting

Fixtures in corridors, stairwells and other paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

11. Telecommunication Services

This building will be fed from the campus fiber distribution system, originating in the basement of Building #5. New single mode fiber optic cabling will be run in existing underground pathways to patch panels located in the building's main IT room. All required copper telephone cabling will be routed alongside fiber in existing pathways and will terminate at punchdown blocks on the wall of the main IT room. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner's representatives at time of design.

Network accessibility within the building will be accomplished via wall jacks and wireless access points. Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

12. Security Systems

Video surveillance will be accomplished via exterior cameras.. Cameras will be strategically located throughout the site to provide coverage of all building entrances, parking lots and walkways. Cameras will also be located in pharmacies and other high-priority areas. Full corridor coverage will not be provided. All cameras will be IP and connected to the campus network.

An access control system will be provided in this building. Card readers will be provided at each building entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. Additionally, card readers will be located in pharmacies and other high-priority areas. All card readers will be tied into system nodes located in the building's main IT room. Nodes will be networked together to provide system monitoring from security locations throughout the campus.

An intrusion detection system will not be provided in this building, as it is manned 24/7.

13. Fire Alarm Systems

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices (i.e. smoke detectors, manual pull stations, monitoring modules) and notification devices (i.e. speakers, strobes, elevator tie-ins) as required by applicable codes.

d. <u>ESGR DAYCARE</u>

<u>Architectural</u>

Building 18 was built in 1994 and was used as a daycare for the staff and residents of the VA Campus. It is currently unoccupied. This building still appears to be in good shape and could be reused as a day care for children or possibly be converted into an adult day care. In either case, review of current codes and regulations would need to be undertaken prior to any design or repurposing.

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service

Daycare spaces will be protected by a NFPA 13 light hazard sprinkler system. The sprinkler heads will be concealed.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the daycare spaces by the buildings domestic water distribution system from the central hot water heating plant.

3. HVAC Ventilation

Ventilation will be provided to each space using dedicated outside air (DOA) units. Several DOA units will be located in the roof where outside air and exhaust air will be exchanged thru an energy recovery wheel. Outside air from the DOA will be ducted downstairs into each space, while exhaust air from bathrooms will be ducted into the DOA unit for removal.

4. HVAC Terminal Devices

Active chilled beams and/or fan coil units will be provided for cooling of the public spaces. Units will be located within the ceiling grid and will provide cooling and ventilation to each individual office area. Windows for rooms with chilled beams will be fixed (non-operable) to prevent condensation at the beam. Perimeter finned tube heating will be provided for additional heat at the exposures.

5. HVAC Control System

A central Building Management System (BMS) will be provided for each building. The BMS will monitor and control all items within the mechanical systems of the buildings and will also tie into the campus BMS system for remote interface. Where possible, occupancy sensors will be provided for system setback during periods of non-use.

6. Electrical Service

Two pad-mounted, three phase exterior transformers will feed all administrative buildings. The transformers will be connected to the campus normal and emergency power distribution loops.

7. Electrical Distribution

From the transformer secondaries, feeders will be run underground (in conduit) to each building’s main electrical room. Normal power will directly feed a normal distribution switchboard. A dedicated breaker in this switchboard will feed the normal side of an automatic transfer switch located in the respective building, with the emergency side being fed directly from the emergency transformer. Emergency power for each building will run from the load side of the transfer switch to a separate distribution switchboard. Each switchboard will feed various branch panels located throughout the respective building. Convenience receptacles will be located based on furniture layouts and other basic requirements.

Dedicated branch panels will be provided for commercial HVAC units, and larger units will be powered directly from the corresponding building’s main (normal power) switchboard.

8. Emergency/Optional Standby Power

The two main services will be backed up via generators located at the campus power plant. One service will be dedicated for life safety systems and the other will provide optional standby power to the remainder of each building’s load.

9. Lighting

Buildings will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility spaces, wall mounted fixtures will be provided in stairwells, and architectural fixtures will be provided in specialty areas requiring accent lighting.

10. Emergency Lighting

Fixtures in corridors, stairwells and other paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

11. Telecommunication Services

Daycare buildings will be fed from the campus fiber distribution system, originating in the basement of Building #5. New single mode fiber optic cabling will be run in existing underground pathways to patch panels located in the each building's main IT room. All required copper telephone cabling will be routed alongside fiber in existing pathways and will terminate at punchdown blocks on the wall of the main IT room. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner's representatives at time of design.

Network accessibility within each building will be accomplished via wall jacks and wireless access points. Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

12. Security Systems

Video surveillance will be accomplished via exterior cameras only. Cameras will be strategically located throughout the site to provide coverage of all building entrances, parking lots and walkways. Additionally, each building entrance will be equipped with a short-range camera. Building interiors will not be equipped with cameras.. All cameras will be IP and connected to the campus network.

An access control system will be provided in these buildings. Card readers will be provided at each building entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. All card readers will be tied into system nodes located in each building's IT room. Nodes will be networked together to provide system monitoring from security locations throughout the campus.

An intrusion detection system will be provided in these buildings. Magnetic door contacts and ceiling-mounted motion sensors will act as building burglar alarms when the building is unoccupied and armed. A keypad will be located at each main building entrance, allowing staff to arm and disarm the system.

13. Fire Alarm Systems

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices (i.e. smoke detectors, manual pull stations, monitoring modules) and notification devices (i.e. speakers, strobes, elevator tie-ins) as required by applicable codes.

e. AMENITIES

Architectural

Some of the types of amenity spaces currently lacking or in need of renovation include the following:

- Laundry
- Barber shop
- Convenience store
- Deli
- Gym
- Swimming Pool
- Pool hall
- Tennis/basketball courts
- Baseball field
- Library
- Juice bar
- More weight rooms
- Wi-Fi needs to be site wide
- ATM on campus
- Visitor meeting spaces
- Child care services and playground
- Park type pavilions
- Club/Activity Rooms
- Repair Garage
- Maker Space
- Pedestrian trails

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service

Amenity spaces will be protected by a NFPA 13 light hazard sprinkler system. The sprinkler heads will be concealed.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the amenity spaces by the buildings domestic water distribution system from the central hot water heating plant.

3. HVAC Ventilation

Ventilation will be provided to each space using dedicated outside air (DOA) units. Several DOA units will be located in the roof where outside air and exhaust air will be exchanged thru an energy recovery wheel. Outside air from the DOA will be ducted downstairs into each space, while exhaust air from bathrooms will be ducted into the DOA unit for removal.

4. HVAC Terminal Devices

Active chilled beams and/or fan coil units will be provided for cooling of the public spaces. Units will be located within the ceiling grid and will provide cooling and ventilation to each individual office area. Windows for rooms with chilled beams will be fixed (non-operable) to prevent condensation at the beam. Perimeter finned tube heating will be provided for additional heat at the exposures.

5. HVAC Control System

A central Building Management System (BMS) will be provided for each building. The BMS will monitor and control all items within the mechanical systems of the buildings and will also tie into the campus BMS system for remote interface. Where possible, occupancy sensors will be provided for system setback during periods of non-use.

6. Electrical Service

Two pad-mounted, three phase exterior transformers will feed all administrative buildings. The transformers will be connected to the campus normal and emergency power distribution loops.

7. Electrical Distribution

From the transformer secondaries, feeders will be run underground (in conduit) to each building’s main electrical room. Normal power will directly feed a normal distribution switchboard. A dedicated breaker in this switchboard will feed the normal side of an automatic transfer switch located in the respective building, with the emergency side being fed directly from the emergency transformer. Emergency power for each building will run from the load side of the transfer switch to a separate distribution switchboard. Each switchboard will feed various branch panels located throughout the respective building. Convenience receptacles will be located based on furniture layouts and other basic requirements.

Dedicated branch panels will be provided for commercial HVAC units, and larger units will be powered directly from the corresponding building’s main (normal power) switchboard.

8. Emergency/Optional Standby Power

The two main services will be backed up via generators located at the campus power plant. One service will be dedicated for life safety systems and the other will provide optional standby power to the remainder of each building’s load.

9. Lighting

Buildings will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility spaces, wall mounted fixtures will be provided in stairwells, and architectural fixtures will be provided in specialty areas requiring accent lighting.

10. Emergency Lighting

Fixtures in corridors, stairwells and other paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

11. Telecommunication Services

Amenity buildings will be fed from the campus fiber distribution system, originating in the basement of Building #5. New single mode fiber optic cabling will be run in existing underground pathways to patch panels located in the each building's main IT room. All required copper telephone cabling will be routed alongside fiber in existing pathways and will terminate at punchdown blocks on the wall of the main IT room. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner's representatives at time of design.

Network accessibility within each building will be accomplished via wall jacks and wireless access points. Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

12. Security Systems

Video surveillance will be accomplished via exterior cameras only. Cameras will be strategically located throughout the site to provide coverage of all building entrances, parking lots and walkways. Additionally, each building entrance will be equipped with a short-range camera. Building interiors will not be equipped with cameras. All cameras will be IP and connected to the campus network.

An access control system will be provided in these buildings. Card readers will be provided at each building entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. All card readers will be tied into system nodes located in each building's IT room. Nodes will be networked together to provide system monitoring from security locations throughout the campus.

An intrusion detection system will be provided in these buildings. Magnetic door contacts and ceiling-mounted motion sensors will act as building burglar alarms when the building is unoccupied and armed. A keypad will be located at each main building entrance, allowing staff to arm and disarm the system.

13. Fire Alarm Systems

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices (i.e. smoke detectors, manual pull stations, monitoring modules) and notification devices (i.e. speakers, strobes, elevator tie-ins) as required by applicable codes.

f. <u>CENTER FOR EXCELLENCE (Built By Others)</u>

This new facility is transformative in future Veteran service delivery by hosting multiple service organizations' critical functions focused on enabling the veteran community as a whole becoming more adaptive, agile and applicable to tomorrow's challenges in the workplace and at home. This facility built by others will specifically function as a multipurpose center containing partners serving Veterans and their families at Federal, State and other levels/

The new Veterans' Center for Excellence will house:

- A multipurpose physical fitness center – Internal/External

- Multipurpose classrooms – Distance learning, simulation, meetings
- Veterans Service Offices and Assistance Units – State, Federal, NFP
- Veterans Community Center – Temporary Quarters
- Medicine and Physical Rehabilitative Suites
- A walking museum throughout focusing on:
    - CT's Veterans' contributions to our Nation and State
    - CT's State Veterans' Home history and services to Veterans
- Partners serving Veterans and their families at State and Federal level:
    - State Departments i.e. Education, Mental Health, Housing and Labor
    - Federal Departments i.e. Education, Veterans

Chapter B.6
Foodservice

FINAL REPORT

Date: May 9, 2016

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APPLICABLE CODES AND STANDARDS

All building systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

1. 2005 Connecticut State Building Code with 2009 supplements
2. 2005 Connecticut State Fire Safety Code with 2009 supplements
3. 2003 International Building Code (IBC)
4. 2003 International Plumbing Code (IPC)
5. 2003 International Mechanical Code (IMC)
6. 2009 International Energy Conservation Code (IECC)
7. NFPA, All Latest Adopted Versions
8. ASHRAE 90.1
9. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

a. BUILDING 2 - COMMISSARY

Architectural

Building 2 is the existing commissary. The building itself is in fair condition. The functions within the four-story building are offices, food service and assembly space. The food service is the only kitchen on the entire Rocky Hill campus. There is no redundancy of this function, so the space needs to remain functional during any type of renovation on this building. The existing building was built in 1938 and is on the State's historic register. The building at this time does not meet current ADA requirements

An ADA study was completed in June 2015 by Geddis Architects. This study includes signage, updating stair handrails with extensions, water fountains, updating doors with lever handles, exit devices, audible signals and tactile information on the interior of the elevator cab, renovate toilet rooms, and reconfiguring existing interior ramps with a new wheelchair lift and enclosure. The cost of these improvements are $861,465.

The existing dining area needs to be renovated. The aesthetics are more of a mess hall while the VA would like this area to have more of a restaurant feel. This area is also used for bingo, and consideration should be given to sub-divide this large space into more intimate, discreet multi-purpose rooms, dining rooms possibly craft and games rooms as well.

The existing building does not have a sprinkler system and the VA is in the process of obtaining a grant to do this work.

The security office is now located in this building and is to remain. A stand-alone building that will house all of their closed circuit television monitors, along with office space for police officers to conduct interviews and paperwork, would be located in a new gatehouse. See Chapter B.2 above for further discussion of this topic

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service

The entire building will be protected by a NFPA 13 sprinkler system to ensure that the entire building is sprinkled. A wet sprinkler system will serve all of the heated spaces while any un-heated areas (attics, outside overhangs, un-conditioned basements, etc) will be protected using a dry system. Sprinkler heads will be either be recessed ceiling pendants or recessed side wall heads. Cover plates will be used to reduce the visual aspect of the sprinkler heads. Sprinkler heads in the kitchen area will be of the high- temperature classification. An Ansul fire protection system will be provided for the kitchen hood system, with appropriate emergency shut off buttons placed throughout the kitchen. The fire protection service will enter through the basement or designated mechanical space with either enough pressure from the central system or a small fire pump will be used to provide the building with the proper flow and pressure to provide an operational system. Outside of where the fire protection system enters the building there will be an alarm bell, fire department connection and sprinkler drain. The fire department connection will be located on the building towards the access road to give the fire department quick access to the system in case of a fire.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the commissary by the central hot water heating plant. Domestic water cold and hot water re-circulation lines will be provided to ensure stagnation of water does not occur. Domestic water entering the building will be provided with a check valve and a water meter which will be connected to the campus building management system for the owner to be able to monitor water consumption at the building. Two tempering valves will be provided in the mechanical room to provide 120°F and 140°F to the kitchen equipment. New grease traps will be installed with point of use grease interceptors installed under wash service sinks to extend the life of the grease traps. Hose bibs and floor drains will be installed throughout the kitchen for ease of cleaning.

3. **HVAC Kitchen Exhaust Air**

The existing kitchen exhaust system is a constant volume system without adequate means for makeup air. Significant reconfiguration is recommended as follows:

Stainless steel kitchen hoods will be provided for each cooking and dishwashing area producing vapors or smoke. Fire rated duct systems (welded or manufactured) will be used to exhaust hoods via roof mounted fans. Kitchen exhaust fans will be used to discharge grease and vapor laden air from the building. Kitchen exhaust fans will be controlled by a cooking detection system which will modulate and activate/deactivate fans during periods of non-use. Significant energy savings will be realized by using a variable flow kitchen exhaust system.

4. **HVAC Kitchen Makeup Air**

Dedicated makeup air units will be provided to supplement kitchen exhaust and maintain overall kitchen space pressure to a slightly negative level. The makeup air units will modulate airflow to track hood exhaust flow as needed. Gas fired heating and DX cooling will be provided for tempering of makeup air.

5. Electrical Service

The proposed commissary will be powered via two pad-mounted, three phase transformers located outside the building. The transformers will be connected to the campus normal and emergency power distribution.

6. Electrical Distribution

From the transformer secondaries, feeders will be run underground (in conduit) to the building’s main electrical room. Normal power will directly feed a normal distribution switchboard. A dedicated breaker in this switchboard will feed the normal side of an automatic transfer switch located in the building, with the emergency side being fed directly from the emergency transformer. Emergency power for the building will run from the load side of the transfer switch to a separate distribution switchboard. Each switchboard will feed various branch panels located throughout the building. Convenience receptacles will be located based on furniture layouts and other basic requirements.

Dedicated branch panels will be provided for commercial HVAC units, and larger units will be powered directly from the main (normal power) switchboard. Dedicated branch panels will also be provided for each commercial kitchen.

