

Preservation Management Plan for the North Cemetery Wayland, Massachusetts



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Preservation Management Plan for the North Cemetery Wayland, Massachusetts

**Prepared For
The Town of Wayland**

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June 30, 2015

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MANAGEMENT SUMMARY

The Town of Wayland retained the services of Barbara Donohue, RPA, Cultural Resource Consultant, to prepare a Preservation Management Plan for the North Cemetery. The cemetery is a valuable historic resource in the town and should be treated in a manner consistent with its significance. Careful planning and research is required when undertaking a project of this type due to the sensitive nature of the materials and features in historic cemeteries. The development of the Preservation Management Plan is the first step in addressing the needs of the cemetery and is consistent with the practices recommended by the Massachusetts Historic Preservation Initiative.

The goal of the Preservation Management Plan is to provide the town with a plan of action to ensure the protection of valuable historic and cultural resources and fabric within the cemetery for future generations. This goal is established through understanding the historic character of the grounds and identifying elements within the grounds that need to be addressed to eliminate safety hazards and the associated threats to historic resources. A second goal is to demonstrate the historical significance of the cemetery that will make a strong case to those issuing grants for historic preservation.

Although the North Cemetery has great potential, much must be done.

Many of the problems seen at the North Cemetery are the result of deferred maintenance – doing too little over too long a period of time, a situation occurring in many cemeteries throughout the Commonwealth. The problem with this approach is that eventually the historic fabric can no longer sustain further maintenance cuts without a significant and noticeable degradation of the historic fabric. Exacerbating the problem are changes to the funding level and staffing devoted to the cemetery by the Town of Wayland, a problem that dates to at least the late nineteenth and early twentieth century when this issue was discussed at town meetings.

The Preservation Management Plan contains three key components: historic documentation consisting of an in-depth land use history of the cemetery, a preservation assessment that evaluates all of the identified needs requiring conservation activities, and a ground penetrating radar survey that evaluates the location of three former meeting houses in the Old Section, the location of identified Indian burials in the Middle Extension and the location of a purported seventeenth/eighteenth palisade in Section D.

ACKNOWLEDGMENTS

There were many people in the town who not only supported, but also provided considerable assistance to the consultant team. These people include, Tonya Largy, Elizabeth Doucette, Elisa Scola, Beth Klein, Diane Gorham, Mike Lindeman, the Wayland Historical Commission, the Wayland Historical Society and the Wayland Public Library.

1.0 INTRODUCTION

Cultural Resource Consultant Barbara Donohue was hired by the Town of Wayland to complete a Preservation Management Plan for the North Cemetery that was funded under the Community Preservation Act. The project was a joint effort between lead consultant Barbara Donohue, Chicora Foundation, and New England Geophysical. Ms Donohue's work involved project management, historic research, writing the historic context and coordinating the final report. Chicora's work involved a field assessment of the cemetery, writing the preservation assessment section of the report and preparing treatment proposals for the Stoney Section. Conducting the assessment for Chicora were Dr. Michael Trinkley and Debi Hacker. New England Geophysical, under the direction of Russell Kempton, conducted a ground penetrating radar (GPR) survey.

This study examines the town-owned and maintained North Cemetery in Wayland, Middlesex County, Massachusetts (Figure 1-1). The North Cemetery is located at 65 Old Sudbury Road (Massachusetts



Figure 1-1. North Cemetery in the Town of Wayland, Middlesex County.

Route 27), about 0.7 mile north of Wayland's Town Center and 2.7 miles southeast of the Sudbury Town center. The cemetery is bounded by the Beit Olam Jewish Cemetery to the east, and private house parcels to the south, west, and north. Some of these tracts, such as the 6 acre parcel of Peter Viles to the north and the 4 acre parcel of Christopher Bogan to the northwest, are substantial. Houses along Old Sudbury Road date primarily from the eighteenth and nineteenth centuries. Across Old Sudbury Road is the 65 acre Cow Common Conservation Area, owned by the Town. To the west and north is the 3,800 acre Great Meadows National Wildlife Refuge, operated by the U.S. Fish and Wildlife Service.

The North Cemetery is one of three in Wayland, along with South Cemetery (1.7 acres, historically called Centre Cemetery) and the newest developed property, Lakeview Cemetery

with 9.7 acres (Figure 1-2). All three are owned by the Town and operated by Wayland's Department of Public Works' Parks, Tree, and Cemeteries Division. In addition to these cemeteries this Division is responsible for over 175 acres, including school grounds, 26 athletic fields, town buildings and lawns, the Town Beach, as well as the maintenance of over 200 miles of roadside town trees (Anonymous 2013:56-57).

Prior to March 1967 the town's cemeteries were managed by the Cemetery Commission, which for a brief period also oversaw the community's trees. With the creation of a Parks and Recreation Department, control of cemeteries was passed to that department. The cemetery currently includes 10 named sections, totaling about 5.82 acres and over 1,700 monuments (Figure 1-3; Table 1-1). It consists of two parcels as identified in the Town of Wayland Assessor's Files. The older core, excepting Section A, is identified as parcel 18-032A and is reported to include 8.26 acres. While identified as a cemetery, the assessor assigns the tract a land value of \$485,000. A deed book reference of 7692/305, dating to 1945 is provided. The expansion to the northwest that includes Section A and additional undeveloped land is listed as parcel 18-032. It is reported to contain 3.97 acres. With a land value of \$109,200, the deed reference is 12377/603.



Figure 1-2. Overview photographs of the North Cemetery (top), South Cemetery (middle), and Lakeview Cemetery (bottom).

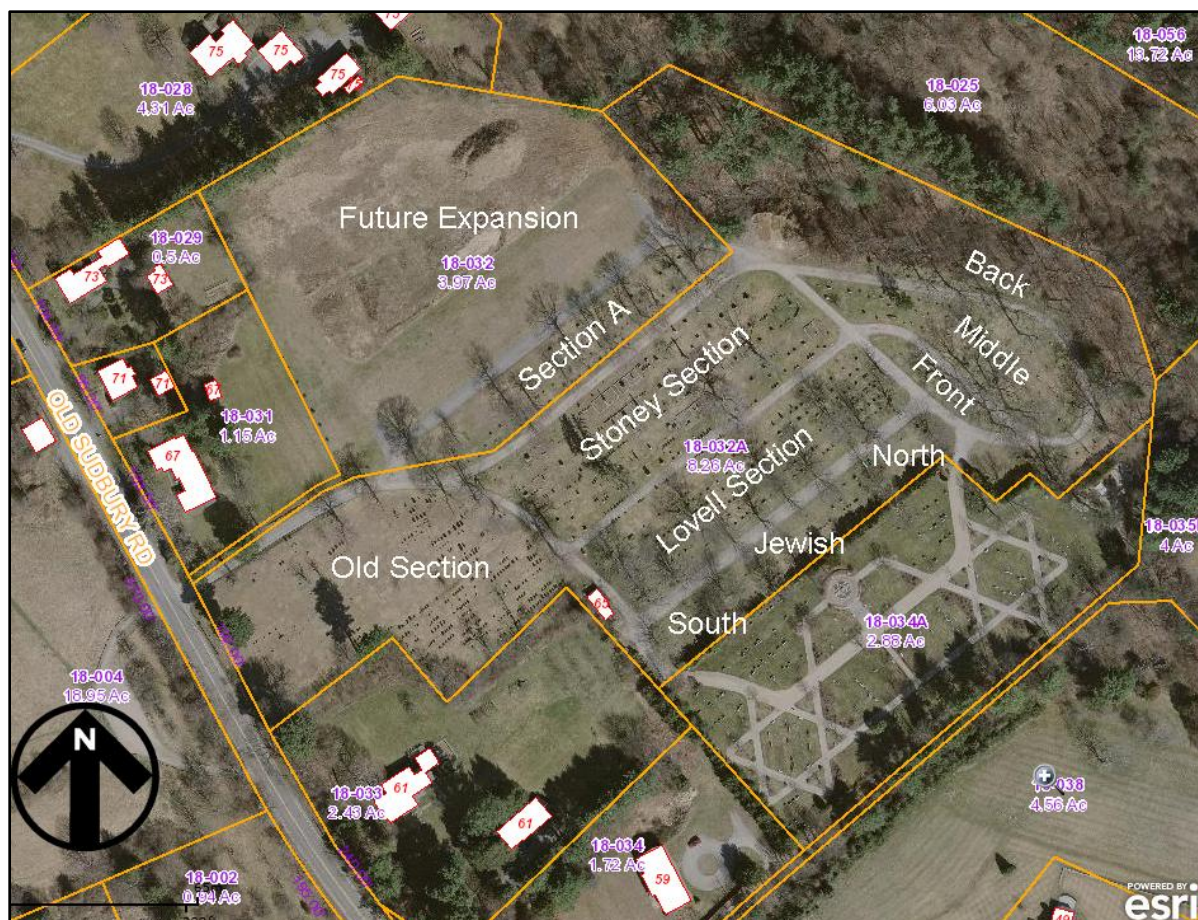


Figure 1-3. Aerial view of North Cemetery.

Table 1-1. Acreage and Monuments at the North Cemetery.

Cemetery Section	Acres	Number of Marked Graves
Old Section	1.60	416
Section A	0.62	119
Stoney Section	1.20	338
Lovell Section	0.93	354
Lovell South Extension	0.14	57
Jewish Section	0.53	60
Lovell North Extension	0.14	50
Front Extension	0.11	39
Middle Extension	0.53	208
Back Extension	0.02	80
Active Cemetery	5.82	1721
Not Yet Developed	2.80	
Not Suitable for Development	3.61	
Total Cemetery Acreage	12.23	

INTRODUCTION

The cemetery has been assigned Inventory Number WAY.800 in the Massachusetts Historical Commission's Cultural Resource Information System. When the North Cemetery was surveyed in May 2002 by Gretchen Schuler, the site was recommended individually eligible for listing on the National Register of Historic Places under Criteria A (associated with events that have made a significant contribution to the broad patterns of our history) and C (embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction), and Criteria Consideration D (the cemetery derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events).

The burial monuments reflect funerary traditions from at least the eighteenth century through the twentieth century and some sections are continuing to be used today. A variety of architectural styles are found in the obelisks, headstones, and other markers.

The landscape architecture of the North Cemetery is characteristic of early churchyard cemeteries with rigid geometric formality, few plantings or identifiable pathways, and artistic iconography, especially in the Old Section. Later sections do illustrate defined family plots, fence work, and low-to-ground markers more characteristic of the Rural and Lawn-Park cemeteries. Nevertheless, there is little evidence of early garden styles and a planned landscape can only be seen in the more recent Lakeview Cemetery.

2.0 HISTORIC CONTEXT

The purpose of this section of the Preservation Management Plan is to provide a land use history of the cemetery in order to understand the historic character of the grounds. Research was conducted at the Wayland Historical Society, the Wayland Public Library, Wayland Town Hall, Middlesex South Registry of Deeds, Mass State Archives, and the internet.

The following manuscript records archived at the Town Hall were reviewed in the Clerk's Office: *Sudbury Records, Vol 1, 1638-1703; Sudbury Records, Vol 2, 1703-1733; Sudbury Records, Vol 3, 1733-1760; Records Vol. 1 Town Meetings Minutes 1780-1817, Town of Wayland; Records Vol. 2 Town Meetings Minutes 1817- 1853, Town of Wayland; Records 1854-1882, Wayland; Records 4 Town Meetings Minutes 1883-1901, Town of Wayland; and Records 5 Town Meetings Minutes 1901-1919, Town of Wayland.* Starting in 1906 the yearly town meeting reports and yearly town committee reports appear in bound volumes entitled *Official Reports of the Town of Wayland* and are also located at the Clerk's Office in the Town Hall. These bound volumes were reviewed for the years 1906 to 2012.

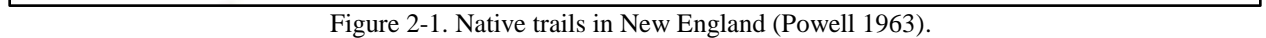
An effort was made to locate deeds associated with the cemetery that could shed light on the initial conveyance to the town, expansion of the cemetery, and the Indian Burial Ground.

2.1 The Sudbury Grant and Township 1638-1640

Wayland, Sudbury and northern Framingham were originally included in a 5-mile land grant issued by the General Court, the official source of power and authority for Massachusetts Bay Colony, on September 6, 1638. Approximately 16 men and their families moved from Watertown to the newly granted land with more settlers arriving in the spring from Watertown, Cambridge and Charlestown. A year later on September 4, 1639 the General Court ordered that "the newe Plantation by Concord shall be called Sudbury." It was the nineteenth town settled in Massachusetts Bay Colony (Scott 1989).

Located at the junction of the Sudbury River and the uplands of the Boston Basin, the area was a major connecting point for native trails crossing west around the river wetlands including two regional paths, the Great Trail and the Connecticut Path (today Route 126 through Wayland) (Figure 2-1). English settlers who traveled from Watertown following native trails to find food for their livestock happened upon a large stretch of river meadow in the Musketaquid Valley. The valley whose Algonquin name means "grassy ground" proved to be an ideal location for much needed pastureland and hay ground (Powell 1963). While the Sudbury River with its associated meadows and marshland dominated the landscape, the area also contained two major bodies of water, Lake Cochituate and Dudley Pond, as well as several streams and small upland ponds. The first priorities for the new community were the division of land and agricultural management. Peter Noyes, Brian Pendleton and Rev. Edmund Brown were appointed by the General Court to lay out the town lands. They designated North and South fields for farming; a Town Common for grazing livestock; as well as a house lot, meadowlands, and farmland for each family. In 1639 a clustered settlement formed on the east side of the Sudbury River along the town's first road. Highways and cart paths were soon laid out on both sides of the meadows. (Figure 2-2).

Tradition states (Hudson 1891; Robinson 1976) that when the house lots were laid out in 1639 land was set aside for a meeting house and ½ acre was purchased from John Loker for a burying ground. According to Hudson (1891) Loker was assigned a house lot just west of the meeting house where he lived in a house with his mother as late as 1678. Hudson further states that "it is said that before 1652 he married Mary Draper" and that "tradition confirms the record of house-lots, and shows that the lots were more or less built upon. The John Maynard and John Loker estates were kept for years in their families" (Hudson 1891).



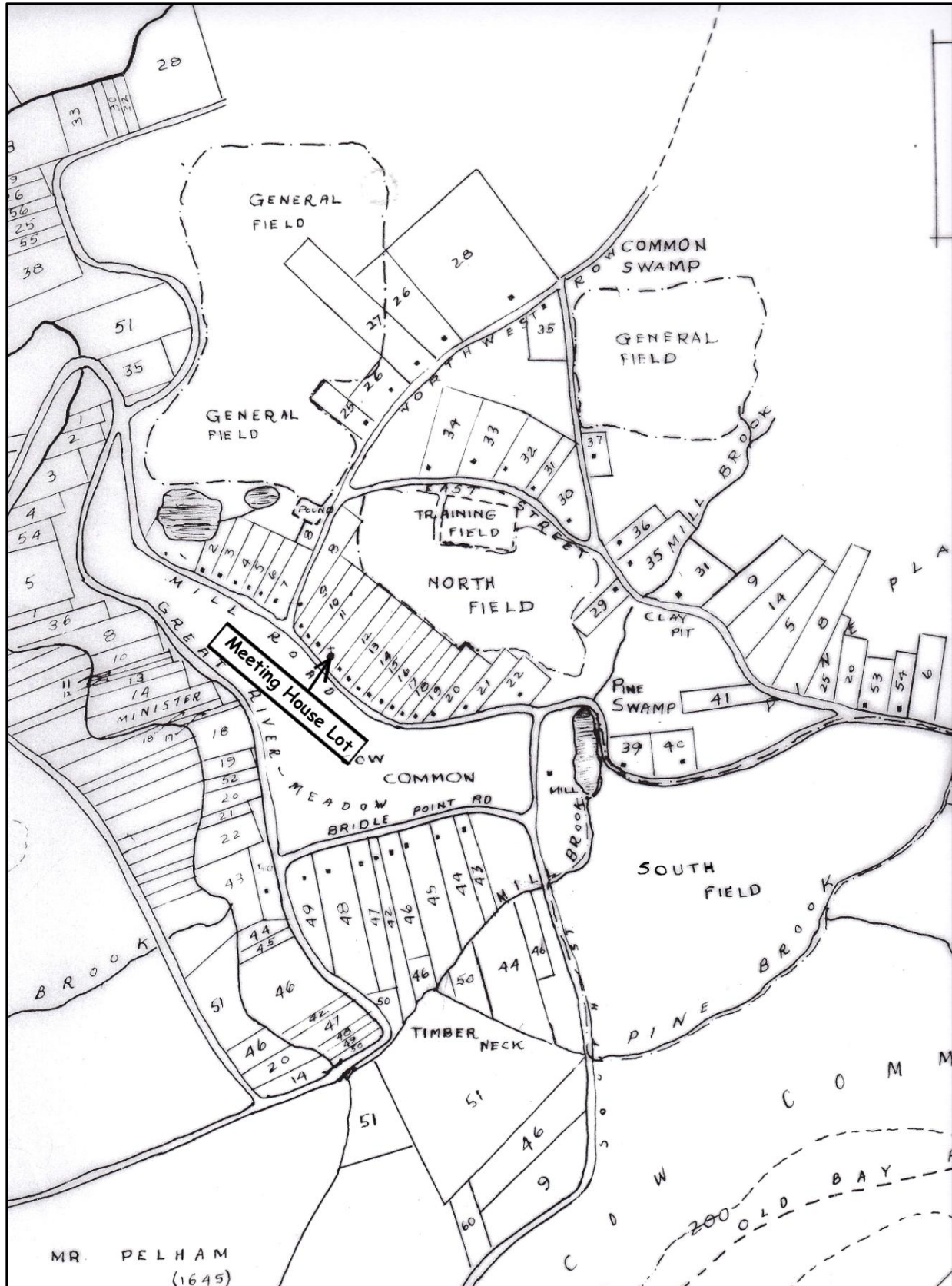


Figure 2-2. Reconstructed map of Sudbury 1639-1640 from notes of Powell's book (1963) (Cromie 1948).

Genealogical research though suggests that John Loker who received the house lot ca 1639 was likely the father of John Loker who lived with his mother until 1678 (see Figure 2-2, lot # 11). As described in various deeds the widow Loker, formerly Mary Draper (1628-1697), was married to John Loker (1608-1653) who came to New England from England and was one of the early residents of Sudbury. Appendix VI: Early Sudbury Settlers: Land and Town Officers 1638-1655 in Powell (1963) notes that John Loker had 1 acre of meadow, 6 ½ acres of meadow and was not granted a new lot in the 1655 land division. The latter fact would make sense as the senior John Loker died in 1653. Vital records only note that John and Mary had one daughter, Mary, who was born in Sudbury in 1653. Unfortunately no father or mother is listed in any vital records for a John Loker (1650-1719) who was born in Sudbury in 1650. It's possible that Mary and John Loker also had a son, John, whose birth was not properly registered or the records were lost. Deeds from that time period note that the widow Loker's son, John, was married to Sarah. This would agree with vital records of John Loker (1650-1719) who married Sarah Rice Grout (1655-1703) in 1673 in Sudbury. (www.ancestry.com). At the time of his marriage to Sarah he would have been 23. Information discussed below with regard to an agreement between Mary Loker and the town in 1664 note that her son John was of "nonage" meaning a minor, which would accord with a birth date of 1650 as he would have been 14. It is unclear why Mary Loker, the daughter of John and Mary, who was born in 1653 was not mentioned in the 1664 agreement - possibly because she was a female. Genealogical research states that she married Jonas Prescott in 1672 and died in Groton in 1735 (www.ancestry.com).

With regard to the burying ground Hudson (1891) notes: "Tradition says that prior to the selection of this spot a few interments were made just over the hill to the north, where tradition also states that there was an Indian graveyard. These traditions have perhaps some confirmation in the fact that on the northern hillside remains of human skeletons have been exhumed."

Within a year of being settled the town witnessed steady growth petitioning the General Court in 1640 for an additional 3,200 acres along its southern border and was granted 6 extra miles of territory. Following individual grants of meadow and upland by town officials approximately 89% of the town's total acreage remained common lands (Powell 1963). While the meeting house lot was set apart in 1639, the first church was formally organized in 1640 when the Puritan covenant was signed by the majority of the townsfolk (Hudson 1891). The town's first minister was Edmund Brown "whose labors in the doctrine of Christ Jesus hath hitherto abounded wading through this wilderness with much cheerfulness of spirit," and the first deacon was William Brown (Hudson 1891).

2.2 Meeting Houses in North Cemetery - ca 1640 to 1724

A Colonial Meeting House

Unless otherwise noted the following is a synthesis of material found in Earle (1891) and Bliss (1894). The meeting house was the focal point of a colonial settlement. Even though one had to be a member of the church to be a voting member of the town, everyone who lived in the town was taxed in order to pay the salary of the minister, the construction of the minister's house, and the construction of the meeting house. While the meeting house was used for Sunday services it was also used to conduct civic affairs, such as voting on taxes for road improvements, school construction, and other town business. The form and size of the meeting house was determined by structural limitations as they were at first built with heavy timbers. Also important was the need to clearly hear the liturgy of the minister as dozing off during the service was a punishable offense. This put a great premium on being close to the speaker whether for a Sunday service or a town meeting (Donham 2007).

Meeting houses were generally located by the center of town so that everyone had equal access. If there was a disagreement regarding its location the General Court sent a viewing committee to determine the center of the town and set a stake at that location, thus ending any dispute. During the early stages of a

settlement no dwelling house was located greater than ½ mile from the meeting house.

Each citizen was required by law to take part in or contribute to raising the meeting house this included labor, logs, lumber, and the use of horses or oxen. Entries in the account books of early churches note that contributions were also collected for the inevitable barrel of rum. When the people of Medford built their second meeting house they provided five barrels of rum, one barrel of good brown sugar, a box of fine lemons, and two loaves of sugar for both the workmen and bystanders. The fact that 2/3rds of the frame fell and many were injured is likely associated with the libations that were provided.

The first meeting houses were simple buildings. They were generally square log houses chinked with clay, had steep thatched roofs, hard-packed earthen floors and oiled paper in the windows to admit light. There was neither paint nor plaster on the inside and there were holes in the floor that were used as spittoons. As fierce fires often swept through the forests overwhelming and destroying towns, the trees in the immediate vicinity of the meeting house were cut down. Destitute of shade the heat and blazing light in summer were as hard to bear as was the cold in winter when the congregation sat "shivering on the brink of perdition [damnation] if the icy temperature of the house and the terrible doctrines of the sermon are to be taken together" with the sacrament bread "frozen as hard as pebbles, and pieces of it rattled as they fell in the pewter plates."

In the early meeting houses the preacher stood behind a table while the congregation sat on long, narrow, uncomfortable benches, which were made of simple, rough planks placed on legs like milking stools. There were "men's seats" and "women's seats" that were separated by impassable barriers. All were required to occupy the seats assigned to them.

Rules for seating the congregation were not the same in all towns. Generally a committee of dignified and influential men was appointed to assign each person his or her place, according to rank and importance. In many towns people were placed according to "1st, dignity of descent; 2d, place of public trust ; 3d, pious disposition and behaviour ; 4th, estate ; and 5th, peculiar service-ability of any kind." Where age was ranked first, wealth was equivalent to it. The seats in the gallery were universally regarded in the early churches as the most exalted in the house, with the exception of the dignity bearing front seats and the few private pews. In many meeting houses the tops of the pews and of the high gallery railings were ornamented with little balustrades of turned wood. As the colonies grew in wealth and importance pews were at first sold to a few rich or influential men who wished to sit in a group together and then each family of dignity or wealth sat in its own family pew.

As townspeople habitually grumbled when taxes were proposed for making repairs, a meeting house gradually fell into a dilapidated condition. Nonetheless as population and wealth increased, towns began to build meeting houses of larger size and better quality. Some were nearly square with the roof sloped up from the four sides to a belfry spire standing on the centre. The first refinement made to the interior was the elevation of the preacher into a pulpit. The pulpit became large and lofty, resembling a section of a fortress with long stairs ascending to its door and a canopy or sounding board suspended over it. According to one town's annals bats would make nests in the canopy and "it was no uncommon thing for a bat to get loose during the service and go scooting through the house."

While meeting houses eventually had side doors, back doors and private doors, the great front door that faced the county road on which all travelers passed and tavern goers loitered provided an important function for each community. As was the custom in England, it became the town's bulletin board where notices of all kinds, such as the warrant for a town meeting, public warnings and important information, were nailed to it. Even though the main function of the meeting house was for the worship of God and for town meetings, it served multiple purposes through time. It was used as a watch house from which the town could keep a vigilant lookout for the approach of hostile Indians, it provided a landmark for

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travelers journeying through the woods as it was generally located on a high elevation and could be seen for miles around, and until after the Revolutionary War it was used as a storehouse for munitions.

The First Meeting House ca 1642-1652

(Unless otherwise noted all information in the following narrative was taken from *Sudbury Records, Vol 1, 1638-1703.*)

On February 17th, 1642 " It is agreed between the townsmen of this town on the one part, and John Rutter on the other part, that the said John Rutter for his part, shall fell, saw, hew and frame a house for a meeting house thirty foot long, twenty foot wide, eight foot between joists." The structure would have six windows, two with four lights apiece and four with three lights.

Rutter, a carpenter, would be paid 6 pounds; 3 pounds in corn (assessed at 3 shillings a bushel) or in money by February 27 with the remaining 3 pounds in money, corn and cattle. The location for the meeting house was "upon the hillside before John Loker's houselot on the other side of the way." When looking at Figure 2-2 the "way" may have been located between Loker's house lot (#11) and the meeting house, likely an access path leading northeasterly from Mill Road (present-day Old Sudbury Road) to North Field. The town records also noted that every inhabitant with a house lot would either attend the raising of the meeting house or "send a sufficient man" to help raise the meeting house. Those who defaulted would be fined 2 shilling and 6 pence. The date to raise the meeting house was set for May 16, 1643. On August 6th of the same year a rate of 10 pounds was assessed on "meadow and upland and all manner of cattle above a quarter old" in order to finish the meeting house (Figure 2-3).

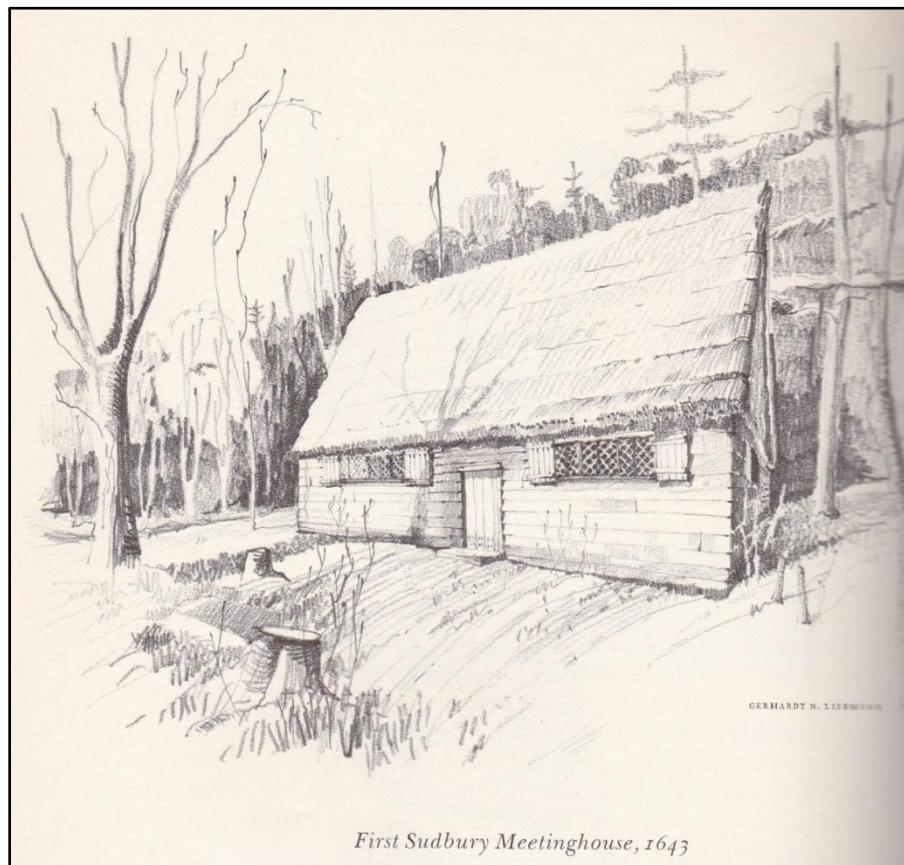


Figure 2-3. Conceptual drawing of the first meeting house (Powell 1963).

The meeting house was not mentioned again until January 21, 1643/4 when John Toll was selected to clean the meeting house for one year for 6 shillings 8 pence. On November 5, 1645 those “appointed to have seats” in the meeting house were to “bring in their payment.” It is not clear if this was a payment owed since the meeting house was first in use. On March 8, 1647 Hugh Griffin was selected to be the town’s marshal as well as to sweep the meeting house. This underscores the multiple civic jobs that many early residents took within their community.

While there is little data on the town’s population during this time period, it must have been growing fairly rapidly for on January 19, 1648 the town discussed enlarging the end of the meeting house and adding a watchtower. It then selected a committee to follow through with what had to be done. At the following meeting on January 26 it was decided that the meeting house would be enlarged by extending the front out 10 ft all along its length with a gable added at each end in the front. It was further ordered that the back of the meeting house be mended and “made handsome.” Enlarging the northwest end of the structure, which was discussed in the previous meeting, was repealed.

On September 25, 1650 it was decided that the deacon would take care of the meeting house and make it comfortable with expenses for the same taken out of the town rate. By this time the town had grown rapidly with 200 members in the congregation and nearly 70 families living on the west side of the Sudbury River (Scott 1989). On December 10, 1651 a special town meeting was held to discuss if the town should build a new meeting house. A vote was taken with 25 voting for a new meeting house and 14 voting against it. A little over a month later on January 23, 1651/2 four men were selected by the town to see if the pastor would approve the addition of galleries in the meeting house and if he did the town would pay for them. In August of the same year it was decided to use the meetinghouse for a watch house and on December 21 the town agreed to build a new meeting house, appointing a committee to “see an agreement perfectly drawn up” between the town and the workmen.

The Second Meeting House 1652-1686

According to an account of the second meeting house dated December 27, 1652 the town appointed Thomas Plympton, Peter King & Hugh Griffin to find timber to fell, prepare and carry to the location of the proposed meeting house, to level the ground and to find sufficient help to raise the house. The outside of the building, which measured 40 ft by 20 ft, would be covered with clapboards, the inside would be lined with either cedar or good spruce boards, the roof covered with thatch and the walls filled with tempered clay. The sleepers of the doors would be either white oak or good swamp pine and planks would be used for the floors. The 12 men hired to do the work would be paid ½ a crown a day. It was also noted that the new meeting house would be erected in the site of the old meeting house (Hudson 1891). Additional details of the meeting house include constructing four 5-ft-wide transom windows (a window above a door or other window built on and commonly hinged to a transom or crosspiece in a structure [Gove 1959]) in the front of the building, one window at each end, pinnacles (an upright architectural member generally ending in a small spire to give additional weight to a buttress or an angle pier [Gove 1959]) at each end, and a gable at each end with a clearstory (an outside wall of a room or building carried above an adjoining roof and pierced with windows [Gove 1959]). As the town planned for galleries the structure would have two doors 3 ½ ft wide “nailed diamond fashion.” The builders were to use iron to hang the doors and “bolt to bolt” one of the doors on the inside. The meeting house structure, which was to stand 8 in above the ground, would be completed by the 16th of the following November at a cost to the town of 5 pounds, 20 shillings. Payment would be made with Indian corn, rye, cattle and money. The contract for the meeting house was witnessed by Edmund Goodwin and Thomas Noyes. From the above details the meeting house appears reminiscent of medieval architecture with gothic detail used for ecclesiastical buildings in Europe (Figure 2-4).



Figure 2-4. Conceptual drawing of the second meeting house (Powell 1963).

On May 28, 1655 a committee was given the power to find a workman to remove both the Pastor's and the Deacon's seats out of the old and into the new meeting house. The work was to be done according to the Pastor's approval, be completed "this week or next" and would be paid for out of the money levied for the carpenters. Following that meeting the Pastor requested that he be allowed to put a seat for his wife under the window by the pulpit and on November 27 it was voted that the meeting house should be "seated with new seats" as speedily and conveniently as possible. They further voted that the seats brought into the meeting house be taken out and that the selectmen would have the power to place men in their seats when they were built. Additionally it was ordered that each man pay the same for their seats as they were alike "both for workmanship and size," but preferable locations were given to those who paid the most towards construction. On December 27 an agreement was reached between the town and the workmen to build the seats with the work completed the following May. The seats were described as being higher than those in the old meeting house, constructed of "sufficient timber" with post and rails and benches of oak. It was reiterated that all seats should be the same. The workmen would be paid 1 shilling 8 pence for each seat with $\frac{1}{2}$ in wheat and $\frac{1}{2}$ in rye to be paid within one week of completion of the work.

From the time that the meeting house was described in the December 1652 meeting to the time that the seats were expected to be installed in May of 1656 represents a period of almost 4 $\frac{1}{2}$ years of construction planning and activity. During most of that period the burying ground not only held the first meeting house but accommodated construction activity associated with the second meeting house. The interior of the meeting house was not completed until sometime after February 16, 1658 when the town voted to

construct stairs into both galleries where floors would be laid and a rail or well-turned banister would be constructed. When completed the church officers would have the sole power of seating people there.

It's obvious that the town put considerable time and detail into planning the construction of the second meeting house. Not only were specific materials used in its construction, but the emphasis on the same construction for each seat and the mention of the pastor's pulpit suggests that quality of design and appearance were becoming important to this growing yet still rural community.

On July 2, 1664 the town initiated a land swap with the widow Loker. According to the terms of the agreement she would receive 4 acres of meadowland at the south end of the Strawberry Hill meadows "in lieu of half an acre of upland, whereon now the meeting house stands." The deal would be finalized when the heir or heirs of the widow Loker concurred with the agreement. Until that time the widow Loker and her heir(s) would have use of the meadow land.

The issue was brought up again at a town meeting on March 16, 1684/5 as the heir of the widow, her son John, was of age to confirm the above agreement. The discussion stated:

"Upon the mother of John Loker, of this town concerning the four acres of meadow, granted him formerly by an agreement made (by the widow Mary Loker, his Mother, and Henry Loker, his Uncle during the nonage of the said John) lying at the south end of Strawberry Meadow, bounded as it was formerly laid out possessed and enjoyed by the said Mary and the said John Loker, ever since to this day, *and is in lieu of half an acre of land (which his Mother in his behalf) granted and surrendered to the Town, for to set up the public meeting house upon thereof, and is used to this day for God's public worship, the rest being used for the common burying place of this town, and for as much as no record can at present be found in the town books,* [italics added by author] of this exchange, and the said John Loker now declaring his satisfaction in the said exchange, and hereby all confirming the same, it is mutually agreed & concluded now..."

This agreement is important as it is discussing the location of the second meeting house and has implications regarding the original ½ acre given/conveyed to the town for the first meeting house. The wording that is emphasized in the above quotation strongly suggests that this is the original ½ acre parcel that was conveyed by John Loker, Mary's husband. As her husband died in 1653, any reaffirmation of the original agreement made between John Loker and the town would have to be made with his widow. Then as with most communities of that period after a meeting house was constructed burials were conducted around that structure.

During the 1660s and 1670s the meeting house is discussed a few times in the town records. In 1662 due to damage from heavy spring rains John Rutter proposed to underpin the front side of the structure at the two front corners and in the middle and in 1667 the ground on the south side of the meeting house had to be raised and the land leveled 10 ft out from the meeting house towards the street. The surveyors for the highways were tasked to complete that later improvement "with all speed" suggesting that that meeting house was in bad shape. In 1670 John Rutter was also paid 20 shillings to underpin the meeting house with stone and clay. The above repairs suggest that erosion was a constant problem.

The two oldest grave markers in the cemetery date to the time period of the second meeting house. They belong to Anne Goodenow who died in 1675 at age 67 and her son Joseph who died in 1676 at age 31. Their flush stone markers with no motifs contain inscriptions that were likely done by the same carver given the similarity of the letters on each (Figure 2-5). The only other seventeenth century grave marker in the cemetery belongs to Capt Edmund Goodenow who died in 1688 at age 77. Edmund, the husband of Anne and father of Joseph, came from England in 1638 and was one of the original settlers of the town. A date of February 18, 1691 above Capt. Edmund's inscription conveys that the marker was carved



Figure 2-5. Anne Goodenow's marker (top) and her son, Joseph (bottom).

approximately three years after his death. The carved letters are quite different than those on his wife's and son's stones pointing to a different carver (Figure 2-6). Secondary sources state that the burials are located to the east of the "old meeting house."



Figure 2-6. Capt. Edmund Goodenow's marker.

house bring an accounting to the March meeting if they wanted to be paid. The fortification remained around the meeting house until 1681. In February of that year some of the logs were used to repair the town pound and in March the town decided to haul away all the logs left of the fortification and reserve them for later use. The posts around the watch tower and the posts and planks around the gate were left in place. It is not clear when/if the remaining post and planks were taken down.

While considerable damage was done to outlying farms during King Philip's War, only minimal damage occurred in the village center. According to the census of 1676 Sudbury contained 263 houses and 316 families for a total population of 1,773. Following King Phillip's War the town witnessed steady growth (Massachusetts Historical Commission 1980).

The Rev. Brown died on June 22, 1678. In order to secure the services of the town's second minister, Rev. James Sherman, the town purchased the east end of John Loker's house for a parsonage. The parcel was described as being located before and near the meeting house, together with an orchard, 4 acres of upland, and 1 acre of meadow in the Great Meadow. John's mother would live in the western end of the house until she either died or remarried. The town would pay John 50 pounds, 25 pounds in money and the rest with 40 acres of common land of his choice on the west side of the Great River (Sudbury River). According to the deed that is dated October 23, 1678 John's property "was fondly left him by his father and all that is given by agreement or otherwise . . . granted to him by his mother the widow Mary Loker" (Hudson 1889; Town Records Vol 1; Middlesex Deeds 7:23).

The widow Loker appeared at the town meeting in October of 1678, and surrendered all her reversion in the western end of the house to the town, reserving the liberty to have twelve months in which "to provide herself otherwise." She also promised to quit all egress and regress through the eastern end of the house and every part thereof." The town then voted to pay her 25 shillings and to raise 25 pounds with which to

In September of 1675 with Indian hostilities associated with King Phillip's War imminent the Rev. Edmund Brown sent a letter to the Governor asking for help to defend the town (Hudson 1891). While he mentioned fortifying his house, the town took measures to fortify the meeting house. In March of 1676 Sgt. Rutter was ordered to provide two oak posts of the same length and size of those used for the meeting house gate. The town then ordered that the rate for "fortifying about the meeting house" be done in the spring "leaving out all strangers and sojourners." The logs were valued at 2 shillings 6 pence each, the boards 5 shillings 6 pence per hundred feet and every man's labor at 8 ? (illegible). On February 26, 1777 it was ordered that those who brought boards, posts and worked at fortifying the meeting

repair the house. A year later in a meeting on October 29, 1679 the town voted to take a suit against the widow Loker as she refused to give the town the part of the house, ground and trees that her son sold to the town. The next day she conveyed a deed to the town affirming her son's agreement regarding the house lot that formerly belonged to her husband, John Loker (Town Records Volume 1; Middlesex Deeds 7:196).

In 1679 the meeting house was not only in disrepair, but also suffering from an increased membership. In February the town voted to have the selectmen contract with workmen to have the sills of the meeting house repaired in the spring and to move forward constructing two more seats from end to end in the gallery as well as moving the stairs to the opposite corners. The town's population growth continued to cause issues with the meeting house. In October of 1683 the town discussed enlarging the meeting house or building a new one. It was decided to leave the meeting house as it was for a year, but making it as warm and comfortable and as convenient as it could in order to sit as many as possible. According to Powell (1963) there was much agitation and dispute at this time in the town over the form and shape of the meeting house before a decision was made.

The Third Meeting House 1686-1724

It was not until October of 1686 that the town voted to construct a new meeting house that would be "erected, finished and stand upon the present burying place and on the most convenient part thereof on where behind or about the old meeting house." It was specified that the new meeting house would be a square structure "after the mode of Dedham." A committee of six was chosen to find "with all convenient speed" several workman, carpenters and others to build and complete the structure that would have the same dimensions and shape as the Dedham meeting house. In 1687 various town meetings were taken up with the details of the construction of the meeting house. The committee was given until the January meeting to report on all the construction and price particulars for the job.

A number of details regarding the new meeting house surface in town meetings in 1687 including using cedar clapboards for the exterior and using either plane boards or cedar clapboards for lining the interior. The dimensions, the number, and the placement of the windows were left to the discretion of Lt. David Pond and his son. On December 6, 1687 the town voted, "that Leut. Daniel Pond shall be left to his liberty whether he will leave a middle alley in the new meeting house, or shut up the seats as they are in the Dedham meeting house, provided always that the seats do comfortably and conveniently hold and contain seven men in one end of the seats and seven women in the other end of the seats." While the town left some of the construction details to Leut. Pond, other explicit interior details, such as "there shall be four short seats made from the northern doors to the pulpit stairs," were determined at a town meeting (Figure 2-7).

It was further voted "that the most considerable rule for seating of persons in the meeting house shall be by what they pay to the building thereof, excepting in respect to some considerable persons or to age and other considerable qualifications." Additionally it was voted that there should be "a good, sufficient and strong ladder placed at the meeting house with as much speed as may be, to prevent whatsoever occurrence may happen." Mary Loker was chosen to sweep and keep the new meeting house clean for one year for 1 pound 15 shillings. The meeting house would also have "a convenient place for the storing of the ammunition of the town over the window in the south west gable."

In January of 1688 it was voted that Peter King could have the old meeting house for 6 pounds. Included in the deal were the Pastor's and the Deacon's seats, but none of the other seats. In February of 1688 the town decided that the dirt on the northeast and southeast side of the new meeting house was to be moved and placed at the front so that the ground could to be raised to within four or five inches of the sill and would then be covered with gravel. A "convenient way in" was to be made at the doors. The raising of

the front part of the structure and the need to construct a “convenient way in” suggests that the meeting house was located on a sloped section of the interior of the property. In May of that year the seats in the old meeting house were removed and placed in a vacant room in the new meeting house with all new seats made with “all convenient speed.” It appears that construction problems began to plague the project as the town stated that two doors of the new meeting house would be “forthwith removed” and carried down the stairs and that the windows that stand there would be removed and set in place where the doors now stand.

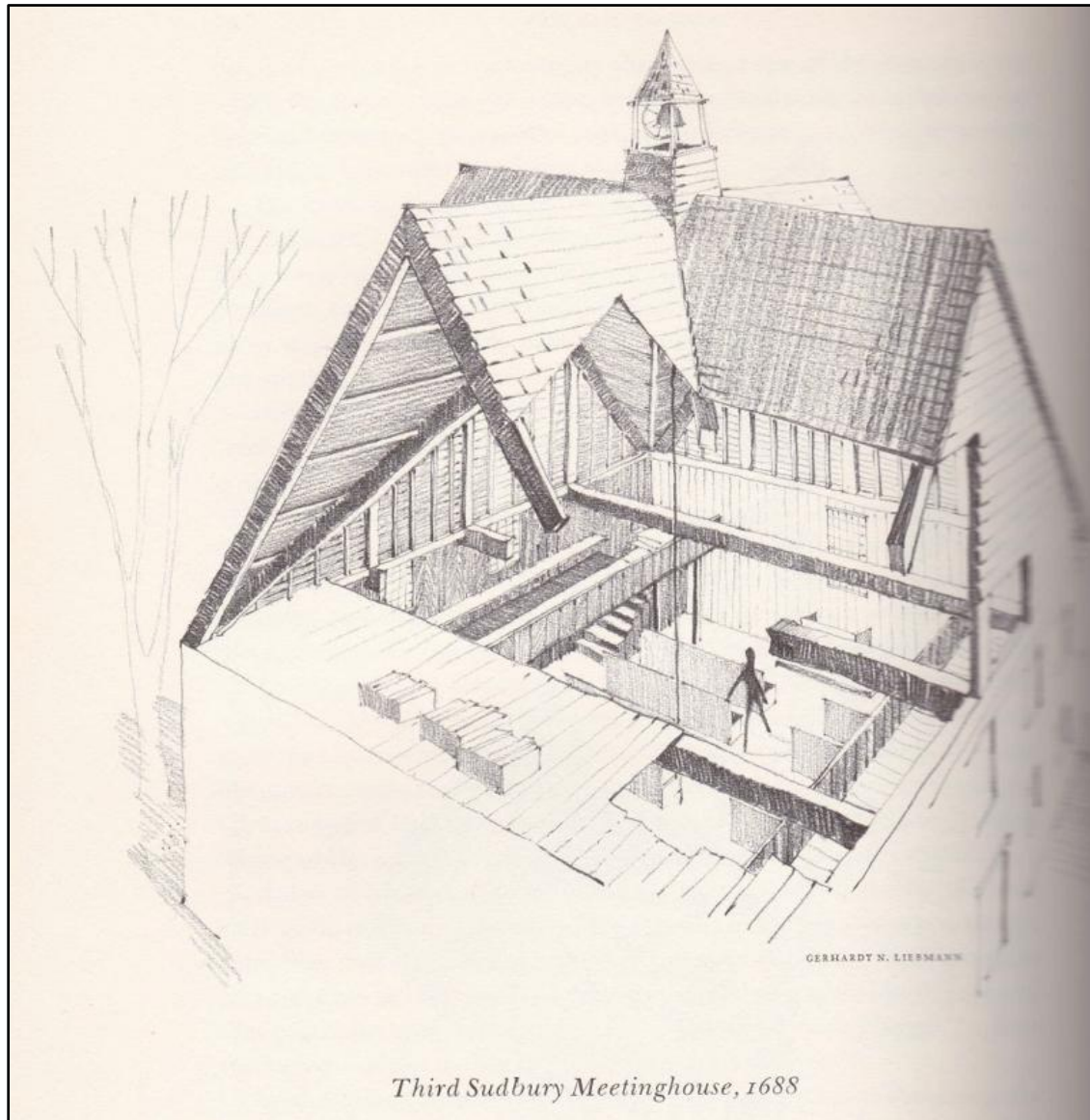


Figure 2-7. Conceptual drawing of the third meeting house (Powell 1963).

Little information is revealed about the meeting house through the turn of the eighteenth century. A few years after the meeting house was built a bell was provided that cost "twenty and five pounds in money." Of interest though is that in 1690 Elizen Whiting was hired to dig graves at 1 shilling 6 pence. Then Lt. Thomas Rutter was hired to dig graves, carry the bier (stand to hold the corpse or coffin with the corpse), and the cloth to cover the coffin to the location of the deceased person. This is the first time that a person is mentioned to assist with burial practices.

HISTORIC CONTEXT

After the beginning of the eighteenth century there was a gradual shift of the village center south to present-day Wayland Center. As the area to the west of the Sudbury River became more populated a burying ground was established there in 1716 and the East and West precincts were established in 1721, present-day Wayland and Sudbury, respectively (Figure 2-8). After 1723 the population of Wayland Center grew as its location provided convenient access to the Post Road, part of the first system of mail delivery routes between Boston and New York. At that time this section of the highway was included in the Upper Post Road alignment (present-day Route 20) connecting Boston to Springfield. A new common, town pound and school were soon established in this small village center. With scattered farmsteads throughout, the town remained an agricultural community that was able to prosper due to its strategic location along a major transportation system (Massachusetts Historical Commission 1980).

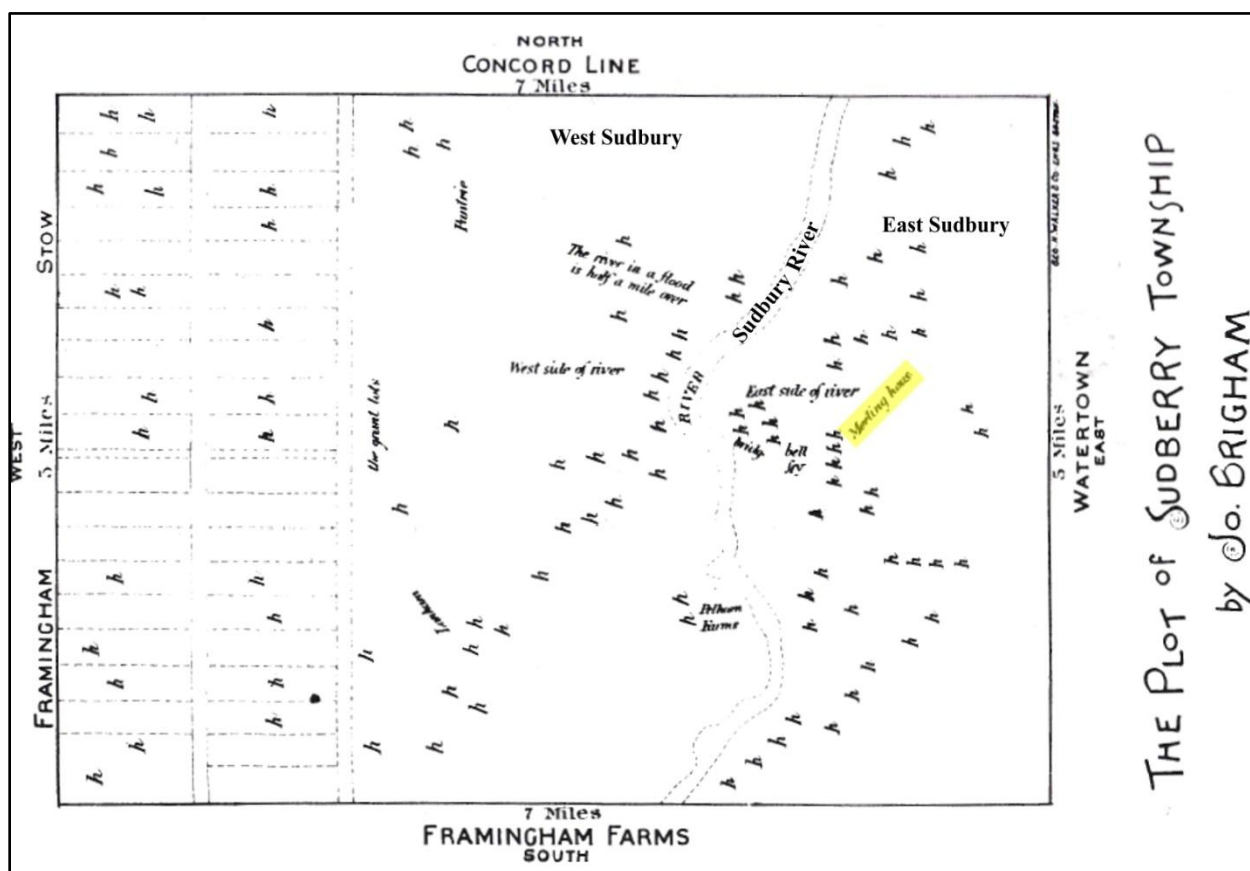


Figure 2-8. Plan of Sudbury Township (Scott 1989).

(Unless otherwise noted all information in the following narrative was taken from *Sudbury Records, Vol 2, 1703 -1733.*)

There appears to have been some controversy regarding the burying ground for on April 5, 1715 the town "granted by a vote to Ens John Noyes a Liberty To fence in the old burying place but yet ye said Noyes his heirs and assigns are forever prohibited and hindered from breaking up said burying Place or setting up any building on the same it being kept and reserved for burying ground."

By August of 1721 the Meeting House had fallen into disrepair and the town voted to mend the steps and to "set up" the underpinnings of the building that had fallen down. These repairs may not have been

made as the town voted in January of 1721/2 to take down the meeting house and rebuild it further to the south. While the General Court ordered the repair of the old meeting house in November of 1722, it then agreed that the town could move the meeting house in January of 1723.

In July of 1724 the town chose a committee to pull down the third meeting house and dispose of the old timber, the new timber, and all other materials with the exception of the bell. The fact that “new timber” was mentioned suggests that the town had repaired some of the meeting house as ordered by the General Court in 1722. They then voted to use the \$150 appropriated to fix the old meeting house to be used in building and finishing the new meeting house.

Summary of Events to 1724

While the construction of the town’s meeting houses were discussed in great detail in the town records, little discussion centered on the burying ground. This is not surprising as confirmed by previous research conducted in other towns during this time period (Donohue-Putnam 1990; Donohue and Mertz 2005; Donohue et al 2011; Donohue and Trinkley 2013a, 2013b; Donohue 2014).

The Puritans believed in God’s “Divine Purpose” that chose a select few for salvation and only God knew who were chosen. As a result, the Puritan’s life was filled with agonizing insecurity trying to understand the reasons for problems in their lives on earth and then their fate in the afterlife. Puritan ministers continually heightened this sense of insecurity:

“So is a false peace and assurance one of the most grievous judgements that can befall a man . . . it were better to be vexed with continual doubts and feares, than to be lulled asleep with such an assurance.” – Arthur Hildersham

Burying grounds were most often located adjacent to a town’s meeting house. Land was also set apart for its convenience, soil type, or merely where an area had been cleared of woods. As slate was imported from England during the early days of settlement, headstones were expensive. Some historians believe that few headstones were placed over the graves of early settlers due to their cost. Most often, early burials were marked with wood markers, primitive stone markers, or were not marked at all.

The Puritan grave was oriented in an east-west direction. The headstone had the carved image and inscription on its west side and the coffin was placed on the east side between the headstone and a footstone. The footstone, which generally mimicked the shape of the headstone though smaller, often had the deceased’s initials or name inscribed on the east side. This tradition was based on the belief that a body lying on its back with feet pointing to the east would sit up and face Jerusalem on Judgment Day.

The Puritan burying ground was simply a place to bury the dead. As the Death Head motif provided a stark reminder of the uncertainty of one’s life after death no thought was given to visiting the dead, commemorating the dead, or even maintaining the grounds. There was little formal organization within the burying ground, and its overall appearance was barren with rough, uneven topography and few if any pathways. Typically burying grounds were overgrown with long grass and weeds, had dilapidated fences, crumbling tombs and headstones lying on the ground. Some, such as the early burial ground in Dedham, were surrounded by a board fence so that no one could see in. Residents also used the burying ground to graze cattle since the land was considered common to the community. Boundary fences were important as they prevented encroachment on the burying ground by farmers and animals from adjacent property as well as encroachment on adjacent property by unwanted burials. Through this early period of settlement burying grounds were often used as locations for powder houses in case of explosions.

Wayland town histories state that a lot was provided for a meeting house the same time that house lots were given out to the early settlers in 1639 and that John Loker sold a ½ acre lot to the town for a burial

HISTORIC CONTEXT

ground. No primary records could be found to either prove or disprove those facts. Evidence from town records during the time of the second meeting house note that the agreement for use of the ½ acre parcel where the meeting house stood could not be located. The town therefore negotiated an agreement with the widow Loker for the ½ acre parcel, which was previously conveyed to the town for a meeting house as described above in the 1684/5 town meeting: *“for to set up the public meeting house upon thereof, and is used to this day for God’s public worship.”* The first public meeting house was erected in 1643, the ½ acre parcel would have been conveyed to the town by the widow Loker’s husband, John, who died in 1653. Therefore the town had to re-negotiate with the widow Loker in 1664 and then confirm the agreement with her son when he came of age. As with other meeting house properties of the period, burials were conducted around the facility.

