

TOWN OF MONSON:
HILLSIDE CEMETERY STONE WALL REPAIRS Phase II
 HILLSIDE CEMETERY MAIN STREET MONSON, MA



3 Converse Street Palmer, MA 01069
 413-283-2553 fax 413-289-8993
 e-mail: admin@architectural-insights.com



PROJECT SCOPE

1 OVERALL SITE
 1" = 100'-0"
 NORTH
 ALTERNATE 1

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No.	Description	Date
1	Phase II Work	9-17-14

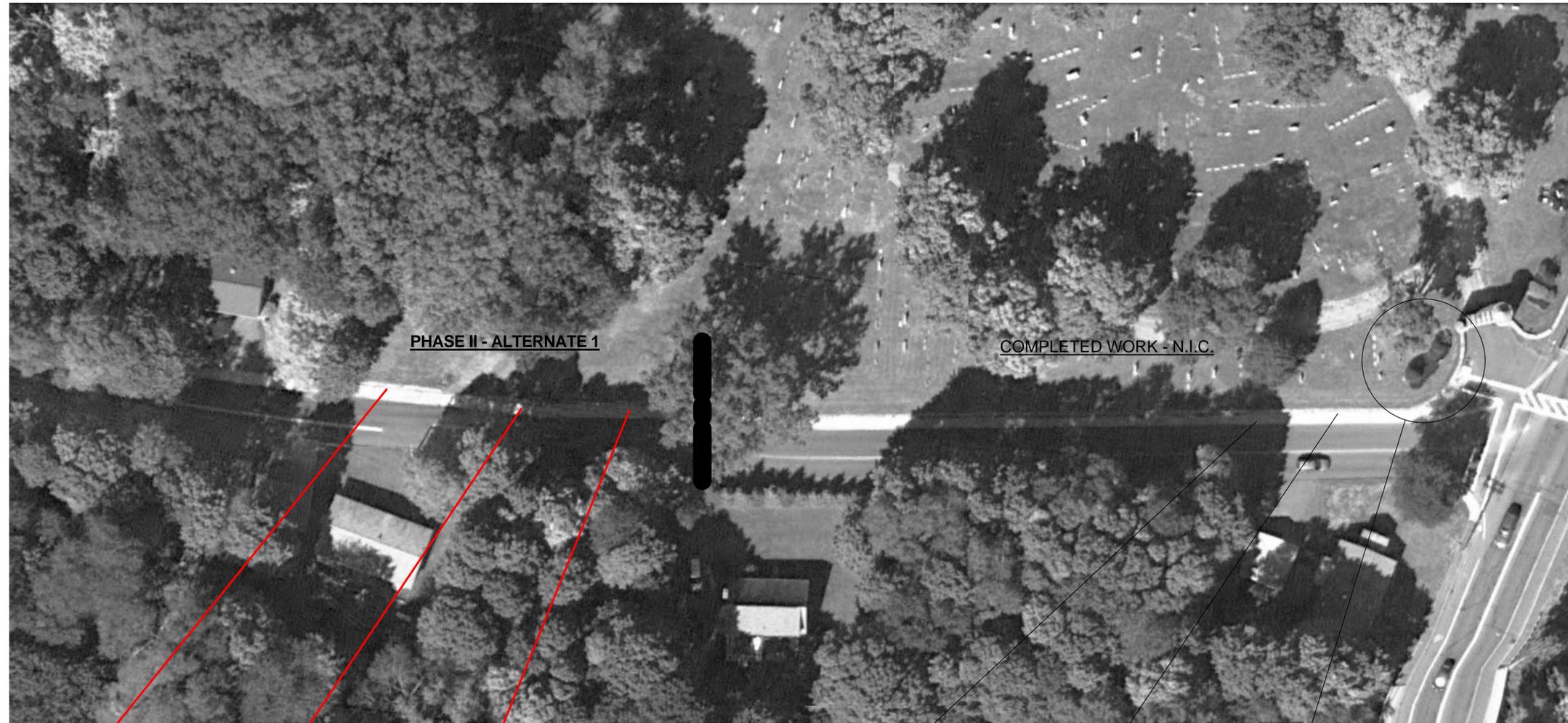
Sheet Title:
OVERALL KEY PLAN

©/Project/111122 Monson Cemetery Stone Wall Repair/1122.rvt
 Printed on: 9/22/2014 3:56:49 PM
 Issue Date: 05/09/12
 Project No. 1122
 Drawn By: DD
 Checked By: RSH
A101

