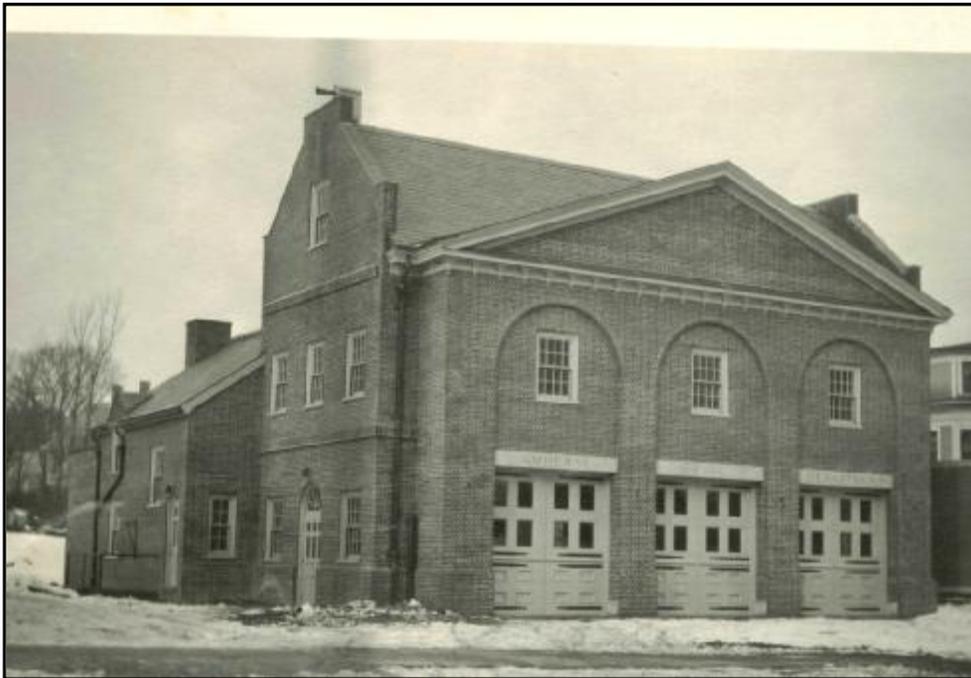


Fire Station Site & Building Assessment Work Amherst, MA

Revised
August 25, 2006



Prepared for

**AMHERST FIRE STATION
STUDY COMMITTEE**

Prepared by



CAOLO & BIENIEK ASSOCIATES, INC.

Architecture Planning Interior Design

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Part 1 – Introduction

1.1 – Study Objectives & Scope of Work

1.1.1 – Background & Study Objectives

“Utilizing the national standards for EMS (emergency medical services) and fire responses, determine if Amherst needs two or three staffed fire stations to meet these objectives, and report on possible locations of a new or several station(s).” – Committee charge from Town Manager Barry Del Castillo

This study is intended to provide facts and figures to enable the Fire Station Study Committee and the Town of Amherst to generate recommendations and make decisions respecting accommodation strategies for the Amherst Fire Department future fire service.

1.1.2 – Scope of Work

The scope of services for this report is based on the March 2006 Request for Proposals published by the Amherst Fire Station Study Committee. The scope of work can be summarized as follows:

- Evaluate the existing Fire Headquarters – determine its existing condition and provide various options and costs to address facility shortcomings, including the physical and moral impact of inefficient facilities, health & safety and accessibility issues.
- Review feasibility of renovating the existing headquarters fire station to remain the department’s headquarters. Review to include structural, utilities and code analysis.
- Review feasibility of renovating the existing headquarters fire station and convert the facility to a sub station. Review to include structural, utilities and code analysis.
- Identification and analysis of potential sites for a new sub station in South Amherst. Analysis to include environmental concerns, public utilities, building siting and traffic pattern issues.
- Identification and analysis of potential sites for a new headquarters station in South Amherst. Analysis to include environmental concerns, public utilities, building siting and traffic pattern issues.
- Identification and analysis of potential sites for a new headquarters station in central Amherst. Proposed site to be no farther than 1-1/2 miles from the Town Center. Analysis to include environmental concerns, public utilities, building siting and traffic pattern issues.
- Develop construction cost estimates and total project cost models for each option. Cost models to include potential operational costs associated with new and/or renovated facilities.
- Present formal options to Study Committee and Select Board.

1.1.3 – Study Options

Three options were studied as part of this report and include the following:

Option I: *(Original Fire Station Study Committee Option #1)*

- IA - Renovate the existing fire station headquarters
- IB – Construct a new fire station sub station in South Amherst

Option II: *(Original Fire Station Study Committee Option #2)*

- IIA - Renovate the existing fire station headquarters and convert into a sub station
- IIB – Construct a new fire station headquarters in South Amherst

Option III: *(Original Fire Station Study Committee Option #4)*

- IA – Decommission the existing fire station headquarters
- IB – Construct a new fire station headquarters outside of the downtown district toward south Amherst

Original Fire Station Study Committee Option #3 which included decommissioning of Central Station, keeping North Station and building two new stations was not pursued as part of this study.

1.1.4 – Study Participants

The following people participated in this study through regular progress meetings and workshop sessions:

Study Steering Committee:

- Fire Station Study Committee
- Town of Amherst GIS Administrator – Michael Olkin
- Town of Amherst Planning Department – Niels la Cour
- Fire Department – Fire Chief Keith Hoyle

Consultants:

- Caolo & Bieniek Associates, Inc. – Jim Hanifan
- Berkshire Design Group – Rick Klein
- Robt. W. Hall Consulting Engineering, Inc. – Sandy Lake
- A. M Fogarty & Associates, Inc. – Peter Timothy
- R. J. Greeley Company, LLC – Frank Fitzgerald

1.1.5 – Study Limitations

Disclaimer – limit of liability: This study is intended to provide an overview of the issues, opportunities and alternatives that are available to the Town of Amherst to meet accommodation requirements for fire department services in the town as described above. We have engaged the services of several specialist consultants to provide professional opinions on various aspects of the study. These opinions and those of Caolo & Bieniek Associates, Inc. are based on the anticipated scope of work and level of detail for a study of this type. Our findings are not intended to be exhaustive and all-inclusive, but rather to present in general terms the issues and alternatives available to the Town of Amherst, to facilitate decisions on accommodation strategies for its two primary Fire Department services.

Part 2 – Fire Department Facilities

2.1 – Existing Facilities

2.1.1 – Fire Department Facility Overview

The existing Fire Department consists of two facilities, a headquarters building located in downtown and a sub station located in the north section of Amherst. Each station is equipped to respond to various fire emergencies and EMS (emergency medical services) emergencies. Response to medical emergencies is performed by the EMS staff while response to general alarms is achieved through three forces of the fire department. These include employees or “career” fire fighters, volunteer staff or “Call” fire fighters and student fire fighters. Each of the three forces are assigned their own equipment and apparatus.

2.1.2 – Existing Facilities - Headquarters

Building General

The existing downtown headquarters was originally constructed in 1929 with a later one story garage addition constructed on the rear of the building. This addition has since been converted into office space and functions as the Business and Chief’s Office. The 77 year old structure is in fair to good condition but is in need of major renovations to meet the fire department’s program needs and serve as a fire station for the next decades. The major renovations needed include:

1. Apparatus space: The present three bay configuration does not provide sufficient horizontal and vertical clearances for modern fire fighting apparatus. Equipment is moved in and out of the building daily with inches of clearance at the overhead door and masonry walls. It is recommended that renovations include changing the bay configuration to a two bay system along

North Pleasant Street with a third bay on the side of the building. In addition, the existing concrete floor slab would be lowered to provide necessary vertical clearance.

2. Demolition/Addition: Due to the limited site area, demolition of the one story section of the building which once served as garage space is recommended to allow for additional program space. This section of the building presently houses the Chief's Office, Business Office, general storage and ambulance/supply storage. A three level addition consisting of a basement, first floor and second floor would be constructed in the same area to provide the additional program space needed for reuse of the structure as detailed in Options 1 and 2.
3. Renovations: Renovations throughout the remaining structure will include gutting the partition walls and finishes back to the masonry structure to create the new layouts per the program and install new building systems.

Structural Conditions: (see Johnson & Seaman Engineering, Inc. report attached)

The existing building consists of a masonry interior and exterior load bearing walls. A steel frame supports the sloped gable roof. Steel supports run through the attic at various heights supporting the roof which leave unusable space other than storage. The existing concrete floor slab in the apparatus bays spans over a small basement and crawl space at the perimeter of the building. This slab is cracked at the crawl space locations and requires significant repairs to support heavy fire department equipment. The apparatus bay structure is a clear span to the building exterior walls and encased steel columns. Interior partition walls are a mix of original masonry and renovated wood framing.

In addition to program renovations, seismic up-grades will be required in the large scale renovations to the building. The addition of shear walls and anchoring the exterior walls to the floor slabs to create a diaphragm will be needed. Diagonal steel cross bracing would also be a consideration at existing steel columns.

Existing HVAC Conditions.

The existing boiler is a Weil McLain cast iron steam boiler. Boiler output is rated at 562 MBH. The oil fired Carlin burner appears to be recently installed. The existing condensate receiver and pump are manufactured by Hoffman Watchman.

The boiler has some evidence of corrosion on the boiler jacket. Boiler was not on at the time of our inspections, but personnel at the site indicated no major problems with the boiler plant. Steam traps located in the boiler room are of various ages with some appearing to be recently replaced.

Two fuel oil storage tanks are located adjacent to the boiler room. These tanks appear to be in good condition with no indication of corrosion. Vent and fill connections to the tanks appear to be code compliant. Fuel oil piping from the tanks to the boiler appears to be in good condition and installed in a proper manner.

There are no code required combustion air openings in the boiler room.

Heating for the Apparatus Bays is provided with a ceiling mounted, vertical discharge unit heater. Ventilation for the Apparatus Bays is provided by a wall mounted fan with a manual switch located at the entrance to the Bays. The fan does not have sufficient capacity to meet the code requirement of 1.5 cfm of outdoor air per square foot for ventilation of enclosed parking areas.

Additional exhaust is provided for the vehicles by a Plymovent vehicle exhaust capture system.

Heating for the offices and the staff rooms is provided by two pipe steam cast iron radiators. A central thermostat is located in the main circulation area outside of the bedrooms. Individual heating controls consist of a manual valve on some of the radiators. Air conditioning is provided by window units in each room. There is no mechanical ventilation to any of the rooms.

Heating for the offices located in the building addition is provided by electric resistance baseboard. Baseboard in each room is controlled by a wall mounted thermostat. Air conditioning is provided by window units in each room. There is no mechanical ventilation to any of the rooms.

Recommended HVAC

The existing heating plant is nearing the end of its useful life and should be replaced if the building is to be kept in operation. The boiler plant is not large enough to support any expansion of the building. We

recommend replacing the existing steam boiler with new high efficiency gas fired boilers. These boilers can be sized to support any building additions and the addition of ventilation air that would be required for any renovations of the office and staff rooms.

Combustion air for the boilers will be required, either by gravity through wall louvers or directly to the boilers for sealed combustion equipment. The type of combustion air will depend on the type of heating equipment installed.

Apparatus Bay ventilation is not sufficient, and should be upgraded to be code compliant. We recommend an air to air heat exchanger to provide ventilation, while offsetting the cost of heating the ventilation air during the winter months. Installation of a new ventilation system in the existing structure will be difficult due to the extremely tight clearances between the ceiling equipment and the trucks parked in the building. Additionally, a gas detection system to detect unsafe levels of carbon monoxide from gasoline engines and nitrous dioxide from diesel engines should be installed.

Central air conditioning systems for the offices and the staff rooms are recommended. Packaged rooftop units would provide all heating, cooling and ventilation required for these spaces.

Existing Electrical Conditions.

The existing electric service is 200 Amperes, 120/208Volt, 3-phase, 4-wire. This service is run underground from WMECO manhole to duct box in basement to a 225 Ampere main lugs only distribution panel. This panel feeds all of the various electric panels located throughout the building in addition to the emergency generator. Located on the same wall as the electrical distribution, is the emergency generator transfer switch and the emergency panel.

The existing emergency generator is located in a separate room in the basement. This generator is rated 15Kw, 3-phase, 4-wire, 120/208Volt. It has an additional manual transfer switch in this room.

The existing lighting throughout has been retrofitted to T5 & T8 technology with electronic ballasts. In the majority of offices this lighting level is sufficient, but in most other areas is not adequate for the tasks to be performed.

There is a lack of sufficient receptacles throughout the facility.

The fire alarm control panel is an EST2 addressable system that is relatively new.

Recommended Electrical

Provide new underground electric service. Service shall be a minimum of 400 Amperes, 120/208Volt, 3-phase, 4-wire with new main distribution panel, feeders and reconnection of existing panels and new loads.

A new 30Kw emergency generator is being installed on an exterior concrete pad by the owner in the immediate future. In conjunction with this generator is an automatic transfer switch. This is being installed as a replacement to the existing 15Kw generator described above. If this is to be a "true" emergency generator and not a standby generator, then the room that the automatic transfer switch and emergency panel(s) will be located in must be 2-hour rated with no "foreign" objects present as required by the Massachusetts Electric Code. If this generator is being classified as a standby generator, then this room is not required to be 2-hour rated.

Install new lighting fixtures in all areas being renovated and in areas where no new work is planned, but lighting level is below the recommendations of IES. Provide emergency illumination (including exit lights) as required by code.

Provide ample receptacles for general use and as required for equipment requiring dedicated circuits.

Provide additional initiating and signaling devices, carbon monoxide detectors, etc. connected to the existing EST2 fire alarm control panel as required by NFPA and AHJ.

Accessibility (Massachusetts Architectural Access Board & Americans with Disabilities Act)

The Massachusetts Architectural Access Board requires that existing facilities that are undergoing renovations of 25% or more of the assessed value of the building be brought into compliance with this

code. The extent of handicap accessibility in the present facility is that the Business and Chief's Offices are located on the ground floor. As a fire department headquarters, the existing facility would be required to be fully handicap accessible for employees and public use. Up-grades would include accessible parking spaces, entrances, new doors & hardware, the addition of an elevator serving all levels, accessible toilet rooms, accessible kitchen facilities and signage. As a fire department sub station, renovations would include handicap access into the building and to an accessible toilet room for public use at a minimum. Variances from full compliance of an existing building with minimal public use can be reviewed with the Massachusetts Architectural Board.

All new buildings, both headquarters and sub stations, would be designed for full compliance with the Massachusetts Architectural Access Board & Americans with Disabilities Act.

Site & Parking

The current site occupied is comprised of two parcels – totaling around 9,030 sq.ft. (0.2 acres). Twelve parking spaces are available for Fire Department staff and department vehicles, however, none are designated for handicap accessibility. The current apparatus bay apron is minimally sufficient in size to accommodate a responding aerial apparatus leaving the facility and turning on North Pleasant Street. The slope of the apron will accommodate the proposed lowering of the apparatus bay floor elevation.

The size of the present headquarters site is the limiting factor for options of reuse for a fire station facility. The program for either a headquarters or sub station requires a minimum of 50% of the building to be located on grade. The required number of parking spaces for the facility may also require an exemption or variance from the Town.

2.1.3 – Existing Facilities – North Station

Although this facility is not part of the physical building analysis of the study, the overall operations and program were reviewed for an understanding of the Amherst Fire Department.

The existing North Station is a modern sub station facility which houses the student component of the Amherst Fire Department. The structure appears to be designed to provide sufficient spacing for staff and apparatus; however, the facility is also housing the overflow material of the department. Overflow fire fighting equipment is stored in the aisle of the apparatus bays and several pieces are stored outside in tents on land not owned by the Town.