Table 2-1. Summary of events to 1724.

Date	Event	Source
1639	Meeting house parcel set aside when house lots given out	Town histories
Unknown	John Loker conveyed ½ acre to town for burying place	Town histories
1643	First meeting house	Town Records
1655	Second meeting house	Town Records
1664	Widow Loker agrees to swap ½ acre where meeting house and burying ground are located for meadow land	Town Records
1675	Earliest extant grave marker – Anne Goodenow	Cemetery
1684/5	John Loker confirms his mother’s agreement of 1664, it states that ½ acre was land set aside for meeting house and still used for meeting house and burying ground	Town Records
1688	Third meeting house	Town Records
1716	Burying ground established on west side of the Sudbury River	Town histories
1724	Fourth meeting house constructed elsewhere, third meeting house removed from burying ground	Town Records

It is obvious from the town records associated with the construction of the three meeting houses that both exterior and interior design details and quality of construction became increasingly important as the town prospered. Yet the state of the third meeting house, which was constructed to exacting standards, was such that when it was pulled down both the old and new timber was disposed of rather than being sold or reused. As in other New England towns the Puritan ethic slowly waned as individuals became more prosperous. Yet the burial ground remained in the background with regard to its place in the community retaining its association with its Puritan roots.

What remains unclear is the former location of the three meeting houses within the ½ acre parcel. Town records confirm that during construction of the second and third meeting houses, the previous meeting house was still on the property and likely being used until the new one was ready. No town records or deeds were found to suggest that the ½ acre parcel had been extended during this time period. It appears from design and repair details that each meeting house was on sloped land that suffered from erosion. While a marker at North Cemetery notes the approximate location of the “first meeting house” it is not clear why that location was chosen for that particular meeting house. The only evidence that can be gathered from a walkover of the property is that the 17th century burials for the Goodenow family occurred when the second meeting house was standing making that location a contender for the location of the first meeting house.

2.3 North Cemetery - 1724 to the End of the Nineteenth Century

As the fourth meeting house was located elsewhere, the following narrative first focuses on the evolution of the Colonial burial ground and then on the North Cemetery: how it expanded, changes made to the landscape and how these changes fit into general trends of this time period.

Evolution of the Colonial Burial Ground



Figure 2-9. Mid 18th century Death Head in North Cemetery.

As eighteenth-century lifestyles changed and orthodox Puritan values waned, resistance to change also lessened. While the Death Head motif persisted (Figure 2-9), the Cherub motif emerged portraying a sense of optimism with eternity waiting for everyone (Figure 2-10). Portraits of the deceased also appear (Figure 2-11). Early portraits contained nearly identical faces with small stylistic variations portraying gender, such as buttons on garments for males and caps on females.

By the end of the eighteenth century the congested state of

affairs within burying grounds led to the construction of family tombs, either as subterranean chambers, shafts, or above-ground rooms mounded over with turf (Figure 2-12). Vaults were deeply excavated and entered by stairs. The underground passages were lighted through iron grates on the surface. While many vaults were covered with ledger stones others were finished with a raised mound of earth. A depersonalization of death was heralded in with the Urn and Willow motif in the latter part of the eighteenth century. This new style was reminiscent of Greek revival symbols of mourning that were fashionable in Europe (Figure 2-13).

Even though perceptions began to change, conditions continued to deteriorate through the turn of the nineteenth century. As relayed in Blanche Lenden-Ward's book (1989) on Mt. Auburn Cemetery a writer of that period noted that "the burying ground continues to be the most neglected spot in all the region . . . and the meanness of its enclosures, without a tree or shrub to take from it the air of utter desolation."



Figure 2-10. Cherub motif in North Cemetery.



Figure 2-11. Portrait motif in North Cemetery.

history, a repository for the past, and a place commemorating lives lived rather than the traditional reminder of the final act of death.

One response to the burying ground dilemma was The New Burying Ground, an experiment in burying ground landscape design in New Haven, Connecticut. Incorporated in 1797, The New Burying Ground was the first private corporation of its kind in America. The overall landscape design was based on family plots constructed in a formal grid pattern that were divided by walkways thereby managing to maximize the number of burial lots that could fit in the burying ground. The grid pattern allowed for accurate burial records. As older stones from colonial burying grounds were moved into family plots, new stone markers and simple monuments of marble were added, creating a crowding of many stones together in one plot. Here the burying ground was meant to be an institution of



Figure 2-12. Example of a tomb in North Cemetery.



Figure 2-13. Urn and Willow motif in North Cemetery.

While this concept did not become popular, the Rural Cemetery movement did following the opening of Mount Auburn Cemetery in Cambridge, MA in 1831. One of the main concerns of the founders of Mount Auburn Cemetery was the maintenance and improvements to the grounds – the importance of which was discussed in committee meetings in the planning stages of the cemetery. The committee felt that they needed a “wise and fixed policy to secure funds . . . to lay the foundation of an accumulating fund to the preservation, embellishment and improvement of the grounds was of highest importance” (Garden and Cemetery Committee 1834).

Stressing the historical and commemorative function of the cemetery, the Rural Cemetery movement, which was popular through the 1850s, featured a picturesque landscape design with a system of pathways indicating that lots were sacred. As it was felt that nature in the form of a “tree-covered, green countryside” was disappearing, trees became a major element of the landscape. Family lots featured large central family monuments often covered with rough turf that were bounded with stone edging, ornate iron fences or hedges, and cast iron fencing (Figure 2-14). It was felt that a beautiful cemetery that was frequently visited was a characteristic of an enlightened Christian community. Thus began use of the term “cemetery.”

The opening of Mt. Auburn Cemetery not only changed the nature of landscape design for new cemeteries, but also led to a remodeling of the landscape in many Colonial burying grounds, creating an atmosphere more conducive to the times and changing attitudes toward death. In several communities the change from a Colonial burying ground to a rural cemetery was accomplished through a public-private effort. In Dedham improvements began at present-day Village Cemetery in 1839/1840 following fundraising activities, such as fares and money raised by subscription and private donations. In Marshfield improvements began at present-day Winslow Cemetery in 1853 following the death of Daniel Webster who was buried in the town’s first burying ground. There the “Ladies of Marshfield” sponsored a fair to raise money for improvement of the grounds. By 1860 rural cemeteries were located throughout the country.

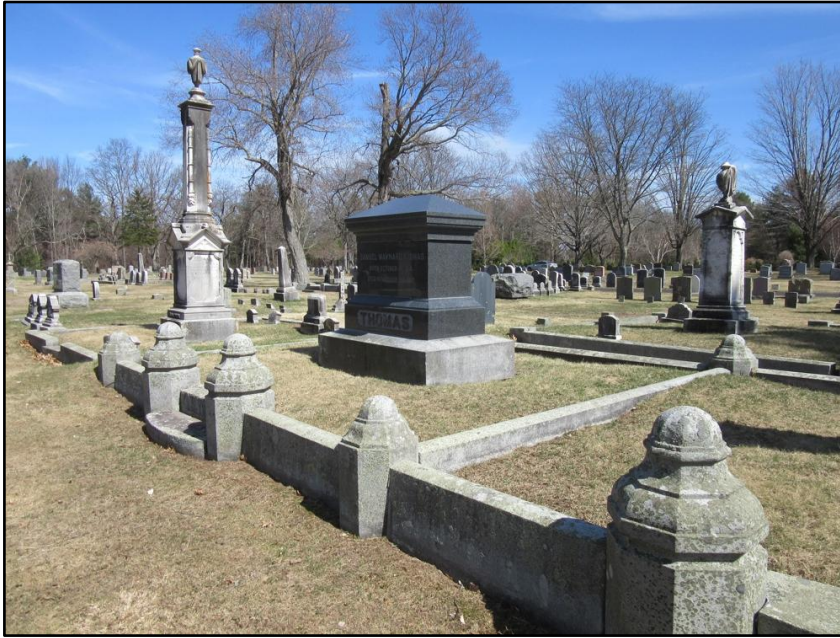


Figure 2-14. Elements of the Rural Cemetery movement in North Cemetery.

During the last half of the nineteenth century a simpler and cleaner cemetery landscape known as the Lawn Park movement attempted to create a landscape of green lawns interspersed with trees, shrubs and flower beds. Monuments were almost always granite and rather than using granite curbing and iron fences to define family plots, which typically contained a family monument with smaller markers for individual family members, low/flush to the ground corner bounds were preferred (Figure 2-15). The position

of cemetery superintendent was established in the early days of this movement underscoring the importance of a cemetery's appearance. The lawn mower, which was patented in England in 1830, increased efficiency in cemetery maintenance and cemetery crews grew as maintenance required more workers. The cemetery was becoming professionalized. These changes reflect an embrace of the City Beautiful movement that rejected the excesses of the Rural Cemetery movement defining beauty as not simply decoration but as a concept that included functional utility as well (Sloane 1991).



Figure 2-15. Elements of the Lawn Park movement in North Cemetery.

North Cemetery - 1724 to 1834

(Unless otherwise noted all information in the following narrative was taken from *Sudbury Records, Vol 2, 1703 -1733; Sudbury Records, Vol 3, 1733 -1760; Records Vol 1, Town Meeting Minutes 1780 - 1817 Town of Wayland; Records Vol 2, Town Meeting Minutes 1817 - 1853 Town of Wayland; Records 1854 – 1882, Wayland; and Records Vol 4, Town Meeting Minutes 1883 - 1901 Town of Wayland.*)

While only mentioned a few times in the town records through the end of the eighteenth century, the burial ground and burials are beginning to be discussed in town records (Figure 2-16). In 1782 the town allowed Lt. Noyes to put a rail fence along the east side of the burying ground and construct a fence 6 ft wide for “convenient passage.” In 1782 William Revis was chosen to dig graves and take care of the burying ground and in 1785 he was paid 10 shillings to construct a gate for the burying ground. This was the first time a caretaker is mentioned for the burying ground. In 1791 the town procured a carriage to convey the dead from the extreme parts of the town to the burying ground.

In April of 1792 the town voted to choose a committee of three selectmen to see if it was necessary to make an addition to the burying ground. In October of 1794 the town voted for the committee to determine the bounds of the old burying ground and then to see if the town could procure land for the burying ground. Finally in April of 1797 the town received the report of the committee and in May of 1799 the selectmen voted to try to procure land for an addition to the burying ground without spending any money (Figure 2-17).

In January of 1800 another committee of three was tasked with seeing if they could purchase or exchange land with Nathan and Luther Gleazen who owned property adjacent to and south of the burying ground. In March the town accepted the committee’s report to purchase all the land of Nathan and Luther Gleazen that formerly belonged to the house and shop lot of Abel Gleazen’s estate for \$100 excepting ½ acre next to the road that contained the shop. Finally in September of 1800 the town purchased ½ an acre plus ½ of a quarter of an acre from Luther Gleazen for \$100 to enlarge the cemetery. Previous to the town’s purchase, Luther had purchased the above mentioned property from Nathan (Middlesex Deeds 135:203). The descriptions of the boundaries in both the deed from Nathan to Luther as well as the one from Luther to the town are of interest. The parcel from Nathan to Luther for 1 acre and 20 rods was the former house and shop lot of the deceased Abel Gleazen. At that time Nathan was the administrator of Abel’s estate. The parcel was bound northerly by the burying ground, as the fence now stands; easterly and southerly by the widow Tabitha Noyes, as the fence now stands; and westerly by the County Road. The lot’s boundaries suggest a square or rectangular parcel (Middlesex Deeds 135:203). The bounds of the parcel that the town bought from Luther in September of 1800 (the ½ acre plus ½ of a quarter of an acre) began (Middlesex Deeds 136:487):

- at a stake and stones at the northern corner of the premises at the southeast corner of the old burying ground,
- then running southerly by the widow Tabitha Noyes as the fence stands to a stake and stones at the corner of the wall,
- then westerly by the widow Noyes to a stake and stones,
- then northerly by Elisha Parker’s land to a stake and stones,
- then easterly by the burying ground to the bound first mentioned.

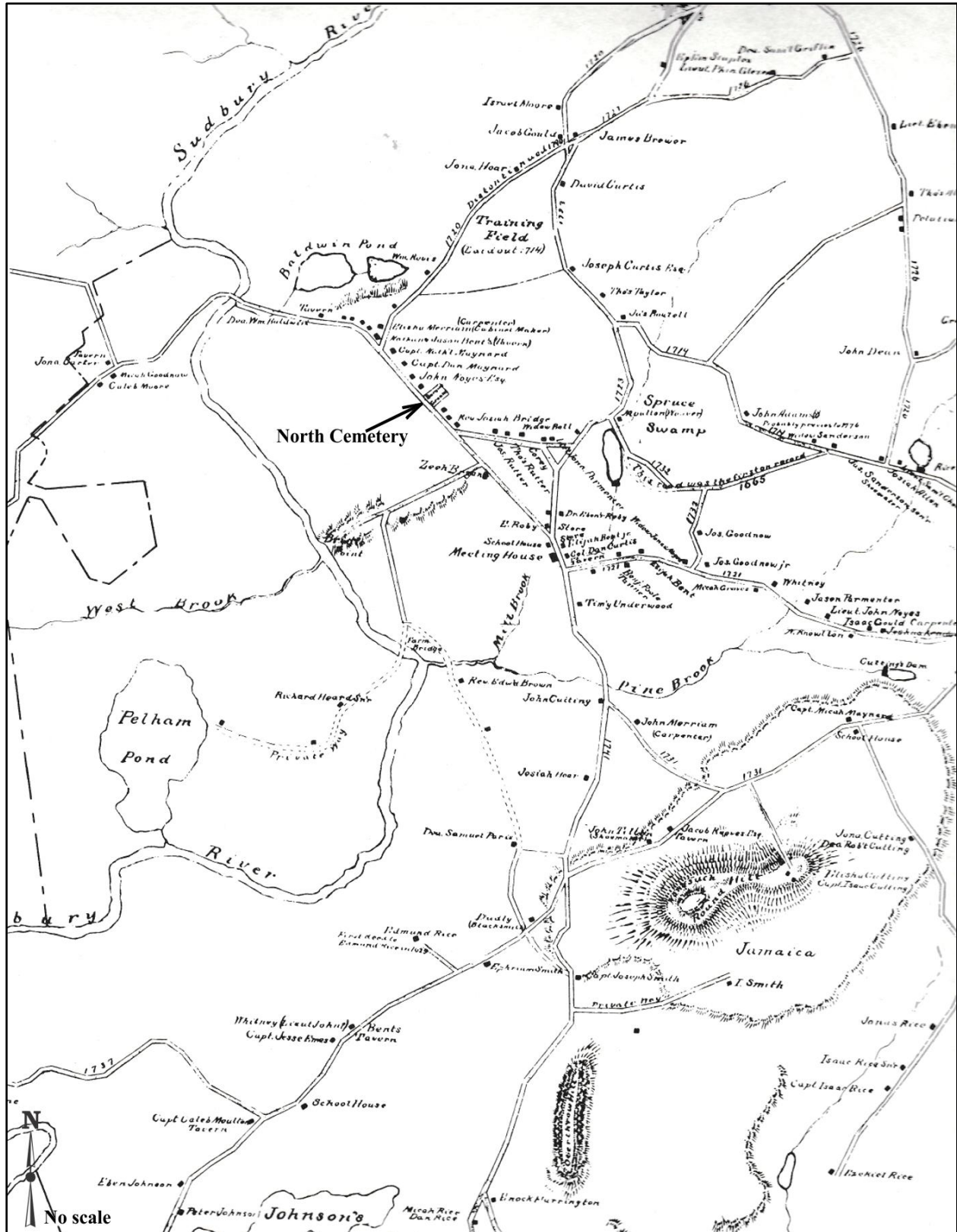


Figure 2-16. Detail of Wayland in 1776 (Smith 1881).

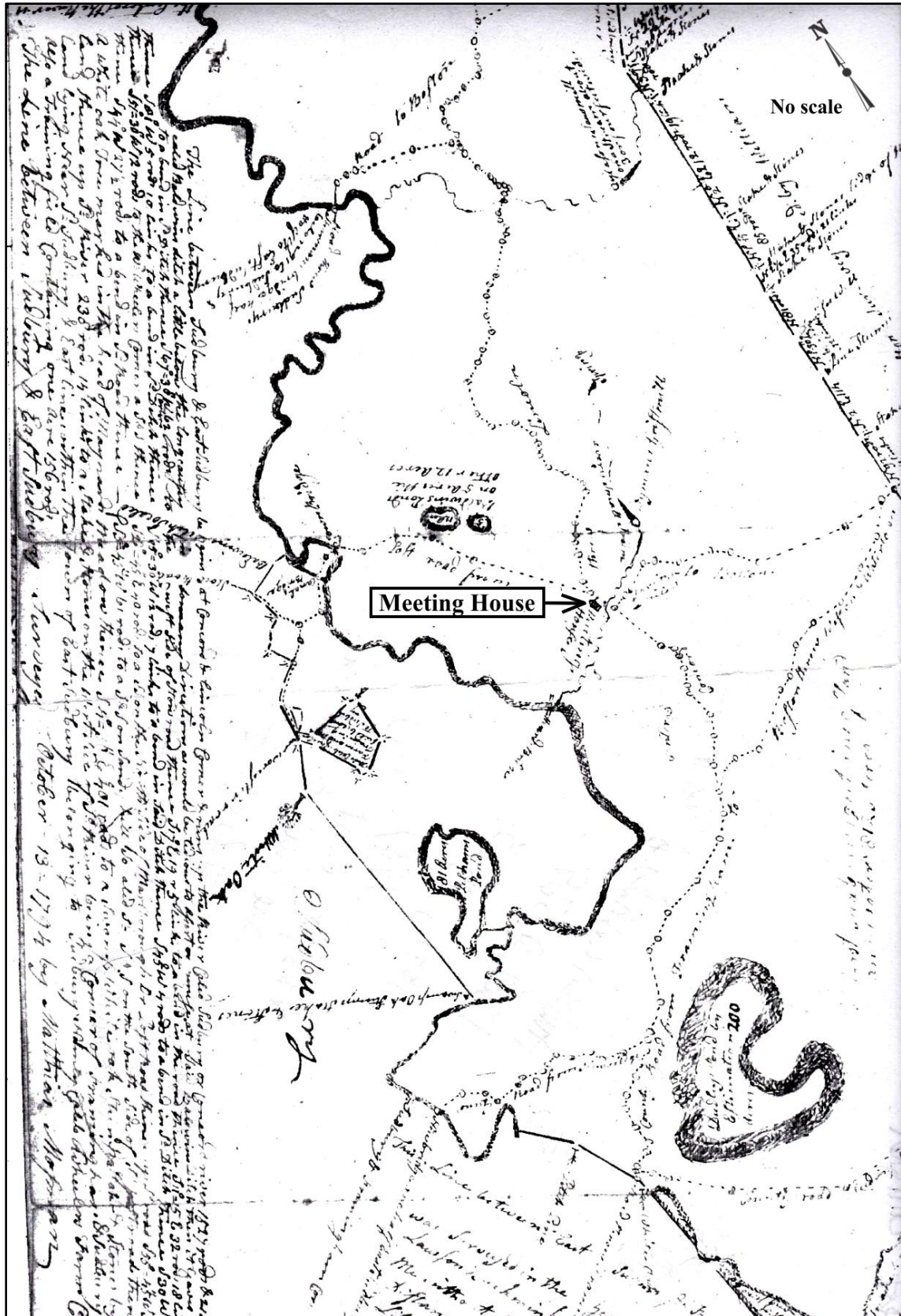


Figure 2-17. Detail of Wayland in 1794 (Mofman).

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In March of that year Luther had sold Abel's $\frac{1}{2}$ acre houselot that was bounded northerly by the burying ground and westerly by the County Road to Elisha Parker (Middlesex Deeds 136:61) accounting for Parker's presence in the above boundary description. Figure 2-18 depicts the approximate location of the 1800 addition on an 1857 plan of North Cemetery. As it is difficult to identify the starting point for the 1800 bounds on the 1857 plan, the shaded location representing the 1800 addition in Figure 2-18 is smaller than the acreage described in the deed.

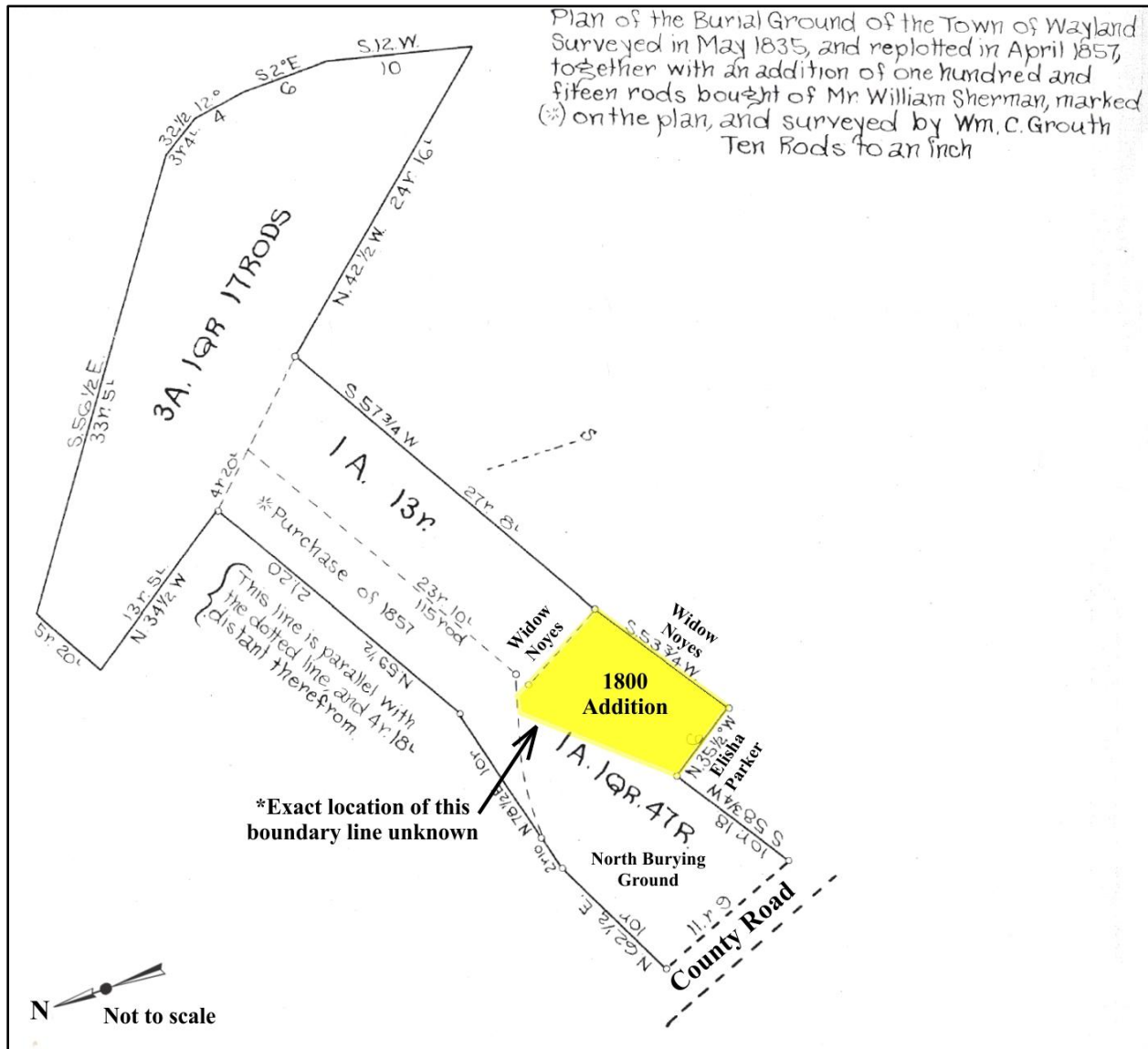


Figure 2-18. Conjectured location of the 1800 addition and North Burying ground on 1857 plan (Grouth).

The burying ground did not appear in the town records again until the 1820s. In 1821 the town discussed selecting someone to make sure the graveyard was kept sufficiently enclosed. An article in the warrant of February of 1823 asked if the town would hear the report of a committee chosen at a former meeting to select suitable grounds in the burying yard to build tombs and then adopt those measures. At the meeting the article was postponed and not addressed. No further details regarding the tombs were found following the February meeting. The present tombs in the front of the cemetery adjacent to Old Sudbury Road date to that time period (Figure 2-19).



Figure 2-19. Photo of tombs facing Old Sudbury Road.

Between October of 1831 and November of 1834 the town had various discussions about the burying ground. In the warrant for the 1831 meeting there was an article to see if the town would take measures for the preservation of the burying ground by rebuilding a fence around it; at the meeting that followed a committee was chosen to examine the fence around the burying ground and in February of 1832 the town accepted the report of the committee voting to complete the fence for the “safety of sd ground and the benefit of the town.” Unfortunately most committee reports in the town meetings were not described in detail in the town reports. While the warrant for the November 1833 town meeting asked if the town would enlarge the burying ground and repair the fence around it, the article was passed over at the meeting. Then in March of 1834 all former committees for the burying ground were discharged. In November of that year another committee was formed to look into repairing the fence around the burying ground and in December the town decided to purchase property to enlarge the old burying ground and possibly purchase property for a new burying ground.

North Cemetery - 1835 to the End of the Century

In 1835 the town took decisive steps. At a meeting on February 16 the town made plans to lay out lots and “repair and make new” the fence on the property it purchased for a new burying ground and chose an agent to survey, fence, and sell the wood standing in the old burying ground. Less than a week later on February 22 the town made an agreement with William Sherman, the guardian for William Noyes, “for a piece of land to unite the two old Burying grounds together.” Sherman would be offered \$50 per acre for the property.

On August 31, 1835 a deed was executed between William Sherman, who was described as guardian of William Noyes of Wayland a non compos mentis person, and the Inhabitants of Wayland. Sherman was empowered by the Court of Probate to sell a 1 acre 30 rod parcel for \$59.38. The deed is of particular interest for the information it imparts. The boundaries began at the west corner of the burying ground on the northerly side of the County Road then north 21 ½ degrees west 12 ft to the northerly side of the wall

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“which the Inhabitants have erected on the premises since the present sale and purchase was contracted for that was erected by the town since the purchase and sale was contracted” and then continued (Middlesex Deeds 346:380):

1. north 62 ½ degrees east 10 rods,
2. north 71 ½ degrees east, 2 rods,
3. north 84 degrees east, 5 rods, and
4. east 17 ½ degrees north, 7 rods and 15 links to the northeast end of the wall, this strip averaging 12 ft wide and bound by lands of William Noyes on the northwesterly side of the wall,
5. north 32 ½ degrees east on the land of Noyes as the fence now stands 24 rods 7 links to the “ancient Burying Place,”
6. then southeasterly by “said Ancient Burying Place to the land of Luther Gleason,
7. then south 57 ¾ degrees west 27 rods and 8 links to the burying ground first named,
8. then by the burying ground northwesterly, westerly and southwesterly to the first bound on the county Road.” The town was to “forever support a lawful and sufficient fence on the line between the parties.”

Figure 2-20 shows the above boundaries of the 1835 addition on the 1857 plan of the cemetery. As the 1857 plan was an update of an 1835 plan associated with the above deed, it is likely missing some of the detail from the 1835 rendition. Nonetheless it appears from the deed that part of the purchase was an access pathway to reach the addition that connected the two burying grounds, that is the “Ancient Burying Place” to the “burying ground.” The 1857 plan shows the addition as 1 acre 13 rods suggesting that the pathway was 17 rods. The wall that had been constructed by the town between the burying ground and Noyes’ property is likely the same wall that is along the northern side of the entrance drive (Figure 2-21). There appears to have been an issue of encroachment in 1842 as Article 5 in the November 6th warrant for the town meeting asked whether the town would reach a settlement with William Sherman concerning land that he asserted the town claimed possession of as part of the old burying ground. At the meeting on November 14 the town appointed a committee to investigate whose investigation continued until April of 1843. The outcome of the investigation was not noted. In November of 1844 a committee was selected to erect or cause to be erected a fence around the whole burying ground and then voted to remove or sell the old Hearse House – it is unclear where the hearse house was located. It appears that the investigation into Sherman’s allegation prompted a survey of the boundaries of the burying ground that was followed by the construction of the fence in order to prevent any further issues regarding encroachment. It’s possible that the Hearse House was outside of the boundaries, maybe on Sherman’s land, and was therefore removed or sold.

Improvements continued to be made at the town’s burying grounds. In October of 1847 the town voted to have stone posts erected in the burying grounds and then referred it to the selectmen. In March of 1848, the committee chosen to erect the stone posts made a partial, verbal, report of their findings and the town voted to proceed to erect them for \$50. In November of 1848 the town heard the report of the committee chosen to erect monuments as well as a special report dividing the burying ground into lots; the recommendations from both reports were accepted. While it is unclear which burying ground within the town they are reporting on, it is clear that the landscape within the burying grounds was undergoing change. Concern for the landscape continues into May of 1850 when a committee of three was chosen to find an agent to right the stones in the old burying ground. The warrant for November 1853 asked if the town would allow an individual to create a square lot “as near as the stones now stand” for a family burial. At the following meeting it was voted that the selectmen could give written permission to a person to have lots and half lots and that the Town Clerk keep a record of same and furnish the sexton with a list of the lots.

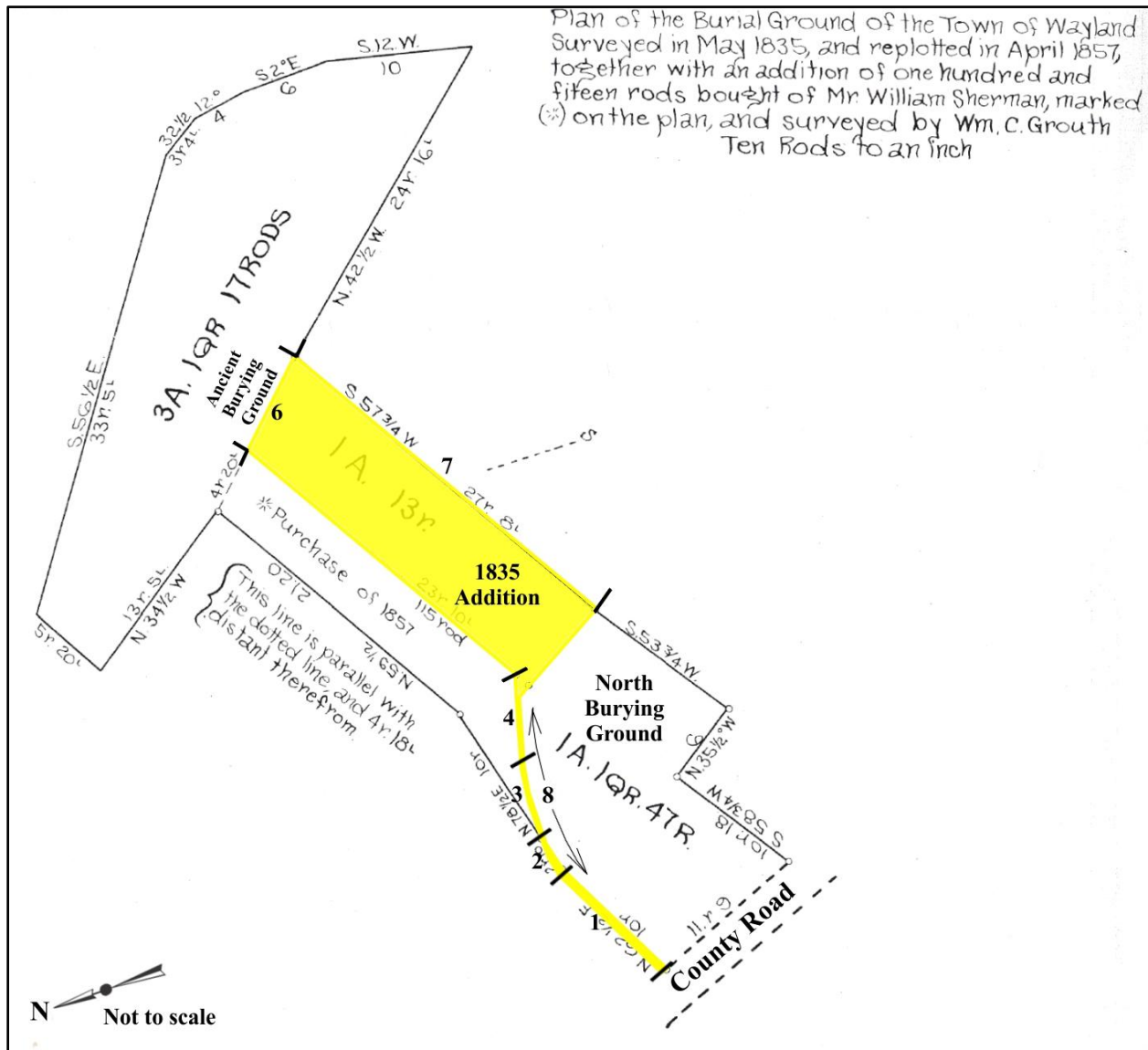


Figure 2-20. Boundaries of 1835 addition on 1857 plan (Grouth).



Figure 2-21. Photo of the stone wall along the northern boundary of the entrance drive.

During the 1850s and 1860s the town was very busy with planning and then making improvements in the burying ground. In November of 1854 they decided to enlarge the old burying ground and chose a committee to purchase an adjacent parcel (Figure 2-22). Evidently the need for an addition was not pressing as it was not until May 4, 1857 that the town purchased an adjacent parcel of land from William Sherman for \$208.15; this was part of the land that Sherman had purchased from Tabitha Noyes et al in 1843 (Middlesex Deeds 436:150). It was when the town purchased Sherman's land that the 1835 plan of the cemetery was updated. According to the deed the land was "adjoining the northerly burying ground." While the property bounds are long and detailed they will be given as the updated plan seems to suggest that the Sherman parcel was only that area designated by a "star" when in fact it was much larger. Figure 2-23 follows the bounds described below in the deed from Sherman to the town. Beginning at the northerly side of the wall now standing on the northwesterly side of the burying ground at a point 12 rods and 10 links northeasterly from the County Road at the land of Sherman:

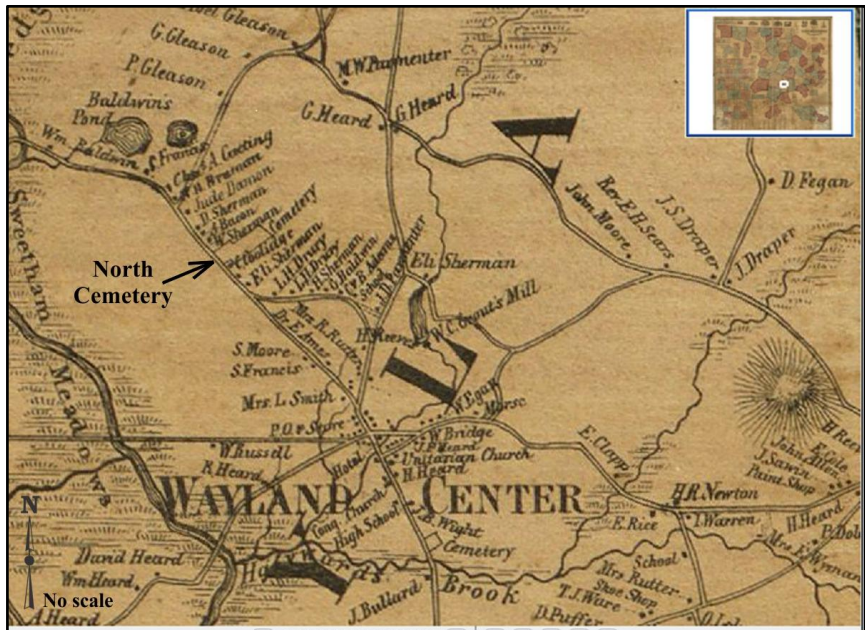


Figure 2-22. Detail of Wayland in 1856 (Walling).

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Three years following the acquisition of the above property a committee report on laying out the burying ground was accepted and a plan adopted in March of 1860. A report from the committee to lay out lots and erect a monument in the new part of the burying ground was accepted and adopted and superintendents for both the north and south cemeteries were selected, James S. Draper and William Dudley, respectively in April of 1860. The town then voted that the superintendents purchase or have a receiving tomb put in the burying ground in accordance with the report of the committee. They then voted to spend \$125 for stone posts. Unfortunately as in previous town meetings committee reports were read, but details of those reports were not included in the minutes. In May of 1861 the report from James S. Draper on the purchase of a receiving tomb was accepted (Figure 2-24). Draper also on the Committee on Burials reported on “relations relative to the burying ground in Wayland” that was accepted.



Figure 2-24. Photo of receiving tombs and posts.

While it is hard to determine the extent of the improvements in the burying ground in the town records, the boundaries in deeds from the property to the south, present-day 61 Old Sudbury Road (formerly 59 Old Sudbury Road), provide important detail. After reviewing deeds listed in the “Richard T. Lombard house/land history” gathered by homeowner Jo Goselt there appears to be a distinct change in terminology from early deeds up to and including the deed from Luther B. White to Charles Coolidge in 1852 and then from the deed from Charles Coolidge to Capt. Edward Pausland in 1857 through the end of the century. While each deed conveys two parcels of land, the boundary description of the 10-acre parcel is important. In the 1852 transaction the bounds of the 10 acre parcel:

begin at the southwest corner at the road and land used as the School Lot, then east and south on the School Lot to land of Eli Sherman, then east on Sherman to a corner of the *burying ground*, then north on the *burying ground* to a corner, then westerly and northerly on said *burying ground* to the road, then on the road to the first bound (Middlesex Deeds 639:131).

In the 1857 transaction the bounds of the 10 acre parcel:

begin at the southwest corner of the premises by the road and land formerly used as a school house lot, then southeast on said lot to the land of the late Eli Sherman, then to a corner, then east

on land of Sherman to a corner at the *Indian Burial Ground*, then *on said burial ground* to a corner, then northwest on the *Wayland Cemetery* to the road, then southeast on the road to the bound first mentioned (Middlesex Deeds 835:64).

In both of the above boundary descriptions the words were purposely placed in italics by the author to emphasize an important differentiation. While the bounds in the 1852 deed suggest one burying ground, those in the 1857 deed suggest two burial grounds as well as two separate landscapes, one belonging to the Indian Burial Ground and one to the Wayland Cemetery. At some point between 1852 and 1857 the changes that the town was making in the burial ground were completed to the point that the name Wayland Cemetery was being used while the landscape in the easternmost section, cited as the Indian Burial Ground in the deed, had likely not been further developed.

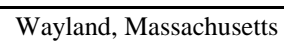
Through the remainder of the 1860s the town reports only note that the report of the superintendent of the burying grounds was accepted and in the 1870s the town reports focus on the new Lakeview Cemetery (Figure 2-25). North Cemetery is mentioned several times towards the end of the 1880s. In March of 1886 it was voted to remove “certain” trees in the North and Center cemeteries and to fence the south side of the North Cemetery. In March of 1887, \$150 was appropriated to build a fence and remove trees from the North Cemetery and it was voted to set apart a lot in the North and Lakeview cemeteries to be known as the Soldiers Burial Lots. Then in 1888 the town appropriated \$150 to the Superintendent for a fence on the south side of the North Cemetery with any remaining money spent within six months for improvement of the grounds.

Other than removing trees and constructing a fence on the south side of North Cemetery little information could be gleaned from town records in the 1870s and 1880s. At some point during this 20 year period the cemetery suffered from deferred maintenance as an 1891 description states: “It has the general appearance of an old-time graveyard – Wild grass covers the toughened and irregular sod, and the uneven surface of the ground indicates that it was long, long ago broken by the sexton’s spade” (Hudson 1891).

The town addressed the maintenance issue in the 1890s by appropriating \$50 each year for the care of each cemetery. Typically the \$50 expenditure on North Cemetery represented a very small appropriation; in 1894 it was .0026% of the town’s total yearly budget. The warrant for the 1896 town meeting asked if the town would appropriate money received from the Superintendent from the sale of lots for beautifying the cemeteries, but the article was dismissed at the meeting. At the same meeting the town appropriated \$50 to place a marker at the grave of each Revolutionary soldier or sailor, with that expense not to exceed \$1 per marker. Beginning in 1897 the town voted to spend all the money collected from the sale of cemetery lots on the cemeteries.

Summary of Events from 1724 to the End of the Nineteenth Century

Following the removal of the third meeting house from North Cemetery there is little mention of it in the town reports for approximately 60 years when it was voted to have someone take care of the burying ground and construct a gate. Concern for the getting the deceased who lived a distance from grounds was also addressed by the town. It is interesting to note that when the town discussed the addition to the burying ground in the 1790s they needed “to determine the bounds of the old burying ground.” It may be that the “old burying ground” referred to where the early settlers were buried rather than the bounds of North Burying Ground. Following the purchase of the Gleazen property in 1800 the burying ground was not mentioned until the 1820s when the town’s major concerns consisted of keeping the facility sufficiently enclosed and deciding the location for tombs.



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While the town's economy continued to rely on agriculture, transportation improvements associated with a turnpike along the Post Road, and boot and shoe manufacturing in the Village of Cochituate enabled the town to be prosperous and self-sufficient. Between 1840 and 1855 the town witnessed a general increase in population and new religious societies were formed. From 1870 to the end of the century the foreign-born population grew due to industrial employment in Cochituate and an expanded transportation system that included both the railroad and street railway systems (Massachusetts Historical Commission 1980). Not only was the town growing and changing, but so too were ideas towards death and burial practices. The first clue to this change occurs in the town records in 1834 when all former committees for the burial ground were dismissed in March, a new committee was created in November, and the town decided to purchase property to enlarge the burying ground in December. In an 1835 meeting the town made an agreement for a parcel of land to "unite the two old Burying grounds together" meaning the early settlers' burying ground to the east and the burying ground adjacent to the County Road. It may be that the "way" described earlier that separated the Loker parcel from the meeting house parcel was a path that went easterly from the County Road to North Field and/or the early settlers' burying ground. As the 1835 parcel was in an interior location a 12 ft wide strip of land was included for access and was separated from the neighbor's property by a wall that the town constructed. The bounds in the 1835 deeds clearly describe two separate parcels one being the "Ancient Burying Place" and the other the "burying ground." Previous research has shown that many communities during this time period called the burying ground of the earliest settlers the "Ancient Burying Place."

In 1844 the town voted to enclose the entire burying ground with a fence and then between 1847 and 1853 the landscape within the burying ground was modified with elements of the Rural Cemetery movement. While the town records did not note exactly where landscape changes occurred, neighboring deed transactions clearly point to a difference in boundary designations between 1852 and 1857 with the use of the term "burying ground" for all associated boundaries in 1852 and the terms "Indian Burial Ground" and "Wayland Cemetery" in 1857. It is interesting to note that it was some time in the nineteenth century that Hudson (1891) states that bodies were dug up in the easternmost section of the burying ground and associated them with either the early settlers or Native Americans.

In 1854 the town again decided to enlarge the burying ground eventually buying another parcel of land in 1857. The 1857 plan that updated the 1835 plan has provided a much needed footprint to understand the development of the cemetery. Even though some details from 1835 were likely changed leaving some deed boundaries unclear, both the 1857 plan and 1857 deed boundaries provide sufficient information to understand the locations of the various sections of the cemetery (Figure 2-26).

When a superintendent for each cemetery was chosen in 1860 another round of landscape improvements occurred. Through the end of the century fencing continued to be an issue and the town included money in its yearly budget for maintenance and improvements of the grounds before voting to spend the money collected from the sale of the lots in the cemeteries.

Table 2-2. Summary of events to the end of the nineteenth century.

Year	Event	Source
1780	Town split into East Sudbury (now Wayland) and West Sudbury (now Sudbury)	Town Records
1800	Town purchased ½ an acre plus ½ of qtr of acre to enlarge the burying ground	Town Records, Deeds
1835	Wayland became a town	Town Records
1835	Town purchased 1 a & 30 rods to enlarge the burying ground and to connect and "unite the two old Burying grounds together"	Town Records, Deeds

Changes in the cemetery in the nineteenth century reveal that the town leaders and town residents did not live in a vacuum with regard to changing attitudes toward death. While some in the community may have resisted change - possibly including those who were in the cemetery committee that were dismissed in 1834 - the majority of the townsfolk embraced change. Unfortunately town records during this time period do not provide sufficient detail of committee reports to totally understand changes in the cemetery and where those changes occurred. Details gleaned from the town reports suggest two waves of a changing cemetery landscape that include elements of the Rural Cemetery movement. Elements associated with the with The New Burying Ground concept, such as keeping records, and the Lawn Park movement, such as the appointment of a superintendent, are also evident. While the superintendant proved to be an advocate for the town cemeteries at town meetings, the town did not address yearly funding for the maintenance of their cemeteries until the end of the century.

2.4 North Cemetery – The Twentieth Century

The cemetery in twentieth-century America

At the turn of the century there were three broad categories of cemeteries: ones where ethnic, racial or religious groups preferred headstones, individual markers and family monuments; ones that followed the design elements associated with the rural cemetery movement; and ones that followed the design elements associated with the lawn park movement. During the twentieth century cemeteries became commercialized entrepreneurial ventures using their grounds as a selling point. Maintenance crews became larger. Cremation, which had become popular after the Civil War, became associated with a new public health movement and private crematories were incorporated (Sloane 1991).

In the 1920s and 1930s the Memorial Park movement became popular allowing the cemetery to reemerge as a home for art and a repository for American culture and religion (Figure 2-27). The memorial park design that started with Forest Lawn Cemetery in California spread slowly to the east coast where the only locations available were in the suburbs. Memorial Park cemeteries offered a planned landscape with a choice of sections, each with a separate theme. When a section was sold out another section was developed (Figure 2-28). Professional management was essential in order to control the appearance of the landscape. Cemeteries now reflected the suburbanization of the city with one of the more striking features being the introduction of the metal memorial as the primary marker (Sloan 1991).

As during the previous stages of cemetery development, the town cemetery had to cope with these new trends in landscape design and attitudes towards death in order to compete. Administration and lines of authority became more complex and management that included a large office staff became the norm. The selling of lots led to an increase in competition for business. By the end of the 1920s for-profit cemeteries overtook the number of municipal cemeteries. By mid century many municipal cemeteries were in financial trouble as the cost of doing business was escalating due to higher per grave maintenance expenses with sale prices failing to cover management and maintenance costs. By the 1930s long term maintenance became a concern (Sloan 1991).

Beginning in the 1950s organizations to befriend older cemeteries had turned into a “quiet but pervasive movement throughout the United States.” Twentieth century changes in maintenance, including the use of back hoes, mechanical trimmers, water systems, and design, including roads for cars, proved to be expensive for older cemeteries. As a result roadway and water systems were not properly maintained, older sections were mowed less frequently, and monuments were not repaired. Within the oldest burial grounds gravestones were in danger of falling apart due to dirt, acid rain, vandalism and aging. While local, state and national associations, such as the Association for Gravestones Studies, have raised public awareness, the task of maintaining the oldest burial grounds proved to be enormous (Sloane 1991).

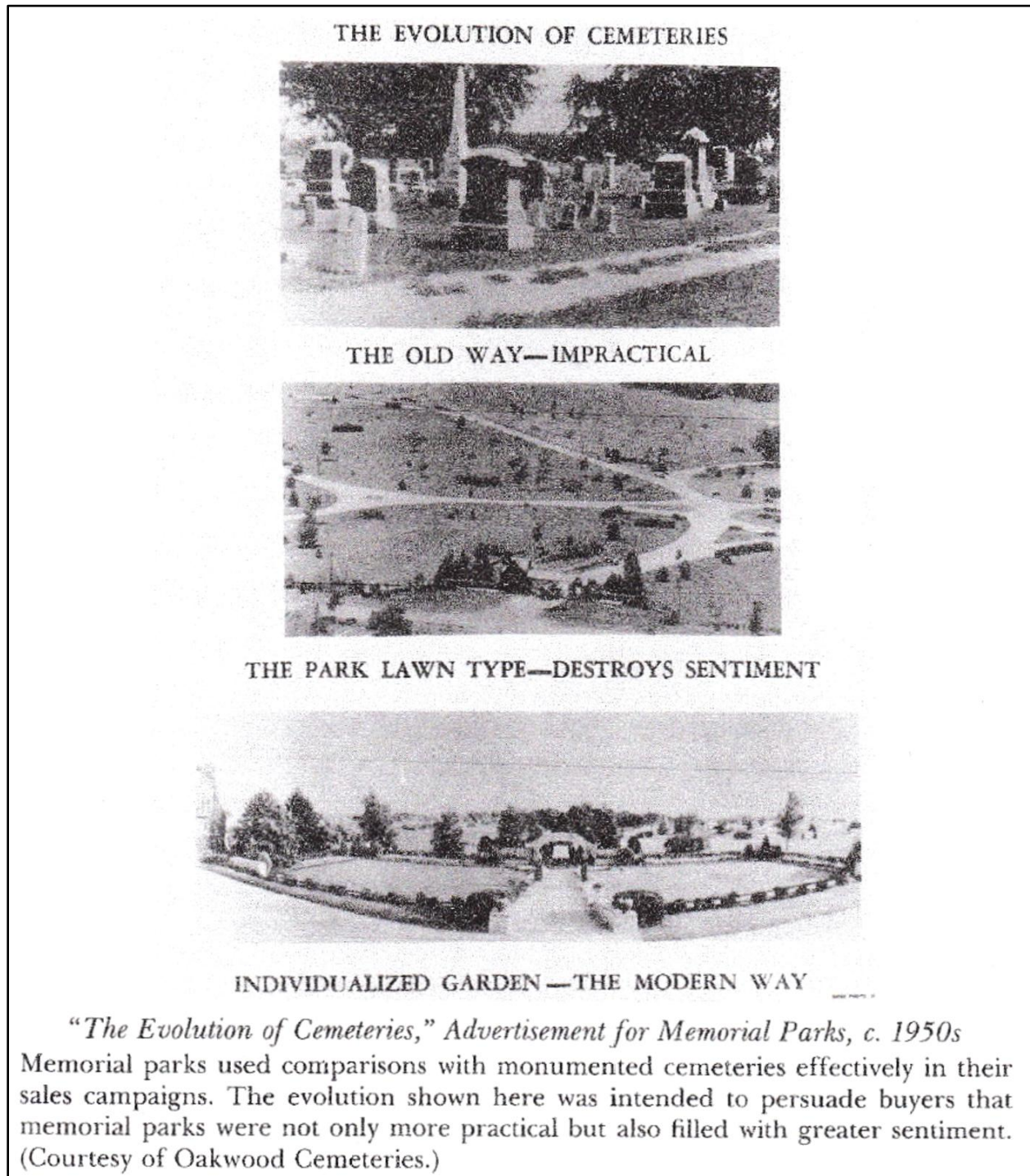


Figure 2-27. Advertisement for Memorial Park Cemetery (Sloan 1991).



Figure 2-28. Elements of the Memorial Park movement in North Cemetery – sectional development.

North Cemetery

Little is mentioned in the town records until 1906 when a Cemetery Commission was organized. From its beginning the commission worked diligently to provide adequate maintenance in the town cemeteries. During the early part of the twentieth century the Cemetery Commissioners developed rules and regulations for the cemetery and formal deeds with the burials regulations included. During this period each yearly report included the amount appropriated for each cemetery, a list of receipts and expenditures, and a brief synopsis of the year's events.

Budgetary problems become evident in their first meeting in 1906 when \$100 was appropriated from contingency funds to reset stones and to make repairs in the North Cemetery where no family members remained. As there were only 11 unsold lots in North Cemetery, the commissioners recommended developing a 2-acre wooded tract that was within the cemetery and "with judicious clearing could be made available for burial lots." The town appropriated \$500 to have the tract surveyed and laid out by a competent landscape architect with a view to preparing a limited amount of lots each year in order to meet the demand. Three bequests for perpetual care were also received in that year. In 1908 the Commissioner noted a slow but steady interest of lot owners in the care and appearance of their lots. A report on the progress of the cemetery extension noted that the roughest part of the work was the removal of trees and stumps and laying out of even paths.

HISTORIC CONTEXT

For the most part money appropriated to the cemeteries only allowed for the annual cleanup such as the mowing of grass in walks and avenues, but not for improvements. In 1908 the Commissioner noted that the growing interest by the proprietors to improve the appearance of their lots “adds to the general appearance of the whole.” In 1913 the town received \$400 for the improvement and perpetual care for the burial place of Charles Holbrook who died in 1886 from the Commonwealth due to the efforts of Wayland’s representative in the Legislature. Holbrook’s estate became the property of the Commonwealth as he had no heirs. The report states that “The lot which had been entirely neglected has been thoroughly repaired and put in first class condition, with new foundation for curbing and head stone” and further notes that “the above case of Mr. Holbrook’s lot, illustrates how soon, without care, lots become dilapidated, and to the thoughtful should be an incentive to make provision for perpetual care of their lots.” Other than the above story the Cemetery Commissioners’ reports from 1909 to 1916 reveal little information and from 1917 to 1919 they become a boiler plate report followed by the “General Cemetery Account.”

While the number of perpetual care bequests continued to increase in 1920, the Commissioner reported than half the amount of work was accomplished at the cemeteries than in previous years due to the cost of labor and shorter work hours resulting in a neglected appearance in the latter part of the season. He further stated that “It would seem that the town might be a little more liberal in its appropriation for the care of the cemeteries out of regard for the memory of the citizens who have passed on but bequeathed to us so much that we benefit by and enjoy.” Nonetheless the Commissioner managed to have a metallic fence erected on the northerly side of the North Cemetery by utilizing the old iron posts. He hoped that the money saved by using the old iron posts would be available for replacing another “badly out of repair” section of the fence.

The Commissioner’s plea for the cemeteries evidently did not fall on deaf ears for in the following year, 1921, the town appropriated additional money for the cemeteries some of which was used in clearing the newer part of North Cemetery. While problems, including the disability of the superintendent and damage from an ice storm, plagued the cemeteries through 1924, improvements continued. In 1923 the entrance to North Cemetery was “greatly improved” by grading the roadway and removing dead trees and stumps and in 1924 old headstones were repaired and straitened.

In 1925 the Commissioner noted that there were many complaints about the condition of the cemeteries during the last part of the year and lashed out at the citizens saying that an appropriation of \$400 for a man making \$5 a day only allowed for 80 days of work for the year. He hoped that at the next town meeting “citizens having pride in the Cemeteries of the Town will take action and provide sufficient funds for proper care of the Cemeteries.”

In 1926 the Commissioner reported that the citizens should give serious consideration to laying a water pipe from the entrance of the North Cemetery through the old part and through the extension with a few faucets and connecting them with a new water supply. At that time the only source of water was from one hand pump in the center of the old section. The Commissioner stressed the urgent need for the extension of water pipes in both the North and Center cemeteries as the owner of lots were inconvenienced trying to keep decorations fresh. Money was appropriated for the water pipes in 1929.

The town also gave the Superintendent greater authority in 1929. Not only was he put in charge of all cemeteries in the town and all burials, but he was also in charge of placing the foundations for monuments and gravestones. All money from the sale of burial lots was also put in a special fund to be used for the beautification and improvement of the cemeteries, including planting trees and improving fences. As a result a great deal of brush was cleared from the North Cemetery the following year.

In 1931 the town appropriated \$1,000 for the care and upkeep of North and Center cemeteries and a like amount for Lakeview Cemetery. By the end of the year it was reported that “the Cemeteries were in good condition.”