Currently, the two proposed transitional housing wings are powered via a centralized switchgear in the commissary. Although the existing equipment will need to be replaced, this system would be a viable and potentially cost-saving option.

7. **Emergency/Optional Standby Power**

The two main services to the building will be backed up via generators located at the campus power plant. One service will be dedicated for life safety systems and the other will provide optional standby power to the remainder of the building.

8. **Lighting**

The building will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility spaces, wall mounted fixtures will be provided in stairwells, and architectural fixtures will be provided in specialty areas requiring accent lighting. In large assembly areas, high-bay pendant LED fixtures will be provided.

9. **Emergency Lighting**

Fixtures in corridors, stairwells and other paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

10. **Telecommunication Services**

The building will be fed from the campus fiber distribution system, originating in the basement of Building #5. New single mode fiber optic cabling will be run in existing underground pathways to patch panels located in the building’s main IT room. All required copper telephone cabling will be routed alongside fiber in existing pathways and will terminate at punchdown blocks on the wall of the main IT room. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner’s representatives at time of design.

Network accessibility within the building will be accomplished via wall jacks and wireless access points. Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

11. **Security Systems**

Video surveillance will be accomplished via exterior cameras. Cameras will be strategically located throughout the site to provide coverage of all building entrances, parking lots and walkways. Building interiors will be equipped with cameras in areas of assembly only (i.e. dining halls). Full corridor coverage will not be provided. All cameras will be IP and connected to the campus network.

An access control system will be provided in this building. Card readers will be provided at each building entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. Additionally, card readers will be provided at the entrances to the transitional/women's housing wings. All card readers will be tied into system nodes located in the building's main IT room. Nodes will be networked together to provide system monitoring from security locations throughout the campus.

An intrusion detection system will not be provided in this building, as it is manned 24/7.

12. **Fire Alarm Systems**

The existing fire alarm system for each building is currently in the process of being upgraded as part of a campus-wide infrastructure renovation. Expansion to this system will be provided as required to accommodate any new building additions in this project. In general, buildings will be provided with initiation devices (i.e. smoke detectors, manual pull stations, monitoring modules) and notification devices (i.e. speakers, strobes, elevator tie-ins) as required by applicable codes.

b. LEVITOW HEALTHCARE CENTER

Architectural

The existing Levitow Healthcare Center is to remain. The building houses 125 beds.

When the original building was designed, there were additional wings considered but not constructed as described above. If these wings are designed and built, they would be able to hold another 125 beds and should include a full functioning kitchen to replace the existing warming kitchen. There needs to be a redundancy of kitchens since Building 2 is the only kitchen on campus, and if that kitchen goes off-line, the whole campus has no food service capabilities.

Mechanical, Electrical, Plumbing and Fire Protection

1. Fire Protection Service

The entire building will be protected by a NFPA 13 sprinkler system to ensure that the entire building is sprinkled. A wet sprinkler system will serve all of the heated spaces while any un-heated areas (attics, outside overhangs, un-conditioned basements, etc) will be protected using a dry system. Sprinkler heads will be either be recessed ceiling pendants or recessed side wall heads. Cover plates will be used to reduce the visual aspect of the sprinkler heads. Sprinkler heads in the kitchen area will be of the high- temperature classification. An Ansul fire protection system will be provided for the kitchen hood system, with appropriate emergency shut off buttons placed throughout the kitchen. The fire protection service will enter through the basement or designated mechanical space with either enough pressure from the central system or a small fire pump will be used to provide the building with the proper flow and pressure to provide an operational system. Outside of where the fire protection system enters the building there will be an alarm bell, fire department connection and sprinkler drain. The fire department connection will be located on the building towards the access road to give the fire department quick access to the system in case of a fire.

2. Plumbing Water Service

Domestic cold and hot water will be provided to the Levitow Healthcare Center by the central hot water heating plant. Domestic water cold and hot water re-circulation lines will be provided to ensure stagnation of water does not occur. Domestic water entering the building will be provided with a check valve and a water meter which will be connected to the campus building management system for the owner to be able to monitor water consumption at the building. Two tempering valves will be provided in the mechanical room to provide 120°F and 140°F to the kitchen equipment. New grease traps will be installed with point of use grease interceptors installed under wash service sinks to extend the life of the grease traps. Hose bibs and floor drains will be installed throughout the kitchen for ease of cleaning.

3. **HVAC Kitchen Exhaust Air**

Stainless steel kitchen hoods will be provided for each cooking and dishwashing area producing vapors or smoke. Fire rated duct systems (welded or manufactured) will be used to exhaust hoods via roof mounted fans. Kitchen exhaust fans will be used to discharge grease and vapor laden air from the building. Kitchen exhaust fans will be controlled by a cooking detection system which will modulate and activate/deactivate fans during periods of non-use. Significant energy savings will be realized by using a variable flow kitchen exhaust system.

4. **HVAC Kitchen Makeup Air**

Dedicated makeup air units will be provided to supplement kitchen exhaust and maintain overall kitchen space pressure to a slightly negative level. The makeup air units will modulate airflow to track hood exhaust flow as needed. Gas fired heating and DX cooling will be provided for tempering of makeup air.

5. Electrical Service

The proposed new healthcare facility kitchen will be powered via one or more branch panels fed from the existing building's main switchgear.

6. Electrical Distribution

Branch panels will feed all new kitchen equipment, along with all required HVAC units. Larger HVAC loads will be powered directly from the existing building switchgear.

Convenience receptacles will be located based on furniture layouts and other basic requirements.

7. **Emergency/Optional Standby Power**

The new commercial kitchen panels will be tied to an optional standby distribution system. All associated kitchen equipment will be powered via the existing building generator in the event of a power failure. Additional studies and calculations will need to be performed to determine if the existing generator will need to be upsized.

8. **Lighting**

The kitchen will be outfitted with an LED lighting system consisting of different fixtures based on the space of application. In general, recessed 2x4 and 2x2 troffers will be provided in areas with grid ceilings, surface mounted linear wraparounds will be provided in utility closets, and pendant mounted LED industrial fixtures will be provided in kitchen areas with exposed structure.

9. **Emergency Lighting**

Fixtures in paths of egress will be provided powered via emergency lighting relays, which will turn the lights to full brightness in the event of a power failure. Emergency lighting will be connected to the life safety distribution switchboard. LED exit signs will be provided at each egress door, as required by code. Exit signs will also be powered via emergency lighting circuits.

10. **Telecommunication Services**

Communication service cabling in the new kitchen will be fed from the closest IT room in the existing healthcare facility. Exact requirements and type of telephone system (VOIP vs. analog) shall be coordinated with owner's representatives at time of design.

Based on furniture layouts, each computer, copier and telephone will be provided with its own wall jack. Horizontal cabling for data and VOIP will be routed to patch panels located in the closest IT room. Analog telephone cabling will be routed to a punchdown block located in the main IT room.

11. **Security Systems**

An access control system will be provided in the new kitchen. Card readers will be provided at each kitchen entrance and will be programmed to lock/unlock doors based on time of day and type of entrance. All card readers will be tied into the existing healthcare facility access control network.

Cameras will not be provided in the new kitchen.

An intrusion detection system will not be provided in this building, as it is manned 24/7.

12. **Fire Alarm Systems**

Fire alarm initiation and notification devices will be provided as required by applicable codes. The existing healthcare facility fire alarm control panel will be expanded as required. Additionally, kitchen equipment fire alarm tie-ins will be provided as required.

Chapter B.7
Vision Site Plans

FINAL REPORT

Date: May 9, 2016

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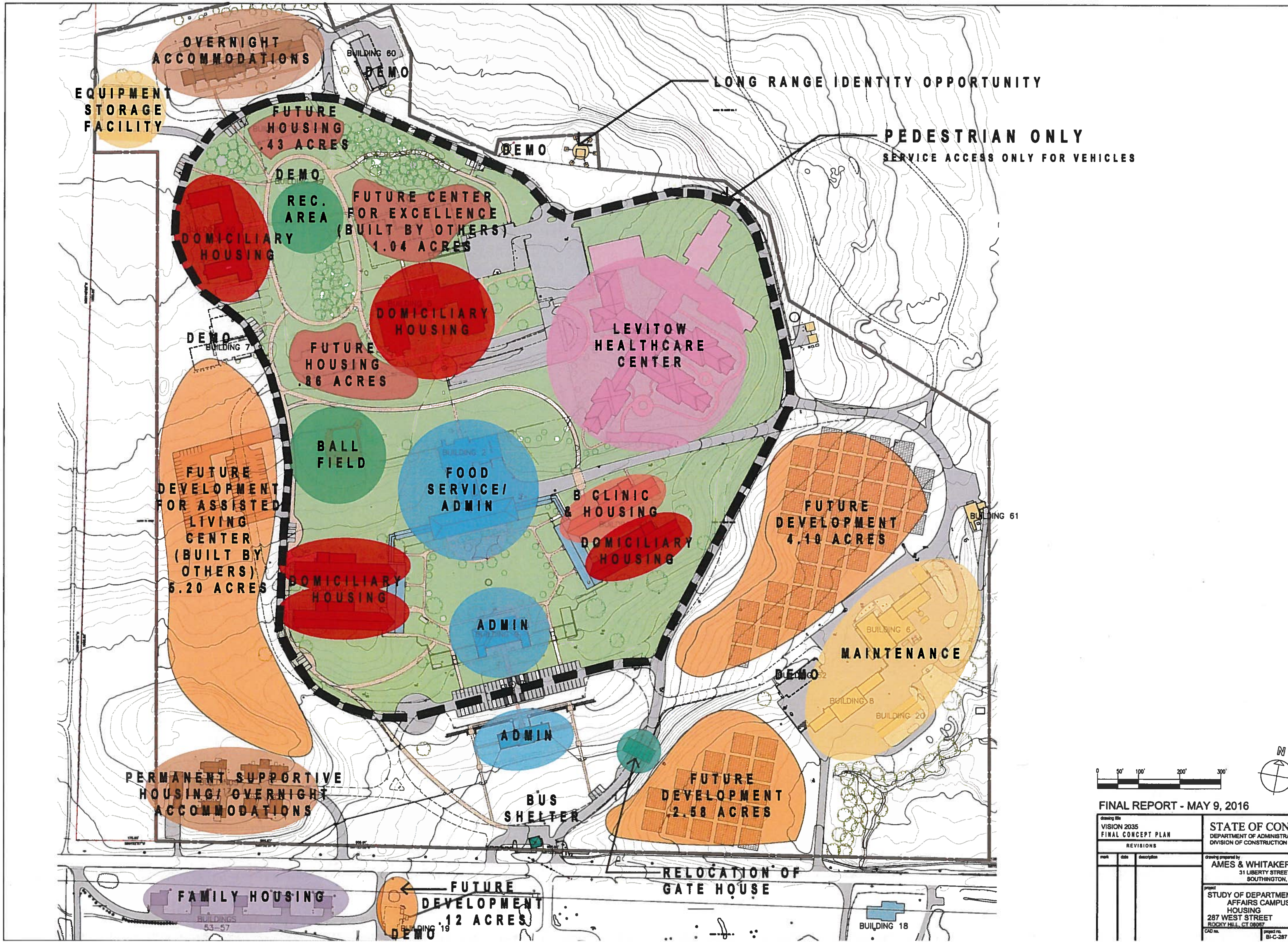


FINAL REPORT - MAY 9, 2016

drawing title
VISION 2035
FINAL CONCEPT PLAN

REVISIONS

mark	date	description

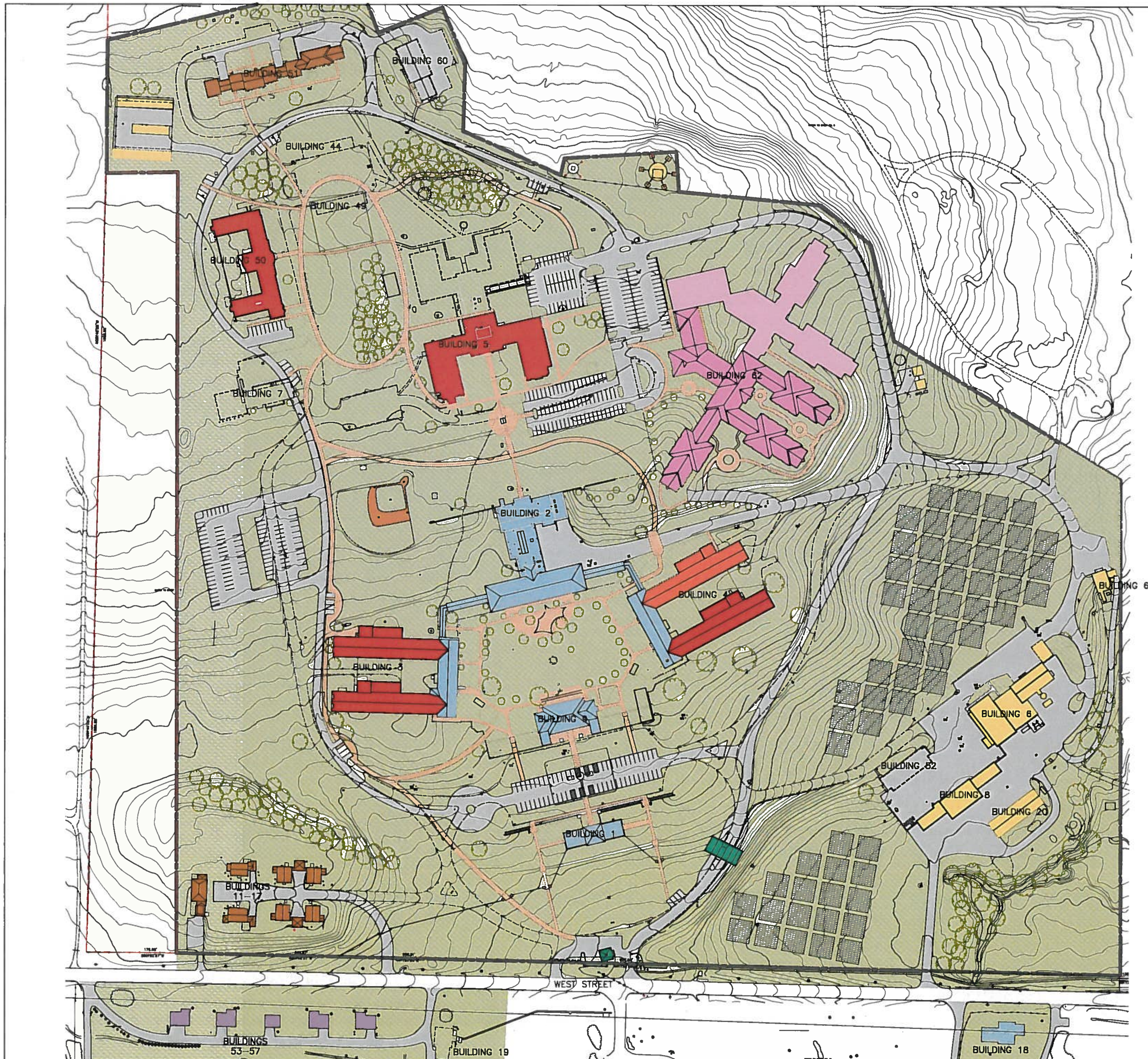
STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

drawing prepared by
AMES & WHITAKER ARCHITECTS
31 LIBERTY STREET, SUITE 208
SOUTHINGTON, CT 06489

date 05/09/16
scale AS NOTED
drawn by
approved by

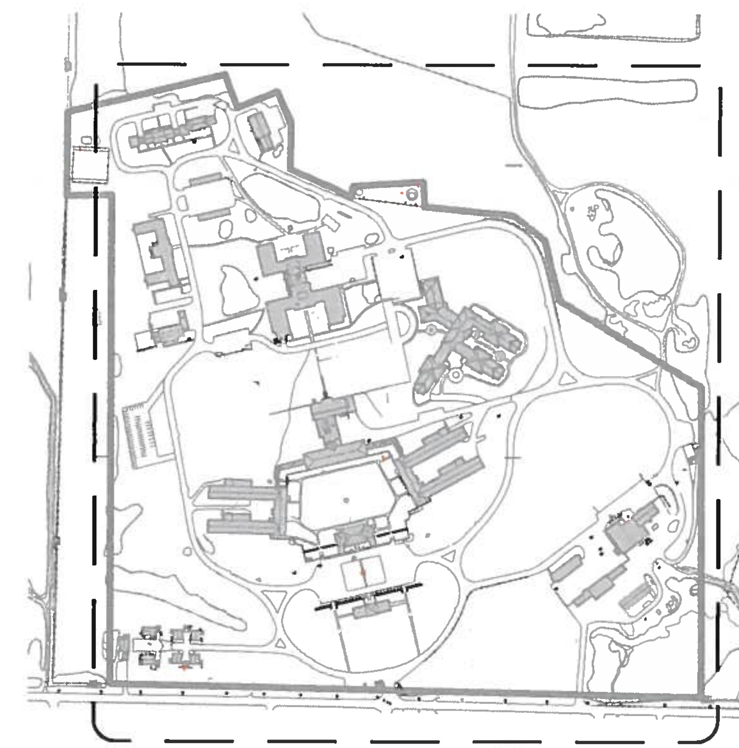
project
STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

