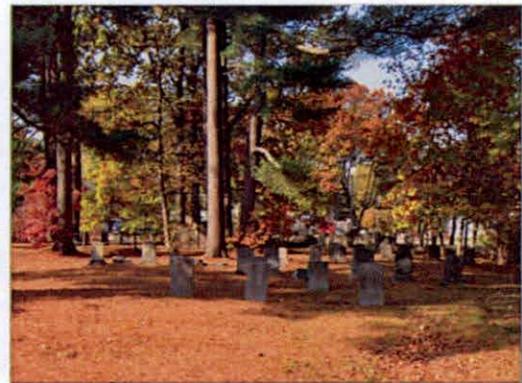
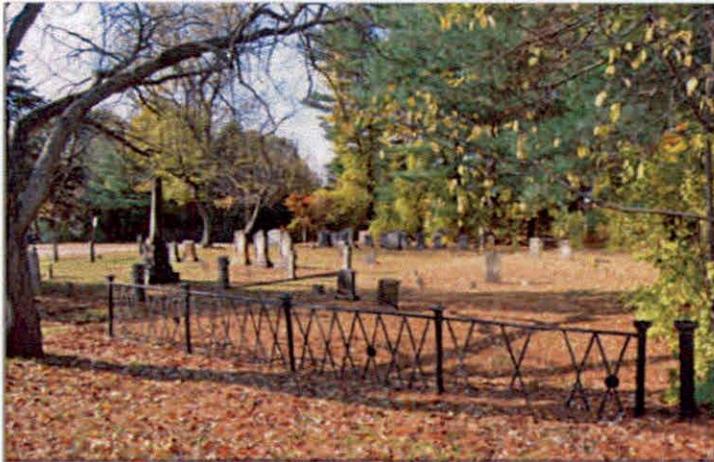
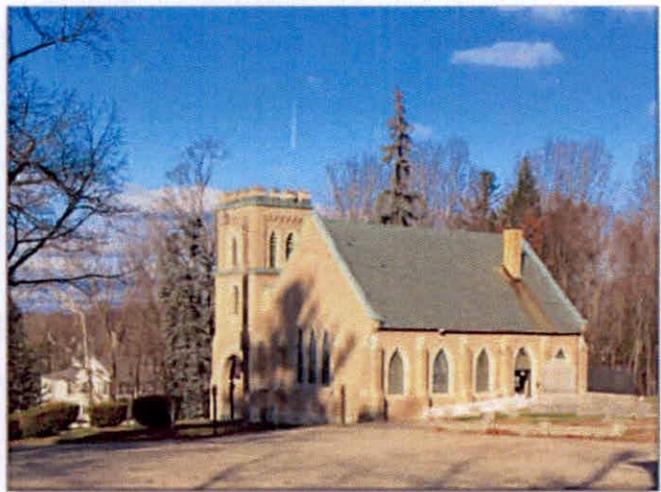


CITY OF DOVER FACILITIES, GROUNDS & CEMETERIES MASTER PLAN

CITY OF DOVER, NEW HAMPSHIRE

FEBRUARY 2018



Prepared by:

Mitchell
& Associates



**BENNETT
ENGINEERING**
MECHANICAL • ELECTRICAL



Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS

159 FRONT STREET SOUTH PORTLAND, MAINE 04106

February 27, 2018

Mr. Grover Tasker, Chairman, Cemetery Board Members and Sharon Sirois
C/O Department of Facilities, Grounds and Cemeteries
City of Dover
288 Central Ave, **2nd Floor**
Dover, NH 03820

Re: City of Dover Facilities, Grounds & Cemeteries Master Plan

Dear Grover and Board Members:

It is with great pleasure that we submit the 2018 Master Plan for the City of Dover Facilities, Grounds & Cemeteries. The master plan establishes the framework that identifies current conditions and identifies current and future needs and improvements for the cemeteries as well as the needs of the Community Services Department.

The City's only active burial grounds maintained by the City, Pine Hill Cemetery, serves as the operation facilities for the Community Services Department that maintains City buildings, parks, playgrounds, public spaces, street lighting and traffic signals and cemeteries. The City also maintains three early historic settler cemeteries; Austin-Tuttle, Pinkham and Roberts (First Settlers) cemeteries.

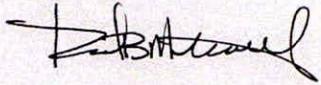
The Master Plan has identified existing conditions, assessment of existing structures at Pine Hill and needs assessment based upon staff and Board input. The plan includes recommendations for future improvements, conceptual design plans for specific recommendations and descriptions of priority items for implementing improvement projects to be included in the City Capital Improvement project budget.

Mr. Grover Tasker, Chairman and Board Members

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Throughout the duration of this study we have experienced invaluable cooperation, guidance and support from the Cemetery Board and Sharon Sirois; Superintendent of Facilities, Grounds and Cemeteries Department. We are honored to have this opportunity to contribute toward the development of a Master Plan that establishes a framework for guiding the long term sustainable maintenance and needs of the City Facilities, Grounds and Cemeteries Department to maintain and facilitate Capital Improvement funding

Sincerely,
Mitchell & Associates

A handwritten signature in black ink, appearing to read "R. Metcalf", is written over a light-colored rectangular background.

Robert B. Metcalf, Principal
Maine Licensed Landscape Architect

Enclosure

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- Cemetery Barn & Quonset hut
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- Parking

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5.1.1 City of Dover Master Plan 2009 (Not Attached)

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5.5 Recommended Plantings

The Dover Cemetery Master Plan was prepared under direction of the Dover Cemetery Board and in cooperation with Sharon Sirois, Superintendent Facilities, Grounds and Cemeteries. Their ideas, insights and comments have been invaluable and have shaped the plans final recommendations.

Dover Cemetery Board

Grover Tasker, Chairman

Rob Marggraf, Vice Chairman

Belinda Labourdette

Jo Ann Rohde

Martha Haley

Sean Greenlaw, Alt.

Bob Lucier, Alt.

Sharon Sirois, Superintendent Facilities, Grounds and Cemeteries

Meghan Moisan, Cemetery Coordinator

The City of Dover Community Services Department initiated the Master Plan process in the fall of 2016 to prepare a roadmap for maintaining the City owned cemeteries, identify operational and spatial needs for the Community Services Department. Based upon a needs assessment, evaluation of existing facilities, and evaluation of existing cemeteries, recommendations have been developed to establish guidelines and prioritize short term and long term improvements. The focus of the master plan is to establish goals, objectives and prioritization of recommended improvements and or actions to substantiate capital improvement expenditure to sustain the cemeteries and other Community Service Department responsibilities. This Master Plan will identify existing conditions of the four city owned cemeteries, and conditions of existing structures located at Pine Hill cemetery to develop a needs assessment to support operations of the Community Services Department that manages City properties and facilities -buildings, pools, parks, playgrounds, public turf areas and cemeteries. Publically maintained cemeteries include Pine Hill Cemetery, Austin Tuttle Cemetery, Pinkham Cemetery and Roberts Cemetery (First Settlers). Pine Hill Cemetery is the only one that have facilities-buildings and serves as home for the Community Services Department's Facilities, Grounds & Cemeteries division.

The Community Services Department is responsible for maintaining the city's four public cemeteries. Its' responsibilities extend well beyond the management and maintenance of the cemeteries. This division is housed at the Pine Hill Cemetery with offices in the Ricker Memorial Chapel and the maintenance operations are located in a two story masonry block building with a metal (Quonset hut) building for storage of equipment and material. The 1888 brick tomb also serves as a storage facility.

The department is responsible for maintaining public facilities which sustain a safe environment and quality of life for the community. Responsibilities include the following:

- Maintenance of twenty (20) public buildings providing cleaning, maintenance and repairs of the buildings and inclusive of the building envelopes and all interior systems, flags and flag poles,
- Maintain twenty (20) city parks - fourteen (14) of which have playgrounds, the Garrison Hill Tower, fifteen (15) ballfields (3 multi-purpose, 3 soccer, 2 softball, 7 baseball) seven (7) tennis courts, four (4) pickle ball courts and five (5) basketball courts,
- Maintain the Community Trail and Riverwalk along Orchard Street and through Henry Law Park, 65 public turf areas and five (5) irrigation systems. Oversee turf treatments and curb line weed control throughout the City,
- Maintains the city traffic signal network at twenty-eight (28) intersections and city traffic signage, inclusive of all street name, warning and regulatory signage,
- Maintenance of the decorative lighting in the urban core and on community trails,
- Maintain City street trees, trees and other vegetation in the public cemeteries and public parks.

- Maintain the facilities and grounds of Pine Hill Cemetery, of which 75 acres are currently developed, prepare burial spaces, conduct burials and inurnments, installation of foundations for monuments and markers. Maintain various memorial monuments and spaces throughout the City.

Department staff provide the following services:

- Maintain burial records, assist families in arranging and scheduling burials (interments and inurnments), maintain records for sale of graves, collect fees and process paperwork, contracts and payments, schedule and arrange for pouring foundations, maintain working relationships with funeral homes and monument vendors,
- Assist the general public with questions, concerns and complaints regarding various issues such as lighting, condition of trees, signage, conditions at facilities, parks, playgrounds, trails, and special events such as lowering the flags on memorial occasions, as well as hosting Memorial Day and Veterans Day ceremonies,
- Design, construct, install and repair equipment and facilities and assorted landscape areas,
- Provide carpentry, mechanical, plumbing, electrical, sheet metal and welding skills, in the construction, repair and maintenance of all buildings,
- Maintain the equipment necessary to perform landscaping, field maintenance, construction and tree maintenance,
- Maintenance of all small engine equipment, mowers, trimmers and Chain saws, etc.,

1.3 Dover Community Services Department City of Dover Facilities, Grounds & Cemeteries: 2018

- Perform landscaping, brush and tree removal at all city facilities, groom, mow and line ball fields, winterization of three (3) seasonal irrigation systems,
- Perform custodial duties at all city facilities,
- Coordinate maintenance schedules with other divisions,
- Maintains and install all City signage,
- Liaison for “Eversource” and “Affinity LED Lighting” for street lighting issues and maintenance,
- Maintain the Community Trail with assistance of volunteers,
- Perform snow removal and sand salt operations, as needed, throughout the Cemetery and the City during storm events.
- Clear and treat all walkways to City buildings and facilities during weather events.

1.4 Dover Cemeteries Goals and Guiding Principles City of Dover Facilities, Grounds & Cemeteries: 2018

The Cemetery Board is charged with oversight of the City Cemeteries in conformance with the City Code. The following are responsibilities of the Board:

1. To consider and recommend general policies for the operation of municipal cemeteries.
2. To make recommendations on the investments and expenditures of donations and bequests made to the city for benefit of said cemeteries.
3. Make an annual report of all cemeteries to the City Manager and keep such records and reports as he/she shall direct.

Goals:

- Develop a long range plan to guide the sustainable maintenance and operation of the city cemeteries.
- Identify opportunities for increasing burial and cremations at Pine Hill cemetery.
- Develop recommendations for sustainable maintenance of early city owned cemeteries for early settlers of Dover.
- Develop a strategy for addressing the needs of the Community Services Department and existing infrastructure at Pine Hill Cemetery that include potential renovation and or construction of new facilities.
- Promote safe access, circulation, passive recreation and easy way-finding signage within the Pine Hill cemetery.
- Enhance visitor awareness of the history of the cemeteries including signage.
- Establish a framework and prioritization of improvements to support Capital Improvements Projects (CIP) in the municipal budget.

- Encourage the public to independently conduct genealogy searches and locate family members and ancestors by making maps and burial information electronically available through a website.

Guiding Principles

- Maintain the historic character of the city owned cemeteries.
- Encourage public use of Pine Hill cemetery for walking opportunities and exploration of history of the city ancestry and public figures.
- Sustain the landscape character of Pine Hill cemetery and enhance the landscape of the east side.
- Promote opportunities for public involvement in support of the cemeteries through volunteer efforts and or financial contributions toward identified improvements.

2.1 Pine Hill Cemetery – Sections - (West) & Cemeteries: 2018

Area Description: Cemetery between Central Avenue and East Watson Street. Area to include main entrance, historic Chapel, Tomb, historic cemetery and cemetery facilities building (Cemetery Barn). The west side is the oldest portion of the cemetery with a stately canopy of pines and maple trees. The topography rises from Central Avenue to the west to a high point above the Tomb then slopes easterly and southerly towards East Watson. In general the lawn areas are in reasonable condition given the



minimal treatment beyond applications of grub control. Turf coverage is also dependent on tree canopy, with areas below pine trees impacted due to acidic soil and shade conditions. The paved roads for the most part are in good condition with several areas recently overlaid. Exceptions are the Main Avenue approach from Central Avenue that poses potential safety hazards due to failed road and sidewalk pavement and curbing. There are less traveled roads/lanes that have poor pavement conditions that could be reclaimed and upgraded with a gravel surface.

Recommendations:

- The Ricker Memorial Chapel, constructed in 1911, needs structural improvements and mechanical upgrades to meet code conformance and accommodate for current programming needs and modern use. Building Envelope Solutions completed an assessment of the chapel and provided the following; the chapel is in need of repair. Open mortar joints are visible around all sides of the buildings masonry features and on each elevation. The load bearing buttress are in poor condition with spalling and fractured masonry units. The cast stone features have been coated with a cementitious coating that is now peeling, resulting in advanced deterioration. The masonry in the tower is in poor condition and is advanced deterioration that is accelerating each year. The slate roof has missing and fractured shingles that is allowing bulk water to penetrate the roof assembly. The copper flashing has broken solder joints and the copper is cracked and damaged material. Due to these conditions a comprehensive building renovation plan is recommended. Refer to Section 2.3 Buildings. See appendix 5.3 for full report and recommendations.
- Bennett Engineering completed an MEP evaluation of the chapel and provided the following: Plumbing and heating; the existing interior drainage system is deteriorating, failures, leaking and flooding throughout the building were observed, condition leads to other structural issues and mold conditions. There is no fire suppression system, bath room is not ADA compliant and fixtures should be replaced. The heating system is nearing it life expectancy and should be replaced. Electrical service panel has exceeded it life expectancy, the wiring system should be completely replaced to bring to code, and outlet receptacles are insufficient for the current office use. Exit Egress Lighting for emergency exits is in adequate and non-code compliant. There are numerous NFPA 101 Life Safety Code deficiencies. Refer to Section 2.3 Buildings. See appendix 5.3 for MEP report.