2.2 – Present Staffing & Inventory

2.2.1 – Staffing

Total Fire Department Staffing currently housed at the Central and North Fire Stations:

1 Chief	1 Chaplin (part of Call Force)
2 Assistant Chiefs	22 Call Force Fire Fighters
1 Fire Prevention Officer	36 Volunteer Firefighters
8 Captains	
32 Fire Fighters	
1 Business Officer	

2.2.2 – Apparatus & Equipment Inventory

Current number and size of apparatus and equipment housed at the Central Station:

#	Vehicle	Label	Size
2	Pumpers	E-1, E-2	32' 0" L x 9' 9" W x 9' 6" H
2	Ambulance	A-11&12	24' 6" L x 9' 0" W x 9' 6" H
1	Heavy Rescue	Rescue	32' 0" L x 8' 0" W x 10' 0" H
1	Fire Prevention Car	X-2	15' 0" L x 6' 0" W x 5' 0" H
1	Officer Car	X-1	15' 0" L x 6' 0" W x 5' 0" H

Current number and size of apparatus and equipment housed at the North Station:

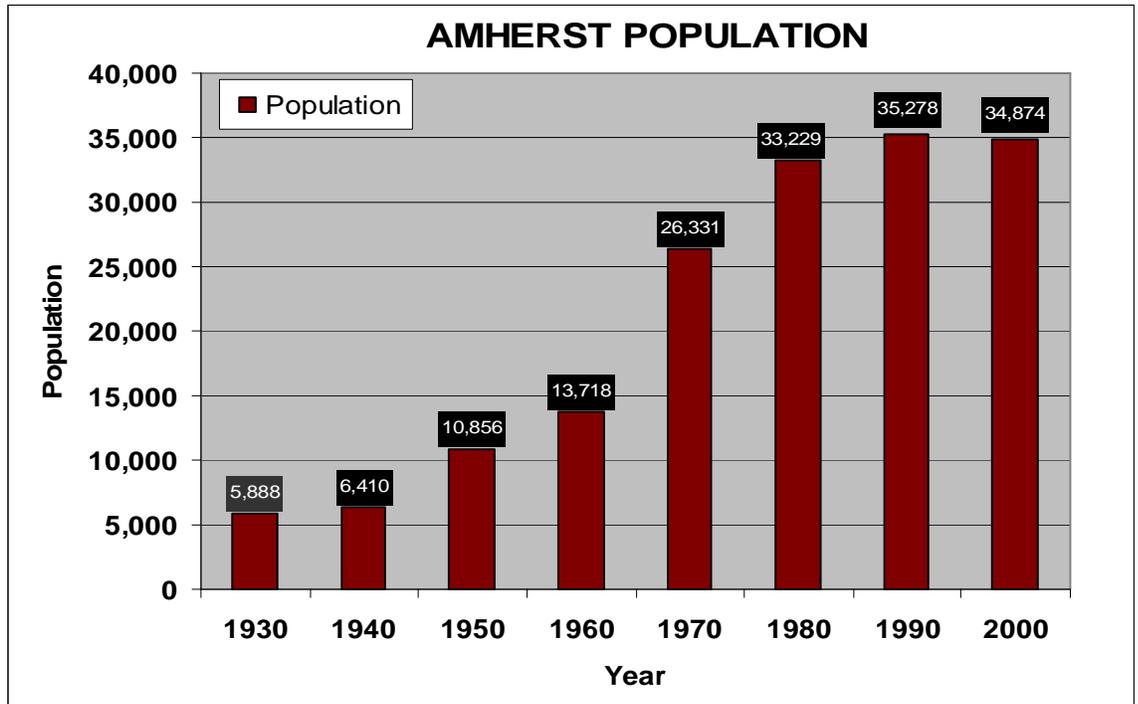
#	Vehicle	Label	Size	Equipment Outside
4	Pumpers	E3-E6	32' 0" L x 9' 9" W x 9' 6" H	1 parked outside in a tent
3	Ambulance	A13-16	24' 6" L x 9' 0" W x 9' 4" H	
1	Aerial Ladder Apparatus	L-1	48' 0" L x 10' 0" W x 12' 0" H	
1	Pick-up Truck	R-3	16' 0" L x 6' 0" W x 6' 0" H	
1	Brush Truck	R-1	18' 0" L x 6' 6" W	Parked outside in a tent
1	Van	X-3	18' 0" L x 6' 6" W x 6' 6" H	Parked outside in a tent
1	Officer Car	X-4	15' 0" L x 6' 0" W x 5' 0" H	Parked outside
1	Pick-up Truck	X-5	16' 0" L x 6' 0" W x 6' 0" H	Parked outside
1	Stake Body Truck	X-6	16' 0" L x 6' 0" W x 6' 0" H	Parked outside
1	Gator/Snowmobile Trail	Gator	12' 0" L x 6' 0" W	Parked outside in a tent
1	DECON Trailer	DECON	16' 0" L x 6' 6" W	Parked outside
1	SAFE Trailer	SAFE	16' 0" L x 6' 6" W	Parked outside
1	Trailer	MCI/EMS	16' 0" L x 6' 6" W	Parked outside
1	Boat	Boat	14' 0" L x 6' 0" W	Parked outside
1	Box Storage Trailer	N/A	30' 0" L x 6' 0" W	Remain outside
1	Tanker	T-1	18' 0" L x 6' 6" W x 7' 0" H	

Part 3 – Facility Requirements

3.1 – Land Use & Population

3.1.1 – Population & Service Demand

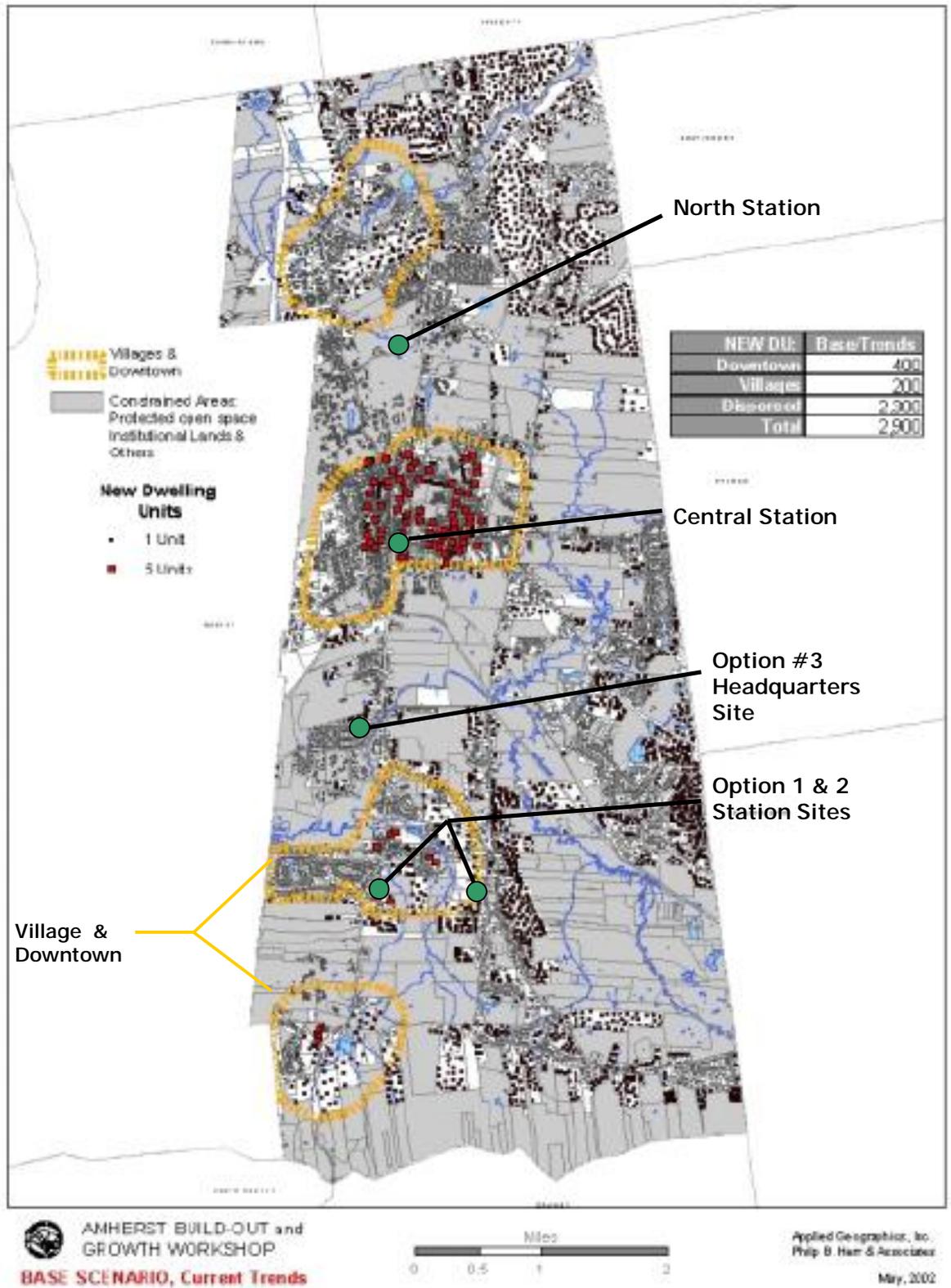
The land use in the Town of Amherst includes a mixed use of housing, business, college use, protect conservation land and unprotect/agricultural/forest land. Present population is estimated at 34,874 based on 2000 figures provided by the Planning Department. The Town of Amherst is presently anticipating a fall completion of a master plan project which will up-date census information. The chart below details the population changes back to the original construction of the Central Station.



Future land development and growth are projected as follows:

1. College/Secondary Education facilities – renovations & new construction
2. Downtown – renovations
3. Housing – new construction concentrated in “villages” in north, central & south Amherst - See attached plan from the Amherst Build-Out and Growth Workshop

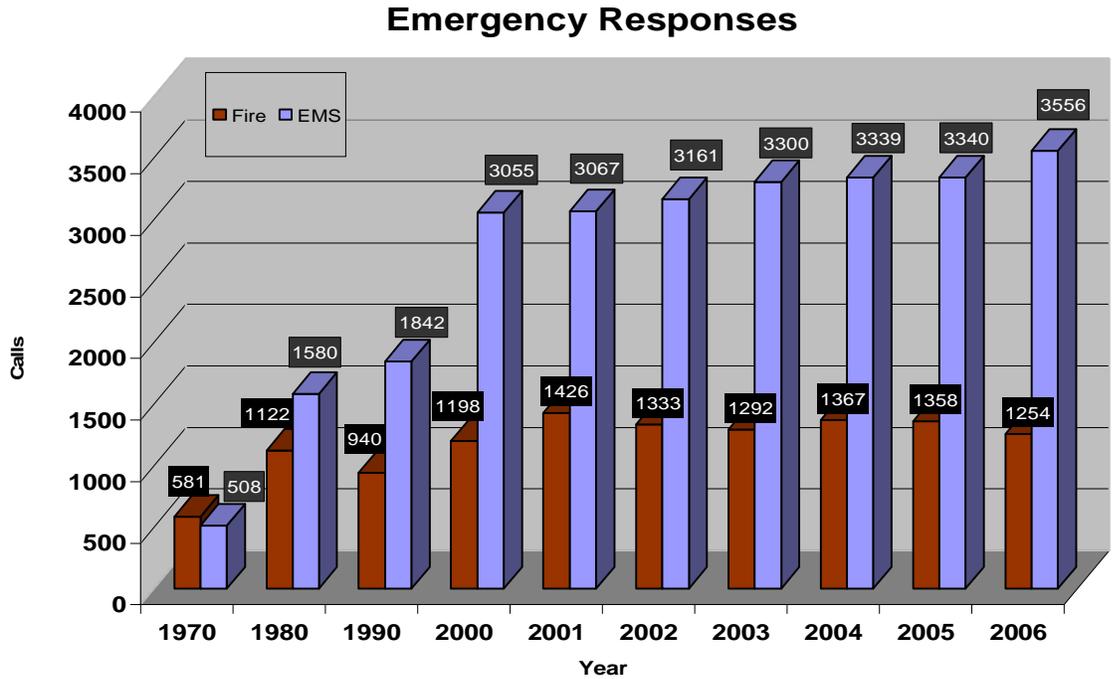
The Amherst Build-Out Analysis and Future Growth Study date October 2002 produced the following graphic indicating the areas of anticipated new dwelling unit construction. The “Base Scenario” indicated shows significant growth in the north, south and downtown area.



3.2 – Fire Services in Amherst

3.2.1 - Calls for Service

The Amherst Fire Department answers an increasing number of fire and EMS calls each year.



3.2.2 – Response Time

At the time of this report, the Commonwealth of Massachusetts does not dictate a minimum response time for fire or EMS services. Federal guidelines from NFPA and the American Medical Association are accepted by the industry to set the guidelines. The Commonwealth of Massachusetts is presently requiring that all municipalities establish and approve an EMS response time for their City or Town under the “Service Zone Planning Act”. Response time is determined by the following:

$$\text{Total Response Time} = \text{Dispatch Time} + \text{Turnout Time} + \text{Travel Time} + \text{Setup Time}$$

Current NFPA guidelines require the following:

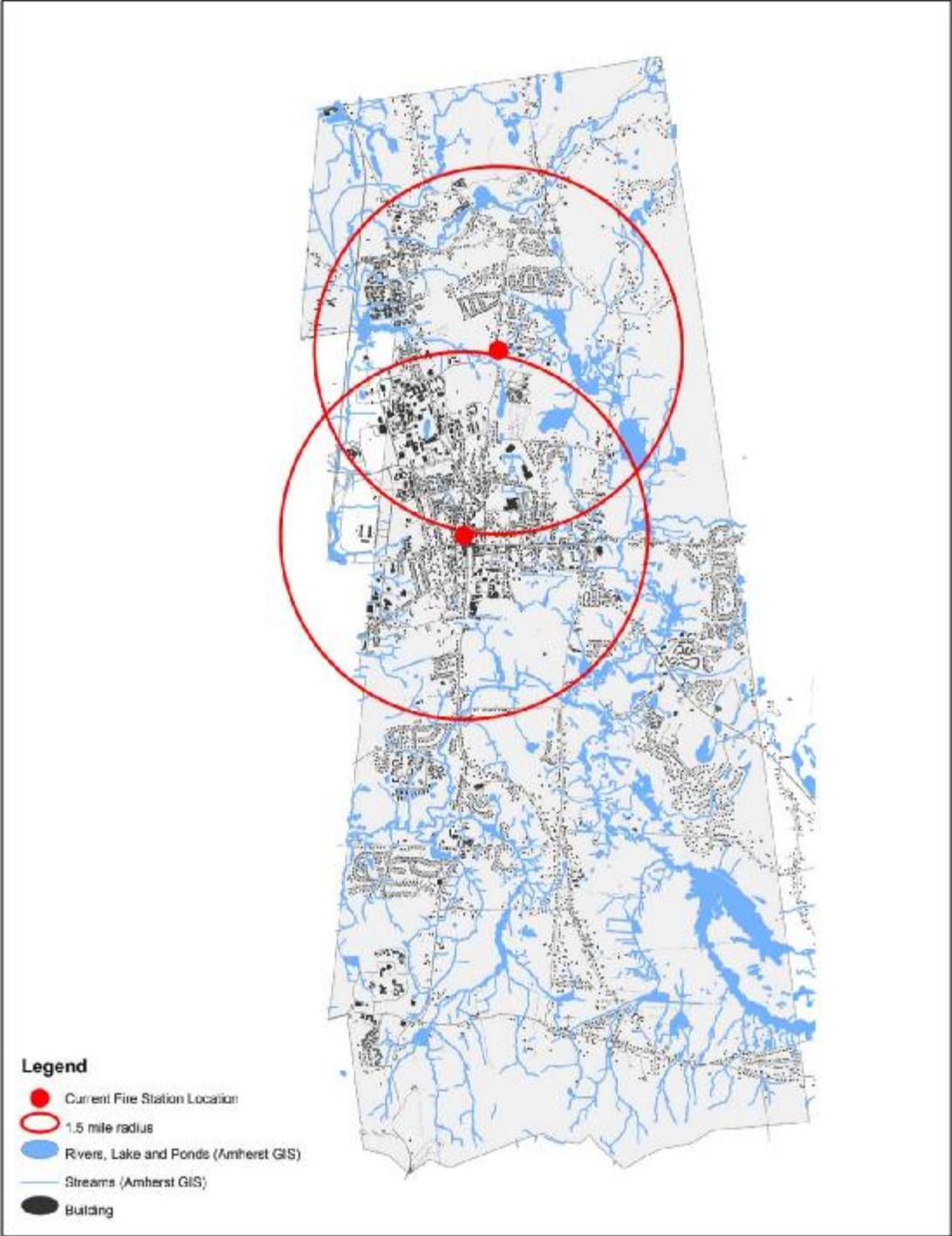
- First two pumper apparatus be located within 1.5 miles of the central business district.
- Ladder apparatus are required to be located within 2.5 miles of a central business district.
- Pumper apparatus response time is to be 6 minutes or less.
- Ambulance to cardiac arrest or anaphylactic shock response time is 4 minutes.

The present location of the headquarters and north sub station provides sufficient coverage for both fire and EMS calls in the downtown or central business district. These two stations also provide suitable response times in the north, east and west.