North Cemetery benefitted from the Civic Works Program of the Federal Government in 1934. Federal money was used to rebuild the cemetery’s entrance. Many trees were cut down as some were rotting and others were damaged by ants in the cemetery’s extension and the stumps were taken out. Federal money gave employment to about 15 men and “bettered the appearance of the cemetery at little expense to the town.” Other projects in the 1930s included replacing the picket and wire fence that were entirely rotted, installing a water pipe in the extension, and rebuilding 150 ft of the Main Avenue.

The town also benefitted from a Works Progress Administration (WPA, renamed Works Projects Administration in 1939) following the Hurricane of 1938. At that time the federal government funded the cleanup of debris in the towns’ cemeteries. As a result of the project 162 were cut up and 132 stumps were excavated of which 87 were removed from the site and 45 stumps were left to be hauled away. The town planned to complete the balance of the work as part of a State Wide Emergency Project.

While the town tried to procure more money from the WPA to finish cleaning up their cemeteries, the money did not come through. Between 1939 and 1943 the town continued to work on the cleanup effort. Cleanup in the North Cemetery consisted of clearing fallen trees and selling the logs with the proceeds going to the town treasury in 1939; removing uprooted and lodged trees, grading several sections, and repairing the roadway in 1940; continuing restoration and requesting an allotment to continue work in 1941; repairing and straightening displaced stones, widening and improving the entrance gateway, and treating the top of the roadways in 1942; and continuing to remove and dispose of stumps and widening the entrance in 1943. Figures 2-29, 2-30 and 2-31 show damage to North Cemetery resulting from the hurricane.



Figure 2-29. Historic photo of damage in North Cemetery due to the Hurricane of 1938
(Courtesy Wayland Historical Society).



Figure 2-30. Historic photo of damage in North Cemetery due to the Hurricane of 1938
(Courtesy Wayland Historical Society).



Figure 2-31. Historic photo of damage in North Cemetery due to the Hurricane of 1938
(Courtesy Wayland Historical Society).

Of particular interest is an article on the hurricane in the Wayland Chronicle stating that “The magnificent double row of pine trees, known as the ‘Catherdral Pines’ has been practically annihilated. Only two or three trees are left standing – the others lie in an even row like ninepins” (Anonymous 1938). A post card

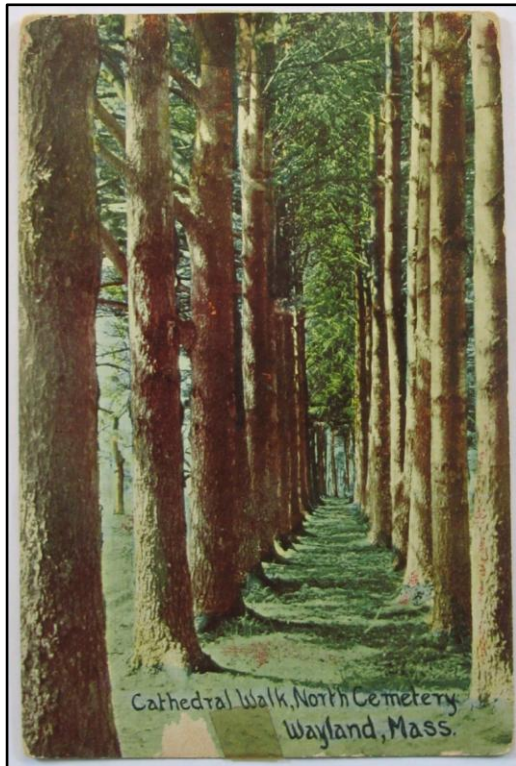


Figure 2-32. Postcard of the Cathedral Pines (Courtesy Wayland Historical Society).

(Figure 2-32) and historic photo (Figure 2-33) taken of the Cathedral Pines by A.W. Cutter sometime between 1881 and 1935 can be found at the historical society.. Unfortunately no one seems to know where they were located in the cemetery. Figure 2-33 notes that Cutter called that view the “South Transcept of Wayland Cathedral” at North Cemetery. Assuming that “transcept” is misspelled and refers to “transept” suggests a rectangular area that cuts across a main axis and would likely be located within the southern section of the cemetery. When looking at the front of the cemetery one notices an entrance that opens into a path-like cleared area that heads towards the east (Figure 2-34). Along the southern boundary of this pathway about mid-way into the Old Section is a pine that towers over the rest of the trees (Figure 2-35). This location may have been the former “Cathedral Walk” and the tree may be the lone survivor of the Cathedral Pines.

Additional concerns through the end of the 1940s include the care of cemetery lots by the town rather than the owner as only 204 out of 1200 lots in the three cemeteries were being taken care of by the owner, the difficulty in getting competent help, the high cost of labor, and limited tools and material that only allowed for general upkeep of the grounds.

In 1948 the Cemetery Commission discussed purchasing a tract of land adjacent to North Cemetery in order to enlarge the area for lots, possibly allowing for the construction of a better avenue for access, building an attractive receiving tomb (considered a present need), and building a store house for tools and supplies. The town then voted unanimously to purchase a 2 ¼ acre piece of land that was located adjacent to the south and east of the cemetery from Ralph and Helen Stewart. The property was paid for by taking \$1,200 from the Sale of Cemetery Lots and Graves Fund and \$1,500 from Excesses and Deficiency. In 1949 the need to enlarge North Cemetery was discussed again with only the purchase details outstanding. At that time the Town wanted to sell the triangular area of land at the extreme southern end of the “Extension, so-called” that was located “beyond the area developed for cemetery use; or to exchange this area for an equivalent area now owned by Ralph Stewart and forming a part of the tract which the Town is in the process of purchasing.” The Cemetery Commission and the owner agreed on swapping the land without exchanging money and the purchase was completed.

In the following year the small balance left in the rehabilitation fund was used to plant evergreen trees on the two restricted lots where the Indian graves were located and to weld the hinges and locks on the old tombs sealing them against “any further molestation.” The town also filled and seeded over 300 sunken graves using loam from the school department.

In 1951 the new addition was cleared of the old apple trees and stumps, the land was cultivated and enriched in preparation for grading and laying out lots and a hedge separating the properties as required by the deed was set out. The heavy stone posts at the entrance gate were reset thereby widening the

HISTORIC CONTEXT

entrance by an additional 2 or 3 ft, the entrance road was rebuilt from the highway to the top of the slope in a “permanent form” with hot top as it had been washed out twice in the past year, and the crumbling face wall adjacent to the stone post at the entrance was relaid. In 1952 it was reported that the new section was being developed rapidly with the evergreen hedge set with approximately 160 arborvitae trees further noting that they had additional trees if needed for replacement (Figure 2-36). Between 1953 and 1954 rain fall and hurricanes led to long mowing seasons and a greater number of sunken graves while an increasing number of burials made it difficult for the staff to keep up.

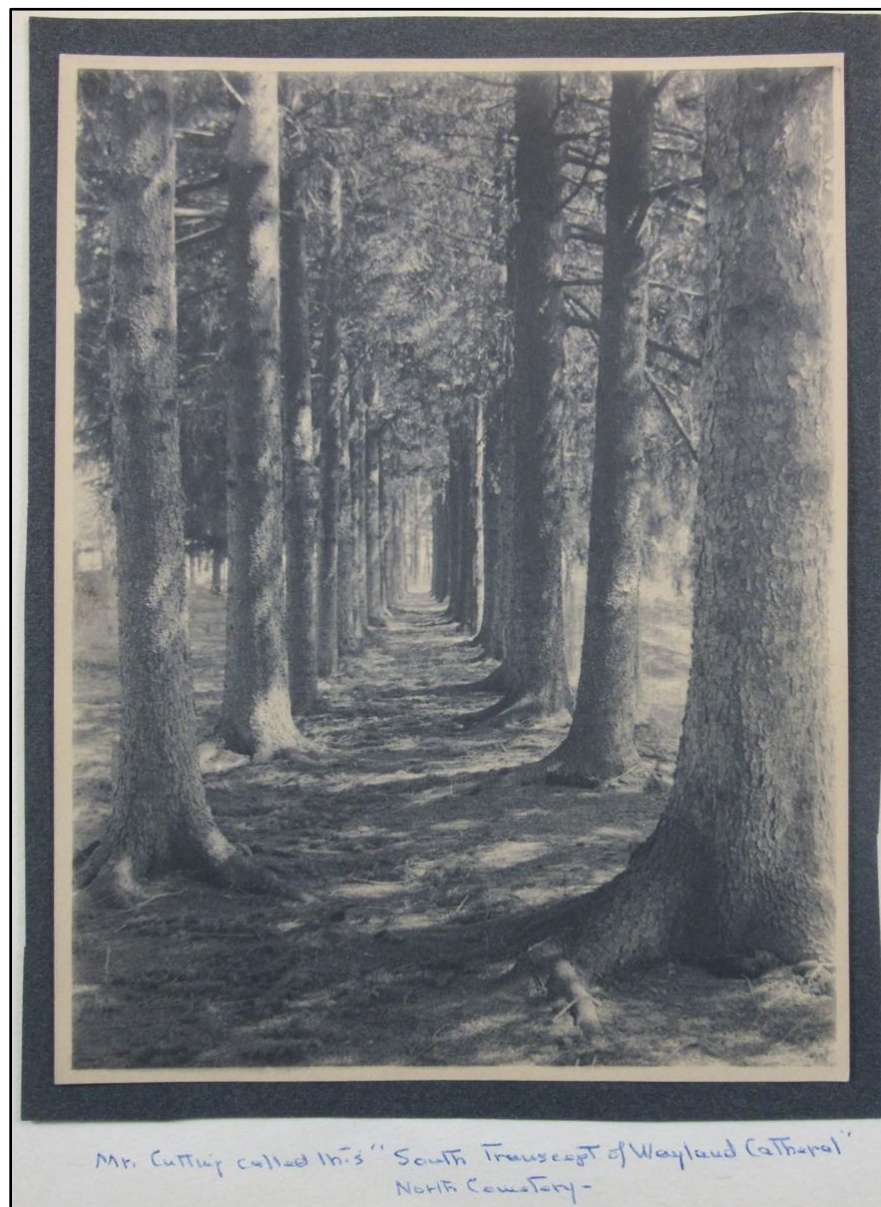


Figure 2-33. Historic photo of the Cathedral Pines
(Courtesy Wayland Historical Society).



Figure 2-34. Photo of the southern entrance to North Cemetery.



Figure 2-35. Photo of possible Cathedral Pine in background, looking towards Old Sudbury Road (top) and possible path of Cathedral Walk, with trunk of Cathedral Pine on left (bottom).



Figure 2-36. Photo of arborvitae tree boundary of 1948 addition by Jewish Cemetery (top) and by store house (Bottom).

HISTORIC CONTEXT

During the remainder of the 1950s and into the 1960s reports on the North Cemetery center on the work that remained in the new section. The first section of the new addition at the cemetery was divided into lots and opened in 1955 and the road system connecting it with the road in the extension was completed in 1956. By 1957 the new area was completely laid out into lots and paths and streets were ready for paving (Figure 2-37). Between 1959 and 1960 the hot top was finished.

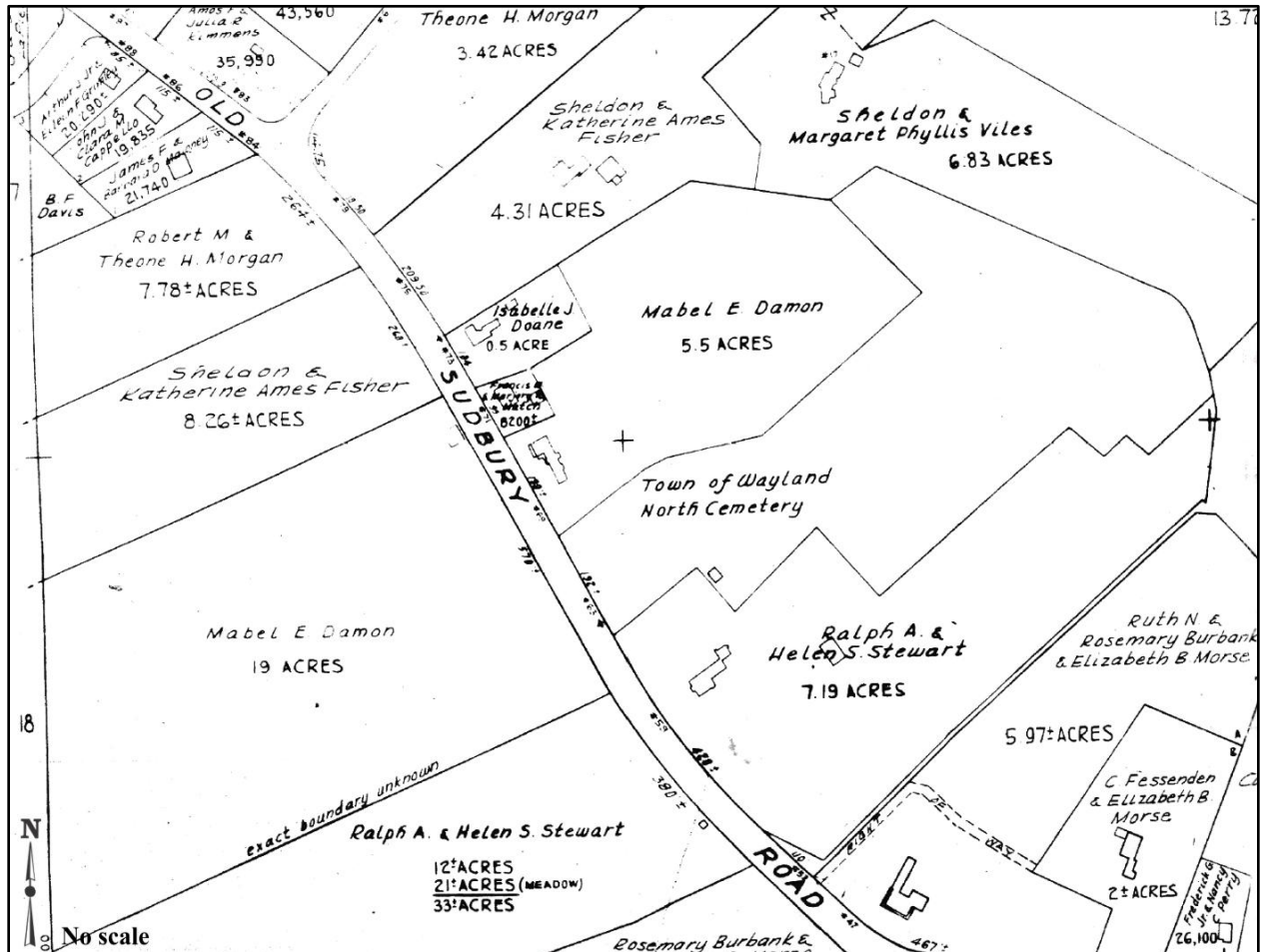


Figure 2-37. Boundaries of North Cemetery in 1958 (Anonymous).

The first report of the newly created Park, Recreation and Cemetery Department was given in 1968. Combining the departments was an attempt by the town to improve services and efficiency without or with very little additional cost to the town. That year the report discussed developments at Lakeview Cemetery with the development of new lots in both Lakeview and North Cemetery discussed in 1969.

It is interesting to note in the 1971 report that the acreage maintained in the cemeteries (32.91) represented 21% of the total acreage (155) maintained by the department. While the average cost per acre for maintenance was \$800, cemetery maintenance was \$1,000 per acre. Income for the department consisted of:

Beach	\$ 4,983.61
Recreation	\$ 4,864.55
Cemetery	\$10,973.00

The department's budget for the year was 2.7% of the town's total budget. Within a decade the department's income increased significantly in beach and recreation far outstripping that of the cemetery by charging fees for a variety of items.

Very little information regarding North Cemetery, other than a breakdown of income appears in Town Reports through 2009. In 1972 the Department reported that they had purchased 4 additional acres for long range development (Figure 2-38).

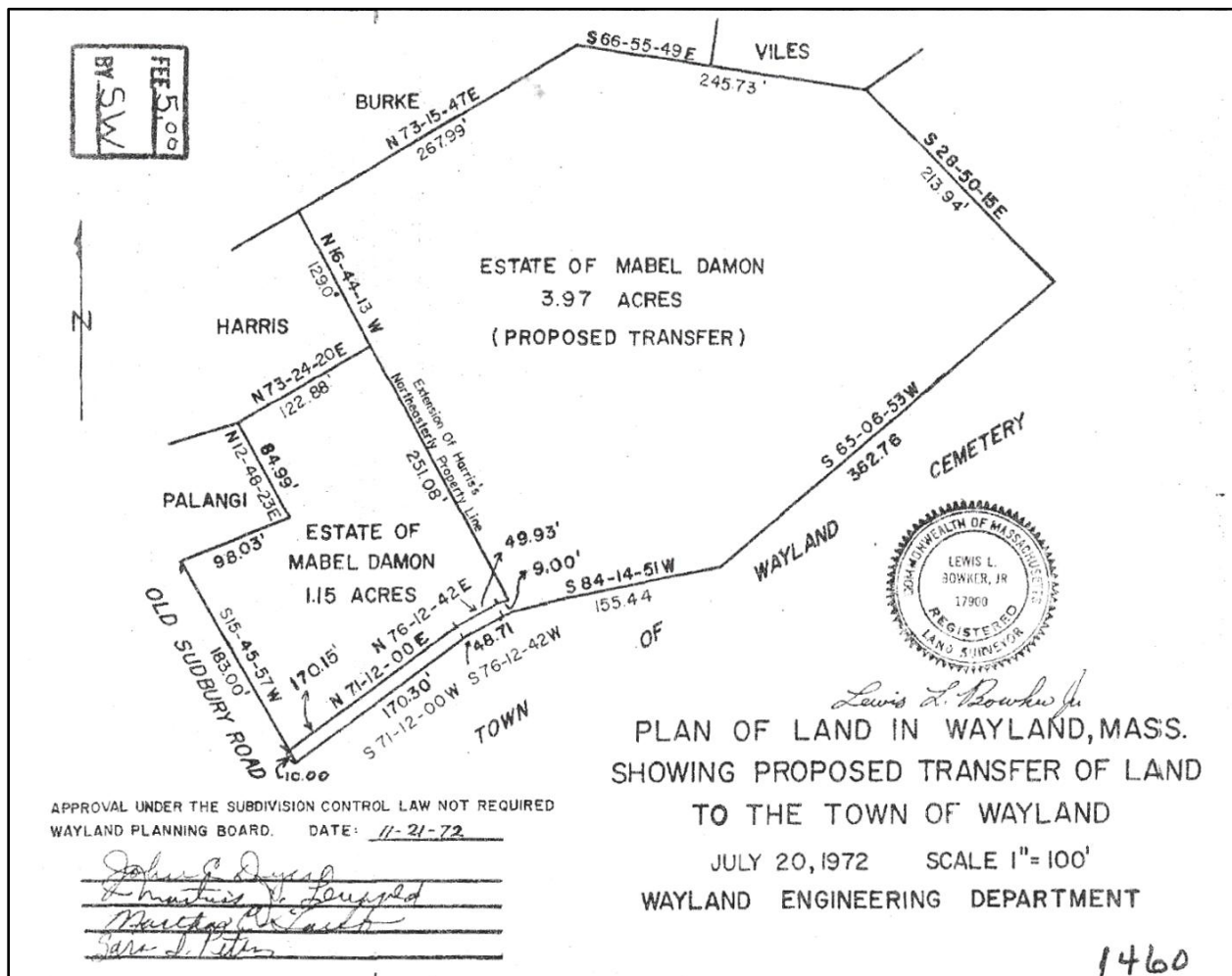


Figure 2-38. Plan of property added to North Cemetery in 1972, labeled "proposed transfer" (WED).

Summary of Events in the Twentieth Century

At the beginning of the twentieth century the town's cemeteries had an advocate in the Commissioner of the newly formed Cemetery Commission. As expressed in Hudson (1891) in the latter part of the nineteenth century the cemetery was not in good shape. Maintenance continued to be a problem as reflected in the description of the Holbrook grave site in 1913 with the Commissioner noting that "how soon, without care, lots become deplapidated." While the town did its best to maintain the cemeteries the Commissioner expressed annoyance in one town meeting after another about problems with owners not taking care of their lots, complaints about the condition of the cemeteries, the lack of funding and labor, ultimately hoping that the citizens would take pride in the cemeteries and take action.

HISTORIC CONTEXT

Considerable damage was done to the towns' cemeteries from the Hurricane of 1938. While historic photos shows a large number of trees in the cemetery at the time of the hurricane, an 1880 survey of trees in public lands only list 7 elms and 1 sycamore (Draper 1880). With some initial federal money the town was eventually able to clean up the cemeteries. Unfortunately few owners cared for their lots and maintenance issues continued due to a lack of funding and labor.

New life was brought into the cemetery following the purchase of the 1949 addition. Not only was the new area developed, but many upgrades were accomplished in other sections of the cemetery, including the entrance. Following the inception of the Park, Recreation and Cemetery Department in 1968 the cemetery began to take a back seat in town meeting discussions as it was subsumed within a larger department with statistics rather than conditions highlighted in town reports.

Two additions were added to the cemetery in the twentieth century a 2 1/2 acre parcel purchased from Ralph A and Helen Stewart in 1949 and a 4 acre parcel from the Damon Estate in 1972 (Figure 2-39).

Table 2-3. Summary of events to the end of the twentieth century.

1906	Cemetery Commission formed
1911	2 acre wooded tract cleared and laid out for lots
1920s	Small improvements made despite labor and money problems
1923	Entrance "greatly improved" by grading roadway
1929	Money appropriated for water pipes
1934	Civic Works Program funded tree issues
1938	WPA cleanup after Hurricane of 1938; repairing stones, widening entrance drive
1939-1943	Town continued cleanup after the Hurricane of 1938
1948/49	Tool shed constructed
1949	2 1/4 acre added from land purchased from Ralph A. and Helen S. Stewart
1949	Town swaps small triangular section for additional property included in Stewart sale
1950	Evergreens planted around 2 restricted lots of Indian graves
1950s	Work on new addition continues, arborvitae planted, first section opens 1952, completely laid out 1957; general upgrades made to other sections of the cemetery
1968	Park, Recreation and Cemetery Department formed
1972	4 a purchased from Damon estate for long range development

North Cemetery struggled in the twentieth century to maintain itself. While it had an advocate looking out for it and being very vocal in town meetings, an unforeseen natural disaster stretched the town to the limits with funding and labor resources. The 1949 addition appears to have brought new life and interest in the cemetery not only with its development, but also with needed improvements including to the entrance of the cemetery thereby enhancing its curb appeal. Elements of the Memorial Park movement, such as the development of various sections, can be seen on the landscape.

Like other municipal cemeteries of this time period, the town had to cope with new trends in landscape design and attitudes towards death in order to attract customers. With the coming of the Park, Recreation and Cemetery Department, administration and lines of authority became more complex and the cemetery certainly appeared to be less of a problem at town meetings as it was mentioned less in yearly town

reports. Throughout the century financial issues arose as the cost of doing business was escalating due to higher per grave maintenance expenses with sale prices failing to cover management and maintenance costs.

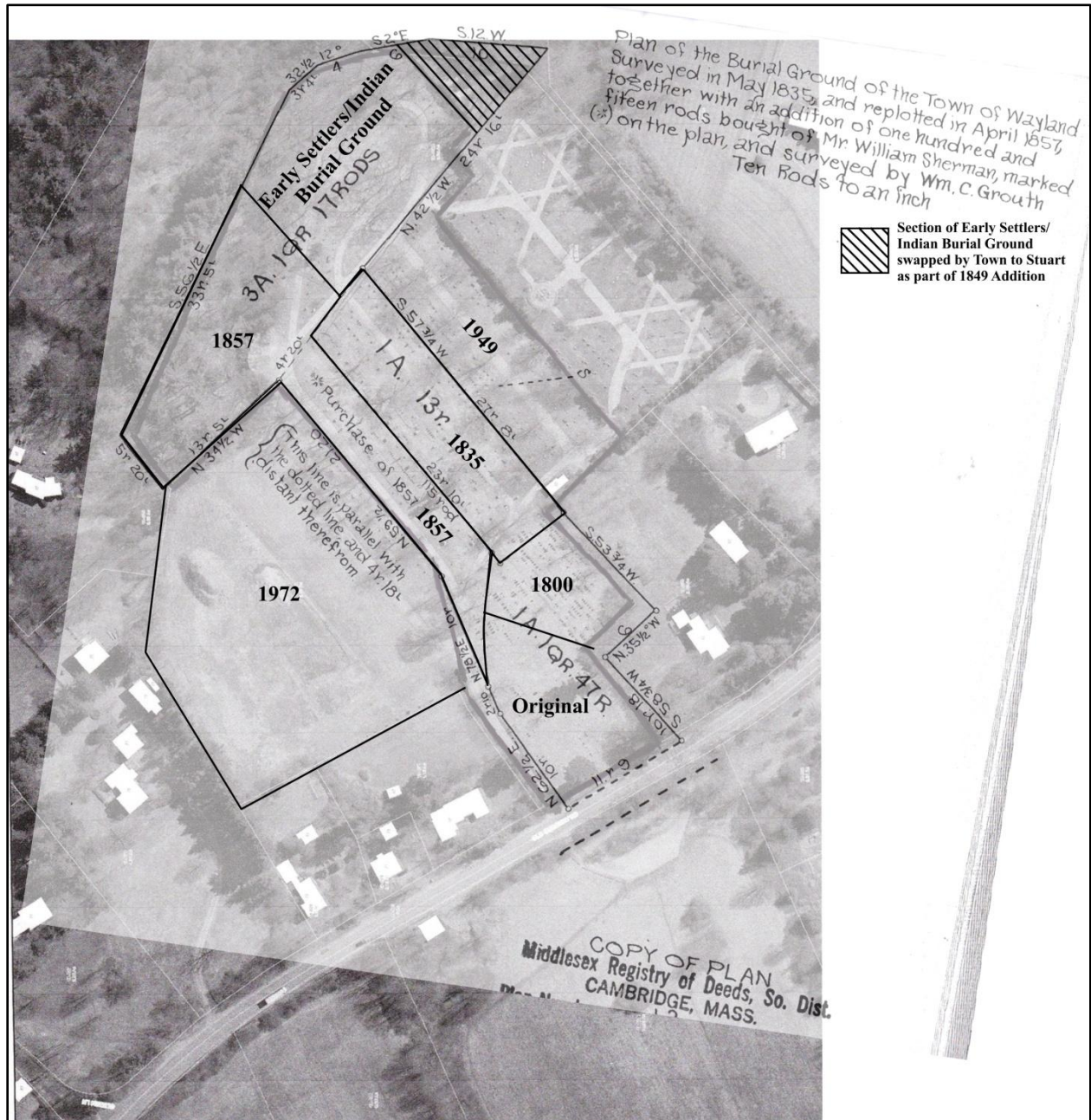


Figure 2-39. All additions to North Cemetery through 1972 on overlay of 1857 plan on aerial.

2.5 North Cemetery – Twenty-First Century and Beyond

In 2007 The Parks and Recreation Department was divided into four divisions: Recreation, Parks, Cemeteries and Forestry. At that time the yearly report did not even mention the cemeteries. In 2008 and 2009 minimal reports were given only mentioning that the division oversees three town cemeteries and noting the number of burials and plots sold and that some grassed areas at Lakeview were renovated. North Cemetery appears to be heading back to its original state of little to no visibility in Town Records.

The North Cemetery has a complex history that is only partially reflected in its visual attributes – its gravestones, monuments, walls, and landscape. The fact that the town purchased additional land for expansion in 1972 makes it unusual when compared with other colonial burying grounds in Massachusetts. The future development of Section D will likely bring the cemetery into the forefront again for awhile and when it does it is most important that repairs and improvements to present sections be done in a manner compatible with their place in history and with their age.

Table 2-4. Summary of events from 2000 to 2015.

2007	Recreation, Parks, Cemetery and Forestry Division created
2015	Preservation Management Plan completed

The importance of maintenance was discussed in committee meetings when planning Mount Auburn Cemetery. The committee felt that “by wise and fixed policy to secure funds, which should arise from its success to public purposes of an enduring and permanent character . . . and above all to lay the foundation of an accumulating fund to the preservation, embellishment and improvement of the grounds was of highest importance” (Garden and Cemetery Committee 1834). There appears to be several lessons learned from the history of North Cemetery. While the burial place suffered from no maintenance when first developed, this was not a concern to the community as it was the norm. With higher expectations those who planned Mount Auburn Cemetery knew that this issue, common to early burial grounds, had to be addressed and considered from the beginning. Throughout the nineteenth and twentieth centuries the conditions within North Cemetery were in a constant state of flux between poorly maintained and well maintained. It is hoped that this Preservation Management Plan will generate renewed interest in this remaining vestige of the town’s settlement.

3.0 PRESERVATION ASSESSMENT

In 2003 Fannin-Lehner Preservation Consultants evaluated the current conditions of stones in the Old Section, making recommendations on treatment needs. In this study they assessed 286 stones and offered some brief observations on the overall condition of the cemetery, noting that while there was little evidence of recent vandalism, many of the stones exhibited evidence of recent mower strikes.

Subsequent to the Fannin-Lehner assessment, Monument Conservation Collaborative conducted treatments, including resetting, construction of new bases, structural adhesion, infilling of cracks and losses, and repair of delaminations.

This assessment was conducted from December 8 through 12 by the authors, Michael Trinkley and Debi Hacker. The work involved two day stone-by-stone examination of the Stoney Section, as well as an overview of condition issues throughout the 5.8 acre active cemetery. The work was funded by the Town, using Community Preservation Act (CPA) money. As is our routine process, we submitted a questionnaire in an effort to begin collecting information on the cemetery and its current maintenance practices. An effort to obtain a meeting with representatives of the Parks, Tree, and Cemeteries Division was not successful. Although we submitted additional questions concerning maintenance, insurance, budget, and other issues, none of these questions were addressed. Consequently, this assessment is based on the best information we were able to obtain without input from the Town of Wayland.

This preservation plan incorporates issues of not only maintenance of the landscape, but also security, pedestrian and vehicular access, vandalism, and maintenance of the cemeteries' hardscape. The assessment also includes a review of critical conservation issues associated with monuments, plot fences, and surrounding walls.

The presence of a plan, however, does not guarantee improvement. This document is a "road-map" for preservation issues, but it is incumbent on the Town's Board of Selectmen to not simply implement its recommendations, but to embrace them. Many of the recommendations focus on fundamental operational changes.

Yet failure to make substantive changes will have serious effects on the long-term quality of the landscape, the cemetery monuments, and community support of the cemetery.

3.1 Preservation Fundamentals

Why Preserve?

Preservationists may take the question "why preserve" for granted; yet it remains an important issue, especially in the current economic climate. It is useful to provide at least some brief discussion of why preservation of Wayland's North Cemetery is a worthwhile – even critical – goal for the town and its citizens.

Cemeteries are different from all other types of historic sites. Most fundamentally they contain the physical remains of past generations and are considered sacred, consecrated ground. The right to a decent burial has long been recognized in common law. So, too, is the duty to continue a cemetery once begun. Thus a municipality or other organization, by opening a cemetery, creates a duty through its officials to execute the trust and maintain the cemetery for the benefit of the public. This is a fundamental responsibility of the Board of Selectmen.

Cemeteries are also artistic sites, such as a sculpture garden or outdoor museum, which contain a collection of three-dimensional artifacts. The monuments trace changes in both designs and social

attitudes toward religious and moral views, death and eternity. They provide examples of the largely disappeared art of stone carving, illustrating numerous famous artisans. They are permanent collections, but must be considered finite and irreplaceable. Fannin-Lehner Preservation Consultants (2003) have previously observed that the North Cemetery burial ground, “contains stones of high artistic merit, such as those carved by Daniel Hastings and the Lamson family [as well as] great breadth of iconography and style.”

These collections are archives, having the same value and importance to the community as any paper archives. They are storehouses of genealogical information that often cannot be identified through any other means. They provide information concerning both the individual and collective pasts.

Sometimes it is thought that once a genealogical assemblage of the cemetery is collated and published, archival concerns have been fulfilled. This is incorrect. Few such compilations include detailed photographs and full transcriptions, including verses. Moreover, is a picture of the famous Mona Lisa painting the same as the painting itself?

In addition, part of this archive is the archaeological and bioanthropological information the cemetery contains – even if the burials are never excavated. The graves and tombs can provide information on mortuary behavior, such as the coffins and hardware chosen by relatives. The human remains can provide information on diet, disease, and burial practices – information that is available from no other source.

Cemeteries are also scenic landscapes, similar to parks or open spaces, except they are much more. They are far more fragile and susceptible to damage and deterioration. As such they require distinctly different care.

Thus, cemeteries are important social, historic, architectural, and archaeological artifacts. When there is little else physically remaining of a community’s earliest history, there will often be a cemetery that provides a unique tie to the community’s collective past that would otherwise be lost.

Beyond these ties to the community’s history and the ethical responsibility of caregivers, the preservation of our past also has clear economic benefits to a community. These serve to dispel the argument that while history may be important, there are more pressing needs. History can, in fact, generate the economic stimulus to help address the other needs of a community.

Taking just a few examples from the numerous studies available:

- Historic preservation activities generate more than \$1.4 billion of economic activity in Texas each year.
- Rehabilitation of historic properties in Georgia during a five-year period created 7,550 jobs and \$201 million in earnings.
- Each dollar of Maryland's historic preservation tax credit leverages \$6.70 of economic activity within that State.
- In one year, direct and indirect expenditures by heritage tourists in Colorado reached \$3.1 billion.
- A New York state study found that prices of houses in historic districts are higher than those of similar houses outside historic districts.

- A detailed Massachusetts study found that heritage tourism travelers spend “considerably more” than other travelers and that most come from out of state, further accentuating the economic contribution of heritage tourism. The study found that heritage tourists contributed an estimated \$2.5 billion annually over the 1998 through 2000 period. Considering both direct and multiplier effects, Massachusetts received annually from heritage tourism 53,000 jobs; \$1.2 billion in income; \$1.8 billion in gross state product; \$559 million in taxes (including \$301 million in state-local taxes); and annual in-state wealth creation of about \$1.5 billion.

Thus, we see a broad range of reasons why we should be concerned about the preservation of North Cemetery. We argue, in fact, that the significance of cemetery preservation is actually greater than the sum of its parts.

Preservation or Restoration?

Preservation is *not* restoration. Restoration means, very simply, making something “like new.” Restoration implies dramatic changes of the historic fabric, including the elimination of fabric that does not “fit” the current “restoration plan.” Restoration is inherently destructive of patina and what makes a property historic in the first place. The “restorer” of a property too often knows little of the Secretary of the Interior’s Standards for Preservation and may care even less.

One of the most important early writings was that of nineteenth century art critic and observer John Ruskin. In *The Seven Lamps of Architecture* published in 1849 and in particular, “The Lamp of Memory,” Ruskin introduces us to the issue of trusteeship where he explains,

it is again no question of expediency or feeling whether we shall preserve the buildings of past times or not. *We have no right whatever to touch them.* They are not ours. They belong partly to those who built them, and partly to all the generations of mankind who are to follow us (Ruskin 1989:245)

Ruskin also crisply stated the difference between restoration and repair, noting that “restoration” means,

the most total destruction which a building can suffer: a destruction out of which no remnants can be gathered: a destruction accompanied with false description of the thing destroyed (Ruskin 1989:241).

In contrast, preservation (or conservation for that matter) can be defined as preventing or delaying loss, depletion, waste, or harm. Preservation seeks to limit natural deterioration.

Preservation will respect the historic fabric, examine the variety of options available, and select those that pose the least potential threat to the property. Preservation (as well as conservation) will ensure complete documentation, whether it is of cleaning, painting, or repair. Preservation treatments will ensure that the work done today does not affect our ability to treat the object tomorrow.

Secretary of the Interior’s Standards

Preservation is not an especially difficult concept to grasp, although the key principles are not always clearly articulated. The fundamental concepts are well presented in the Secretary of the Interior’s Standards for Preservation (see Table 3-1).

Table 3-1. Secretary of the Interior's Standards for Preservation.

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

This document reminds us – at least at a general level – of what caregivers need to be thinking about as they begin a cemetery preservation plan. Those responsible for the care of North Cemetery should be intimately familiar with the eight critical issues it outlines.

For example, all other factors being equal, a cemetery should be used as a cemetery. Until the caregivers are able to do what needs to be done, it is their responsibility to make certain that the site is preserved – it must not be allowed to suffer damage under their watch.

Caregivers must work diligently to understand – and retain – the historic character of the cemetery. In other words, they must look at the cemetery with a new vision and ask themselves, “what gives this cemetery its unique, historical character?” Whatever it is, those undertaking its care and preservation become the guardians responsible for making certain those elements are protected and enhanced (whether they are particularly appealing to the caregivers or not).

Whatever conservation efforts are necessary must be done to the highest professional standards; these conservation efforts must be physically and visually compatible with the original materials; these conservation efforts must not seek to mislead the public into thinking that repairs are original work; and the conservation efforts must be documented for future generations. If the caregivers aren't conservators, it is their responsibility as the stewards of the property to retain a conservator appropriately trained and

subscribing to the Code of Ethics and Standards of Practice of the American Institute for Conservation (AIC). If volunteers are to be used, they must be thoroughly trained and carefully supervised to ensure that correct methods are used.

The Secretary of the Interior reminds those responsible for the resources that each and every cemetery has evolved and represents different styles and forms. Few, if any, cemeteries are “frozen in time.” For example, Wayland’s North Cemetery, while originating in the earliest period of the community’s settlement, contain examples of a variety of later memorials, including nineteenth and early twentieth century granite die on base monuments.

It is the responsibility of care-givers to care for all of these modifications and not seek to create a “Disney-land” version of the cemetery, tearing out features that don’t fit into their concept of what the cemetery “ought” to look like.

Likewise, caregivers are reminded that there will be designs, monuments, and other features that characterize the cemetery – and the caregivers are responsible for identifying these items and ensuring their preservation. Caregivers must be circumspect in any modifications, ensuring that they are not destroying what they seek to protect (a problem with virtually all “restoration” efforts).

Before acting, those responsible for preservation are required as good and careful stewards to explore and evaluate the property, determining exactly what level of intervention – what level of conservation – what level of tree pruning – is actually necessary. And where it is necessary to introduce new materials – perhaps a pathway – into the cemetery, they must do their best to make certain these new elements are not only absolutely necessary, but also match the old elements in composition, design, color, and texture.

In other words, if the cemetery has dry laid rock walls, they would be failing as good stewards if they allowed synthetic stone on concrete masonry units to be used – especially if the only justification was because new wall was less expensive or easier to maintain.

Where conservation treatments are necessary, the Secretary of the Interior tells stewards that they must be the gentlest possible. However phrased – less is more – think smart, not strong – caregivers have an obligation to make certain that no harm comes to the resource while under their care. And again, one of the easiest ways to comply is to make certain that caregivers retain a conservator subscribing to the ethics and standards of the American Institute for Conservation.

Finally, the caregivers must also recognize that the cemetery is not just a collection of monuments and the associated landscape – the cemetery is also an archaeological resource. They must be constantly thinking about how their efforts – whether to repair a monument, put in a parking lot, or resurface a path – will affect the archaeological resources – archaeological resources that are the remains of people buried at the cemetery by their loved ones.

These are especially critical issues for the North Cemetery. The cemetery has been fighting gradual – and at times exponential – deterioration since at least the early twentieth century.

Attention to the Secretary of Interior Standards for Preservation is even more critical today since the North Cemetery has been determined eligible for listing on the National Register of Historic Places. There is no longer an option for “business as usual.” The City must embrace these Standards and we recommend that a working meeting be held during which the standards are fully explained to all participants and care-givers.

The Cemetery Setting, Location and Context

North Cemetery, once in the town center, is today situated north of Wayland's Town Center. While there is residential development, the cemetery retains a very rural setting. Figure 3-1 shows the development

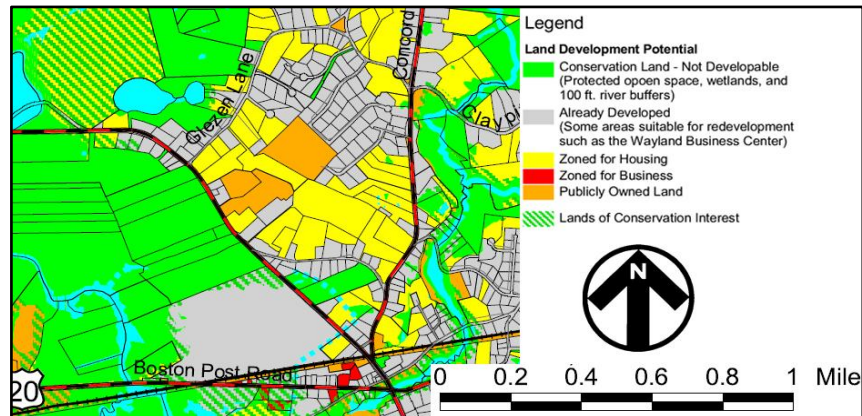


Figure 3-1. Development plan for Wayland in the vicinity of the North Cemetery.

potential surrounding the cemetery. To the west of the Old Sudbury Road are conservation lands, providing an exceptional meadow buffer. To the east the lands are heavily developed. Fortunately, the tracts immediately surrounding the cemetery are sufficiently large to help moderate the feeling. The North Cemetery is also buffered to the east by the Beit Olam Jewish Cemetery.

In spite of the low incidence of development, the cemetery is situated on a road with heavy traffic. While nearby Bow Road is identified as a scenic road, Old Sudbury Road is identified as a principal urban arterial with a traffic count of over 22,400 vehicles. The intersection of Old Sudbury and Concord roads is identified as a major accident location in the 2004 Wayland Master Plan. The curve of Old Sudbury Road combined with the heavy traffic can make it difficult to exit the cemetery (Figure 3-2). This impacts not only those visiting graves of loved ones, but also deters heritage tourism.

The development plan for the past 20-30 years has “catered to the automobile.” Although Wayland is a member of the Massachusetts Bay Transportation Authority (MBTA), there are currently no MBTA bus or rail services in the Town – a condition that dates back at least a decade without change. Commuter buses are operated in the vicinity, but these are not suitable for either family or heritage tourists.

A similar problem exists in terms of any pedestrian access to the cemetery. While an effort has been made to protect the rural character of the community and some pedestrian pathways have been constructed, there are none that would allow access to North Cemetery. There are no sidewalks in the vicinity of the cemetery and it would be imprudent, given the traffic count on Old Sudbury Road, to attempt to bike to the cemetery, even though a narrow shoulder is provided.

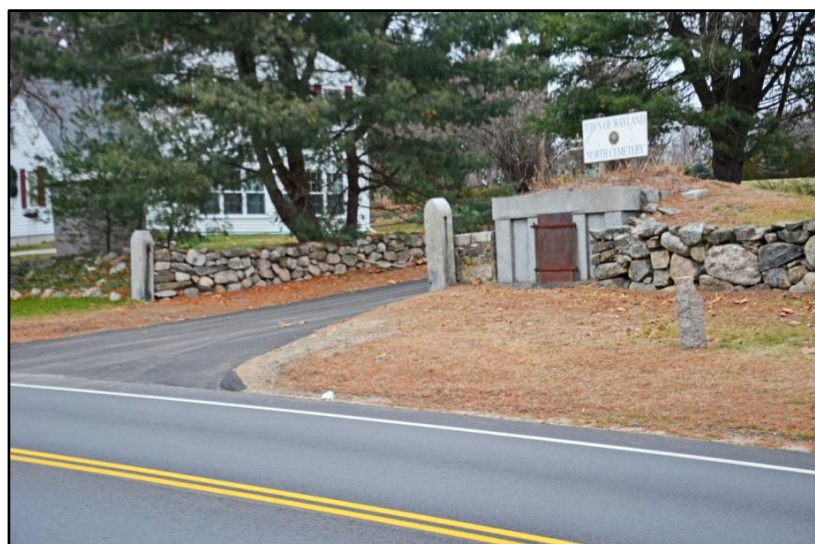


Figure 3-2. Entrance to the North Cemetery showing the narrow shoulder and no passing zone on the curve.

There is one vehicular entrance

to the cemetery and two pedestrian entrances. All at one time were gated, but no gates remain today.

Wayland is situated in what is known as the Seaboard Lowland Section of the New England Physiographic Province. It is lower in elevation than the New England Upland Section which it borders to the west. The lowlands are usually viewed as the sloping margin of the uplands. Topographic relief is typically less than 200 feet above mean sea level (AMSL). Small streams and rivers generally flow toward the coast along this land-surface slope.

The North Cemetery is situated on a ridge at an elevation of about 150 feet AMSL. To the east the topography drops dramatically into a valley terminating in a tributary of the Sudbury River. To the west topography descends more gradually to the meadows along the Sudbury River, about 2,500 feet from the cemetery. Bedrock in the cemetery area consists of Precambrian sedimentary and volcanic rocks. The surface deposits have been shaped by glacial activity with the cemetery found in an area of fill deposition plus stratified drift in small, narrow valleys (Flanagan et al. 1998).

The cemetery is found in the Glaciated Section of Braun's (1974) Oak-Chestnut Forest Region. In many areas the chestnut has been nearly eliminated as a dominant, replaced by trees such as chestnut oak, red oak, white oak, hard maple, and red maple.

The cemetery is in Census Block 366201-1-033, a small area north of Wayland containing 0.29 square mile and 221 people. There is great value in examining the population characteristics of the Wayland area since those surrounding a cemetery can affect it in terms of community support.

The Wayland population in 2010 was 12,994, a slight decline since the 2000 census reporting 13,100 people. Most of the residents (87.2%) are white and only 0.9% are African American. Education levels exceed those for Massachusetts in general, with 96.5% of the town's residents having a high school degree, two-thirds having a B.A. degree, and over a third having a graduate degree. In contrast, only 89% of Massachusetts residents have a high school degree and only 39% have a B.A. degree.

Residents are also very wealthy. The median income for a household in the town is \$121,036 and the median family income is \$204,033. This ranks Wayland third, behind Weston and Sherborn. In comparison, the median household income for Massachusetts is \$66,866, just over half that of Wayland. The median house value in Wayland is \$676,738, compared to \$323,800 in Massachusetts.

Nevertheless, in 2010 about 2.1% of the families and 2.5% of the population was below the poverty line, including 2.7% of those 65 years or older. The unemployment rate in Wayland is about 2%, compared to a statewide average of about 5.8%.

Wayland's residents are typically white, well educated, and wealthy. This is the demographic typically identified as most supportive of historic preservation and heritage tourism.

The 2012 index crime rate per 100,000 people in Wayland was 34.2. This is a very low figure and Wayland is ranked the second safest city in Massachusetts, with 60 violent crimes per 100,000 and 377 property crimes per 100,000. This is unusual considering Wayland has only 1.66 police officers per 100,000 citizens compared to the Massachusetts average of 2.49 officers per 100,000 citizens. The low incidence of property crime may help explain the relatively low incidence of vandalism in the North Cemetery.

We were unable to find a count of the current homeless population in either Middlesex County or the Town of Wayland. The 2013 *State of Homelessness in America* however identifies 1,500 chronic homeless individuals, a drop of about 10% since 2011.

Factors Affecting Landscape Character

Only two soil series are present in the cemetery (Figure 3-3). The most common soil, found in 70% of the cemetery area, is Merrimac fine sandy loam. The other soil series are found either on the steep slopes at the north and northeast edges of the property or in the yet to be developed sections.



Figure 3-3. Soils in the North Cemetery.

Merrimac fine sandy loam is a very deep, nearly level, somewhat excessively drained soil found on terraces overlooking major stream valleys. The soils are strongly acidic and seasonal high water tables are at depths of about 6 feet. A typical profile consists of an Ap horizon about 10 inches in depth consisting of very dark grayish brown (10YR 3/2) fine sandy loam. Below is the Bw1 horizon to a depth of 15 inches. This is a brown (7.5YR 4/4) fine sandy loam with a granular structure. The Bw2 horizon consists of a dark yellowish brown (10YR 4/4) gravelly sandy loam to a depth of 22 inches. To 26 inches is the Bw3 horizon of dark yellowish brown (10YR 4/4) gravelly loamy sand. The 2C horizon is found to 65 inches and consists of yellowish brown (10YR 5/4) and dark grayish brown (10YR 4/2) very gravelly sand.

The Windsor soils consist of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep on glaciofluvial landforms. The A horizon may extend to about 3 inches and consist of very dark grayish brown (10YR 3/2) loamy sand. Below is a Bw1 horizon of strong brown (7.5YR 5/6) loamy sand to a depth of 9 inches. The Bw2 horizon extends to 20 inches and consists of a yellowish brown (10YR 5/6) loamy sand. To 25 inches is a Bw3 horizon of light yellowish brown (10YR 6/4) sand. The C horizon extends as deep as 64 inches and consists of pale brown (10YR 6/3) and light brownish gray (10YR 6/2) sand (Peragallo 2009).

The cemetery is situated above the flood zone of the Sudbury River to the west, although much of the meadows west of the cemetery would be inundated during a 100-year flood. In addition, minor flooding can be expected along the tributaries of the Sudbury to the east. Although this flooding will not directly affect the cemetery, it will close the Old Sudbury Road, making access to the cemetery difficult.

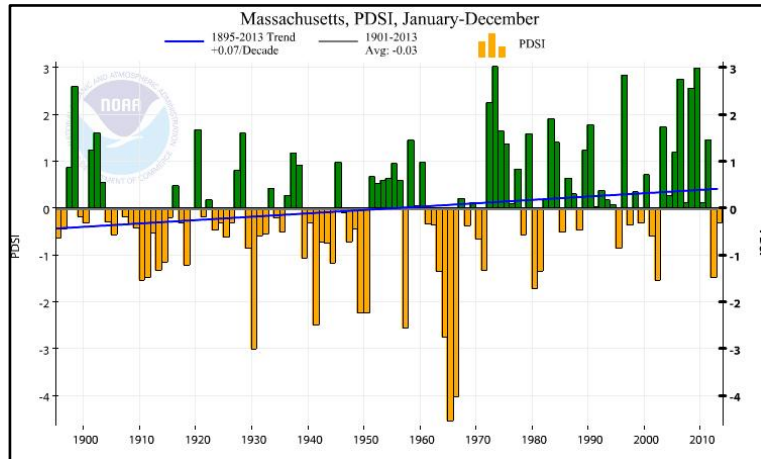


Figure 3-4. Palmer Drought Index for Massachusetts.

In general, Wayland winters are cold and summers are warm. The start and the end of the warm period are somewhat delayed by the moderating effects of the Atlantic Ocean. In winter the average temperature is 28°F and the average daily minimum temperature is 18.5°F. In summer the average temperature is 69°F with an average daily maximum of 80°F. Seasonal, and even daily, variations in humidity can be significant. The average annual relative humidity is 58%, although humidity levels can spike at 73% in the evenings.

The total annual precipitation is about 46.9 inches. Of this, about 22.6 inches, or 48%, usually falls in April through September. The average seasonal snowfall is about 53.2 inches. Figure 3-4, however, reveals that Massachusetts exhibits potential for drought. Although rainfall over the past several years has been below average, overall the state is showing an increased incidence of above average rain years. This is important since droughts can have a significant impact on plantings, even native tree species.

Between 1955 and 2012 Middlesex County has experienced 17 tornadoes, 11 of which were classified as either FS-0 or FS-1. The strongest, an FS-3, occurred on September 29, 1974. None have occurred in the vicinity of North Cemetery.



Figure 3-5. Plant Hardiness Zones in the vicinity of Wayland and the North Cemetery.

The area has an average growing season of about 186 days, although this will vary by specific location, with low areas often evidencing late frosts. Figure 3-5 shows that all of Williamson County is situated in Plant Hardiness Zone 6a, where the minimum temperatures are expected to be between -10 and -5°F. Since this “new” planting zone map was released the zones have shifted even further northward, potentially placing North Cemetery in Zone 5b.

This is firmly within the zone where cool season turf grasses perform best. Typical grasses include Kentucky bluegrass, perennial ryegrass, red fescue, turf-type tall fescue.

A factor not only affecting the landscape but also stone preservation is the level of pollutants. Based on monitoring in the region, the annual mean of NO₂ is 0.033 ppm and the annual mean of SO₂ is 0.028 ppm. These levels result in significant levels of acid rain and deterioration of marble and many sandstones. Figure 3-6 shows the impact of these pollutants on rainfall, with pH averages of about 4.6.

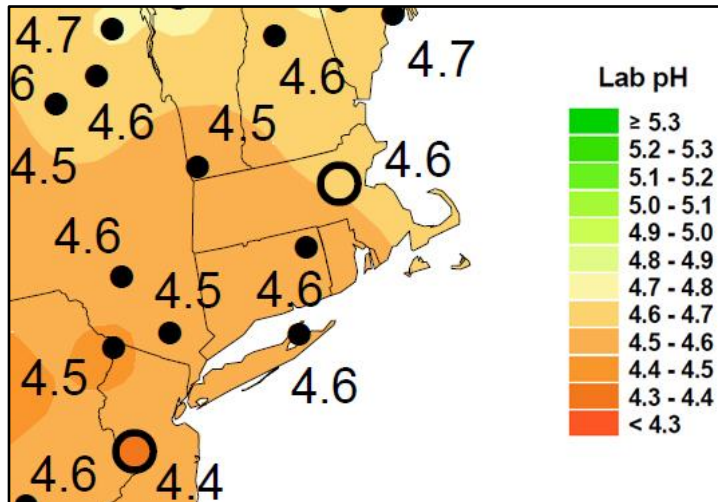


Figure 3-6. Rainfall pH in Massachusetts.

There are two sources of EPA regulated air pollution within a mile of the cemetery. To the southeast is the Wayland School Department and to the southwest is the former Raytheon facility. There are 14 nearby sources of hazardous waste. The closest include the Wayland Country Club to the northwest, and a string of facilities along Boston Post Road south of the cemetery. To the southeast is Waters Manufacturing, Inc. Many of these sources are not especially mobile and none are immediately adjacent the cemetery.

This review reveals that the cemetery faces a variety of natural and man-made environmental factors, all of which have the potential to impact monuments, the cemetery hardscape and the cemetery vegetation. Long-term preservation involves balancing all of these concerns.

The only way for cemetery caregivers to deal with all of these potential events is to develop a detailed cemetery disaster plan. Just as museums, libraries, archives, and businesses must have plans to deal with floods, loss of electrical power, hurricanes, and weather events, cemeteries too must be ready to respond when there is a significant event – either weather-related or caused by humans.

Chicora Foundation has developed a detailed manual to assist cemeteries in disaster planning, but it is critical that Wayland take the threat seriously and conduct the planning in order to respond in an effective and timely manner.

Recommendations

- A joint meeting of the Parks, Trees, and Cemeteries Division with the Historical Commission should be devoted to a careful review of the Secretary of Interior Standards. The caregivers should focus on a fuller understanding of how daily operations affect the long-term preservation of the cemeteries, making necessary adjustments to current policies and procedures. A presentation should then be prepared for the Board of Selectmen outlining critical budgetary and operational modifications.
- The Parks, Trees, and Cemeteries Division should prepare a disaster plan to cover events such as tornadoes and other weather emergencies, as well as more routine events such as vandalism and tree damage.

3.2 Administrative Issues

In this section we will examine a broad range of administrative issues that affect preservation efforts, including the laws protecting the cemetery, and cemetery rules. It is important to realize that we are neither attorneys nor financial planners and the observations made here are intended to promote discussion and further exploration.