- Review the feasibility of relocating and increasing the size of the facilities building. The existing facilities building is in poor condition and both spatially and functionally does not meet the needs of the cemetery grounds crew. Existing grades within the current location and proximity to active grave sites pose challenges to expanding the facility in its current location. In addition, expanding the building in the current location could potentially negatively impact the surrounding residential neighborhood. Relocating a new larger facility within the cemetery grounds would enable the grounds crew to function more effectively and efficiently.



- Building Envelope Solutions completed an assessment of the maintenance barn and provided the following; the barn is in need of repair. Open mortar joints are visible all around the building masonry features and on each elevation. Exterior load bearing walls are in poor conditions with spalling and fractured masonry units. The split-face blocks have been coated with a cementitious coating that is now peeling, resulting in spalling units. Embedded steel lintels over the large door openings are in poor condition due to the oxidation of the steel. Wooden soffit trim has larger areas of rot and peeling paint due to moisture infiltration. Wooden trim around door and windows are peeling with some areas of rot. The ballasted roof was not observed closely, however damage to the wooden soffits suggest moisture infiltration at the roofs edges. Due to the condition of the building and lack of efficient programming, BES recommends this building be demolished.
- Bennett Engineering completed an MEP evaluation and provided the following: See appendix 5.3 for HVAC assessment prepared by Bennett Engineering and 5.4 for building envelope evaluation prepared by Building Envelope Solutions.
- Should the Chapel use convert from office space to public ceremonial space, improvements to the site should be reviewed including: parking, exterior lighting, paving, landscaping and access requirements. See Exhibit B.

- Install drip strip around chapel and underdrain for foundation.
- Review feasibility of improving access into the main entrance off of Central Avenue.
See Exhibit A and description of existing conditions.
- Widen the sidewalk to five feet from Central Avenue to the Chapel with new curbing along Main Avenue to the Chapel entrance drive.
- Repair failing sections of pavement on Main Avenue near chapel entrance.
- Investigate options to improve drainage on Main Avenue where the main entrance meets Central Avenue.
- Close public vehicular access into the cemetery from East Watson Street at Avenue M and Avenue R intersection to improve vehicular safety along the road curve and manage controlled points of access to the cemetery.
- Remove utility poles that no longer provide service.

2.1 Pine Hill Cemetery – Sections - (West) & Cemeteries: 2018

Description:

The main entrance into the cemetery from Central Avenue is difficult to navigate due to lack of signage, poor sidewalks, steep road grade and narrow road width. The proposed design removes the walkway on the south side of Main Avenue, widens the roadway and expands the sidewalk along the north side of the drive. Additional unified signage is recommended to allow clear identification/direction from Central Avenue.

The existing road to the chapel is in poor condition with cracked pavement and failing sections along the north side of road. Main Avenue should be repaired in this location.

Exhibit A

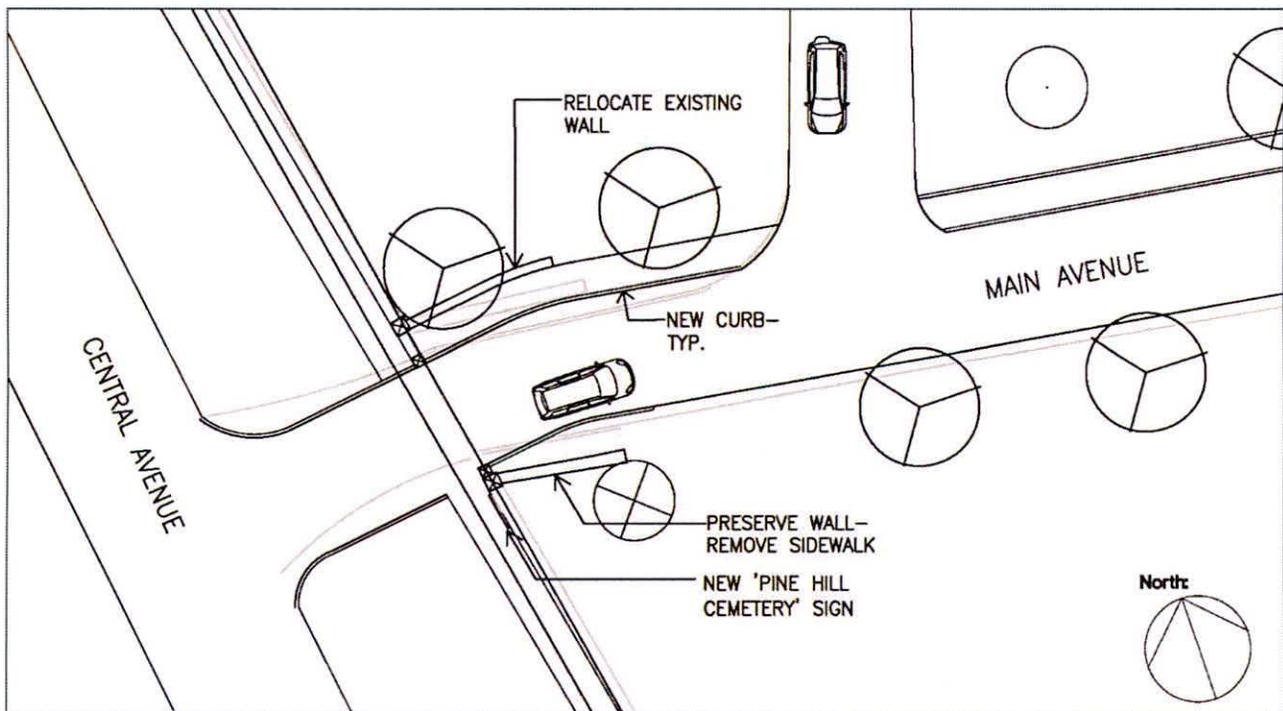
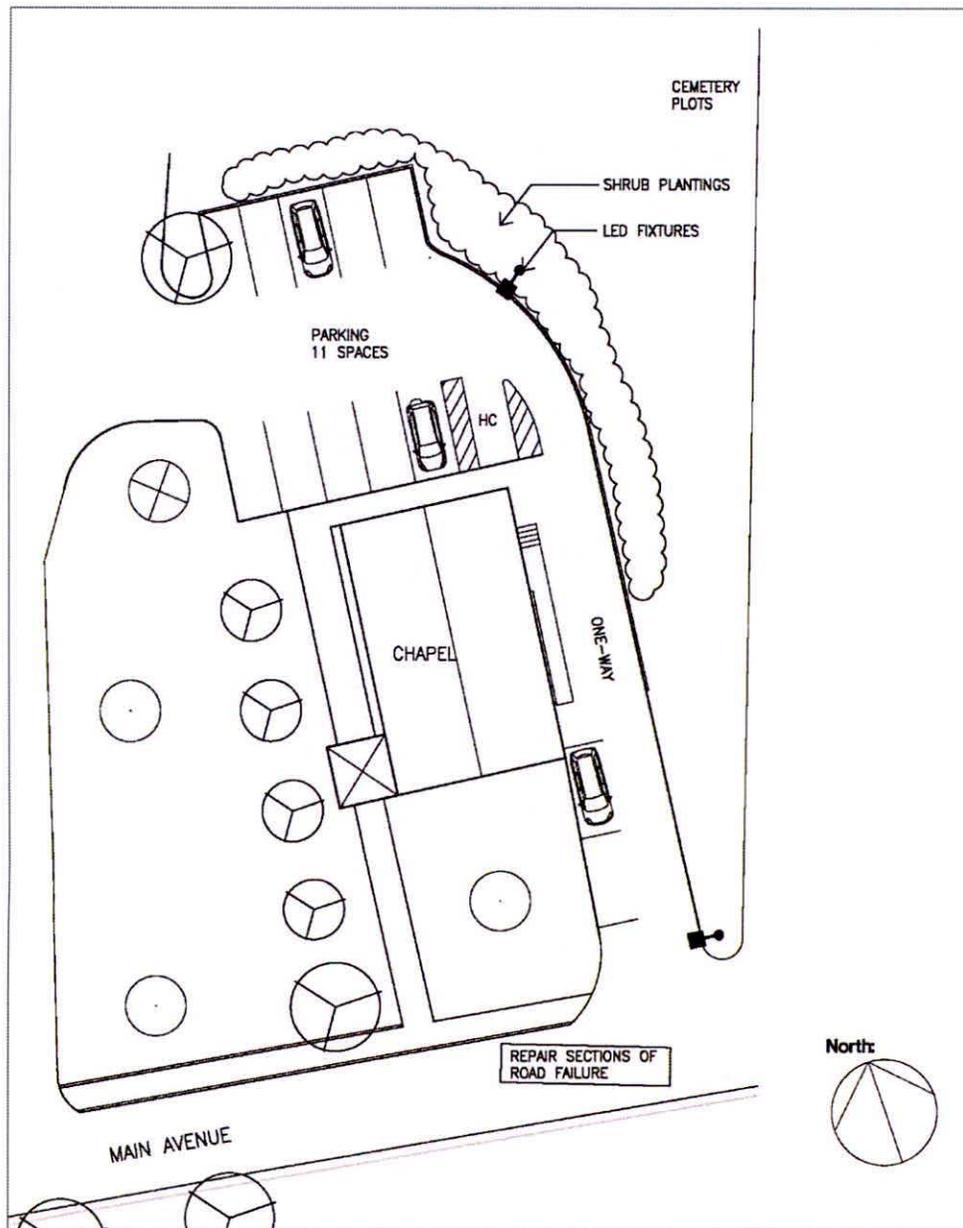


Exhibit B



Description:

Proposed site improvements are intended to decrease maintenance and support public events held at the Chapel. The following improvements are proposed: expanded parking lot with striping, granite

curbing, improved ADA access, light fixtures, replacement of asphalt walkway to bell tower with 5' stone dust walk, removal of yew shrubs, provide shrub plantings along steep slopes to stabilize and additional landscaping to reinforce the architecture and enhance the grounds surrounding the chapel.

2.2 Pine Hill Cemetery – Groups - (East)
Grounds & Cemeteries: 2018

City of Dover Facilities,

Area Description: Cemetery between East Watson Street, Court Street and neighborhood to the east. Area to include Gate 5, organic waste materials storage area, Veterans Circle and 9/11 memorial. The topography is relatively flat sloping to the east, with a mature tree cover along the westerly third and relatively open lawn in the middle third and a wooded area to the east. Observations, including staff input include shallow to bedrock conditions, seasonally wet areas along the easterly edge of the active cemetery. The remaining wooded area has a drainage area flowing from the adjacent neighborhood. Soils data indicates that a portion of the wooded area is a Scantic soil that is a wetland (hydric) soil indicator.



The East side of Pine Hill Cemetery has a different character than the West side. The cemetery is laid out on a more radial configuration, is a mix of headstones, burial vaults, flat grave markers and columbarium's. It is predominantly an open lawn area with interspaced areas of mature trees and trees obviously planted within the last 20 years. There is no clear connectivity with the West side indicating that this is part of Pine Hill Cemetery on East Watson Street. There are four entry points along Court Street with no identification as Pine Hill Cemetery.

Recommendations:

- Review feasibility of establishing an enhanced gateway (main) entrance to this area of the cemetery from East Watson Street. Design should incorporate similar materials as used within the main entrance at Central Avenue and constant identifying signage.
- Review the feasibility of relocating and consolidating cemetery offices with the grounds crew facility in a new expanded building located at the eastern portion of the cemetery with access to Court Street (See Exhibit C).
- Reduce the amount of public access points into the cemetery from Court Street. Close access at Oak Avenue and Cypress Avenue #2. Provide identification signage.
- Install improvements at Veterans Circle including lighting and landscaping (See Exhibit D).
- Relocate organic materials storage area or provide significant screening to reduce visibility.
- Minimize maintenance and improve recognition of 9/11 memorial. Provide raised granite curbing (10' diameter) around pole; install flag pole mounted LED up-lighting. Low maintenance ground cover plantings should be installed within raised circular area (See Exhibit D).