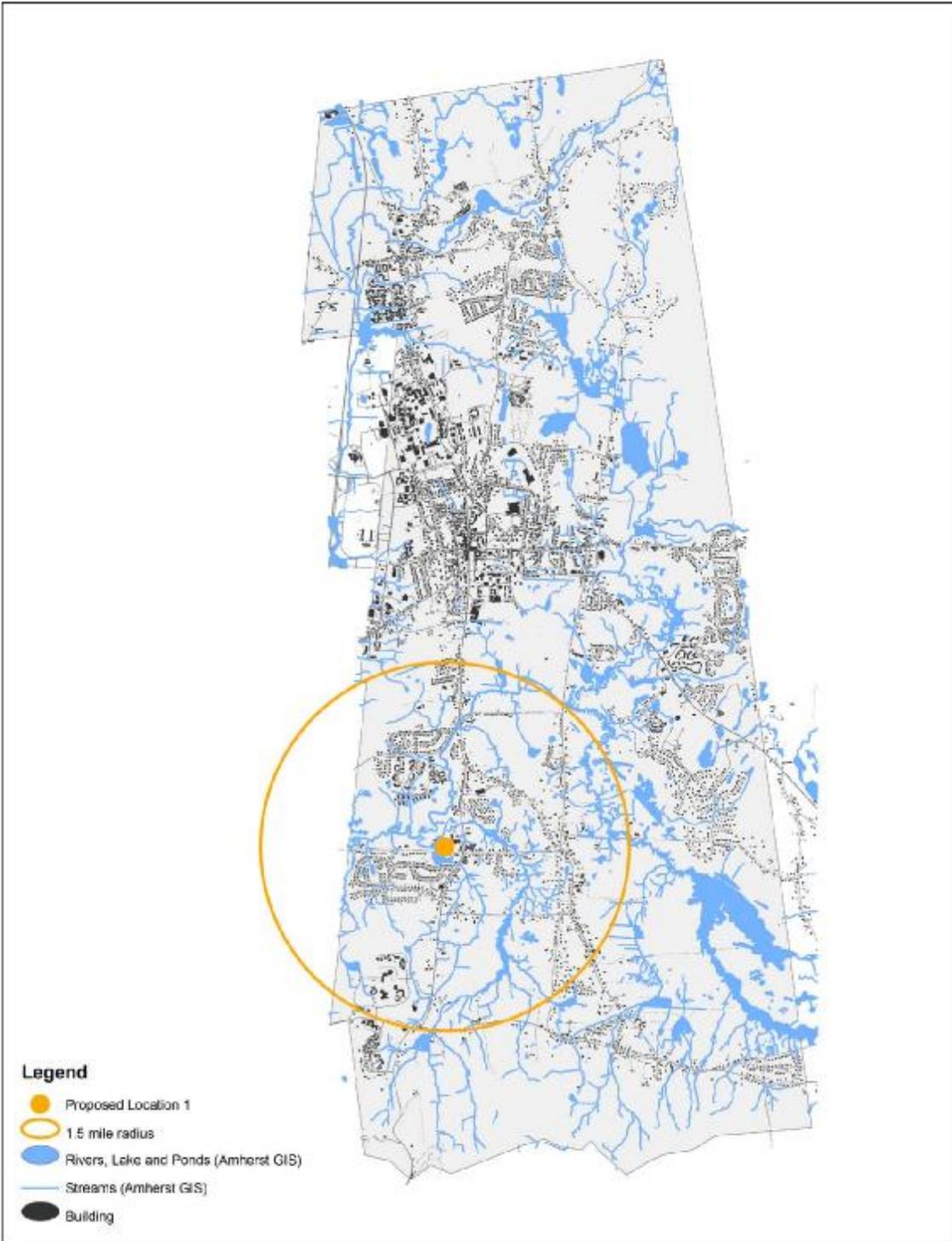
Response times within the guidelines described above are not possible to the majority of the densely populated areas in South Amherst. This is primarily due to the geographical location of the existing headquarters and the sub station in relationship to South Amherst. The physical distance needed to be traveled from the closest station (present headquarters) to Bay Road of South Amherst exceeds four miles. In addition, topography, low clearance bridges, reduced road widths and recently added speed bumps reduce “travel time”.

The graphic below indicates the present location of the Central & North Station. A 1.5 mile radius has been extended from each of the stations to represent a general area that can be within an acceptable response time. Graphic illustrations are also included representing the areas recommended for new facilities under each option.

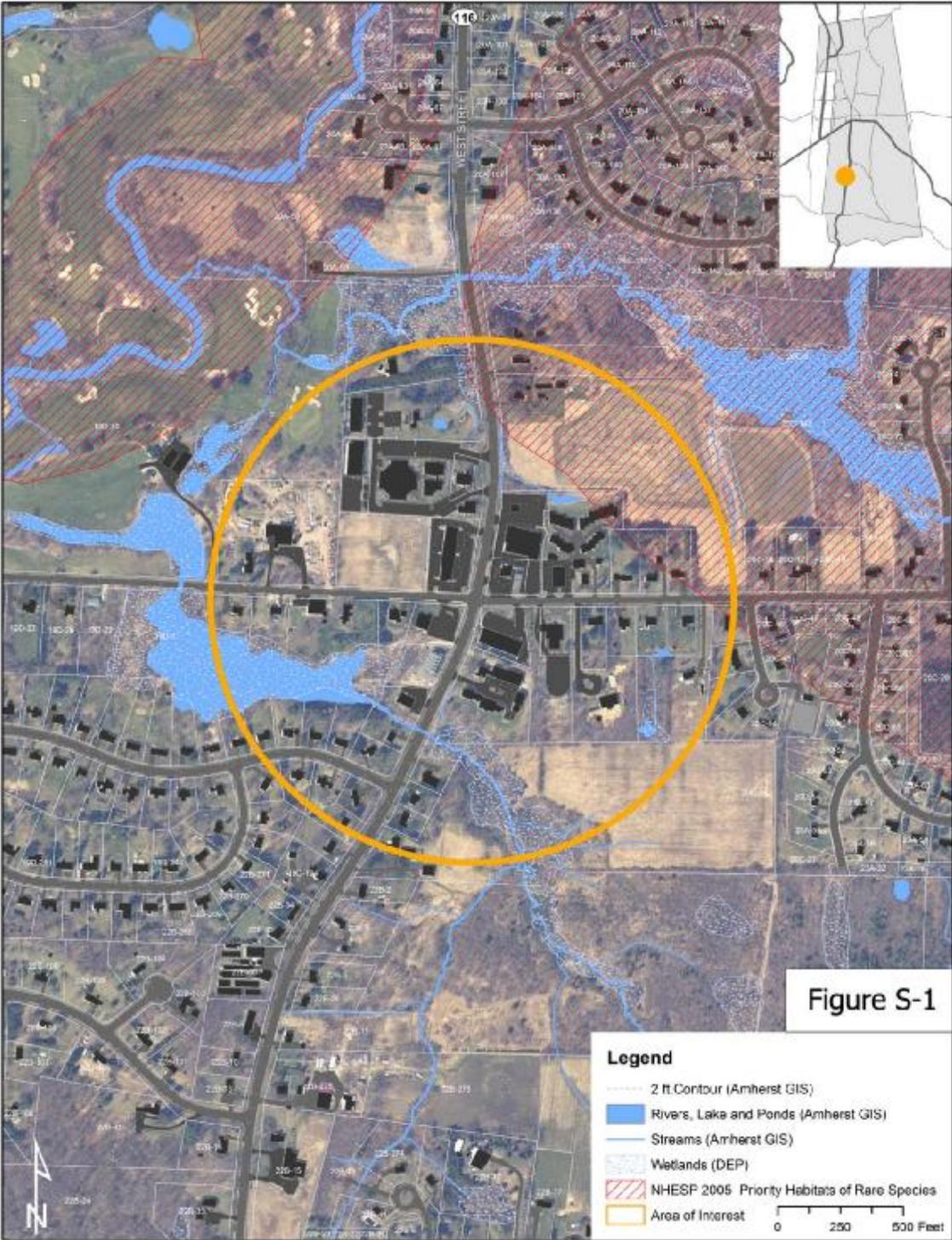
Generic locations are purposely indicated to allow the Town of Amherst the ability to negotiate with several land owners to achieve the location and best value for a new facility.

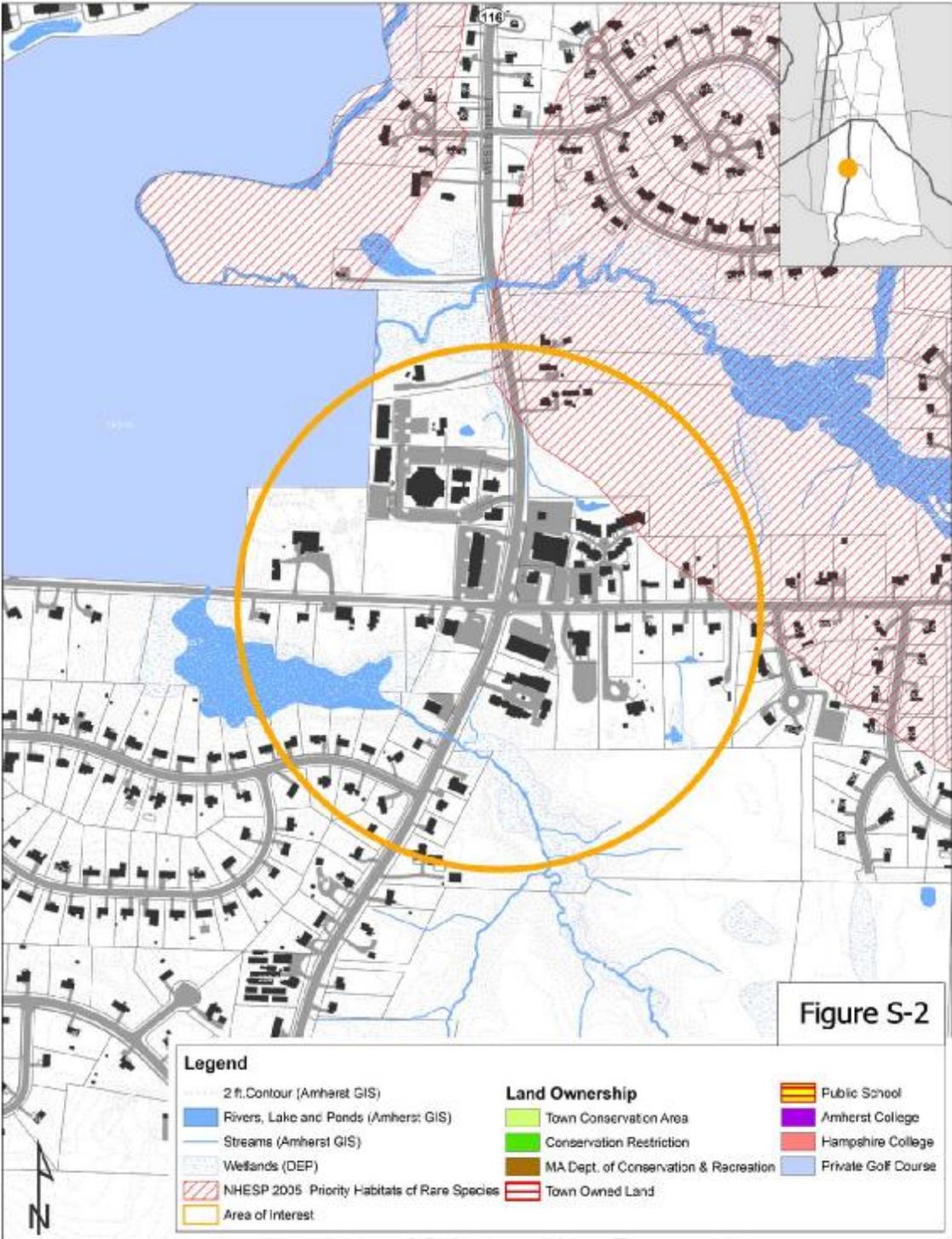


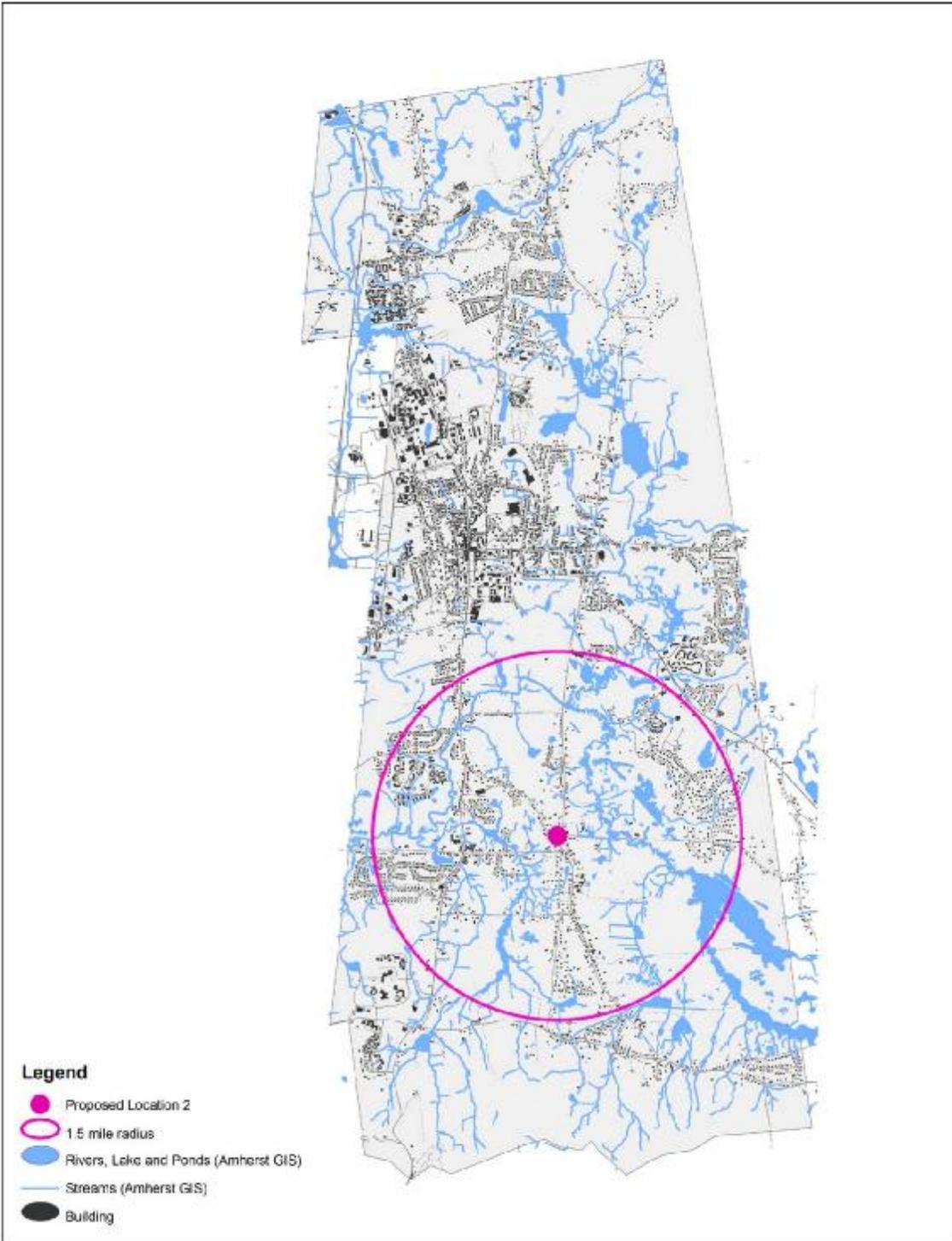
Existing location of Central & North Stations