Cemetery Regulations

There is only one municipal ordinance that refers to the town's cemeteries. Section 91-5, Conduct of Dogs, specifies that dogs are not allowed in the town's cemeteries except that a dog "may attend the funeral of a member of its keeper's family and may accompany family members to visit the grave site of a deceased family member." The dog must be kept on a 6-foot or shorter leash and must not be allowed to "urinate or defecate on grave sites or gravestones."

There are, however, other broad ordinances which are applicable to the cemetery. For example, Section 139-11 prohibits consumption of alcohol on public properties; Section 138-9 prohibits carrying or discharging a firearm on public property; and Section 139-2 prohibits noise that could disturb the peace.

Massachusetts also has several state laws that are applicable to cemeteries and provide additional protections. For example, Chapter 114, Section 15 specifies that towns may, "appropriate money for enclosing any cemetery lawfully provided by them or for constructing paths and avenues and embellishing the grounds therein, and may establish all necessary rules relative thereto consistent with law." This provides very broad legal authority, not only to raise funds for the care of a cemetery, but also to establish reasonable regulations. This provision, however, also places several additional requirements on towns. For example, Section 15 requires that once a lot is sold, the town must install a marker indicating the number of the lot and must maintain records, open to the public, concerning the location and numbering of the lots. In addition, proceeds of cemetery lot sales, "shall be paid into the town treasuries, be kept separate from other funds, and be appropriated to reimburse the towns for the cost of the land, its care, improvement and embellishment, or the enlargement of the cemetery." Thus, none of the funds from cemetery lot sales may be added to the general fund.

Section 17 also deals with "ancient burial grounds," specifying that, "A town shall not alienate or appropriate to any other use than that of a burial ground, any tract of land which has been for more than one hundred years used as a burial place; and no portion of such burial ground shall be taken for public use without special authority from the general court. "Burial place", as referred to in this section, shall include unmarked burial grounds known or suspected to contain the remains of one or more American Indian." Thus, once a cemetery, always a cemetery, inclusive of Native Americans.

Visitation hours are established by state law in Section 42A, requiring that cemeteries be open, "eight o'clock antemeridian and sunset, except during the months of June, July, August and September when such cemeteries shall remain open until the hour of seven o'clock postmeridian."

Rules Promulgated by the Department of Public Works

We have been provided three separate documents purporting to represent the regulations for Wayland cemeteries:

- Rules and Regulations for the Town of Wayland Cemeteries Issued by the Board of Public Works, dated October 8, 2014
- North Cemetery: Layout 1, dated December 2010
- Town of Wayland Cemeteries - Lakeview, North and South – Rules and Regulations, no date (http://www.wayland.ma.us/Pages/WaylandMA_DPW/parks/Cemetery%20Rules%20and%20Regs%20website.pdf)

A fourth document was found on-line at:

http://www.wayland.ma.us/Pages/WaylandMA_GIS/Maps/013.pdf.

Although there is some overlap, each of these documents is significantly different in organization and even in the rules listed. This creates confusion and would likely make enforcement difficult since there is little internal agreement. Some rules are applicable only to lots currently available for purchase and they cannot be enforced on lots already purchased; consequently, these rules should be itemized on the reverse of the deeds provided by the Town. Only the one set of rules, posted on the Parks, Trees and Cemeteries webpage is publically available.

Clearly there is a need for uniformity, consistency, and clarity – all of which are currently lacking. The only dated document, “Rules and Regulations for the Town of Wayland Cemeteries Issued by the Board of Public Works” reads as though it was assembled by committee with no effort to make it a cohesive document. The section entitled “history” has only one sentence which provides historical information; the remainder of the section is a assemblage of mission statement and other vague comments. Nowhere in the document is there a clear statement of rules suitable for posting at the entrance to the cemeteries. Reading through the document is likely to leave individuals confused and uncertain regarding most activities that are allowed or disallowed. These regulations require extensive revision, simplifying and better organizing the concerns.

Of considerable concern, it becomes clear that many of the rules listed in all of the documents are not being enforced in any of the cemeteries (we briefly visited South and Lakeview cemeteries, in addition to our focus on North Cemetery). The following rules (taken from the 2014 document) are being routinely ignored:

- *Flower beds, limited to 18 inches directly in front of an upright monument, and on either side of an upright monument, are allowed. Flower beds, plantings, or any ground coverings are not allowed behind an upright monument.* We observed plantings surrounding numerous monuments.
- *No grave adornments of any kind are allowed.* We observed a vast array of “adornments” throughout the cemetery.
- *No lights are allowed.* We observed at least two solar powered lights and one solar powered Christmas tree “adornment.”
- *No shepherd hooks or other items are allowed.* We identified at least one such hook.
- *All decorations must be removed by lot owner starting 10 days after a holiday.* We observed an July 4th arrangement still in the cemetery.
- *Owners of lots are not permitted to plant rose bushes . . . twiggy bushes, vines.* We observed numerous monuments where plants other than evergreens had been planted and were often not being cut back.
- *Temporary grave markers shall be removed within six (6) months following interment.* We found multiple funeral home markers still present in the cemetery, some being there for so long that identifying information was missing.

Selective enforcement of rules and regulations places the Town in a precarious position (Figure 3-7). It also suggests that the Parks, Trees and Cemeteries Division is not adequately supervising the cemetery.



Figure 3-7. Failure to enforce rules at North Cemetery. Upper left photo shows display of alcohol, glass containers, and funeral home marker not removed after 6 months. Potted plant is not placed on the flush marker, but rather beside it. It appears that statues are allowed only at upright markers. Upper right photo shows non-evergreen shrub and hook at a grave. Middle left photo shows floral arrangement from July 4th still in the cemetery. Middle right photo shows a solar light at a monument. Lower left photo shows a solar light with cord extending to a Christmas tree on the grave. Lower right photo shows non-evergreen shrub and a variety of adornments at a grave.

Visitation

We do not have specific data on annual visitation, but during our four-day assessment we observed fewer than 10 people visiting the cemetery, not including one burial procession. While this is relatively low visitation – perhaps only a thousand individuals a year – we suspect that number is low given the promotion that the cemetery receives.

Wayland seems to have devoted little effort to promote heritage tourism of its cemeteries. There are no brochures concerning the cemetery (information boxes at the North Cemetery were empty during this assessment and no brochure was submitted) and very little promotion on the town web site. We found that the local historical society offers only one program a year at the cemetery (<http://wayhistsoc.home.comcast.net/~wayhistsoc/whs/Events/events.htm>). The neighboring Sudbury Historic Society has a riding tour of local historical sites that includes the North Cemetery (<http://www.sudbury01776.org/tour1/HistoricSudburyTour.pdf>). Otherwise, we found only one on-line article that explored the rich symbolism found in the North Cemetery (<http://www.wickedlocal.com/article/20111031/News/310319375>).

We found no on-line information concerning guided or even self-guided tours of Wayland (excepting the one provided by the Sudbury Historical Society). In fact, we did not even find a stub article concerning North Cemetery in Wikipedia. As near as we can determine, the Parks, Trees, Cemeteries Division has taken no steps to promote the cemetery or encourage its appropriate heritage tourism use. We encourage the examination of work being done at Atlanta's Oakland Cemetery (<http://www.oaklandcemetery.com/>) and Cincinnati's Spring Grove Cemetery (<http://www.springgrove.org/events/events.aspx>). While both are far larger than either of Franklin's cemeteries, the range of activities should provide some additional programming options.

Budget

We were unable to obtain any meaningful budget estimates from Wayland's Parks, Trees, and Cemeteries Division. The closest we came was the observation that, "there is no official budget for the cemetery. There is one budget that covers *all* work that is done within the town's DPW Park Division. Between labor, materials, fuel, and administrative time, \$55,000 is transferred from Perpetual Care to the DPW Park budget for all three town owned cemeteries." If allocated on a per acre basis, this suggests that North Cemetery is being maintained with \$18,546 (or \$3,198 per acre).

The Town's Annual Report (Anonymous 2013) does specify that the Parks budget in FY2013 was \$590,788 – a decline from the FY2012 budget of \$625,747. Of the \$590,788 allocated, only \$582,475.76 was actually used. With a reduction of nearly \$35,000 (double the amount presumed to have been spent caring for North Cemetery), it is difficult to understand why even \$8,000 would have gone unspent. We cannot address needs elsewhere in Wayland's parks, but there certainly are \$8,000 worth of special needs in North Cemetery.

Equally troubling, the Town took in only \$5,040.00 on the sale of cemetery lots. Given the maintenance needs of the Town's 17.2 acres of cemeteries, this is a very small revenue and it calls into question the stability of the perpetual care funds. The Annual Report identified only \$147,959.23 in the category of "Receipts Reserved Sale of Cemetery Lots." If this represents the perpetual care fund, it seems impossible to routinely pull \$55,000 without exhausting the principal in short order.

We were initially told that the Town's charges for cemetery plots were "competitive" with those of surrounding cemeteries. The submission of a worksheet showing current charges in other towns, however, calls into question this claim. A simplified version of this worksheet is provided as Table 3-2. Even a

brief glance reveals that Wayland's charges are lower across the board than the average of surrounding towns with only one exception – Non-Resident double grave where the Wayland charge is \$2,300 and the average of surrounding communities is \$2,166.67. In every other case, Wayland is significantly undercharging based on surrounding communities. We suspect that Wayland's fees are even lower than the average charged by commercial cemeteries in the area. For example, they are substantially less expensive than fees charged by the Boston Catholic Cemetery Association or St. Michael Cemetery.

Table 3-2. Cemetery Fee Comparison.

Service	Wayland	Dover	Marlboro	Medford	Northboro	Sherborn	Waltham	Average	Wayland Difference from Average
Resident lot fee, single grave	600.00	1,900.00	800.00		600.00	1,000.00	1,550.00	1,075.00	(\$475.00)
Resident lot fee, 4 graves	2,250.00	7,600.00	3,200.00		2,400.00	4,000.00	3,700.00	3,858.33	(\$1,608.33)
Non-Resident lot fee, single grave	1,200.00	n/a	1,600.00		900.00		n/a	1,233.33	(\$33.33)
Non-Resident lot fee, 4 graves	4,500.00	n/a	6,400.00		3,600.00		n/a	4,833.33	(\$333.33)
Full Casket Burial Fee, Weekday Adult	650.00	750.00	600.00	875.00	575.00	1,000.00	1,000.00	778.57	(\$128.57)
Cremation Burial Fee, Weekday Adult	250.00	300.00	200.00	150.00	250.00	300.00	500.00	278.57	(\$28.57)

While the citizens of Wayland may be delighted to obtain such low prices, the community as a whole ends up paying for this subsidized service. The funds generated by lot sales and burial fees cannot begin to cover the maintenance costs. Moreover, as will be apparent in this review, the level of maintenance at North Cemetery is substantially below what is needed to ensure the long-term preservation of the cemetery.

Cemeteries are very different from the more conventional parks that the Town typically manages. They require different mowing and trimmer equipment and procedures; they require different periodic visitation; and they require a host of maintenance activities not typically associated with other park types. As a result, we recommend that special budgetary consideration be given to the cemeteries to ensure that they are adequately funded. At the present time the cemeteries do not have a line-item budget and we recommend that they should have a protected line of funding. It is insufficient to simply allocate to the cemeteries whatever funds may be available from perpetual care accounts.

As this document reveals, the North Cemetery has been allowed to deteriorate and receives, at best, what may be viewed as deferred maintenance. To bring the cemetery back up to reasonable preservation standards will require a great deal of additional attention and funding.

Recommendations

- It is critical that the various rules and regulations be simplified and revised to reflect a standard and consistent format. All versions should be replaced with the revised rules.
- The Town should work to develop a heritage tourism model integrating the North Cemetery and making it more attractive to visitors.
- The Town should begin integrating additional community activities at North Cemetery in order to increase visitation and support. Within two or three years several activities per month should be sustainable.
- The cemeteries (including North Cemetery) should receive a line-item budget allocation commensurate with their needs and the special care that they require. This will require a substantial increase in the budget allocation.

- The Town should increase the cost of burial plots and burial fees to make them commensurate to those found in nearby towns and commercial facilities.

3.3 Roads and Pedestrian Issues

Vehicular Access and Circulation

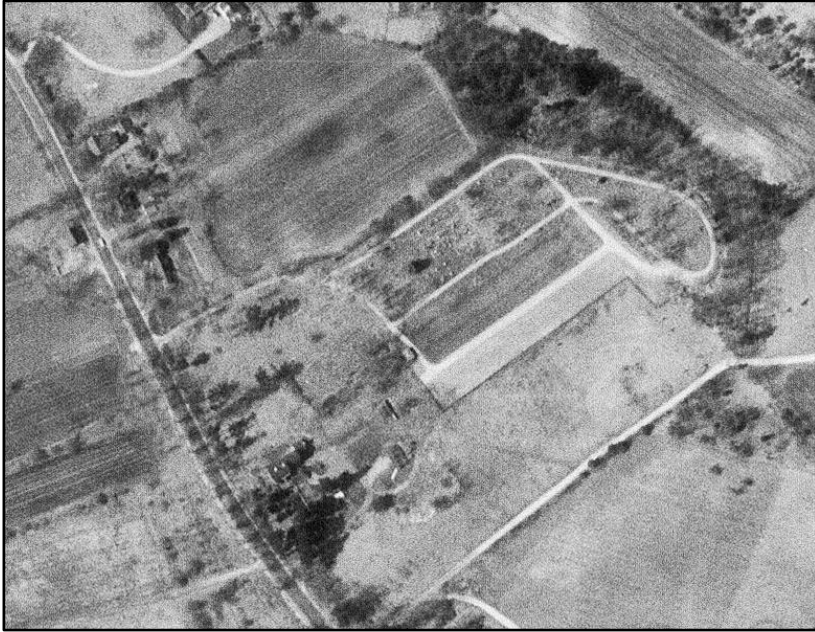


Figure 3-8. Portion of a 1957 aerial showing the North Cemetery and its road system (GS-VQU-1-42).

Today's road system was in place by at least 1957 when it is shown on an aerial image (Figure 3-8). Original construction details are not known, although it seems unlikely that the road system was originally paved. Additional research may help us better understand the nineteenth and early twentieth century development of the cemetery.

At the cemetery drive entrance the road is 14 feet in width, although the two granite posts are 24 feet apart and originally supported a double gate.

Indicative of a failure to understand the Secretary of Interior Standards, the Parks, Trees, and Cemeteries Division has mechanically attached a device to the northern post allowing water meter readings (Figure 3-9). Understanding the significance of the cemetery and its historic fabric would preclude this type of modification.

We calculate about 0.7 linear mile of roads in the cemetery, although the Parks, Trees, and Cemeteries Division reports 0.75 linear mile. The roads vary in width from about 10 to 16 feet. This variation suggests that the roads began as very narrow paths for horse-drawn hearses and were only recently widened where possible (see Figure 3-10).

Widening, however, has been only marginally effective and virtually all of the roads with the exception of the entrance, are no more than a single travel lane in width. Even on the roads that are 16 feet in width, passing is difficult and most vehicles partially pull off onto the



Figure 3-9. Device to read a water meter attached to the cemetery's southern granite entrance drive post.



Figure 3-10. Road between Stoney and Lovell sections showing limited space between the road and monuments.

cemetery into three southwest-northeast sections: Stoney, Lovell, and a section encompassing two Lowell extensions and a Jewish Section. To the northeast there are three irregularly shaped sections designated the Front, Middle, and Back extensions. The basis of the divisions is unclear, although the extensions essentially occupy all of the level property before the tract drops off to the northeast.

More recently the regularity of the Stoney and Lovell roads has been maintained with the addition of Section A to the northwest.

This gridded road system is characteristic of cemeteries laid out by municipal authorities in the nineteenth century.

Although it is tempting to suggest that roads be made one-way in an effort to ease congestion, visitation is so low that we doubt this effort would be observed by regular visitors. It would, however, be helpful to post the 5 MPH speed limit identified in the rules and regulations.

Parking

There is no designated parking for the cemetery and no available on-road parking. Typically visitors park on the grass verge where available or on the road itself. In either case the practice causes congestion.

While this is acceptable for the current low visitation, promotion of the cemetery for heritage tourism will need to further consider alternative parking options. One approach is to focus on bused tours of the

grass. This causes wear and damage to the cemetery (Figure 3-11).

Only the entrance road exhibits curbs and these occur only on the south side of the road. The curbs are in fair condition and appear to function primarily to contain erosion from steep roadside banks. Cracking is evident and the Town will need to formulate a plan for their repair in the near future.

There is a single entrance road running northeast off Old Sudbury Road with the Old Section along its southeast side. This road bifurcates forming a fairly regular pattern dividing the main body of the



Figure 3-11. Damage to roadside by car leaving the road to park.

cemetery. Prior to the development of additional sections, consideration should also be given to widening the roads, allowing bus and automobile parking.

Road Surfacing

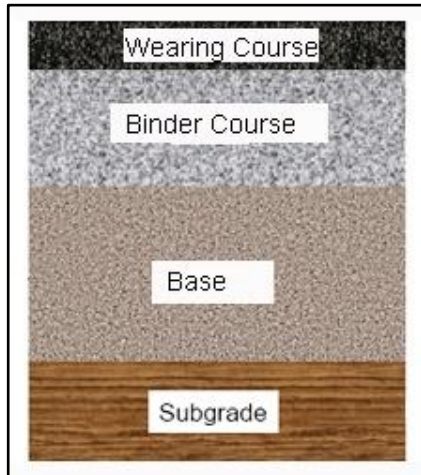


Figure 3-12. Road profile.

The Parks, Trees, and Cemeteries Division reports that in October 2014 the roads had “complete resurfacing/re-paving” conducted that consisted of “6-inches of additional processed gravel with a binder course of 2-inches, and a top course of 1¾-inches.” There is no mention of the subgrade and whether this native soil was further compacted once the overlying pavement was removed (Figure 3-12).

The base is an aggregate layer designed to dissipate the weight of vehicles into the underlying subgrade. While the base course is often as deep as 12-inches, the depth depends on the design of the road and the anticipated traffic. This base layer uses mixtures of gravel and sand, often supplemented by crushed mineral aggregate, to form a frost-resistant layer that conducts water away from the upper pavement layers, reducing freeze damage.

The binder course is an intermediate layer which can be up to 3-inches in thickness. It is a mixture of asphalt and aggregate and is designed to be the main load-bearing layer of the road.

The uppermost bituminous surface, usually called the wearing course is usually about 2½-inches in depth and also a mix of asphalt and aggregate. The aggregate in this course are smaller than those below and the layer is designed to be removed and replaced as it “wears” out.

It is far less expensive to keep a road in good condition than it is to repair it once it has deteriorated. Thus, it is imperative that the Town establish good maintenance practices for the North Cemetery road. These practices should focus on keeping water out of the pavement, binder, and base. This requires appropriate crowning of road surfaces in design and sealing small cracks with crack sealer to prevent water from enlarging cracks through frost weathering.

It does not appear that the roads were crowned (often a minimum slope of ⅛-inch per foot is recommended) and during the prolonged period of rainfall while this assessment was conducted, we did not observe positive water flow off the roads in many areas. This is problematic since it will promote early deterioration of the roads.

With the 2014 work extending to the base level, it sounds as though the roads were completely reconstructed and this, in turn, suggests a prolonged period of little or no maintenance with extensive evidence of road failure. Although the Parks, Trees, and Cemeteries Division indicates that they use “best management practices” this is difficult to reconcile with the extent of this road work. It is critical that the Parks, Trees, and Cemeteries Division establish routine maintenance practices including written inspections and a protocol for sealing cracks and periodically conducting a chip and seal program. Even a thin asphalt overlay will be far less expensive than complete reconstruction of the roadways as we see here.

Snow Plowing and De-Icing

The Parks, Trees, and Cemeteries Division reports that cemetery roads are “plowed after all the town roads have been plowed.” It is unclear if this work is truly needed since the Town has no information on visitation to the cemeteries. It seems likely that visitation dramatically declines during periods of poor weather.

Some communities and caregivers plow their cemetery roads only if a burial is to take place. Some even require that burials be postponed in order to prevent damage to their roads. There is considerable wisdom in this approach since snow plowing causes a number of problems to asphalt roads.

First, frost penetration under snow cover is less than under bare ground; therefore snow plowing a road surface may increase the depth of frost penetration and this can cause damage to the base material, weakening the overlying road courses and causing premature failure.

Second, frost melts mostly from the surface down. Plowed road surfaces absorb heat and melting is accelerated. Soil directly below road structure becomes saturated with a resulting loss of strength. Rutting or pavement distress cracks form from normal traffic wheel loads.

Third, plowing of the traveled width and allowing the shoulders to remain snow covered results in the "bathtub" effect. This occurs when the subgrade under the plowed area becomes saturated and drainage cannot occur due to the still frozen and impermeable road shoulders.

While there may be legitimate needs to accept these problems for community roads, there seems little reason to accept the problems in a cemetery where traffic is minimal. We recommend that the Town re-evaluate the need to routinely plow the cemetery roads.

In addition, we found multiple examples of damage in North Cemetery as a result of snow plowing. Most of this damage occurred to turf areas, where the plow tore up the road side (Figure 3-13). In one area, however, we also observed damage to markers that have been hit by the snow plow (Figure 3-14). If snow plowing is to occur in North Cemetery it is essential that the Town use fiberglass pole markers to delineate the roadside and monuments susceptible to damage.



Figure 3-13. Snowplow damage to turf.

The Parks, Trees, and Cemeteries Division also reports the use of deicing compounds, including salt (sodium chloride, NaCl, or ordinary rock salt), magnesium chloride ($MgCl_2$), and liquid magnesium.

Sodium chloride is cheap and readily available, so it is the most common deicing chemical agencies use. This material can cause damage from freeze-induced expansion pressures by increasing number of freeze/thaw cycles. It is also very corrosive to metal. In addition, the sodium ion is toxic to vegetation.



Figure 3-14. Damage to plot marker caused by snow plowing.

We strongly recommend that deicers not be used in North Cemetery. There is insufficient public need to offset the documented damage that these materials cause to historic stones. The only possible exception may be on the main access road with a steep slope when funerals must occur during periods of snow.

Pedestrian Access and Pathways

As previously discussed, it is unlikely visitors will arrive at North Cemetery except by automobile. There are no sidewalks leading to the cemetery, bike traffic is unlikely, and there is no bus service. Thus, while there are two pedestrian gates along Old Sudbury Road, it is highly unlikely that either are used except very irregularly.

The cemetery is walled on its northwestern side, along the frontage with Sudbury Road, and along a portion of its southeastern boundary. The wall along Sudbury Road is penetrated by three gates: two for pedestrians and one for the modern drive.

The central gate is at the top of four granite steps and the two granite posts are set about 4½ feet apart. Hardware for a gate is found on the south post (Figure 3-15).



Figure 3-15. Pedestrian gates. The upper photo shows the central gate with pintles in the southern post. The lower photo shows the southern gate with pintles in both columns, indicating a double gate.

Magnesium chloride affects concrete and stone in a similar fashion as sodium chloride and thus can cause spalls. It appears to be less harmful to vegetation, although on a percentage basis, magnesium chloride contains 17-56% more chloride ions than other “salt” type deicers.

Thus, all deicing compounds have some impact on both roads and vegetation. In addition, there is ample research to demonstrate the damage caused to marble, sandstone, and even granite by salt compounds.

The southern gate is at the top of a single granite step and the two granite posts are set about 6 feet apart. A single gate was mounted on the southern post. It appears that what has previously been described as a “dry ditch” is actually a heavy worn pedestrian pathway leading to this gate. Careful inspection reveals that the pathway wanders somewhat, as though visitors for years moved around stones. A property line, with a “dry ditch” would not waiver in this fashion. This suggests that this southern gate was the primary access point for the cemetery over much of its history. This use is further supported by the double or wider gate and single step, allowing far easier access into the cemetery with coffins.

Because of the steep slope to this gate, there is active erosion (Figure 3-16). During the spring the Parks, Trees, and Cemeteries Division should prepare this ground and apply sod. Sodding will more quickly and effectively control the erosion that efforts to seed.



Figure 3-16. Erosion at the southern pedestrian gate fronting Old Sudbury Road.

It is a tremendous loss to the cemetery that all three entrances have lost their gates. Historic research should focus on identifying a photograph of these gates so it is possible in the future to consider their replacement. If replaced, the pedestrian gates should be locked. The drive gates can be left open.

There are no visible formal pathways in the cemetery and examination of various early aerial photographs fails to suggest that any existed within the past 50 years. Examination of the lot layout, however, suggests that the Stoney Section was designed with both north-south and east-west

pathways, dividing the lots into six distinct rows with alternating narrow and wide grassed pathways. There was a single wide path running north-south. This design allowed convenient access by the hearse, with equally convenient walking pathways. While there may have been some expectation that these pathways would be formalized, this does not appear to have occurred or have been lost over the past 50 years.

Visitation is sufficiently low that we observed no social trails (informal trails or paths created by erosion due to foot traffic from people and animals) within the cemetery. We did, however, identify a single social trail leading from the cemetery through a vegetative hedge into an adjoining property (Figure 3-17). It seems unlikely that this was created by



Figure 3-17. Path from adjacent property owner into the Lovell Section of the cemetery.

the public; it has most likely been created by the owner of the adjacent tract. Although such social trails can cause erosion and other damage to cemetery property, the topography in this case suggests that most of the damage is occurring to the adjacent property. Nevertheless, the Town should evaluate whether it is appropriate to close this pathway using fencing or plants.

Universal Access

Many who visit cemeteries are elderly and therefore impairments associated with older age should particularly be taken into consideration, especially when cemeteries are amenities for tourism.

Of course while it is not always possible to make a natural landscape fully accessible, partial access is better than none at all (Figure 3-17). Moreover, all future modifications should explore accessibility issues in an effort to maximize access by all citizens.

The cemeteries lack steep grades, except at its entrance and thus there are no elevation barriers to access. Nevertheless, virtually all areas have rough terrain and in a few locations the proximity of monuments can make movement difficult. In addition, we found animal burrows throughout the cemetery, offering further obstacles to those with handicaps.

The existing grass is a less than ideal surface for wheelchairs and others with mobility or sight disabilities. Paths in a cemetery or grassed setting should have a smooth, regular surface, with tactile warning underfoot of any hazards such as a change in level. A critical factor is to avoid simply repeating street pavement details that would clash with the cemetery setting.

Gravel should only be used if it is well compacted, with no loose stones greater than 1/4". This makes it possible to push wheelchairs and reduces the possibility of tripping for those who are unsteady on their feet. Regular maintenance is required, although bound gravel or epoxy bound gravel reduces the level of maintenance. Gravel, however, is often a harsh introduction into a burial ground where pathways were never found historically or were historically grassed. Moreover, the gravel should not use stone already found in the cemetery (such as marble or granite) since such efforts may confuse the public, giving the impression that monuments were converted to paving material.

Should paving pathways eventually be required, a far better choice is to use grass tracks underlain by a reinforcing system to provide a firm, but free draining layer on which the grass can grow. If the grass is well maintained it will not unduly hinder wheelchairs. Unattended, however, it will inhibit wheelchairs, as well as hide tripping hazards – so maintenance is critical. The pathway can be clearly identified by using a grass distinct in color and texture, providing clear visual clues to those using it.

One grass reinforcement system commonly available is the Grasspave2 porous pavement by Invisible Structures, Inc. (<http://www.invisiblestructures.com/grasspave2.html>). This system has the added benefit of having been approved for ADA use (Figure 3-18).

The construction of any pathways will, however, require archaeological investigations to ensure that burials or other archaeological features are not damaged.

Ideally paths should be at least 5'7" in width to accommodate wheelchair users and people with visual impairments assisted by a sighted person or guide dog. A path of this width will also allow an adult and child to walk together. The minimal suitable width is 3'11".

There are, of course, additional issues in achieving universal access, such as the use of appropriate signage and even the selection of routes in the cemeteries. While ADA compliance may not be required,

the goal should be to create additions to the cemeteries that are as accessible as possible. In addition, existing obstacles to access should be removed wherever possible.

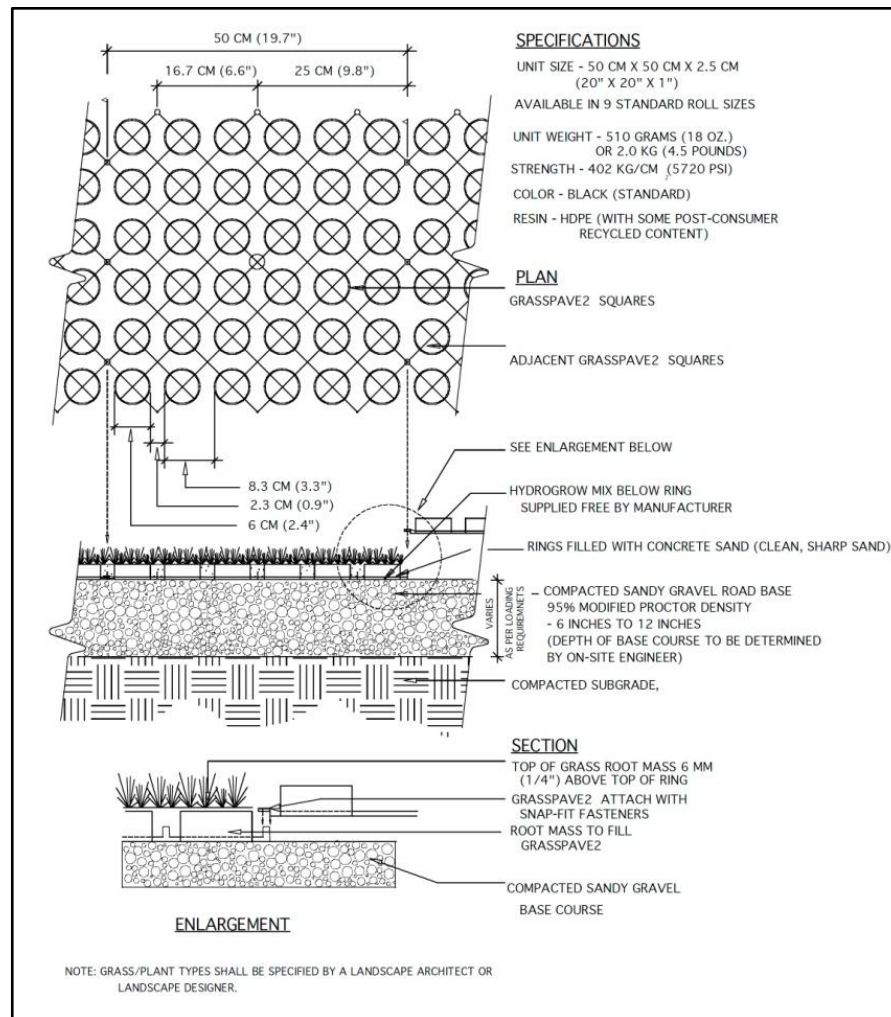


Figure 3-18. Specifications for one brand of grass reinforcement system.

Recommendations

- The water meter device should be removed from the entrance gate column.
- Curbs on the entrance road are showing cracks and the Town should develop a plan for their maintenance and repair.
- The Town should post the cemetery speed limit at the entrance to the property.
- The Town should consider wider roads in the yet to be developed sections to allow for visitor parking.
- The Town should develop a written inspection and preventative maintenance program for the cemetery roads to minimize the need for future reconstruction.

- Snow plowing of the cemetery roads should be eliminated or conducted only in the event of a necessary funeral.
- The Town should install roadside snow plow markers to ensure that plowing does not damage the turf or adjacent monuments.
- Deicing compounds should be eliminated from within the cemetery with the possible exception of use on the steeply sloping entrance road.
- The south entrance gate area in the Old Section requires resodding to control erosion.
- Research should be conducted in an effort to document the lost gates in the interest of future replacement.
- The Town should consider closing the informal pathway between the cemetery and the adjacent property owner.
- All future modifications should explore accessibility issues in an effort to maximize access by all citizens.
- Should pathways become necessary because of increased heritage tourism activities, a grass reinforcement system is likely the least intrusive and most effective approach.

3.4 Cemetery Boundary Walls and Fence

Stone Walls

The North Cemetery incorporates rock walls on three sides: about 160 linear feet along the Old Sudbury Road boundary, about 225 linear feet along the northwest side of the entrance road into the cemetery, and about 300 linear feet along the southeastern boundary of the Old Section (Figure 3-19).

The wall on the northwest side and the one bordering Old Sudbury Road are both in very good condition and are examples of dry laid walls. The wall on the southeast side is in poor condition and while likely originally dry laid, there are many portions with large amounts of a hard Portland cement mortar. These likely represent recent, inappropriate repairs and the repair technique has likely contributed to failure of so much of this wall.

The walls consist of stacked native rock rubble about three feet in height. The walls appear to be built without a batter, exhibiting no noticeable slope inward, and are about two or more feet in width.

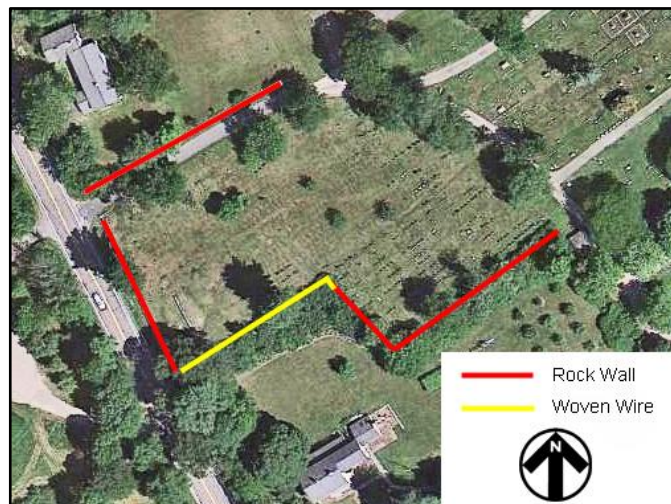


Figure 3-19. Walls and fence locations at North Cemetery.



Figure 3-20. Wall along Old Sudbury Road.

The wall along Old Sudbury Road (Figure 3-20) serves as a retaining wall. Given the ground pressures involved, this wall is in excellent condition, offering a testimony to the dry laid construction technique and its builders. The wall heads are retained by stone stoups. The presence of foundation stones was not determined, but the builders were careful to use very large stones toward the base in order to ensure stability. The condition of the wall is generally excellent; they would be given an A Condition Class. Top stones are nearly all in place, the sides are smooth and straight. We observed no evidence of bowing, bellying, or slumping and there were virtually no fallen stones.

The wall along the entrance drive (Figure 3-21) is in nearly identical condition, although overall the stones appear smaller and less angular, suggesting a different construction episode. The wall was constructed at the time of the 1835 addition and was repaired in the twentieth century. A stone stoup is found at the southwest end of the wall; at the other end the wall terminates without a stoup. This wall would be considered “stockproof” and in excellent condition.

The third wall, which is found on two sides of the Old Section is not stockproof and would be given an E Condition Class (Figure 3-22). It is not maintained as stockproof in any way. There are large sections of fallen stone and reduced wall height in multiple locations. While most of the wall stones appear to be present, some are buried. Major defects include bellying and bowing, in addition to areas of complete failure.

There are approximately 160 linear feet (about 53% of the total wall) that require complete reconstruction. An additional 19% or 57 linear feet require the removal of inappropriate Portland cement pointing and these may also require substantial rebuilding, depending on the tenacity of the mortar. Thus, less than a third of the wall (27% or 83 linear feet) is in satisfactory condition. These repairs should receive a high priority in order to prevent further deterioration.



Figure 3-21. Wall on the northwest side of the cemetery entrance road. Upper view shows the wall at the entrance. The lower view shows the wall leading up the cemetery slope.



Figure 3-22. Examples of damage to the stone wall on the east side of the Old Section. The upper row shows examples of failing wall, with toppled stones. The middle left photo shows the wall barely protruding from the grade with fallen stones partially buried. The middle right photo shows a tree intruding into the wall. The lower left photo shows scrub vegetation intruding into the wall as well as collapsing stones. The lower right photo shows a wall section poorly pointed with a hard Portland cement mortar.

Under no circumstance should any mortar be used in the repair or resetting of these walls. Repairs should be conducted by individuals with training in stone walling techniques. Such training is available from the Dry Stone Conservancy (<http://www.drystone.org/>). We recommend that the minimum qualifications be

Certified Journeyman Drystone Mason (<http://www.drystone.org/masons/>). A simple document that may be of assistance is the Dry Stone Walling Association's *Technical Specifications for Dry Stone Walls* (<http://www.dswa.org.uk/userfiles/file/Leaflets/1-Technical-specifications-updatd-2011.pdf>).

Gates

We have previously mentioned that the two pedestrian gates (one being a double gate) and one drive gate (also a double gate) along Old Sudbury Road should be replaced, *if the original gates can be historically documented*. Absent such documentation any gate replacements would only be fictionalized and would not enhance the historic fabric of the cemetery. However, if accounts or photographs can be found, their replacement would augment the historic landscape.

Woven Wire Fence

Along the southern boundary there are about 200 linear feet of woven wire fence, probably dating from the early twentieth century. The fence consists of decorative woven wire attached to relatively heavy gauge line posts and top rails. The woven wire, where intact, is in fair condition although virtually all of the fencing exhibits light to moderate corrosion. The line posts and top rails, where not damaged, are in good condition, with only light corrosion breaking through the galvanizing compound. Nevertheless there are multiple areas where the fence has been extensively damaged by tree falls and the entire length of the fence has been overtaken by second growth of scrub (Figure 3-23).

We have identified at least two sources for replacement woven wire fencing: Hutchinson, Inc., 1228 Zimmerman Drive, Grinnell, IA 50112, (800) 588-6155 (<http://livestockequineequipment.hutchinson-inc.com/viewitems/utility-fabric-2/ornamental-and-flower-bed?>) and American Fence and Supply Co., 6612 Harborside Dr., Galveston, TX 77554, (409) 744-7131 (<http://afence.com/store/home.php?cat=464>). Only woven wire should be used on this fence – it must not be replaced with a modern chain link since that would significantly alter the appearance of the Old Section.

While the current woven wire fencing is off the fence, the posts and top rail should be painted with a zinc-rich paint. One suitable type is the ZRC Cold Galvanizing Compound (<http://www.zrcworldwide.com/products/zrc-cold-galvanizing-compound>). Whatever type is used the metallic zinc content should be no less than 95% by weight in the dry film. Zinc dust should be used as specified in ASTM D 520 Type III.

As much of the original posts and top rail design should be reused, although where the damage is extensive, it is acceptable to replace parts *in-kind*.

In the future, the Town's Parks, Trees, and Cemeteries Division should inspect this fence line monthly to ensure that it is in good condition. The use of herbicides should be limited and instead nylon trimmers should reduce vegetation on either side of the fence periodically.

Recommendations

- because of extensive deferred maintenance, approximately 160 linear feet of the stone wall on the southeast side of the Old Section requires complete rebuilding. An additional 57 linear feet require removal of inappropriate Portland cement pointing. Only a Certified Journeyman Drystone Mason should be retained to perform this work. Under no circumstance should the use of any mortar be allowed in the repair of this wall.
- About 80 linear feet of the woven wire fence along the southern side of the Old Section requires

PRESERVATION ASSESSMENT

extensive repair, including painting with a zinc-rich paint. It is likely that the entire 200 linear feet will require new woven wire fencing be installed. Under no circumstance should chain link fencing be installed.

- If it becomes possible to document the three lost gates on the wall along Old Sudbury Road the gates should be recreated and reset. However, no gates should be installed without clear and convincing historic documentation.



Figure 3-23. Examples of damage to the woven wire fence along the southwest side of the Old Section. Upper two rows of photos show damage to the woven wire and fence structure caused by fallen trees. These sections will require replacement. Note also the dense scrub vegetation that must be removed from around the fence. The lower photo shows a detail of intact fencing.

3.5 Cemetery Security

Vandalism

Our assessment of North Cemetery failed to identify unequivocal evidence of vandalism, although it is possible that some of the broken stones observed were the result of previous vandalism. The Parks, Trees, and Cemeteries Division reports that they are unaware of vandalism issues and that they have no written policy to handle acts of vandalism. Unfortunately Town staff spends so little time in the cemetery it is unlikely that they would notice if vandalism occurred. In addition, there is no complete photographic record of stones in the cemetery for comparative purposes.

We are told that the Town's insurance covers any acts of vandalism, but upon further questioning it appears that the insurance does not cover private monuments. While this is not unusual, it does leave the Town in a very precarious situation. Claiming that 200 year old monuments are "private property" begs the question of how families with ownership rights can be identified and notified of damage. Without repair of damage – whether from a snow plow, vandalism, or a falling tree – the cemetery will gradually become degraded and lose its historic significance. As this occurs it will become increasingly difficult to sell plots, creating a downward spiral.

In the absence of either insurance or family involvement, it is in the public interest for any damage in the cemetery to be immediately identified – and corrected - by the Town.

Thus, the Parks, Trees, and Cemeteries Division must have a formalized mechanism for identifying or reporting vandalism specific to the cemetery setting. In addition, the Division must implement better maintenance practices in order to reduce the likelihood of vandalism since there is a correlation between maintenance and vandalism.

At the present time there is no systematic inspection process. It seems unlikely that the maintenance staff would recognize vandalism for what it is, or have any idea when it occurred. It will be difficult to ascertain the level of damage the cemeteries suffer without some method of periodic inspection.

We recommend that the Parks, Trees, Cemeteries Division develop a form designed for the reporting of cemetery-specific vandalism (Figure 3-24). This form should include information such as what was damaged, with specific information concerning each stone, including the name and lot/plot; how the stone was damaged (toppled, broken into how many fragments, scratched, etc.); where is the stone now (was the broken stone gathered up for storage, if so, where it is stored); an estimate of when the damage occurred, including the last time the stone was known to be undamaged; an estimate – from a conservator – of the extent of the damage and cost for repair; a photograph of the damaged stone; when police were notified; when police responded and took a report, with a copy of the report attached; and the outcome of the police investigation.

The Parks, Trees, Cemeteries Division was not aware of crime details in the vicinity of the cemetery, covering the issue with statement that they "rely on the police." It is unsatisfactory to not be aware of the level of crime, especially property-related crime, in the vicinity of cemeteries since this knowledge better helps caregivers to "harden targets" and develop appropriate strategies.

Moreover, a reliance on police to patrol the cemetery seems unrealistic. During this assessment we did not see any police presence (or, for that matter, any presence by Parks, Trees, and Cemeteries Division crews). The Town's police force appears to be rather small for the population of the community and like many departments likely spends much of its time reacting to specific calls, incidents, or problems.


	Chicora Foundation, Inc. PO Box 8664 Columbia, SC 29202 803-787-6910	<h2 style="margin: 0;">CEMETERY VANDALISM/DAMAGE REPORT FORM</h2>
Cemetery:	Number of Stones/Objects Involved:	Are Human Remains Involved: <input type="checkbox"/> yes <input type="checkbox"/> no
Grave #:	Section #:	Lot #:
Date/Time Damage was First Observed:	am/pm	Name of Observer:
Date Last Observed Undamaged:	am/pm	Name of Observer:
Potential Witnesses:		
Nature of Damage (attach photographs of damage):		
Date Reported to Police:	Investigating Officer:	
Police Incident No:	(Attach a legible copy of police report to this form)	
Estimate of Damage (attach justification, conservation treatment proposals): \$		
Owners of Monuments Identified: <input type="checkbox"/> yes <input type="checkbox"/> no Owners Will Repair: <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not certain		
Follow Up with Police:		
Repairs Undertaken by Cemetery (attach conservation treatment reports):		
Total Cost of Repairs: \$	Insurance Eligible: <input type="checkbox"/> yes <input type="checkbox"/> no	Date Claim Submitted:
Date Claim Approved/Paid:	Amount of Claim Payment: \$	
Internal Evaluation for Future Prevention:		
Form Completed By:	Date(s):	

Figure 3-24. Example of a vandalism report recommended by Chicora.

The Department of Public Works, through the Town's Selectmen, should formally request periodic police patrols through North Cemetery, both during the day and at night. Random police patrols have the potential to promote overall safety in the cemetery.

There must also be a Town presence at North Cemetery. Throughout our discussions the Parks, Trees, and Cemeteries Division has repeatedly claimed inadequate staff. If this is the case, then the Division must obtain a sufficient budget to ensure that the cemetery is minimally driven through on a twice daily basis. There are multiple purposes for such visits. First, it maintains a Town presence to dissuade vandalism or inappropriate behavior. Second, it quickly alerts the Town to immediate maintenance needs such as downed trees, limbs, trash, or similar problems. Third, it assists the staff in becoming more familiar with the cemetery. We cannot over emphasize the importance of this simple maintenance activity.

In addition, with adjacent neighbors along Old Sudbury Road, the Town should enlist the assistance of neighbors to report any suspicious activities in the cemetery. Unusual noise, lights, or activities should be sufficient to have neighbors call the police to report their concerns. This can be especially beneficial at night.

The Wayland Historical Society should develop a volunteer group to conduct citizen patrols of cemetery property on a daily basis. Membership and regular participation in voluntary patrols increase when some form of prestige is offered to volunteers. Effective practices include:

- patrolling regularly, but at unpredictable times;
- ensuring volunteers have cell phones for prompt communication with police or other emergency services;
- engaging in passive surveillance only, and not interacting with potential vandals or intruders in any way; and
- publicizing activities and outcomes through school-based and local media outlets.

There are no specific records of theft, but we have previously mentioned the loss of all gates along Old Sudbury Road.

Dealing with Homelessness

It appears that there is a very low incidence of homelessness in the Wayland area. Nevertheless, we recommend that the Town evaluate the need for a defined policy. At present we were told only that "should a problem occur, it would be referred to the Police Department."

All laws with respect to public behavior should be enforced in the cemeteries by law enforcement. Should any shopping carts, bedding, or other personal belongings be found secreted away in the cemeteries, they should be removed from the property promptly. The landscape must be maintained to prevent hiding places and to ensure clear lines of sight. The Cemetery must be kept free of litter and debris.

Recommendations

- The Town must accept responsibility for all damage occurring to monuments in excess of 50 years old since it is likely for most there is no surviving family.

- The Town must develop a formalized mechanism for identifying and reporting vandalism specific to the cemetery setting.
- The Town must enlist the assistance of the Police Department to conduct routine patrols of North Cemetery.
- The Parks, Trees, and Cemeteries Division staff must visit North Cemetery at least twice daily.
- Adjacent neighbors must be enlisted to help watch over the cemetery.
- A volunteer group should be formed to periodically visit the cemetery to ensure a public presence and help report any problems.
- The Parks, Trees, and Cemeteries Division should develop a specific plan for dealing with homeless issues in the cemetery.

3.6 Cemetery Fixtures and Furnishings

Boundary fences and walls, sometimes discussed under “fixtures and furnishings,” have already been discussed in a separate section because of their complexity. Readers should review that previous section for additional information on the boundary fence, and walls. No gates remain.

Various Amenities

The North Cemetery is rather Spartan in its appearance. There are, for example, no public benches (although there are several bench monuments). Urns and vases are scarce and, where present, are associated with a specific monument.

This is not necessarily bad. The absence is certainly related to the time period of the burials at the cemetery. Benches tend to be rather late introductions. Their absence absolves the Parks, Trees, and Cemeteries division of their maintenance – which can often be significant. In addition, benches are often attractive nuisances and we generally do not recommend their installation.

Similarly, urns and vases tend to be maintenance issues. Urns are often sold by monument companies to clients who are unaware of the upkeep. As a result, the urns often hold water, breed mosquitoes, collect trash, are turned upside down, or are just ignored. They are rarely repaired or replaced when broken. They are likely not used since most floral arrangements today come in their own plastic container, rendering the urns and vases redundant.

Since the current regulations require that all work be approved, some consideration should be given to prohibiting the introduction of urns or vases in the cemetery.

Introduction of New Memorials in Old Sections

Various groups may wish to introduce new markers or memorials into the older sections of the cemetery. Since the Cemetery has been determined eligible for inclusion on the National Register, the Town should be very circumspect in allowing modern additions to the landscape or modifications of the existing historic fabric. It is very important that the historic context and appearance of the cemetery be carefully maintained. Modifications or additions should be reviewed in light of the Secretary of the Interior’s Standards for Preservation.

Replacement Monuments

All people deserve the dignity of ensuring their grave is marked and there are times when a marker is so eroded or difficult to read that it no longer serves as an appropriate memorial.

The original marker should never be removed. Nor should it be recarved. Instead, the original marker should be left in place and a new marker laid at its foot as a lawn marker (a horizontal plaque). The new marker may be bronze or granite as both exhibit considerable longevity. By allowing only lawn markers, the three-dimensional landscape of the cemetery is maintained, while the grave continues to be memorialized.

The new marker should contain only what is (or was) on the original marker, with the addition in small letters that it is a replacement marker erected in a particular year. This helps ensure that it is made clear that it is a recent introduction into the historic cemetery.

New Monuments

New monuments should be allowed only for new burials. If located in an older section (minimally Old, Stoney, Lovell, and the Extension sections) these new monuments should match the existing markers as closely as possible. If granite must be used, it should be limited to shades of gray (pinks, reds, blacks, and similar colors should not be permitted). Preferably lawn markers (flush-to-the-ground) should be used in order to preserve the historic three-dimensional appearance of the cemetery. Many individuals have opted for slate monuments and these are an excellent choice, helping to maintain the historic appearance of the cemetery from a distance.

In addition, the City should not allow the mounting of any plaques, emblems, or other devices on historic monuments (i.e., monuments 50 years or more in age). Any organization that wishes to especially recognize an individual in the cemetery with such plaques or emblems should be allowed only to attach the devices to a granite lawn marker and place the marker flush with the ground in proximity to the existing historic marker.

Recommendations

- The Town should not allow the introduction of benches, urns, or vases in the cemeteries.
- The introduction of new memorials must be very carefully monitored and limited. New monuments should be allowed only when the historic monument is no longer legible. In such cases, the original monument must remain and a new flush marker with the precise language of the original marker erected as a flush-to-ground lawn marker.
- New monuments marking new burials in older sections should match existing markers in size, material, and design. If this is not possible, then new markers should be limited to gray granite. Preferably any new marker should be erected as a lawn marker flush to the ground.
- Brass signs or emblems should not be allowed to be mounted on markers over 50 years in age. They may be set flush to the ground on granite lawn markers.

3.7 Landscape Issues

Staffing

In the assessment questionnaire we are told that the Parks, Trees, Cemeteries Division has a staff of eight, but that these individuals “have the responsibility of all outside maintained areas within the Town including schools.” As a result, we are told that if they do not “have a burial or a particular issue to take care of” they will typically not be in the cemetery. Elsewhere in the questionnaire we are told that the Parks, Trees, Cemeteries Division has a staff of nine full-time maintenance staff, although these staff are also “shared” with other Department of Public Works divisions, as well as three seasonal maintenance staff.

With apparently no staff assigned, even primarily if not exclusively, to cemetery duties, it makes it almost impossible to ascertain staffing levels or to judge the appropriateness of those levels. This situation is similar to the budget issue, with no assigned budget for the maintenance of the cemetery.

We typically recommend two workers and one supervisor full-time per 10 acres. This is based on the Boston Historic Burying Grounds Initiative (Atwood et al. 1989) and is particularly suitable for the situation at Old Cemetery since it is estimated that mowing old cemeteries with 3-dimensional monuments requires six-times the labor than modern lawn park cemeteries (Klupar 1962:239; Llewellyn 1998:100).

Thus, for the approximately 6 acres at North Cemetery, we would recommend a full-time staff of two people – dedicated to nothing other than the maintenance of this property. If we add in the acreage at South and Lakeview cemeteries, for a total of about 17 acres, these cemeteries require the full-time attention of at least one supervisor and four workers – a full-time crew of five.

It may seem difficult to understand the work available for five individuals assigned to only these three cemeteries; that is because too many caregivers assume that cemeteries require nothing more than occasional grass mowing. Nothing could be further from the truth and it is this thinking, focusing on little more than grass mowing, which has led to the overall deteriorated conditions we observed at all three of Wayland’s cemeteries.

Appropriate maintenance established by good practice includes weed control, tree trimming, pruning, seasonal cleanup, maintaining the paths and roads, conducting section inspections, survey of monuments for maintenance needs, maintenance of shrub beds, maintaining section signs, maintaining water lines, rehabilitation of barren areas, raking, resetting stones as needed, inspecting and repairing fences, watering newly planted areas, sodding as necessary, identification of trees for removal, removal of flowers and grave decorations, and removal of wild growth (see, for example, Klupar 1962:226-228). The form shown in Figure 3-25 provides a clear idea of the issues that must at least weekly be addressed at every cemetery property.

The importance of maintenance was clearly stated by West, “one thing is certain, the cemetery must be maintained in a proper manner or public confidence will suffer” (West 1917:26). Improved management and maintenance of the cemeteries will improve public confidence in the Town’s stewardship of these sites.

This permanent crew would also allow the Town to train certain employees in the appropriate way to reset monuments, as well as make simple repairs. It would be possible to undertake, for example, an appropriate level of fence maintenance, including the collapsing stone walls.

Cemetery Maintenance Inspection Form					
Cemetery: _____		Date: _____		Inspected By: _____	
Elements	Issues	Good	Requires Attention	Not Applicable	Comments/Location
LAWNS	General Appearance				
	Mowing Height				
	Water/Moisture				
	Edging/Trimming				
	Pest/Disease Control				
	Weed Control				
	Fertilization				
	Other				
BEDDING PLANTS & PLANTERS	Plant condition				
	Water/Moisture				
	Pest/Disease Control				
	Cultivation				
	Staking				
	Dead Heading				
	Trimming				
	Fertilizing				
	Weed Control				
	Edging				
PERENNIALS & GRASSES	Plant Condition				
	Water/Moisture				
	Pest/Disease Control				
	Cultivation				
	Staking				
	Dead Heading				
	Trimming				
	Fertilizing				
	Weed Control				
	Edging				
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Elements	Issues	Good	Requires Attention	Not Applicable	Comments/Location
SHRUBS & GROUNDCOVERS	General Condition				
	Water/Moisture				
	Pest/Disease Control				
	Pruning				
	Shearing				
	Trimming				
	Weed Control				
	Cultivation				
	Fertilizing				
	Mulching				
TREES	General Condition				
	Water/Moisture				
	Pest/Disease Control				
	Edging Wells				
	Mulching				
	Pruning				
	Repair				
	Hazards				
	Plant Support				
	Stakes/Wires/Anchors				
IRRIGATION	Heads/Risers				
	Pressure				
	Coverage				
	Controller Settings				
	Leaks				
DRAINS/DITCHES	Debris				
	Pollution				
	Other				
FURNISHINGS & FIXTURES	Damage				
	Dirty				
OTHER					
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Figure 3-25. Form that can be used to weekly evaluate cemetery conditions and needs.

Operating a permanent crew will also allow the employees to develop a sense of ownership and continuity. It also reduces the need to identify seasonal staff, appropriately train them, and ensure adequate oversight – only to lose those employees only a few months later.

Although we were told that Town staff resets monuments, additional discussion reveals this is not the case: “there is very little if any time to do this and there is no formal training.” Similarly, while initially we were told that the Town resets plot curbs, in subsequent questioning we found that the staff has “very little time to do this.”

Time and again throughout this assessment conditions in the cemetery were excused, if not justified, by inadequate time and staff. Thus, it appears clear that the Parks, Trees, and Cemeteries Division recognizes that they are unable to appropriately care for the cemeteries under their control, but no effort has been made to increase the budget to ensure an adequate, and trained, staff is available to care for these resources.

Job Oversight

At the present time we are told that maintenance crews “work independently performing perpetual care, burial preparation and completion tasks, successfully performing their duties without the need for constant supervision.” As this assessment reveals, this is an overly optimistic assessment and the absence of supervision and quality control standards is resulting in needless deterioration of the landscape and monuments.