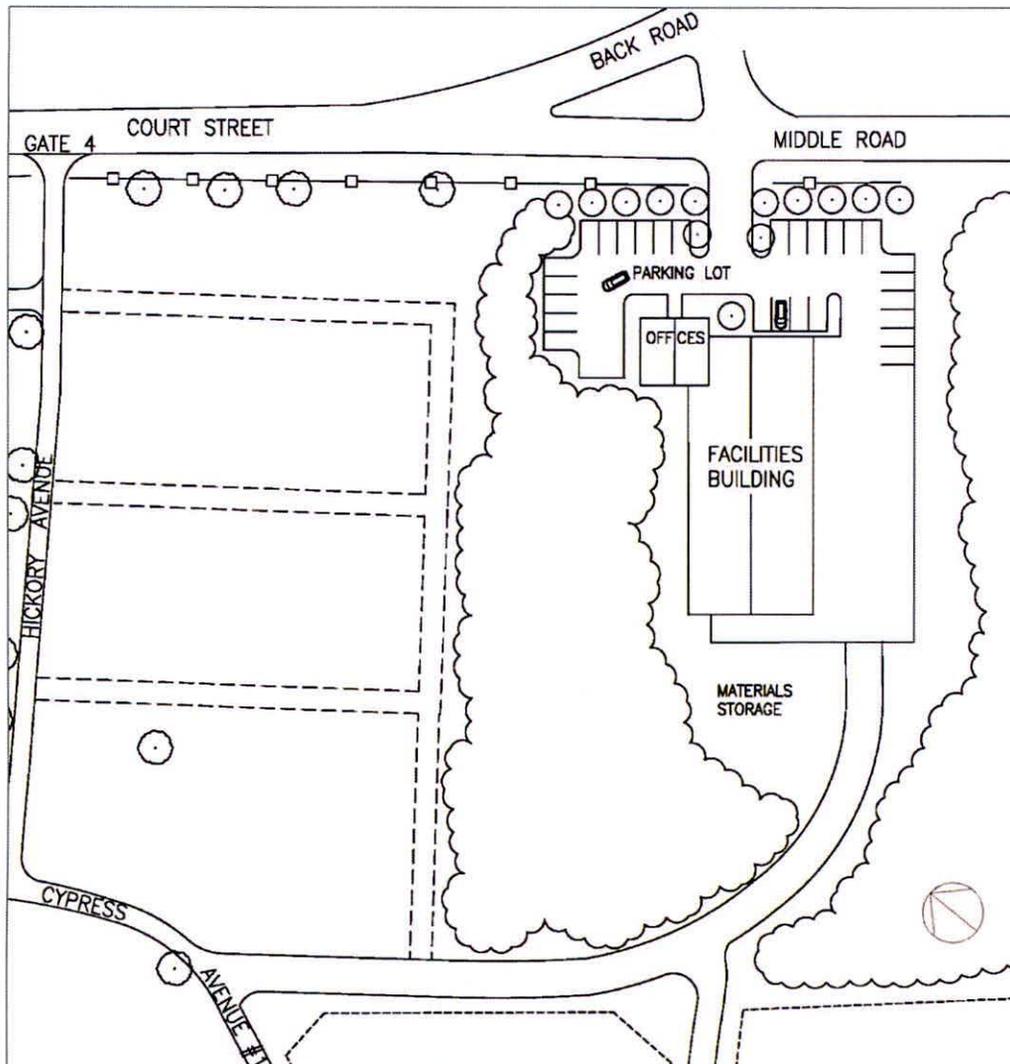


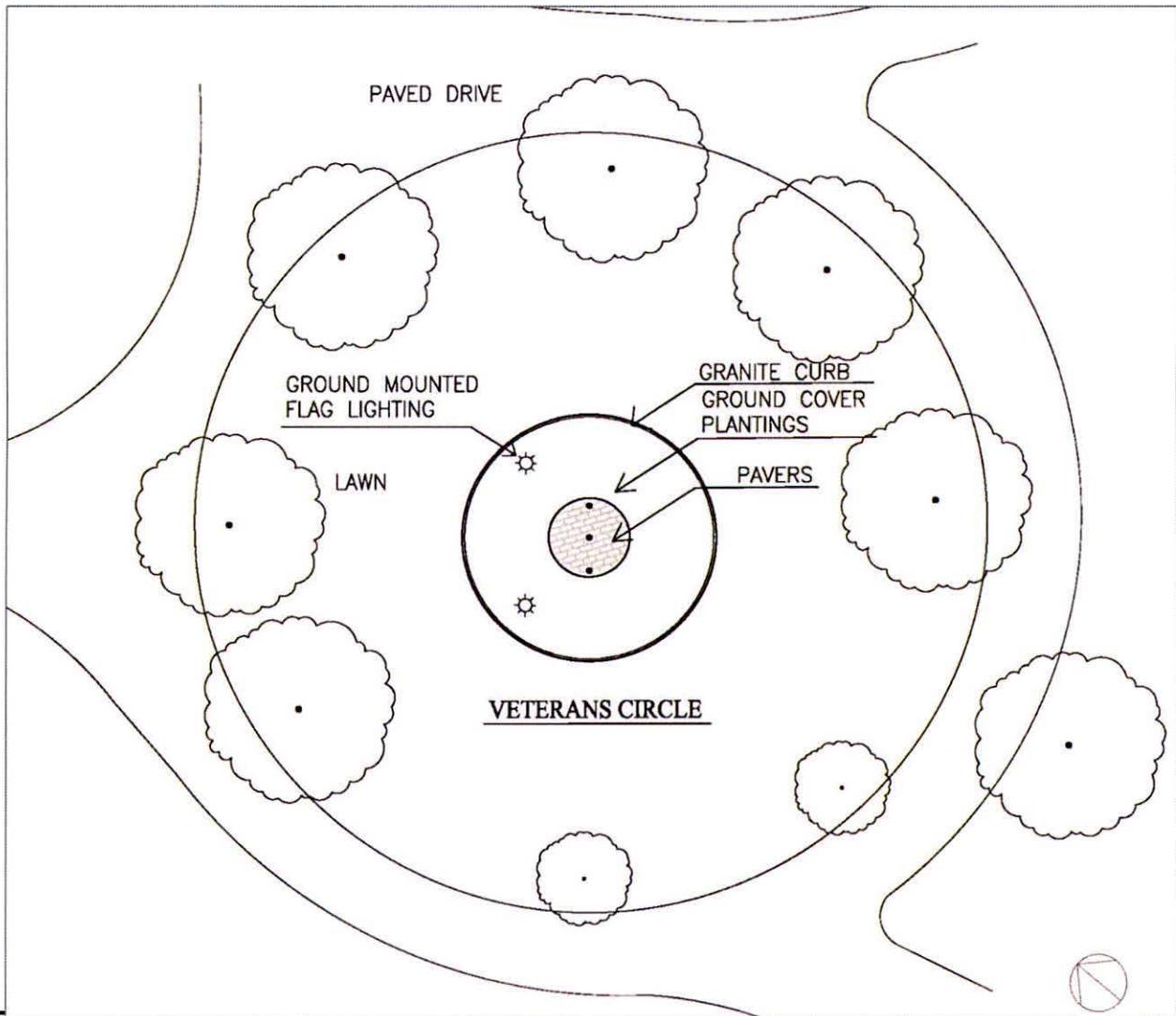
Exhibit C

Description:

The existing cemetery 'Barn', that houses the grounds crew, lacks in garage storage, shop/work space, an eye wash station and kitchen and bathroom facilities. The Ricker Memorial Chapel, which serves as the cemetery administration building requires additional office and storage space and a meeting room. The proposed expanded facility combines administrative and grounds crew in one building for greater efficiency. The new building could support greater garage space for heated storage of vehicles, safe storage of

flammables and adequate space for repairs. Improved administrative space could offer an appropriate meeting room for bereaved families, additional office space and storage area for cemetery files.

Exhibit D



Description:

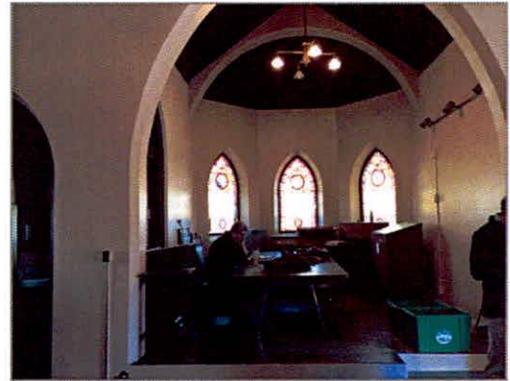
The proposed design highlights the Veteran flags with an enlarged circular planting area (50' diameter) defined by granite curbing. Low ground cover plantings within this area would require minimal maintenance and no mowing. The existing pole mounted light should be removed and efficient ground mounted LED lighting installed within the planting area. A simple stepping stone path through the plantings and a small area of pavers at the base of the flags are proposed to facilitate raising and lowering of flags.

Chapel

The cornerstone for Ricker Memorial Chapel was laid November 10, 1911, was erected in memory of Mary Edith “Mamie” (Ricker) Gallagher and given as a gift to the City from the will of her mother. Mary Abby (Ham) Ricker. The A.T. Ramsdell – designed building was completed the following spring. At formal ceremonies on September 29, 2012, the small church was conveyed to the City by the will’s executor, Mr. Fernald, who presented the keys to the Dover mayor Dwight Hall.

In 1967, extensive repairs and renovations were made to the deteriorating building and oil heat was installed. After many years of being vacant, the city moved the Facilities, Grounds and Cemetery offices from the cemetery ‘barn’ to the chapel in the mid 1990’s.

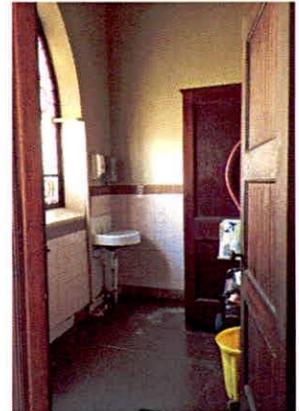
The chapel building is divided into three main areas including a small front room, central pew seating area and a rear office area that has been separated from the remainder of the chapel with a wall partition. A small restroom is located adjacent to the front of the chapel. The small front room stores’ miscellaneous chapel and office items. The central part of the chapel is used as storage space for pews, large format plans, cemetery records and other miscellaneous items. The rear office includes a central reception desk, two small offices and storage area.



The basement holds the sign shop, storage of cleaning and paper products for all municipal buildings, snow shovels and other miscellaneous maintenance items.

The three full time employees work at the chapel. While the chapel is architecturally interesting and worthy of renovation, its use as an office space for the Facilities and Grounds Department is inadequate. The following issues have been highlighted:

- Insufficient Storage Area.** While the department is in the process of digitizing cemetery burial records, many of the 35,000 burial records remain as hard copy documents. A central location for record storage would allow efficient retrieval of documents and better control over safe storage of historic documents. A flat file should be provided for preservation of large format plans.
- Insufficient Work Area.** Office duties include engaging with the public to arrange burials, storage and dispersal of supplies, organization of records and management of grounds crew among other tasks. The current office area does not provide adequate room to efficiently and appropriately handle tasks.

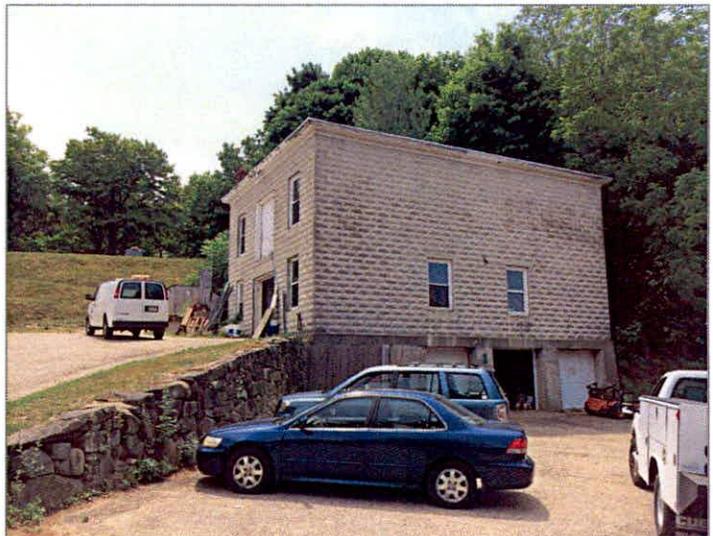


- **Receptionist Area.** The receptionist area requires more room than the limited space currently available.
- **Meeting Room.** A meeting/conference room is required to privately meet with families to prepare burial arrangements and hold inter-office meetings.
- **ADA Accessibility.** Improvements to accessibility should be made throughout the building including bathroom and main entrance.
- **General Building Issues.** Structural and mechanical system issues have been recorded in the attached reports by Building Envelope Specialist and Bennett Engineering.

Cemetery Barn (Grounds Maintenance Building)

The Grounds Crew consists of 6 full-time employees and 8-10 part time or seasonal employees. Cemetery tasks include mowing, minor tool/equipment repair and grave site preparation. In addition, the crew maintains all municipal parks and public spaces.

The cemetery barn has many structural issues highlighted in the report by Building Envelope Specialists. Functionally, the space is highly inefficient to serve the diverse needs of the grounds crew.



The following deficiencies were highlighted:

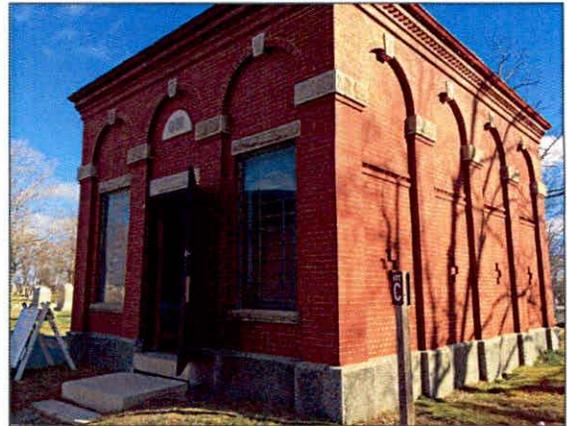
- **Work space.** Lack of heated workshop space for equipment repair & lack of a repair bay hoist
- **Equipment Storage Space.** Lack of heated garage bay for bucket truck and temperature sensitive machinery
- **Code Compliant Storage Space.** Flammable materials storage space
- **Storage Space.** Lockable tool storage
- **Functional Space.** Adequate breakroom/kitchenette space
- **Functional Space.** Adequate restroom facilities
- **Fuel Storage.** Code compliant fuel storage
- **Exterior Storage.** Exterior materials storage

Tomb

The tomb was originally used to store bodies during the winter till the ground thawed. The cemetery now practices year round burials therefore winter storage is no longer necessary. The brick building is dry, in good condition and easily accessible. No utilities are connected to the building. Current use of the facility is storage for inventory items such as paper towels and tissue, various size trash bags, ice melt and a variety of Christmas and other seasonal decorations used downtown and around the municipal buildings.

We recommend this building remain as unheated storage. City Christmas decorations could be consolidated into this building to streamline access. Additional shelving could be installed to efficiently store the other materials.