CAD no.
project no. BI-C-287
drawing no. A.10



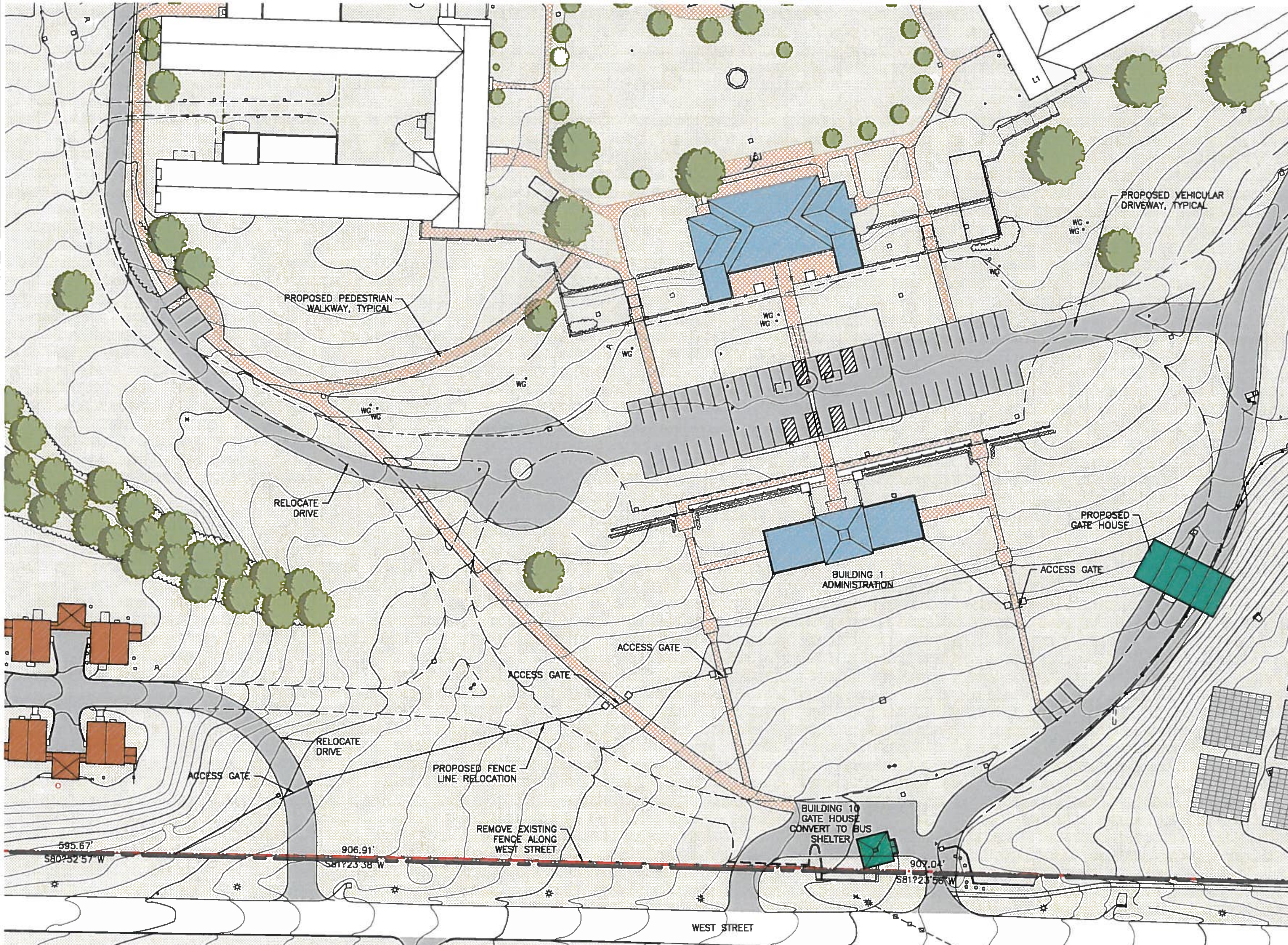
LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT



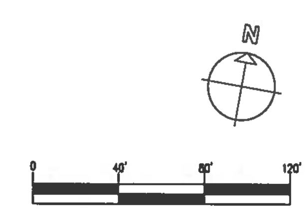
FINAL REPORT - MAY 9, 2016

drawing title VISION 2035 SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES	
REVISIONS mark / date / description	drawing prepared by AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 206 SOUTHINGTON, CT 06489	date 05/09/16 scale AS NOTED
	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by approved by
	CAD no. | project no. BI-C-287	drawing no. A.11



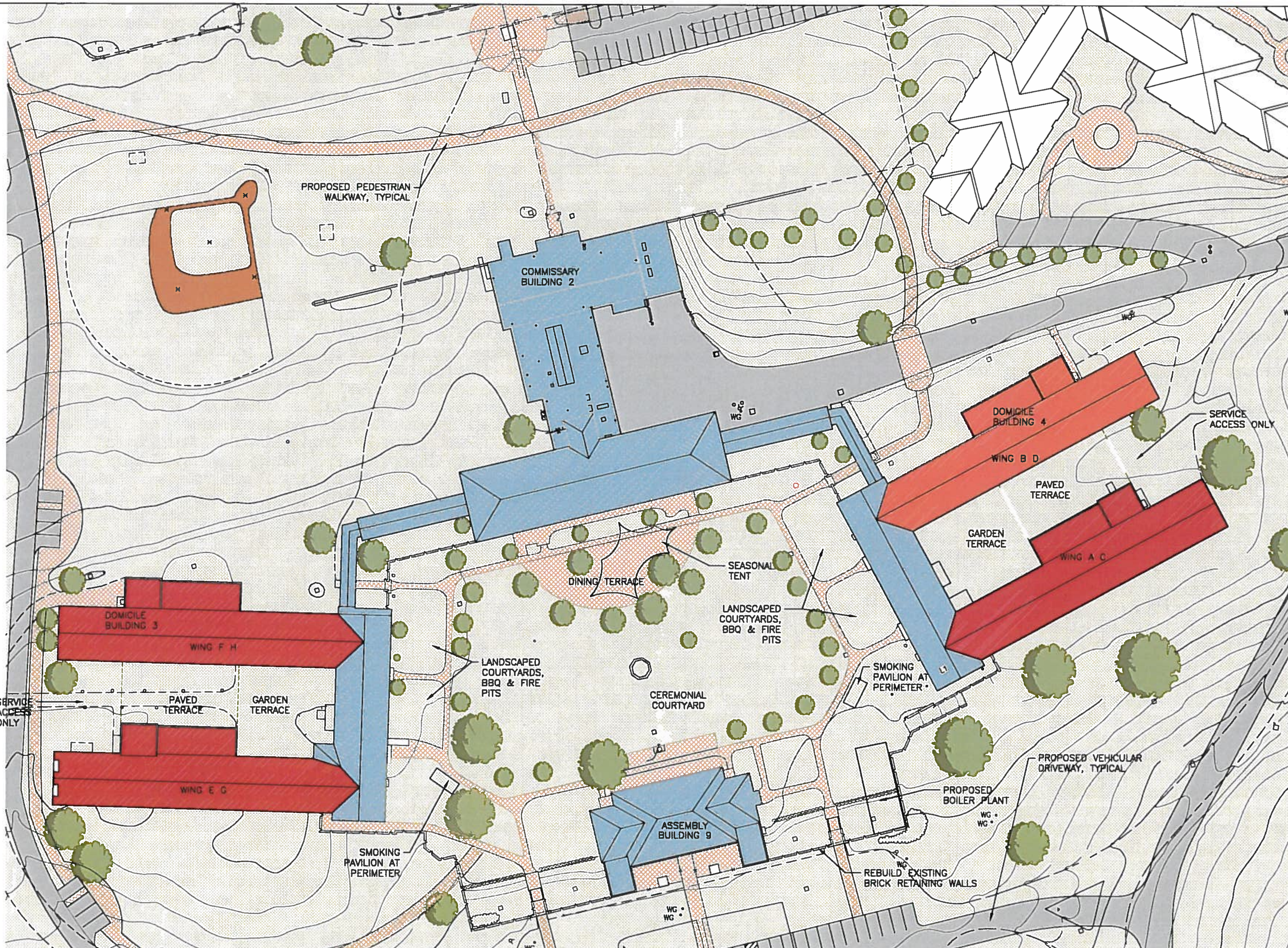
LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT



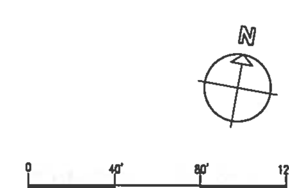
FINAL REPORT - MAY 9, 2016

drawing title: VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS, 31 LIBERTY STREET, SUITE 208, SOUTHINGTON, CT 06489 — date: 05/09/16 — scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING, 287 WEST STREET, ROCKY HILL, CT 06067 — drawn by: — approved by:
	CAD no. — project no.: BI-C-287 — drawing no.: A.12



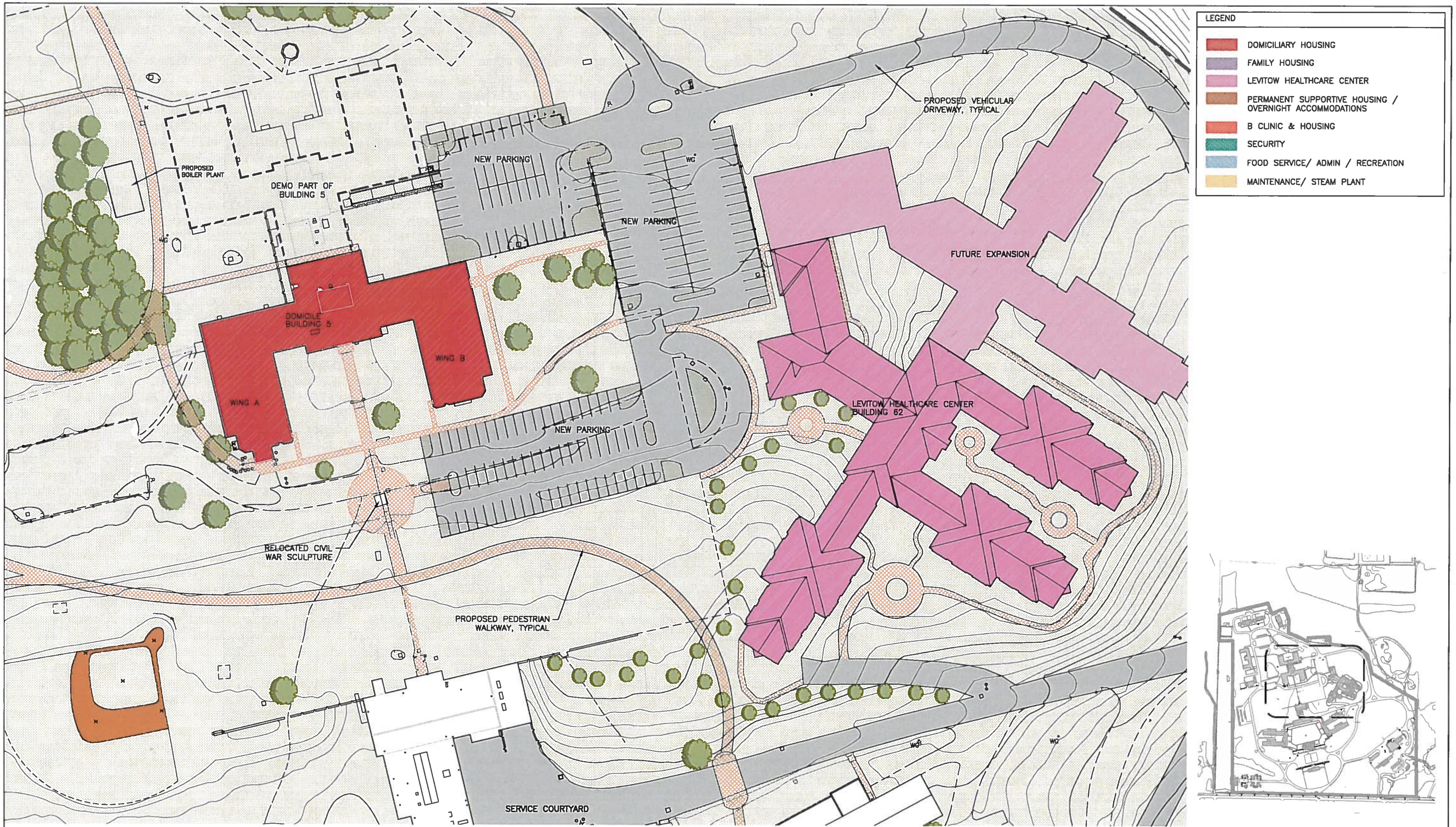
LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT



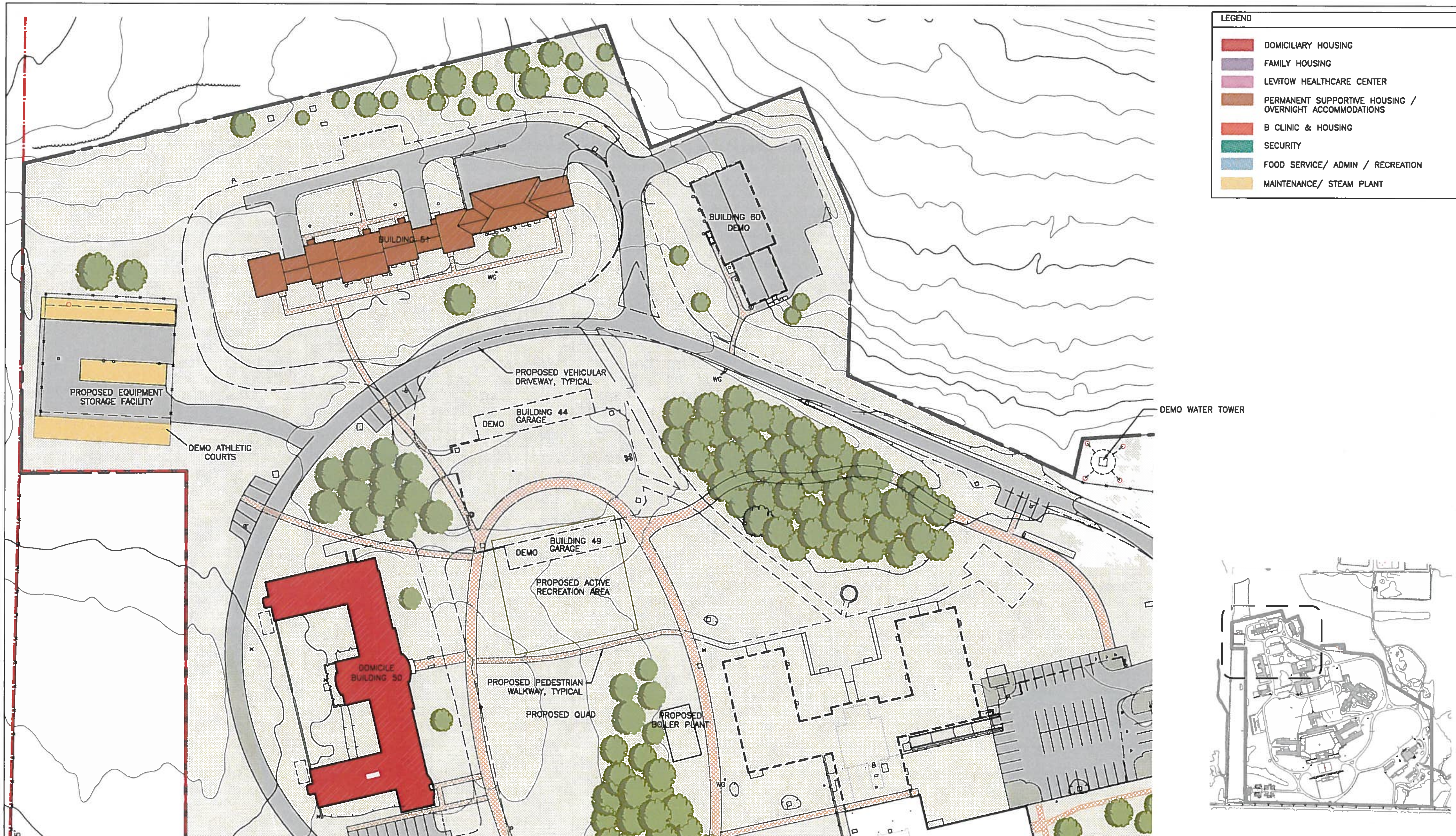
FINAL REPORT - MAY 9, 2016

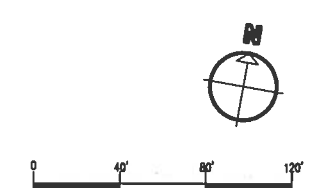
drawing title: VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS — mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 206 SOUTHINGTON, CT 06489
date	05/09/16
scale	AS NOTED
project	STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
drawn by	
approved by	
CAD no.	
project no.	BI-C-287
drawing no.	A.13



FINAL REPORT - MAY 9, 2016

drawing title: VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES	
REVISIONS mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489	date: 05/09/16 scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by approved by
	CAD no. / project no. BI-C-287	drawing no. A.14





FINAL REPORT - MAY 9, 2016

drawing title: VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS — mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no. / project no. BI-C-287

date	05/09/16
scale	AS NOTED
drawn by	
approved by	
drawing no.	A.15

LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT

FINAL REPORT - MAY 9, 2016

drawing title: VISION 2035 ENLARGED SITE PLAN

REVISIONS

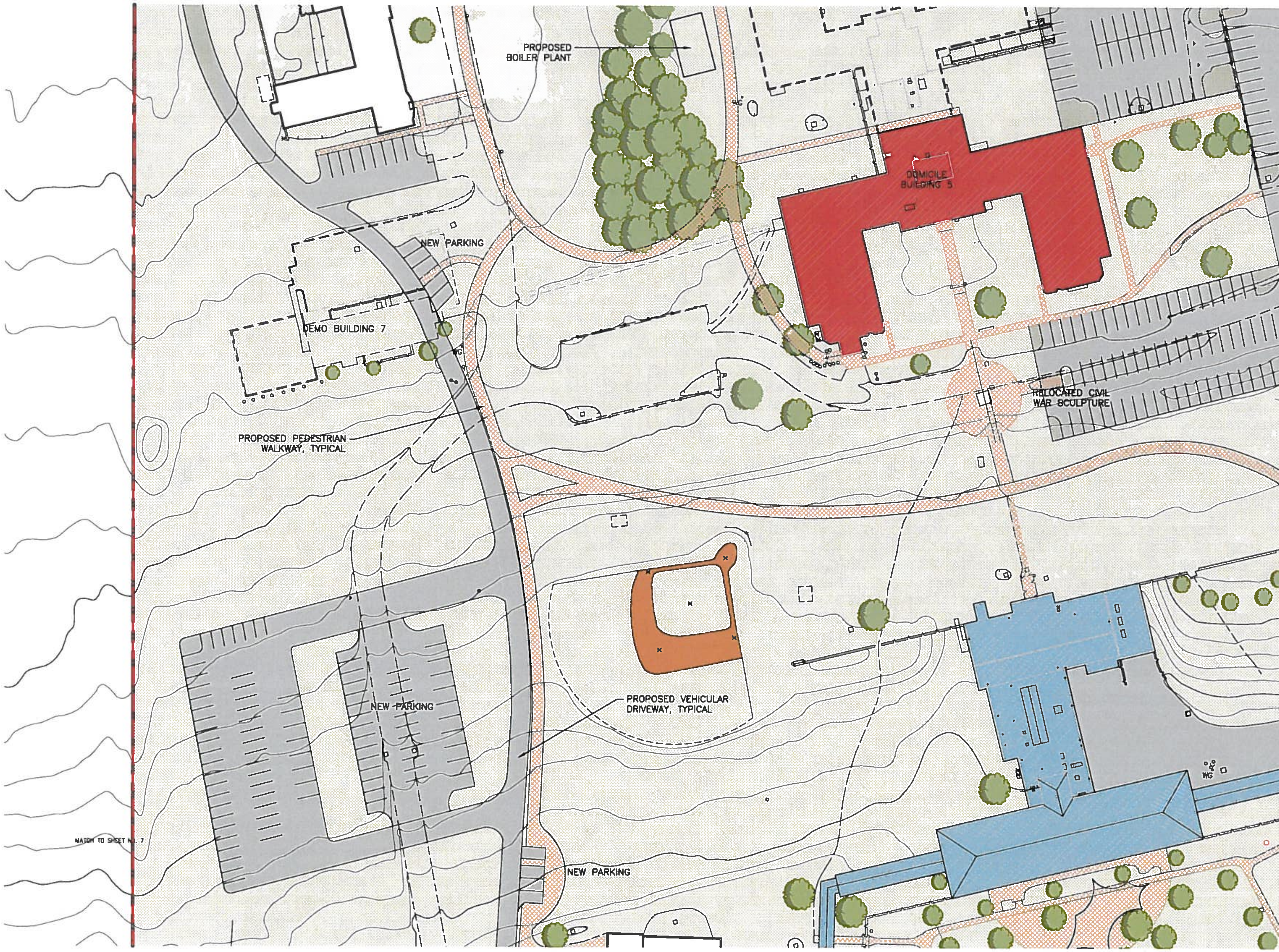
mark	date	description

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

drawing prepared by: AMES & WHITAKER ARCHITECTS
31 LIBERTY STREET, SUITE 206
SOUTHINGTON, CT 06489

project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

date: 05/09/16
scale: AS NOTED
drawn by:
approved by:
CAD no.:
project no.: BI-C-287
drawing no.: A.16



LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT

0 40' 80' 120'

FINAL REPORT - MAY 9, 2016

drawing title: VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS — mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS, 31 LIBERTY STREET, SUITE 208, SOUTHINGTON, CT 06489 — date: 05/09/16 — scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING, 287 WEST STREET, ROCKY HILL, CT 06067 — drawn by: — approved by:
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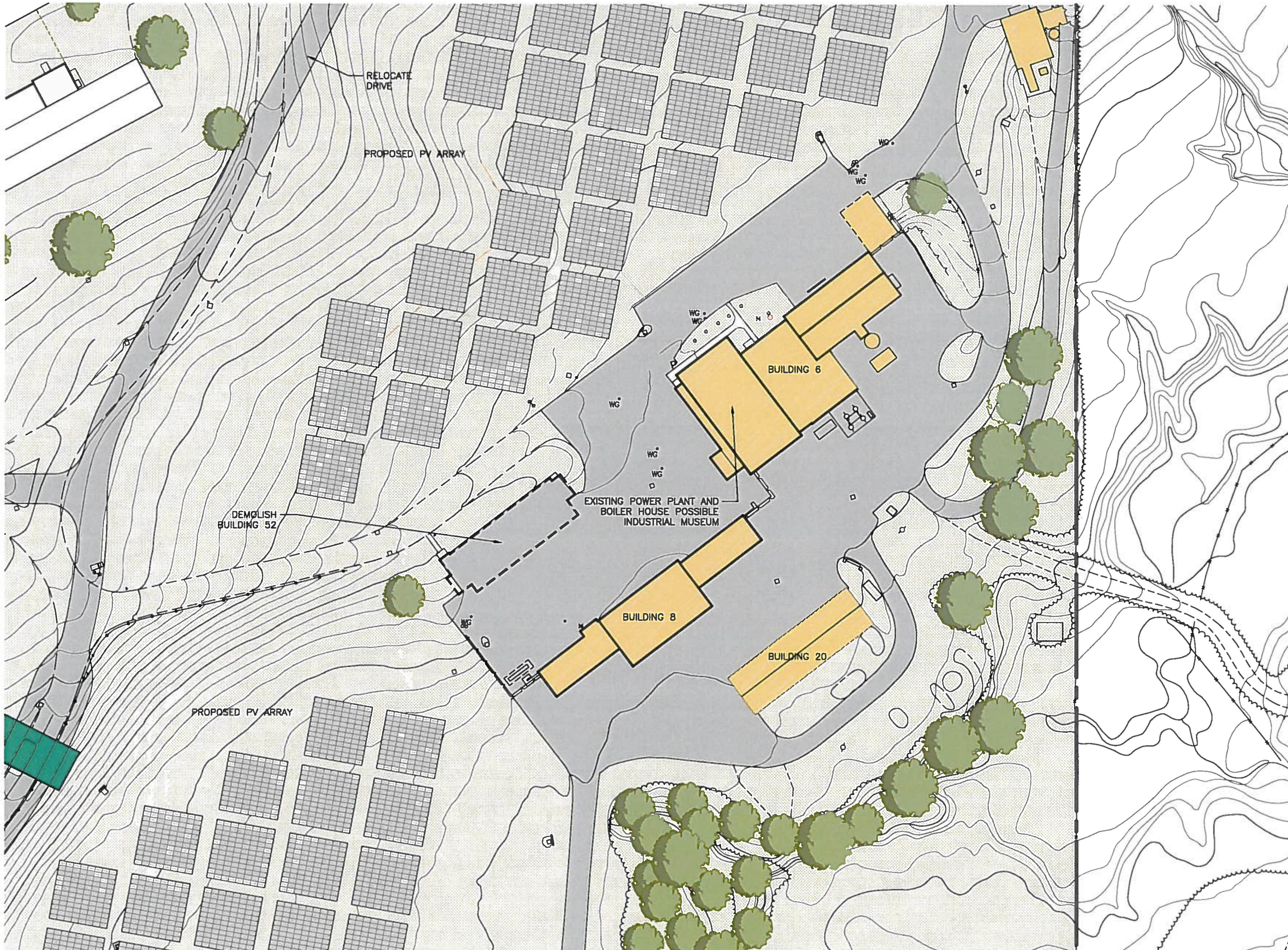


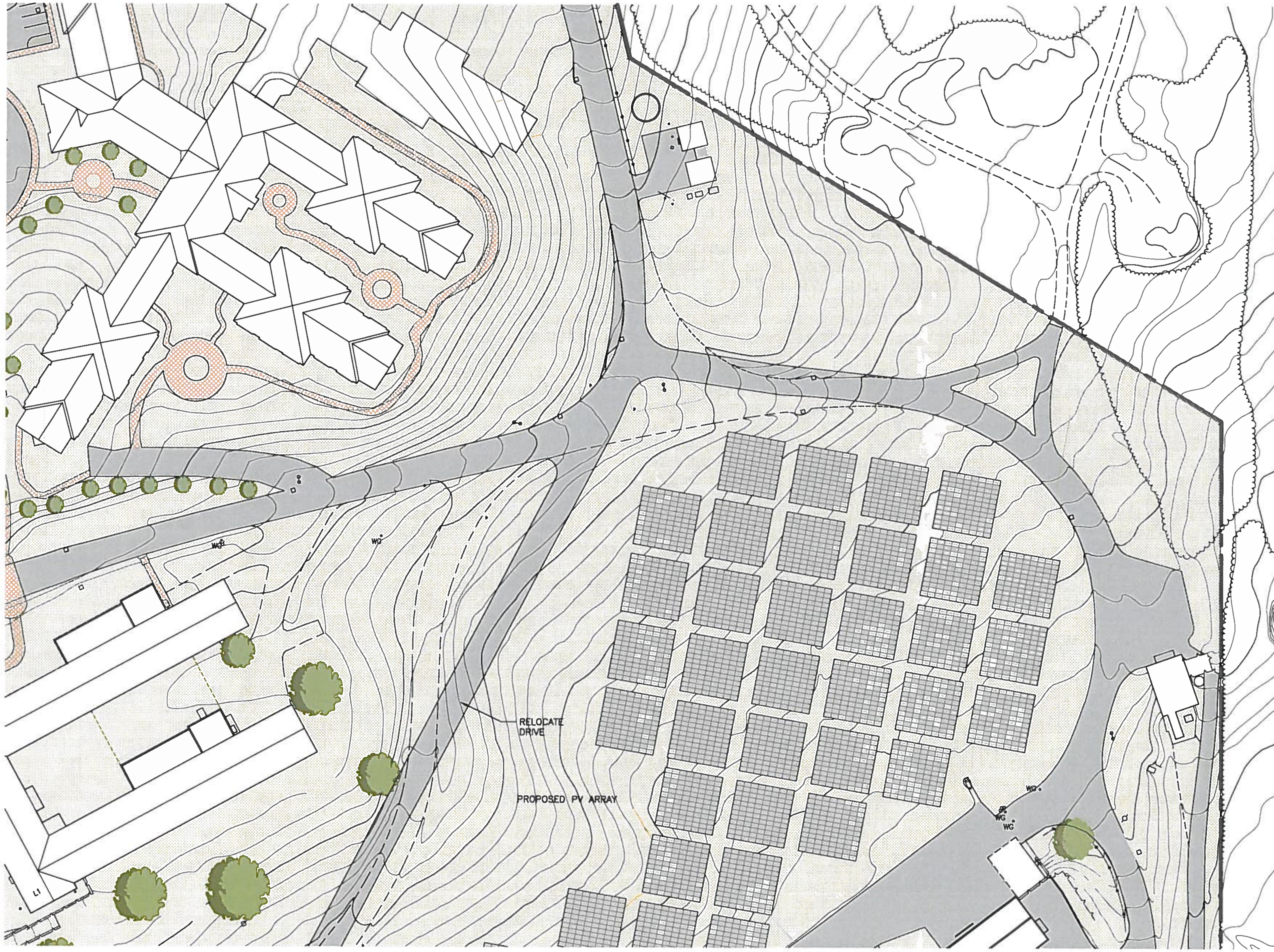
LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT

0 40' 80' 120'

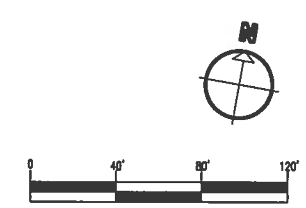
FINAL REPORT - MAY 9, 2016

drawing title: VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS mark / date / description	drawing prepared by AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	date: 05/09/16
	scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	drawn by:
	approved by:
	CAD no.:
	project no.: BI-C-287
	drawing no.: A.18



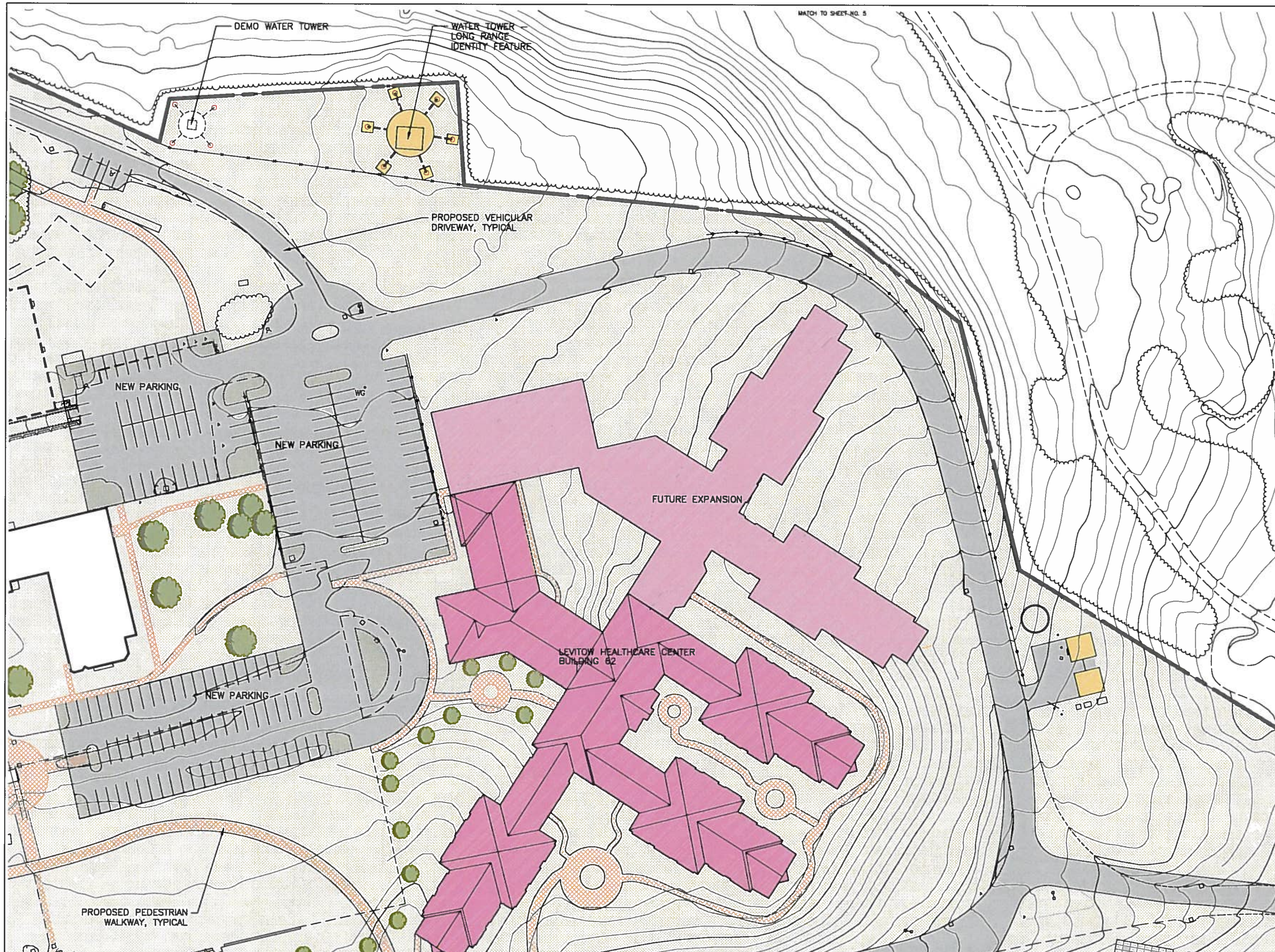
LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT



FINAL REPORT - MAY 9, 2016

drawing title: VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
date: 05/09/16	scale: AS NOTED
project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by: approved by:
CAD no.:	project no.: BI-C-287
drawing no.: A.19	



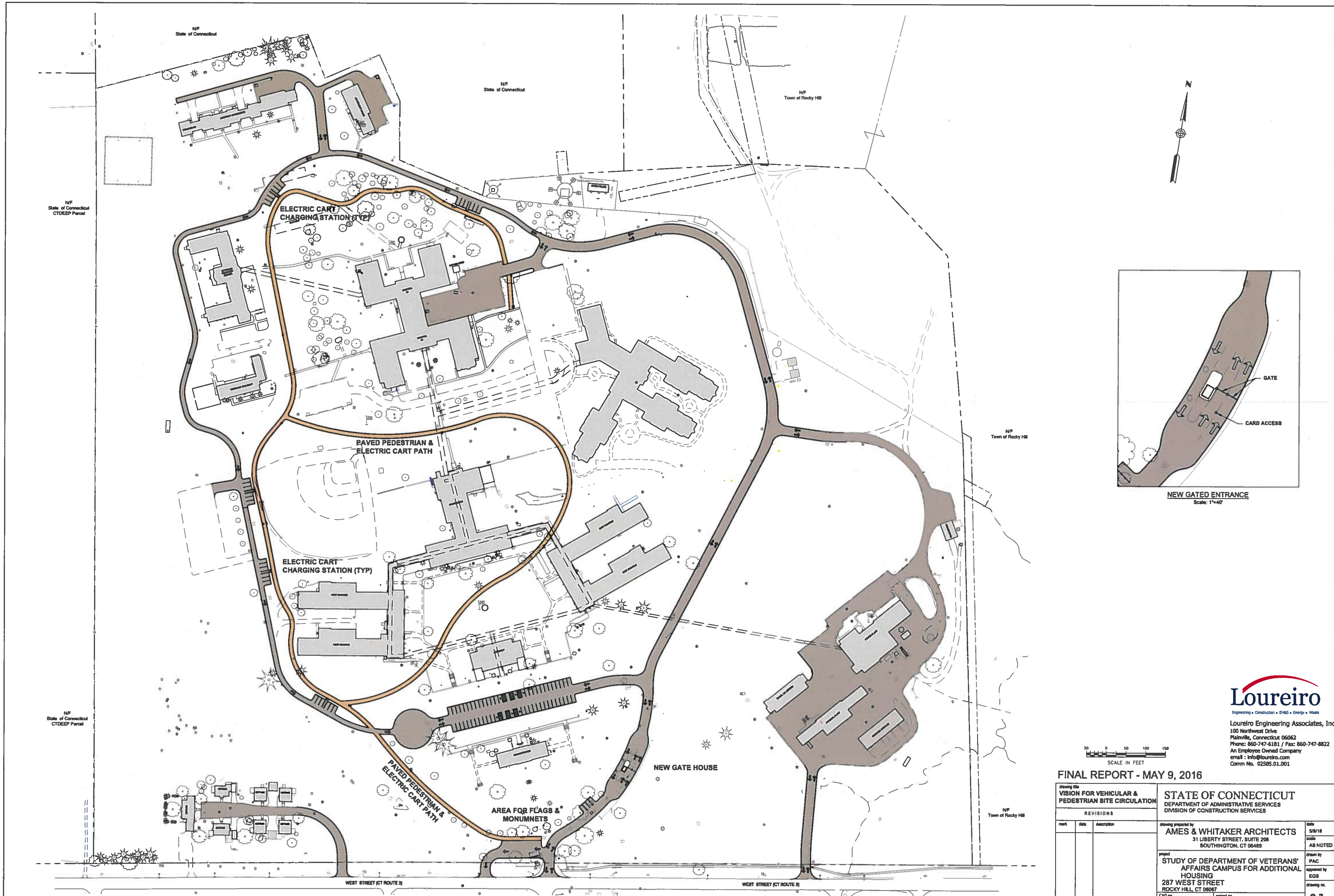
LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- PERMANENT SUPPORTIVE HOUSING / OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN / RECREATION
- MAINTENANCE/ STEAM PLANT

FINAL REPORT - MAY 9, 2016

drawing title VISION 2035 ENLARGED SITE PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS mark / date / description	drawing prepared by AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no. / project no. BI-C-287

date	05/09/16
scale	AS NOTED
drawn by	
approved by	
drawing no.	A.20



Loureiro

Engineering • Construction • EH&S • Energy • Waste

Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062
Phone: 860-747-6181 / Fax: 860-747-8822
An Employee Owned Company
email : info@loureiro.com
Comm No. 02585.01.001

FINAL REPORT - MAY 9, 2016

drawing title
VISION FOR VEHICULAR & PEDESTRIAN SITE CIRCULATION

REVISIONS

mark	date	description

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

drawing prepared by
AMES & WHITAKER ARCHITECTS
31 LIBERTY STREET, SUITE 208
SOUTHINGTON, CT 06489

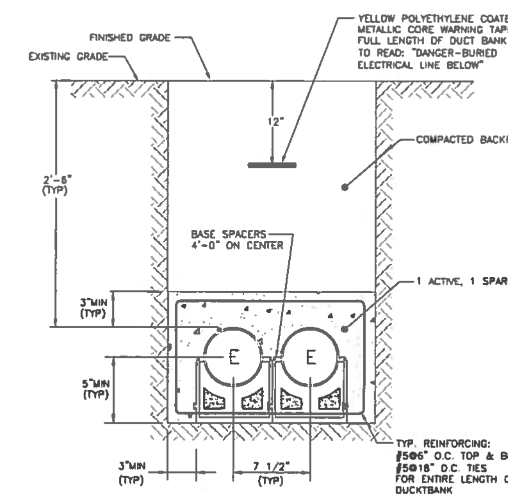
project
STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

CAD no.
project no. BI-C-287

date 5/9/16
scale AS NOTED
drawn by PAC
approved by EGS
drawing no. C-7

LEGEND

- DOMICILIARY HOUSING
- FAMILY HOUSING
- LEVITOW HEALTHCARE CENTER
- OVERNIGHT ACCOMMODATIONS
- B CLINIC & HOUSING
- SECURITY
- FOOD SERVICE/ ADMIN/ RECREATION
- MAINTENANCE/ STEAM PLANT



TYPICAL ELECTRICAL CONCRETE ENCASED DUCT BANK

NTS

0 50' 100' 200' 300'

Loureiro
Engineering • Construction • EH&S • Energy • Waste
Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062
Phone: 860-747-6181 / Fax: 860-747-8822
An Employee Owned Company
email : info@loureiro.com
Comm No. 02585.01.001

FINAL REPORT - MAY 9, 2016

drawing title: VISION FOR ELECTRICAL DISTRIBUTION	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS — mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 206 SOUTHINGTON, CT 06489 — date: 05/09/16 — scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067 — drawn by: — approved by:
	CAD no.: — project no.: BI-C-287 — drawing no.: C-8

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Chapter B.8
Vision Floor Plans

FINAL REPORT

Date: May 9, 2016

APPLICABLE CODES AND STANDARDS

All building systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements.

a. 2005 Connecticut State Building Code with 2009 supplements
b. 2005 Connecticut State Fire Safety Code with 2009 supplements
c. 2003 International Building Code (IBC)
d. 2003 International Plumbing Code (IPC)
e. 2003 International Mechanical Code (IMC)
f. 2009 International Energy Conservation Code (IECC)
g. NFPA, All Latest Adopted Versions
h. ASHRAE 90.1
i. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition.

a. DOMICILIARY HOUSING PLANS

All units were “designed” following Federal VA Guidelines for “CLC” Units and contain common features, layouts, and finishes to allow flexibility. All of these spaces meet the technical requirements for accessibility.

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1 DOMICILE – BUILDING 3 – FIRST FLOOR PLAN
30,015 SF

PLAN KEY

PRIVATE BEDROOM AND BATHROOM	orange
COMMUNITY SPACE	blue
CIRCULATION	yellow
OFFICES	green

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 03 - FIRST FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 206 SOUTHINGTON, CT 06489
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no: / project no.: BI-C-287

date	05/09/16
scale	AS NOTED
drawn by	SP
approved by	AL
drawing no	A.21

2 DOMICILE – BUILDING 3 – SECOND FLOOR PLAN
30,015 SF

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 03 - SECOND FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS, 31 LIBERTY STREET, SUITE 208, SOUTHINGTON, CT 06489
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING, 287 WEST STREET, ROCKY HILL, CT 06067
	CAD no. / project no. BI-C-287
	date: 05/09/16
	scale: AS NOTED
	drawn by: SP
	approved by: AL
	drawing no. A.22

3 DOMICILE – BUILDING 3 – TYPICAL CLC WING FLOOR PLAN

0 8' 16'

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 03 - TYPICAL WING	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
date	05/09/16
scale	AS NOTED
project	STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
drawn by	SP
approved by	AL
CAD no	
project no.	BI-C-287
drawing no	A.23

1 DOMICILE – BUILDING 4 – FIRST FLOOR PLAN
30,015 SF

0 8 16 32

FINAL REPORT - MAY 9, 2016

drawing title BUILDING 04 - FIRST FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS mark / date / description	drawing prepared by AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	project STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no / project no. BI-C-287

date	05/09/16
scale	AS NOTED
drawn by	SP
approved by	AL
drawing no	A.24

2 DOMICILE – BUILDING 4 – SECOND FLOOR PLAN
30,015 SF

0 8 16 32

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 04 - SECOND FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS, 31 LIBERTY STREET, SUITE 208, SOUTHINGTON, CT 06489
date	05/09/16
scale	AS NOTED
project	STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
drawn by	SP
approved by	AL
CAD no	
project no	BI-C-287
drawing no	A.25

3 DOMICILE – BUILDING 4 – TYPICAL CLC WING FLOOR PLAN

0 8' 16'

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 04 - TYPICAL WING	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
date: 05/09/16	scale: AS NOTED
project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067	drawn by: SP approved by: AL
CAD no	project no: BI-C-287
drawing no	A.26

1 DOMICILE – BUILDING 5 – FIRST FLOOR PLAN
23,465 SF

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 5 - FIRST FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS	
mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	date: 05/09/16
	scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	drawn by: SP
	approved by: AL
	CAD no:
	project no.: BI-C-287
	drawing no.: A.27

(2) DOMICILE – BUILDING 5 – SECOND FLOOR PLAN
23,220 SF

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 5 - SECOND FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS: mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 206 SOUTHINGTON, CT 06489
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no / project no. BI-C-267
date	05/09/16
scale	AS NOTED
drawn by	SP
approved by	AL
drawing no	A.28