The complexities of cemetery maintenance require that the technicians are well supervised and are held accountable for their performance. It is therefore critical that a supervisor be present *on-the-ground* and carefully checking all work performed in the cemetery. Supervision from an office is unacceptable.

Staff Training

We are told that while office staff receive no training, even in customer service, the town’s maintenance staff receives safety, customer service, equipment, and landscape maintenance training. We could not, however, obtain any information on the nature of this training. It is difficult to reconcile such training with the problems we observed in the cemetery landscape, but this may relate to the absence of adequate funding, adequate staffing, and/or adequate supervision.

We are told that no one with the Parks, Trees, and Cemeteries Division is a member of a national, state, or local landscape organization. No one on staff is a member of an arboriculture organization. Nor is anyone a member of a national, state, or local cemetery organization (such as ICCFA). This is troubling since such organizations provide and promote continuing education of their membership and membership denotes a commitment to ensuring that best practices are used in all cemetery activities.

A horticultural degree is a significant asset in cemetery landscape management, as is membership in professional organizations such as the Professional Grounds Maintenance Society (PGMS) or the Professional Landcare Network (PLANET). Similarly, it is critical that cemeteries take advantage of certified arborists. These individuals have a minimum of three years experience in some aspect of tree care and have passed an exam developed by an international panel of experts. The exam extensively covers every aspect of tree care and the individuals must have an acceptable level of knowledge in all areas of arboriculture. The International Society of Arboriculture has recently developed the Tree Risk Assessment Qualification (TRAQ) program. This provides education and training in the fundamentals of tree risk assessment, promoting the safety of people and property by providing a standardized and systematic process for assessing tree risk.

The Town's tree warden is not a certified arborist, a member of the Society of Municipal Arborists, or a member of the Society of American Foresters. Under Massachusetts law, the only requirement for the town's tree warden is an Associate of Science Degree in Arboriculture/Urban Forestry or a related degree.

Since the cemetery will require considerable involvement of an arborist in evaluating and maintaining tree health, as well as ensuring proper pruning, we strongly recommend that the Town contract out this work. There are 14 Certified Arborists for hire within 10 miles of Wayland (Table 3-3).

Table 3-3. ISA Certified Arborists within 10 miles of Wayland.

Name	Company Name	Telephone
Kenny A. Patey	Kenny's Landscaping	(617)347-7066
Mike Jerome	Bark Busters Tree Service	(781) 320-9800
Christopher Copeland		(413) 209-1597
Andrew Airoidi	Tree Advocate	(978) 758-8673
John Platt	John Platt Certified Arborist	(508) 877 2582
Jonathan Grinnell	J. Grinnell Tree and Landscape	(978) 823-0192
David Rines	Rines ArborWorks LLC	(781) 820-9363
Keith Bernard	BTSE, Inc.	(617) 616-5281
Russell Holman	Harty Graymont	(781) 444-1227
Michael Colman	Harty Graymont	(781) 444-1227
Trumbull Barrett	Barrett Tree Service East, Inc.	(617) 616-5281
Jennifer Kettell	Jen Kettell Horticulture	(617) 444-9607
Mark Young	Barrett Tree Service East, Inc.	(617) 616-5281
Richard Stoner	Stoner Trees & Shrubs	(508) 651-0469

There are a variety of organizations that can provide additional training and certifications to cemetery maintenance staff.

The PGMS offers certifications for both managers and technicians. It also offers the PGMS Landscape Management and Operations Accreditation.

In 2005 the Associated Landscape Contractors of America (ALCA) and the Professional Lawn Care Association of America (PLCAA) merged to form PLANET. There are nine member organizations within 10 miles of Wayland, two of which have certified staff.

PLANET offers three certification programs.

The first is the Certified Landscape Technician – Exterior. The exam for this certification is a hands-on field test and candidates can be tested in Installation, Maintenance, or Irrigation.

The second is Certified Turfgrass Professional – a comprehensive study of both warm and cool-season turf grasses. Certification in this area demonstrates a mastery of weed, insect and disease identification/control, as well as diagnosis of common turfgrass problems. The material supports Integrated Pest Management concepts and pesticide safety – significantly reducing the Town's liability for operations.

The third is Certified Ornamental Landscape Professional. This certification emphasizes tree and shrub maintenance procedures with candidates concentrating on landscape trees and ornamental woody plant physiology, health care management, and establishment. The University of Georgia has developed several exceptional training programs readily available either on-line or through DVDs. One is the SuperCrew series that provides professional training developed in cooperation with industry leaders and endorsed by

professional organizations. Topics range from “Being Safe with Grounds Equipment” to “Pruning Ornamentals.”

The training is available through either nine DVD programs that can be used to train staff on-site or through individual on-line enrollment. The former has a cost of \$470, although the DVDs can be used to train an unlimited number of individuals and include both English and Spanish scripts. The second option allows a single individual to take the nine lessons self-paced for a total of \$170. The latter option allows the individual to receive a Certificate of Completion after successfully completing the online quizzes. Additional information is available at <http://www.supercrew.caes.uga.edu/>.

There are, in addition to PLANET, no fewer than three professional landscape organizations in Massachusetts, including the Massachusetts Association of Lawn Care Professionals (<http://malcp.org/>), the Massachusetts Association of Landscape Professionals (<http://www.mlp-mclp.org/>), and the Massachusetts Nursery and Landscape Association (<http://www.mnla.com/>). Each provides a variety of membership benefits, including continuing education and networking opportunities.

We strongly encourage the Town to support staff seeking certifications and additional training. In fact, the Town should not simply provide opportunities for its staff to become certified in different areas, but must insist on continuing education and training for all employees.

Cemetery Soils

Although the initial questionnaire response indicated that soil samples were collected for testing every five years, we learned upon additional inquiries that, “no soil test data [is] available. With limited funding for the cemetery, and the scope of work that needs to be accomplished with the Parks division for the Town of Wayland DPW, services for the cemeteries are impacted.”

The University of Massachusetts at Amherst (<http://soiltest.umass.edu/>) provides routine soil testing for no more than \$15 a sample. The commercial A&L Eastern Laboratories (<http://www.al-labs-eastern.com/Default.aspx>) provides soil testing for only \$10 per sample. It is impossible to manage vegetation in the cemetery if there is no data on the condition of the soils.

It is good practice to test soils every three to five years and we recommend this practice begin immediately. The University of Massachusetts Extension Center for Agriculture’s *Best Management Practices for Lawn and landscape Turf* recommends that soil testing be conducted every three years, with soil pH monitored yearly. A simple tutorial on soil sample collection is provided at <https://soiltest.umass.edu/fact-sheets/sampling-instructions-routine-soil-analysis>.

For this assessment two samples were collected from North Cemetery: one from the Stoney Section and a second from the Old Section. Analysis was conducted by A&L Eastern Laboratories. The results of these tests are provided in Figure 3-26.

The soils have low cation exchange capacity (3.1 in the Old Section and 3.6 in the Stoney Section). The cation exchange capacity is the maximum quantity of total cations, of any class, that a soil is capable of holding, at a given pH value, available for exchange with the soil solution. It is used as a measure of fertility and nutrient retention capacity, and in general, the higher the number, the higher the soil fertility. In addition, low cation exchange capacity, as seen in North Cemetery, means the soils are more susceptible to cation nutrient loss through leaching. Although the soils tested have relatively abundant organic matter, the very sandy soils are promoting rapid nutrient loss (according to the soil surveys, all of the soils in the cemetery are either loamy sands or sandy loams). The soils would benefit from soil

amendments, although this is difficult to accomplish in turf soils. More important than the current levels are changes over time – providing another reason by periodic testing is beneficial.

The soil pH ranges in the two sections from 4.4 to 4.9. Most plants prefer levels from 5.8 to 7.0, so this is below the acceptable range. A sandy soil needs to be limed more frequently because of its lower buffering capacity relative to a soil higher in clay and organic matter.

Liming is recommended at rates from 60 to 70 pounds per 1,000 square feet in both sections in order to increase the soil pH and promote greater microbial activity. The target pH is 6.2 and the application of dolomitic lime will not only raise the pH but will also improve the magnesium level. Lime application, however, should not exceed 50 pounds per 1000 sq. feet per application. Thus, the total should be split and applied every 4 to 6 months until the recommended amount is completed.

Best practices also encourage core aeration in conjunction with lime application to increase the effectiveness of the lime and raise the pH level more quickly. Core aeration has a variety of additional long-term benefits for turf. Compaction increases soil hardness and inherently reduces soil infiltration rates. These inhibit rooting depth and density. These conditions also promote surface water runoff as well as nutrient and pesticide losses, conditions that reduce plant and irrigation efficiency and compromise environmental quality. While aeration in a cemetery setting requires smaller equipment and greater care, it can be done successfully.

Old Section

Test	Results	SOIL TEST RATINGS				
		Very Low	Low	Medium	Optimum	Very High
Soil pH	4.4					
Buffer pH	6.73					
Phosphorus (P)	91 ppm					
Potassium (K)	35 ppm					
Calcium (Ca)	176 ppm					
Magnesium (Mg)	26 ppm					
Soluble Salts	0.08 mmhos/cm					
Organic Matter	7.3 % ENR 150					

Stoney Section

Test	Results	SOIL TEST RATINGS				
		Very Low	Low	Medium	Optimum	Very High
Soil pH	4.9					
Buffer pH	6.77					
Phosphorus (P)	144 ppm					
Potassium (K)	60 ppm					
Calcium (Ca)	292 ppm					
Magnesium (Mg)	46 ppm					
Soluble Salts	0.06 mmhos/cm					
Organic Matter	6.9 % ENR 150					

Figure 3-26. Soil sample results.

Phosphorus (P) levels are high in both samples. Phosphorus is essential for photosynthesis, seed and fruit production, plant energy production, and cell division. Adequate supplies will promote root growth and formation, greater flowering and seed production, better growth in cold temperatures, and efficient water use.

Potassium (K) is also essential in photosynthesis, plant growth, and effective response to drought stress. Like phosphorus, it tends to be reduced by low pH and low cation exchange capacities. Thus, it is not surprising that it is low to very low in the two samples. Balancing soil pH will likely improve potassium levels.

Calcium and magnesium levels also are considered low. The reason for this is not known. In general, these levels are affected by the soil acidity and the low cation exchange capacity.

Finally, we tested for soluble salts. These may be contributed by road salts, but are common in virtually all commercial fertilizers. They can affect not only the plants, but also the stones at the cemetery. Soluble salt levels were under 0.1 mmho/cm and these levels are considered very low. None of the tests came from the roadside, so the effect of road salts is not adequately examined by these tests.

These tests do not include nitrogen since no soil test currently exists that can reliably provide data on nitrogen levels in Northeast turf. Consequently, nitrogen rates must be determined based on variables such as expected quality of the turf, use of the turf, condition of the growing environment, grass species and varieties present, and available fertilizer and nutrient containing materials. The level of nitrogen applied and its frequency should be sufficient to provide vigorous growth without promoting surge growth, overstimulation, or loss of nitrogen from the turf.

In addition, it may be possible to reduce nitrogen levels in certain situations, such as when traffic is not intensive, a higher height of cut is practiced, grass clippings are returned to the turf, and the turf is not irrigated.

This brief discussion reveals that the availability of many plant nutrients is being affected by the low soil pH. Thus, while fertilizers could productively be used in several areas, we recommend instead that an effort first be made to raise the pH and then conduct additional soil tests to further evaluate macro and micronutrient levels.

We were told that turf fertilization occurs and upon further inquiries found that “fertilization is usually done one time per year based on budget constraints; it is done in the early spring right before Memorial Day mostly for aesthetics at a rate of 1 pound per 1,000 square feet.” No information was provided regarding the grade used; however, focusing on aesthetics suggests product may be very heavy in nitrogen in order to “green up” the grass.

Application of fertilizers with no soil testing and without adjusting soil pH is a waste of time and funds. In addition, heavy or excessive nitrogen fertilization may promote excessive growth and this is likely to increase turf management issues such as an increase in disease problems, a reduced tolerance to high and low temperature, a reduction in traffic tolerance, and increased moisture stress due to shoot growth and reduced rooting.

In addition, while nitrogen application is often conducted during late spring (approximately Memorial Day), primarily to enhance quality going into summer and to encourage growth before the high temperatures and moisture stress of summer; it is important that this late spring application does not stimulate the turf into growth during the stressful summer months (especially if irrigation is not available as is the case at North Cemetery).

We are not opposed to fertilization – although as previously explained, it should only be conducted after the soil pH is appropriately adjusted. The amounts recommended are shown in Table 3-4. Application should be split into three or four events to keep the lawn green and prevent fertilizer loss. The Town should not apply more than 0.7 lbs of soluble nitrogen per 1,000 square feet in a 30 day period; or more than 0.9 lbs of nitrogen per 1,000 square feet if a slow or controlled release product is used during the same 30 day period. Custom blend is best to meet exactly the requirement.

Table 3-4. Lime and Fertilization Rates Recommended for North Cemetery
(per 1,000 square feet).

	Liming	Fertilization		
		1 st	2 nd	3 rd
Old Section	70 lbs.	8 lbs. 14-4-8	8 lbs. 14-4-8	6 lbs. 21-3-7
Stoney Section	60 lbs.	10 lbs. 10-0-20	6 lbs. 21-0-0	6 lbs. 21-0-0

The best time to apply fertilizer for cool season grass (bluegrass, fescue, ryegrass) is in the fall when the grass is growing. For the Northeast region the time is from mid August to October. Fertilization during this period helps the turf recover from summer stress injury. In addition, increased shoot growth from tillering and rhizome production are enhanced by sufficient nitrogen availability throughout the fall. Fall application should start as soon as the day time high temperature is below 80-85°F, and be applied with the interval of one month.

Spring application is recommended when there is exceptional fertilizer loss due to heavy spring rain leaching and the turf looks pale green. Spring application can start as soon as the grass starts to grow in April. In the case of exceptional warm spring, the application can be made earlier. A spring application of nitrogen can also be coupled with the use of preemergence weed control materials are being applied.

Fertilization should occur on un-irrigated turf, such as at North Cemetery, to coincide with rainfall whenever possible, although application should avoid periods of extended or excessive rainfall. As with liming, fertilization that coincides with core aeration promotes incorporation of the fertilizers into the root zone.

If fertilizers are to be applied now or in the future, slow release organic fertilizers are preferable to commercial inorganic fertilizers since they have significantly lower salt indices. An excellent source explaining the differences between organic and inorganic fertilizers is <http://www.cmg.colostate.edu/gardennotes/234.pdf>. The publication at http://www.caes.uga.edu/applications/publications/files/pdf/C%20853_3.PDF provides information on converting traditional inorganic fertilizer recommendations to safer organic recipes.

Cemetery Trees

Trees at the North Cemetery are dominated by maples and other deciduous species, although arbor vitae, crab apple, and other evergreens are also present. Only the arbor vitae, planted at cemetery boundaries, and a double row of maples planted along the road separating the Stoney and Lovell sections appear to be intentionally planted (Figure 3-27). Trees elsewhere appear to be self-propagated.

Selection Issues

Cemeteries, in general, have historically been dominated by large deciduous trees, although evergreens such as cedar are also very common. The trees provide a distinctly inviting image for visitors and passersby. They also provide some visual separation from adjacent buildings – especially in cluttered

urban environments. They provide shade, reduce stormwater runoff, stabilize soil, and reduce evaporative water loss.

All other issues being equal – plantings should focus on those tree species that are known to have been used.

The Parks, Trees, and Cemeteries Division reports that if a tree is removed an effort is made to replace it. This may be a reference to the Town's Code, Section 171-1, Replacement of Public Shade Trees, that requires one tree to be planted for every four cut. If so, the problem is that the ordinance does not require planting in the same approximate location. Nor does it mandate conformity with any known selection issues.

In addition, the Town specifies only that “indigenous varieties” will be planted. While diversification may be acceptable, it should not dilute the original design or intent. Therefore, we urge care in selecting additional plantings, focusing on a small number of historically appropriate trees to maintain the historical integrity of the cemetery.

Some trees, whether historically appropriate or not, should be avoided since they pose significant maintenance issues. These include trees that produce dense shade (causing problems with the turfgrass); trees that exhibit suckers or surface roots (also causing turfgrass problems); trees that drop large quantities of leaves, seeds, or sap; and trees that are especially weak or vulnerable to wind or ice damage.

For example, both the sugar maple and white ash are native species. In general, the sugar maple has no significant litter problem, requires little pruning to achieve a good form, is resistant to breakage, and surface roots are generally not a problem. In contrast, the white ash produces significant litter, requires pruning to develop a strong structure, the wood is susceptible to breakage at the crotch because of poor collar formation, the wood itself is weak and tends to break, and surface roots can displace monuments and interfere with mowing. Consequently, one indigenous species, the sugar maple, would be an acceptable cemetery tree, while another indigenous species, the white ash, would be a very poor choice for North Cemetery. Each tree must be carefully evaluated, looking beyond whether it is a native species.

Replanting

Trees should be replanted as older ones are removed and a general effort should be made to plan for future tree replacement, perhaps using a mix of fast-growing but short-lived trees intermixed with slow-growing but long-lived trees to create a planned appearance.



Figure 3-27. Intentionally planted trees at North Cemetery.

It is also appropriate to plant replacement trees in anticipation of their need, allowing them an opportunity to become established before the diseased or damaged tree is removed.

Planting Issues

Locations chosen for planting should not interfere with gravestones, curbing, or fences. Sometimes caregivers are concerned about planting in a cemetery. Appropriate planting requires a hole twice the width of the root ball, but no deeper than the rootball. Thus, the potential for disturbing a grave is almost non-existent, especially if only 1-2 inch caliper trees are chosen. Issues of security should also be considered and the use of small trees that obscure eye level views should generally be limited or avoided.

Research is suggesting that trees, especially older mature trees, improve in health when turfgrass is removed under the branch spread and mulch is applied at a depth not exceeding 3 to 4-inches. Fine-textured mulches prevent evaporative water loss better than coarse-textured mulches. This is a practice that could be productively employed at North Cemetery. Staff should be closely supervised to prevent over mulching of vegetation.

All replacement trees or new plantings should be of at least 1-inch caliper and meet the minimum requirements of the American Nursery and Landscape Association's American Standard for Nursery Stock (ANSI Z60.1-2004). While water is present at North Cemetery, we believe it would be more appropriate to provide new trees with water bags, thus reducing dependence on staff watering practices. There are a variety of water bags for young trees, including the Treegator (<http://www.treegator.com/home/>). In fact, bags are now readily available in many hardware stores.

Special care should be exercised to prevent bark damage from mowers and trimmers. We recommend the use of tree guards (<http://www.amleo.com/tree-bark-protectors/p/VP-BG/>).

Tree Maintenance

Maintenance involves at least four basic issues: watering, fertilization, pruning, and pest control.

The Town does not water mature trees, relying instead on rainfall. While this is typically acceptable, the landscape plan should include provisions for deep-root water during periods of severe drought (assuming this is permissible). This is a critical step necessary to protect the historic landscape fabric of the cemeteries. Using a root feeder without fertilizer, it is possible to apply water 12-inches below the surface. This approach can be used not only during severe drought, but also during extended periods of dry weather during the winter (as long as the temperatures are above freezing).

The staff also reports that no mature tree fertilization is conducted. The mature trees area a vital component of the landscape. They represents part of the historic fabric and steps must be taken to protect that aspect of the landscape and vista. A certified arborist can determine if a feeding program would benefit trees in the cemetery.

Based on the recommendations of an ISA Certified Arborist (see Table 3-4), the Town should anticipate periodic fertilization of mature trees. Fertilization should be conducted on the basis of need as excess fertilization can damage trees; nevertheless, the ISA position is that, "tree fertilization should be done in accordance with ANSI A300 standards" (Lilly 2001:47). These ANSI A300 (Part 2)-1998 standards represent the standard of care in the industry. This is why more proactive involvement by certified arborists in cemetery maintenance is essential.

Fertilization is typically accomplished through deep root fertilization – an approach where the liquid fertilizer is injected into the soil with a probe, usually 6 to 12-inches below the surface at a spacing of about 2 to 3 feet. This process not only provides fertilization, but also some aeration of the soil. An alternative approach uses a drill to excavate holes in a similar pattern which are then filled with a granular fertilizer. Either is acceptable. The ANSI 300 standards allow foliar applications, injections, or implants only when soil application is impractical or ineffective.

It is best to fertilize trees when they are actively growing and have available water to help absorb nutrients. In Wayland this is typically from the spring, after new leaves emerge, through mid-season. Fertilizer should not be applied late in the season, during the winter, or during periods of drought.

In a cemetery setting organic fertilizers should be the primary choice. These materials, such as cottonseed meal and bone meal, have much lower salt indices than inorganic fertilizers – resulting in reduced salt uptake by monuments. This is important since salts cause staining, spalling, and deterioration of marbles, sandstones, brick, and even granites. In addition, organic fertilizers have a slower release rate and are easy on the root systems.

We are told that tree inspections are conducted, but upon additional questioning it was determined that “nothing is done in writing” and the inspection is conducted by the Tree Warden “visually” at “various times.”

There are various publications that can help individuals evaluate hazard trees (for example, <http://www.na.fs.fed.us/spfo/pubs/uf/utmmm/> and <http://www.forestpathology.org/hazard.html>), and the ISA has developed a comprehensive form for documenting inspections (http://www.isa-arbor.com/education/resources/educ_treehazardform.pdf). There are, however, two critical elements in an appropriate program, training and documentation.

While we are unable to evaluate the training that the Town’s Tree Warden has received, the failure to commit the inspections to writing is very troubling. Such a failure leaves the Town exposed to significant liability since it can be easily argued that the existing inspections fail to take responsible action to adequately protect either visitors or monuments. Moreover, the Town has failed to develop a programmatic approach to managing hazardous trees.

In fact, during this assessment we observed a variety of conditions suggestive of hazardous trees and we found no compelling evidence that the Town was using “ordinary and reasonable care.” In fact, the Parks, Trees, and Cemeteries Division admits that its tree work is not based on need, but rather on available funding.

Figures 3-28 and 3-29 show a sampling of the problems we observed, including trees with extensive trunk damage and rot, a very large number of trees that have been previously topped, and trees with dead wood in the canopy.

While most smaller wounds can heal in two to three years, large or reoccurring wounds can lead to the introduction of rot and other disease. The presence of loose bark and evidence of fungi can be clues that a tree is compromised.

Topped trees pose a variety of problems. In many trees the leader is important for both upward growth and desirable appearance. While the tree may live without its leader, it will likely be a stunted or deformed version of the original. None of the topped trees in Figures 3-28 and 3-29 can be considered aesthetically pleasing. But there are even more significant problems presented by topped trees. Topping tends to promote growth of weakly attached branches that are even more likely to break when the next

storm occurs. Topped trees are also deprived of the food and nourishment needed for regrowth. Finally, storm topping can lead to the introduction of sap rot, further compromising the tree's stability and integrity.



Figure 3-28. Tree Problems. Upper left photo is of a rotted tree trunk in Section A. Upper right photo shows extensive damage to a young tree in the Jewish Section. Middle left photo shows a dead limb hanging in a tree in the Lovell Section. This is an example of a “widow maker.” Middle right photo shows dead wood in a tree canopy in the Lovell Section and is another example of a “widow maker”. The lower two photos show codominant stems forming weak crotches prone to failure.

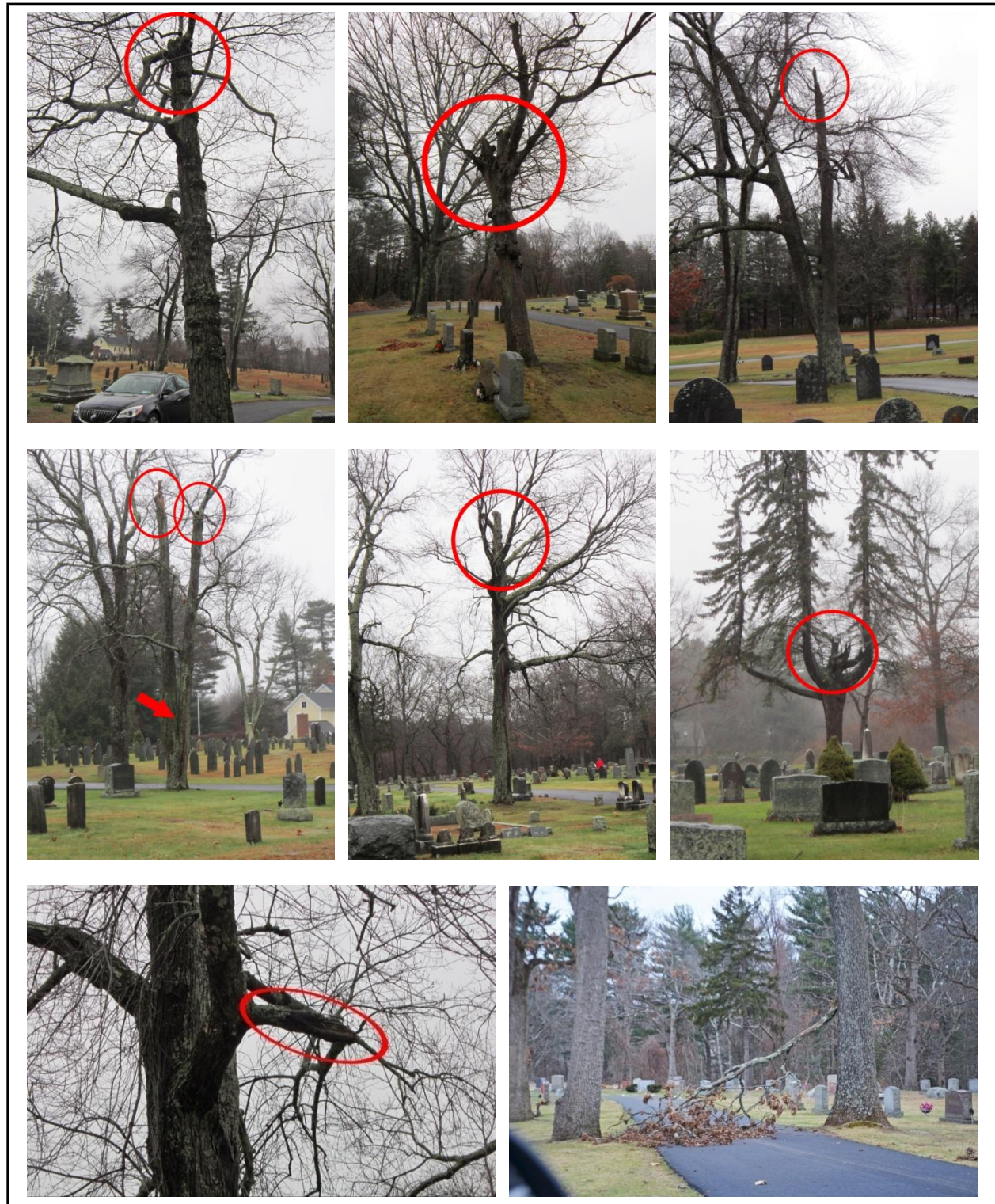


Figure 3-29. Tree Problems. Upper row shows topped trees in Section A and the Old Section. Middle row shows three topped trees in the Stoney Section. The middle left shows a tree that also has a codominant stem forming a weak crotch prone to failure. Lower left photo shows dead limb in the Stoney Section. Lower right photo shows a limb torn and fallen from a tree, blocking the road.

OSHA defines a widow maker as "broken off limbs that are hanging freely in the tree." These are extremely dangerous and present the public with a continual source of danger.

The presence of dead wood in many of the trees is an equally serious problem since this dead wood has the potential to become "widow makers." They require pruning for either thinning or cleaning.

Thinning is a technique of pruning that removes selected branches to increase light and air movement through the crown. This also decreases weight on heavy branches. The natural shape of the tree is retained and its overall health is improved. In cleaning, the pruning removes branches that are dead, dying, diseased, crowded, broken, or otherwise defective. This includes narrow crotches.

Trees should be pruned in such a manner as to preserve the natural character of the plant and in accordance with ANSI A300 (Part 1) - 2001 standards. Branches should always be cut just beyond the branch collar (an extension of the main stem) and not flush with the trunk. Large branches should be removed with three cuts to prevent tearing of the bark which can weaken the branch and lead to disease. All pruning within the cemetery should be performed by or under the supervision of an ISA Certified Arborist.

Trees should be inspected for potential threats to monuments, as well as general health. Ideally these inspections should be made yearly and after any storm where the winds exceed 55 mph. They should be pruned to remove potentially hazardous dead wood on a yearly basis, but safe pruning every 5 years by a certified arborist is acceptable.

The Parks, Trees, and Cemeteries Division is not able to perform the needed work, as evidenced by the variety of problems present in the cemetery. Consequently, we recommend that an ISA Certified Arborist be retained to inspect all of the trees, remove those that pose significant risk to monuments, and prune all of the trees in the cemetery.

Shrubs

North Cemetery has a relatively low incidence of shrubs and virtually all have been planted by families on individual graves. Although the rules and regulations specify that only dwarf evergreen shrubs may be planted, there are several examples of the deciduous shrubs that do not appear to be properly pruned (Figure 3-30).

Because of the low incidence of shrubs, little needs to be done except to ensure that they are not run over by mowers. We identified a yucca clump in the Stoney Section that had been mowed over (Figure 3-31). This is unacceptable and detracts from the historic landscape.

Turf Issues

North Cemetery does not exhibit a good stand of turf. The Parks, Trees and Cemeteries Division euphemistically refers to it as "indigenous turf." There are areas with fine fescue and even some areas with Kentucky bluegrass. But much of the turf consists of broadleaf weeds and there are very large areas where there is no grass at all (Figure 3-32). The Town reports using no pre- or post-emergent herbicides. Coupled with only very limited fertilization, the condition of the turf is not unexpected.

We observed several areas where seeding had been attempted, but had failed. We observed no cover for the seed and the seed was apparently scattered in the late fall – at a time when the ground was too cool to promote germination and turf development. Improper seeding such as this is only a waste of time and materials.



Figure 3-30. Shrubs. While the rules specify that only two “dwarf evergreen shrubs” may be planted on either side of the monument “not to exceed the height of the monument,” this is not being enforced. As a result, we see the presence of non-evergreen plantings, plantings that exceed height requirements, and plantings that are not dwarf varieties.



Figure 3-31. Yucca that has
been mowed.



Figure 3-32. Turf problems. The upper two rows shows weedy, damaged turf in Section A, Lovell Section, and the Stoney Section. Lower left photo shows a seeded area with no cover and rotting seed.
Lower right photo shows some of the broadleaf weeds present in the cemetery.

We are told that North Cemetery is mowed weekly from about the middle of May to the end of November. The frequency of mowing is at least partially the result of the abundance of broadleaf weeds that grow more quickly than turf grasses.

North Cemetery requires three staff 6 hours a day, for a total of 18 person hours for mowing and upwards of 24 person hours for trimming. The work is conducted using three zero turn Hustler Super Z mowers with 72-inch decks. These mowers have a top speed of 14 mph. Also used are 52-inch deck Skagg mowers and it is claimed that 22-inch walk behind Toro mowers are also used.

With the exception of the 22-inch Toro mowers, these represent very large deck mowers to be used in historic cemeteries and even a zero turn mower can prove difficult to operate among closely spaced monuments. Mowers capable of being driven at 14 mph are rarely throttled back by staff to safe speeds, particularly without close supervision.

Stones in the cemetery clearly reveal the damage that can be done by large equipment combined with less than perfect handling. We observed breakage and impacts consistent with mowers, scratches from decks being operated too closely to monuments, and even paint transfer from mowers onto stones. The current mowing practices, either through speed, carelessness, or simply using mowers too large for the available space, are doing extensive damage to monuments in the cemetery and represent a significant threat to the long-term preservation of the monuments. Examples of this damage are shown in Figure 3-33, including damage even to young, recently planted trees. Figure 3-34 shows a variety of scratches on monuments – some modern – that disfigure the stone.

These impacts and scratches are the result of mower decks being operated immediately adjacent to the stone – a practice that is done by staff in order to minimize the amount of time required in the use of nylon trimmers. It is a sign of inadequate training and supervision. Left unchecked, the damage will increase and eventually result (if it hasn't already) in broken stones.

Even where nylon trimmers are being in the cemetery, we found abundant evidence of improper use – allowing the trimmer line to repeatedly impact and scratch the stone (Figure 3-35). This problem is likely exacerbated by the use of trimmer line that is too heavy for use in a cemetery with fragile stones. Line as heavy as 0.105 inches in diameter is being used in the cemetery. Lines this thick can cause extensive, and unnecessary, damage to stones. We recommend a line diameter no greater than 0.065-inch. If the trimmers being used cannot accept line with this diameter, then the lightest weight line possible should be used.

We also observed numerous examples in the cemetery where surface roots of trees were scalped by mowers. While the surface roots are an issue associated with the existing trees, the damage being caused to these roots will impact the health of the trees. It will also damage the mowers.

The extent of damage may also suggests that the Parks, Trees and Cemeteries Division is attempting to mow too low, perhaps in an effort to delay the next mowing.

It is good practice to mow at the upper end of acceptable mowing height range. Most lawns of cool season turfgrass species (Kentucky bluegrass, perennial ryegrass, the fine fescues and tall fescue) should be mown in the range of 2½ to 3½ inches. The grass we measured appears to have been cut to a height of about 1½-inches – too low and prone to damage surface roots.



Figure 3-33. Mower damage to monuments and trees at North Cemetery.

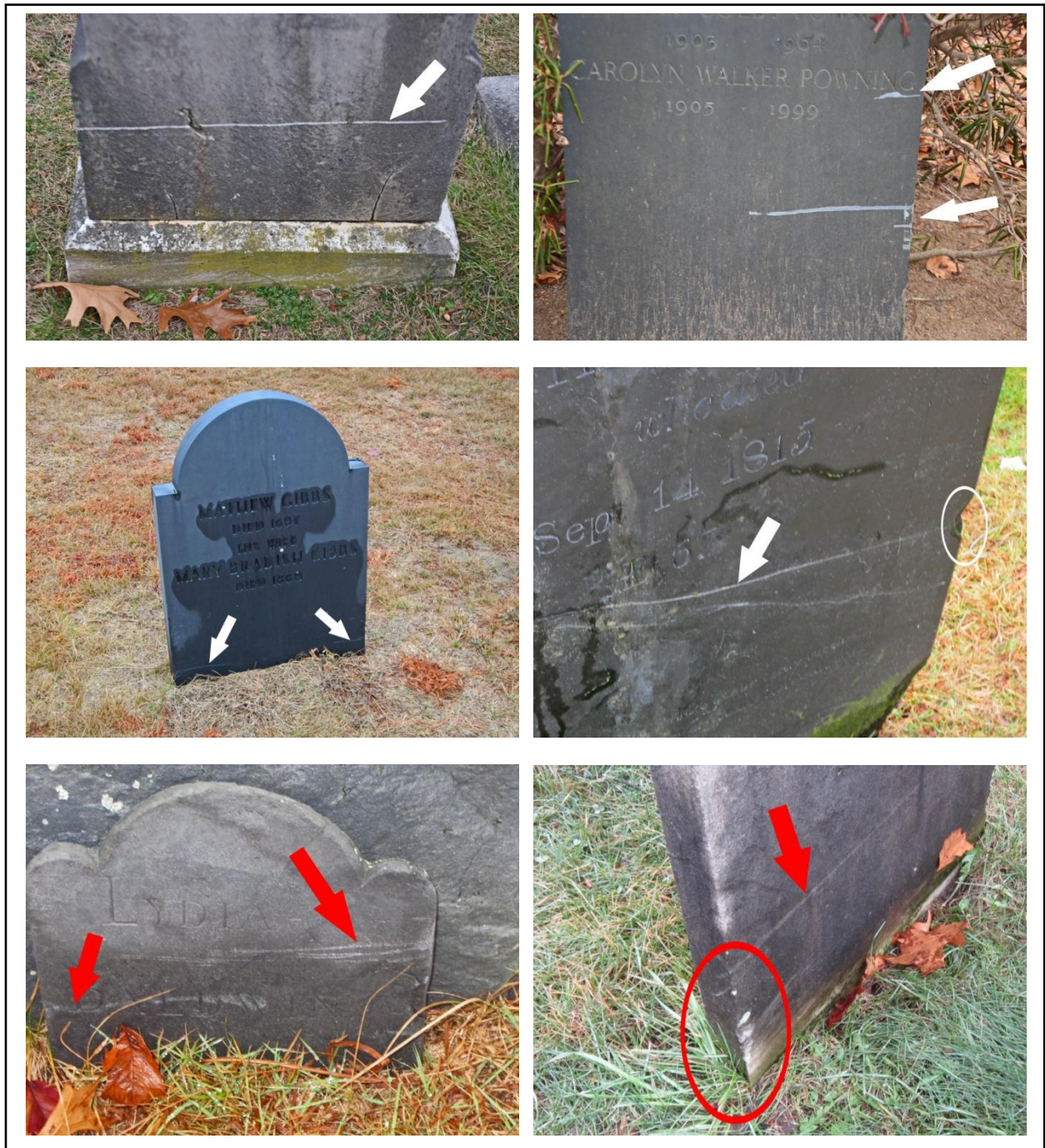


Figure 3-34. Scratches to stones caused by mowers operating too close. Both marble and slate stones are being damaged. Even modern replacement stones are being damaged by inappropriate mowing practices.



Figure 3-35. Nylon trimmer damage caused by improper operation and the use of string that is too heavy for the delicate stones.

Low mowing reduces the amount of leaf area available for photosynthesis, reducing plant vigor. Low cutting heights also tend to reduce the depth of grass roots, making the grass more susceptible to drought. Combined, these issues increase environmental stresses, making the grass more prone to invasion by weeds – a situation that is clearly evident at North Cemetery.

It is also essential that mower blades be kept sharp. Dull blades tear the grass blades, resulting in excessive injury to the plant, causing a brownish cast to the turf, and promoting additional disease problems. It had been too long since the last mowing for us to accurately gauge how sharp blades were, but this can easily be identified during the mowing season.

In addition to carefully training staff on proper mowing and trimming, there are several additional steps that can be taken to minimize problems.

The smallest mower practical must be used. We see very few areas in the cemetery where 72-inch deck mowers could be productively used. Even 52-inch deck mowers would have to be used with extreme caution. All

mowing should be conducted under careful supervision to ensure quality control. No mower should be allowed to come closer than 12-inches to any monument or curbing.

We recommend that the edges and sides of each mower be painted a different color. This will transfer when stones are hit and it will be possible to determine who caused the damage. That individual should be removed from mowing and provided with remedial training. Continued disregard for monuments should be grounds for termination.

A second step that can be taken is to install closed cell foam pad attached to the sides and front edges. This bumper will help to minimize accidental damage and its damage will also provide evidence of impacts.

Several other turf issues were observed during this assessment (Figure 3-36). We noticed several animal burrows in the cemetery. These pose a hazard to the public visiting the cemetery and an effort should be made by the Parks, Trees and Cemeteries Division to at least monthly infill these holes. This will be particularly easy to accomplish during mowing season since the holes can be flagged while mowing and infilled during trimming.



Figure 3-36. Other turf issues. The upper three photos show examples of surface roots scalped by mowing to low. The next two photos show evidence of animal burrows in the cemetery. The lower right photo shows branches that must be collected prior to mowing.

We did not ascertain how the Parks, Trees and Cemeteries Division handles leaves in the fall. We found that some leaves had been blown to the edge of the steep drop at the northeast edge of the cemetery.

Many cemeteries deal with leaves by using power equipment to create rows that are then either mechanically bagged or, just as often, mulched using mowers with micro mulch blades. The latter approach not only eliminates the work of gathering and removing leaves, but it also adds nutrients back into the soil.

For example, a Lexington, Kentucky cemetery deals with 130 acres of leaves with a crew of seven employees using blowers to blow all the leaves to the driveways. Next, a crew of three picks up the leaves using a large vacuum, which shreds and shoots them into a covered dump wagon. The shredded leaves can then be composted.

The process at Spring Grove Cemetery and Arboretum in Cincinnati, Ohio is even simpler. There, on 430 acres, they blow the leaves away from markers and flower beds, then mulch them with riding mowers. The mulch is sufficiently fine that there is no need to gather any of the debris – everything is simply mulched back into the soil.

Turf Renovation

We recommend that the cemetery implement a renovation program in order to establish a good stand of a single grass type. This work can be accomplished section by section, gradually implementing the efforts throughout the cemetery. A good source for such a program is available at <https://extension.umass.edu/turf/publications-resources/best-management-practices>.

Prior to beginning this process it is important to establish weed control, especially control of perennial broadleaved and grassy weeds as well as tough to control weeds such as nutsedge. This is far safer than attempting to identify herbicides that will be appropriate to use during seeding operations.

Areas of heavy shade should be removed from turf and mulched. This will reduce maintenance, improve overall appearance, and help maintain the health of aging trees.

Recommendations

- The North Cemetery and the other Town cemeteries are significantly understaffed and underserved. At least two full-time maintenance workers are required for North Cemetery. For all of the Town's cemeteries a full-time staff of one supervisor and four workers is required.
- It is essential that there is an on-the-ground supervisor for all cemetery work. Remote supervision and delegation does not provide appropriate quality control or job oversight.
- It does not appear that the Tree Warden can provide the level of attention to the cemetery that is required. The Parks, Trees, and Cemeteries Division should retain the services of a ISA Certified Arborist.
- It appears that staff training is currently inadequate. The Town should require and support staff certifications through PLANET or similar landscape professional organizations as part of a continuing education program.
- The cemetery soils require liming and likely fertilization. This work should be incorporated with

core aeration.

- Only fertilizers with very low salt indices should be used in the cemetery. The best choice are organic fertilizers.
- All trees removed from the cemetery should be replaced with trees of at least 1-inch caliper that meet the minimum requirements of the American Nursery and Landscape Association's American Standard for Nursery Stock (ANSI Z60.1-2004). Replacement trees should have water bags and should be carefully protected from mowing or trimmer damage.
- An ISA Certified Arborist should evaluate the need to provide fertilization to the mature trees in the cemetery.
- The cemetery exhibits a variety of serious tree problems, many that pose a hazard to both the public and the monuments. It is critical that an ISA Certified Arborist be retained to inspect all of the trees, remove those that pose significant risk to monuments, and prune all of the trees in the cemetery.
- The Town must enforce its rules regarding the planting of shrubs by plot owners or abandon the rules entirely.
- Care must be taken to avoid mowing or damaging historic plantings in the cemetery.
- Many stones in the cemetery are being needlessly damaged by the use of mowers that are too large. These problems are exacerbated by a lack of adequate supervision. We recommend that the smallest deck mowers possible be used, entirely eliminating the current 72-inch deck mowers.
- All mowers must have closed cell foam bumpers installed. These must be replaced as needed. Operators with excessive wear on the bumpers should be given remedial training and instruction.
- Mowing should never be closer than 12-inches to a stone.
- Mowing must be conducted with sufficient frequency to maintain turf at a height of about 2½ to 3½ inches.
- Trimmers should use line no heavier than 0.065-inch. If this is not feasible with the trimmers being used, then the lightest weight line available for that equipment should be used.
- Animal burrows must be filled in at least monthly.
- Given the soil conditions and the extensive weeds, consideration should be given to a section-by-section renovation of the cemetery turf in order to establish a good quality turf. This would improve the appearance of the cemetery and may potentially reduce mowing.

3.8 Other Maintenance Issues

This section briefly explores other cemetery maintenance concerns exclusive of the landscape. We will briefly discuss signage issues, trash, policies dealing with orphan stones, and other activities in the cemetery.

Signage

At the present time North Cemetery does not have effective signage. It is scattered and is all different with no unifying theme.

From a cemetery preservation perspective signage is of four basic types: identification, regulatory, informational, and interpretative. They are generally recommended in this same priority.

Identification signage might include the name of the cemetery and might also include the cemetery's date of founding and historic significance (i.e., listed on the National Register).

Regulatory signage specifies laws, regulations, or expected standards of behavior.

The last two types of signage are informational (for example, directional signs) and interpretative (information on historic people buried in the cemetery). While these are excellent and improve the visitor experience, they are not recommended at this point, but may be added in the future.

The City must strive to develop effective and well-designed signage. Signage should combine good and consistent design, and meet the needs of visitors.

Specifically, the signage should provide consistent information; should be universally accessible; viewable by several people at once; and be very durable and able to withstand abuse or constant touching. Signage should be located near entrances and at major circulation intersections.

If the Town currently has standardized signage, this should be used, so long as it is not too industrial looking (i.e., as though it came from the sign department of a highway agency).

Identification Signage

The current identification sign, while consistent with signage for South Cemetery and Lakeview Cemetery, is unimpressive and does not encourage visitation (Figure 3-37). It looks more like a temporary billboard than a sign for a cemetery.

The painted sign is mounted on two 4x4 wood posts that have been sunk into the earth covering of a vault. This is a very poor location since it dramatically detracts from the solemnity of the vault and may have compromised the stability of the vault roof (which has not been inspected recently since the door itself is welded shut).



Figure 3-37. Current identification signage at the entrance.

At the very least the location should be changed, removing the sign from the vault. We also recommend a more suitable design that encourages public interest. For example, a sign in classic black with rich gold lettering using a contemporary, but easily read typeface would be appropriate.

Attention to the current signage is also distracted by the presence of a small green plastic sign situated immediately below the entrance sign. This sign announces that the “garden” is in the memory of veterans and marks a weedy, unimpressive patch of annuals. We are told that these are “put in just prior to Memorial Day and receive very little maintenance – it’s when we can get to them.”

If annuals cannot be maintained, particularly if the point is to honor military veterans, then it is far better not to plant them. In addition, it is a very poor idea to plant on top of a vault that has not been inspected to confirm that it can reasonably take the periodic walking and maintenance activities. Thus, we recommend that the plantings be removed and the vault resodded.

Regulatory Signage

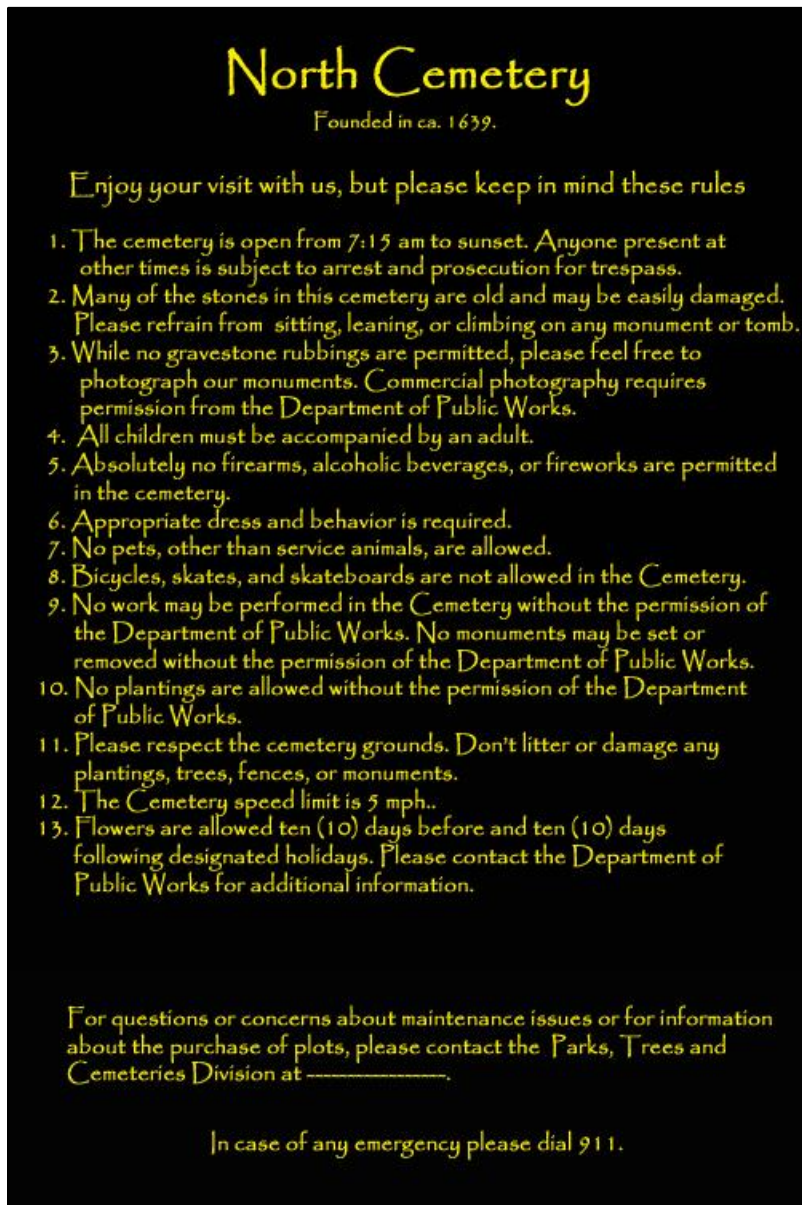


Figure 3-38. Example of a possible regulatory sign for North Cemetery that covers essential rules.

There is no regulatory signage of any description. This signage is critical and should be located at or near the entrance, so visitors will be clearly informed concerning correct behavior. The signage should be erected parallel to the road, making it readable not only to those entering through the gate, but also those driving by and perhaps preparing to park.

We have previously recommended that the cemetery regulations be made consistent and simplified. It is not possible to translate a 17-page rules booklet to a sign. Critical rules should be presented in a dignified manner that allows the public to rapidly understand the expected behavior. An example is provided in Figure 3-38.

Informational Signage

At the present time the only map available is mounted on the wall of the concrete block structure, a considerable distance from the entrance. If a map is warranted, then it must be placed near the entrance – where visitors will be certain to see it and take advantage of its presence. In addition, a better presentation is necessary.

It may be that a simple tour brochure incorporating a map might be useful. Although we found a box in the cemetery identified as “Cemetery Information,” when we opened the box it was empty and appears to have been empty for quite some time (Figure 3-39). If information is being offered, the boxes must be inspected at least weekly – otherwise it appears that the Town really does not care about its cemetery.

Since no brochure was present and nothing was identified in the assessment claiming to be distributed to the public, we cannot evaluate the effectiveness of what should be in this box.

Interpretative Signage

There is effective interpretative signage presently at the cemetery.

There is a historical marker along the Old Sudbury Road identifying the area as the original Town Cemetery. While this sign does mention a meeting house, it fails to mention the cemetery, which is the only obvious feature today. We don’t know how difficult it is to revise language on these signs, but if possible the sign should incorporate some information concerning North Cemetery.

Otherwise there are two boulders with bronze plaques in the cemetery (Figure 3-40). These are difficult to find and provide very little information.

At some future point it would be useful to develop additional interpretative signage, perhaps focusing on the cemetery’s history and multiple meeting houses, the iconography of the slate markers, and the different styles of markers present in the cemetery. Embedded fiberglass signage would be resilient, could incorporate a variety of drawings, photos, and maps, and would be of a very high quality.



Figure 3-39. Cemetery Information box, while present, was found to be empty, except for a candy wrapper.



Figure 3-40. Sign commemorating the early burials in North Cemetery.

Trash

Trash is not as significant a problem at North Cemetery as it is in many municipal cemeteries. We did, however, see several issues worthy of attention.

The first is that the only trash can present is a green plastic curbside container, located adjacent to the concrete block structure in the cemetery. This container distracts from the dignity and beauty of the cemetery and should be replaced with a more suitable container in a more visible location (although not distracting from monuments).

Second, we did observe trash that had been tossed down the slope at the north edge of the cemetery, including plastic pots and even a propane tank (Figure 3-41). The Parks, Trees, and Cemeteries Division should remove these items and should periodically ensure that no additional trash is thrown down this bank.

Lost and Orphan Stones

In the initial questionnaire we were told that the Town secures loose monuments. Upon addition questioning, however, we were told, “they are mostly left where they are and [we] rely on the lot owner for repair.” While this may be a suitable approach for stones dating to the last several decades, it is entirely unreasonable for the historic sections of the cemetery.

We found a large number of orphan stones during our assessment and they were, in fact, leaning against walls, other stones, or trees (Figure 3-42). This fails to

secure the stones and we understand that an adjacent property owner has found stones on their property and has thus far refused to give the stones back to the cemetery. This is understandable if the Town is simply going to allow the stones to lay where they fell and be subject to vandalism, theft, or damage from lawn maintenance activities.



Figure 3-41. Trash thrown down the bank behind the Back Section.

Good management requires that these stones be documented, collected and an effort made to return them to their proper locations. Long-term storage or simply ignoring them is inappropriate.

Stones should never be allowed to be removed from their original location without full documentation – where was the stone found, why it is being removed, where it is being stored, what should be done to reset the stone, what action is being taken to resolve the issue. Staff must understand that once a stone is separated from the grave, the potential that the grave will become lost – regardless of the quality of the cemetery records – dramatically increases. Thus, every effort should be made to ensure that stones remain on their grave.

A form that can be used to document fragments or orphans is provided as Figure 3-43. Such a form should be completed for every object found orphaned in the cemetery in preparation for storage.

Until it is possible for repairs to be made, every orphan object should be documented with a photograph and form. The object should be carefully identified using a stainless steel tag (such as available from Forestry Suppliers, http://www.forestry-suppliers.com/product_pages/Products.asp?mi=11821&title=DoubleFaced%20Aluminum%20Tags,%203%94%20x%204%94,%20Box%20of%2050&itemnum=79262) and then stored to prevent loss or additional damage. All objects should be stored in one secure location, such as the building at the south edge of the Cemetery.



Figure 3-42. Examples of orphan stones found throughout North Cemetery. Leaving these stones unsecured subjects them to mower and trimmer damage (see, for example, upper right and lower left photos). It also risks vandalism or theft. The Town has a responsibility to document and secure these stones – as well as to return them to their proper locations.


 <p>Chicora Foundation, Inc. PO Box 8664 Columbia, SC 29202 803-787-6910</p>		<p>MONUMENT FRAGMENT AND REMOVAL RECORD</p>	
Cemetery:	Date:	Fragment ID#:	
Origin, if known: Grave #:	Section #:	Lot #:	
Type: <input type="checkbox"/> Headstone/primary monument <input type="checkbox"/> Footstone <input type="checkbox"/> Other: <input type="checkbox"/> Unknown			
Stone: <input type="checkbox"/> marble <input type="checkbox"/> slate <input type="checkbox"/> granite <input type="checkbox"/> sandstone <input type="checkbox"/> concrete <input type="checkbox"/> other:			
Dimensions (inches):		x	Thickness:
Visible Inscription:			
Visible Design:			
Location of Find:			
How Found:			
Storage Location & How Stored/Wrapped:			
Comments:			
Surveyor:			
Photograph and/or Sketch:			

Figure 3-43. Monument Fragment and Removal Record to document orphan and broken stones.

In addition to lost and orphan stones, we found a number of similarly damaged emblems lying on the ground (Figure 3-44). It seems likely that the bulk of damage done to these emblems is the result of landscape activities. If the Town can't find the funds to ensure these emblems are repaired and correctly placed on graves, then an effort should be made to identify a veteran's organization willing to do the work.



Figure 3-44. Damaged and orphaned emblems in North Cemetery. Upper left is an example of a broken shaft in the Old Section. Upper right shows a damaged emblem from the Lovell South Section. Middle left shows a fallen emblem in the Lovell Section. Middle right shows a damaged emblem from the Lovell Section. Bottom image shows an orphan emblem from Section A. Failure to repair or replace these military emblems is not only disrespectful, but will result in many being stolen.