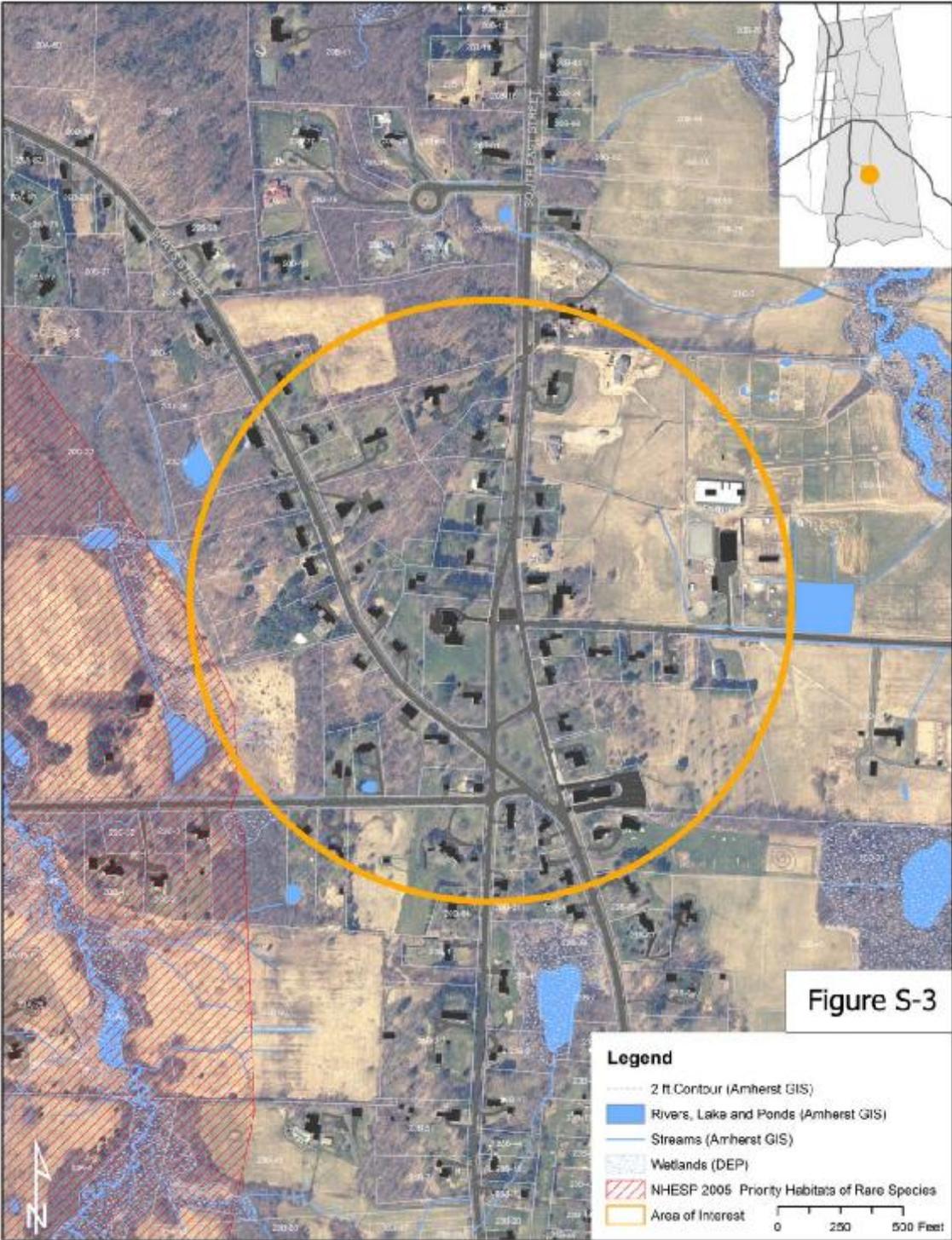
Option #1 & 2 Proposed New Facility Location "A"

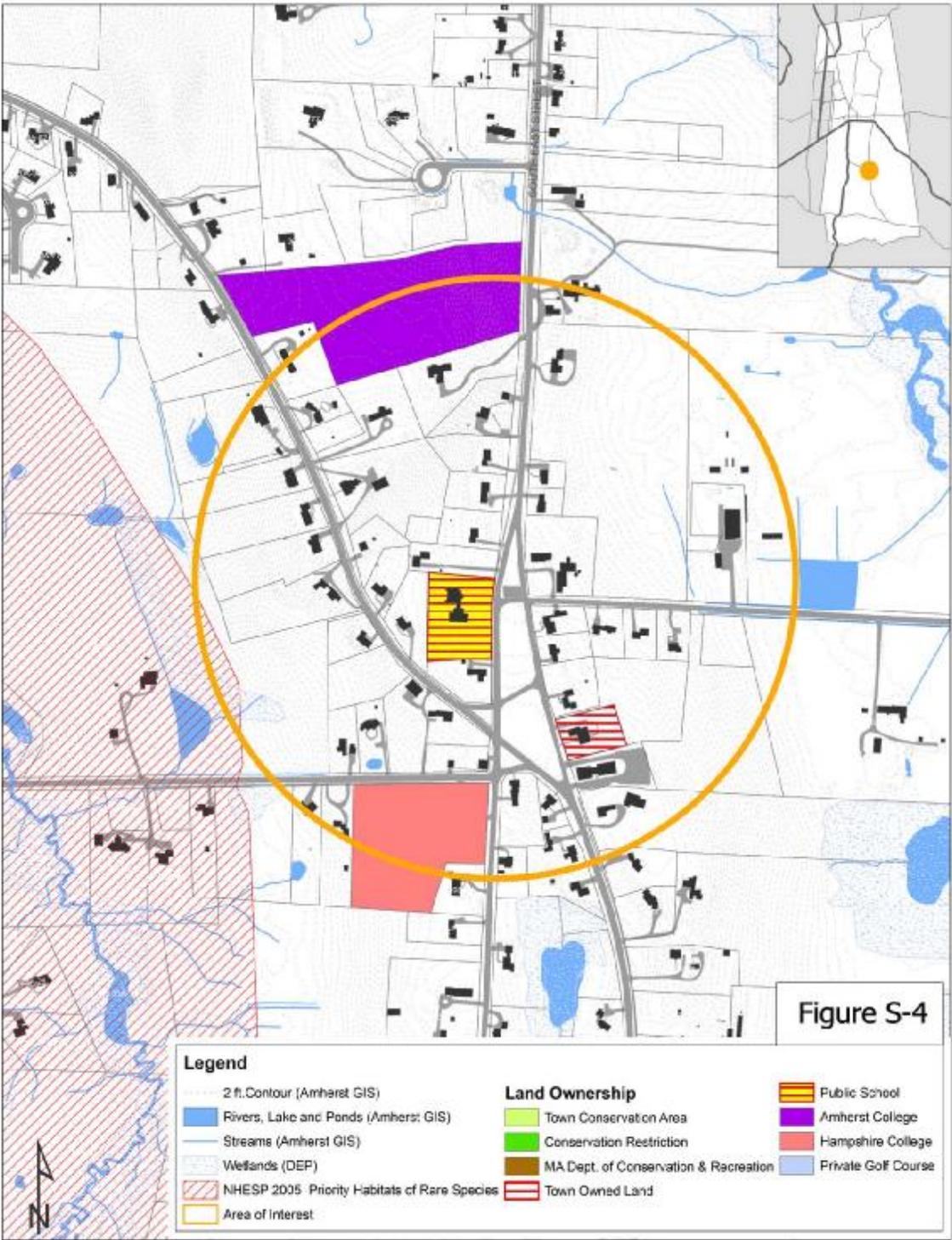


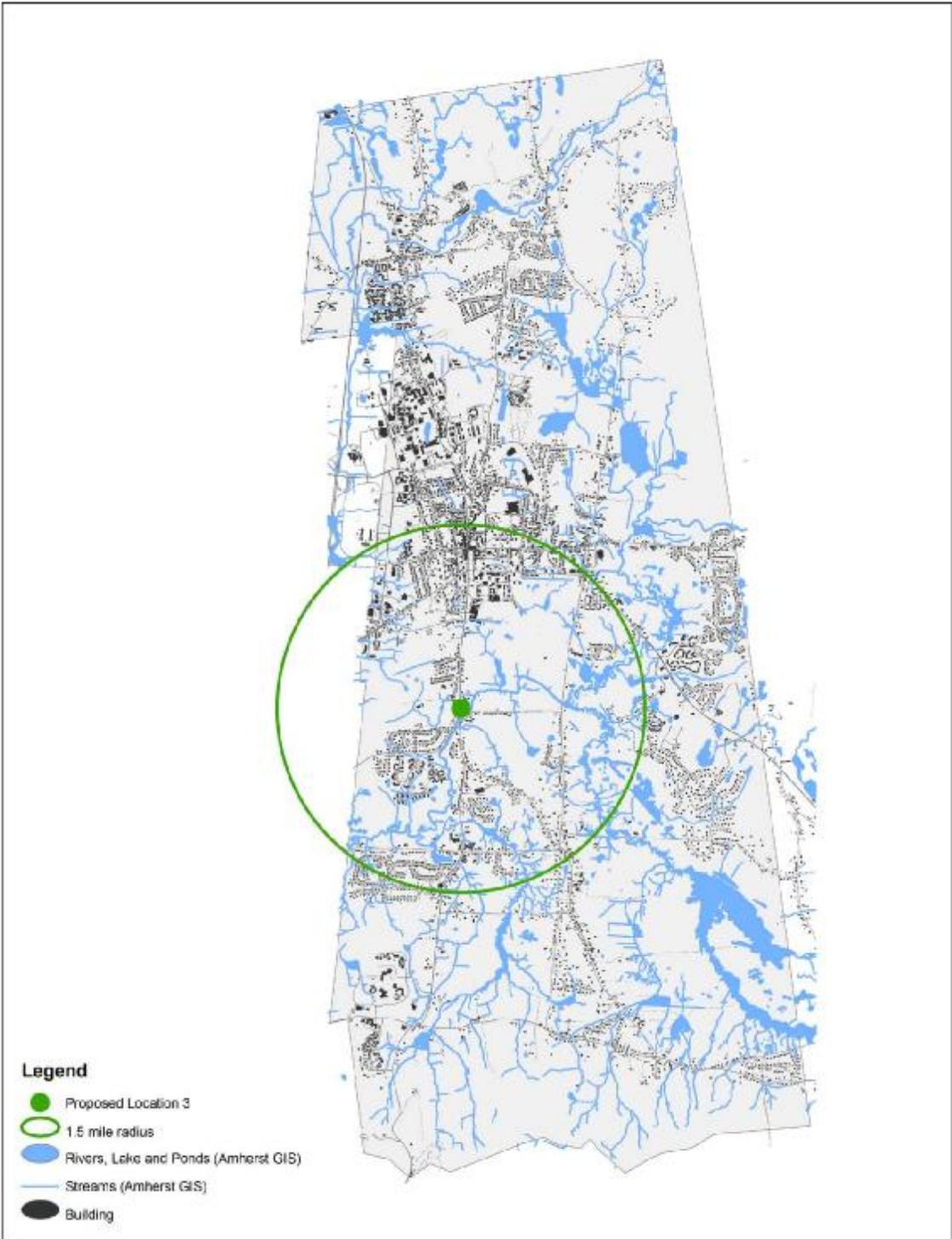




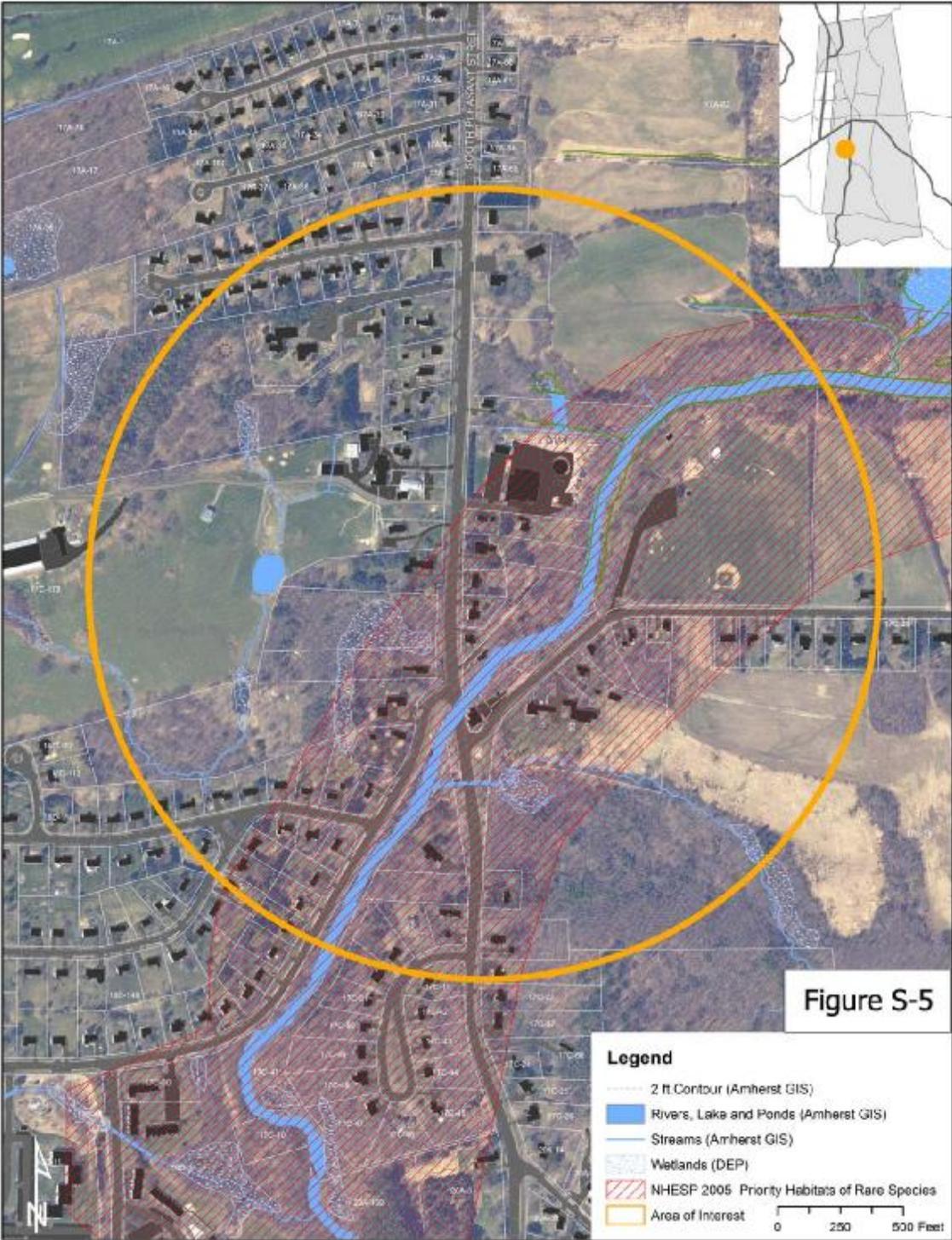
Option #1 & 2 Proposed New Facility Location "B"

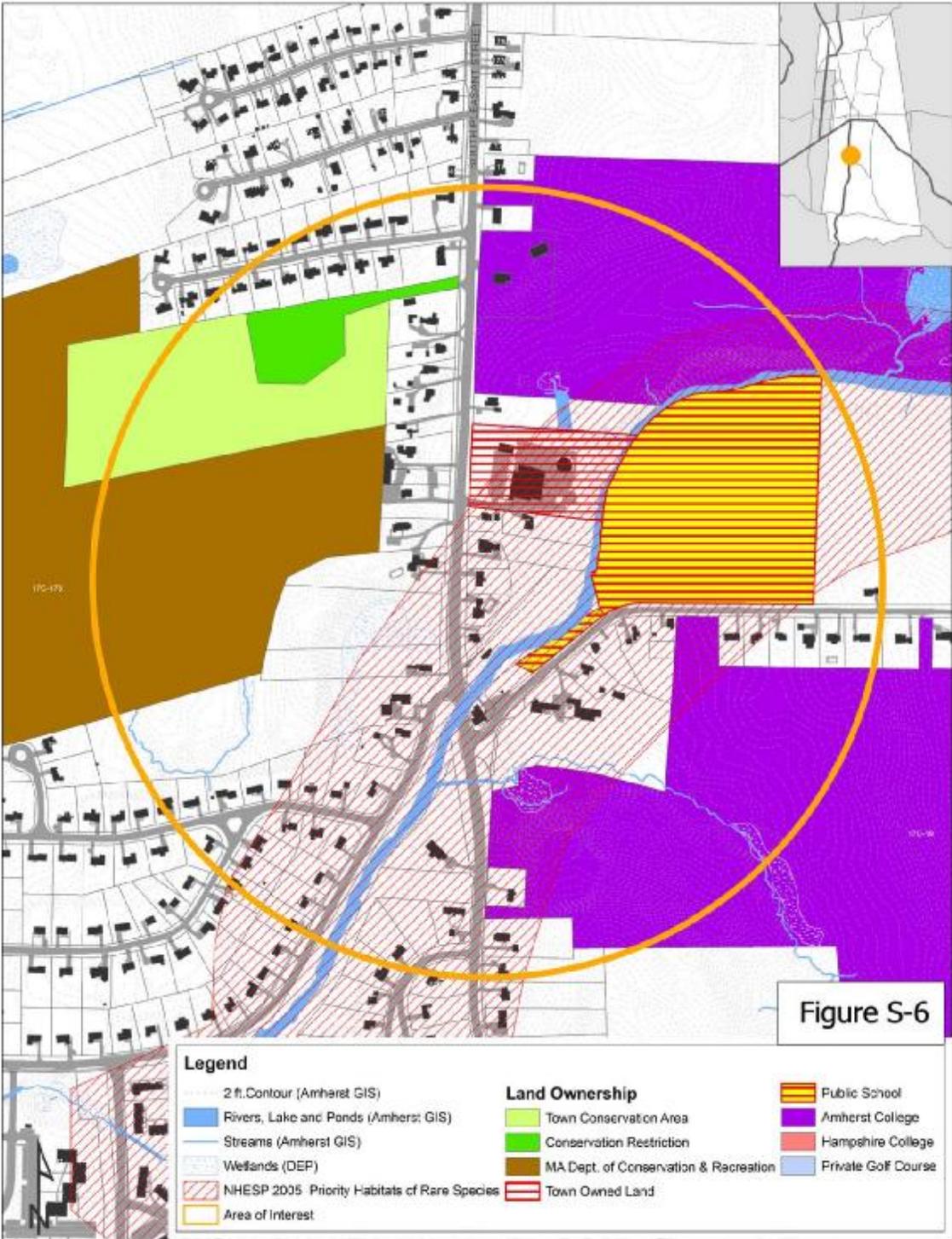






Option #3 Proposed New Facility Location "C"





Part 4 – Site Selection

4.1 – Methodology

The methodology used in the site selection process for this study involved taking the results of the previous study, re-confirming those results, and further analyzing more specific areas and properties that can both support the program for a new fire station, and that qualify for examination by virtue of response time.