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Reset capstones and repair former mortared joints to remove unsightly repairs and to repoint as necessary

Repoint face of wall for length of wall within Alternate A limits



Reset capstones and repair former mortared joints to remove unsightly repairs and to repoint as necessary

Repoint face of wall for length of wall within Alternate A limits



Reset capstones and repair former mortared joints to remove unsightly repairs and to repoint as necessary

Repoint face of wall for length of wall within Alternate A limits



Reset capstones for length of wall within Alternate 1 for only those stones out of alignment with vertical wall face



Reset capstones and repair former mortared joints to remove unsightly repairs and to repoint as necessary



Reset capstones and wall stones to make a consistent curve and smooth transition at the tangent of the straight section of wall and the curve; rejoin vertical wall section



ILLUSTRATION OF STANDARD OF JOINT TO STRIVE AND REPLICATE REALIZING ALL STONE SURFACES ARE NOT REGULAR SHPAE



Repoint face of wall for length of wall within Alternate A limits



Section of wall that is listing and requires rebuilding and resetting of capstones



Illustration of misaligned capstone and protruding wall below - restructure to make a smooth transition from curve to straight wall as best as possible using existing capstones

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**PHASE II WORK
 ALTERNATE 1**

**COMPLETED WORK
 N.I.C.**

No.	Description	Wk	Date
1	Designation Scope of Work	9-17-14	

Sheet Title:
**MILL STREET
 ENLARGED PLAN**

Issue Date: 04/04/11
 Project No. 1122
 Drawn By: DD
 Checked By: RSH

A103

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Reset capstones and repair former mortared joints to remove unsightly repairs and to repoint as necessary; remove all loose mortar

Repoint face of wall; remove all loose mortar prior to repointing; Both faces of exposed wall above grade where applicable.



Reset capstones if required - remove all loose mortar prior to repointing



Reset capstones and repair former mortared joints to remove unsightly repairs and to repoint as necessary; remove all loose mortar

Repoint face of wall; remove all loose mortar prior to repointing; Both faces of exposed wall above grade where applicable.

Reset capstones and repair former mortared joints to remove unsightly repairs and to repoint as necessary; remove all loose mortar

Repoint face of wall; remove all loose mortar prior to repointing; Both faces of exposed wall above grade where applicable.

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No.	Description	Date
Revisions		