Plot Curbs or Coping

Plot curbs and coping are considered here since they are of secondary important to the condition of the monument. However, the curbs and coping are in overall poor condition with considerable displacement. Several examples are shown in Figure 3-45.



Figure 3-45. Displaced and sinking curbs are common, especially in the Stoney Section.

While initially we were told that the Parks, Trees, and Cemeteries resets these curbs, subsequent discussions revealed that the staff “has very little time to do this” and there is no formal training. Infilling of depressed areas and resetting of curbs should be a routine maintenance operation. That it is not is additional evidence that the Town is failing to provide adequate funding and staffing to maintain North Cemetery.

The use of a curb setting tool would be of assistance in this operation, but is not essential and the job can be done by hand.

Building and Work Areas

The existing concrete block building dates to 1949 and does not enhance the cemetery. We are told that it contains “all necessary hand tools, plywood, planting and anything else that might be needed for cemetery work.”

We recommend that careful consideration be given to removing this building. The various items stored can be brought to the cemetery as needed, just as the mowers are currently. This area could then be landscaped and would be an excellent location for interpretative signage.

If this is not possible, we recommend that the building be screened using suitable plantings.

An equal eyesore is the soil dump area, situated almost within the cemetery (Figure 3-46). While we understand there has been limited space in this cemetery, there is today a very large area to the west where this soil could be relocated and appropriately screened. This would leave the current location open for additional interpretative signage.



Figure 3-46. The soil area detracts from the cemetery and should be moved or screened.



Figure 3-47. Depression and spoil pile in the section being developed.

As with the storage building, if removal is not possible, then the area must be screened using plantings so that it doesn't detract from the cemetery's ambiance.

Finally, in the new area there is a very large hole and spoil pile (Figure 3-47). We did not inquire concerning their purpose, but they were not present in 1969. It will be difficult to sell plots when families have what appears to be a construction site next to their loved one. The Town must take its responsibility as a cemetery provider seriously and this area must be immediately graded and seeded.

Drains

In our original questionnaire we inquired about the presence of subsurface drains in the cemetery. However, during our inspection we identified at least three drains in the cemetery. We are uncertain if they are tied to a system limited to the cemetery or are part of the larger street drainage system for the village. In any event, it is troubling that the Town was unaware of the drains on its property.

Catch basin sumps need periodic cleaning. Sediment and heavy debris can collect in the sump over long periods of time. The sediment can accumulate to the level where it restricts the outlet flow. These sumps should be cleaned at least once a year. Left unattended there is a potential that the drainage pipes themselves can become clogged, requiring the use of a snake or a high pressure water jetting device (with pressures of up to 4,000 psi and the capability to extend up to 500 feet) by a company that specializes in this work.

We also observed that drains were not being cleaned during heavy rains and that at least one drain was defeated by the piling up of soil around it (Figure 3-48).



Figure 3-48. Issues with drains in the Cemetery. The photo on the left shows a drain clogged by leaves and other debris. On the right is a photo of a largely ineffectual drain with soil piled up around it, causing localized flooding or ponding of water in the cemetery.

The location of the drains and the associated runs should be included in the Cemetery's GIS mapping layers for future reference.

Recommendations

- The current identification signage is not attractive and its location on a vault is problematical. The signage should be removed and relocated elsewhere at the entrance. We also recommend that the signage be redesigned to be more suitable for a cemetery.
- The garden on top of the vault should be removed and the vault resodded.
- The Cemetery requires a combined identification and regulatory sign placed at the entrance. An example of one possibility has been provided.
- The current roadside historical marker and boulder markers can be left in place, but the Town should consider adding modern interpretative signage that promotes an interest in the Cemetery.
- A more appropriate trash container should be more centrally located to encourage its use. It should not, however, block or detract from the historic landscape.
- Trash observed on the slope north of the Back Section should be removed.
- "Orphan" stones should be documented using a form and collected for short-term safe keeping until their appropriate location is identified through research. In so far as possible, stones should not be allowed to become disassociated with their graves as this effectively loses the grave location.
- Plot curbs or coping throughout the Cemetery are in deteriorating condition. The repair of these curbs must be viewed as routine maintenance and must be integrated into the maintenance plan.
- Consideration should be given to removing the concrete block building and using the area for interpretative signage. If the building cannot be removed, it should be carefully shielded from view within the cemetery using plantings.
- The spoil pile is an eyesore and should be moved to a more distant location in the cemetery. If this is not possible, the area should be carefully screened from view within the cemetery.
- Drains present in the cemetery must be maintained. This includes not only removing leaves and debris on a regular basis, but also ensuring that water can access the drain and there is no localized flooding in the cemetery.

3.9 Conservation Issues

In the beginning of this section we briefly discussed a variety of preservation issues, tackling the question of why it is important to preserve sites like North Cemetery, as well as how preservation and restoration differ, and introducing the reader to the Secretary of Interior's Standards for Preservation. Readers may want to refer back to those discussions since they form a foundation for our discussion of the conservation needs at North Cemetery. Appendix 1 also provides a stone-by-stone assessment identifying those monuments in the Stoney Section that require conservation intervention.

Standards for Conservation Work

The Town of Wayland is the steward of North Cemetery, holding what belonged to past generations in trust for future generations. As such the Board of Selectmen and the Board of Public Works bear a great responsibility for ensuring that no harm comes to the property during their watch.

One way to ensure the long-term preservation of the cemetery is to ensure that all work meets or exceeds the Secretary of the Interior's Standards for Preservation, discussed on pages 57 to 59 of this study.

Another critical requirement is that Parks, Trees, and Cemeteries Division ensures that any work performed in the Cemetery be conducted by a trained conservator who subscribes to the Guidelines for Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC) (<http://www.conservation-us.org/about-us/core-documents/guidelines-for-practice#.VKA4LP8IQU> and <http://www.conservation-us.org/about-us/core-documents/code-of-ethics#.VKA32v8IQU>).

These standards cover such issues as:

- ❖ Respect the original fabric and retain as much as possible – don't replace it needlessly.
- ❖ Ensure that the treatment chosen is suitable for the object, recognizing that at times no treatment is the best option.
- ❖ Choose the gentlest and least invasive methods possible.
- ❖ Is the treatment reversible? Is retreatment possible?
- ❖ Don't use a chemical without understanding its effect on the object and future treatments.
- ❖ Don't falsify the object by using designs or materials that imply the artifact is older than it is.
- ❖ Replication and repairs should be identified as modern so that future researchers are not misled.
- ❖ Use methods and materials that do not impede future investigation.
- ❖ Document all conservation activities and ensure that documentation is available.
- ❖ Use preventative methods whenever possible – be proactive, not reactive.

The AIC Code of Ethics and Guidelines also require a professional conservator provide clients with a written, detailed treatment proposal prior to undertaking any repairs; once repairs or treatments are completed, the conservator must provide the client with a written, detailed treatment report that specifies precisely what was done and the materials used. The conservator must ensure the suitability of materials and methods – judging and evaluating the multitude of possible treatment options to arrive at the best recommendation for a particular object.

These Guidelines of Practice and Code of Ethics place a much higher standard on AIC conservators than individuals or commercial monument companies that offer "restoration services." This higher standard, however, helps ensure that North Cemetery receives the very best possible care and that the treatments conducted are appropriate and safe.

Past Conservation Efforts

As is the case in all cemeteries, some of the previous repairs have used what are known today to be inappropriate materials. Some stones have suffered from the well meaning, but inappropriate treatments (Figure 3-49). Recently, however, the Town of Wayland has taken great efforts to ensure that appropriate conservation treatments were used.

In 2003 Fannin-Lehner Preservation Consultants (2003) were retained to conduct an assessment of the monuments in the Old Section and shortly thereafter Monument Conservation Collaborative (2005) was

retained to conduct treatments in the Old Section at North Cemetery.

These projects establish an excellent standard for the Town.

General Types of Stone Damage

Although a stone-by-stone assessment was only conducted for the Stoney Section, it is possible to provide some general observations concerning the types of problems faced by the monuments in other sections of North Cemetery. These discussions provide general observations that will help place the recommendations in a broader context.

Figure 3-50 shows a tabulation of damage in North Cemetery by section. At the present time over 200 stones in this cemetery require repair. This is nearly 13% of the stones in the cemetery and does not include those with excessive biologicals or those that have been damaged by mowers or trimmers.

The most common damage (representing 31% of the tabulations) is sinkage. This is almost exclusive the result of stones being improperly set coupled with a failure to provide adequate maintenance. This is followed by stones that are loose, representing 27% of the monuments. This problem also originates with the original setting of the monuments, generally the failure to adequately pin individual monument components. The third most common problem is severe tilting – which results from a combination improper setting and a sinking grave. The problem is exacerbated if the monument is not pinned so as it tilts the individual components begin to be displaced and pose a hazard.

Ferrous pins were observed in 6% of the monuments; 6% are also identified as orphans – stones that are no longer associated with their graves. Broken stones account for 5% of the total, along with displaced monuments. Improper cleaning was observed on 2% of the stones in the cemetery.

The damage at these two cemeteries is significant, but is not the worst we have observed. Readers should understand that this damage did not occur in a matter of weeks or months. Rather it reflects decades of inattention.

Sinking and Tilted Monuments

Monuments tend to sink or tilt because they were originally set without an adequate foundation on the grave shaft (Figures 3-51 and 3-52). As a result, as the grave collapsed inward, the monument followed. Of course, some tilting occurs because of maintenance impacts as well.



Figure 3-49. Poor repairs. In the top photo a silicon caulk has been used in an effort to adhere a broken slate stone. In the lower photo a slate stone has been encased in a hard Portland cement.

PRESERVATION ASSESSMENT

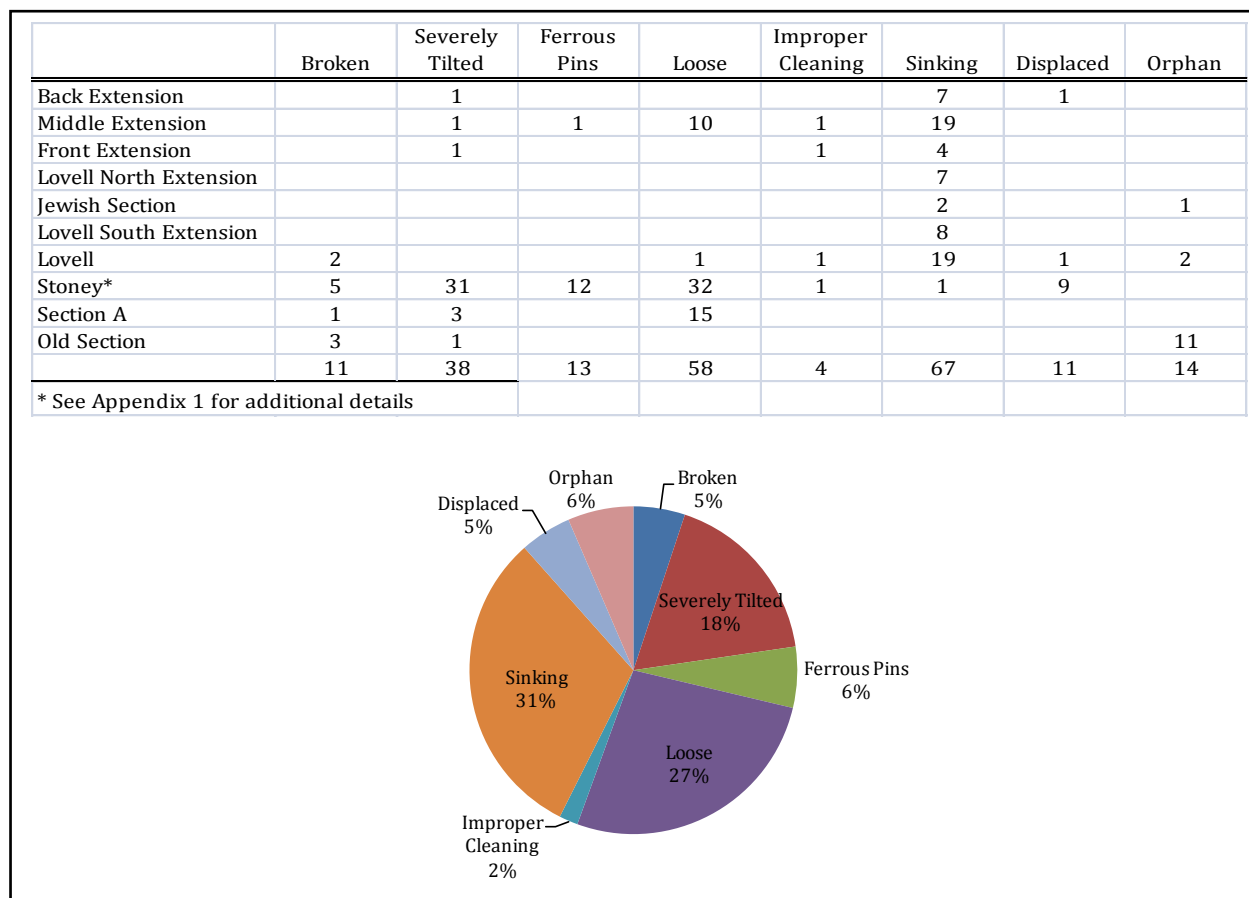


Figure 3-50. Damaged stones and conservation problems in North Cemetery.



Figure 3-51. Examples of damaged stones. Upper row shows severely tilted stones, both the Old Section. Middle row shows sunken markers in the Jewish Section (left) and Lovell Section (right). Lower row shows broken stones in the Old Section (left) and Lovell Section (right).



Figure 3-52. Examples of damaged stones. Upper left shows a stone out the ground (Stoney Section). Upper right shows a broken stone (Stoney Section). Middle left shows a broken sandstone cross with heavy lichen (Stoney Section). Middle right shows unattached die on base (Stoney Section). Lower left shows a cracked slate (Old Section). Lower right shows severe spalling of a slate stone (Old Section).

This is a significant, long-term problem for the Cemetery since as stones sink they become more likely to topple. As they topple not only is the appearance of the Cemetery dramatically altered, but the monuments can present a significant liability to the Town. In addition, as monuments topple they are very

likely to hit coping, walls, or other stones, causing damage to themselves or the objects they hit. This dramatically increases repair costs.

The solution involves the resetting of these monuments, prior to their further collapse.

Simple Resetting

A large number of stones in the cemetery require resetting. Some of these are flush-to-ground lawn markers or tablets that have sunk and are now either tilted or being covered with soil and grass. Others have fallen and are being covered by soil and grass. Resetting is generally simple and a suitable task for volunteers.

The stone should be excavated, being careful to avoid shovel damage. If the monument has been set in concrete, the removal of this material may require a conservator to ensure that the stone itself isn't damaged. Otherwise, the hole can be deepened and filled with decomposed granite as bedding. The lawn marker should be reset about 1 inch above the ground level – tall enough to prevent being covered by soil and grass, but not so tall that it will be damaged by mowing. Tablets should be set with about 25 to 33% of the stone below grade. Additional gravel should be packed in around the stone as it is being leveled. The upper inch of backfill should be soil to allow for revegetation.

It is critical that Portland cement never be used to reset stones since it removes their ability to shift if they are accidentally hit by mowing or other landscape activities.

Resetting Die on Base Stones

All cemeteries have a number of granite or marble die on base stones that were originally set using setting compound, mortar, or often nothing. Setting compound is a commercial product typically consisting of calcium carbonate, talc, and occasionally calcium silicate in linseed oil or a similar material. It is designed to be applied under a granite monument to help seal it to base and prevent water intrusion. Because it contains oil it may leave a halo on marble and should only be used for setting granite monuments. Setting compound is not an adhesive and will eventually dry out. It also does not prevent a monument from being tipped over, so care must be taken when the monument being set is top heavy, very tall, or is in a setting where vandalism is likely. In such cases it is good practice to set the monument not only with setting compound, but also with one or more fiberglass pins.

Marble stones were typically set with a mortar rather than setting compound, although this too is not an adhesive and will often fail.

In order to reset a die on base that is loose or shifted, it is first necessary to remove the die and set it aside. The base then must be checked to determine if it is both stable and level. In many cases it will be necessary to remove the base, establish a new foundation with pea gravel or decomposed granite.

All old mortar or setting compound must be removed from the base and the die. This can usually be accomplished using plastic spatulas or a small chisel. Care must be taken not to disfigure the stone during this cleaning process.

If pins are to be installed holes must be drilled and cleaned in both the die and base. Either fiberglass or stainless steel pins should be inserted that are slightly shorter and smaller than the holes. While they may be set using epoxy or lime mortar, it is often acceptable to leave them loose.

The purpose of these pins is to help secure the base and die, making it more difficult to accidentally (or intentionally) tip a monument over.

If setting compound is being used on granite markers, it should be rolled between your hands to create “strings” 1-2 feet in length and about ½ inch in diameter. These strings should be set about ½-inch inside the edge of where the die will make contact with the base. Poly cushion spaces should be used at the four corners to prevent the setting compound from being expelled when the die is reset.

If the monument is marble, then a lime based mortar (never Portland cement mortar) should be used rather than setting compound. Setting cushions should be used to ensure that the mortar is not forced out by the heavy die.

The stone is then reset and appropriately centered – there are special monument setting devices to assist in this. Setting compound that is pushed out can be cut off using a plastic spatula for later reuse. Excess mortar can be manually removed and then the monument can be cleaned off using a barely damp sponge and fresh water. If there are any gaps, additional setting compound or mortar will need to be used to fill these gaps.

At times the dies were originally set using ferrous pins. This further complicates resetting since these ferrous pins must be removed and replaced with either fiberglass or stainless steel.

Loose Monuments

There are a number of loose monuments throughout the cemetery. These are typically die on base markers where the monument company failed to insert a pin to stabilize the two parts (the die and the base). These monuments remain upright through gravity and consequently pose a significant threat to the public, other monuments, and themselves.

For such monuments we recommend drilling and pinning as described earlier to improve stability and reduce the Town’s liability.

Large Monuments

There are, unfortunately, some large monuments that are severely tilted. Depending on their size, these will require the use of a tripod or small equipment to facilitate resetting. These should be reset by a conservator trained in rigging and using the equipment needed for large, heavy monuments.

Ferrous Pins

North Cemetery exhibit a number of die on base stones joined using ferrous pins. These stones should be given a high treatment priority since, left untreated, the corrosion of the ferrous pins will cause significant spalling, cracking, and breakage of the stones – a process known as “iron jacking.” The corrosion products of these ferrous pins have a greater volume than the original pin and as the corrosion products expand, they crack the stone. Many of these stones already exhibit corrosion staining and cracking.

It is necessary to use diamond core drills to remove the corroded ferrous pins and replace them with either fiberglass or, rarely, stainless steel. Afterwards it is necessary to fill the voids with a natural cementitious composite stone material.

In some cases the iron pins have already caused the stone to spall. Treatment is similar, except that the replacement pins must often be longer and inserted into stone that is still capable of bearing the weight of the monument. Such repairs also necessitate major reproduction of lost stone and therefore are more time consuming and expensive.

Broken Stones

There are at least 11 broken monuments at North Cemetery. Leaving these stones laying on the ground or leaning against other stones subjects them to additional damage, increasing the eventual cost of appropriate repair. Stones on the ground are walked on, may have mowers run over them, and if they are marble or limestone, are subject to greater acid rain damage. It is always critical to erect fallen stones and this simple resetting is an activity that volunteers could undertake.

Adding to the problem there are a few stones that have been improperly repaired, using poor materials and techniques. It is always far easier to conduct an appropriate conservation treatment than to “undo” inappropriate actions, such as simple epoxy repairs or the use of ferrous pins. The use of “simple epoxy” repairs – where stone fragments are joined using a continuous bead of epoxy, are inappropriate except for slate stones. Experience indicates that for a long-lasting repair of marble, particularly in structural applications, use of pins is necessary. Moreover, most adhesives are far stronger than the stone itself, meaning that failure of the repair of marble stones is likely to cause additional damage. The use of ferrous pins has already been discussed.

Appropriate conservation treatment requires a blind pin repair. This drilling and pinning is a process that involves carefully aligning the fragments, drilling the stones, and setting fiberglass, or occasionally threaded 316 stainless steel rod, using a structural epoxy in the drill holes.

Diameters and lengths of pins vary with the individual application, depending on the nature of the break, the thickness of the stone, its condition, and its expected post-repair treatment. The choice of epoxy depends on the required strength, among other factors.

Since there is also usually some loss of fabric along the break, this treatment will also involve infilling areas of loss with a compatible mortar. This consists of a natural cementitious composite stone material resembling the original as closely as possible in texture, color, porosity, and strength. This type of repair may be used to fill gaps or losses in marble.

Under no circumstances should latex or acrylic modified materials be used in composite stone repair. These additives may help the workability of the product, but they have the potential to cause long-term problems. Such products are not appropriately matched in terms of strength or vapor permeability.

More suitable materials include Jahn (distributed by Cathedral Stone) or the lime-based mortars of U.S. Heritage, or a product known as Lithomix. These closely resemble the natural strength of the original stone, contain no synthetic polymers, exhibit good adhesion, and can be color matched if necessary.

Drilling stones is a complex treatment that should only be conducted by a trained conservator. Infill is similarly complex and the Jahn products require certification in their use through Cathedral Stone.

Spalling

We are using this term to cover a variety of problems inherent to slate, including delamination. This problem is caused by a variety of factors.

One is suggested to be seasonal saturation and desiccation in climates with distinct wet and dry seasons. Rainwater infiltrates the stone; where clay minerals are present along cleavage traces the rock can be hydrated, causing expansion. As the stone dries or dehydrates, there is shrinkage. Cracks develop along the cleavage planes, exposing the stone to additional damage.

Another factor thought to affect slate stones set vertically is frost wedging. When water freezes to ice there is an expansion of about 9%. Cycles of freezing and thawing in pre-existing cracks can cause repeated wedging, opening the crack wider and allowing even more water to penetrate.

Just as low temperatures can affect slate, so too can high temperatures through thermal expansion and contraction. Since slates tend to be dark, they absorb solar radiant heat. Studies in Arizona show that asphalt readily reaches temperatures of nearly 160°F in summer. The heated surface of the monument will expand. But slate has a relatively low coefficient of thermal conductivity, so the rock immediately beneath the surface stays cooler. This can result in cracks about 3mm (about 1/8 inch) from the front and back of the stone.

Treatment for various cracking problems typically requires preventing water from reaching the cracks in the stone. In the past this was accomplished by installing lead shields over their tops. Lead could be readily worked around caps, the tympanum, and other features and wasn't too noticeable. It was, however, attractive to vandals and rarely stayed in place very long. Efforts to fill the cracks with some sort of cementitious mortar, such as Jahn flowable grout such as M-40 or one of the Edison Coating products, such as Custom System 45 specifically for slate, have also been used. These products have good adherence, protecting the cracks from rainfall or melting snow. Thus, they reduce penetration and the resulting damage. They do not, however, tend to stay in place for very long. Recently some specialized elastomeric caulks have been tried in an effort to stabilize the treatments.

Cleaning

Many of the stones exhibit relatively dense deposits of lichen (a symbiotic association typically between fungus and green algae). While sometimes viewed as only an aesthetic issue, there are many stones in North Cemetery where the biologicals have become so thick that the carving on the stone is today illegible. These biologicals may damage stone in a variety of additional ways. As lichen and other plants grow, they can exert pressure on the mineral grains, weakening the intergranular structure. Some organisms produce acid compounds that dissolve the calcium carbonate. Some can even etch granite. Many of the lichen and algae allow water to migrate into cracks and crevices of the stone, leading to freeze-thaw damage.

While cleaning is often recommended, inappropriate cleaning can result in a significant amount of damage. We observed multiple examples at North Cemetery where individuals, in an effort to read the stone, have used a coin or other metal object to scrape the surface. This causes damage to the stone surface which often can be removed only by polishing the surface. In another case a pressure washer was inappropriately used causing streaks on the stone (Figure 3-53).

Table 3-5 lists problems with a variety of “common” stone cleaning processes widely used by commercial firms and the public. This information is important to the Parks, Trees, and Cemeteries Division and should also be made available to any families that may inquire about cleaning their specific monuments.

A suitable biocide for cleaning stones is D/2 Biological Solution ([http:// d2bio.com/](http://d2bio.com/)) available from a variety of conservation suppliers. Stones should always be prewetted prior to application of D/2, and after dwelling for a few minutes followed by gentle scrubbing, should be flushed from the stone.

It would be useful for volunteers to be trained in appropriate cleaning and the worst monuments (those whose inscriptions are illegible) be cleaned using D/2. We do not recommend cleaning more than once every 3 to 5 years.



Figure 3-53. Cleaning Issues. Upper left photo shows typical extensive development of lichen on many stones at North Cemetery. Upper right and lower left both illustrate improper efforts to clean just names, probably for genealogical research. Lower right photo shows a marble stone incorrectly cleaned with a pressure washer (notice the streaks, especially on the left side of the die).

Table 3-5. Comparison of Different Cleaning Techniques.

Cleaning Technique	Potential Harm to Stone	Health/Safety Issues
Sand Blasting	Erodes stone; highly abrasive; will destroy detail and lettering over time.	Exposure to marble dust is a source of the fatal lung disease silicosis.
Pressure Washers	High pressure abrades stone. This can be exacerbated by inexperienced users. Pressures should not exceed 90 psi.	None, unless chemicals are added or high temperature water is used.
Acid Cleaning	Creates an unnatural surface on the stone; deposits iron compounds that will stain the stone; deposits soluble salts that damage the stone.	Acids are highly corrosive, requiring personal protective equipment under mandatory OSHA laws; may kill grass and surrounding vegetation.
Sodium Hypochlorite & Calcium Hypochlorite (household and swimming pool bleach)	Will form soluble salts, which will reappear as whitish efflorescence; can cause yellowing; some salts are acidic.	Respiratory irritant; can cause eye injury; strong oxidizer; can decompose to hazardous gasses.
Hydrogen Peroxide	Often causes distinctive reddish discolorations; will etch polished marble and limestone.	Severe skin and eye irritant.
Ammonium Hydroxide	Repeated use may lead to discoloration through precipitation of hydroxides.	Respiratory, skin, and eye irritant.
D/2 Architectural Antimicrobial	No known adverse effects, has been in use for nearly 15 years.	No special precautions required for use, handling, or storage.

Iron Objects

There are two cast iron markers, remnants of a plot chain, and multiple iron vault doors and hinges (Figure 3-54). At the present all of these objects appear stable. They would nevertheless benefit from limited treatment.

It did not appear that any of the iron objects exhibit remaining paint. This is a perfect situation for light brushing to remove loose corrosion followed by the application of Rust-Oleum Rust Reformer®. This product has been tested by the Canadian Conservation Institute, including exposure to very harsh salt spray and was one of their top three best performers (it is, today, the only formulation still available). Rust Reformer® is a conversion process that stabilizes the corrosion products and serves as a primer. This product cures to a blue-black color.

It should be top coated with Rust-Oleum High Performance Protective Enamel® in flat white followed by a final top coat of flat black 24 hours later. This is a quality assurance process since any areas missed by the flat white will immediately be identified by the undercoat of black Rust Reformer®. Similarly any areas missed by the application of final top coat of flat black will immediately be recognized by the underlying white paint.

Paint application should be by brush, producing an initial dry coat of 1-2 mils (the wet build-up is typically twice this). If airless sprayers must be used there will be much overspray, requiring much larger amounts of paint. In addition, all vegetation and all stones within the plot – and all immediately adjacent plots – must be fully wrapped in plastic to prevent damage from drift. The requirement for additional paint and the time required to wrap vegetation and monuments will significantly increase the cost of the work.



Figure 3-54. Iron objects in North Cemetery. Upper left photo shows the two cast iron markers in the Old Section. Upper right shows a portion of the chained plot in the Stoney Section. The lower two rows show four of the five iron doors on vaults in the cemetery.

The Vaults

It does not appear that the vaults have been inspected in a very long time, if ever, as all of them were welded shut in 1950. Welding is a very poor security approach since it prevents the Town from

determining the condition of the roofs and determining what intervention may be necessary without great effort to break the welds.

Nevertheless, vaults such as these with soil over them can develop significant leaks that will compromise the stone work or masonry and could eventually cause collapse of the vault. This is not only a liability to the Town, but it would represent an extraordinary loss of historic fabric. It is critical that the vaults be inspected on a basis of at least once every decade, with repairs, if necessary, performed as a priority.

The opening of the vaults would also offer the opportunity to better conserve the iron hardware, ensuring that both front and back were treated and that bent portions were straightened. Any damage from the welding could also be repaired and a new locking system devised, allowing for easier inspections in the future.

The opening of the vaults should include an archaeologist, conservator, and possibly a structural engineer.

Recommendations

- The Parks, trees, and Cemeteries Division must require that all work performed in the cemeteries on monuments, vaults, or walls be conducted or overseen by a trained conservator who subscribes to the Guidelines for Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC).
- While additional stone-by-stone assessments would refine our understanding of treatment issues in the Cemetery, this broad assessment identified over 200 stones that require treatment.
- The cleaning of the worst soiled stones in the Cemetery using D/2 Biological Solution should be undertaken by volunteers. This will dramatically improve overall appearance and provide a very visible improvement to the cemetery landscape.
- There are iron objects in the Cemetery that should receive priming and painting as a high priority.
- The vaults in the cemetery pose potential hazards to the public and should be inspected every 5 to 10 years by a conservator, archaeologist, and possibly a structural engineer. It will be necessary to break the welds on the vault doors and a better system of securing the vaults should be identified.

3.10 Priorities

Many municipalities or caregiver groups seem inexplicably out of touch with the problems facing their cemeteries. In the case of North Cemetery, the Town seems to have focused on the obvious, such as “repair of historic stones,” “repair of lots, granite boundaries,” and “cleaning of stones.” All of these actions are necessary and we fully support them, but they do not fully tackle the fundamental issues

Perhaps the most troubling issue we observed is that while the Historic Commission desires to improve conditions at Wayland’s historic North Cemetery, those responsible for the cemetery’s maintenance have not bought into this effort and appear satisfied with “business as usual.” Unfortunately, “business as usual” based on our independent professional assessment is causing damage to the cemetery and detracts from the property’s historic significance.

Secondary in importance is that the Parks, Trees, and Cemeteries Division has fallen into a trap of

offering an absence of funding as a fundamental excuse for issues at North Cemetery, rather than attempting to identify additional sources of funding. This seems to be internal issue since not only has the budget been cut, but the Division failed to spend all of the funds that it had.

Thus, an essential recommendation is to change the culture of the Town's Parks, Trees, and Cemeteries Division, opening it to new approaches and new ways of achieving maintenance of the community's exceptional cemeteries.

The long-term prognosis for the cemetery is entirely dependent on the actions taken by the Historic Commission to push forward the need for additional funding and a focus on operating the cemetery in a proactive and professional manner. Actions must be carefully formulated and designed to make substantive changes and promote long-term preservation. Most critically, these preservation efforts will require substantial allocations of funds.

Recommended Priorities

It is our professional view, based on the questionnaire responses, considerable research, three-days on-site, and several meetings that the five fundamental needs of North Cemetery are:

1. An improved understanding of how historic properties must be maintained.

The Historical Commission must work to educate the Department of Public Works and others in Town government of how historic properties must be treated, focusing on issues such as the Secretary of Interior's Standards for Preservation and the importance of only using trained conservators. In addition, the Historical Commission must seek to help the Town understand why the cemetery deserves the additional care we recommend, pointing out the fragility of the resource, as well as its heritage tourism potential.

2. Improved maintenance operations.

The most beneficial change would be assigning at least two maintenance staff to full-time maintenance of North Cemetery. These individuals would be on-site 5 days a week, 12 months a year.

These individuals would be responsible for far more than mowing – although we recommend that the use of large deck mowers be eliminated in favor of smaller mowers likely to do less damage. This staff would be responsible for weed control, tree trimming, pruning, seasonal cleanup, conducting section inspections, survey of monuments for maintenance needs, rehabilitation of barren areas, raking, resetting stones as needed, inspecting and repairing fences, watering newly planted areas, sodding as necessary, identification of trees for removal, removal of flowers and grave decorations, and removal of wild growth.

3. Signage at the Cemetery.

While signage seems to be a relatively small concern, we view it as necessary for the Town to fully take ownership of these cemeteries and inform the public that there are clear rules and regulations for these historic resources, just as there are for other historic properties in the community.

However, it is also important for the rules and regulations to be consistent from one publication to another and to be readily understandable. Moreover, it is critical that the Town begin enforcing

the rules and regulations it promulgates. Failure to ensure the rules is tantamount to having no rules.

4. Conservation treatments of monuments, walls, iron work, and vaults.

In the past it seems that the Town has focused on “monuments” to the exclusion of other resources, such as the vaults, the collapsing stone walls, and iron plaques. All of the cemetery’s resources are equal in importance and require the community’s attention.

It is also important to understand that repair of monuments must be ongoing, especially until more gentle and appropriate landscape maintenance practices are adopted. Conducting an assessment and performing repairs in a particular section does not mean that section is “fixed” and can be ignored. There must be constant monitoring and re-evaluation of repair strategies.

5. Recognize that the Cemetery must be adequately funded.

None of the actions outlined here can be achieved without funding. Wayland is an exceptionally wealthy community, ranked third for wealth in Massachusetts, with a median family income of \$204,033. It seems unlikely that Wayland cannot afford to appropriately protect and maintain its historic cemeteries.

But even if there is considerable agreement concerning what needs to be done, it is often difficult to prioritize all of the actions necessary to achieve those goals. It is also easy to become distracted as other problems occur. Assigning a permanent staff to the cemetery will help combat some of this distraction since there will be individuals consistently responsible for the condition and appearance of the cemetery.

Table 3-6 lists the recommendations offered throughout this assessment, classifying them as an *organizational need*, a *first priority*, a *second priority*, or a *third priority*.

Organizational needs are rules, policies, or procedural issues that can be quickly resolved by either the Selectmen, the Public Works Board or the Director of the Parks, Trees, and Cemeteries Division. These organizational needs require little or no funding, but do demand a philosophical change in how the cemetery is operated. They must be enacted as a foundation upon which other changes are constructed. We strongly believe that most cemetery projects fail through inadequate or inappropriate planning – thus, we recommend in the strongest possible terms that the Town of Wayland engage in the necessary planning to help ensure success.

First priorities are those we recommend undertaking during the coming fiscal or calendar year (2016). Some are issues that have the potential to affect the public health and safety and consequently require immediate attention.

Second priorities are those that should be budgeted for over the next 2 to 3 years (2017-2018). They represent urgent issues that, if ignored, will result in both significant and noticeable deterioration of the two cemeteries as historic resources.

Third priorities are those that may be postponed for 4 to 5 years (2019-2020), or alternatively, may require 3 to 5 years to see fruition. They are issues that can wait for appropriations to build up to allow action. Some actions are also less significant undertakings that require other stages to be in place in order to make them feasible or likely to be successful. Although they are given this lower priority they should not be dismissed as trivial or unimportant.

Table 3-6. Prioritization of Recommendations.

Priority	Action	Notes
Organizational	0.1 A joint meeting of the Parks, Trees, and Cemeteries Division with the Historical Commission should be devoted to a careful review of the Secretary of Interior Standards. The caregivers should focus on a fuller understanding of how daily operations affect the long-term preservation of the cemeteries, making necessary adjustments to current policies and procedures. A presentation should then be prepared for the Board of Selectmen outlining critical budgetary and operational modifications.	
	0.2 The Parks, Trees, and Cemeteries Division should prepare a disaster plan to cover events such as tornadoes and other weather emergencies, as well as more routine events such as vandalism and tree damage.	
	0.3 The Town should begin integrating additional community activities at North Cemetery in order to increase visitation and support. Within two or three years several activities per month should be sustainable.	
	0.4 It is critical that the various rules and regulations be simplified and revised to reflect a standard and consistent format. All versions should be replaced with the revised rules.	
	0.5 The Town should work to develop a heritage tourism model integrating the North Cemetery and making it more attractive to visitors.	
	0.6 The Town should consider wider roads in the yet to be developed sections to allow for visitor parking.	
	0.7 The Town should develop a written inspection and preventative maintenance program for the cemetery roads to minimize the need for future reconstruction.	
	0.8 Snow plowing of the cemetery roads should be eliminated or conducted only in the event of a necessary funeral.	
	0.9 Deicing compounds should be eliminated from within the cemetery with the possible exception of use on the steeply sloping entrance road.	
	0.10 All future modifications should explore accessibility issues in an effort to maximize access by all citizens.	
	0.11 Should pathways become necessary because of increased heritage tourism activities, a grass reinforcement system is likely the least intrusive and most effective approach.	
	0.12 The Town must accept responsibility for all damage occurring to monuments in excess of 50 years old since it is likely for most there is no surviving family.	
	0.13 The Town must develop a formalized mechanism for identifying and reporting vandalism specific to the cemetery setting.	Form Provided

Table 3-6. Prioritization of Recommendations continued.

Priority	Action	Notes
Organizational, continued	0.14 The Town must enlist the assistance of the Police Department to conduct routine patrols of North Cemetery.	
	0.15 The Parks, Trees, and Cemeteries Division staff must visit North Cemetery at least twice daily.	
	0.16 Adjacent neighbors must be enlisted to help watch over the cemetery.	
	0.17 A volunteer group should be formed to periodically visit the cemetery to ensure a public presence and help report any problems.	
	0.18 The Parks, Trees, and Cemeteries Division should develop a specific plan for dealing with homeless issues in the cemetery.	
	0.19 The Town should not allow the introduction of benches, urns, or vases in the cemeteries.	
	0.20 The introduction of new memorials must be very carefully monitored and limited. New monuments should be allowed only when the historic monument is no longer legible. In such cases, the original monument must remain and a new flush marker with the precise language of the original marker erected as a flush-to-ground lawn marker.	
	0.21 New monuments marking new burials in older sections should match existing markers in size, material, and design. If this is not possible, then new markers should be limited to gray granite. Preferably any new marker should be erected as a lawn marker flush to the ground.	
	0.22 Brass signs or emblems should not be allowed to be mounted on markers over 50 years in age. They may be set flush to the ground on granite lawn markers.	
	0.23 It is essential that there is an on-the-ground supervisor for all cemetery work. Remote supervision and delegation does not provide appropriate quality control or job oversight.	List provided
	0.24 It appears that staff training is currently inadequate. The Town should require and support staff certifications through PLANET or similar landscape professional organizations as part of a continuing education program.	
	0.25 Only fertilizers with very low salt indices should be used in the cemetery. The best choice are organic fertilizers.	
	0.26 All trees removed from the cemetery should be replaced with trees of at least 1-inch caliper that meet the minimum requirements of the American Nursery and Landscape Association's American Standard for Nursery Stock (ANSI Z60.1-2004). Replacement trees should have water bags and should be carefully protected from mowing or trimmer damage.	

Table 3-6. Prioritization of Recommendations continued.

Priority	Action	Notes
Organizational, continued	0.27 The Town must either enforce its rules regarding the planting of shrubs by plot owners or abandon the rules entirely.	
	0.28 The Parks, trees, and Cemeteries Division must require that all work performed in the cemeteries on monuments, vaults, or walls be conducted or overseen by a trained conservator who subscribes to the Guidelines for Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC).	
	0.29 The Town should consider closing the informal pathway between the cemetery and the adjacent property owner.	
First Priority (2016)	1.1 The Town should increase the cost of burial plots and burial fees to make them commensurate to those found in nearby towns and commercial facilities.	
	1.2 The cemeteries (including North Cemetery) should receive a line-item budget allocation commensurate with their needs and the special care that they require. This will require a substantial increase in the budget allocation.	
	1.3 The Town should install roadside snow plow markers to ensure that plowing does not damage the turf or adjacent monuments.	
	1.4 The south entrance gate area in the Old Section requires resodding to control erosion.	
	1.5 Because of extensive deferred maintenance, approximately 160 linear feet of the stone wall on the south side of the Old Section requires complete rebuilding. An additional 57 linear feet require removal of inappropriate Portland cement pointing. Only a Certified Journeyman Drystone Mason should be retained to perform this work. Under no circumstance should the use of any mortar be allowed in the repair of this wall.	
	1.6 The North Cemetery and the other Town cemeteries are significantly understaffed and underserved. At least two full-time maintenance workers are required for North Cemetery. For all of the Town's cemeteries a full-time staff of one supervisor and four workers is required.	
	1.7 The cemetery exhibits a variety of serious tree problems, many that pose a hazard to both the public and the monuments. It is critical that an ISA Certified Arborist be retained to inspect all of the trees, remove those that pose significant risk to monuments, and prune all of the trees in the cemetery.	
	1.8 Care must be taken to avoid mowing or damaging historic plantings in the cemetery.	
	1.9 Many stones in the cemetery are being needlessly damaged by the use of mowers that are too large. These problems are exacerbated by a lack of adequate supervision. We recommend that the smallest deck mowers possible be used, entirely eliminating the current 72-inch deck mowers.	

Table 3.6. Prioritization of Recommendations continued.

Priority	Action	Notes
First Priority, continued	1.10 All mowers must have closed cell foam bumpers installed. These must be replaced as needed. Operators with excessive wear on the bumpers should be given remedial training and instruction.	
	1.11 Mowing should never be closer than 12-inches to a stone.	
	1.12 Mowing must be conducted with sufficient frequency to maintain turf at a height of about 2½ to 3½ inches.	
	1.13 Trimmers should use line no heavier than 0.065-inch. If this is not feasible with the trimmers being used, then the lightest weight line available for that equipment should be used.	
	1.14 The current identification signage is not attractive and its location on a vault is problematical. The signage should be removed and relocated elsewhere at the entrance. We also recommend that the signage be redesigned to be more suitable for a cemetery.	
	1.15 The Cemetery requires a combined identification and regulatory sign placed the entrance. An example of one possibility has been provided.	
	1.16 "Orphan" stones should be documented using a form and collected for short-term safe keeping until their appropriate location is identified through research. In so far as possible, stones should not be allowed to become disassociated with their graves as this effectively loses the grave location.	Form Provided
	1.17 The cleaning of the worst soiled stones in the Cemetery using D/2 Biological Solution should be undertaken by volunteers. This will dramatically improve overall appearance and provide a very visible improvement to the cemetery landscape.	
Second Priority (2017-2018)	1.18 There are iron objects in the Cemetery that should receive priming and painting as a high priority.	
	2.1 The water meter device should be removed from the entrance gate column.	
	2.2 About 80 linear feet of the woven wire fence along the southern side of the Old Section requires extensive repair, including painting with a zinc-rich paint. It is likely that the entire 200 linear feet will require new woven wire fencing be installed. Under no circumstance should chain link fencing be installed.	
	2.3 The cemetery soils require liming and likely fertilization. This work should be incorporated with core aeration.	
	2.4 An ISA Certified Arborist should evaluate the need to provide fertilization to the mature trees in the cemetery.	
	2.5 Animal burrows must be filled in at least monthly.	
	2.6 The garden on top of the vault should be removed and the vault resodded.	

Table 3.6. Prioritization of Recommendations continued.

Priority	Action	Notes
Second Priority, continued	2.7 Trash observed on the slope north of the Back Section should be removed.	
	2.8 Plot curbs or coping throughout the Cemetery are in deteriorating condition. The repair of these curbs must be viewed as routine maintenance and must be integrated into the maintenance plan.	
	2.9 Drains present in the cemetery must be maintained. This includes not only removing leaves and debris on a regular basis, but also ensuring that water can access the drain and there is no localized flooding in the cemetery.	
	2.10 The vaults in the cemetery pose potential hazards to the public and should be inspected every 5 to 10 years by a conservator, archaeologist, and possibly a structural engineer. It will be necessary to break the welds on the vault doors and a better system of securing the vaults should be identified.	
	2.11 The Town should post the cemetery speed limit at the entrance to the property.	
Third Priority (2019-2020)	3.1 Curbs on the entrance road are showing cracks and the Town should develop a plan for their maintenance and repair.	
	3.2 Research should be conducted in an effort to document the lost gates in the interest of future replacement. If it becomes possible to document the three lost gates, the gates should be recreated and reset. However, no gates should be installed without clear and convincing historic documentation.	
	3.3 Given the soil conditions and the extensive weeds, consideration should be given to a section-by-section renovation of the cemetery turf in order to establish a good quality turf. This would improve the appearance of the cemetery and may potentially reduce mowing.	
	3.4 The current roadside historical marker and boulder markers can be left in place, but the Town should consider adding modern interpretative signage that promotes an interest in the Cemetery.	
	3.5 A more appropriate trash container should be more centrally located to encourage its use. It should not, however, block or detract from the historic landscape.	
	3.6 Consideration should be given to removing the concrete block building and using the area for interpretative signage. If the building cannot be removed, it should be carefully shielded from view within the cemetery using plantings.	
	3.7 The spoil pile is an eyesore and should be moved to a more distant location in the cemetery. If this is not possible, the area should be carefully screened from view within the cemetery.	

Within these four categories, the individual items are not ranked, as all are essentially equal in importance.

It is likely that some of these recommendations will not be achievable in the five years allotted for this plan. That does not mean that the issues will no longer be of consequence or will not still be critical for the survival of North Cemetery. What it does mean is that after 5 years we recommend sitting down and re-evaluating what has been achieved, what still needs to be done, and determine how to move forward.

Where appropriate, we note that some actions may be suitable for volunteers. We typically do not provide cost estimates since these vary so dramatically from location to location. In addition, costs depend on whether actions are contracted out or conducted in-house. There may also be activities that can be facilitated by other governmental entities with no direct costs.

4.0 GROUND PENETRATING RADAR SURVEY

When physical features are obscured or otherwise disturbed in a cultural landscape, every effort should be made to determine what remains of the original features and design, detail how the landscape has changed, and then determine how what remains (both above and below ground) can best be preserved. A ground penetrating (GPR) survey provides a non-destructive means to permanently document potential areas of concern. Therefore a GPR survey was included in the Preservation Management Plan to answer site-specific questions that were of interest to the historical commission and the town including the location of the original meeting house in the Old Section, information about the Indian Burial Ground in the Middle Extension, and information about a former palisade in Section D. The survey was conducted during November, 2014 and April, 2015. A 400 MHz antenna, which has a typical depth range around 9 to 12 ft depending on the soil conditions, was used for the survey (Figure 4-1).



Figure 4-1. Photo of GPR equipment.

This section of the Preservation Management Plan will be divided into three sub sections: Old Section, Middle Extension and Section D. Each section will contain the following information: purpose of the investigation, the methodology employed, an explanation of the results of the data processed by Mr. Kempton followed by an interpretation of those results in light of the documentary research.

Mr. Kempton's full report, which also provides a basic discussion of GPR including its benefits and limitations, is presented in Appendix A.

4.1 The Old Section and the Original Meeting House

While there is a boulder with a plaque in North Cemetery noting the location of Sudbury's original meeting house, it is unclear how that information was obtained. Indeed the landscape appears as a square area that has been filled (Figure 4-2). As there were three meeting houses constructed within the Old Section in the seventeenth century and there are several large open area areas within this section of the cemetery, the GPR survey was designed to cover as much of the open area as practicable.

Seven survey grids were configured to cover the largest areas with minimal headstone obstruction (Figure 4-3). Grids 1 through 5 were surveyed in November of 2014 and Grids 6 and 7 were surveyed in April of 2015 to further refine the results of the November survey.



Figure 4-2. Photo of the boulder with plaque identifying the location of the first meeting house.

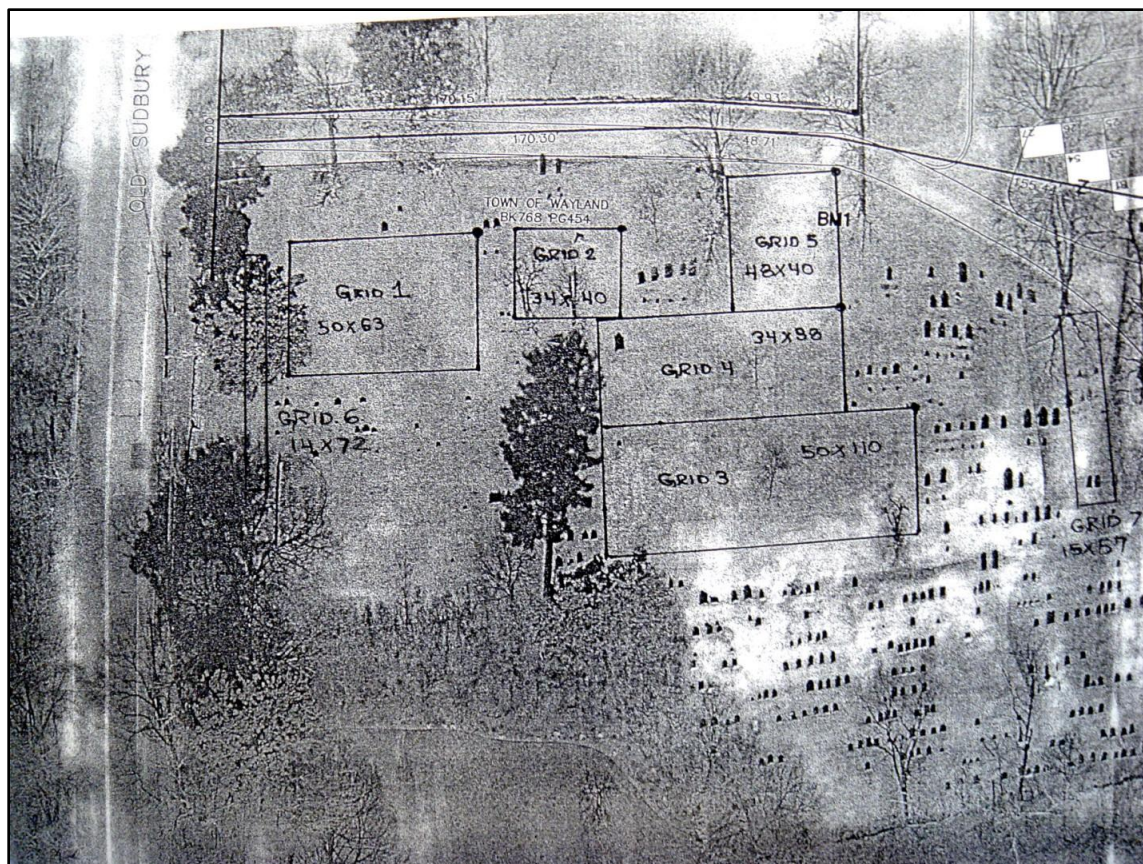


Figure 4-3. Approximate locations of the seven grids surveyed in the Old Section.

The results of the November 2014 survey

The five grids surveyed in November were of varying size (Figure 4-4).



Figure 4-4. Photo of Mr. Kempton laying out Grid 5.

Grid #1 x,y,z grid. x=63 feet, y=50 feet, z=7 feet (depth of scan).

Grid #2 x,y,z grid. x=40 feet, y=34 feet, z=7 feet (depth of scan).

Grid #3 x,y,z grid. x=110 feet, y=50 feet, z=7 feet (depth of scan).

Grid #4 x,y,z grid. x=88 feet, y=34 feet, z=7 feet (depth of scan).

Grid #5 x,y,z grid. x=40 feet, y=48 feet, z=7 feet (depth of scan).

Grid 1 revealed a large subsurface anomaly at a depth of 10 inches continuing to 22 inches. The anomaly is interpreted to be soil disruptions typical of structure construction. There is minimal linearity due to soil migration and mixing over time. Nonetheless, the scan image shows a soil disruption that can be estimated to be around 25 x 30 feet (Figures 4-5 and 4-6).

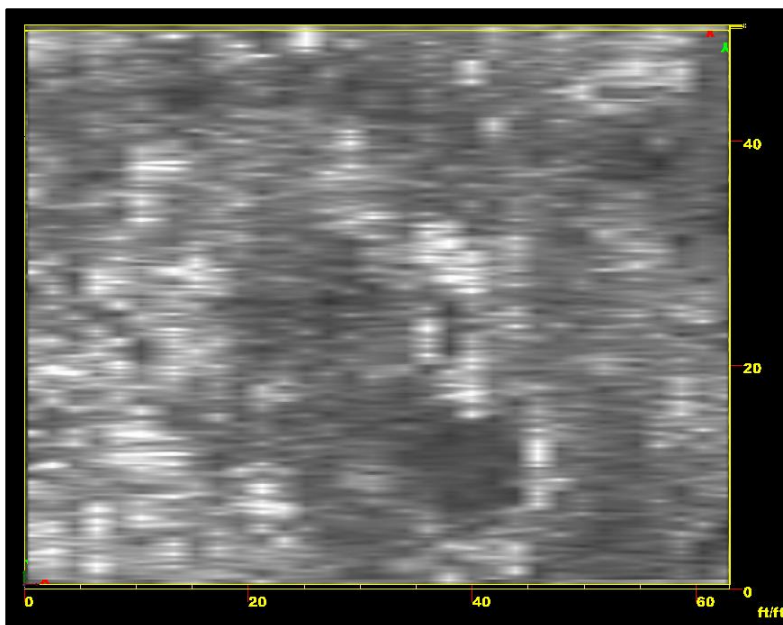


Figure 4-5. Unmarked area of soil disruption in Grid 1.

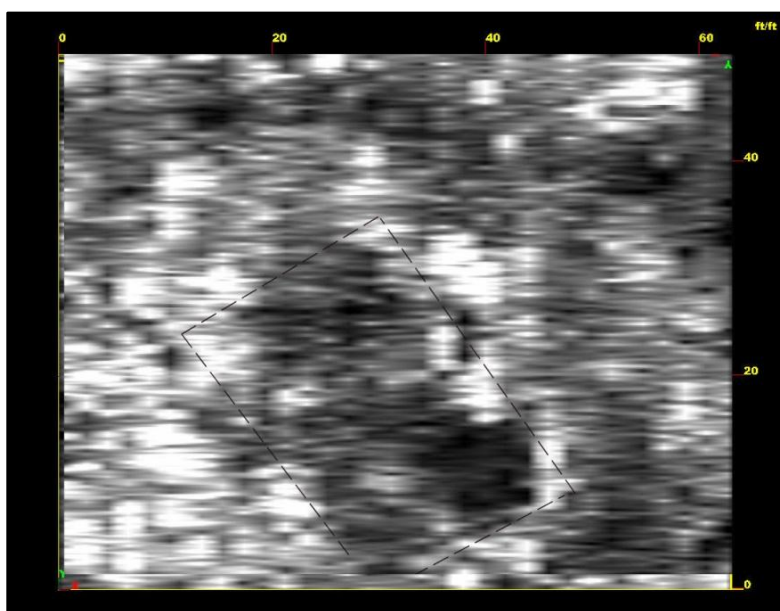


Figure 4-6. Marked area of soil disruption, area of structure, inferred by filled-in soils in Grid 1.

GROUND PENETRATING RADAR SURVEY

Grid 2 is the area currently marked with a large stone and metallic plaque referencing the location of the first meeting house. Scans of this area did not reveal any soil anomalies associated with construction artifacts but did reveal two unmarked graves (Figure 4-7).