As can be expected, sites on side streets or unpaved roads would add to response time, and thus be less desirable for a fire station location. Parcels or areas with the need for L driveways, or in other situations that would add to response time were also placed lower in priority.

Target areas were generated using circles of coverage corresponding to the circles of coverage in the previous study.

A map of ownership of parcels for the target areas was generated using Town of Amherst GIS. Parcels that were in public ownership, college or university ownership, and private ownership were included for study. While preference of parcel selection was given to Town owned or college owned parcels, all parcels that fit the criteria for site selection were included.

It should be noted that the low clearance on the railroad underpasses on Southeast Street creates a barrier for passage of high clearance emergency vehicles such as fire trucks, and had to be accommodated in the selection process. As such, parcels on Southeast Street north of the underpasses were not considered.

After the target areas were identified, all parcels within a specific target area were examined. Each area and potential individual parcels were examined for both ownership and building constraints, with building constraints being defined as wetlands, slope, size of parcel, areas of critical habitat, access, soils, and utilities.

Finally, the program for the new fire stations was developed to scale, and tested on potential subject parcels.

4.2 – Site Selection Criteria

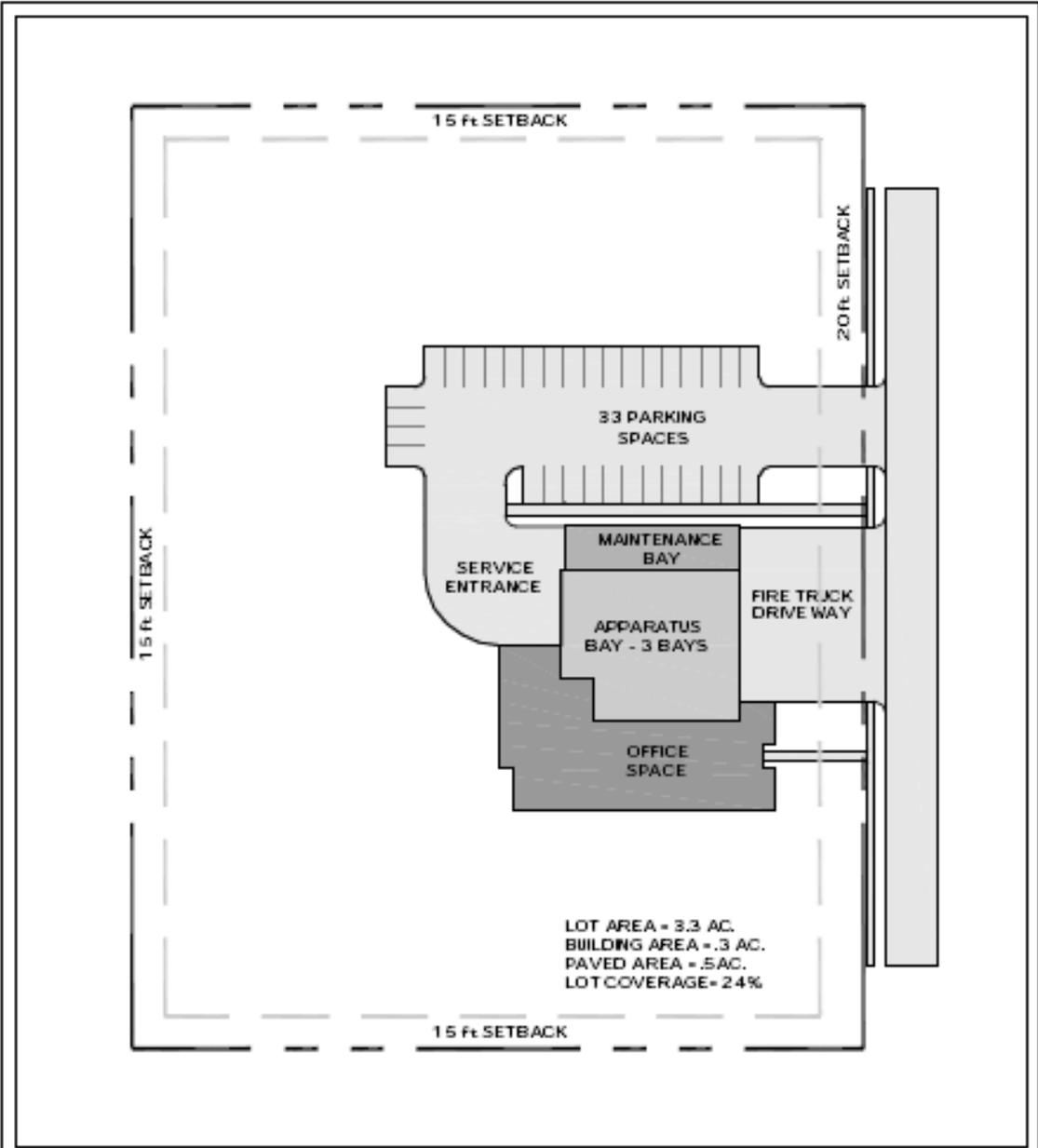
Potential sites were identified for new fire department facilities corresponding to Options I and II. Criteria for possible new building sites include the following:

- Central location in South Amherst on a main travel route to reduce travel time
- Minimum 2 acres for a sub station
- Minimum 3 acres for a headquarters
- Procurement: Town owned, possible donated land vs. purchase from private owner

4.3 - Building & Site Concept Plans

Conceptual site plans for a new Fire Department sub station facility (Option #2) and a new headquarters facility (Option #3) are shown on the following page as a reference. Conceptual site plans demonstrate the special needs for the buildings, driveways and parking lots. Each of the conceptual sites are shown with a portion or all of the apparatus bays as drive through bays.

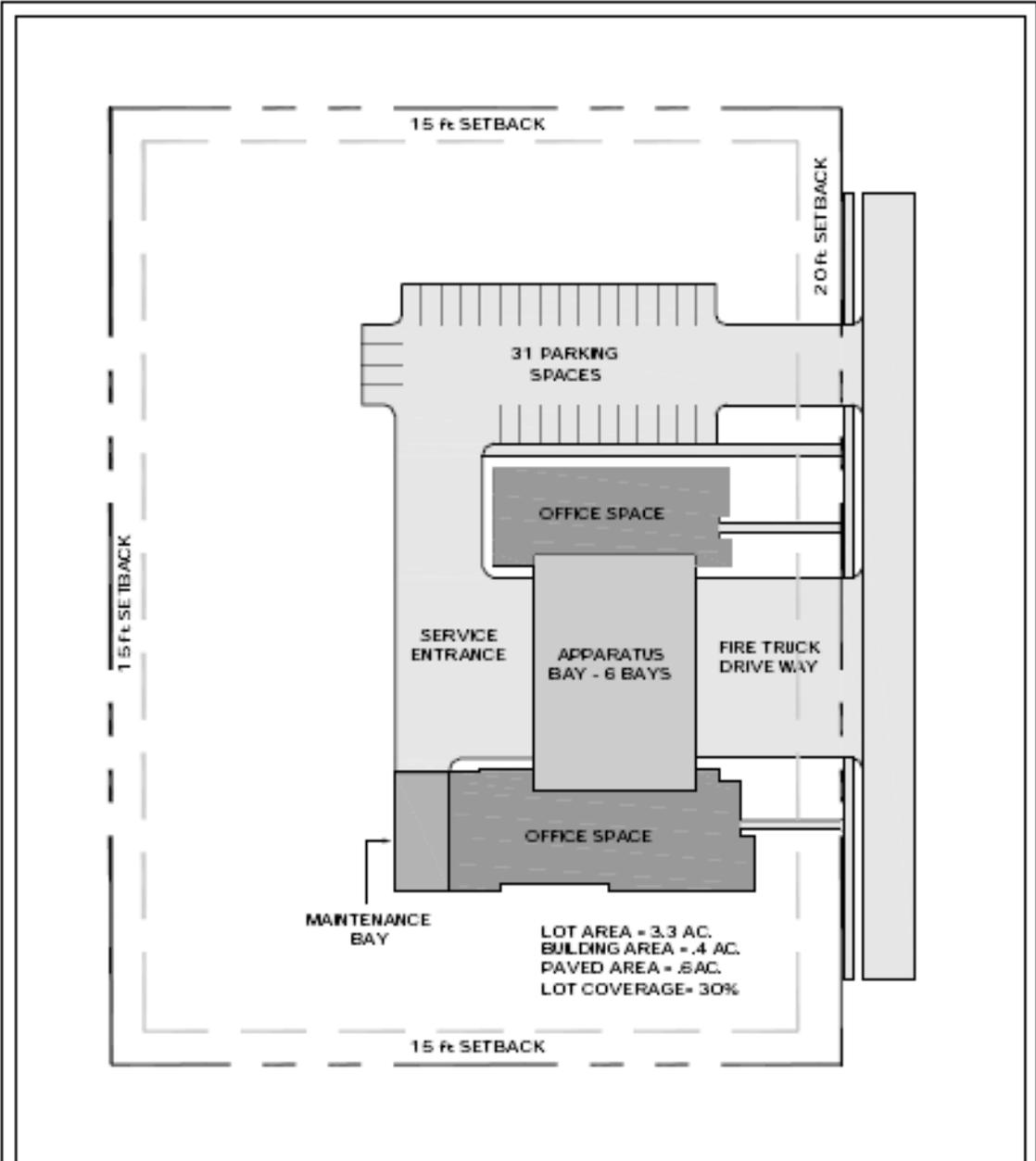
The conceptual site plans are shown based on optimal 3+ acre sites. Exact site conditions, such as: contours, wet lands, available utilities and soil conditions will affect the required size of the site.



The Berkshire Design Group, Inc.
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SAMPLE LAYOUT FOR FIRE DEPARTMENT SUBSTATION

SCALE: 1" = 60'



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SAMPLE LAYOUT FOR FIRE DEPARTMENT HEADQUARTERS

SCALE: 1" = 60'

4.4 – Site Selection Findings

The site selection was accomplished using the coverage circles identified under Option 1 of the previous work accomplished by the fire station committee. That option has evolved into Options 1 and 2 of this report.

Under those options, the center of the coverage circle for South Amherst at the end of the previous work was at the intersection of Pomeroy Lane and West Street, Route 116.

Further examination of this location and the use of arterial roads for fastest response times also led to the inclusion of the South Amherst Common as another potential location for a South Amherst headquarters or substation. The South Amherst Common is located at the confluence of several arterial roads, and would be ideal for response time.

Under Option 3 of this report, with no downtown headquarters or substation, the center of the coverage circle was north of the Mill Lane intersection with West Street.

4.4.1 - Options 1 and 2

Figure S-1 shows the target circle for the Pomeroy Lane/West Street intersection target area. Figure S-2 shows the same area, with parcel boundaries, ownership, and wetlands or critical habitat areas shown. The radius of this target circle is constrained by a critical habitat area, the golf course, and a large wetland system to the southwest. There are no parcels of public or college or university ownership in this target area.

Figures S-3 and S-4 show the target circle for the intersection of the other north south arterial road, Southeast Street, and Pomeroy Lane. Pomeroy Lane or Shays Street are both strong connector streets for response time. This area is less constrained by wetlands or habitat areas, and also has both town owned and college land in the target circle.

Figures S-5 and S-6 show the target circle for Option 3 of this report, where the center of the target circle is on Route 116, north of the Mill Lane intersection. While there are some wetland or habitat constraints, there are also town owned and college owned parcels in this area.

Part 5 – Spatial Needs

5.1 – Existing Conditions

Spatial programming was developed with the Committee and Fire Department and applied to each of the three options. As discussed earlier in this report, the site limitations of the downtown facility requires shifting selected program spaces from the downtown facility to the proposed new building in South Amherst.

From the programming of each option, schematic “bubble diagram” layouts were created to verify the overall square footage and required adjacencies of each program space. *Please note that these schematic layouts are not meant to be design solutions.* These schematic bubble diagrams are also used in the site evaluation process. Program diagrams were overlaid on GIS plans of a potential site as seen earlier in this report as the sample site layout.

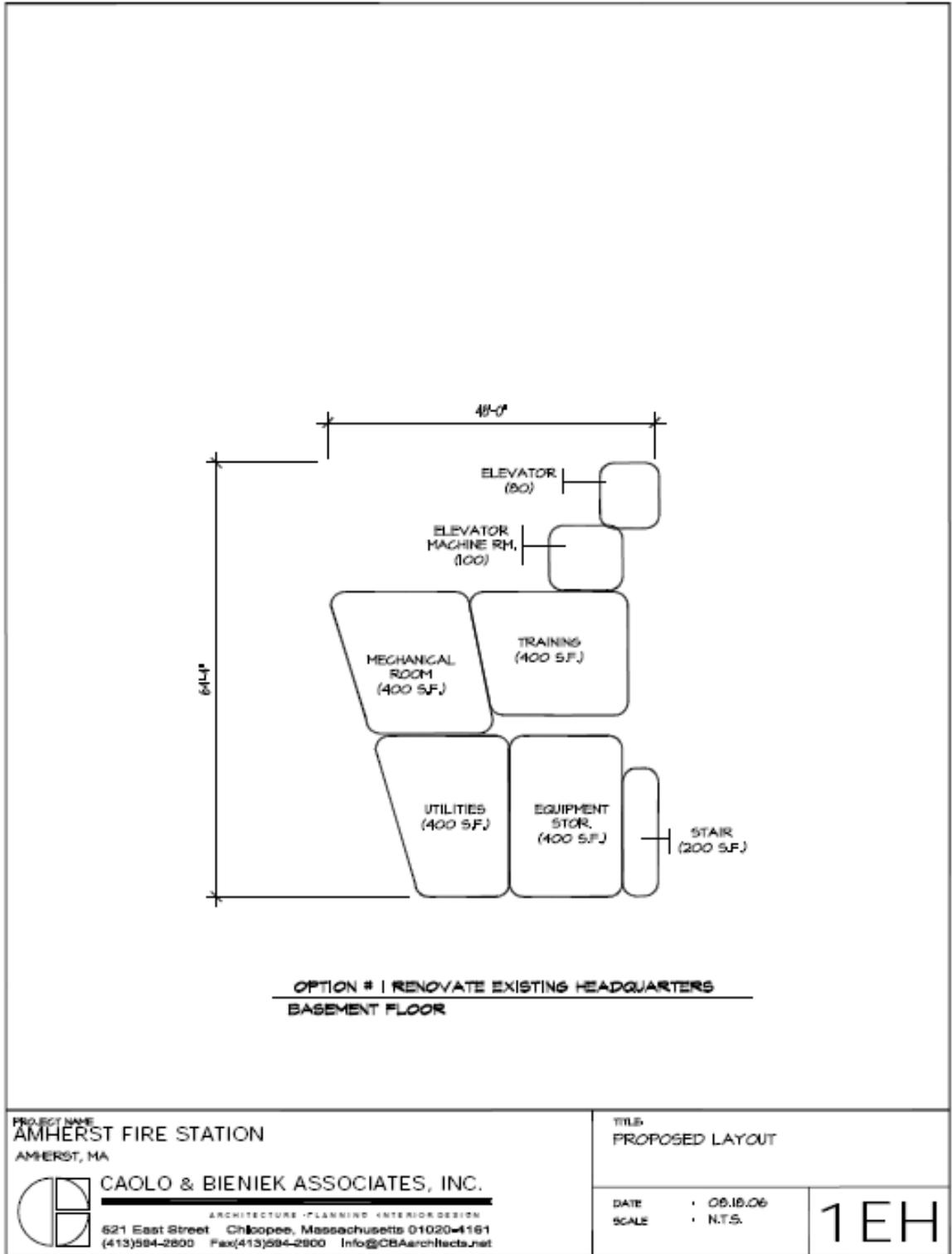
See the attached program table & schematic diagrams.