3 DOMICILE – BUILDING 5 – THIRD FLOOR PLAN
23,220 SF

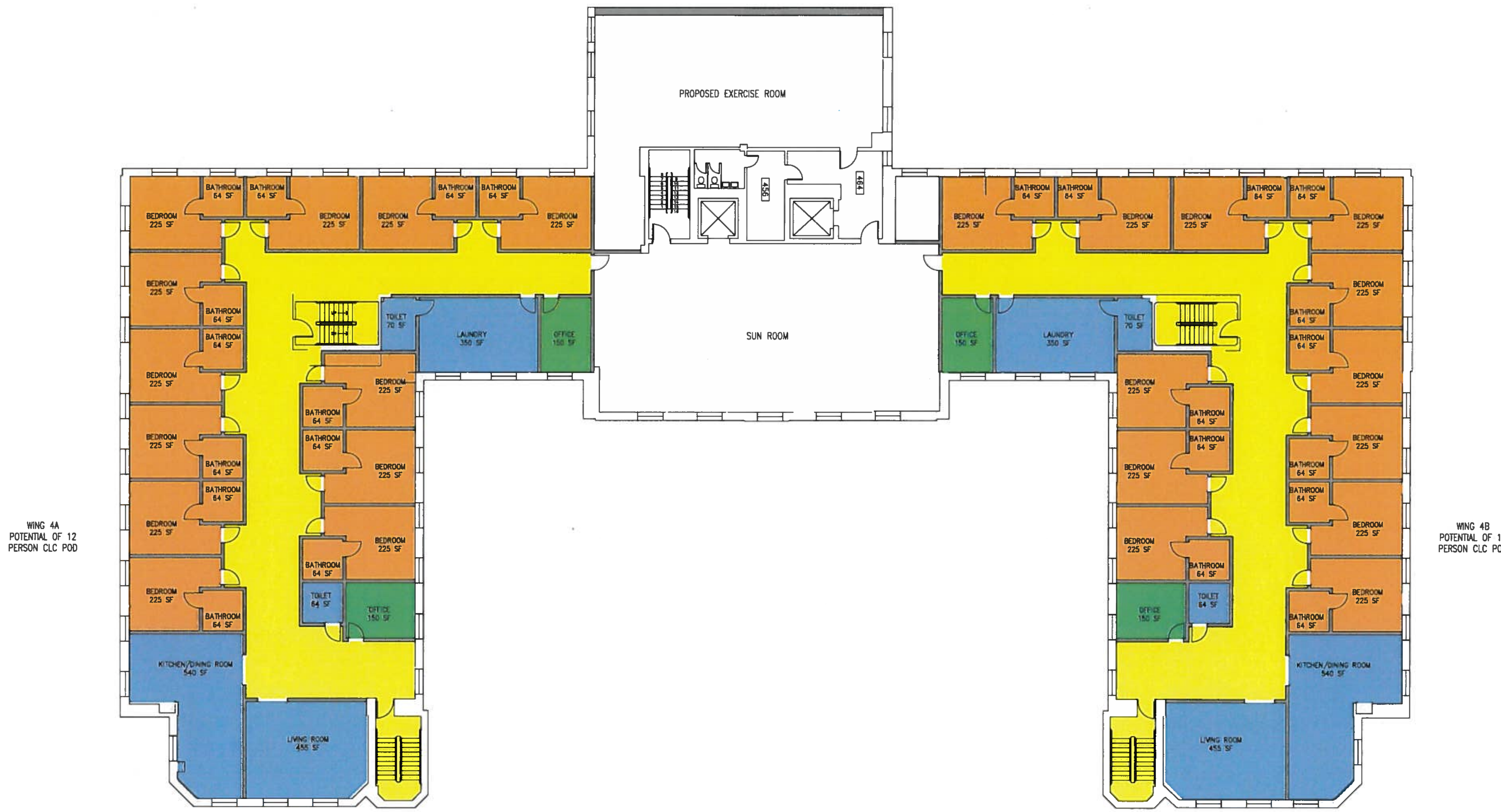
0 8 16 32

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 5 - THIRD FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
date	05/09/16
scale	AS NOTED
project	STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
drawn by	SP
approved by	AL
CAD no	
project no	BI-C-287
drawing no.	A.29



4 DOMICILE – BUILDING 5 – FOURTH FLOOR PLAN
23,220 SF

PLAN KEY

PRIVATE BEDROOM AND BATHROOM	orange
COMMUNITY SPACE	blue
CIRCULATION	yellow
OFFICES	green

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 5 - FOURTH FLOOR NEW WORK PLAN

REVISIONS

mark	date	description

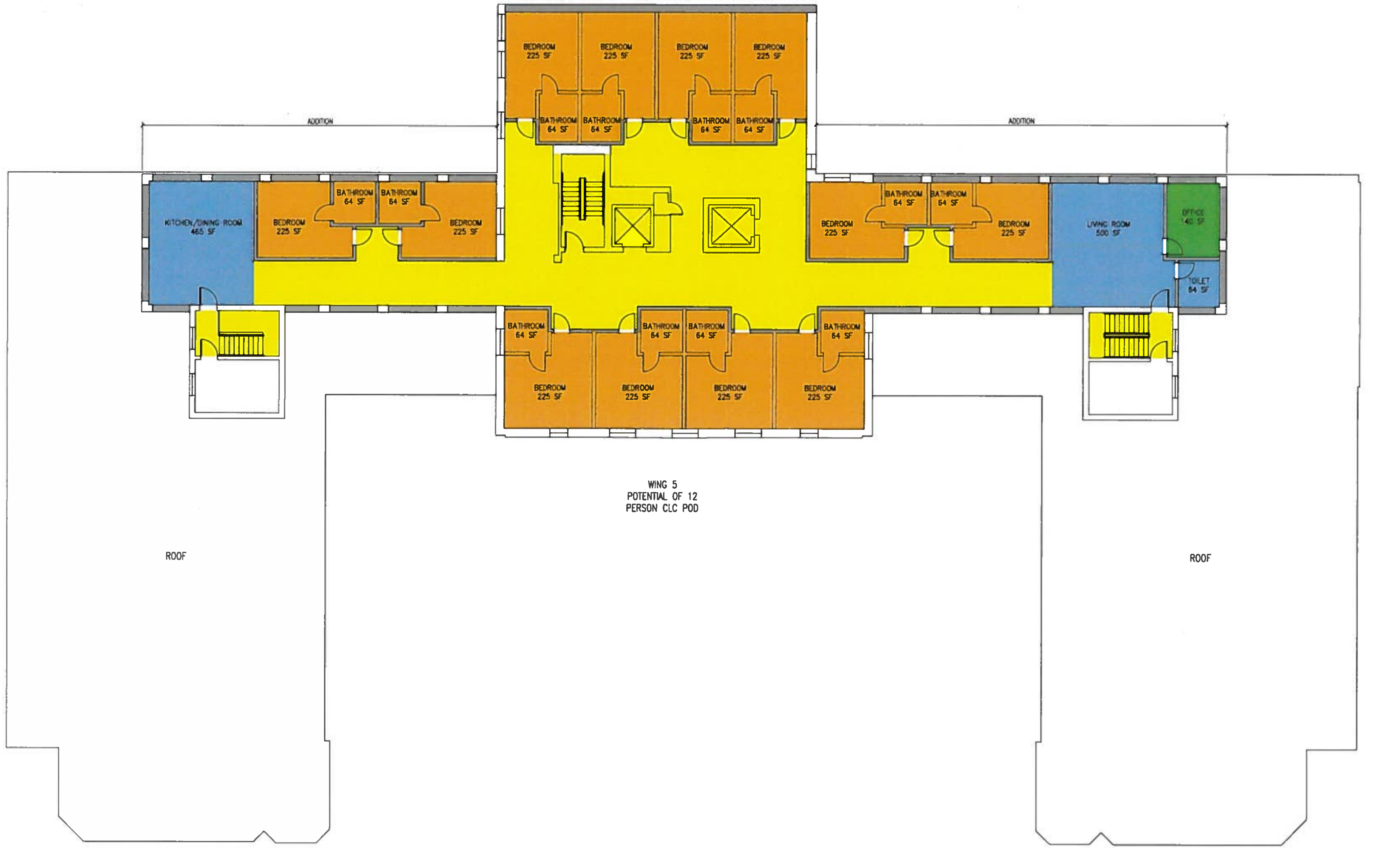
STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

drawing prepared by: AMES & WHITAKER ARCHITECTS
31 LIBERTY STREET, SUITE 206
SOUTHINGTON, CT 06489

project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

CAD no
project no: BI-C-287

date: 05/09/16
scale: AS NOTED
drawn by: SP
approved by: AL
drawing no: A.30



5 DOMICILE – BUILDING 5 – FIFTH FLOOR PLAN
EXIST. – 5,520 SF
ADDITION – 3,525 SF

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 5 - FIFTH FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS: mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS, 31 LIBERTY STREET, SUITE 208, SOUTHINGTON, CT 06489
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING, 287 WEST STREET, ROCKY HILL, CT 06067
	CAD no. / project no BI-C-287

date	05/09/16
scale	AS NOTED
drawn by	SP
approved by	AL
drawing no.	A.31

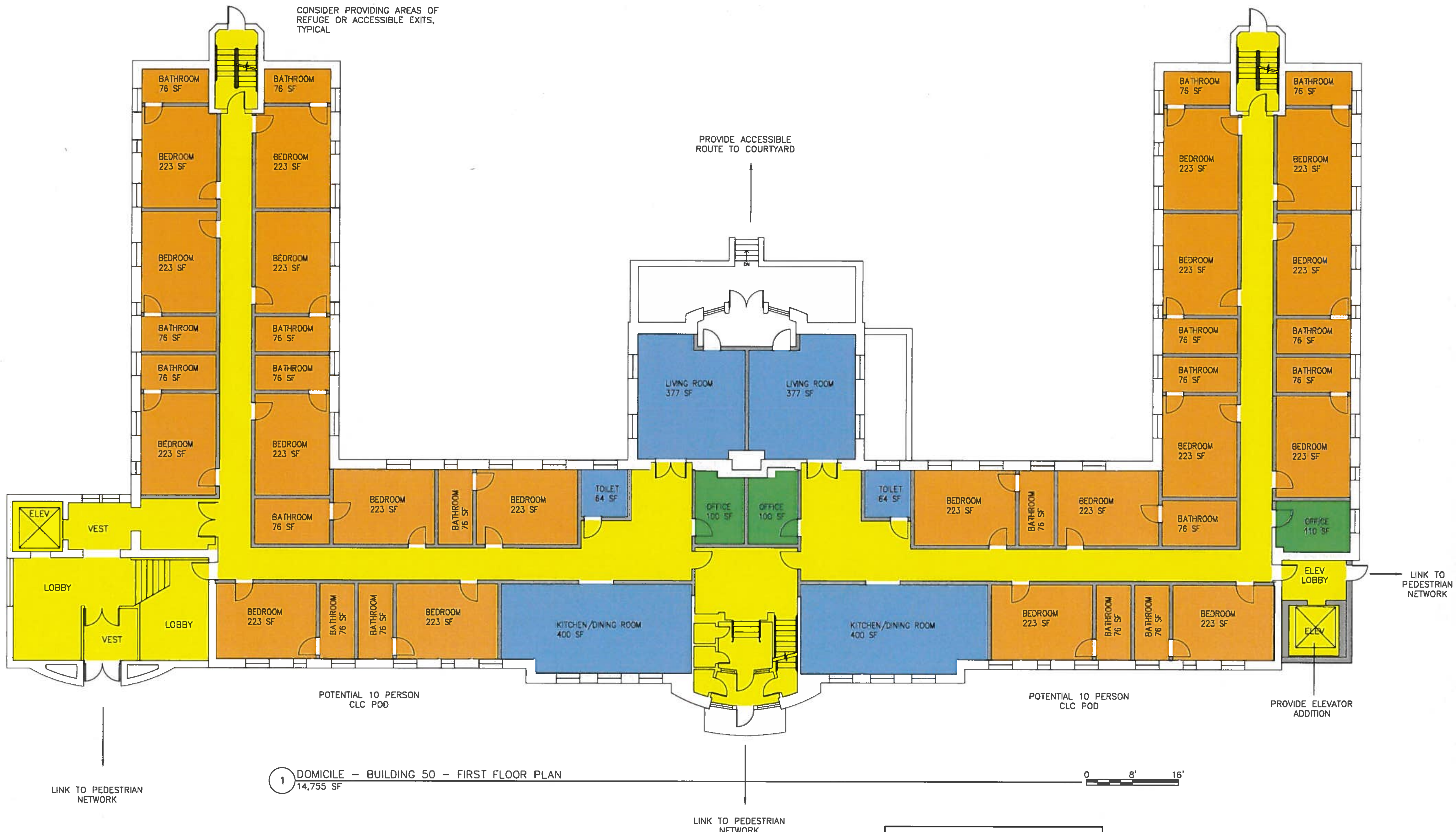
6 DOMICILE – BUILDING 5 – TYPICAL CLC WING FLOOR PLAN

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 5 - TYPICAL WING	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 206 SOUTHINGTON, CT 06489
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	CAD no. / project no. BI-C-287
date: 05/09/16	scale: AS NOTED
drawn by: SP	approved by: AL
drawing no: A.32	

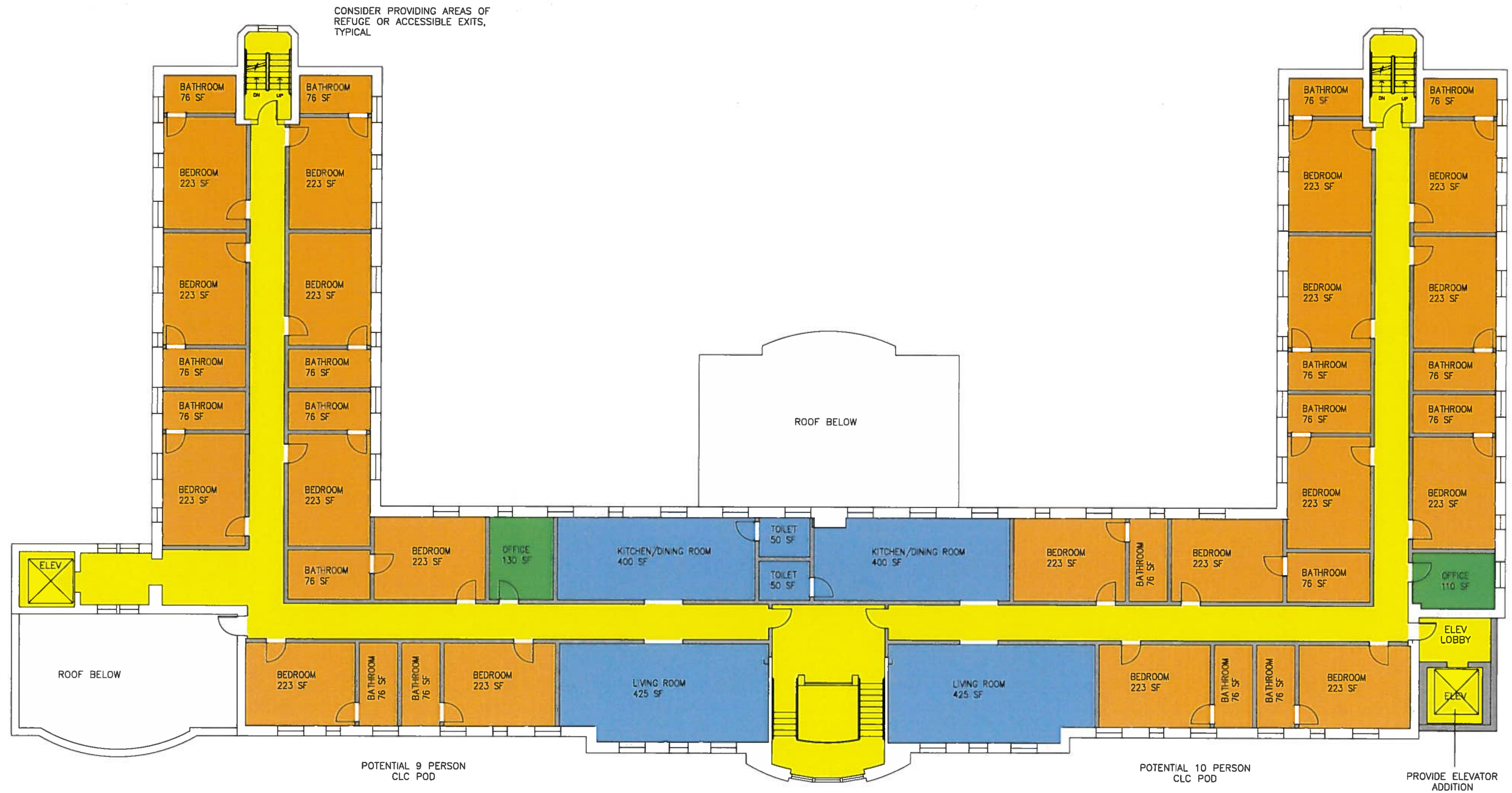


PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 50 - FIRST FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS (mark / date / description)	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	date: 05/09/16 · scale: AS NOTED · drawn by: SP · approved by: AL
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
CAD no	project no: BI-C-287 · drawing no: A.33