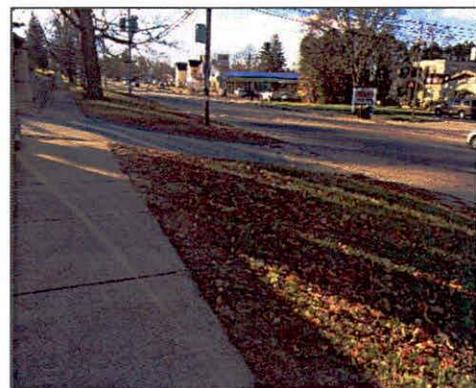
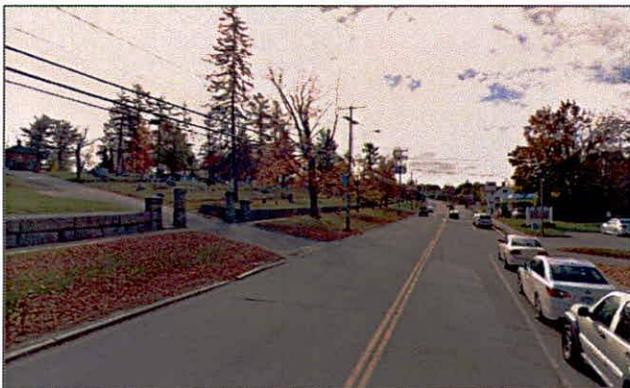
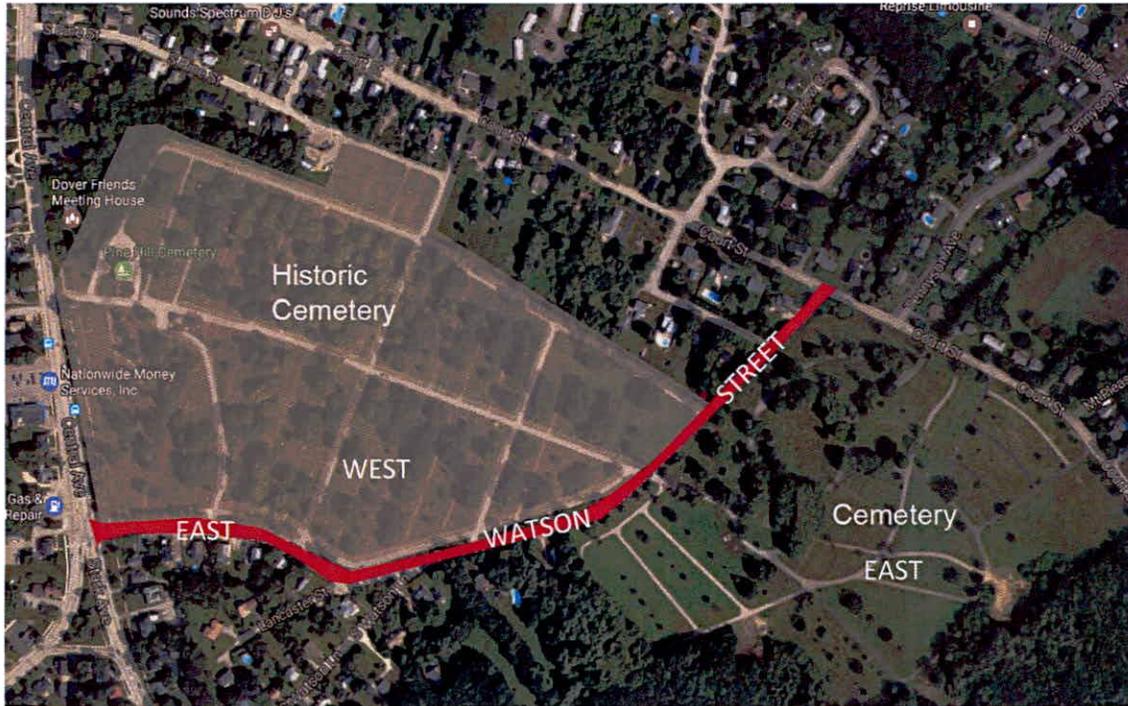
The tomb is centrally located and provides a good location for both interpretive signage and a wayfinding map. Signage could be mounted to the building within the recessed brick areas on the side of the building or on a stand located adjacent to the building.



Analysis

Access:

Pine Hill Cemetery is bisected by East Watson Street. The historic portion of the cemetery to the west has a distinctly different organization for vehicle and pedestrian traffic than the eastern side of Pine Hill Cemetery.



The cemetery's main entrance is located off of Central Avenue and provides quick access to the historic portion of Pine Hill Cemetery and the chapel. This historic entrance is defined by large stone retaining walls and stone pillars. While the entrance is highlighted by these features, access from Central Avenue is difficult due to the high traffic flow along this busy commercial street.

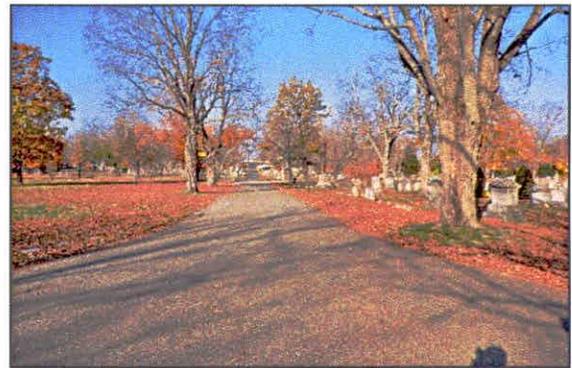
In addition, the narrow entrance drive width and road steepness make both visibility and vehicle access difficult. Main Avenue in the location of the Chapel is in poor condition with cracking pavement and areas of failure. Pedestrians can access the cemetery via a sidewalk from Central Avenue that extends up to the Chapel. The sidewalks in this location are in extreme disrepair.

From East Watson Street, five additional paved entrances allow easier access into the historic portion of the cemetery. In an effort to limit cut-thru traffic, options to close access at some locations should be considered.

Within the eastern portion of the cemetery, the main entrance (Gate 5) into the newer section of the cemetery offers little character or identity as an extension of the historic cemetery. Access from Court Street is provided by four un-gated paved roads and these access roads are close in proximity. Vehicle access could be eliminated at 1-2 of these points if unsanctioned vehicle traffic became an issue.



Gate 5 Entrance



Main Avenue

Circulation:

The circulation system throughout the cemetery is an important design element shaping the experience of visitors to the cemetery. The roadway alignment and grave layout in the historic cemetery was designed in a grid which allows long visibility corridors lined with trees between grassed and paved roads. The main roads are paved and provide circulation around the exterior of the cemetery with few paved connector roads through the center. Main Avenue was established as a central spine connecting East Watson Street to Central Avenue. Because Main Avenue is a straight connector between these two streets, unsanctioned local cut-thru traffic uses this route to avoid stop lights on the main roads. The use of traffic calming techniques could be utilized along roadways within the cemetery where unsanctioned traffic is a continual problem.

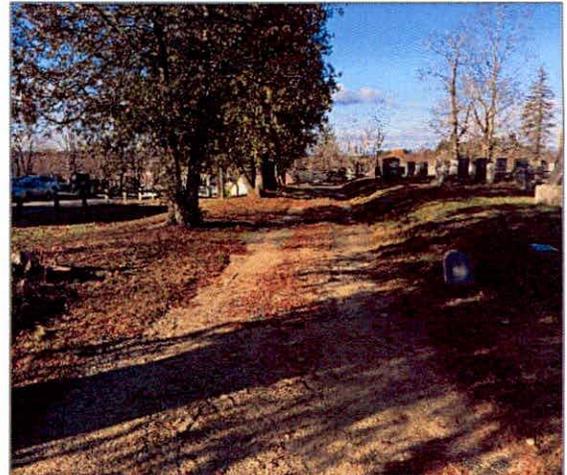
As the cemetery developed across East Watson Street, the circulation pattern changed and this portion of the cemetery was designed with curvilinear roadways and grave layout. As the cemetery continued to expand in this area, the layout converted back to a grid-like pattern. As a result, the design of the cemetery on the east side of East Watson Street lacks cohesion with the historic cemetery and the layout feels haphazard.

With exception to Main Avenue near the Chapel, the roads within the cemetery are in good condition with many of them repaved within the last three years. A continual program of maintaining the existing infrastructure is recommended. Paved roads in poor condition that do not get significant use, should be removed and improved with gravel or reclaimed bituminous pavement to create a uniform travel surface.

Parking:

No parking is defined within the cemetery. Visitors and employees currently pull vehicles to the side of the road to park and the need for a central parking area is not needed. Should the Chapel become a location for services or

events, defined parking should be established adjacent to the Chapel. There are some locations where vehicles pull to the side of the road and into the grassed area to park and these locations show wear. Should this become a consistent problem, signage encouraging visitors to park on grassed roadways should be installed.

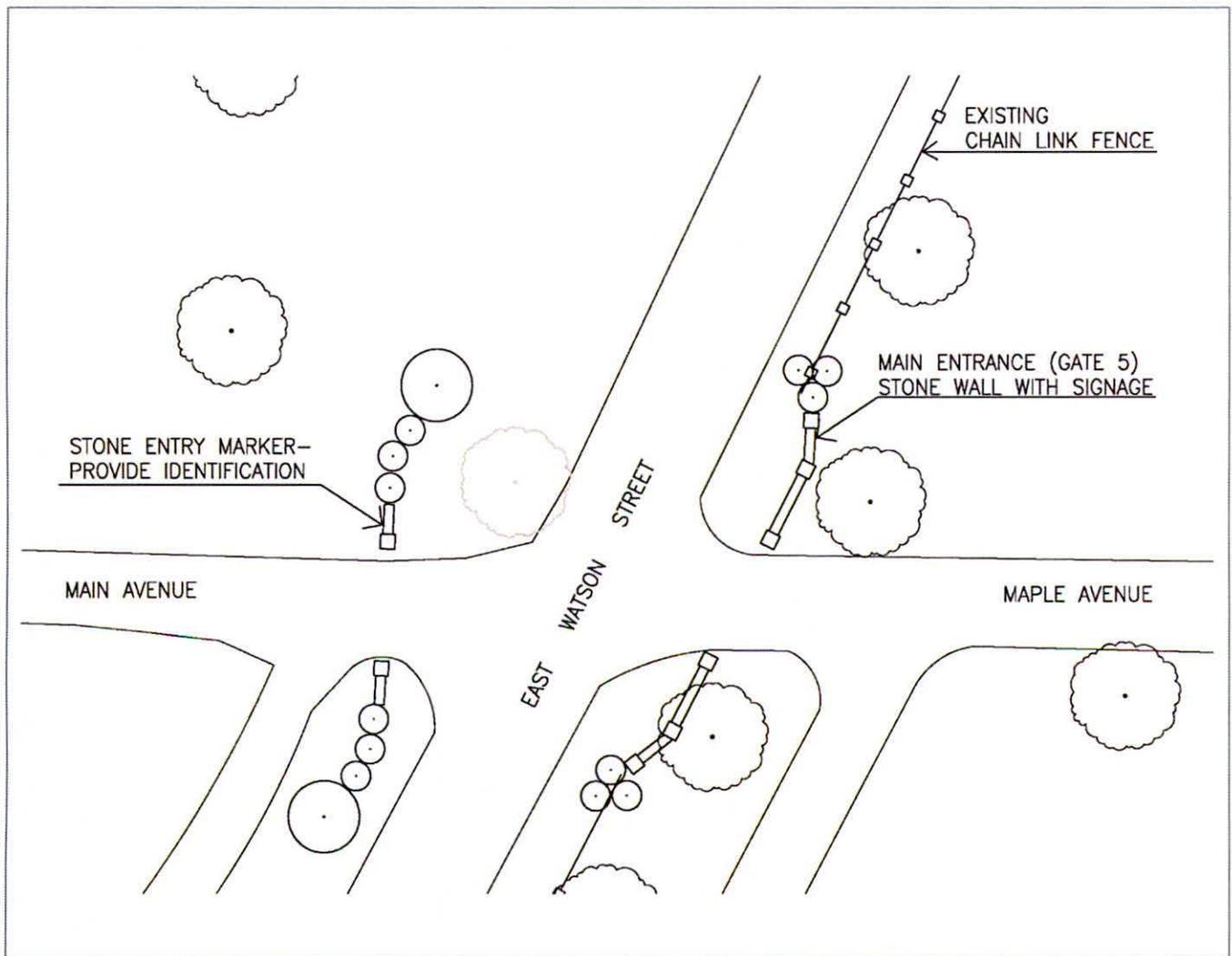


Recommendations:

- Review options to unify the east and west portions of Pine Hill Cemetery through use of repeat materials, signage and gateway elements.
- Review design of the Gate 5 entrance to Pine Hill Cemetery-East and adjacent entrance to Main Avenue. (see Exhibit E)
- Within the historic area of the cemetery, remove minimally used paved roads that are in disrepair. Restore 8' gravel road for maintenance access (see Exhibit F).
- Install traffic calming measures such as raised speed tables, along Main Avenue.
- Apply crack seal to address surface cracks in asphalt and improve longevity of pavement.

- Road sections where failure of pavement (heaving and settlement) occur, milling of pavement and repaving is recommended. Where there is excessive heaving or settlement, a full depth reconstruction should be completed.
- Decrease the amount of vehicular access points into cemetery from East Watson Street and Court Street.

Exhibit E



Description:

The intersection of Main Avenue, East Watson Street and Maple Avenue offers an opportunity to develop key entrances to Pine Hill Cemetery from East Watson Street. The proposed entrances could

integrate unifying design elements between the east and west areas of the cemetery and develop a sense of identity. While the entrances in this location are visibly recognized as entrances to the cemetery, they lack character and identification signage. Through the integration of entry markers that repeat materials seen elsewhere in the cemetery, a palette of design elements can be developed to unify and define cemetery entrances.

Exhibit F



Description:

Some of the less used paved roadways are in poor condition. Removal of pavement within these locations and restoring them to gravel would maintain access, improve aesthetics and decrease long term paving costs. The above Exhibit F highlights 170 linear feet of asphalt in poor condition within the historic section of the cemetery.

Analysis

Entrance Signs:

The main entrance to Pine Hill Cemetery is highlighted by a beautiful stone wall that extends the length of the Central Avenue frontage. Stone pillars mark pedestrian and vehicle access. A small bronze placard with the words 'Pine Hill Cemetery' is located on a pillar at the entrance; this is the only identification signage for the entire cemetery. On an adjacent pillar, a sign with the address is strapped to the pillar with metal straps.

Despite the prominence of the walls and pillars, the combination of having a narrow entrance and the relative height that the cemetery sits above Central Avenue, make identification of Pine Hill Cemetery difficult. The signage at the main entrance is inadequate for easy recognition from Central Avenue. From East Watson Street and Court Street, there is no signage that identifies the cemetery at any of the entrances.