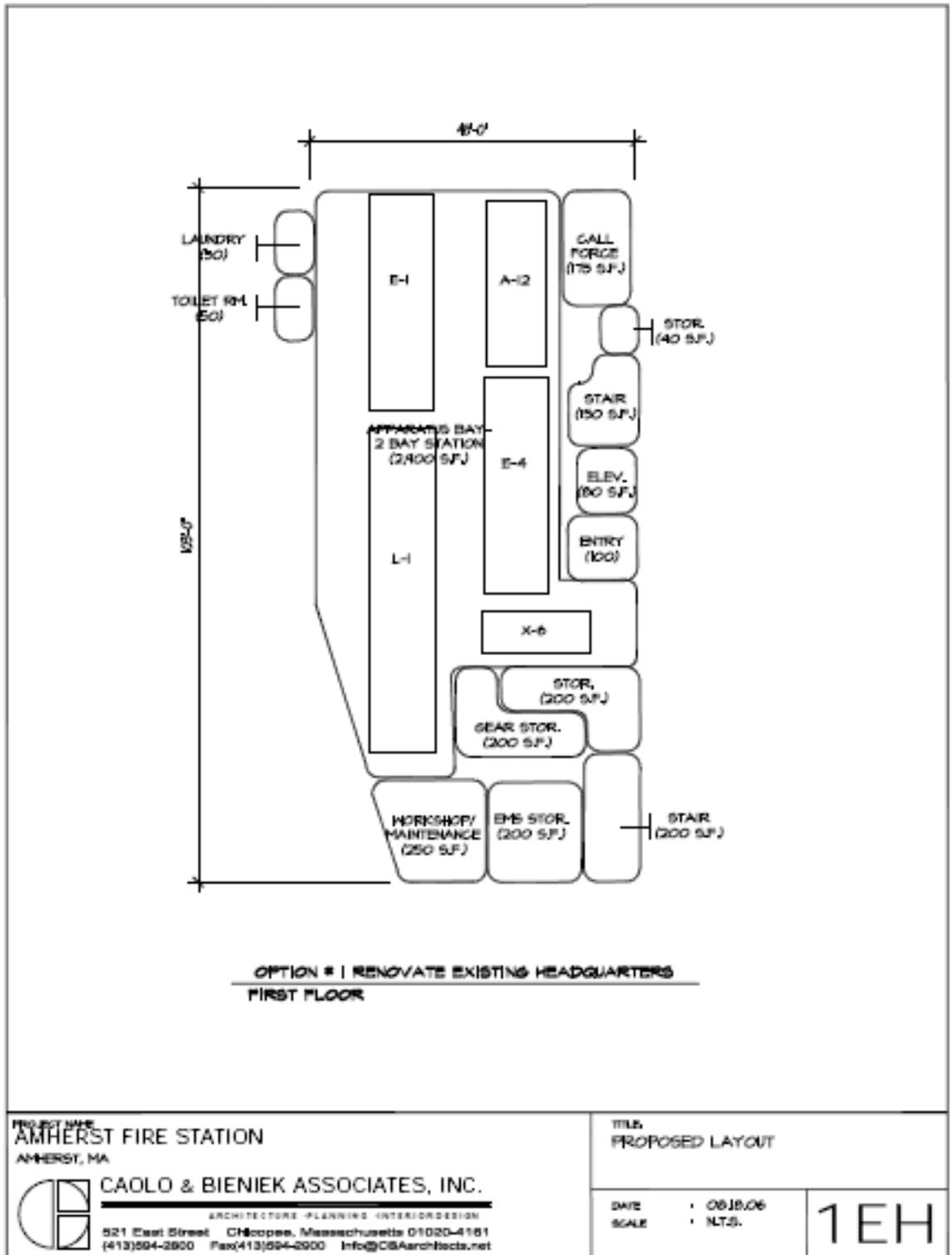
Elevator	80
Stair	160
Basement sub total	1540

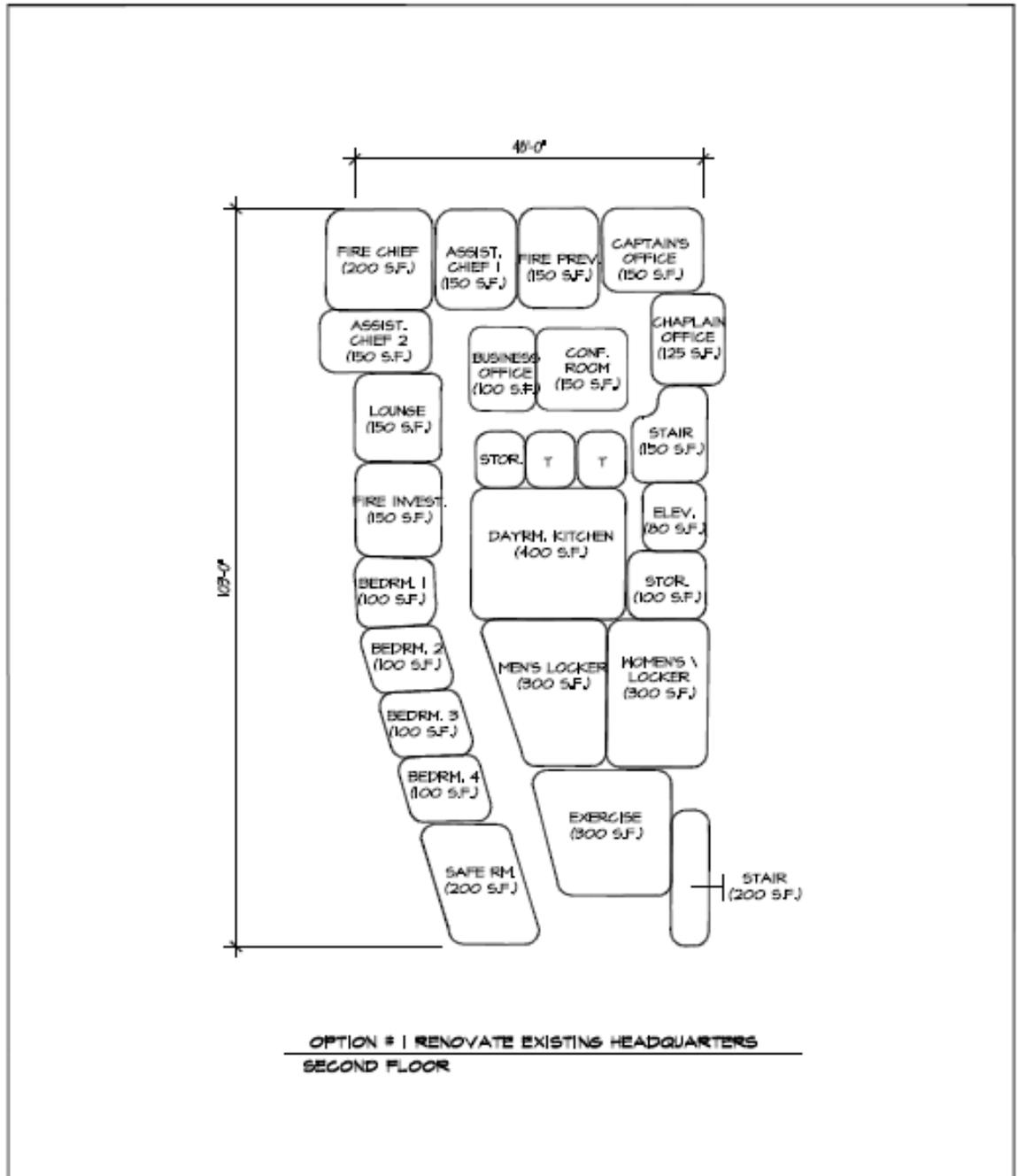
Circulation 20% 2038

TOTAL	12228
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- Notes:
- 1. Existing building 1st floor = 4,300 sq. ft
 - 2 Existing building 2nd floor = 2,100 sq. ft.
 - 3 Proposed 3 story addition = 6,504 sq. ft.
 - Total..... = 12,904 sq. ft.







OPTION # | RENOVATE EXISTING HEADQUARTERS
SECOND FLOOR

PROJECT NAME
AMHERST FIRE STATION
 AMHERST, MA



CAOLO & BIENIEK ASSOCIATES, INC.

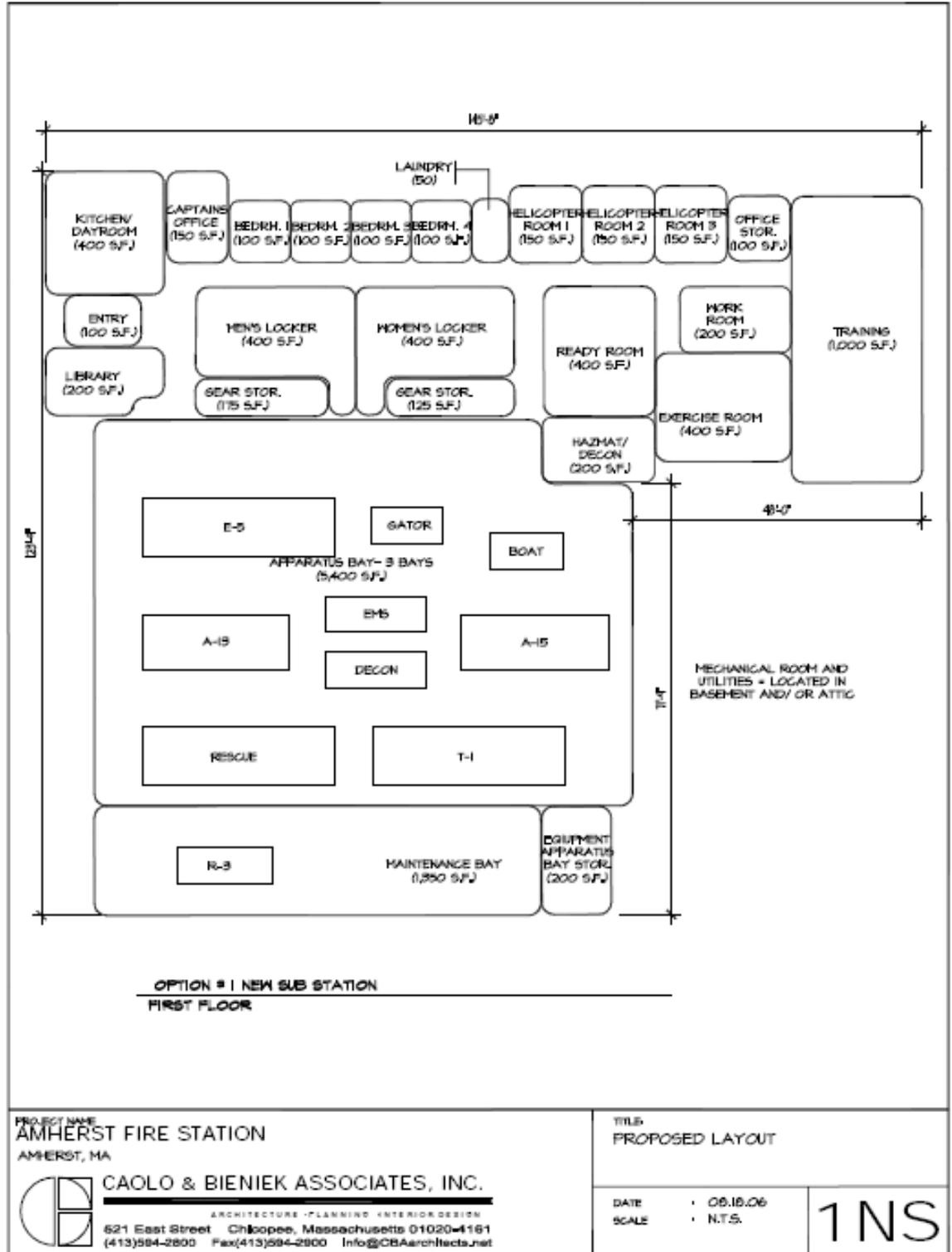
ARCHITECTURE • PLANNING • INTERIOR DESIGN
 521 East Street, Chicopee, Massachusetts 01020-4161
 (413)584-2800 Fax(413)584-2800 Info@CBAarchitects.net

TITLE
PROPOSED LAYOUT

DATE • 08.18.06
 SCALE • N.T.S.