2 DOMICILE – BUILDING 50 – SECOND FLOOR PLAN
12,785 SF

0 8' 16'

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 50 - SECOND FLOOR NEW WORK PLAN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS: mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	date: 05/09/16 scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	drawn by: SP approved by: AL
	CAD no / project no: BI-C-287
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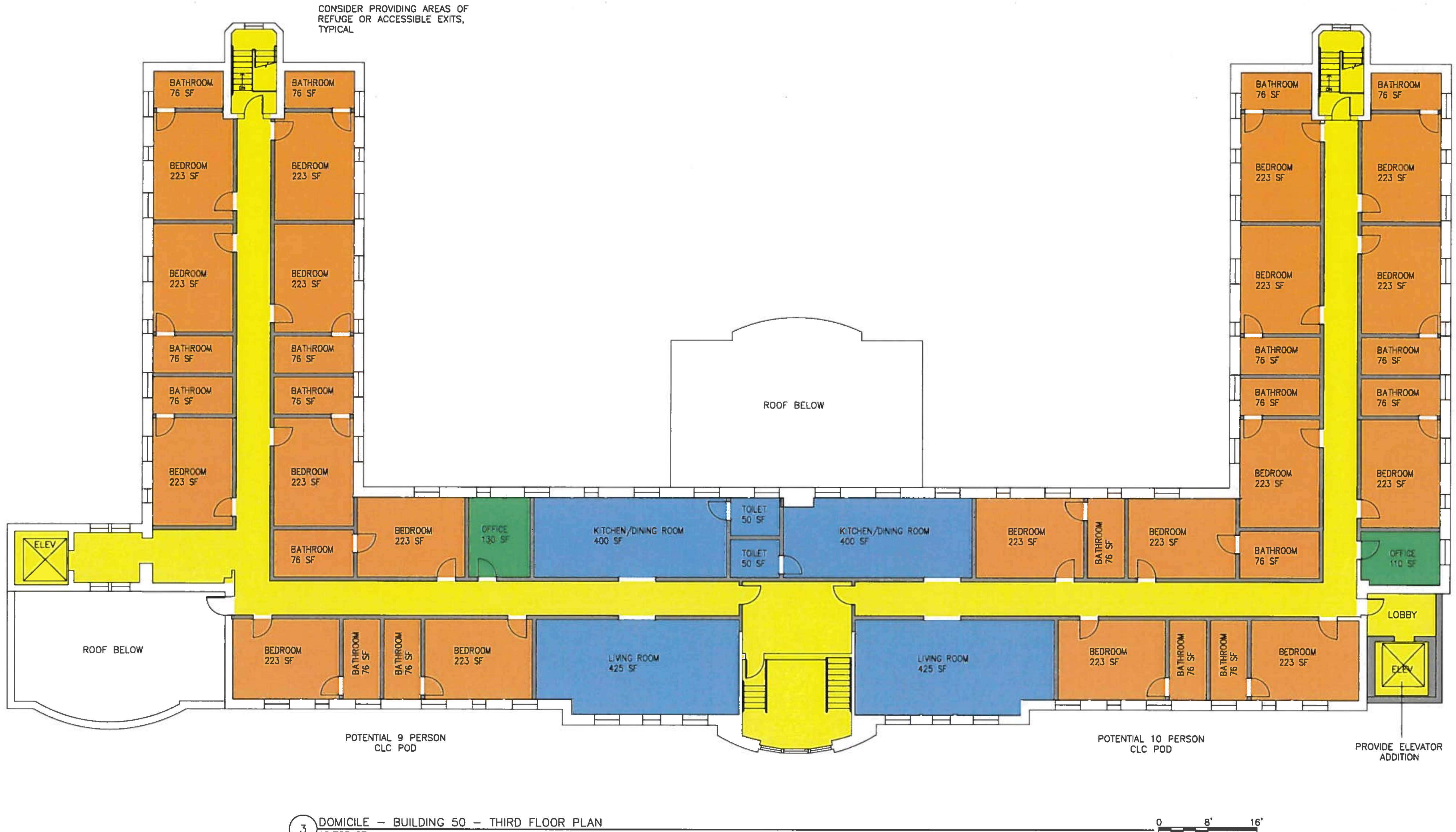


3 DOMICILE – BUILDING 50 – THIRD FLOOR PLAN
12,785 SF

PLAN KEY

- PRIVATE BEDROOM AND BATHROOM
- COMMUNITY SPACE
- CIRCULATION
- OFFICES

FINAL REPORT - MAY 9, 2016

drawing title: BUILDING 50 - THIRD FLOOR NEW WORK PLAN

REVISIONS

mark	date	description

STATE OF CONNECTICUT
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF CONSTRUCTION SERVICES

drawing prepared by: AMES & WHITAKER ARCHITECTS
31 LIBERTY STREET, SUITE 208
SOUTHINGTON, CT 06489

project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING
287 WEST STREET
ROCKY HILL, CT 06067

CAD no.

project no. BI-C-287

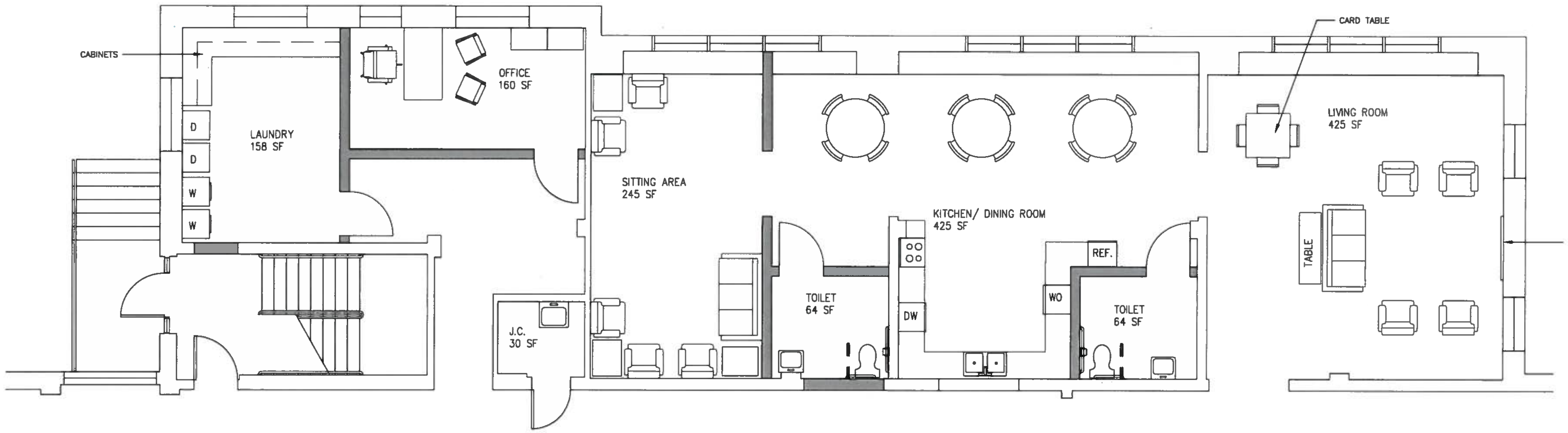
date: 05/09/16

scale: AS NOTED

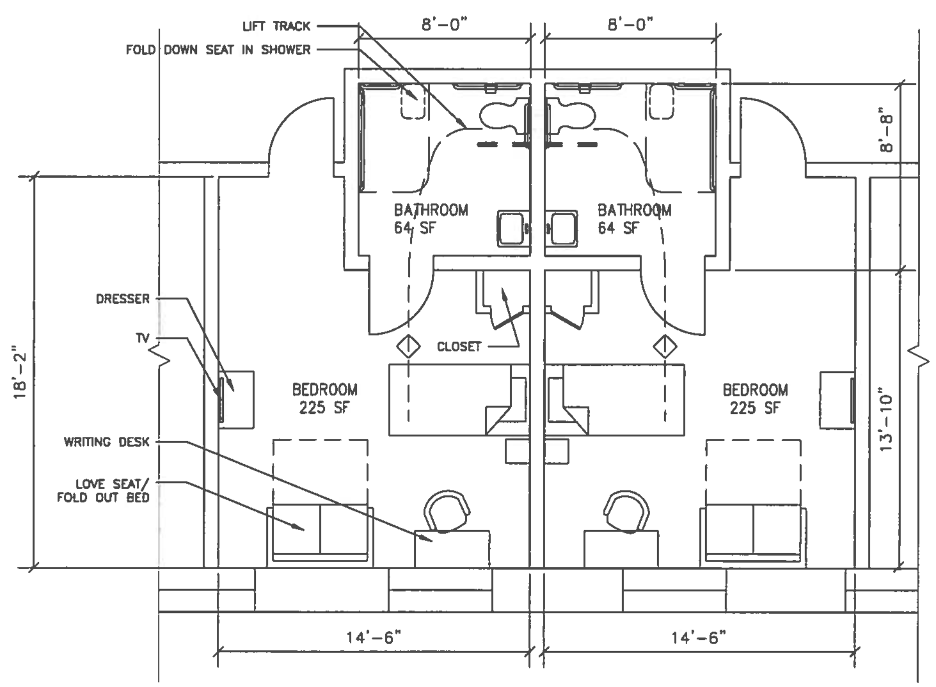
drawn by: SP

approved by: AL

drawing no. A.35



1 TYPICAL COMMUNITY LIVING SPACES



2 TYPICAL PRIVATE BEDROOM & BATHROOM

MINIMUM SIZE SHOWN

FINAL REPORT - MAY 9, 2016

drawing title: TYPICAL CLC PLAN DESIGN	STATE OF CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES DIVISION OF CONSTRUCTION SERVICES
REVISIONS: mark / date / description	drawing prepared by: AMES & WHITAKER ARCHITECTS 31 LIBERTY STREET, SUITE 208 SOUTHINGTON, CT 06489
	date: 05/09/16
	scale: AS NOTED
	project: STUDY OF DEPARTMENT OF VETERANS' AFFAIRS CAMPUS FOR ADDITIONAL HOUSING 287 WEST STREET ROCKY HILL, CT 06067
	drawn by: SP
	approved by: AL
	CAD no / project no: BI-C-287
	drawing no.: A.36

Chapter B.9
Cost Analysis

FINAL REPORT

Date: May 9, 2016

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The cost analysis was provided in March 2016 and will need to be adjusted for yearly inflation. The costs below are for construction only; no design costs have been calculated. Historic preservation costs have been incorporated into the building costs and are also allotted for in the contingency. The gate house has not been calculated into any of the costs below. The contractors will need to be aware that the State of Connecticut uses, at the current time in 2016, PMWeb software for their construction projects. The cost analysis was based upon existing building plan reviews and visual inspection of the various buildings involved. No surveys, destructive testing or hazardous materials testing were undertaken for this report. The scope and opinion of probable construction costs for the tasks follows:

a. CIVIL COST

1. Vehicular Traffic

Cost - $6,500,000

- new parking lots that will receive a 3-inch thick (two 1 ½-inch layers) bituminous concrete pavement over a 12-inch thick gravel base. There are eight parking areas totaling 338,750 square feet of paved areas.
- 2210 linear feet of 24 foot wide two-way traffic roadway pavement. 3-inches thick (two 1 ½-inch layers) on a 12-inch thick gravel base.
- 2700 linear feet of 18 foot wide one-way traffic roadway pavement. 3-inches thick (two 1 ½-inch layers) on a 12-inch thick gravel base.
- 5600 linear feet of pedestrian path pavement that is 12 feet wide. Single 2-inch thick bituminous concrete pavement over a 6-inch gravel base.
- Entry paved area. 6,420 square feet of 3-inch thick (two 1 ½-inch layers) over a 12-inch gravel base.
- Driveways for buildings 11 through 17 is 15,600 square feet of 3-inch thick (two 1 1/2–inch layers) bituminous concrete pavement over a 12-inch gravel base.
- Driveways for buildings 53 through 57 is 21,600 square feet of 3-inch thick (two 1 ½-inch layers) bituminous concrete pavement over a 12-inch gravel base.
- As part of the roadway renovation; 50 new catch basins and 1000 linear feet of 18-inch reinforced concrete pipe.
- Topsoil and seeding along the new roadways.
- Guard rails.

2. Pedestrian Traffic

Cost - $1,250,000

- 5600 linear feet of pedestrian path pavement that is 12 feet wide. Single 2-inch thick bituminous pavement over a 6-inch gravel base.
- Topsoil and seeding along travel lane.

3. Site Lighting Package

Cost - $1,200,000

- Maximum spacing between light poles is 40 feet. The number of required poles required for the traffic and pedestrian travel ways will be approximately 250 poles. Each pole includes a pole base, wiring, and light pole fixture.
- An additional 330 light poles will be required for the parking lots.

4a. Miscellaneous Site Work (Repair Brick Retaining Walls, etc.)

Cost - $530,000

Building #1- wall on east and west side of building north face
Walls between Building #3/Building #9/Building #4
Walls between building #3/Building #2/Building #4
Wall along north side of Building #2

- Demolition and removal of existing brick. Based on limited field review the existing foundations will be reused.
- Re-build the retaining walls with new brick.
- Topsoil and seed disturbed areas.