Identification Sign

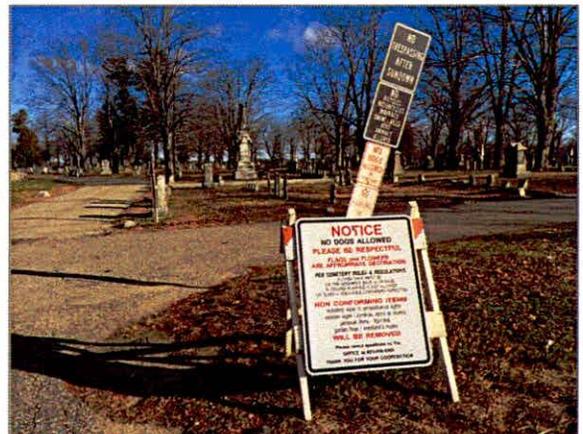


Street Address

Regulatory Signs:

Regulatory signage dominates the cemetery entrances from East Watson Street. Signs consist of standard, utilitarian, street-type signs on posts, nailed to a utility pole or located on a moveable sign board. The clustering of multiple signs stating what the visitor is allowed/not allowed to do presents an uninviting image. This focus misses an opportunity to welcome and share the rich history of the site with visitors. Rules can be incorporated within the context of one sign that conveys respect.

There is a need to establish a coordinated signage plan and design for use throughout the cemetery for informational, directional and regulatory signage. In addition, the use of interpretive signage is an



opportunity to educate the community about the significant history of the cemetery and inform visitors about the ecology of the site. Providing this type of information to visitors may impart recognition of the value of the cemetery as a 'city treasure' and encourage respect and appreciation for the cemetery. Visitors could benefit from the inclusion of a map of the facility near the main entrance and chapel area. The cemetery signage could be part of a wider city signage plan that coordinates park signage, historic sites and other significant city facilities.

Interpretive Signage Examples:



Recommendations:

- Develop a consistent signage design for use within City of Dover cemeteries
- Develop an attractive entrance sign that clearly welcomes, directs, informs and regulates visitors. The signs shall be located at each entrance to the cemetery with larger entrance signs at main entrances.
- Design a series of interpretive signage to share interesting facets of the cemetery and elicit respect and appreciation for the cemetery.
- Develop a sign with a map of the entire facility located in a central location within Pine Hill Cemetery (install in both east and west areas).
- Retain the services of a sign design consultant to create a signage package. Historic information should be coordinated with the cemetery and city historic records. The city in 2016 retained the Gamble Design, LLC, Portsmouth NH, to develop a city wide wayfinding and sign/branding study. This could potentially provide a frame work for the cemetery signage.

Analysis

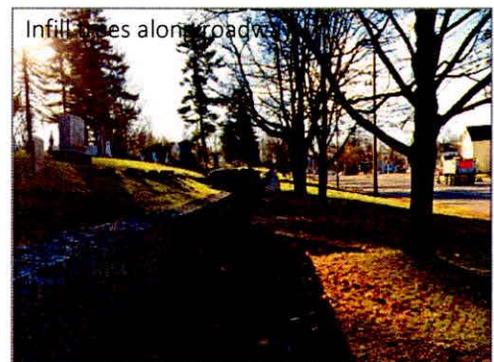
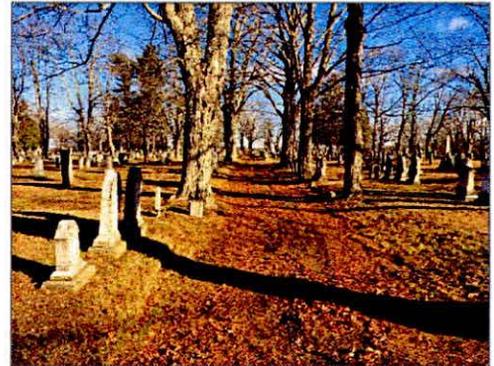
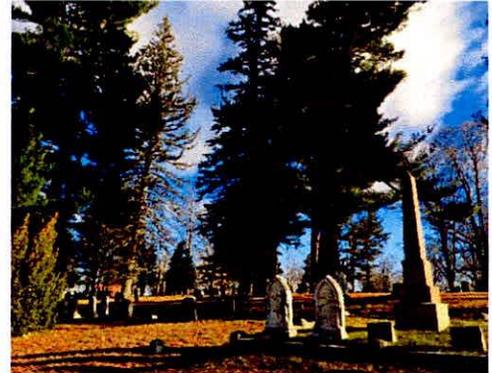
Vegetation is the defining characteristic at Pine Hill Cemetery and what was once probably a landscape dominated by pine trees, gave the cemetery its namesake. While pines still dot the landscape, sugar maple is the dominant tree species. Trees are the primary feature within the landscape and are used to shape views, provide a sense of place and define areas within the cemetery. Planted throughout the 1900's, a strong grid pattern was created within the cemetery west of East Watson Street shaping long view corridors. While many of the maples appear to be in good condition, tree loss has occurred among the older maples and numerous stumps exist.

Trees within the east side of Pine Hill Cemetery represent a wider selection of species and are a mix of new plantings and older trees. There is not a clear organization of plantings and multiple patterns are utilized within the newly developed areas in the cemetery. Developing a plan for future plantings would allow a thoughtful approach to enhancing the character of the cemetery. While a planting plan is beyond the scope of this master plan, focusing plantings along internal roadways would begin to strengthen the design, reinforce the edges and various sections within the cemetery.

Tree plantings that line the public roads at the perimeter of the cemetery are well established. Additional plantings along roadways to infill where tree loss has occurred will maintain a strong presence along the road. Tree plantings along Court Street are minimal and provide little buffer for grave sites that are located close to the busy street. Additional trees would strengthen the existing buffer; shrub plantings along the fence line may be considered to provide additional privacy where grave sites are very close to the road.

A comprehensive tree inventory was prepared in December, 2015. A program of replanting has been established to infill where tree loss has occurred within the older stands of trees and new trees are planted annually within newly developed areas of the cemetery. A program is currently in place for annual tree pruning. Few shrubs exist within the cemetery and shrub plantings are predominately adjacent to gravestones.

Lawn is the predominant ground cover and grubs have been a problem in the past. Grub control was applied in 2015 and 2016. Treatments should be applied on an annual or biennial basis. In general the lawn areas were in good condition. Regular parking along the edges of internal roads has



caused compaction in some areas. If this is a consistent problem, signage could be introduced to direct vehicles to park in grassed travel ways. Fertilization and aeration could improve the health and vitality of lawn areas. Low maintenance, low growing ground covers should be considered within raised graves sites to minimize mowing requirements and provide diversity within the ground plane. Ground covers could also be used within steep sloping areas that are a challenge to mow.

Recommendations:

- Install additional tree plantings along the perimeter of the cemetery at Central Avenue, East Watson Street and Court Street.
- Review options to install ground covers within areas that are difficult or time consuming to mow (steep slopes, raised grave sites).
- Grind stumps and plant new trees where possible.
- Develop a planting plan for newly developed cemetery areas that can be implemented in the capital improvement plan. Refer to appendix 5.5 Recommended Plant List.
- Develop a maintenance program of lawn fertilization, aeration and over-seeding. Prior to fertilization, perform soil testing to determine soil nutrient deficiencies.

Pine Hill Cemetery was officially established as the town cemetery on March 29, 1731, it was voted at a public town meeting to set aside 1.5 acres "for a public Burying-place to be laid out by ye Selectmen near ye Meeting-house on Pine Hill at Cocheca."

The site was first used as a cemetery by Native Americans in the early 1700's, with the first European burials taking place in the 1730's, the oldest burial on record was Ichabod Hayes in 1734 with subsequent burials of family members. The cemetery has 35,000 burials to date with an annual average of 78 interments.

In addition to full burial plots (3'-3" x 10'), Pine Hill Cemetery offers ash burial plots (5' x 5') as well as columbarium vaults. It has been estimated that the cemetery is at 75 percent full capacity. As cremation rates have been on the rise in the past years while full burials have decreased, this will likely affect, in a positive way, the capacity for future burials. Popularity of burial rituals have fluctuated throughout the years and cemetery planning should consider long term trends to accommodate for future needs.

Pine Hill Cemetery has 75 +/- acres (City of Dover, GIS). Thirty-three acres to the west of East Watson Street are developed with limited plot availability. Should the Cemetery 'Barn' be relocated, this area could be redeveloped to support approximately 120 additional burial plots or 240 cremation burial plots. Additional columbarium niches could also be located in this area and would integrate well within the existing sloped grade.

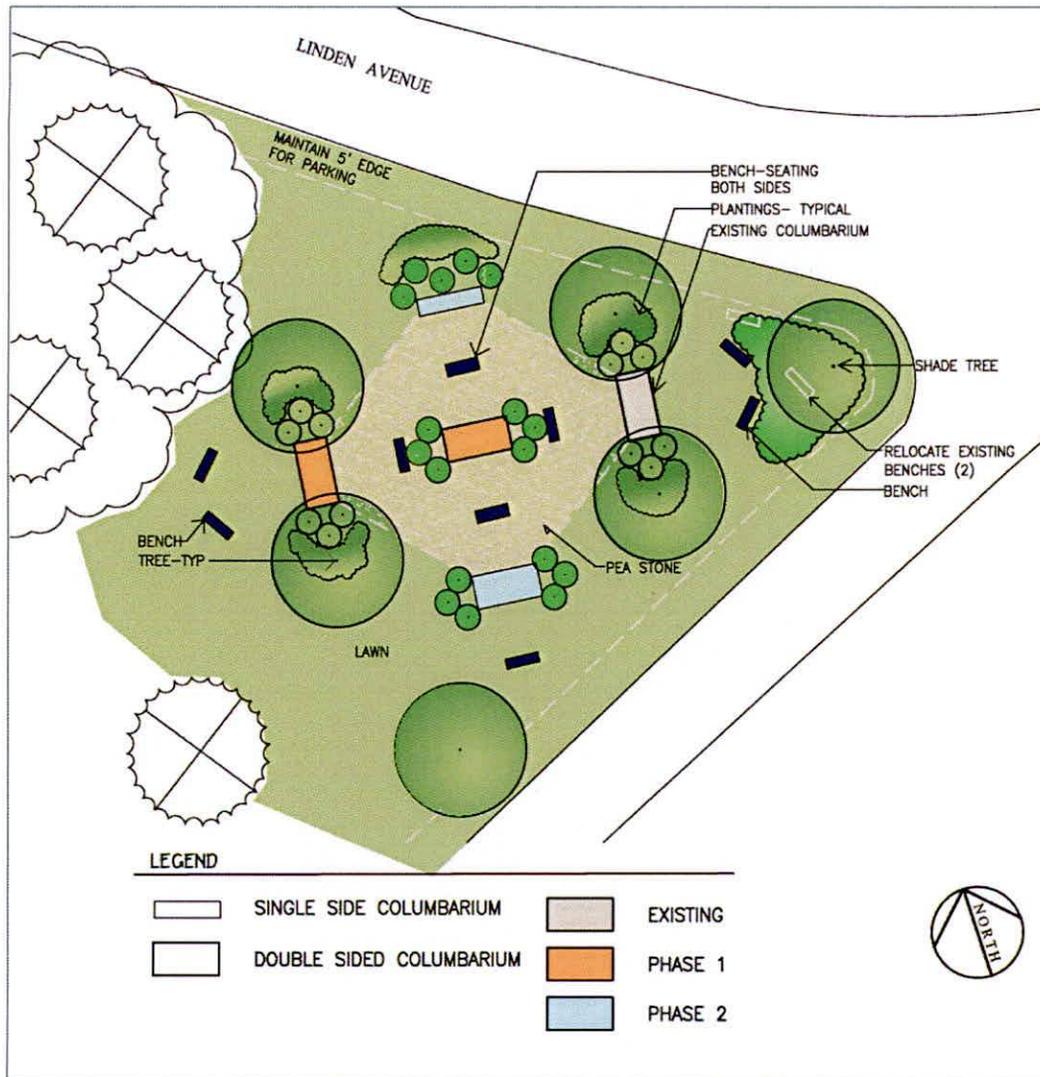
The area east of East Watson Street includes both developed and undeveloped land. Of the 42 +/- acres, approximately 24 acres have been cleared and prepared for burial plots while approximately 18 +/- acres remain undeveloped woodland. The woodland should be explored for the potential to create additional plots. Burial plot layout in this area could take advantage of the established woodlands to create cemetery plots or columbaria with a woodland character. Retaining clusters of existing plant material and developing plots among the established trees would create an interesting and attractive complement to the existing cemetery. Full layout potential would be determined by limits created by wetland areas, soil conditions, steep slopes, existing vegetation and ledge conditions. State soil maps identify small areas of Scantic soils within the woodland area. Scantic soils are conducive to wetland conditions and we understand that wet areas have been observed within the woods. The potential to develop this area could be impacted by wetlands and a wetland survey should be prepared to understand the extent and character of the wet areas. Reconfiguration of the spoils area and constructing a new maintenance facility and offices would require approximately 2 acres.

Recommendations:

- In locations where ledge limits grave digging, burial vaults could be raised and the adjacent landform mounded or raised to provide coverage. Stone walls or granite curbing could be used to create raised landform.
- Alternative for areas with shallow to ledge conditions, where appropriate would be additional columbaria.

- Redevelop the Cemetery 'Barn' lot into burial area. The sloping site could accommodate traditional burial plots as well as columbarium niches within a terraced layout. This location has an opportunity to provide a nice space to transition to the neighborhood.
- The cemetery (East) currently has one columbarium and the city would like to add two additional with the opportunity expand in the future. (See Exhibit G)
- Develop a protocol for scattering ashes.
- Expand burials within wooded area. (See Master Plan East))
- Develop additional cremation burial sections.

Exhibit G



Description:

The proposed design outlines phased expansion of the existing columbarium unit. The existing unit has 48 niches; the full expansion would allow for a total of 216 niches. The design incorporates landscaping and benches organized to create a peaceful memorial space.