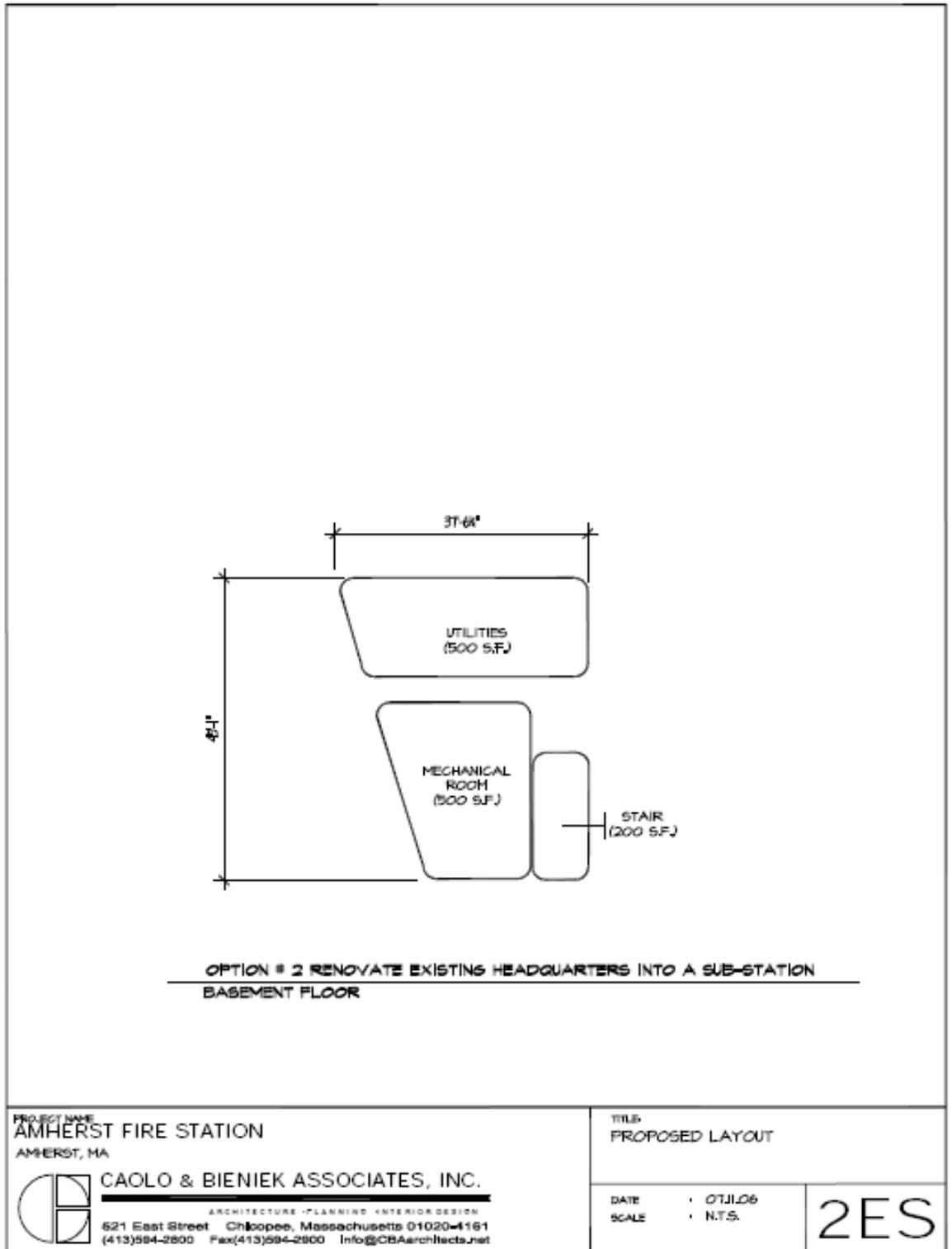
1EH

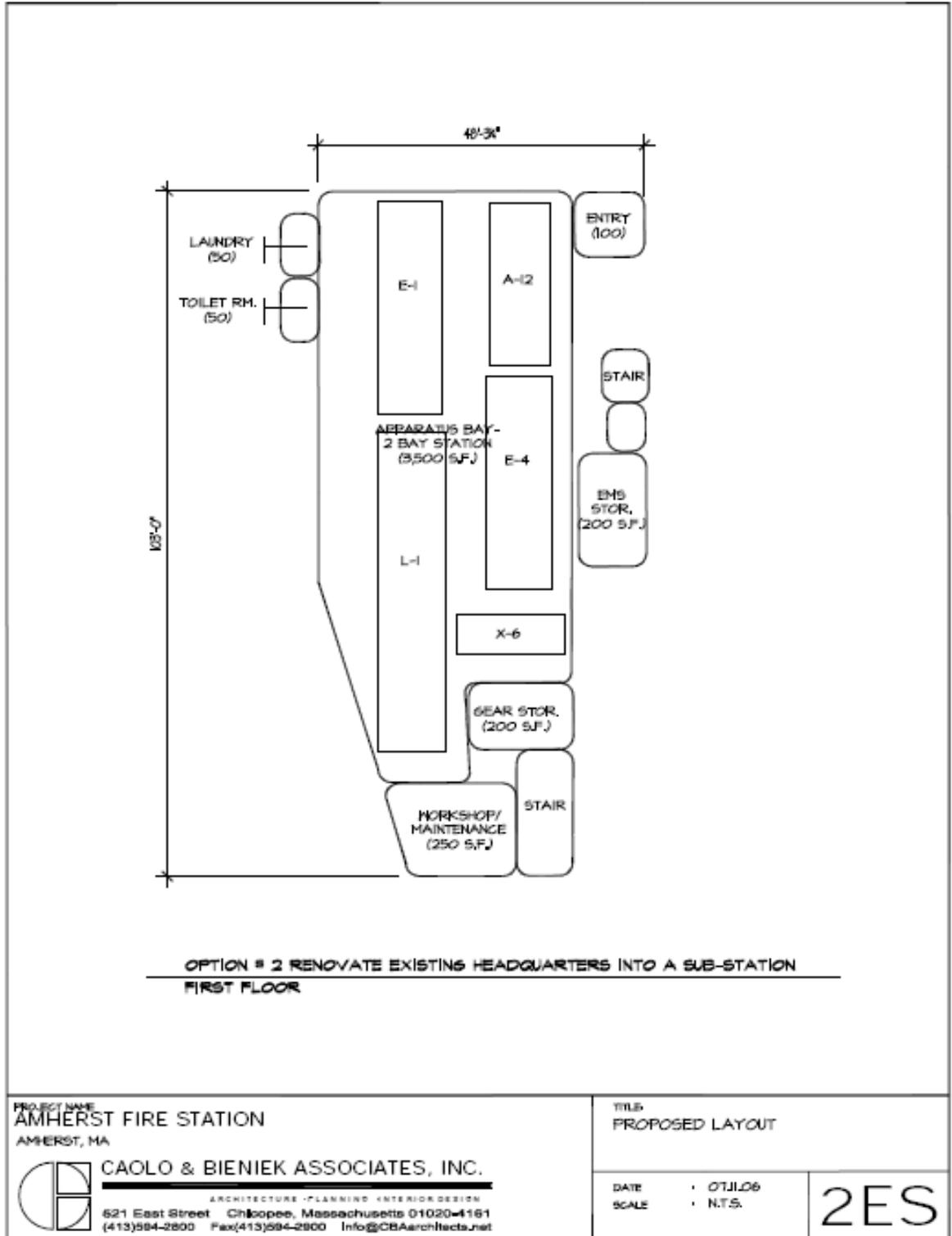
Option #1	New Sub Station
Room	Sq. Ft.
Apparatus Bay - 4 bays	5400
Maintenance Bay	1350
Laundry	50
Hazmat/Decon	200
Library	200
Dayroom / Kitchen	400
Captains Office	150
Bedrooms (4)	400
Office Storage	100
Ready Room	400
Helicopter Rooms (3)	450
Training Room	1000
Exercise Room	400
Work Room	200
Men's Locker Room	400
Women's Locker Room	400
Gear Storage	300
Equipment/Apparatus Bay Store	200
Mechanical Room	500
Utilities	500
Sub Total	13000
Circulation 10%	760
TOTAL	13760

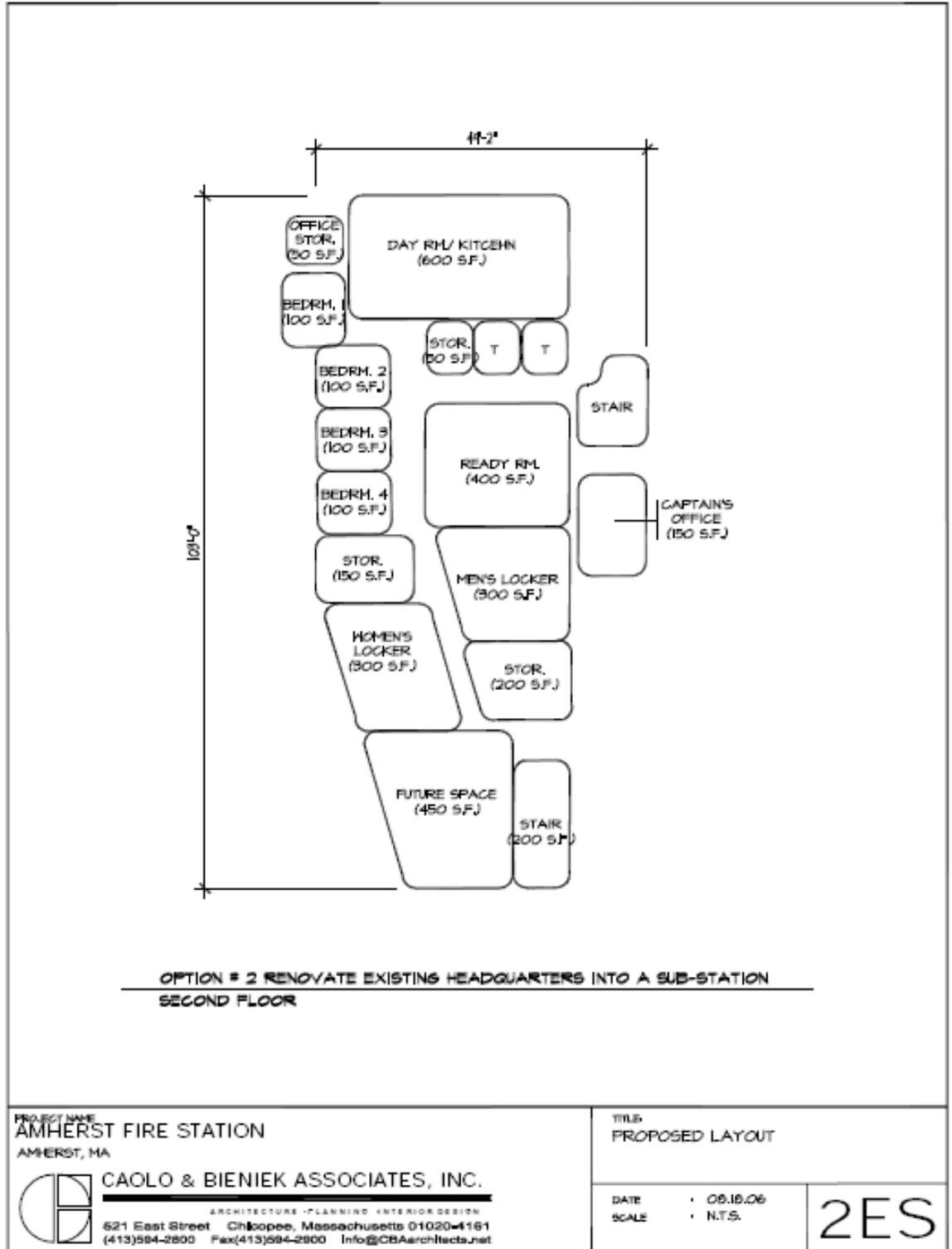


Option #2**Option #2****Renovate Headquarters into a Sub Station**

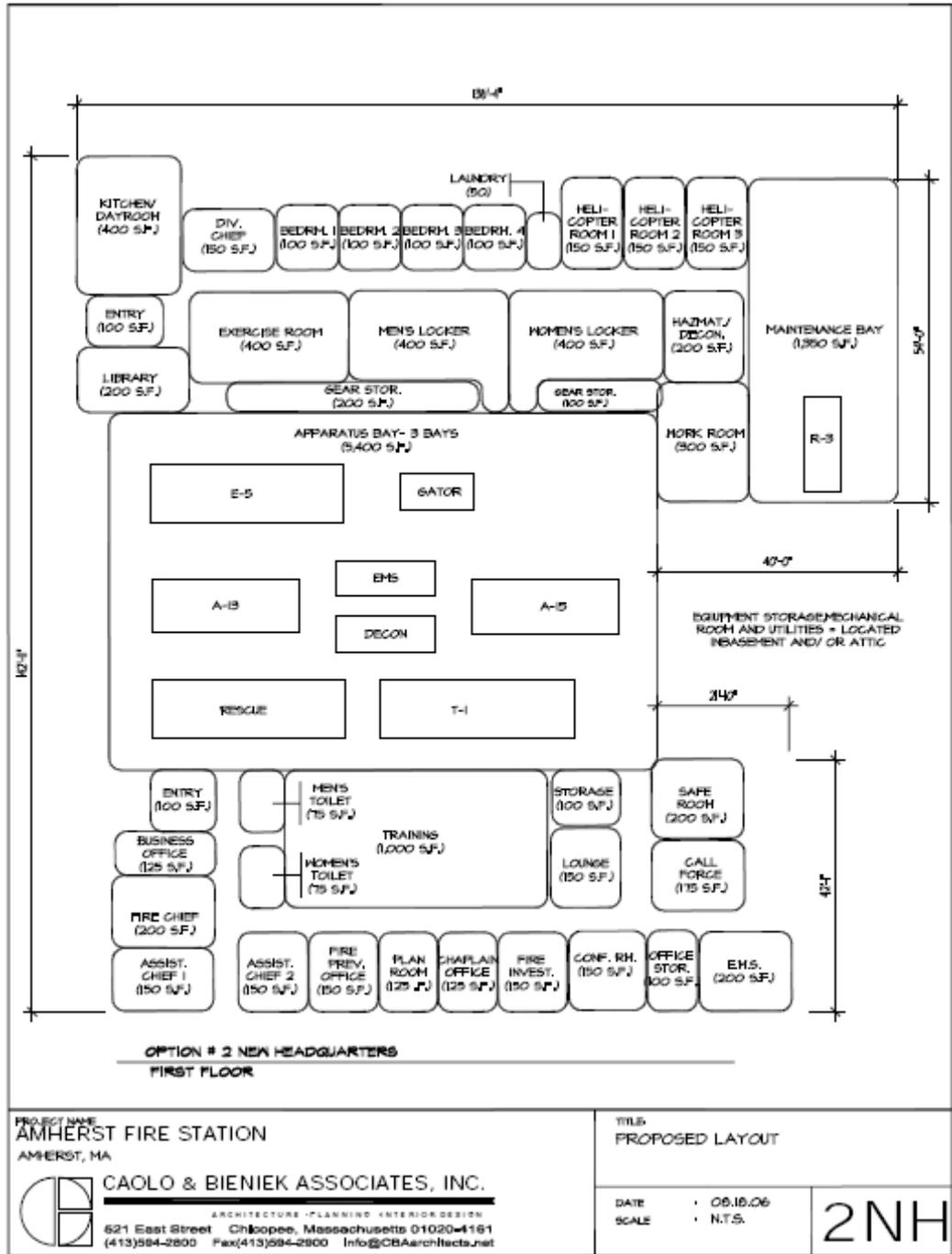
Room	Sq. Ft.
Apparatus Bay - 3 bay station	3500
Workshop / Maintenance	250
Laundry - renovate existing	50
Toilet Room - renovate existing	50
Gear Storage	200
EMS Storage	200
Entry	100
Captains Office	150
Bedrooms (4)	400
Ready Room	400
Men's Locker Room	300
Women's Locker Room	300
Stairs (2)	260
Day Room / Kitchen	600
Office Storage	50
Future Space	450
Storage	200
Mechanical Room	500
Utilities	500
Sub Total	8460
Circulation 10%	846
TOTAL	9306





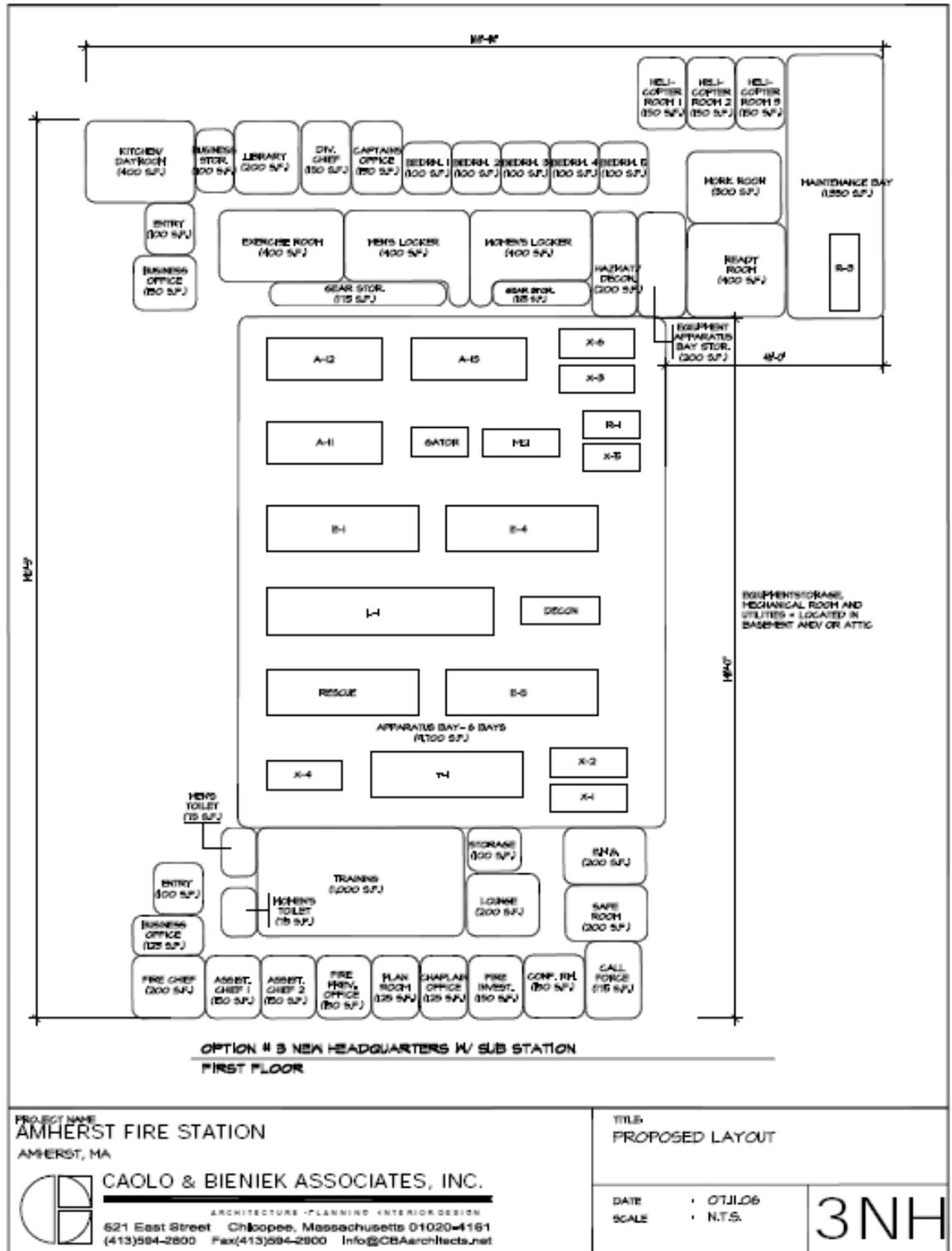


Option #2	New Headquarters
Room	Sq. Ft.
Apparatus Bay - 3 bay station	5400
Maintenance Bay	1350
E.M.S	200
SAFE	200
Storage	100
Gear Storage	300
Hazmat/Decon	200
Laundry	50
Entry	100
Business Office	125
Office Storage	100
Fire Chief Office	200
Assistant Chief 1	150
Assistant Chief 2	150
Fire Prevention Office	150
Plan Room	125
Chaplain Office	125
Fire Investigation Office	150
Call Force Office	175
Lounge	150
Training Room	1000
Toilet Rooms	150
Bedrooms (4)	400
Conference Room	150
Helicopter Rooms (3)	450
Men's Locker Room	400
Women's Locker Room	400
Day Room/Kitchen	400
Library	200
Exercise Room	400
Work Room	300
Division Chief Office	150
Equipment Storage	500
Mechanical Room	500
Utilities	500
Sub Total	15400
Circulation 10%	1540
TOTAL	16940