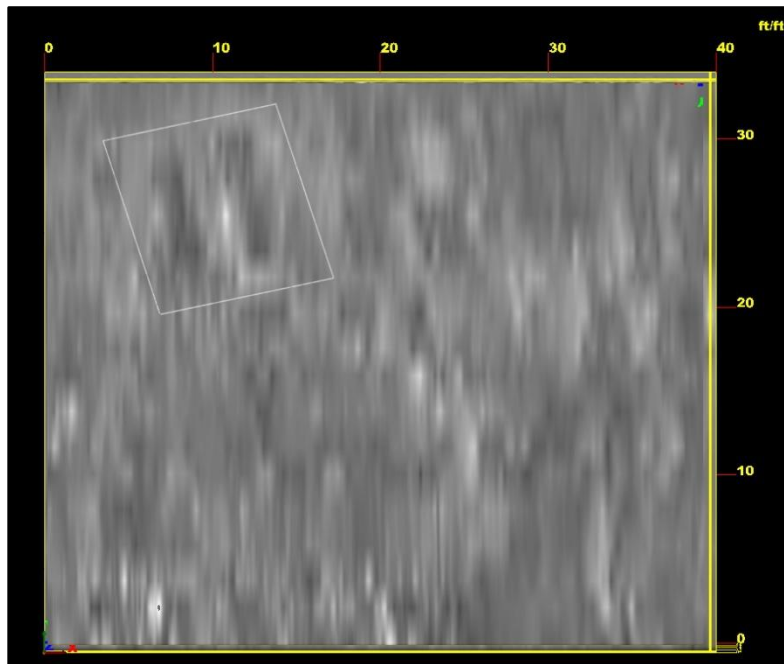


Figure 4-7. Marked location of 2 unmarked graves in Grid 2.

Grids 3 and 4 represent the two largest surveyed grids conducted at the North Cemetery (Figure 4-8). The purpose of these two grids was to look for evidence of possible foundations or structural artifacts. Multiple unmarked graves were revealed in the scans but no structures or evidence of structure excavations were seen (Figures 4-9 and 4-10).



Figure 4-8. Mr. Kempton surveying Grid 4, Grid 2 in background to the left.

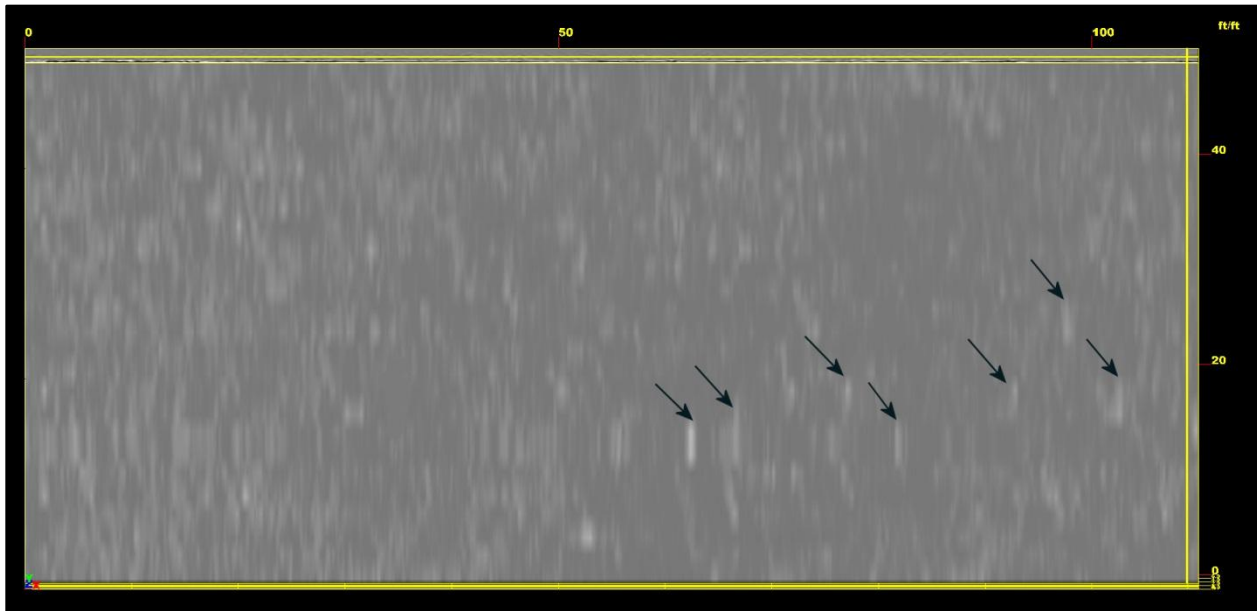


Figure 4-9. Unmarked graves in Grid 3.

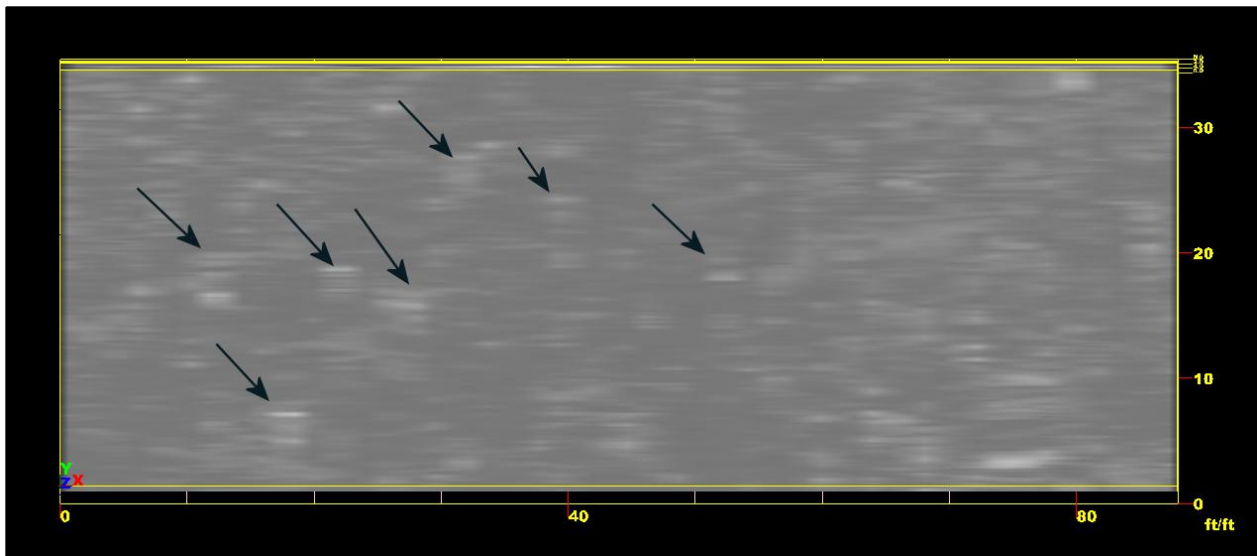


Figure 4-10. Unmarked graves in Grid 4.

Also revealed in the Grid 3 and Grid 4 scans is an unknown and undocumented pathway. Soil interface differences and compaction can reflect GPR signal returns differently than soils with undisturbed stratigraphy. The pathway is located at approximately 6 to 8 inches below surface and continues through Grid 3 and 4 (Figures 4-11 and 4-12).

Grid 5 proved to be featureless, no soil disturbances could be resolved by radar (Figure 4-13).

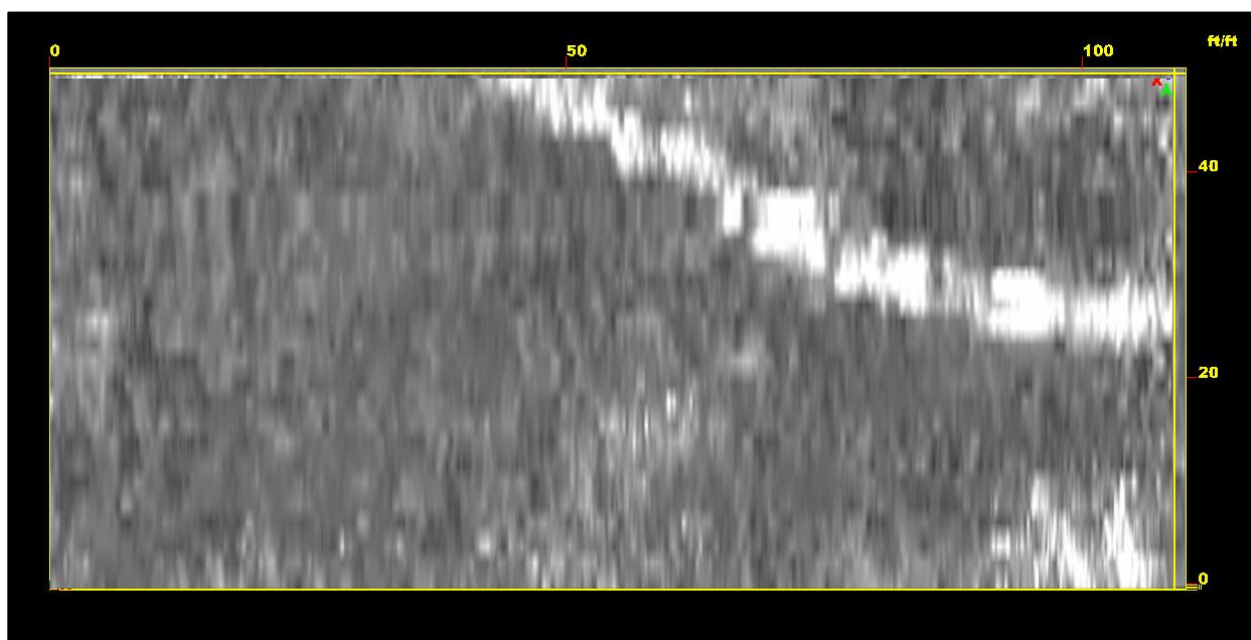


Figure 4-11. Pathway in Grid 3.

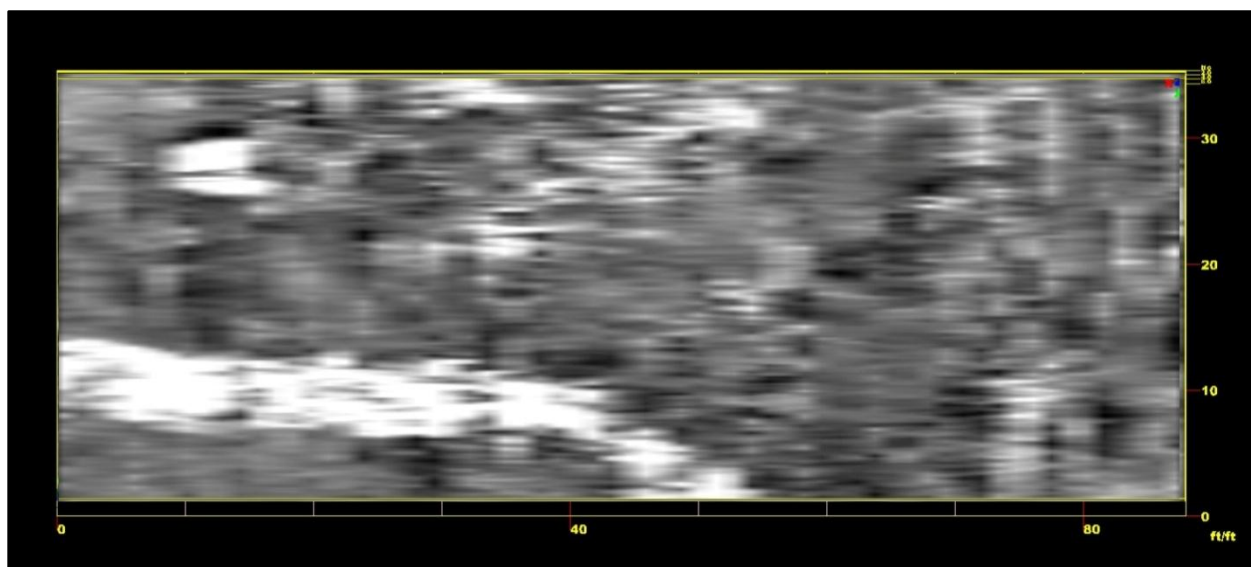


Figure 4-12. Pathway in Grid 4.

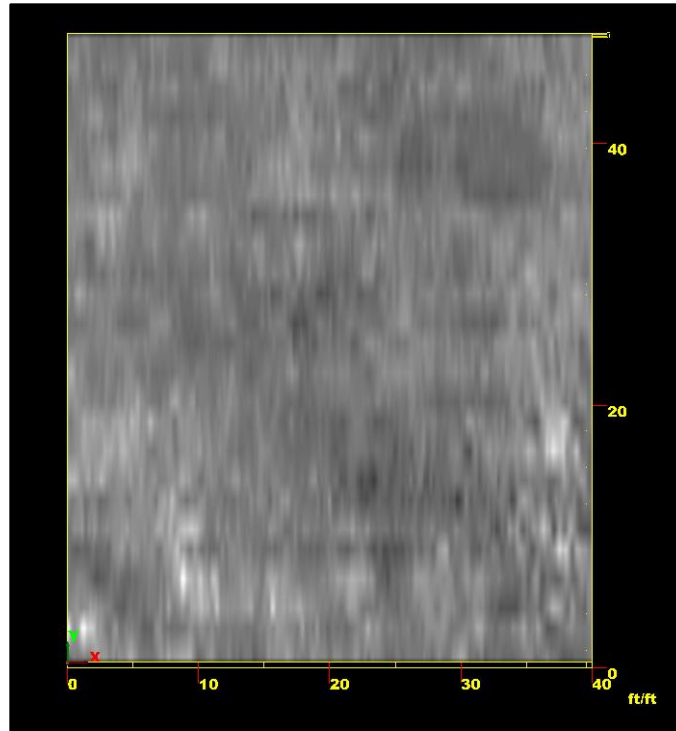


Figure 4-13. Grid 5 showing no features.

The Results of the April 2015 Survey

In April of 2015 two additional scans were conducted to further refine the understanding of the cemetery history. Specifically the goal was to add to the pathway information for future interpretation. Grid 6 and Grid 7 were conducted in an attempt to discern a beginning and end of the pathway.

The two grids surveyed in April were of varying size (see Figure 4-3)

Grid #6 x,y,z grid. x=15 feet, y=57 feet, z=7 feet (depth of scan).

Grid #7 x,y,z grid. x=14 feet, y=72 feet, z=7 feet (depth of scan).

Data from Grid 6 does show the pathway continuing to the front edge of the cemetery by Old Sudbury Road (Figure 4-14) and possible terminating in the lower left of Grid 7 (Figure 4-15). While the image in Grid 7 is rather ephemeral the soils, compaction reflection and depth are consistent with the data in Grids 3, 4, and 6.

In conclusion, the locations of many unknown graves are presented in several grids along with a soil anomaly consistent with the believed size of either the First Meeting House or the Second.

The undisturbed soil stratigraphy of many grid areas that were scanned rule them out as to possible locations of prior structures.

A previously unknown pathway of unknown age has been revealed in Grids 3, 4, and 6. The end of the pathway appears to be in Grid 7.

A huge amount of data was collected and presented in this survey and some of the images are clear and striking. They will hopefully be contributory in refining the understanding and past usage of the North Cemetery.

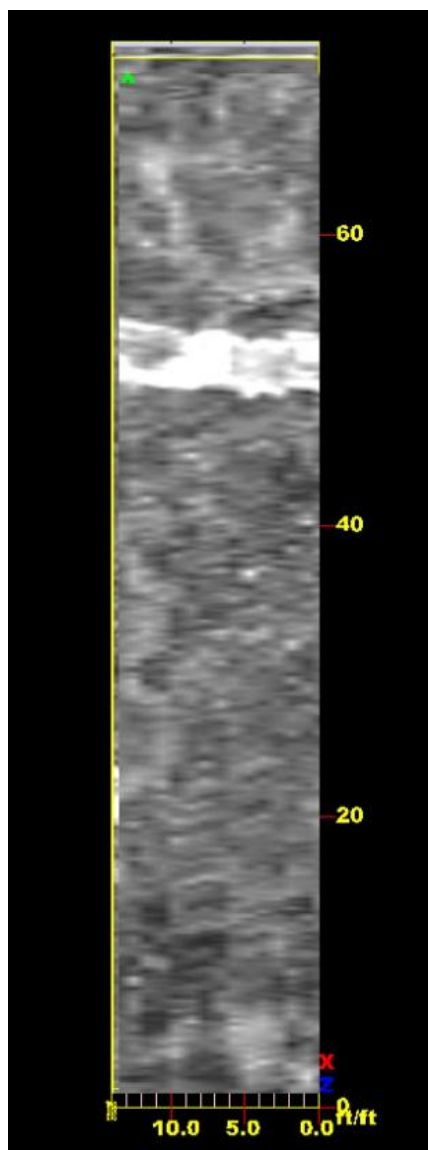


Figure 4-14. Grid 6 by Old Sudbury Road.

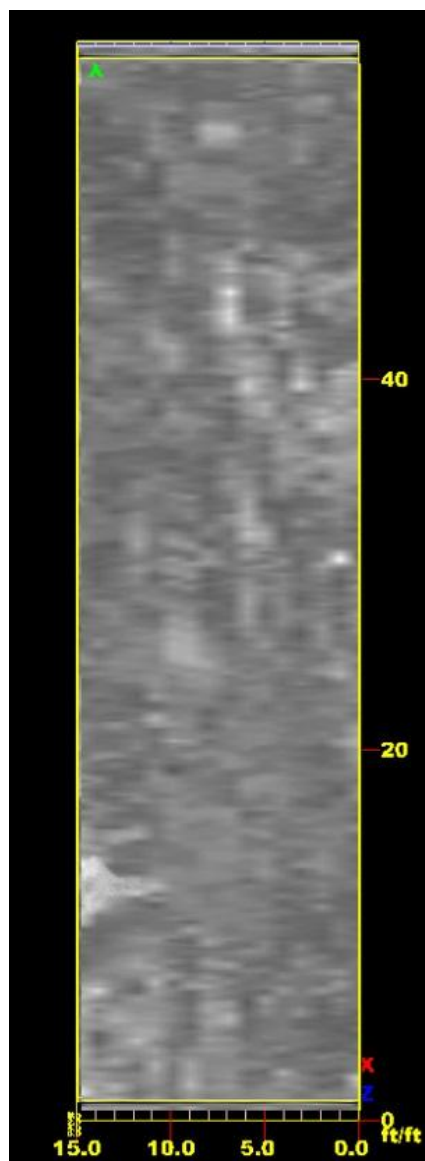


Figure 4-15. Grid 7 opposite Stoney Section.

Figure 4-16 presents a composite overlay of all grid scans to better present the information.

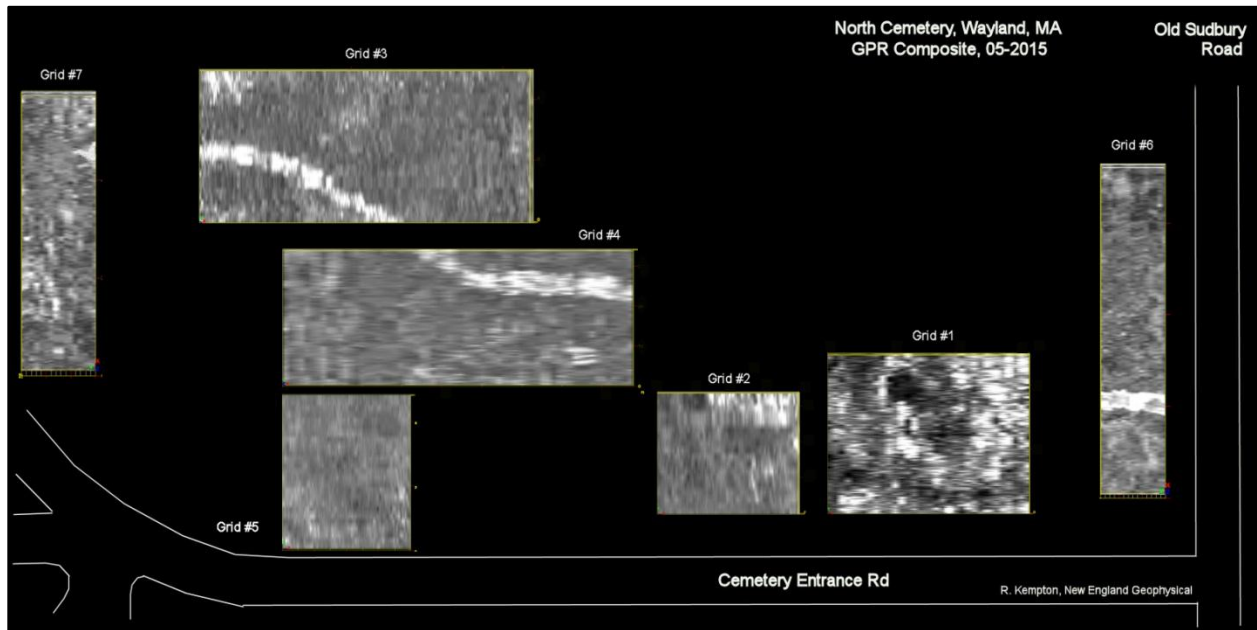


Figure 4-16. Composite of grids scanned in the Old Section of North Cemetery.

Interpretation of GPR Results in the Old Section

During the seventeenth century there were three meeting houses constructed within what is considered today the Old Section, specifically within the $\frac{1}{2}$ acre located near Old Sudbury Road, formerly the County Road. It remains unclear where the boundary between the burying ground by the meeting houses and the 1800 addition of “ $\frac{1}{2}$ acre plus $\frac{1}{2}$ of a quarter acre” is located, the boundaries of the addition suggest it was an interior parcel that was not adjacent to the road. While seventeenth-century town records revealed a lot of detail regarding the construction of each of the meeting houses, no definitive information was given about their location. There are several clues within town records though to help interpret the results of the GPR survey.

First it must be realized that features on today’s landscape may not necessarily represent former landscape features. A lot changes in almost 400 years. The first clue regarding the location of the first meeting house appears in town records in 1642 when it is stated that the meeting house is “upon the hillside before John Loker’s houselot on the other side of the way.” “Before John Loker’s houselot” likely refers to the meeting house being to the south of Loker’s houselot, that is as one is heading north along the former County Road they would pass the meeting house and then John Loker’s houselot.

Many “paths” or “ways” were used in colonial times to access common lands. Prior to the houselots being laid out, much of this area was considered common land. As shown on a reconstructed plan of the town, North Field was located to the east of the County Road (then Mill Road) (see Figure 2-2). This was probably pastureland and a “path” or “way” would have resulted from bringing the cows to pasture. It appears that the first settler’s burying ground was located at an interior location to the east prior to the construction of the meeting house, so a “path” or “way” would have been used to access that too. While today one might think that a “path” or “way” would be located along the boundary of two properties this was not necessarily the case.

What appears clear from the entry in the 1642 town records is that the first meeting house was located to the south of both the “way” and John Loker’s house lot. Also of interest is that when the second meeting house was constructed, the soon to be defunct first meeting house was still on the ½-acre lot and likely still being used. As no information regarding accessing the second meeting house was discussed, it was likely in proximity to the “way” that led from the County Road to the first meeting house.

Additional clues can be surmised from the town planning the construction of the third meeting house. At that time it was stated that the third meeting house would be “erected, finished and stand upon the present burying place and on the most convenient part thereof on where behind or about the old meeting house.” Additionally the new (third) meeting house would be a square structure “after the mode of Dedham.” Of particular interest is the statement that a “convenient way in” was to be made at the doors. This suggests that the location of the third meeting house was not in close proximity to the “way” used to access the second meeting house. The “convenient way in” may have been an offshoot from the “way” used to access the second meeting house from the County Road to the location of the third meeting house. At this point it needs to be restated that the present entrance driveway to North Cemetery was likely developed from the 12 ft entrance path that was included in the deed for the 1835 addition.

It is therefore suggested that the “path” discerned in the GPR survey (hereafter GPR path) is the ca 1640s “way” discussed in the town records when describing the location of the first meeting house. If that is the case then the first meeting house would be to the south of the GPR path on the “hill side” possibly at or near the location of the Goodenow burials. The structure revealed in the GPR survey to the north of the GPR path is interpreted as the second meeting house. Part of the reasoning for this is the white reflectivity that can be seen in Figure 4-6 around the marked area of the structure. Town records note that in 1670 John Rutter was paid 20 shillings to underpin the second meeting house with stone and clay. A clay-rich soil mix can bring on a high reflectivity such as that seen in Figure 4-6.

The area that has been identified as the first meeting house in the cemetery is likely the location of the third meeting house. It is located behind the interpreted location of the second meeting house, it’s far enough away from the GPR path/ca1640 “way” that it would have required a “convenient way in” and the filled-in location appears to be square. Figure 4-17 shows the proposed features revealed from the GPR survey on a plan of the Old Section.

4.2 The Middle Extension and the Indian Burial Ground

As discussed above in Section 2.0, it has been speculated that an Indian Burial Ground is located in the eastern section of the cemetery, specifically in the Middle Extension. Indian graves are believed to be marked at two locations that have flush-to-the-ground (flat) stone markers, one with three flat stones (Figure 4-18) and the other with one flat stone (Figure 4-19). A 1925 photo of the three flat stones provides them with better definition than is visible today (Fig 4-20). In 1950 shrubs were placed around the two burial lots with the flat stones, but have since been removed. Four other locations of Indian Graves are noted on a plan of the Middle Extension.

With GPR, burials and structures can vary in preservation. Often Colonial era burials or structures have degraded and no longer reflect radar energy. When this occurs burials or structures can still be mapped based on stratigraphic truncations and discontinuities produced by excavating for internment or construction. These will present as anomalies. Compacted soils or buried pathways will also present differently than surrounding soils as seen in Grids 3, 4, 6 and 7.

Before beginning the GPR survey within the Middle Extension, data from several test transects were collected in order to identify the geometry of graves from a similar time period (Figure 4-21). This helped to determine what types of reflections might be seen in the GPR scans.

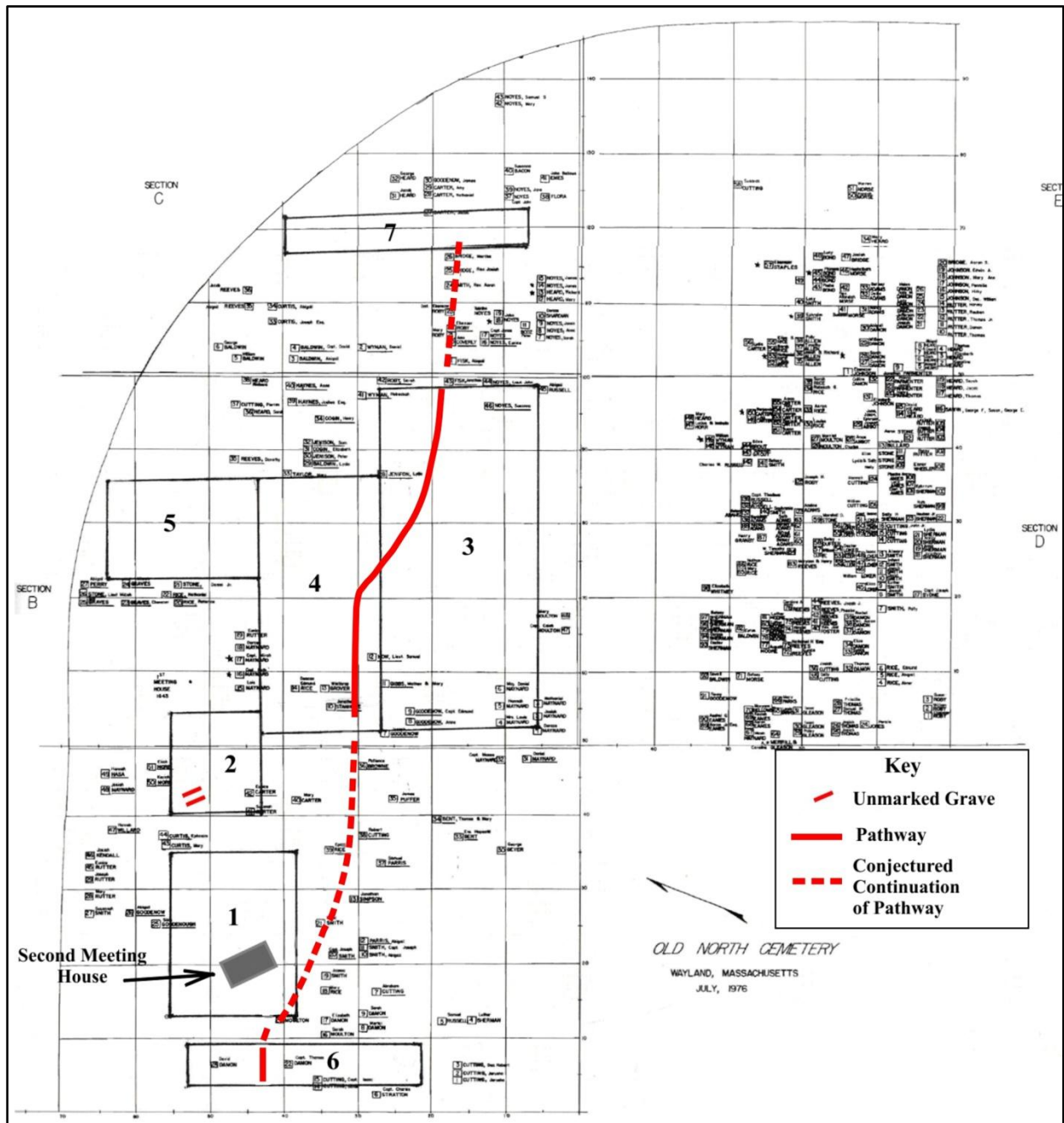


Figure 4-17. Location of GPR features on a plan of the Old Section.



Figure 4-18. Photo of three flat stone markers.



Figure 4-19. Photo of one flat stone marker.



Figure 4-20. Historic photo of three flush stone makers
(Courtesy of Wayland Historical Society).



Figure 4-21. Mr. Kempton working in the Middle Extension.

GROUND PENETRATING RADAR SURVEY

Six plots referenced as “Indian Graves,” located to the back of the cemetery and referenced as Ancient Burial Ground, were scanned in individual transects across the center of each plot. The plot references are: #34, #36, #62, #168, #169, and #182 (Figures 4-22 and 4-23).

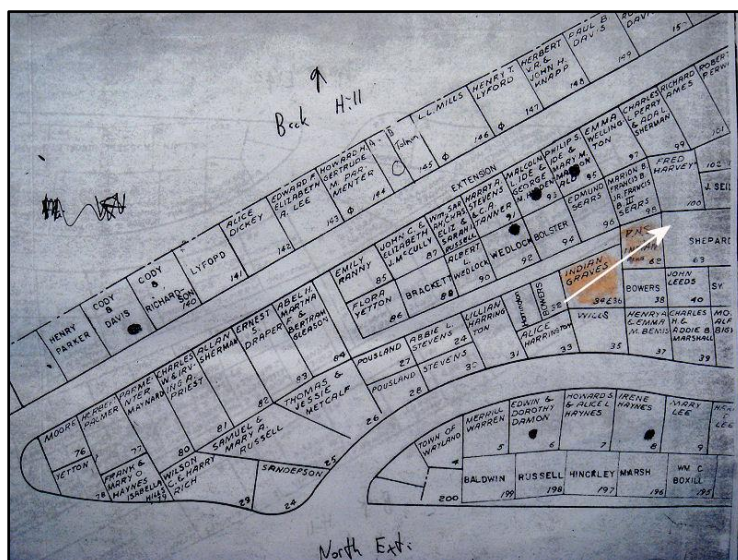


Figure 4-22. Location of transect across plots 34, 36 and 62.

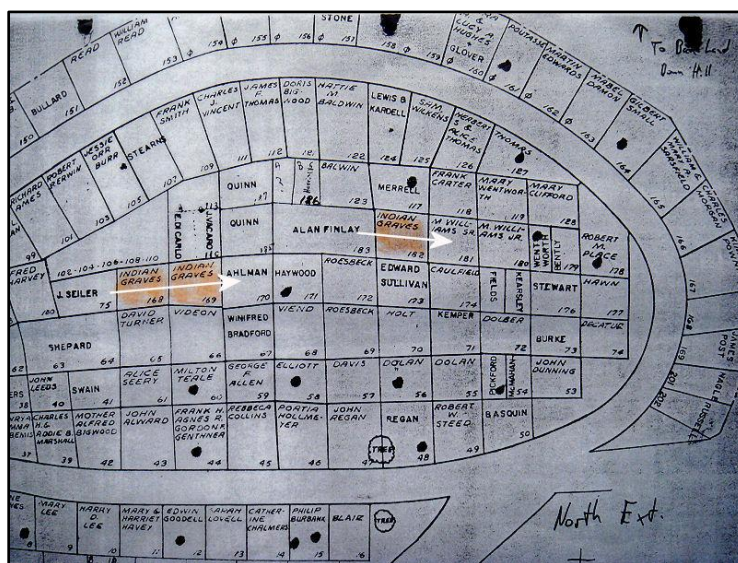


Figure 4-23. Location of transects across plots 168, 169 and 182.

The length of the transect lines varied:

- For plots 34 and 36 the transect was 30 ft long, with 15 ft of burial data
- For plot 62 the transect was 25 ft long, with 10 ft of burial data
- For plot 168 the transect was 15 ft long, with 8 ft of burial data
- For plot 169 the transect was 15 ft long, with 8 ft of burial data
- For plot 182 the transect was 15 ft long, with 15 ft of burial data

A continuous scan conducted between plots 34 and 36 showed three distinct burials at around 4 feet (after surface signal correction) over a distance of 15 feet (Figure 4-24). The burials are poorly defined from soil migration over time and no distinction can be made from this scan between Colonial or Native American burials.

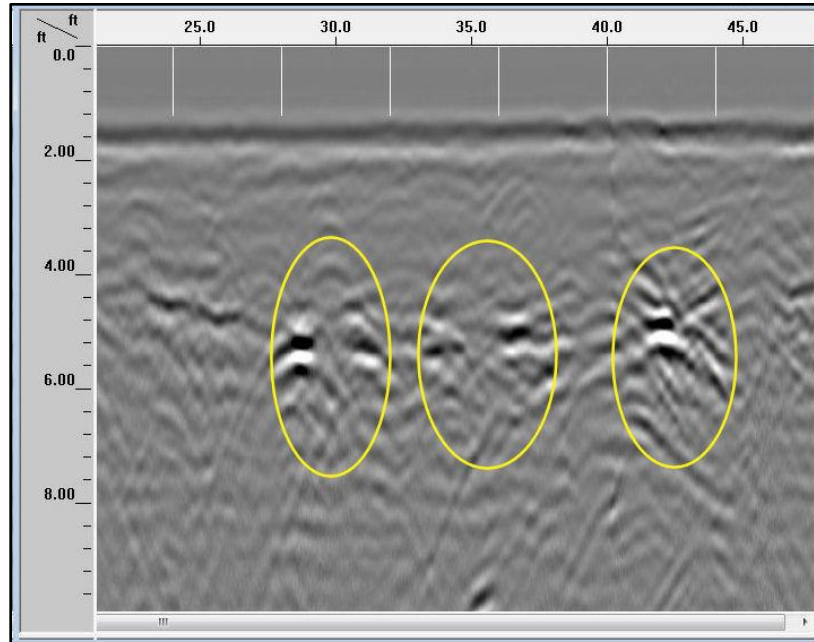


Figure 4-24. Burials in plots 34 and 36, note that they are all at the same elevation.

Only a single burial appears in plot #62. This is at a surface corrected depth of 4 feet. Soil migration has deteriorated the grave shaft (Figure 4-25).

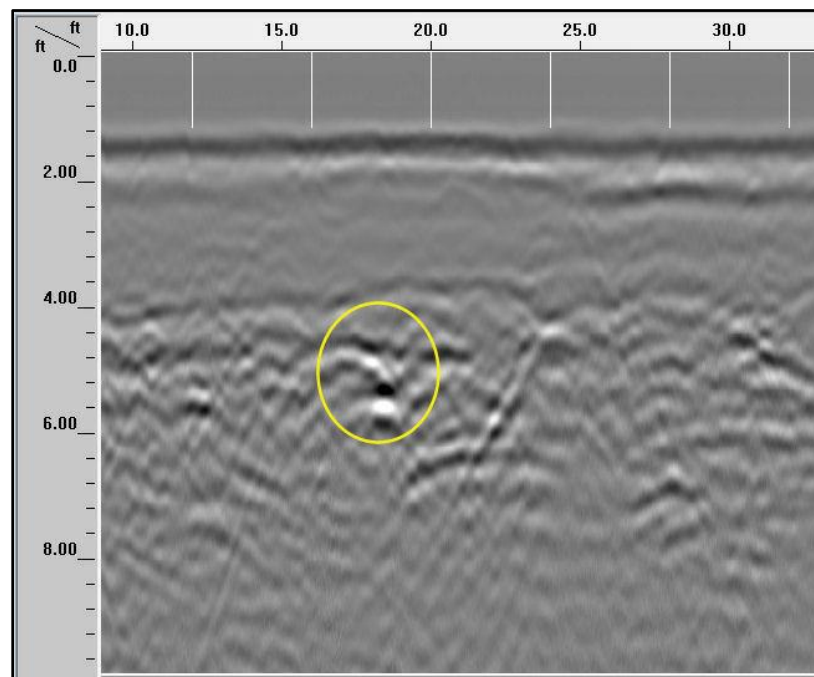


Figure 4-25. Single burial in plot 62.

Plot # 168 shows a multiple (2) burial, poorly defined from soil mixing (Figure 4-26).

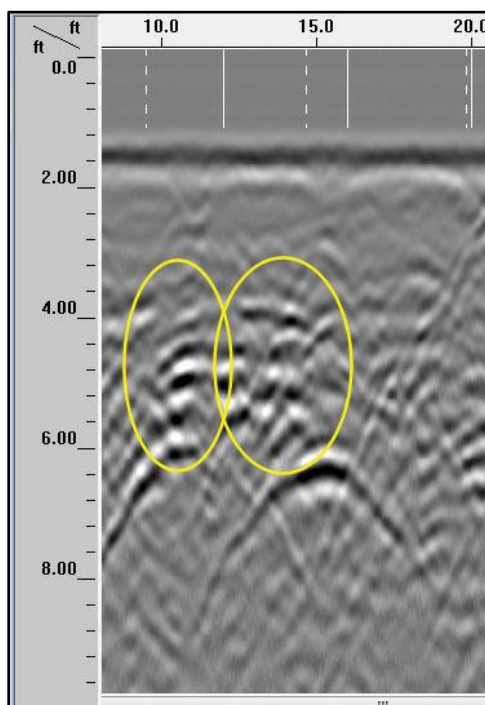


Figure 4-26. Multiple burial in plot 168.

Plot #169 shows a probable grave. The grave shaft is in very poor condition from soil migration (Figure 4-27).

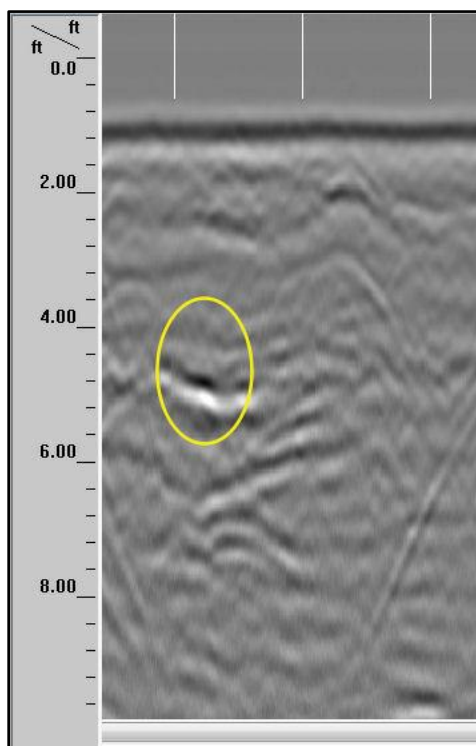


Figure 4-27. Probable burial in plot 169.

Plot #182 shows no anomalies. The soil stratigraphy is uninterrupted. There are no burials in this plot (Figure 4-28).

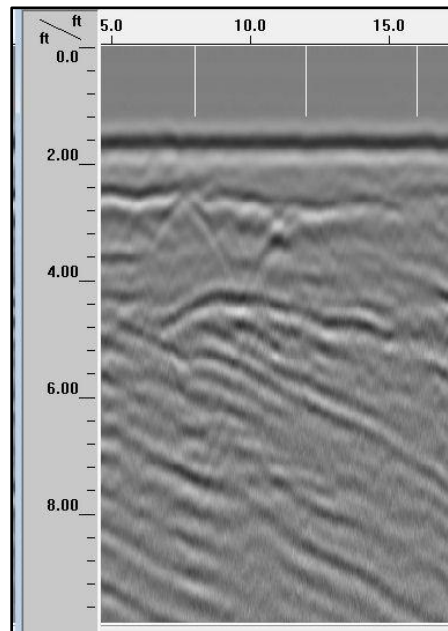


Figure 4-28. No burials in plot 182.

In conclusion, the Indian Graves referenced in plots #34, #36, #62, #168 and #169 all have burials associated with them. The burials do not present any differently than those in the surrounding plots. Additionally the signal reflection from individual line transects show all to be consistent in alignment and depth. From the scans, there is nothing to indicate that these are Native American burials.

There were no burials associated with Plot #182.

Interpretation of GPR Results and Documentary Research in the Middle Extension

While the ***GPR survey*** identified burials in 5 of the 6 burial plots identified as Indian Graves on a plan of the Middle Extension dated ca 1960, it is not possible to discern if the burials are associated with the early settler's or Native Americans.

According to a local history (Hudson 1891), the Native American population at the time of the English settlement was small. Evidence of Native American occupation of the land was discussed in the local history and indeed evidence of Native American activity has been found in the recent past. Both “relics” of native occupation have been discussed and “a cluster of wigwams” have been postulated near the location of the original English settlement.

According to Hudson (1891) the Indian Burial Ground is located on:

“ an elongated strip of land lying adjacent to the old North Burying Ground on the east, and extending several rods beyond it to the north and south. It consists of about two acres, more or less, covered with a growth of pine and oak. Its northerly limit extends beyond the northern brow of the hill to the lower part of the glen beyond. The southern part is a narrow projection generally following the brow of the hill, skirting on the west the land of Richard Lombard (presently 61

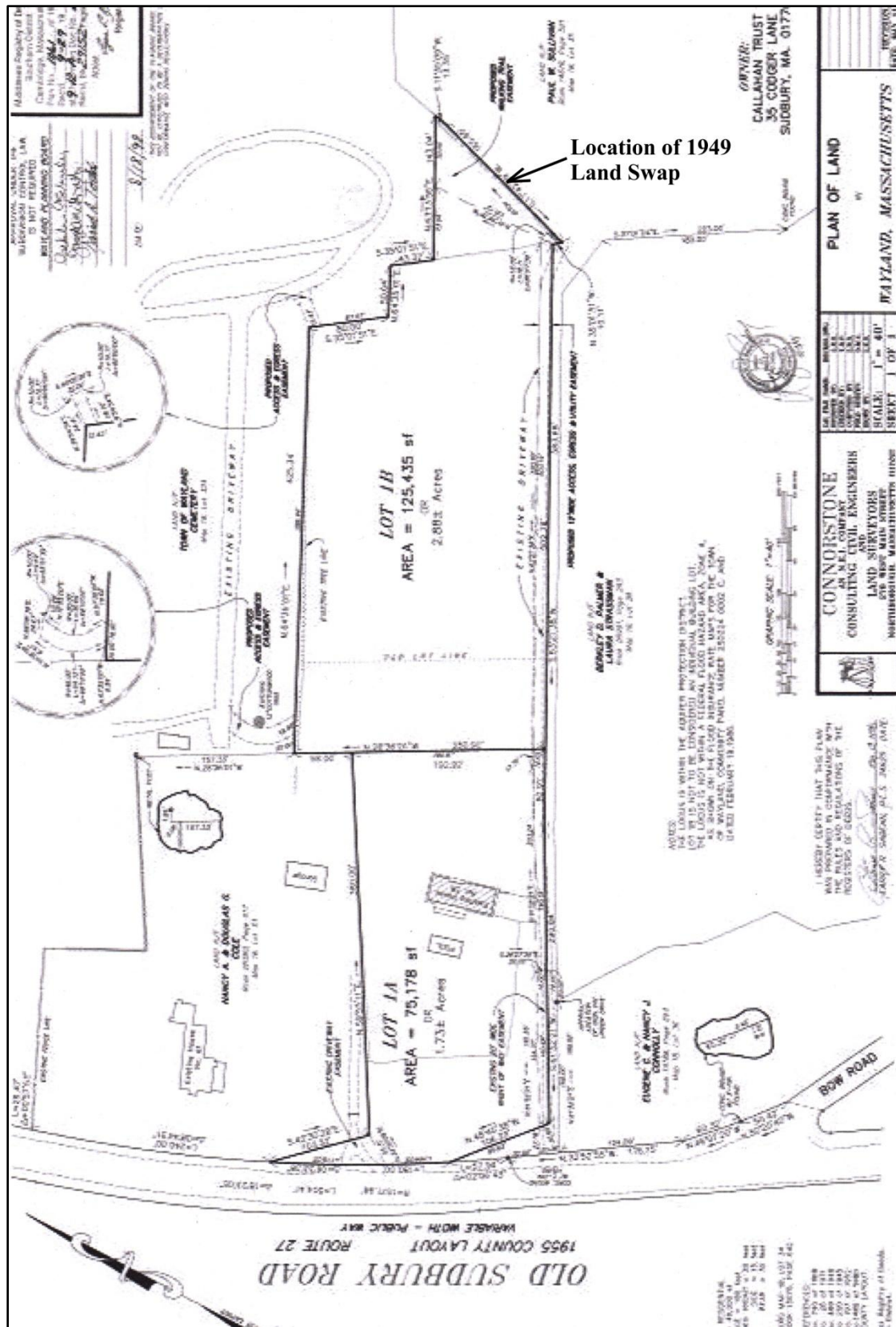
Old Sudbury Road). This land from the settlement of Sudbury, has been known by tradition as the ‘Old Indian Burying Ground’.”

Also discussed by Hudson (1891) is the discovery of human skeletons that were exhumed from the above-described location about 75 years previous and buried “before the memory of the oldest inhabitant, and the date of which has not been preserved.” The discovery consisting of bones from several skeletons exhumed by men digging for gravel would have been made about 1816 (75 years prior to 1891). At that time the bones were reinterred by order of one of the town’s selectmen, James Draper. Hudson goes on to state that “It is supposed they were the remains of Indians.” He continues that nearly a quarter of a century earlier, which would be about 1841, J.S. Draper discovered portions of a skeleton in the same general location that were presumed to be a “white person” as they were found in association with decayed wood that had been marked by nails or screws, suggesting a coffin. The Drapers that Hudson mentions in his text may refer to James Draper (1787-1870) and his son James Sumner Draper (1811-1900). Of interest is that Hudson also mentions the “rude, flat stones” associating them with a family group who died at the time of the settlement.

Hudson had apparently walked over the area for he describes the general location as containing various depressions suggesting previous burials and associates these with early settlers who had no church and therefore no formal burying ground, so they made use of the “burying ground of the Indians.” The only record of a burial from this time period is that of Edward, the servant of Robert Darnill, who died in 1640. It has been conjectured that he was the first person buried in the town possibly at the location of the Indian Burial Ground (Wayland Public Library).

It has also been stated that old deeds, such as the ones associated with 61 Old Sudbury Road reference the Indian Burying Ground as a boundary. Documentary research though has found that neighboring deed transactions clearly point to a difference in boundary designations previous to and including 1852 as well as after and including 1857 with the use of the terms “burying ground,” “old burying ground,” and “Ancient Burying Ground” for all associated boundaries in the first time period and the use of the terms “Indian Burial Ground” and “Wayland Cemetery” in the second time period. It must again be reiterated that the term “Ancient Burying Ground” generally refers to that of a town’s earliest settlers. These changes in terminology appear in the mid nineteenth century when Hudson (1891) associates the eastern part of present-day North Cemetery, that is the Middle Extension, with both the early settlers’ burying ground due to the findings of an unmarked burial with associated coffin and the flat stones associated with an early family and the Indian Burying Ground associated with oral tradition. The only definitive information includes the coffin remains and the flat stones, both of which would be associated with the early settlers. It is therefore possible that the GPR path is also associated with a former Native American trail that also provided access to the Native Burial Ground and was later used by the town.

Documentary research revealed that a triangular piece of land at the southeastern corner of the cemetery was swapped with the Stewart’s when the town purchased the 1849 addition (see Figure 2-37 for the Stewart’s property boundaries in 1958). The Stewart’s property changed hands several times through the twentieth century. In 1997 Perry Beckett purchased the property (Middlesex Deeds 29152:405). A plan of the property entitled Plan of Land in Wayland, Massachusetts and dated 1998 (**Figure 4-29**) shows the property divided into Lot 1A and Lot 1B. In that year Beckett sold Lot 1B to the Beit Olam Cemetery Association (Middlesex Deeds 29152:408) who in turn sold it to the Jewish Cemetery Association in 1999 (Middlesex Deeds 31628:533). The triangular parcel that the town swapped to the Stewart’s in 1949 and now included in the Beit Olam Cemetery is a former portion of the First Settlers/Indian Burial Ground.



4.3 Section D and a former Palisade

It had been speculated that a palisade dating to the seventeenth or eighteenth century was once located between the boundary line of the former Damon property and Section D of the cemetery (Figure 4- 30). Three transects lines of several hundred feet were scanned within Section D. Two test transects documented subsurface conditions within the parcel and one transect was scanned along the boundary line attempting to locate subsurface evidence of the palisade.

Only filled-in and added soils were seen along speculated path of the palisade. No evidence of a palisade could be determined through the use of GPR. About a year prior to the GPR survey the town planted trees along the above-described boundary likely accounting for the disturbance.

As documentary research revealed that a palisade had been constructed around the second meeting house during the period of King Phillips War that may have been the actual location of the speculated palisade.



Figure 4-30. Location of the transect in Section D.

5.0 CONCLUDING SUMMARY AND ARCHAEOLOGICAL POTENTIAL

The Preservation Management Plan provides detailed information from three key components: historic development that is gathered from a review of primary sources, present conditions that is developed from a comprehensive look at the cemetery's landscape, and hidden conditions that is interpreted from remains of the past revealed in a geophysical survey. Each component of the plan has imparted important information about the North Cemetery. The implications of much of the information from one component cannot be completely understood in isolation and are intricately interrelated to information revealed in another component. While questions still remain, much has been learned.

Since its early development, a number of changes and influences have impacted the historical character and condition of North Cemetery. Some of these changes are the direct result of alterations or maintenance over time while others are related to natural forces that shape the New England region. Influences affecting the cemetery include environmental conditions, religious beliefs, changing attitudes towards death, and personal preference.

Historic Development

Research into the town records and deeds revealed important information, most of which cannot be found in secondary sources such as town histories. Town histories though provided general information that helped in understanding detailed issues recorded in town records and deeds.

Information reviewed in the seventeenth century town records centered on the three meeting houses that were constructed within the original ½ acre lot of present-day North Cemetery. It appears clear that the Puritan ethic was waning as evidenced by the increasing comfort and quality of construction for each successive meeting house. Typical of the time period the burying ground was not mentioned and maintenance was not a concern. It was also revealed that as the original conveyance from John Loker to the town for the meeting house and burying ground lot could not be located an agreement and land swap was made with his widow and son, Mary and John Loker. Seemingly inconsequential details providing limited information about each of the meeting houses proved important in interpreting the results of the GPR survey.

It was during the eighteenth century that the burying ground was mentioned in town records with regard to maintenance, determining its bounds, and constructing a gate. As the town was expanding there was a concern about transporting the deceased to the burying ground. It would appear that the burying ground was running out of space as the town discussed its expansion.

The town spent a lot of time discussing the burying ground in the nineteenth century, a period in which changing attitudes towards death led to stylistic changes in gravestone motifs and landscape design. As a result the burying ground became known as a cemetery. While the 1800 addition more than doubled the size of the original ½ acre parcel, the 1835 addition included a second entryway as well as a connection between the burying ground by the meeting house and the early settlers' burying ground to the east of the addition. Aside from increasing the size of the cemetery, the 1857 addition's boundaries and associated plan provided a clearer idea of the perceived size of the early settlers' burial ground in 1857. Town histories and deeds from the mid century on suggest that the early settlers were using an Indian Burial Ground. With the additions the town was quite busy from the 1840s to the 1860s not only instituting new design elements into the cemetery, but also making improvements to existing design features. The appointment of a supervisor in 1860 underscores the town's concern for organization and maintenance in the cemetery. Yet according to a town history the cemetery was in a bad condition during the last decade of the century, the same time period that the town finally included the cemeteries in the yearly budget.

CONCLUDING SUMMARY AND ARCHAEOLOGICAL POTENTIAL

One of the most important occurrences in the twentieth century was the creation of the Cemetery Commission providing an advocate for the town's cemeteries in town meetings. The cemetery commissioner clearly related that he was getting complaints about the condition of the cemeteries stating that it stemmed from lack of funding and labor. While he continued to make small improvements in the cemetery the Hurricane of 1938 dramatically changed the landscape. While a tree survey conducted in 1880 noted that North Cemetery contained only a few trees with a large number of pines along its border, historic photographs suggest that the cemetery was covered with trees. Following many years of cleanup the town purchased additional land in 1949 to expand North Cemetery. Included in the transaction was a land swap for a portion of the Early Settlers' Indian Burial Ground. Development of the addition and general improvements throughout the cemetery occurred in the 1950s. In the following decade the town formed the Parks, Recreation and Cemetery Department and the cemetery began to lose its presence in town meetings. Finally in 1972 another parcel was added for future development.

With ever-increasing maintenance costs, decreasing department funding, and loss of visibility in town meetings, North Cemetery may be returning to its Puritan roots in the twenty-first century.

Conditions Assessment

North Cemetery is unusual when compared to other former colonial burying grounds as it still has room for expansion. At some point, likely in the twenty-first century, the 1972 parcel will be developed for burials. As with the development of previous additions, such as those in the 1840s through 1860s, overall improvements will be made in North Cemetery to attract prospective plot buyers.

As witnessed in twentieth-century town reports a lack of upkeep or deferred maintenance leads to increased deterioration. At times solutions to these problems also pose a threat to the character and historical integrity of a property. These types of threats, which can obscure a "sense of place," include:

- an element that alters or removes a character defining feature,
- an element that introduces modern materials or methods that are inappropriate to the historic character of the property, and
- an element that introduces a land use or new feature that is either inappropriate or non-historical in nature.

It is important that future improvements be thoughtful and in concert with the Secretary of the Interior Standards for Preservation. The historic fabric of North Cemetery should be protected and preserved. Attention to the Secretary of Interior Standards is even more critical today since the North Cemetery has been determined eligible for listing on the National Register of Historic Places. The Preservation Management Plan provides a "road-map" for preservation issues, but it is incumbent on the town to insure that the necessary funding is provided whether through the town budget or a public/private initiative.

Beyond these ties to the community's history and the ethical responsibility of caregivers, the preservation of our past also has clear economic benefits to a community. These serve to dispel the argument that while history may be important, there are more pressing needs. History can, in fact, generate the economic stimulus to help address the needs of the cemetery as well as other needs of a community.

Historic photos of the cemetery may provide important information on the present condition of historic features (including landscape design), the original condition of historic features (including landscape design), and the location of historic features (including landscape design) that are not longer extant.

In order to locate historic photos of the cemetery, such as ones showing the location of the Cathedral Pines, the front entrance, the Stony Section in the 18th/early 19th century, it is recommended that the town

or historic commission place a request for historic photos in the local newspaper or post a request in the senior center.

Geophysical Survey

The GPR survey provided a glimpse of historic features that remain, albeit below ground, of the cemetery's development. Generally the results of a GPR survey need to be ground-truthed, that is investigated through field excavation, in order to be verified. This is not practicable in a cemetery.