4b. Miscellaneous Site Work (Re-build entire retaining structure)

Cost - $1,650,000

Building #1 – wall on east and west side of building north face
Walls between Building #3/Building #9/Building #4
Walls between Building #3/Building #2/Building #4
Wall along north side of Building #2

- Demolition and removal of existing brick and concrete wall structure including the footing.
- Place a new footing and foundation wall system of reinforced concrete
- Rebuild brick masonry walls on new concrete foundation
- Backfill around new retaining wall
- Topsoil and seed.

b. MEP COST

1. Electrical Infrastructure

Campus-Wide Electrical Infrastructure

Medium voltage loop around campus.
Medium voltage switches at each building.
Medium voltage transformers at each building.
Exterior switchgear at the power plant for medium voltage distribution.
(3) 1000 KVA substation transformers for stepping down voltage on street.
(4) 1000 KW diesel generators with all associated accessories.
Fees to Eversource for new primaries from street.
Total Opinion of Probable Construction Cost **- $3,900,000**

Optional 2 MW Photovoltaic System - $8,000,000

2. Central Plants

A pricing exercise was performed on the mechanical plants proposed in chapter B.3 of the initial reports. Pricing scope for each of the mechanical plants includes all components necessary to create a fully functional campus-wide heating and cooling plant. Scope includes mechanical, electrical, plumbing, and fire protection work. The scope and opinion of probable construction cost for each plant is as follows:

- **Upper Mechanical Plant - Option #1 Geothermal Plant:**
  - Geothermal bore field
  - Electric Chiller-Heaters
  - High efficiency pumps
  - Heating boilers
  - Domestic water boilers
  - Repair of existing steam boiler and installation of new steam boiler
  - Total Opinion of Probable Construction Cost **- $4,600,000**

- **Upper Mechanical Plant - Option #2 Dual Fuel High Efficiency Plant:**
  - Dual fuel condensing boilers
  - Gas driven water chiller
  - Electric water chiller
  - Cooling tower
  - High efficiency pumps
  - Domestic water boilers
  - Repair of existing steam boiler and installation of new steam boiler
  - Total Opinion of Probable Construction Cost **- $2,200,000**

- **Upper Mechanical Plant - Option #3 High Efficiency Conventional Plant**
  - High efficiency condensing boilers
  - Electric water chillers
  - Cooling towers
  - High efficiency pumps
  - Domestic water boilers

- Repair of existing steam boiler and installation of new steam boiler
- Total Opinion of Probable Construction Cost **- $2,100,000**

- **Middle Mechanical Plant - Option #1 Geothermal Plant**
  - Geothermal bore field
  - Electric Chiller-Heaters
  - High efficiency pumps
  - Heating boilers
  - Domestic water boilers
  - Repair of existing steam boiler and installation of new steam boiler
  - Total Opinion of Probable Construction Cost **- $5,200,000**

- **Middle Mechanical Plant - Option #2 Dual Fuel High Efficiency Plant**
  - Dual fuel condensing boilers
  - Gas driven water chiller
  - Electric water chiller
  - Cooling tower
  - High efficiency pumps
  - Domestic water boilers
  - Repair of existing steam boiler and installation of new steam boiler
  - Total Opinion of Probable Construction Cost **- $2,400,000**

- **Middle Mechanical Plant - Option #3 High Efficiency Conventional Plant**
  - Dual fuel condensing boilers
  - Gas driven water chiller
  - Electric water chiller
  - Cooling tower
  - High efficiency pumps
  - Domestic water boilers
  - Repair of existing steam boiler and installation of new steam boiler
  - Total Opinion of Probable Construction Cost **- $2,200,000**

c. HOUSING COST OPINIONS

The architectural cost opinion below for each of the Housing Buildings includes: demolition and new work of interior partitions, doors, exterior windows, floor, ceiling, and wall finishes, cabinetry and appliances, furniture in all rooms shown in the schematic plans. The finishes correlate to the Federal VA CLC Design standards. We also included an allowance for repointing the exterior walls.

For the proposed MEP work, a pricing exercise was performed on Buildings 3, 4, 5, and 50 based on the proposed systems described in chapter B.4. In general, proposed mechanical systems include dedicated outside air, individual heating and cooling for each room, and an advanced building automation system for energy management and system control. Plumbing scope includes all new piping and fixtures for the new pod style housing units. Fire protection scope includes a complete code compliant sprinkler system for each building. Lastly, electrical scope includes all new wiring and lighting for each building.

1. BUILDING 3 – 48 CLC Units

This building was recently reroofed therefore no roofing replacement costs were included in the cost opinion.

BUILDING 3	
ARCHITECTURAL	$4,461,609.00
MEP	$7,920,000.00
STRUCTURAL	$720,000.00
SUBTOTAL	$13,101,600.00
OH&P 13%	$1,703,200.00
CONTINGENCY 25%	$3,701,200.00
TOTAL	**$18,506,000.00**

2. BUILDING 4 – 36 CLC Units

This building was recently reroofed therefore no roofing replacement costs were included in the cost opinion.

BUILDING 4–	
ARCHITECTURAL	$3,383,700.00
MEP	$7,920,000.00
STRUCTURAL	$720,000.00
SUBTOTAL	$12,023,700.00
OH&P 13%	$1,563,100.00
CONTINGENCY 25%	$3,396,000.00
TOTAL	**$16,982,800.00**

3. BUILDING 5 – 108 CLC Units

The cost opinion for this building includes the demolition of the rear (north) portion of the building, the reroofing of the remaining portion, and the construction of additional space at the Fifth Floor

BUILDING 5	
ARCHITECTURAL	$16,847,000.00
MEP	$14,653,000.00
STRUCTURAL	$900,000.00
SUBTOTAL	$32,400,000.00
OH&P 13%	$4,212,000.00
CONTINGENCY 25%	$9,153,000.00
TOTAL	**$45,765,000.00**

4. BUILDING 50 – 58 CLC Units

This building was recently reroofed therefore no roofing replacement costs were included in the cost opinion. A second elevator was included to enhance functioning of the residential pods in accordance with Federal guidelines.

BUILDING 50	
ARCHITECTURAL	$4,251,500.00
MEP	$5,328,000.00
STRUCTURAL	$300,000.00
SUBTOTAL	$9,879,500.00
OH&P 13%	$1,284,300.00
CONTINGENCY 25%	$2,791,000.00
TOTAL	**$13,954,800.00**

:

Chapter C.1
Bibliography

FINAL REPORT

Date: May 9, 2016

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a. BIBLIOGRAPHY

- Existing Plans provided by DCS
- Staff interviews conducted on site
- Resident interviews conducted on site
- 2005 Buildings Condition Survey performed by Friar Associates Architects
- 2011 Strategic Restoration Plan for the Department of Veterans Affairs Rocky Hill Campus prepared by Joseph T. Perkins, Deputy Commissioner DVA
- 2014 Veterans Home at Rocky Hill: Residential Services, prepared by Legislative Program Review and Investigations Committee, Connecticut General Assembly.
- 2015 ADA Survey of Buildings 2,3,4 and 50 performed by Geddis Associates, Architects

b. VA SPACE PLANNING CRITERIA

- Department of Veterans Affairs Office of Construction and Facilities Management - June 2011 Community Living Centers Design Guide - available online.

c. CENTRAL STEAM CONSUMPTION

- See attached.

d. OUTSIDE ORGANIZATIONS ON THE CAMPUS

Building 7 - 1st floor - VFW
Ron Rusko 860-616-2363
Rich Difrederico 860-616-2360
Lee Wilson 860-616-2365

Building 7 - 2nd floor - American Legion
Everett Shepard 860-436-9986
Jennifer Theobault
Allison Wood

Building 51 - American Legion Aux.
Doris Lafontaine 860-616-2368

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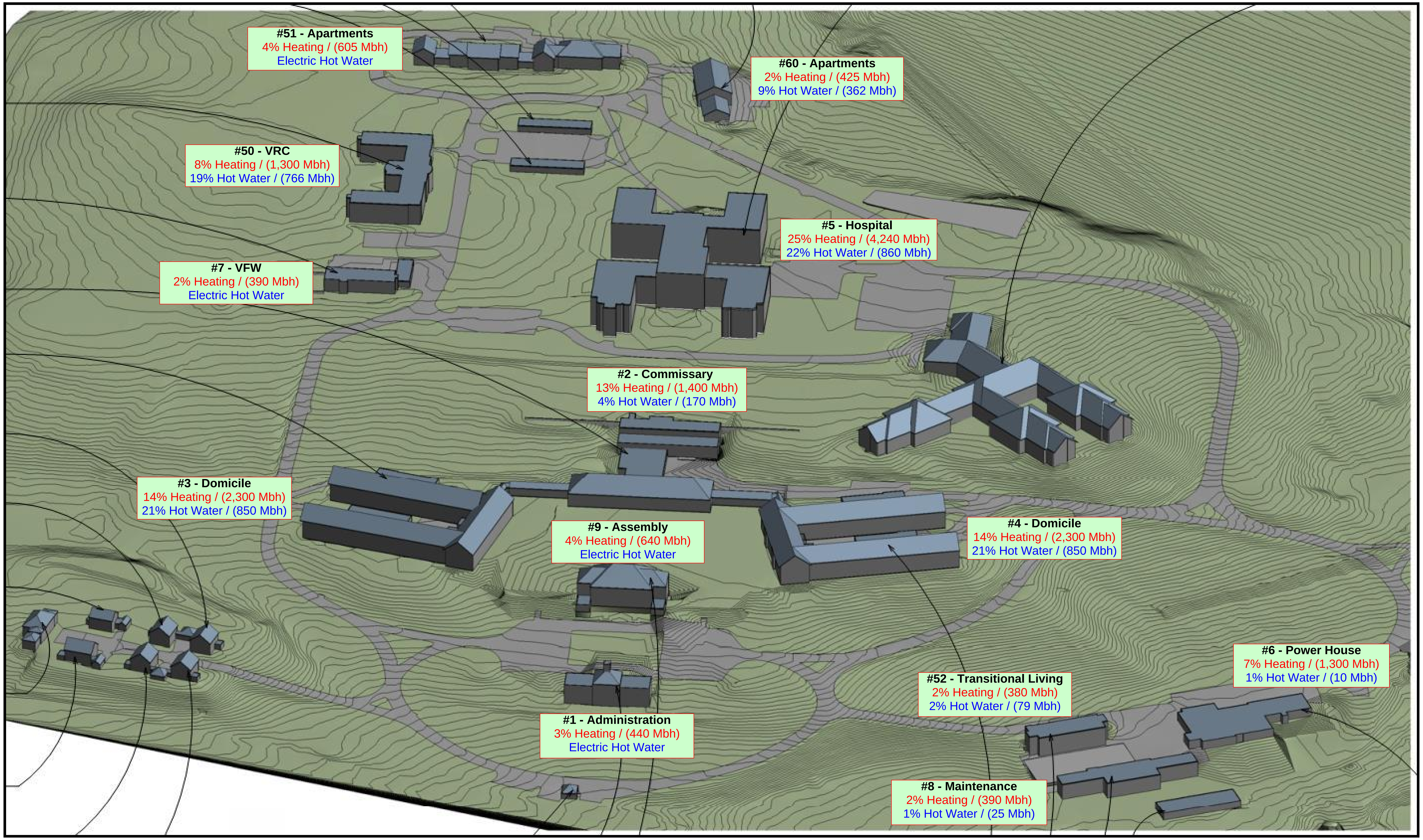
Date: 8/10/2015
Consulting Engineering Services
Job: 2015034
Rocky Hill VA Utility Consumption   OA Temp   0

		Low Pressure Steam (Heating)											
Building Number	Building Name	Heated Floor Area (sf)	Roof Area (sf)	Window Area (sf)	Net Wall Area (sf)	Conduction Heat Load (BTU)	Inflitration (CFM)	Misc. Heat (#/Hr)	Ventilation Heat Load (BTU)	Total Heat Load (BTU)	Check BTU/SF	LP Steam Draw (#/hr) at 7 PSI	% of LP Steam Used
1	Administration	9,780	4,220	3,072	6,084	394,909	450	-	33,048	427,957	44	389	3%
2	Commisary	59,730	24,000	2,074	17,150	812,085	7,650	756	561,816	1,373,901	23	2,005	13%
3	Domicile	75,000	29,000	7,820	41,950	1,776,675	6,300	-	462,672	2,239,347	30	2,036	14%
4	Domicile	75,000	29,000	7,820	41,950	1,776,675	6,300	-	462,672	2,239,347	30	2,036	14%
5	Hospital	200,000	40,000	20,305	79,427	3,550,038	7,800	-	572,832	4,122,870	21	3,748	25%
6	Power House	24,780	13,200	4,958	16,626	858,803	5,000	-	367,200	1,226,003	49	1,115	7%
7	VFW	7,207	3,600	2,399	4,891	315,300	900	-	66,096	381,396	53	347	2%
8	Maintenance	15,560	6,670	1,088	8,488	335,441	600	-	44,064	379,505	24	345	2%
9	Chapel & Assembly	15,030	7,500	2,376	14,523	557,113	900	-	66,096	623,209	41	567	4%
10	Gate House	-	no steam							-		-	0%
11	Residence	-	no steam							-		-	0%
12	Residence	-	no steam							-		-	0%
13	Residence	-	no steam							-		-	0%
14	Residence	-	no steam							-		-	0%
15	Residence	-	no steam							-		-	0%
16	Residence	-	no steam							-		-	0%
17	Residence	-	no steam							-		-	0%
20	Grounds Shop	-	no steam		-					-		-	0%
44	Garage	-	no steam		-					-		-	0%
49	Garage	-	no steam		-					-		-	0%
50	VRC	42,745	12,363	4,623	26,177	1,012,528	3,750	-	275,400	1,287,928	30	1,171	8%
51	Apartments	19,300	9,650	1,488	12,336	480,323	1,500	-	110,160	590,483	31	537	4%
52	Transitional Living	12,150	4,020	1,026	8,956	304,268	900	-	66,096	370,364	30	337	2%
60	Apartments	12,961	4,937	1,300	8,780	332,637	1,125	-	82,620	415,257	32	378	3%
		569,243							3,170,772	15,677,566	34	15,008	100%
											24 hour day:	**360,200**	
											Hourly Rate	**15,008**	

	Med Pressure Steam (Domestic)													Cooling	
Building Number	Lavs (qty.)	Load (GPH) 140°F	Showers (qty.)	Load (GPH) 140°F	Kitchen Sink (qty.)	Load (GPH) 140°F	Washing Machine (qty.)	Load (GPH) 140°F	Total Load (GPH) 140°F	Total Load (GPM) 140°F	Total Heat Load (BTU)	MP Steam Draw (#/Hr) at 60 PSI	% of MP Steam Used	Cooling Load (SF/Ton)	Cooling Load (Ton)
1	0	8	0	75	0	30	0	28	-	-	-	-	0%	400	24.45
2	13	8	0	75	12	30	0	28	206	3	171,667	145	4%	400	149.33
3	77	8	46	75	0	30	0	28	1,017	17	847,083	718	22%	400	187.50
4	77	8	46	75	0	30	0	28	1,017	17	847,083	718	22%	400	187.50
5	351	8	11	75	6	30	11	28	984	16	820,042	695	21%	400	500.00
6	6	8	0	75	0	30	0	28	12	0	10,000	8	0%	400	61.95
7	0	8	0	75	0	30	0	28	-	-	-	-	0%	400	18
8	15	8	0	75	0	30	0	28	30	1	25,000	21	1%	400	39
9	0	8	0	75	0	30	0	28	-	-	-	-	0%	400	38
10	0	8	0	75	0	30	0	28	-	-	-	-	0%		
11	0	8	0	75	0	30	0	28	-	-	-	-	0%		
12	0	8	0	75	0	30	0	28	-	-	-	-	0%		
13	0	8	0	75	0	30	0	28	-	-	-	-	0%		
14	0	8	0	75	0	30	0	28	-	-	-	-	0%		
15	0	8	0	75	0	30	0	28	-	-	-	-	0%		
16	0	8	0	75	0	30	0	28	-	-	-	-	0%		
17	0	8	0	75	0	30	0	28	-	-	-	-	0%		
20	0	8	0	75	0	30	0	28	-	-	-	-	0%		
44	0	8	0	75	0	30	0	28	-	-	-	-	0%		
49	0	8	0	75	0	30	0	28	-	-	-	-	0%		
50	58	8	38	75	0	30	13	28	865	14	720,750	611	19%	400	107
51	0	8	0	75	0	30	0	28	-	-	-	-	0%	400	48
52	10	8	4	75	0	30	0	28	95	2	79,167	67	2%	400	30
60	28	8	15	75	0	30	14	28	376	6	313,708	266	8%	400	32
									4,601	77	3,834,500	3,250	100%		
											16 hour day:	**51,993**			



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