To assist in long term sustainability of cemetery spaces, communities often turn to Friends Groups or local neighborhood groups to get involved with caring for and promoting the cemetery as valuable public space. Many communities consider cemeteries as having the dual purpose of both cemetery space and Public Park and historically, cemeteries were used as spaces that provided a peaceful place for the dead and a spiritually lifting space for the enrichment of the living. Approaching the cemetery as a space of refuge for appropriate low impact, passive recreational activities may bring additional interest and funding opportunities to maintain the cemetery as a valuable public space.

Recommendations:

- Develop a website for Dover Cemeteries to engage, inform and direct the community. Information that could be made available on the website includes interment records, cemetery map, services provided, rules, special events and historic information.
- Review interest in creating a Friends Group for Dover Cemeteries to support fundraising, annual clean up days, long term planning projects, website development, walking tours, and others as determined.
- Provide a perimeter sidewalk connection along East Watson Street between Main Avenue and North Avenue.
- Work with the local community to develop a measured circuit of walking paths for healthy lifestyle promotion.
- Explore opportunity for developing a walking history program. Including signage, phone APP, and school programs.
- Introduce randomly placed granite benches for walkers and visitors to enjoy the beauty of the cemetery landscape and provide opportunities for respite or reflection.

Throughout the years, small private family cemeteries have come under the purview of the City. Despite their charm, maintenance costs are a concern when accepting family plots. The City currently maintains three private cemeteries including the Austin-Tuttle Cemetery, Roberts Cemetery (First Settlers) and Pinkham Cemetery. These sites include historically significant individuals such as the first settlers of Dover and prominent Dover families. The burial sites provide a small window into the communities that lived in Dover in the 1600 to 1800's and the city recognizes that this visible evidence of history should be preserved.

Funding to maintain these sites is extremely limited. Options to increase public interest in these sites could be explored as a means to gain attention and support for maintaining these important cultural sites. Funding opportunities are limited and often only available to non-profit groups.



General Recommendations:

- 1.1 Coordinate with organizations to catalog and research historic significance of individuals buried at each of the three cemeteries. Develop a website to inform and promote interest in the cemeteries.
- 1.2 Develop self-guided cemetery tour brochure with the option for usage of 'quick response' data for retrieving historic information on smart phones using a barcode scan..
- 1.3 Provide historic informational signage at cemeteries.
- 1.4 Coordinate with local school programs to use cemeteries as a resource for educators.
- 1.5 Coordinate community/neighborhood workdays to assist in annual spring cleanup efforts.
- 1.6 Consideration should be given to promoting a non-profit group such as "Friends of Dover Cemeteries" that could provide help in preserving the cemeteries and identifying opportunities for seeking grant funding.

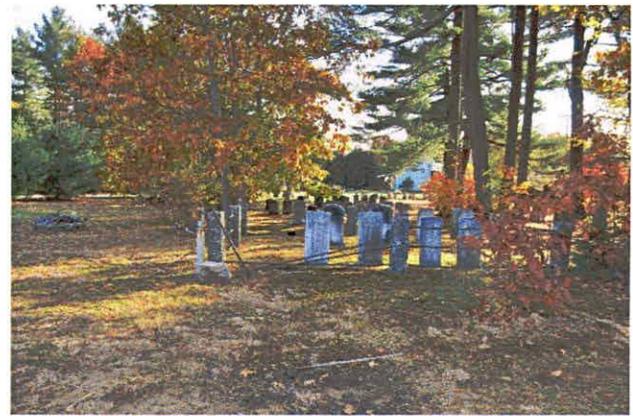
3.1 Austin-Tuttle Cemetery

Location: Old Dover Point Road/Gerrish Road

Size: 0.55 acre

Site Character:

The small cemetery is located within a rural neighborhood, surrounded by single family residences. The lot has well established trees with many large white pines, oak and cedar. Shrubs and understory trees edge the northern property line while a thick growth of Japanese knotweed is overtaking the southerly property line. Based on the existing groundcover of weeds and mosses it is assumed the soils within this area are acidic. Soil pH appears to limit the establishment of healthy lawn. The monuments are in generally good condition although pipe railing around two groups of plots were either bent or broken. Signs of neighborhood activity within the cemetery were visible including children’s play items and garden tools. The limit of the cemetery is not clearly defined.



The following maintenance challenges were highlighted:

- **Invasive Plant Material.** It is recommended that the Japanese knotweed along the southerly border be addressed as the aggressive root system will continue to overtake the cemetery. Currently, numerous headstones are buried within the knotweed.



Eradication of Japanese knotweed requires a thorough process and dedication to its removal. The below table outlines two treatment schedules that vary in length of time to reach results.

• JAPANESE KNOTWEED (<i>Fallopia japonica</i>)					
Initial Treatment			Follow-up Treatment		
Methods	Timing	Notes	Method	Timing	Notes
Cut/mow plant to ground level	Mid-late June	Fragments of this plant can take root- Use extreme caution handling cut material.	Repeat cutting/	After re-sprouting, throughout growing season	Effective, but follow-up needed for 5-6 yrs.
Cut/mow plant to ground level	Mid-late June	Fragments of this plant can take root - Use extreme caution handling cut material.	Foliar spray with 2% glyphosate or triclopyr	As soon as re-sprouting occurs	Effective, but follow-up needed for 2-3 yrs.

Knotweed can also be eradicated by deep excavation of the root system and removal of contaminated soils. This method is highly intrusive and can be costly. It is recommended for isolated pockets of knotweed. Removed soils must be disposed of properly to prevent spread.

- **Monuments.** Considering the age of the grave markers, these were in good condition. Expected signs of deterioration were visible including discoloration, cracked and toppled headstones and surface deterioration which could be attributed to moisture, freeze/ thaw cycles, pollution and algae and lichen colonization.

- **Vandalism.** Typically, neglected landscapes promote more vandalism than sites that are well cared for. While the site had no visible signs of vandalism, the combination of invasive plant material encroaching on the site, pipe railing that was broken or damaged and a lack of clear boundaries contributed to a feeling of neglect within the space. Continuing to maintain the property, repair minor features that do not require extensive restoration and maintain clear and open sightlines, will be important to project signs of care to help in limiting vandalism.



- **Vegetation.** Trees and shrubs within the site were in good condition. There were signs of the root systems of the larger trees disrupting grave stones but this is expected in a cemetery of this age.

Recommendations:

- Develop a schedule for eradication of Japanese knotweed.
- Prune existing trees and shrubs to maintain sightlines and safety.
- Repair broken pipe rail fencing.
- Provide appropriate fencing or granite posts to clarify property lines, define ownership and initiate signs of care.
- Record condition of headstones and monitor for safety.
- Grind stumps if practical.
- Engage a monument specialist to evaluate condition of toppled monuments and options for restoration/repair.

3.2 Pinkham Cemetery

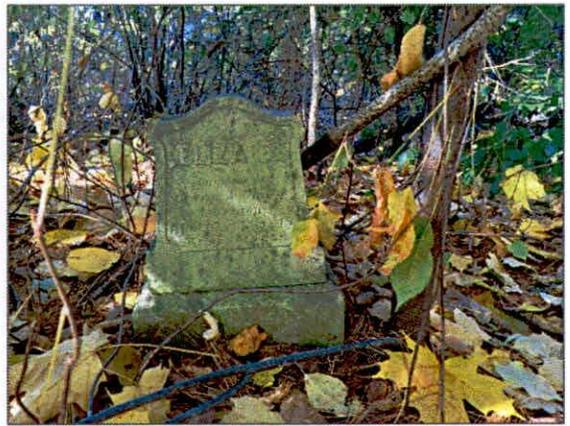
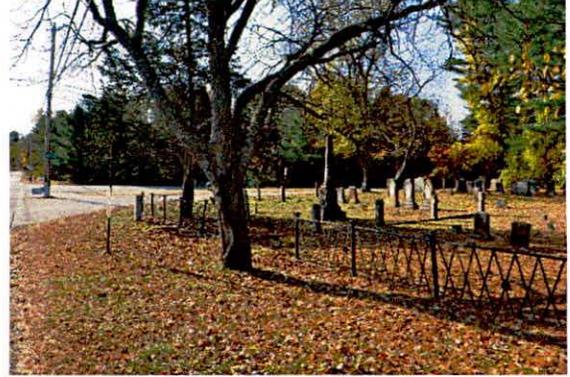
Location: Dover Point Road/ Ayers Road

Size: 8,600 square feet

Site Character:

Pinkham Cemetery is a small, orderly cemetery that appears to be slowly being taken over by the adjacent woodland. A black iron picket fence clearly defines the frontage along Dover Point Road while granite posts demarcate the north and south property lines. Woodland vegetation and invasive plant materials have encroached on the eastern part of the cemetery and many of the grave stones are barely visible among the vegetation. While the southern edge is bordered by Ayers Road, the northern property line abuts a residence and the property line is obscured by vegetation.

Within the mowed area, the monuments are in good condition with expected signs of deterioration. There are few trees within the maintained part of the cemetery and they appear to have been planted to define the perimeter of the cemetery. Throughout the years some of the trees have been removed and stumps remain while some trees have grown around adjacent granite monuments.



The following maintenance challenges were highlighted:

- **Monuments.** The grave markers were in good condition. Expected signs of deterioration were visible including discoloration, cracked and toppled headstones and surface deterioration which could be attributed to moisture, freeze/ thaw cycles, pollution and algae and lichen colonization. The headstones that are located within the overgrown woodland will deteriorate at a much faster rate. Vegetation should be removed around all existing headstones.
- **Vegetation.** Vegetation within the mowed area is well contained. The overgrowth within the woodland area includes invasive bittersweet which is an aggressive woody vine capable of smothering trees and other native vegetation. To minimize deterioration of monuments, shrubs, ground covers and leaf litter should be removed from within the wooded area of the cemetery. Selective tree removal should focus on removal of trees in close proximity of burial plots. Grind stumps were practical. Lawn areas were patchy but sufficient for a minimally maintained location.
- **Vandalism.** The cemetery appeared in good condition with no signs of vandalism. Maintaining signs of care including preserving fencing, removal of trash and landscaping will continue to aid in minimizing vandalism.

Recommendations:

- Remove invasive vegetation from within the wooded area and remove plant material around gravestones. Maintain a vegetated buffer between adjacent properties.
- Prune existing trees and shrubs to maintain sightlines and safety.
- Remove broken granite posts.
- Provide appropriate fencing or granite posts to define property lines, clarify ownership and initiate signs of care.
- Record condition of headstones and monitor for safety.
- Grind stumps where practical.

3.3 Roberts Cemetery

Location: Dover Point Road

Size: 0.69 acres

Site Character:

The Roberts Cemetery is the first settlers burying ground established in 1633. The cemetery is open lawn, or herbaceous cover, to the south and large pines to the northerly edge. The cemetery abuts residential properties and is edged with a woodland buffer. A white rail fence provides a presence for the cemetery along Dover Point Road. Based on the existing groundcover of weeds and mosses and the heavy coating of pine needles, it is assumed the soils within this area are acidic as well as compacted. Aeration of the soil, providing applications of lime, fertilizer and over seeding would be required for reestablishing a healthy vegetated cover.



- **Monuments.** The grave markers were in good condition. Expected signs of decay were visible including discoloration, cracked and toppled headstones and surface deterioration which could be attributed to moisture, freeze/ thaw cycles, pollution and algae and lichen colonization.
- **Vegetation.** The cemetery is primarily open lawn which appears to be in poor condition. The lawn was patchy with prolific moss and weeds, both signs of soil deficiencies. If this was a priority, a combination of soil aeration, over-seeding, and fertilization would help bring a healthy lawn back. A woodland border extends around the rear and sides of the cemetery; canopy trees planted along Dover Point Road would add character and shade to this site.
- **Vandalism.** The cemetery appeared in good condition with no signs of vandalism. Visibility into this cemetery is clear and the site is located along a main roadway.

Maintaining signs of care including preserving fencing and removal of trash will continue to aid in minimizing vandalism.

Recommendations:

- Record condition of headstones and monitor for safety.
- Grind stumps where practical.
- Plant three to four shade trees along the road frontage.
- Provide additional informational signage regarding the significance of this cemetery.
- Test existing soils to evaluate nutrient deficiencies and pH levels.
- Aerate soil, provide application of lime (based upon soil pH) and fertilize with an organic fertilizer before seeding. At a minimum, over-seeding with a drought tolerant grass is recommended for areas with exposed soil.

The following priorities for improvements and or maintenance has been established to provide guidance in identification of Capital Improvement Projects.

Pine Hill Cemetery

- Renovation and or replacement of existing maintenance barn and storage building in-place.
- Renovation of Chapel for expand office use and operations of cemetery including family meeting room.
- Modification of Tomb to provide organized storage.
- Construct new Community Services Department facility including maintenance storage and new office facilities for department and cemetery operations off Court Street.
- Repair Main Avenue from Central Avenue to the Tomb, reconstructing sidewalk, curbing, road repair and repaving.
- Mill and Fill deteriorated pavement sections as needed.
- Upgrade existing unpaved secondary travel lanes, regrade and supplement with increased gravel base and or bituminous reclaim to address erosion and rutting.
- Design and implement unified gateway entry to Main Avenue and Maple Avenue off East Watson Street.
- Develop unified signage plan for wayfinding, informational, historic and regulatory signs including implementation.
- Reclaim site of maintenance barn and storage for expanded burial and or columbarium.
- Construct traffic calming measures on Main Avenue.
- Locate and construct new columbarium.
- Complete and environmental assessment of wooded area for expanded limits of burial plots and or columbarium.
- Restore Chapel for funeral services, special events and others as identified.

Austin – Tuttle Cemetery

- Eradicate Japanese Knotweed and restore area by seeding with drought tolerant seed mix.
- Prune existing trees and shrubs as necessary to enhance public visibility of cemetery to visitors and to deter vandalism. Retain buffer along adjacent residences.
- Repair and or replace existing pipe rail fence delineating cemetery limits and or install granite monuments to establish cemetery limits.
- Provide signage documenting historic significance.
- Repair toppled monuments and record conditions of headstones.