The results of the survey in the Old Section have revealed compelling images. Detailed historic research has provided a viable interpretation of those images. While it was not possible to survey the entire Old Section due to budgetary restraints, there are surely more unmarked graves than revealed in the present survey and likely other historic features present. Within the Middle Extension there was evidence of burials in five of the six plots identified as Indian Graves. The burials covered by the flat stones are likely those of the early settlers as evidenced by the seventeenth century Goodenow graves in the Old Section. All the burials appear at a similar depth and there is no way to discern a settlers' burial from a Native American burial. Due to recent disturbance in Section D there was no way to identify or verify the location of a suspected palisade. Historic research did reveal that a palisade/fortification was constructed around the second meeting house. Of particular interest is that a Native American Trail suspected to cross Section D may have been identified in the Old Section.

In conclusion, cemeteries are important social, historic, architectural, and archaeological artifacts. When there is little else physically remaining of a community's earliest history, there will often be a cemetery that provides a unique tie to the community's collective past that would otherwise be lost.

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Appendix A: Prioritization of Recommendations from the Conditions Assessment

Priority	Action	Notes
Organizational	0.1 A joint meeting of the Parks, Trees, and Cemeteries Division with the Historical Commission should be devoted to a careful review of the Secretary of Interior Standards. The caregivers should focus on a fuller understanding of how daily operations affect the long-term preservation of the cemeteries, making necessary adjustments to current policies and procedures. A presentation should then be prepared for the Board of Selectmen outlining critical budgetary and operational modifications.	
	0.2 The Parks, Trees, and Cemeteries Division should prepare a disaster plan to cover events such as tornadoes and other weather emergencies, as well as more routine events such as vandalism and tree damage.	
	0.3 The Town should begin integrating additional community activities at North Cemetery in order to increase visitation and support. Within two or three years several activities per month should be sustainable.	
	0.4 It is critical that the various rules and regulations be simplified and revised to reflect a standard and consistent format. All versions should be replaced with the revised rules.	
	0.5 The Town should work to develop a heritage tourism model integrating the North Cemetery and making it more attractive to visitors.	
	0.6 The Town should consider wider roads in the yet to be developed sections to allow for visitor parking.	
	0.7 The Town should develop a written inspection and preventative maintenance program for the cemetery roads to minimize the need for future reconstruction.	
	0.8 Snow plowing of the cemetery roads should be eliminated or conducted only in the event of a necessary funeral.	
	0.9 Deicing compounds should be eliminated from within the cemetery with the possible exception of use on the steeply sloping entrance road.	
	0.10 All future modifications should explore accessibility issues in an effort to maximize access by all citizens.	
	0.11 Should pathways become necessary because of increased heritage tourism activities, a grass reinforcement system is likely the least intrusive and most effective approach.	
	0.12 The Town must accept responsibility for all damage occurring to monuments in excess of 50 years old since it is likely for most there is no surviving family.	
	0.13 The Town must develop a formalized mechanism for identifying and reporting vandalism specific to the cemetery setting.	Form Provided

Table 3-6. Prioritization of Recommendations continued.

Priority	Action	Notes
Organizational, continued	0.14 The Town must enlist the assistance of the Police Department to conduct routine patrols of North Cemetery.	
	0.15 The Parks, Trees, and Cemeteries Division staff must visit North Cemetery at least twice daily.	
	0.16 Adjacent neighbors must be enlisted to help watch over the cemetery.	
	0.17 A volunteer group should be formed to periodically visit the cemetery to ensure a public presence and help report any problems.	
	0.18 The Parks, Trees, and Cemeteries Division should develop a specific plan for dealing with homeless issues in the cemetery.	
	0.19 The Town should not allow the introduction of benches, urns, or vases in the cemeteries.	
	0.20 The introduction of new memorials must be very carefully monitored and limited. New monuments should be allowed only when the historic monument is no longer legible. In such cases, the original monument must remain and a new flush marker with the precise language of the original marker erected as a flush-to-ground lawn marker.	
	0.21 New monuments marking new burials in older sections should match existing markers in size, material, and design. If this is not possible, then new markers should be limited to gray granite. Preferably any new marker should be erected as a lawn marker flush to the ground.	
	0.22 Brass signs or emblems should not be allowed to be mounted on markers over 50 years in age. They may be set flush to the ground on granite lawn markers.	
	0.23 It is essential that there is an on-the-ground supervisor for all cemetery work. Remote supervision and delegation does not provide appropriate quality control or job oversight.	List provided
	0.24 It appears that staff training is currently inadequate. The Town should require and support staff certifications through PLANET or similar landscape professional organizations as part of a continuing education program.	
	0.25 Only fertilizers with very low salt indices should be used in the cemetery. The best choice are organic fertilizers.	
	0.26 All trees removed from the cemetery should be replaced with trees of at least 1-inch caliper that meet the minimum requirements of the American Nursery and Landscape Association's American Standard for Nursery Stock (ANSI Z60.1-2004). Replacement trees should have water bags and should be carefully protected from mowing or trimmer damage.	

Table 3-6. Prioritization of Recommendations continued.

Priority	Action	Notes
Organizational, continued	0.27 The Town must either enforce its rules regarding the planting of shrubs by plot owners or abandon the rules entirely.	
	0.28 The Parks, trees, and Cemeteries Division must require that all work performed in the cemeteries on monuments, vaults, or walls be conducted or overseen by a trained conservator who subscribes to the Guidelines for Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC).	
	0.29 The Town should consider closing the informal pathway between the cemetery and the adjacent property owner.	
First Priority (2016)	1.1 The Town should increase the cost of burial plots and burial fees to make them commensurate to those found in nearby towns and commercial facilities.	
	1.2 The cemeteries (including North Cemetery) should receive a line-item budget allocation commensurate with their needs and the special care that they require. This will require a substantial increase in the budget allocation.	
	1.3 The Town should install roadside snow plow markers to ensure that plowing does not damage the turf or adjacent monuments.	
	1.4 The south entrance gate area in the Old Section requires resodding to control erosion.	
	1.5 Because of extensive deferred maintenance, approximately 160 linear feet of the stone wall on the south side of the Old Section requires complete rebuilding. An additional 57 linear feet require removal of inappropriate Portland cement pointing. Only a Certified Journeyman Drystone Mason should be retained to perform this work. Under no circumstance should the use of any mortar be allowed in the repair of this wall.	
	1.6 The North Cemetery and the other Town cemeteries are significantly understaffed and underserved. At least two full-time maintenance workers are required for North Cemetery. For all of the Town's cemeteries a full-time staff of one supervisor and four workers is required.	
	1.7 The cemetery exhibits a variety of serious tree problems, many that pose a hazard to both the public and the monuments. It is critical that an ISA Certified Arborist be retained to inspect all of the trees, remove those that pose significant risk to monuments, and prune all of the trees in the cemetery.	
	1.8 Care must be taken to avoid mowing or damaging historic plantings in the cemetery.	
	1.9 Many stones in the cemetery are being needlessly damaged by the use of mowers that are too large. These problems are exacerbated by a lack of adequate supervision. We recommend that the smallest deck mowers possible be used, entirely eliminating the current 72-inch deck mowers.	

Table 3.6. Prioritization of Recommendations continued.

Priority	Action	Notes
First Priority, continued	1.10 All mowers must have closed cell foam bumpers installed. These must be replaced as needed. Operators with excessive wear on the bumpers should be given remedial training and instruction.	
	1.11 Mowing should never be closer than 12-inches to a stone.	
	1.12 Mowing must be conducted with sufficient frequency to maintain turf at a height of about 2½ to 3½ inches.	
	1.13 Trimmers should use line no heavier than 0.065-inch. If this is not feasible with the trimmers being used, then the lightest weight line available for that equipment should be used.	
	1.14 The current identification signage is not attractive and its location on a vault is problematical. The signage should be removed and relocated elsewhere at the entrance. We also recommend that the signage be redesigned to be more suitable for a cemetery.	
	1.15 The Cemetery requires a combined identification and regulatory sign placed the entrance. An example of one possibility has been provided.	
	1.16 "Orphan" stones should be documented using a form and collected for short-term safe keeping until their appropriate location is identified through research. In so far as possible, stones should not be allowed to become disassociated with their graves as this effectively loses the grave location.	Form Provided
	1.17 The cleaning of the worst soiled stones in the Cemetery using D/2 Biological Solution should be undertaken by volunteers. This will dramatically improve overall appearance and provide a very visible improvement to the cemetery landscape.	
Second Priority (2017-2018)	1.18 There are iron objects in the Cemetery that should receive priming and painting as a high priority.	
	2.1 The water meter device should be removed from the entrance gate column.	
	2.2 About 80 linear feet of the woven wire fence along the southern side of the Old Section requires extensive repair, including painting with a zinc-rich paint. It is likely that the entire 200 linear feet will require new woven wire fencing be installed. Under no circumstance should chain link fencing be installed.	
	2.3 The cemetery soils require liming and likely fertilization. This work should be incorporated with core aeration.	
	2.4 An ISA Certified Arborist should evaluate the need to provide fertilization to the mature trees in the cemetery.	
	2.5 Animal burrows must be filled in at least monthly.	
	2.6 The garden on top of the vault should be removed and the vault resodded.	

Table 3.6. Prioritization of Recommendations continued.

Priority	Action	Notes
Second Priority, continued	2.7 Trash observed on the slope north of the Back Section should be removed.	
	2.8 Plot curbs or coping throughout the Cemetery are in deteriorating condition. The repair of these curbs must be viewed as routine maintenance and must be integrated into the maintenance plan.	
	2.9 Drains present in the cemetery must be maintained. This includes not only removing leaves and debris on a regular basis, but also ensuring that water can access the drain and there is no localized flooding in the cemetery.	
	2.10 The vaults in the cemetery pose potential hazards to the public and should be inspected every 5 to 10 years by a conservator, archaeologist, and possibly a structural engineer. It will be necessary to break the welds on the vault doors and a better system of securing the vaults should be identified.	
	2.11 The Town should post the cemetery speed limit at the entrance to the property.	
Third Priority (2019-2020)	3.1 Curbs on the entrance road are showing cracks and the Town should develop a plan for their maintenance and repair.	
	3.2 Research should be conducted in an effort to document the lost gates in the interest of future replacement. If it becomes possible to document the three lost gates, the gates should be recreated and reset. However, no gates should be installed without clear and convincing historic documentation.	
	3.3 Given the soil conditions and the extensive weeds, consideration should be given to a section-by-section renovation of the cemetery turf in order to establish a good quality turf. This would improve the appearance of the cemetery and may potentially reduce mowing.	
	3.4 The current roadside historical marker and boulder markers can be left in place, but the Town should consider adding modern interpretative signage that promotes an interest in the Cemetery.	
	3.5 A more appropriate trash container should be more centrally located to encourage its use. It should not, however, block or detract from the historic landscape.	
	3.6 Consideration should be given to removing the concrete block building and using the area for interpretative signage. If the building cannot be removed, it should be carefully shielded from view within the cemetery using plantings.	
	3.7 The spoil pile is an eyesore and should be moved to a more distant location in the cemetery. If this is not possible, the area should be carefully screened from view within the cemetery.	

Appendix B: Ground Penetrating Radar Report

Ground Penetrating Radar (GPR) Report

**North Cemetery
Wayland, Massachusetts**

November, 2014 – April 2015

New England Geophysical

June 05, 2015

Introduction

During November, 2014 and April, 2015 a non-invasive, ground-penetrating radar (GPR) survey of several sections of the North Cemetery in Wayland, Massachusetts was conducted. The site has been used as a cemetery by local residents since the early 1600's but the primary goals of the survey were to identify the location and possible remnants of a meeting house or houses that have been lost to time.

The survey was requested by Barbara Donohue, Archaeologist on behalf of the Town of Wayland.

7 grids of data were collected totaling 2230 square meters of area scanned. Additionally there were several areas scanned in the Ancient cemetery that are believed to be possible Native American burials.

Environmental Context

Soils in the North Cemetery vary between organic-rich to sandy and well drained. The U.S. Department of Agriculture – Natural Resource Conservation Services (NRCS) maintains a map of GPR soil suitability for every state. The entire state of Massachusetts is highly suitable for GPR surveys with sandy well-drained soils.

Ground surface conditions on the days of the survey consisted of closely cut grass on flat to sloping surfaces. Without any recent rains, the soils were also well drained and dry.

Objectives

The goals of the survey, as defined by Archaeologist Barbara Donohue was to collect a high density GPR survey in a series of x,y,z grids over areas of interest identified by Donohue.

Ground Penetrating Radar Methods

Ground-penetrating radar is an active geophysical method that emits pulses of electromagnetic energy into the ground surface and records reflections off of buried interfaces. Reflections can be caused by natural or cultural features, such as soil horizons, animal burrows, heath pits, trenches, or foundations. This method is typically suitable for finding features and not artifacts due to the resolution of the data. Results can be displayed either in 2D, 3D, or both to aid in interpretation. The greatest benefit of GPR over other geophysical methods is the ability to get depth information about potential features.

The frequency of the antenna determines the potential resolution and depth range. There is a trade-off between depth and resolution. The shallower a feature the smaller it can be, but the deeper a feature the larger it needs to be. A 400 MHz antenna was used for this survey, which has a typical depth range around 3-4m depending on the soil conditions. At the North Cemetery the soils had an average dielectric of approximately 15 and combined with low conductivity at the site allowed the electromagnetic energy to penetrate to at least 3.9m. Data could have been collected even deeper, but that would not have served the purpose of this survey as everything is expected to be within the first 2-3m.

Seven survey grids were configured to cover the largest areas with minimal headstone obstruction. Additionally several individual line transects were set up to scan individual plots as designated in cemetery plans.

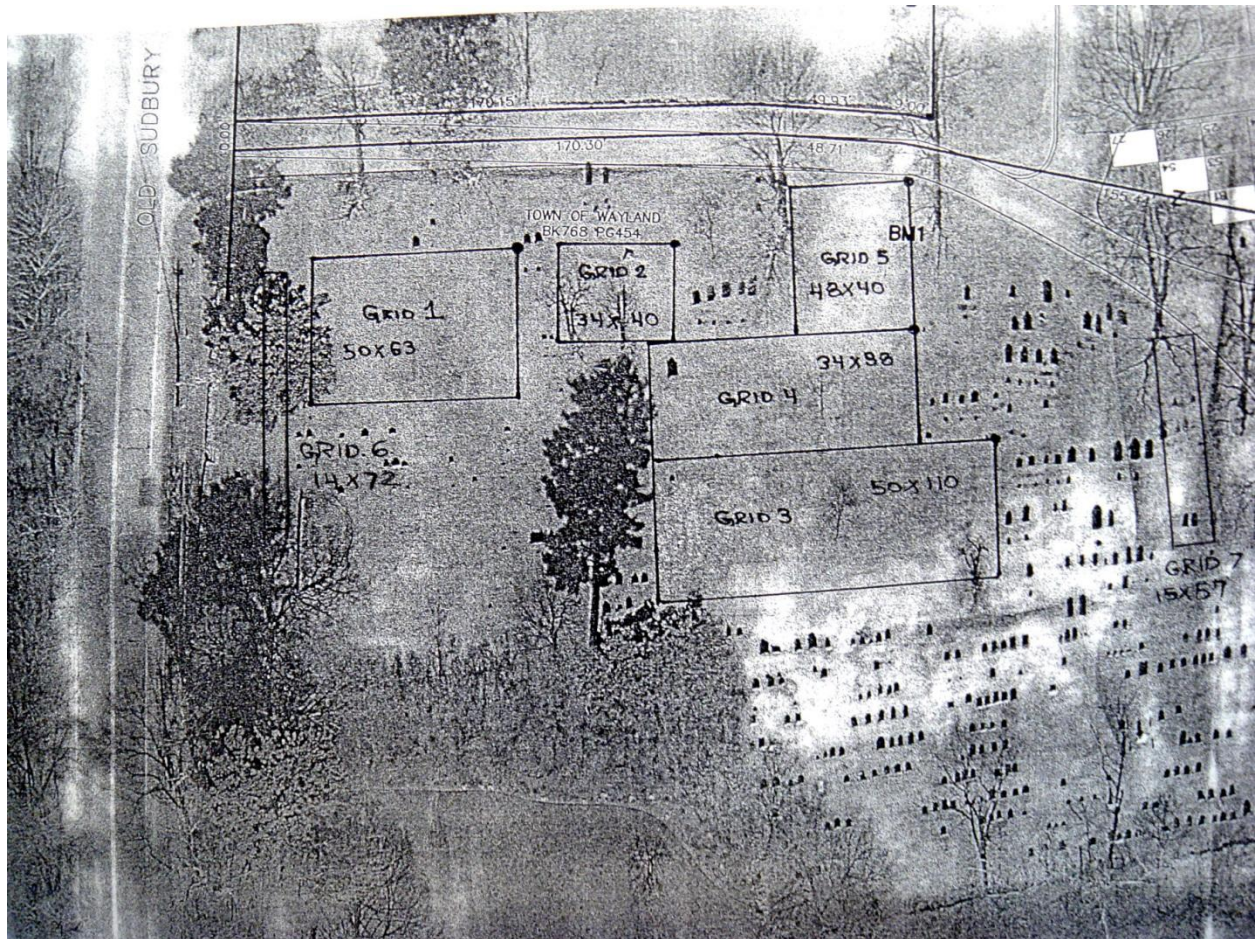


Figure 1: Approximate location of GPR grids within the North Cemetery, Wayland, Massachusetts.

Grid Parameters

Grid #1 x,y,z grid. x=63 feet, y=50 feet, z=7 feet (depth of scan).

Grid #2 x,y,z grid. x=40 feet, y=34 feet, z=7 feet (depth of scan).

Grid #3 x,y,z grid. x=110 feet, y=50 feet, z=7feet (depth of scan).

Grid #4 x,y,z grid. x=88 feet, y=34 feet, z=7 feet (depth of scan).

Grid #5 x,y,z grid. x=40 feet, y=48 feet, z=7 feet (depth of scan).

Grid #6 x,y,z grid. x=72 feet, y=14 feet, z=7 feet (depth of scan).

Grid #7 x,y,z grid. x=57 feet, y=15 feet, z=7 feet (depth of scan).

Results

Grid #1 revealed a large subsurface anomaly at 10 inches continuing to 22 inches. The anomaly is interpreted to be soil disruptions typical of structure construction. There is minimal linearity due to soil migration and mixing over time. Nonetheless, the scan image shows a soil disruption that can be estimated to be around 25 x 30 feet, Figure 2, unmarked and Figure 3, marked.

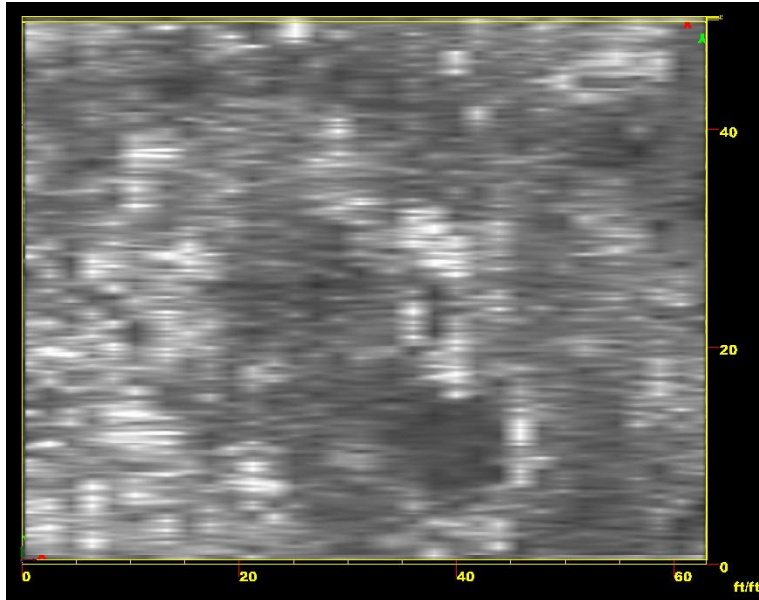


Figure 2, Grid #1.

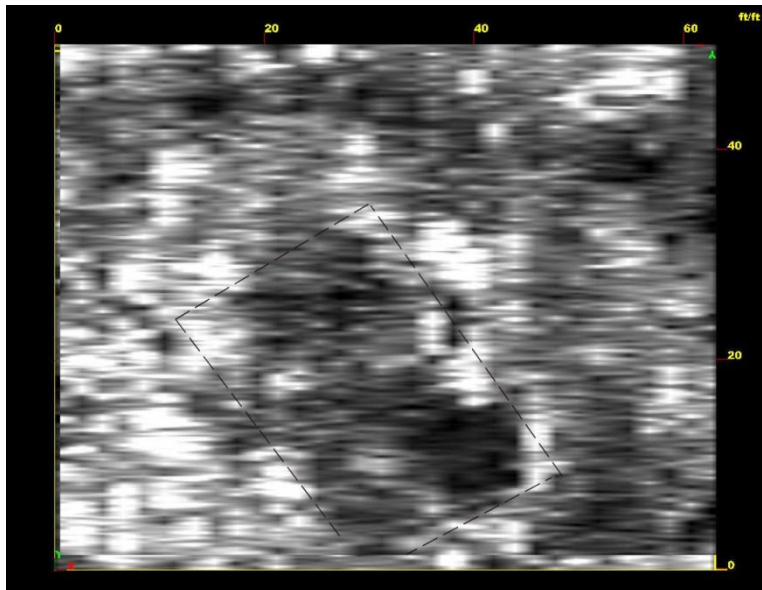


Figure 3, Grid #1, marked area of disrupted soils, structure area inferred by filled-in soils.

Grid #2 is the area currently marked with a large stone and metallic plaque referencing the location of the first meeting house.

Scans of this area did not reveal any soil anomalies associated with construction artifacts but did reveal two unmarked graves, Figure 4 and Figure 5.

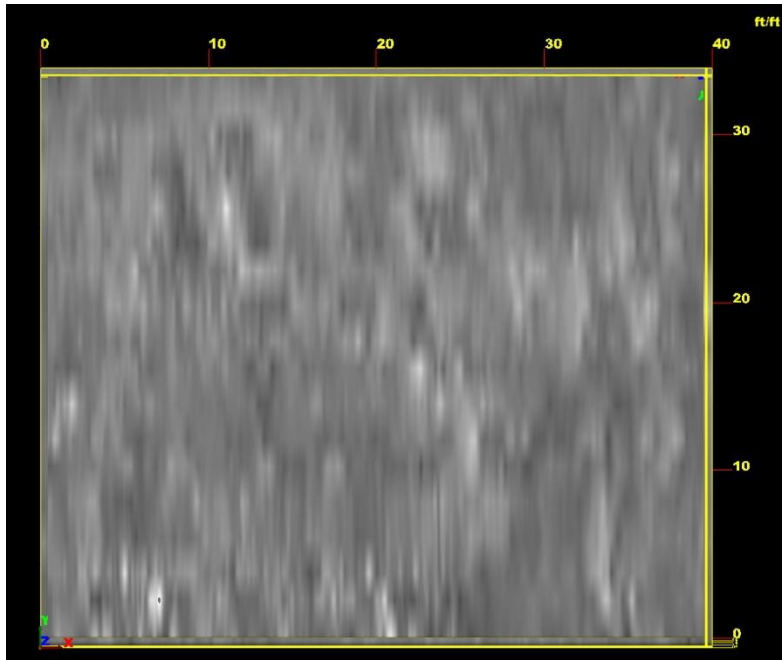


Figure 4, Grid #2.

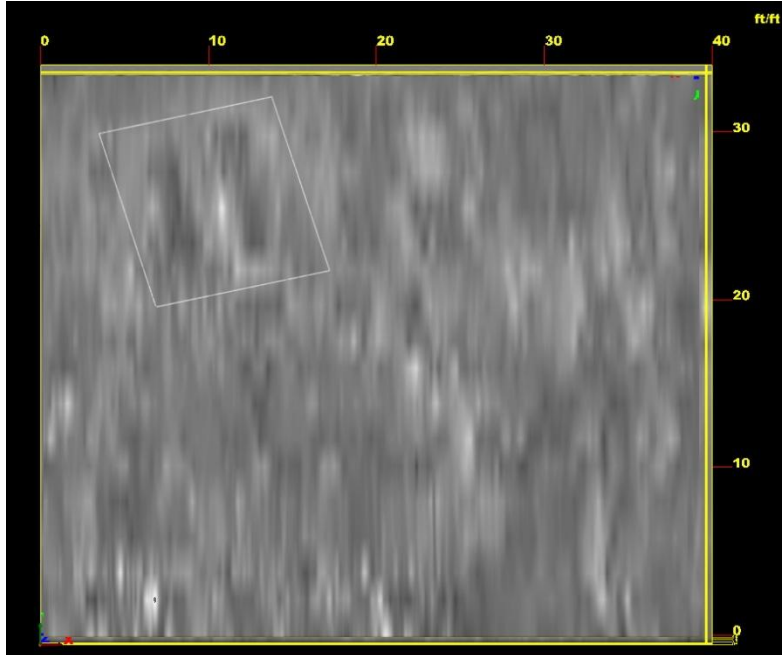


Figure 5, Grid #2 marked graves.

Grids #3 and #4 represent the two largest surveyed grids conducted at the North Cemetery. The purpose of these two grids was to look for evidence of possible foundations or structural artifacts. Multiple

unmarked graves were revealed in the scans but no structures or evidence of structure excavations were seen. Figure 6 and Figure 7.

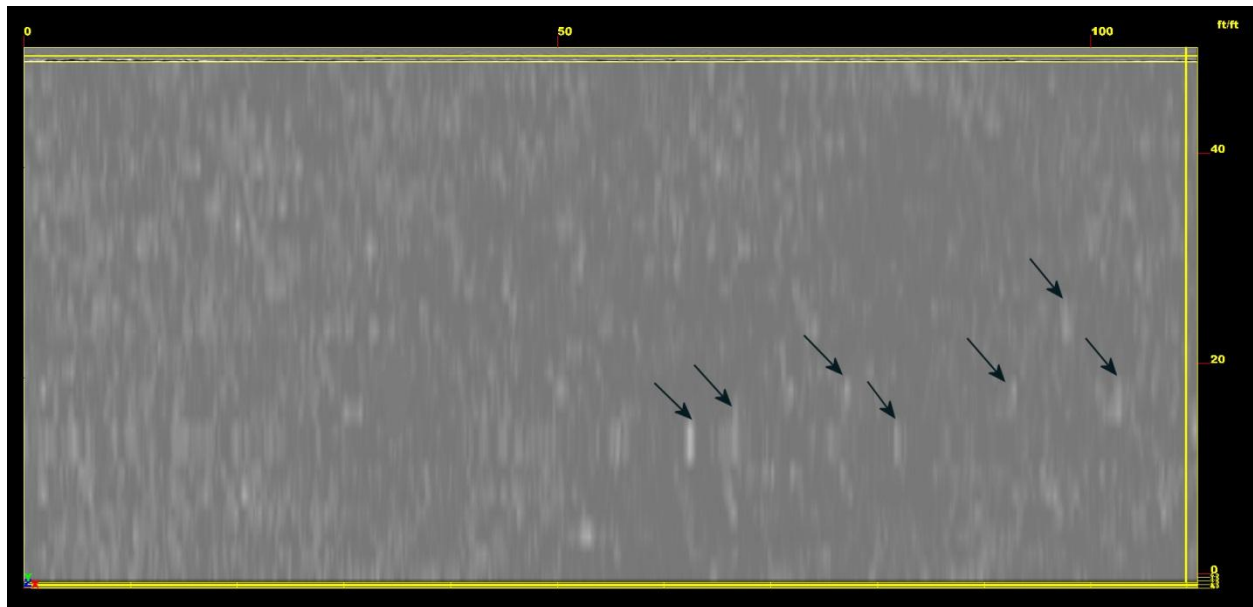


Figure 6, Grid #3, unmarked grave locations.

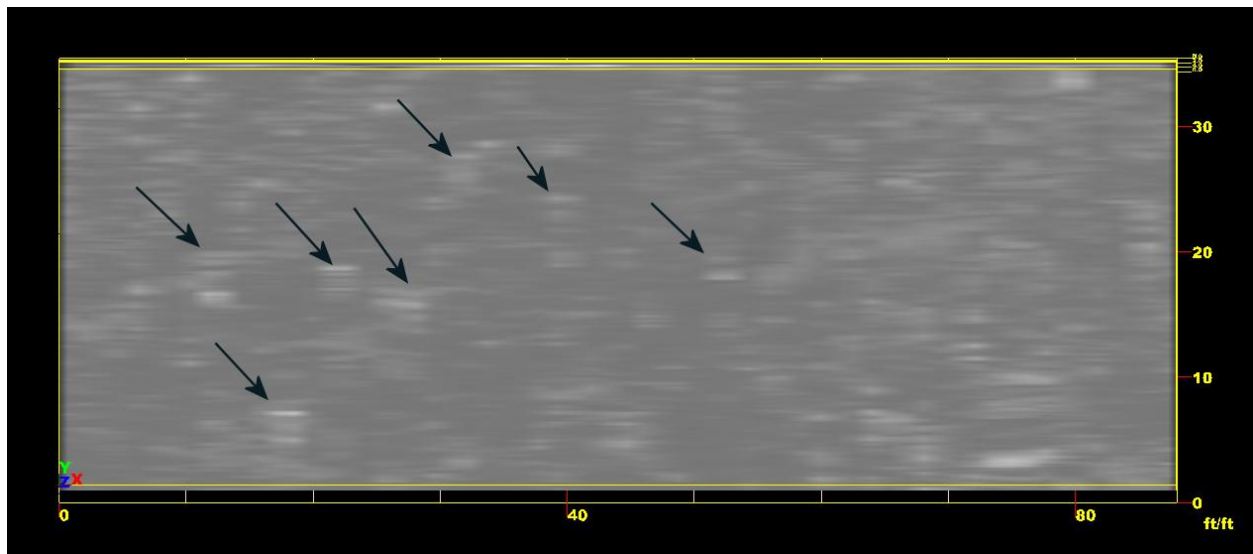


Figure 7, Grid #4, unmarked grave locations.

Revealed in the Grid #3 and Grid #4 scans is an unknown and undocumented pathway. Soil interface differences and compaction can reflect GPR signal returns differently than soils with undisturbed stratigraphy. The pathway is at approximately 6 to 8 inches in depth and continues through Grid #3 and #4. Figure 8 and 9.

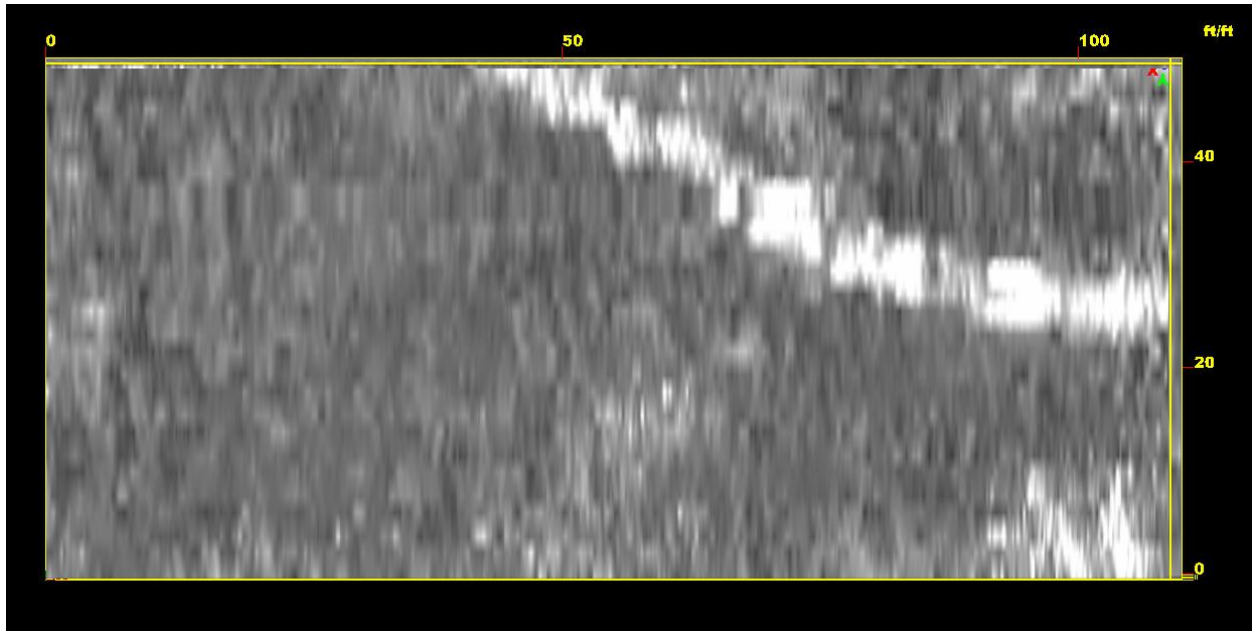


Figure 8, Grid #3, unknown pathway.

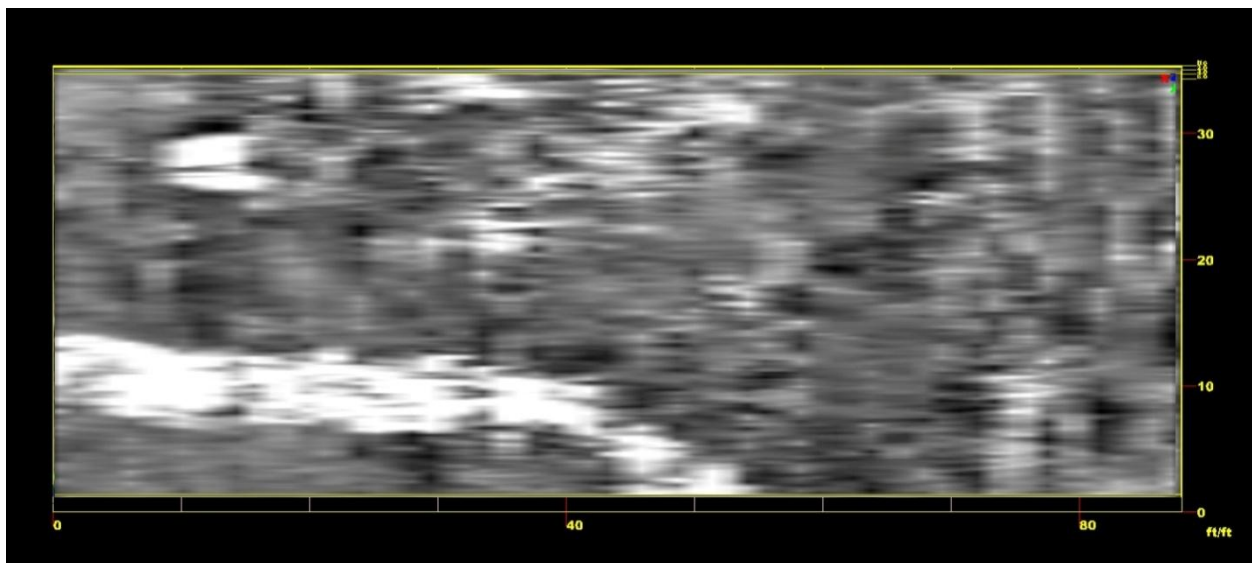


Figure 9, Grid #4, unknown pathway.

Grid #5 is featureless, no soil disturbances could be resolved by radar. Figure 10.

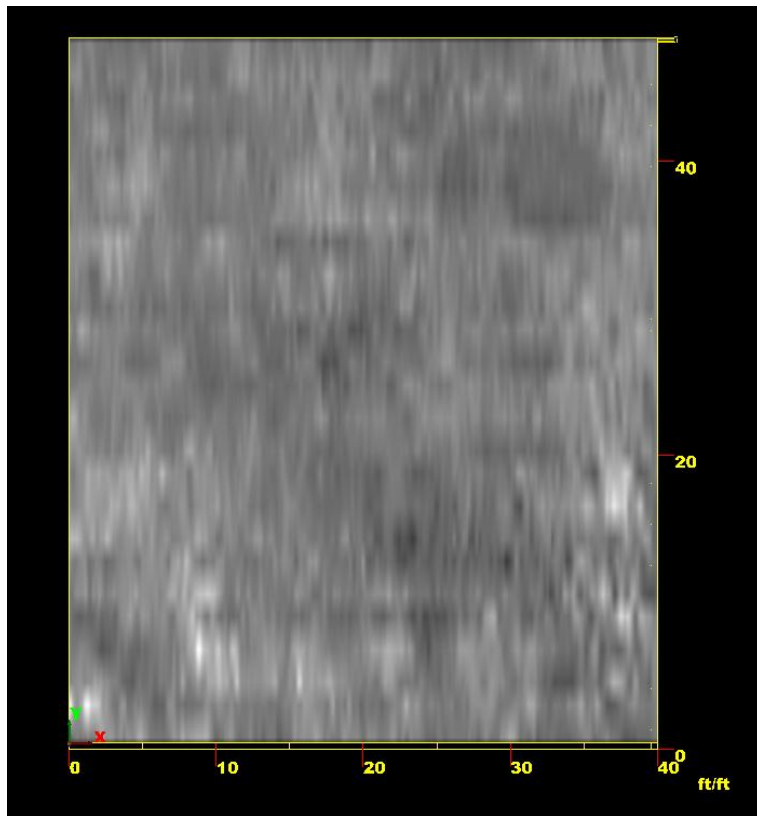


Figure 10, Grid #5

The GPR scans discussed so far in this report were conducted in mid-November of 2014. Snow cover occurred shortly after the scans were completed. The data was analyzed over the 2014-2015 winter.

In April of 2015 additional scans were conducted to further refine the understanding of the cemetery history. Specifically the goal was to add to the pathway information for future interpretation. Grid #6 and Grid #7 were conducted in an attempt to discern a beginning and end of the pathway.

Data from Grid #6 does show the pathway continuing to the front edge of the cemetery out to Old Sudbury Road. Figure 11, and possible terminating in the upper right of Grid #7, Figure 12.

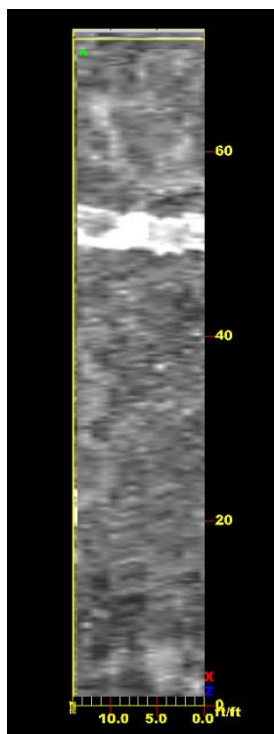


Figure 11, Grid #6, unknown pathway.

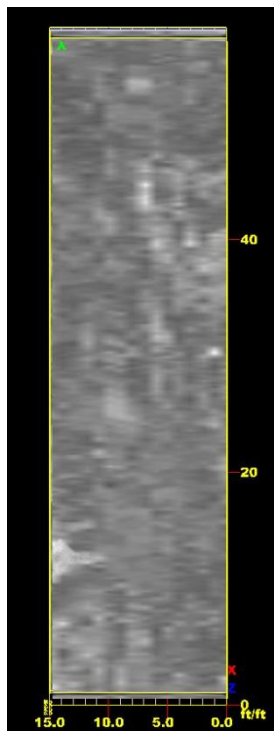


Figure 12, Grid #7.

Ancient Cemetery Scans

Additionally, six plots referenced as “Indian Graves”, located to the back of the cemetery and referenced as Ancient Burial Ground were scanned in individual transects marked by a directional arrow. The plot references are: #34, #36, #62, #168, #169, 182. Figure 13, 14.

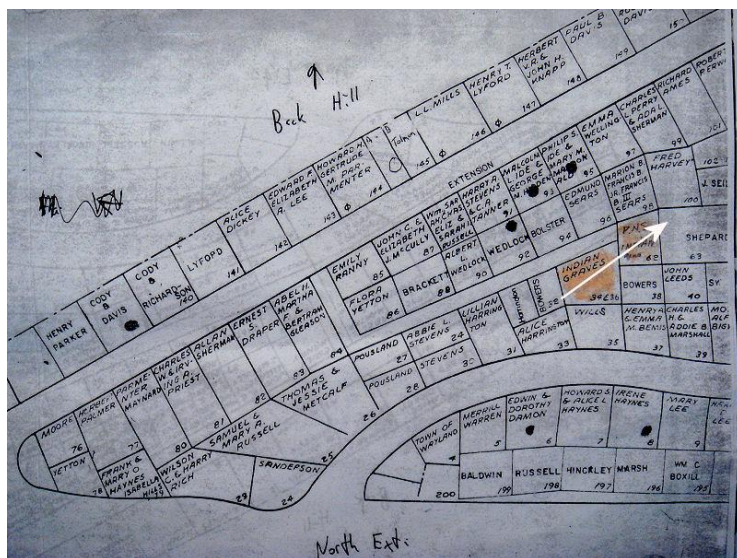


Figure 13.

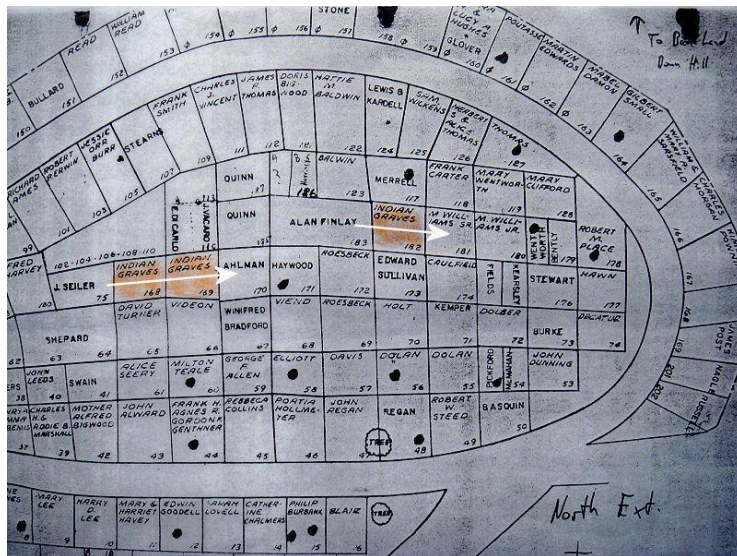


Figure 14.

Burials and structures can vary in preservation. Often Colonial era burials or structures have degraded and no longer reflect radar energy. When this occurs burials or structures can still be mapped based on stratigraphic truncations and discontinuities produced by excavating for interment. These will present as anomalies. Compacted soils or buried pathways will also present differently than surrounding soils as seen in Grids #3, #4 and #6.

Before beginning the GPR survey, several test transects were collected in order to identify the geometry of graves from a similar time period. This helped to determine what types of reflections might be seen in the GPR grids.

Plots #34, #36, #62, #168, #169, #182, all referenced as Indian Graves in the presented plan, Figure 13, and 14, all have burials associated with them excepting Plot #182. However the signal reflection from individual line transects show all to be consistent in alignment and depth with the surrounding graves of the time.

Figure 15 is a line transect scan. Several burials are shown. The burials are all at the same elevation.

From the scans, there is nothing to indicate that these burials differ from those in plots surrounding the reported Native American plots and thus nothing to indicate that these are in fact, Native American burials.

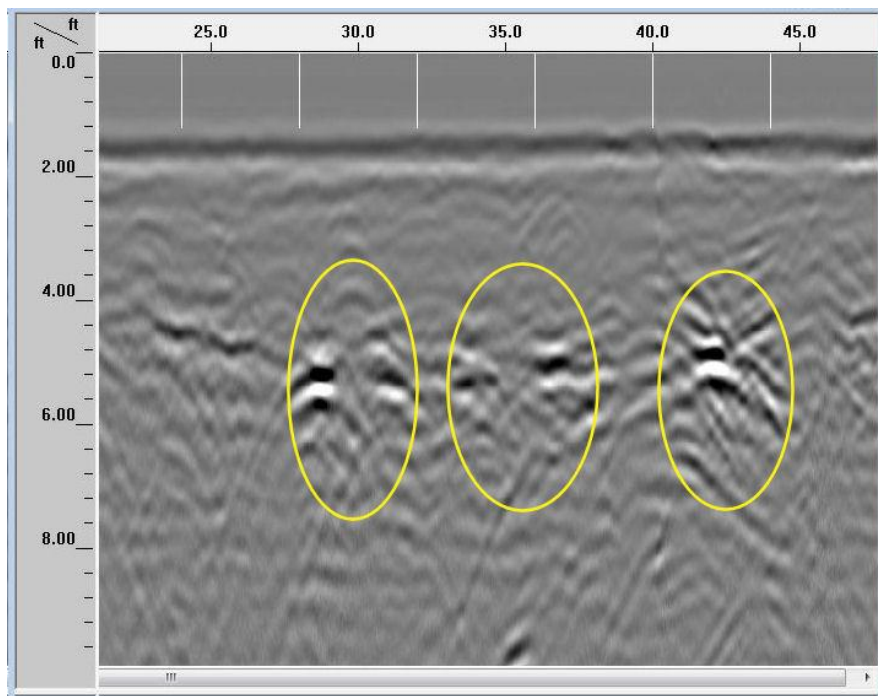


Figure 15, Plot #34 & #36

A continuous scan between Plots #34 and #36 showing three distinct burials at around 4 feet (after surface signal correction) over a distance of 15 feet. The burials are poorly defined from soil migration over time and no distinction can be made from this scan between Colonial or Native American burials.

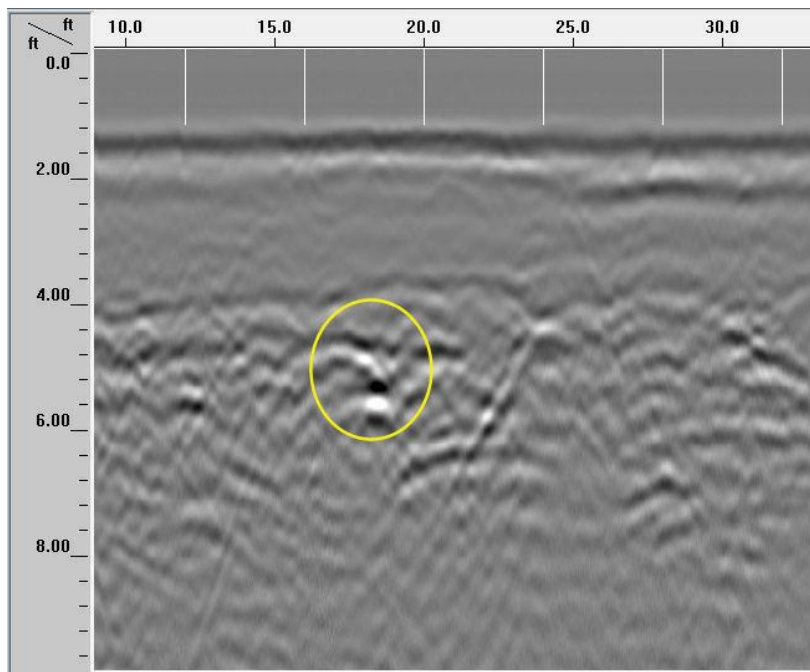


Figure 16, Plot #62

Only a single burial appears in Plot #62. This is at a surface corrected depth of 4 feet. Soil migration has deteriorated the grave shaft.

Plot # 168

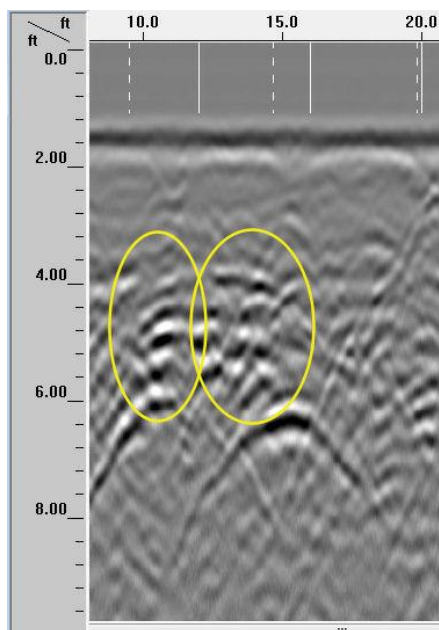


Figure 17, Plot #168

Plot #168 shows a multiple (2) burial, poorly defined from soil mixing.

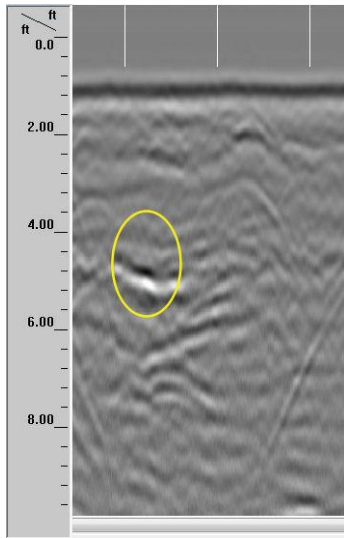


Figure 18, Plot #169

Plot #169 shows a probable grave. The grave shaft is in very poor condition from soil migration.

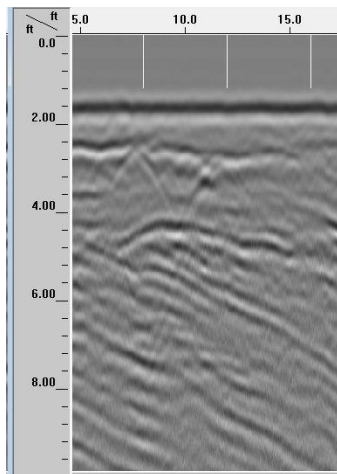


Figure 19, Plot #182

Plot #182 shows no anomalies. The soil stratigraphy is uninterrupted , no burials in this plot.

Plot transect data:

The transect for Plot #34 and #36 was 30 feet long, 15 feet of burial data.

The transect for Plot #62 was 25 feet long, 10 feet of burial data.

The transect for Plot #168 was 15 feet, 8 feet of burial data.

The transect for Plot #169 was 15 feet, 8 feet of burial data.

The transect for Plot #182 was 15 feet, burial data was 15 feet.

Palisade

3 transect scans of several hundred feet were made in an attempt to locate subsurface evidence for a reported palisade and/or the prior construction of one in Section D. Only filled-in and added soils were seen. No evidence of a Palisade could be determined through the use of GPR.

Summary Statement

To better understand the conclusions of this subsurface survey a basic outline of ground penetrating radar and its limitations are presented first.

Ground-penetrating radar data are acquired by transmitting pulses of radar energy into the ground from a surface antenna, reflecting the energy off buried objects, features, or bedding contacts and then detecting the reflected waves back at the ground surface with a receiving antenna.

When collecting radar reflection data, surface radar antennas are moved along the ground in transects, typically within a survey grid, and a large number of subsurface reflections are collected along each line. As radar energy moves through various materials, the velocity of the waves will change depending on the physical and chemical properties of the material through which they are traveling.

The greater the contrast in electrical and magnetic properties between two materials at an interface, the stronger the reflected signal, and therefore the greater the amplitude of reflected waves. When travel times of energy pulses are measured, and their velocity through the ground is known, distance (or depth in the ground) can be accurately measured. Each time a radar pulse traverses a material with a different composition or water saturation, the velocity will change and a portion of the radar energy will reflect back to the surface and be recorded. The remaining energy will continue to pass into the ground to be further reflected, until it finally dissipates with depth.

The depths to which radar energy can penetrate, and the level of resolution that can be expected in the subsurface, are partially determined by the frequency (wavelength) of the radar energy transmitted. Standard GPR antennas generate radar energy that varies in frequency from about 10 megahertz (MHz) to 1000 Mhz.

Low frequency antennas (10-120 MHz) generate long wavelength radar energy that can penetrate up to 50 m in certain conditions, but are capable of resolving only very large buried features. In contrast, the maximum depth of penetration of a 900 MHz antenna is about one meter or less in typical materials, but its generated reflections can resolve features with a maximum dimension of a few centimeters. A trade-off therefore exists between depth of penetration and subsurface resolution. In this survey, a 400 MHz antenna was used, which generally produces data of good resolution at depths of about eight and a half feet.

Below this depth, extraneous noise sources would overwhelm the very weak radar energy that had been attenuated at about 8.5 feet in depth. Any features located below this depth would not be imaged.

Conclusions

Figure 20 is a composite overlay of all grid scans to better present the information.

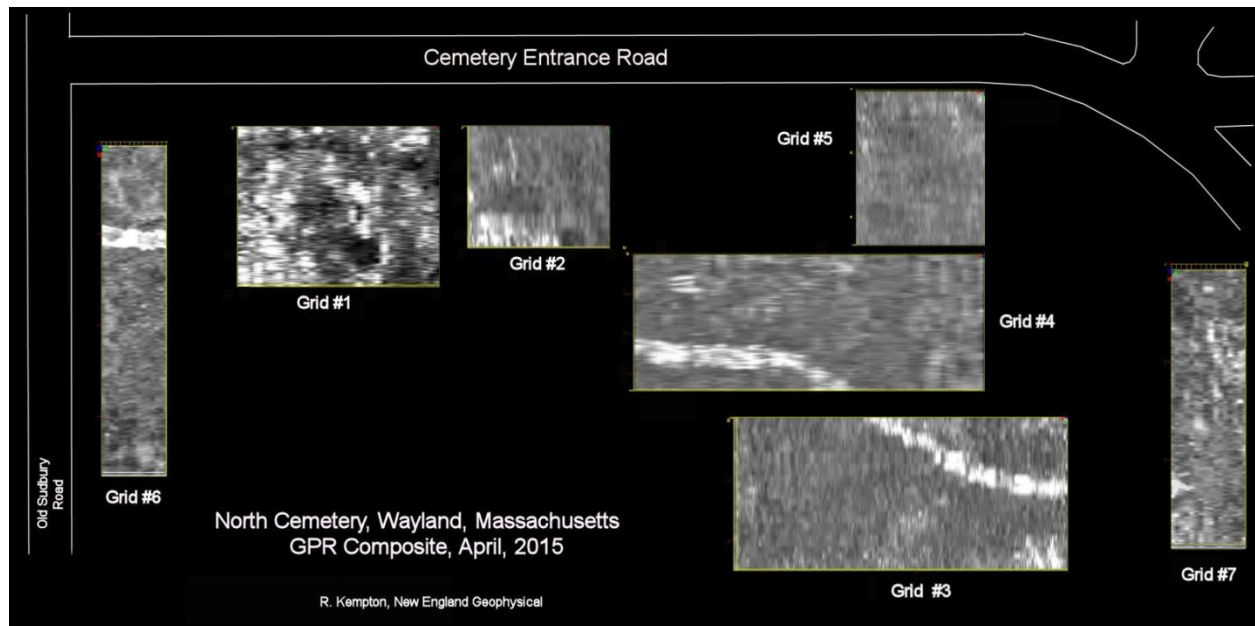


Figure 20.

The locations of many unknown graves are presented in several grids along with a soil anomaly consistent with the believed size of either the First Meeting House or the Second.

The undisturbed soil stratigraphy of many grid scanned areas rule them out as to possible locations of prior structures. Depth to ground water was not determined. Ground water was not detected in any scans.

A previously unknown pathway of unknown age has been revealed in Grids #3,#4,and #6.

The burials in the Indian Burial grave plots referenced as Plots #34, #36, #62, #168, #169, #182, do not present any differently than those in the surrounding plots.

A huge amount of data was collected and presented in this survey. While it needs to be properly collated into the town history by Donohue and others, some of the images are clear and striking. They will hopefully be contributory in refining the understanding and past usage of the North Cemetery.

Submitted June 20, 2015

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New England Geophysical