Option #3 (Formally option #4)

Option #3	New Headquarters
Room	Sq. Ft.
Apparatus Bay - 6 bays	9700
Maintenance Bay	1350
Entry	100
Library	200
Dayroom / Kitchen	400
Captains Office	150
Bedrooms (5)	500
Office Storage	100
Ready Room	400
Helicopter Rooms (3)	450
Training Room	1000
Exercise Room	400
Work Room	300
Men's Locker Room	400
Women's Locker Room	400
Gear Storage	300
Equipment/Apparatus Bay Store	200
Div Chief Office	150
Fire Prevention Office	150
Fire Chief Office	200
Assistant Chief 1 Office	150
Assistant Chief 2 Office	150
Business Office	125
Conference Room	150
Toilet Rooms	150
Hazmat/Decon	200
Laundry	50
Storage	100
Lounge	200
EMS	200
SAFE Room	200
Fire Investigation	150
Chaplain Office	125
Call Force Room	175
Plan Room	125
Equipment Storage	500
Mechanical Room	500
Utilities	500
Sub Total	20600
Circulation 10% (non bay area)	1090
TOTAL	21690



5.2 – Future Expansion

Various types of future expansion have been discussed with the Fire Department for this study. Projections for additional departments and employees have been provided by the Fire Department and factored into the program square footage. The operational costs to employ the added staff and to operate the new and/or larger buildings have been estimated under Part 6 of this study. Interior expansion for future larger apparatus has been studied as follows:

New Facilities: Square footage in the apparatus bays in the new facilities has been based on an 18'-0" on center bay spacing which allows 8' 0" minimum clearance between the sides of the largest apparatus. This space is used for circulation between vehicles, connection of the vehicle exhaust removal system, the ability to allow the vehicle doors to remain open and clearance for future larger apparatus. Overhead door openings minimum sizes are recommended to be 14' 0" W x 14' 0" high and preferably 16' 0" W x 16' 0" high. New facilities also include a minimum of 5' 0" between the front and rear of each vehicle for access to the equipment, restocking equipment in/on apparatus and for larger vehicles in the future. The current schematic plans also include parking the fire department cars inside the building at this time.

Central Station: Under Option 1 & 2, future expansion in area and in larger apparatus in the renovated Central Station will be very difficult. Additional office & staff space has been accounted for on the upper floors of the building; however, grade level square footage is the driving factor. The limited site area prevents including additional square footage in the apparatus bays to accommodate larger vehicles. Replacement of the present structure as described under Part 7 of this study to ensure future expansion must be considered.

Part 6 – Project Cost Options

6.1 - Objectives

The terms of reference for this study are to identify total project costs for each option for anticipated construction with a start date in the summer of 2009.

Project Costs

Project costs include construction costs, contingency, furniture and equipment, construction manager fees, design fees, legal and financing costs, testing and other 'soft costs'. Detailed cost estimates can not be provided at this level of design, however, the cost estimates include the following specific items:

- Municipal fire alarm system in each
- Fire Protection/Sprinklers throughout the buildings
- Emergency generators in each of the buildings
- Room for cleaning of staff & clearing of equipment of hazardous materials (sink, shower, eyewash etc.)
- Limited maintenance/quality materials to match the Amherst character

Costs associated with demolition of existing structures, site cleanup and other unforeseen site costs are excluded from the figures. An estimated land acquisition cost has been carried on the cost estimates.

Other Exclusions – the following items are not included in the total Project Cost estimate:

- Contaminated soils, demolition, adverse soils or topographic conditions
- Premiums associated with accelerated schedules or winter work
- Temporary facilities to operate the Department during construction

Other Costs

CGI/Fire Underwriters recommend provision of a traffic signal system to improve safety and response times. Costs for this should be considered in an overall city emergency services plan.

Contingencies & Escalation

The construction and project cost estimates are based on very preliminary conceptual designs on a generic site. Actual costs may vary depending on the final facility design and may be influenced by conditions related to particular sites (e.g. demolition, soil conditions, site clean-up). A contingency cost has been included reflecting new construction vs. renovations & additions. An inflation factor per year of 6% has been factored into each option. See the spreadsheet at the end of the report for yearly costs through 2009.

We also recommend that at the beginning of the design stage the project scope, quality and budget be re-evaluated and adjustments made, if necessary, to bring them into alignment. Cost estimates of increasing degrees of accuracy, and value engineering should be carried as the design is developed to better control costs.

6.1.1 – Option 1

Existing Building - Headquarters Renovations & Addition	2006	2009
Construction Cost	\$3,606,768.00	\$4,295,718.00
Contingency (10%)	\$360,676.00	\$429,572.00
Construction Manager (8%)	\$317,395.00	\$378,023.00
A/E Fees (7.5)	\$297,558.00	\$354,397.00
Data, Furnishing & Equipment (8%)	\$317,395.00	\$378,023.00
Advertising & Printing	\$20,000.00	\$25,000.00
Testing	\$25,000.00	\$30,000.00
Land Acquisition	N/A	N/A
Administration/Financing/Bond (2%)	\$98,896.00	\$117,815.00
Sub Total Project cost	\$5,043,690.00	\$6,008,548.00
New Sub Station		
Construction Cost	\$4,402,000.00	\$5,242,852.00
Contingency (5%)	\$220,100.00	\$262,142.00
Construction Manager (8%)	\$369,768.00	\$440,399.00
A/E Fees (7.5 & 6.7%)	\$346,657.00	\$412,875.00
Data, Furnishing & Equipment (5%)	\$231,105.00	\$275,250.00
Advertising & Printing	\$20,000.00	\$25,000.00
Testing	\$25,000.00	\$30,000.00
Land Acquisition	\$350,000.00	\$350,000.00
Administration/Financing/Bond (2%)	\$112,292.00	\$133,770.00
Sub Total Project cost	\$6,076,923.00	\$7,172,289.00
Option 1 Total Project Cost	\$11,120,613.00	\$13,180,838.00

6.1.2 – Option 2

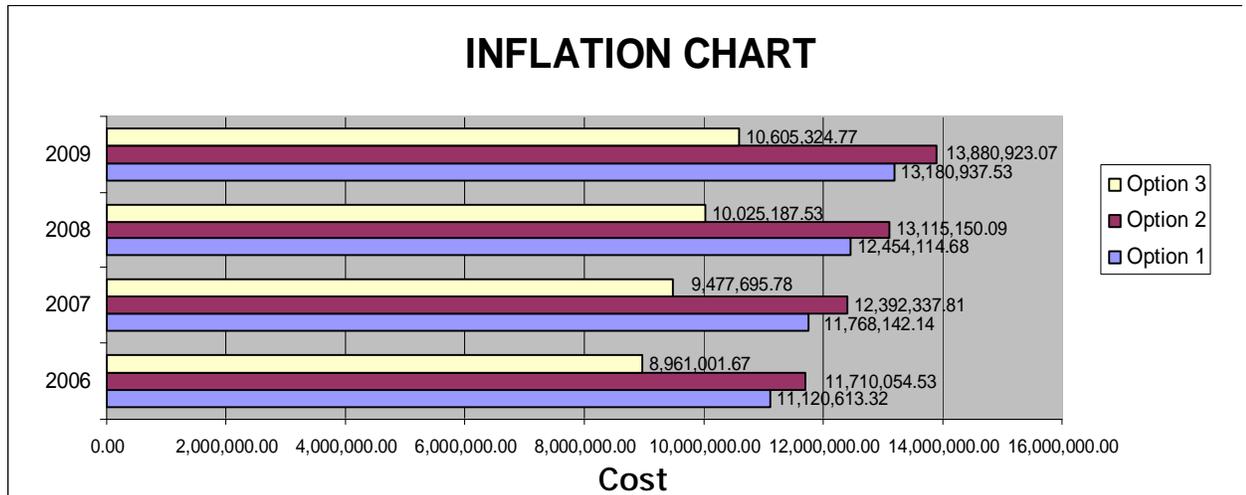
Existing Building – Sub Station Renovations & Addition		
Construction Cost	\$3,023,818.00	\$3,601,416.00
Contingency (10%)	\$302,362.00	\$360,142.00
Construction Manager (8%)	\$266,091.00	\$316,924.00
A/E Fees (7.5)	\$249,464.00	\$297,116.00
Data, Furnishing & Equipment (5%)	\$166,309.00	\$198,078.00
Advertising & Printing	\$20,000.00	\$25,000.00
Testing	\$25,000.00	\$30,000.00
Land Acquisition	N/A	N/A
Administration/Financing/Bond (2%)	\$81,061.00	\$96,574.00
Sub Total Project cost	\$4,134,132.00	\$4,925,250.00
New Headquarters		

Construction Cost	\$5,456,000.00	\$6,498,183.00
Contingency (5%)	\$272,800.00	\$324,909.00
Construction Manager (8%)	\$458,304.00	\$545,847.00
A/E Fees (6.7%)	\$383,830.00	\$457,147.00
Data, Furnishing & Equipment (8%)	\$458,304.00	\$545,847.00
Advertising & Printing	\$25,000.00	\$30,000.00
Testing	\$30,000.00	\$35,000.00
Land Acquisition	\$350,000.00	\$350,000.00
Administration/Financing/Bond (2%)	\$141,684.00	\$168,739.00
Sub Total Project cost	\$7,575,922.00	\$8,955,673.00
Option 2 Total Project Cost	\$11,710,055.00	\$13,880,923.00

6.1.3 – Option 3

New Headquarters

Construction Cost	\$6,510,000.00	\$7,753,514.00
Contingency (5%)	\$325,500.00	\$387,675.00
Construction Manager (8%)	\$546,840.00	\$651,295.00
A/E Fees (6.7%)	\$457,978.00	\$545,459.00
Data, Furnishing & Equipment (8%)	\$546,840.00	\$651,295.00
Advertising & Printing	\$25,000.00	\$30,000.00
Testing	\$30,000.00	\$35,000.00
Land Acquisition	\$350,000.00	\$350,000.00
Administration/Financing/Bond (2%)	\$168,843.00	\$201,084.00
Sub Total Project cost	\$8,961,002.00	\$10,605,324.00
Option 3 Total Project Cost	\$8,961,002.00	\$10,605,324.00



6.2 – Annual Fire Department Budget Impact

Option 1

Existing Building Headquarters / New Sub Station		
Increased Building Operation Costs:		
Headquarters		\$0.00
Sub Station		\$28,280.00
Staffing:		
Headquarters – 0 increase in employees		\$0.00
Sub Station – 12 increase in employees		\$750,000.00

Option 2

Existing Building Sub Station / New Headquarters:		
Increased Building Operation Costs:		
Headquarters		\$0.00
Sub Station		\$37,470.00
Staffing:		
Headquarters – 0 increase in employees		\$0.00
Sub Station – 12 increase in employees		\$750,000.00

Option 3

New Headquarters:		
Increased Building Operation Costs:		
Headquarters		\$44,420.00
Staffing:		
No increase in employees		\$0.00

6.2.1 – Building Operation Cost Description

Option 1 & 2

Existing Building Renovations & Addition – Building Operation Costs:

Although the majority of the existing building square footage is planned to remain, additional utility costs are not anticipated. New energy efficient mechanical, electrical & plumbing systems throughout the building will offset the original building area and any increase in building area. Replacement doors & windows and new building envelope insulation are planned in the renovation.

Option 3

Building Operation Costs:

This option includes the largest amount of new square footage to be added to the Fire Department's operating budget. The increase in building operation cost for this facility is significantly reduced by the removal of the original 1929 building from the Department.

General Assumptions

In order to estimate the operation costs of the proposed options, the spaces have been divided into four categories:

- Non-occupied areas – heated only
- Apparatus Bays, Storage and Maintenance Areas – heat and ventilation only
- Areas occupied weekdays 9 to 5 – air conditioning and ventilation only during occupied hours
- Areas occupied 24 / 7 – air conditioning and ventilation provided continuously

We have assumed that heating will be provided by high efficiency gas fired condensing boilers. Cooling, where indicated will be provided by air cooled condensing units located outside of the buildings, either on the roof or at grade level. It is our experience that this is the type of system that is usually installed in fire station buildings of this size.

Estimates are done on a square foot basis. Costs range from \$1.50 a square foot for non-occupied areas with no ventilation and no electrical use to \$3.00 a square foot for areas with air conditioning and electrical use (lights, computers, etc.) provided around the clock.

Actual energy cost may vary significantly from the estimated for a number of reasons including:

- Energy costs are steadily rising and future rates are difficult to predict
- Program changes between the study phase and actual construction
- Use of buildings may vary from our assumptions
- Energy management/energy saving strategies for the buildings have not been determined

6.3 – New Equipment/Apparatus

The construction of an additional Fire Department facility will require the purchase of two addition pieces of equipment. These include the following:

Apparatus – combine aerial/pumper (2006 cost)	\$510,000.00
<u>Ambulance (2006 cost)</u>	<u>\$155,000.00</u>
Total	\$665,000.00

Part 7 - Demolition of Central Building – Study

1. Reuse of the existing building requires the select demolition of the following:
 - Rear portion of the building would be demolished for a 3 story replacement
 - Existing apparatus bay floor would be demolished for a new slab approx. 2 feet lower in elevation
 - Existing basement would be removed & filled for new bay floor
 - Front elevation would be modified to create a two bay station
 - Entire building would be gutted to create new program space and bring structure into code compliance

2. Fire Department program is less efficient in existing building foot print:
 - Circulation is increased from 10% to 20% of the program
 - Option #1 – Program is reduced by 3,795 sq. ft. (2,500 of apparatus bay moved to new sub station. 1,295 sq. ft. deleted)
 - Option #2 – Program is reduced by 2,400 sq. ft. (2,400 of apparatus bay moved to new headquarters. 500 sq. ft. deleted)

3. Energy / Maintenance Expense
 - New construction allows the entire building to comply with modern energy requirements (new windows vs. replacement – full insulated walls & roof systems)

4. New construction costs include a steel framed masonry building similar in character to the existing headquarters facility. The estimate includes energy efficient systems and low maintenance materials.

5. Renovations Total Project Costs include a 10% contingency vs. 5% for new construction

6. Future Equipment: Reuse of the present apparatus bays limit the possibility of future larger apparatus and equipment. The proposed layout of the bays has more than necessary space between the sides of apparatus; however, space front to back between apparatus is at a minimum. Redesign of the bays would better distribute the clearance on the sides of the bays and provide room for expansion in the opposite direction.

2006 Cost: Option 1 – Renovation for Headquarters

1.	Cost of increased circulation in renovation	\$333,715.00
	<u>Interior demolition for renovations</u>	<u>\$247,880.00</u>
	Sub Total	\$581,595.00
	<u>Estimated demolition cost of building</u>	<u>-\$77,640.00</u>
	Total Cost Savings	\$503,955.00

2006 Cost: - Option 2 - Renovations for Sub Station

1.	Cost of increased circulation in renovation	\$150,675.00
	<u>Interior demolition for renovations</u>	<u>\$247,880.00</u>
	Sub Total	\$398,555.00
	<u>Estimated demolition cost of building</u>	<u>-\$77,640.00</u>
	Total Cost Savings	\$320,915.00

General Square Foot Cost Comparison: Base on 4,500 sq. ft. of program space

1.	20% circulation - Renovate 6,200 of remaining building x \$300 per ft =	\$1,860,000.00
	<u>10% circulation - Construct 5,000 of new building x \$310 per ft + demo cost =</u>	<u>\$1,627,640.00</u>
	Total Cost Savings	\$232,360.00