Pinkham Cemetery

- Remove existing vegetation engulfing headstones on the eastern (rear) portion of the cemetery to expose headstones. Restore the ground area allowing herbaceous vegetation and leaf litter to remain.
- Prune existing trees and shrubs as necessary to enhance public visibility of cemetery to visitors and to deter vandalism.
- Remove broken granite post and replace with new granite post or appropriate fencing to define limits of the cemetery.
- Record condition of existing headstones.
- Provide signage documenting historic significance.
- Grind existing stumps where practicable.

Roberts Cemetery (First Settlers)

- Record condition of existing headstones.
- Grind existing stumps where practicable.
- Provide signage documenting historic significance.
- Evaluate existing soil to evaluate existing nutrient deficiencies and pH levels. Aerate compacted areas, provide fertilizer, lime as required and seed with a drought tolerant low maintenance grass seed mix.

Part 5.0 Appendix

5.1 City of Dover Master Plan Summaries

5.1.1 City of Dover Master Plan 2009 (Not Attached)

5.2 Plans and Maps

5.2.1 Pine Hill Cemetery Master Key Plan

5.2.2 Pine Hill Cemetery Master Plan East

5.2.3 Pine Hill Cemetery Master Plan West

5.3 Bennett Engineering MEP Report

5.4 Building Envelope Specialist Building Report

5.5 Recommended Plantings



Pine Hill Cemetery

Master Key Plan



NOTES:

1. TRADITIONAL BURIAL PLOT DIMENSIONS: 5' X 10'
2. CREMATION BURIAL PLOTS: 5'X5' ; TWO ASHES PER PLOT
3. COLUMBARIUM UNIT: 2-SIDED/48 NICHES
4. APPROXIMATE LOCATION SCANTIC SOILS
(NATIONAL RESOURCES CONSERVATION SERVICE , SOIL SURVEY)



Prepared For:
CITY OF DOVER
 288 Central Avenue
 Dover, New Hampshire

Prepared By:
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Pine Hill Cemetery

Central Avenue Dover, New Hampshire

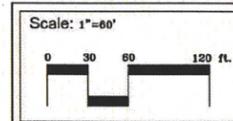
Date:
FEBRUARY 28, 2018

Issued For:
FINAL

Revisions:

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Title:
MASTER PLAN- EAST



North: Sheet No.: **2**



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Pine Hill Cemetery

Central Avenue Dover, New Hampshire

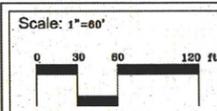
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Title:
MASTER PLAN- WEST



North:

Sheet No.:
3



CEMETERY MASTER PLAN HVAC RECOMMENDATIONS

City of Dover, New Hampshire
February 28th, 2017

EXISTING MECHANICAL CONDITIONS SUMMARY

The items listed below are based on our site visit on Nov 28th, 2016. Our review is based on current conditions and anticipated future use of these building. In the context of current mechanical code references, we used 2009 International Energy Code (IECC). NFPA31, 90A, 90B and 96 are also referenced where applicable. Minimum required ventilation requirements are from the 2009 International Mechanical Code.

CEMETERY CHAPEL

Existing Mechanical and Plumbing Systems

The chapel was built in 1911 and is currently being used as office space for the Dover public works. The final goal is to return the building to public use for ceremonies and receptions. The chapel heating is served by an oil fired 125,000 BTU furnace in the basement. Air is distributed to the building through floor mounted diffusers. The forced air unit is operating but at over 20 years old it is reaching its life expectancy.

The office space has a split system AC unit installed for cooling. This unit is operating but also aged. Cooling for the building is preferred but not required for its intended use.

The drainage systems in the building have deteriorated and flooding and leakage is found throughout the building. The building sanitary line runs overhead in the basement and out of the building by gravity. The chapel has 1 bathroom to remain functioning.

The building domestic hot water is served by a 10 gallon electric water heater. The unit is operating normally.

Sprinkler:

The building does not have a fire protection system installed.

Existing Mechanical and Plumbing Systems Recommendations

The basement furnace can be replaced in kind and continue to use heating oil. The existing unit shall be demolished for replacement. The existing ductwork, supply diffusers, and return grills shall be removed, cleaned, and installed back in place. The new unit would have the ability (if required) to add cooling by installing a separate condensing unit and refrigerant lines. Cooling coil condensate would tie into the building drainage system. The forced air unit would require



an outdoor air intake for building ventilation. The split AC unit serving the office space is operating normally and can be re-used. The unit does not provide enough cooling for entire building conditioning.

The existing piping systems are showing evidence of significant corrosion. It is recommended that drainage and sanitary lines be replaced. The existing sanitary invert location would remain. Replace all plumbing fixtures with ADA compliant fixtures for public use.

It is recommended that the domestic hot water heater remain in operation. The unit can be replaced in the future with no impact to the building.

Existing Electrical Systems

Power Distribution: The electrical service that serves the building is overhead from a pole mounted transformer 120/240V single phase 100A main breaker panel located in the basement. Utility meter is located at side of the building. Much of the wiring and electrical distribution equipment (panel) in the building has exceeded its service life and is in poor condition. All electrical wiring in the building should be replaced.

Receptacles: The back of the Chapel has been converted into office space. The quantity of outlets is insufficient for a modern office space, additional receptacles need to be added around the room to facilitate power needs for technology.

General Lighting: The lighting is a combination of compact fluorescent and linear fluorescent. The majority of the lighting could be upgraded to more energy efficient LED type. These types of fixtures will save on re-lamping costs and energy usage costs.

Exit and Egress Lighting: There are very few emergency lights in the building. There are no illuminated exit signs at the main to comply with current codes. Emergency battery lighting needs to be added to the facility to meet NFPA 101 Life Safety Code on the interior and exterior. Exit signs should be added to meet NFPA 101 Life Safety Code.

Fire Alarm System: There is no fire alarm system in the building.

Existing Electrical systems recommendations

Replace all original wiring and receptacles with new.

Replace panel

Replace lighting with new LED lighting.

Install code required emergency and exit signs.

Install Fire alarm system



CEMETARY BARN (EQUIPMENT STORAGE BUILDING)

Existing Mechanical and Plumbing Systems

The cemetery barn is currently being used for landscaping equipment storage. The building also provides a meeting space for the employees and has small shop for equipment upkeep and repairs. A prefab corrugated metal dome is located outside the barn used for tractor storage. The usage of this building is intended to remain the same. The building is showing signs of deterioration which concerns the town and the town would like more storage space for outdoor equipment.

The barn gets heating from an oil fired 118,000 BTU furnace in the basement. The furnace is only couple years old and is operating normally. The building has some perimeter fin tube radiators that have been abandoned. There is an existing CMU chimney that is not being utilized. This building does not have cooling.

The building has one bathroom and a large wash sink. A 5 gallon electric water heater located next to the sink providing domestic hot water to the building.

The building roof drainage is located at the center of the building and is showing signs of corrosion. Building sanitary exits the building through the basement slab using gravity.

Sprinkler:

The building does not have a fire protection system installed.

The outdoor prefab metal storage building is unconditioned and does not have water or power.

Existing Mechanical and Plumbing Systems Recommendations

The following recommendations are under the assumption that the building will be re-used as it stands.

The oil fired furnace can be re-used for building heating. This unit does not provide enough heat to keep the entire building heated sufficiently. In order to provide a complete heating system it is recommended that electric unit heaters be installed for spot heating depending where occupants desire heat. Based on the low occupancy, operable windows can be used for building ventilation.

Building roof drainage system must be evaluated for replacement. It is prevalent that there is corrosion that will cause problems in the near future. The drainage system integrity is dependent on the building structural condition. There is evidence of a fire in the past that may have caused structural damage. There was no concern for sanitary piping which can remain in place as it is operating normally.



It is recommended that the domestic hot water heater remain in operation. The unit can be replaced in the future with no impact to the building. Replace all plumbing fixtures with ADA compliant fixtures for public use.

Cooling is not recommended for this building.

The outdoor pre-fab building should be assessed for structural integrity. It is not recommended that power or water be provided to this building.

Existing Electrical Systems

Power Distribution: The electrical service that serves the building is overhead from a pole mounted transformer 120/240V single phase 100A main breaker panel located on the first floor above the work bench. Utility meter is located inside the building. Much of the wiring and electrical distribution equipment (panel) in the building has exceeded its service life and is in poor condition. All electrical wiring in the building should be replaced.

Receptacles: The quantity of outlets is insufficient for work bench area office space/breakroom, additional receptacles need to be added around the room to facilitate power needs for technology.

General Lighting: The lighting is a combination of compact fluorescent and linear fluorescent. The majority of the lighting could be upgraded to more energy efficient LED type. These types of fixtures will save on re-lamping costs and energy usage costs.

Exit and Egress Lighting: There are very few emergency lights in the building. There are no illuminated exit signs at the main to comply with current codes. Emergency battery lighting needs to be added to the facility to meet NFPA 101 Life Safety Code on the interior and exterior. Exit signs should be added to meet NFPA 101 Life Safety Code.

Fire Alarm System: There is no fire alarm system in the building.

Existing Electrical systems recommendations

Replace all original wiring and receptacles with new.

Replace panel

Replace lighting with new LED lighting.

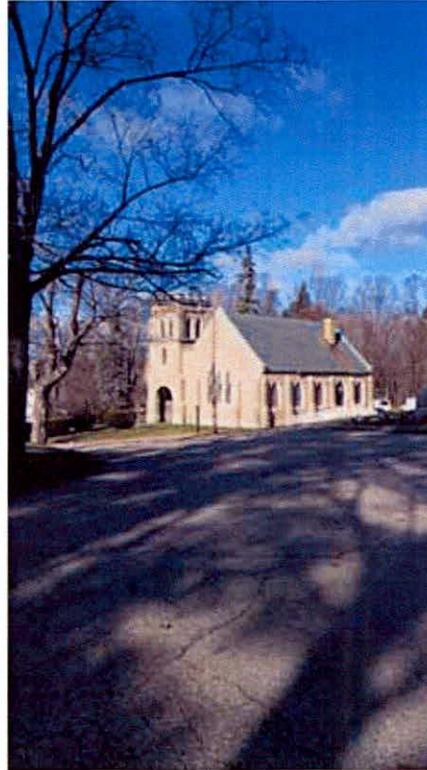
Install code required emergency and exit signs.

Install Fire alarm system



PHOTO DOCUMENTATION

Chapel exterior.



Chapel interior ceiling.

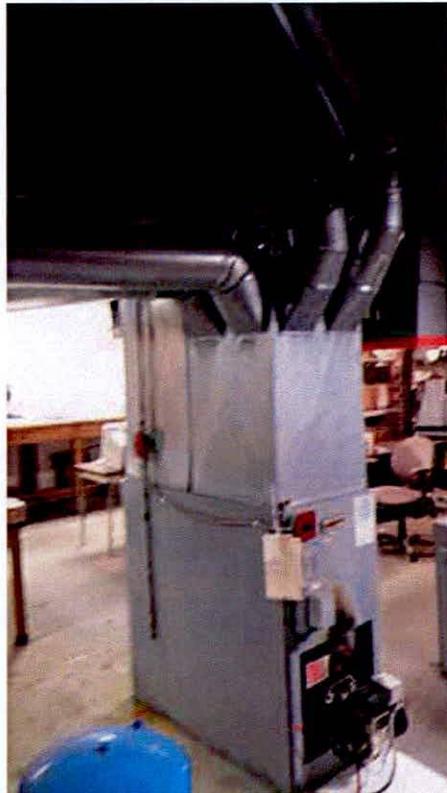




Chapel interior.



Chapel forced air furnace.





Chapel split system AC
outdoor unit.



Chapel domestic hot water
heater.





Chapel drainage piping.



Chapel floor air diffuser.

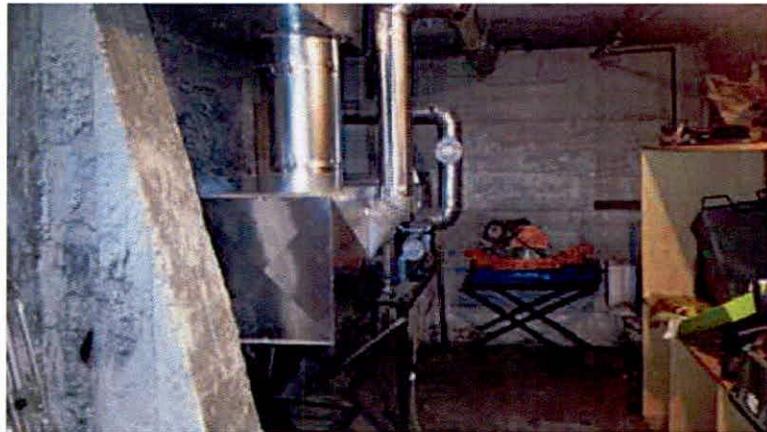




Barn Exterior.



Barn forced air furnace.





Barn wash sink and domestic water heater.

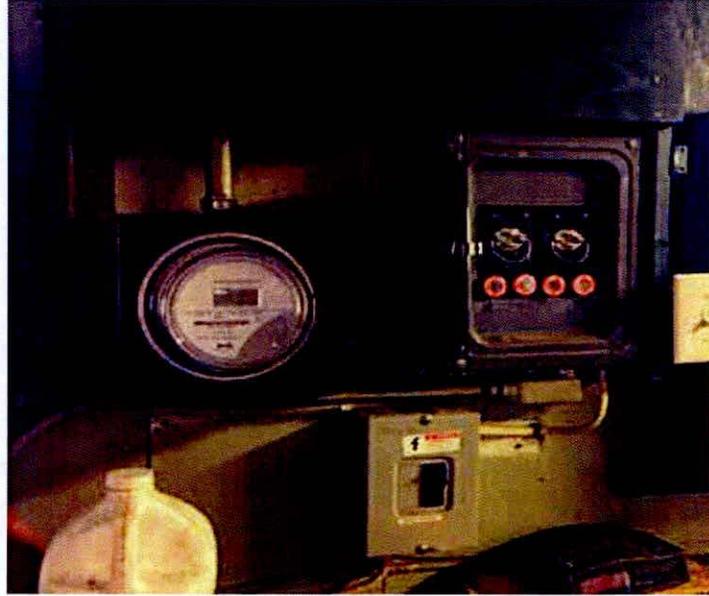


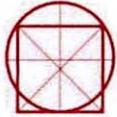
Barn exterior prefab storage building.





Barn Main panel and meter





Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS

March 7, 2017

Sharon Sirois – Superintendent
Facilities, Grounds & Cemeteries
City of Dover
131 Central Avenue
Dover, NH 03820-4169

Re: Facilities Programing and Budget Pricing

Based on the information gathered to date, the following assumptions have been made regarding the preliminary budget pricing:

- The proposed building will be slab on grade and single story with no elevator or stairs.
- The proposed building will be 25% finished office space this equates to 2,895 sf including circulation. Square foot cost for finished areas will include higher HVAC and electrical usage than warehouse areas and are estimated at \$300/sf (2,895 sf @ \$300/sf = \$868,500)
- The remaining 75% of the building is storage, shop, and warehouse areas and are not as densely built or finished as well as more spread out. Square foot cost for storage, shop and warehouse areas are estimated at \$175/sf. The estimated square foot area required for these work areas is 9,085 sf, including circulation, for an estimated cost of \$1,589,875.
- Total building area is 11,980 sf with a blended cost per square foot of \$205.21/sf gives an estimated building cost of \$2,458,375.

This does not address site work beyond 5' of the building.

We look forward to hearing from you. Please let us know if you would like to discuss further.

Warmest regards,

Dave Douglass, AIA

Dave Douglass AIA

Maine and NH Licensed Architect

Building Envelope Specialists, Inc.

City of Dover, New Hampshire

Building Envelope Specialists

Facilities, Grounds and Cemeteries

PO Box 2589, South Portland Maine 04116

Program Requirements

March 7, 2017

Program	Interior Area Requirements	Employee	Program Elements	Private Office	Work Station	Square Footage	Area Subtotal
Admin	Director Sharon Sirois	1		12 x 14		168	
Admin	Administrative Assistant Reception	1		18 x 22		396	
Admin	Working Foreman	1		10 x 12		120	
Admin	Storage - Closet - Office Supplies	1	3 x 12			36	
Admin	General Storage	1	12 x 16			192	
Admin	Conference Room - Family Meet Room	1	12 x 20			240	
Admin	Records Storage and Historic Plans	1	10 x 15			150	
							1302
Common	Kitchen and Lunch Room	1	20 x 26			520	
Common	Mens room with shower and Lockers	1	9 x 18			162	
Common	Mens room with shower and Lockers	1	9 x 18			162	
Common	ADA Lavatory	1	8 x 10			80	
							924
Utility	Garage Bay Double Deep 12'High Door One half bay for the Bucket Truck One bay for the JD tractor and Excavator	3	14 x 48			2016	
Utility	Flammable Storage	1	10 x 10			100	
Utility	Carpenter Shop	1	40 x 50			2000	
Utility	Sign Shop	1	15 x 30			450	
Utility	Wash down area w/ drain and trap	1	10 x 20			200	
Utility	Lawn Mower Repair area with lift and overhead gantry crain for equipment.	1	20 x 24			480	
Utility	Tool and Work Bench Area	1	6 x 24			144	
							5390
General	Storage of Decorations and Historical Markers	1	20 x 28			560	
General	Cleaning Products and Paper products for the other town buildings	1	15 x 30			450	
General	Wiskey Barrel-Planter Storage	1	10 x 20			200	
							1210
Mech	Sprinkler Room	1	6 x 6			36	
Mech	Electrical Room	1	6 x 6			36	
Mech	Mechanical Room	1	12 x 18			216	
Mech	Tele/Server	1	6 x 6			36	
Mech	Janitorial	1	8 x 8			64	
							388
	Subtotal:					9,214	
	Circulation (30%)					2,764	
	Total Building Square Footage:					11,978	



Pine Hill Cemetery Barn

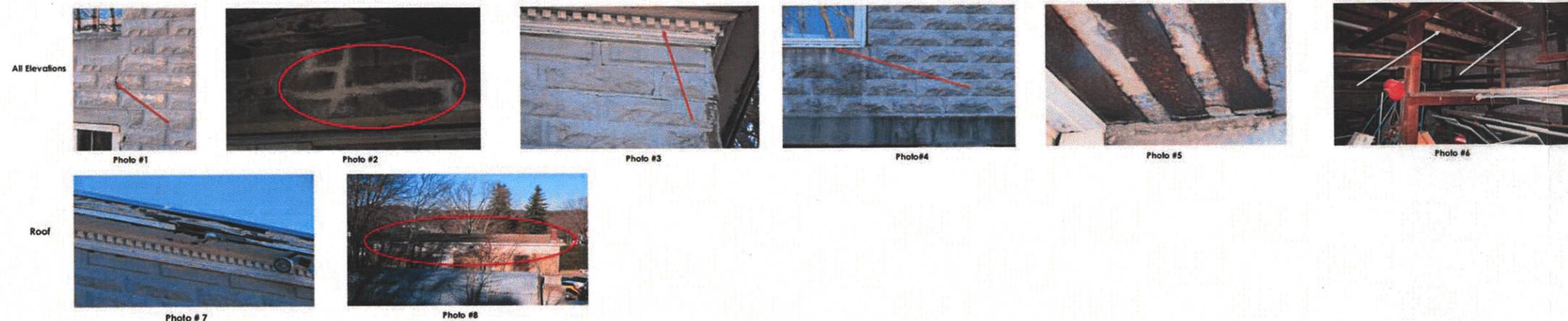
General Building Information		Assessment Information	
Name of Building:	Pine Hill Cemetery- Barn	Date:	11/22/2016
Building Description:	Circa: Unknown cement block building with slit-face concrete block exterior. Standard bearing wall thickness approximately 1'-4"	Survey Team:	SRW & SDJ
		Time:	Morning
		Weather:	Sunny
		Temp:	45
		Assessment Description:	Exterior Envelope Assessment



Building Envelope Specialists

SPECIALIZED BUILDING CONSULTANTS

Assessment Summary	Documentation Section							Action Items			Budgeting Section			Maintenance Section			Maintenance Schedule														
	Condition	Priority	Photo	Roof	North	East	South	West	6 Months	1 Yr.	1 1/2 Yr.	2 Yr.	Under Warranty: Y/N	Due to the overall condition of this building, BES recommends it be demolished.	Immediate Budget	Short-term Budget	Long-term Budget	Indicated Scope	Contract Value	Date Completed	Contractor	Project Coordinator	1 yr.	2 yrs.	3 yrs.	5 yrs.	10 yrs.	15 yrs.			
(P) Poor Condition - 30% of service life remaining. Building element deteriorated and in need of repair.	#1: Critical (1-3)	Needs to be addressed within 0 to 6 months.		Y	Observed at time of assessment.																										
(F) Fair - Approx. 30% to 50% of service life remaining. Building Element shows signs of deterioration and will need repair in the future.	#2: Cautionary (4-6)	Should be addressed within 6 months to 2 Years.		N	Not observed at time of assessment or No.																										
(A) Average - Approx. 50% to 85% of service life remaining. Performing aging as expected.	#3: Stable (7-9)	Should be addressed as needed.		I	Comprehensive inspection at indicated intervals																										
(E) Excellent - 85% of service life remaining. Building elements in newly installed condition.		Items in Priority #1 should be inspected every 12 months. Items in Priority #2 should be inspected every 2 years.		R	Replace/Repair as scheduled maintenance.																										
				N/P	No photograph. N/A Not Applicable.																										
(The barn is in need of repair. Open mortar joints are visible around all the buildings masonry features and on each elevation. Exterior load bearing walls are in poor condition with spalling and fractured masonry units. The slip-face blocks have been coated with a cementitious coating that is now peeling, resulting in spalling units. Embedded steel lintels over the large door openings are in poor condition due to the oxidation of the steel. Wooden soffit trim has larger areas of rot and peeling paint due to moisture infiltration. Wooden trim around door and windows are peeling with some areas of rot. The ballasted roof was not observed closely, however damage to the wooden soffits suggest moisture infiltration at the roof's edges. Due to the condition of the building and its lack of efficient programming, BES recommends this building be demolished.)																															
Building Element																															
Exterior Assembly																															
All Elevations																															
Slit-Face Block	P	1	1		X	X	X	X	X				N	Overall in poor condition with open mortar joints, fractures and failure points.	Remove large sections of the masonry and replace with new.																
Cement Block Back-up	P	1	2		X	X	X	X	X				N	Overall in poor condition with open mortar joints, fractures and failure points.	Consolidate wall with grout and steel reinforcing.																
Wooden Soffit Trim	F	4	3		X	X	X	X		X			N	Overall in fair condition with areas of rot and peeling paint.	Replace rotted sections, scrape, prime and repaint.																
Exterior Wood Window & Door Trim	F	4	4		X	X	X	X		X			N	Overall in fair condition with areas of rot and peeling paint.	Replace rotted sections, scrape, prime and repaint.																
Embedded Steel Lintels	P	1	5		X	X				X			N	Overall in poor condition due to exposure to moisture on the uncoated steel.	Remove embedded steel and recast new coated steel over door lintels.																
Interior Floor Framing	F	4	6		X	X	X	X		X			N	Overall in fair condition with areas of rot, sagging and moisture damage. Assembly has had non-code compliant modifications to support increase loading.	Remove existing flooring system and replace with code compliant assembly.																
Roof Assembly																															
Metal Edge Flashing at Eave	P	1	7	X						X			N	Poor condition with areas of soffit damage due to moisture infiltration.	Replace as part of roof replacement project.																
Vertical Flashing around chimney	P	1	N/P	X						X			N	Poor condition with gaps and openings.	Replace as part of roof replacement project.																
Ballasted Roof Field	F	4	8	X						X			N	Fair condition with inadequate roof drains.	Replace as part of roof replacement project.																
Foundation																															
Notes:																															



5.5 RECOMMENDED PLANT LIST

<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>HABIT</u>
<u>CANOPY TREES</u>		
ACER RUBRUM "RED SUNSET"	RED SUNSET MAPLE "NARROW CROWN"	H 45'- W 25'
ACER SACCHARUM "GREEN MOUNTAIN"	GREEN MOUNTAIN SUGAR MAPLE	H 75'- W 40'
GINKGO BILOBA "MAIDEN HAIR"	AUTUMN GOLD GINGKO "ACCENT"	H 65'- W 45'
LIQUIDAMBAR STYRACIFOLIA "MORaine"	MORaine SWEET GUM "ACCENT"	H 60'- W 35'
NYSSA SYLVATICA "BLACK TUPELO"	BLACK TUPELO "ACCENT"	H 75'- W 60'
QUERCUS RUBRA	RED OAK	H 75'- W 60'
<u>EVERGREEN TREES</u>		
PICEA ABIES	NORWAY SPRUCE	H 80'- W 25'
PICEA GLAUCA	WHITE SPRUCE	H 60'- W 30'
PINUS NIGRA	AUSTRIAN PINE	H 60'- W 25'
PINUS STROBUS	WHITE PINE	H 100'- W 50'
<u>UNDERSTORY AND FLOWERING TREES</u>		
ACER RUBRUM GINNALA	AMUR MAPLE	H 20'- W 15'
AMELANCHIER CANADENSIS	NATIVE SHADBUSH	H 20'- W 15'
BETULA NIGRA	RIVER BIRCH	H 50'- W 40'
CORNUS KOUSA	JAPANESE DOGWOOD	H 20'- W 20'
CRATAEGUS CRUSGALLI "INERMIS"	THORNLESS HAWTHORN	H 25'- W 25'
MAGNOLIA STELLATA "CENTENNIAL"	CENTENNIAL MAGNOLIA	H 15'- W 12'
MAGNOLIA SOULANGIANA "ALEXANDRIA"	ALEXANDRIA MAGNOLIA	H 12'- W 12'

MALUS CANDYMINT (SARGENT)
MALUS "DONALD WYMAN"
MALUS "RED JADE" (WEEPING)
MALUS "SARGENT"

CANDYMINT FLOWERING CRAB H 12'- W 12'
DONALD WYMAN FLOWERING CRAB H 20'- W 20'
RED JADE FLOWERING CRAB H 12'- W 12'
SARGENT FLOWERING CRAB H 10'- W 10'

SHRUBS

CLETHRA ALNIFOLIA (SWEET PEPPERBUSH)
CLETHRA ALNIFOLIA (HUMMINGBIRD)
CORNUS ALBA SIBERICA
FORSYTHIA "NEW HAMPSHIRE GOLD"
ILLEX VERTICILLATA
HAMAELIS VIRGINANA
HYDRANGEA MACROPHYCCA (ENDLESS SUMMER)
HYDRANGEA PANICULATA (GRAND FLORA)
JUNIPERUS HORIZONTALIS "BAR HARBOR"
PHILADELPHUS CORONARIUS
RHODODENDRON CATAWBIENSE "GRAND FLORA"
RHODODENDRON MAXIMUM
RHUS AROMATICA
SPIREA JAPONICA "MAGIC CARPET"
SPIREA K VANHOUTTEI "RENAISSANCE"
SYRINGA VULGARIS

SWEET PEPPER BUSH H 6'- W 8'
HUMMINGBIRD SPICE BUSH H 3'- W 6'
RED TWIG DOGWOOD H 6'- W 6'
NEW HAMPSHIRE GOLD FORSYTHIA H 6'- W 6'
WINTERBERRY H 4-10'- W 6-12'
COMMON WITCHHAZEL H 15'- W 15'
ENDLESS SUMMER HYDRANGEA H 2.5'- W 5'
PEE GEE HYDRANGEA H 10'- W 10'
BAR HARBOR JUNIPER H 6"- W 3'
MOCK ORANGE H 5'- W 4'
GRAND FLORA RHODODENDRON H 8'- W 8'
ROSEBAY RHODODENDRON H 12'- W 12'
FRAGRANT SUMAC H 6'- W 6'
MAGIC CARPET SPIREA H 3'- W 8'
BRIDAL WREATH H 3'- W 4'
COMMON LILAC H 8'- W 8'