Sheet Title:
**THOMPSON ST
 ENLARGED
 LOWER SECTION
 PLAN**

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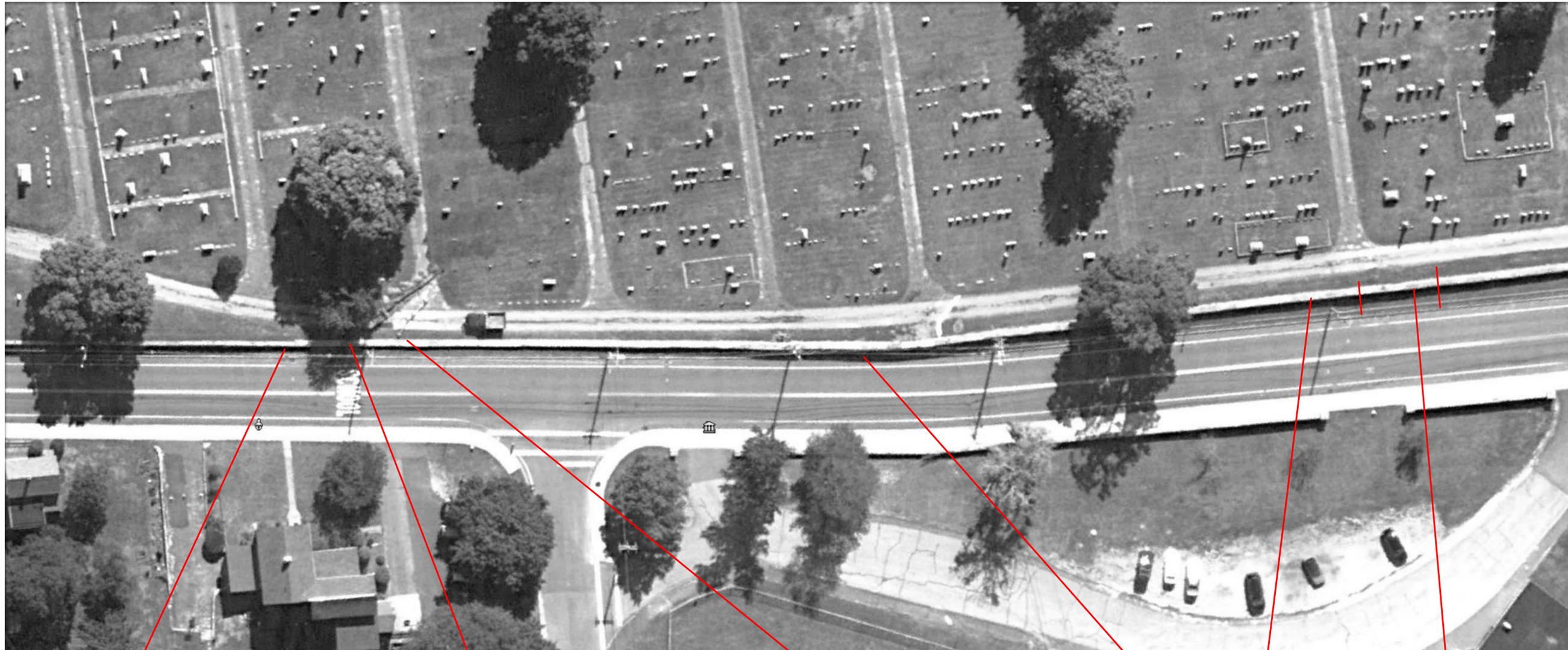
Issue Date:
 09-17-2014
 Project No.
 1122
 Drawn By:
 RSH
 Checked By:
 RSH

A104

TOWN OF MONSON:
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Reset capstones as necessary if out of alignment; remove loose mortar and repoint cap stone joints; Remove loose mortar on face of wall (applicable to both sides of exposed wall above grade) where applicable.



Reset capstones as necessary if out of alignment; remove loose mortar and repoint cap stone joints; Remove loose mortar on face of wall (applicable to both sides of exposed wall above grade) where applicable.



Reset capstones as necessary if out of alignment; remove loose mortar and repoint cap stone joints; Remove loose mortar on face of wall (applicable to both sides of exposed wall above grade) where applicable.

Approximately 30 capstones along this stretch require resetting or adjustments

This area may require a portion of restructuring / resetting of stone of existing wall. Remove loose mortar on face of wall (applicable to both sides of exposed wall above grade) where applicable.



Existing cap stones will remain; repoint as necessary and align outside face of wall (towards street) Repoint joints at capstones



Existing cap stones will remain; repoint as necessary and align outside face of wall (towards street) Repoint joints at capstones



Existing cap stones will remain; repoint as necessary and align outside face of wall (towards street) Repoint joints at capstones



Former repairs to existing wall; Existing wall to remain. Mortar joints to be checked but likely are sound enough not requiring replacement

No.	Description	Date
Revisions		

Sheet Title:
THOMPSON ST ENLARGED MIDDLE SECTION PLAN

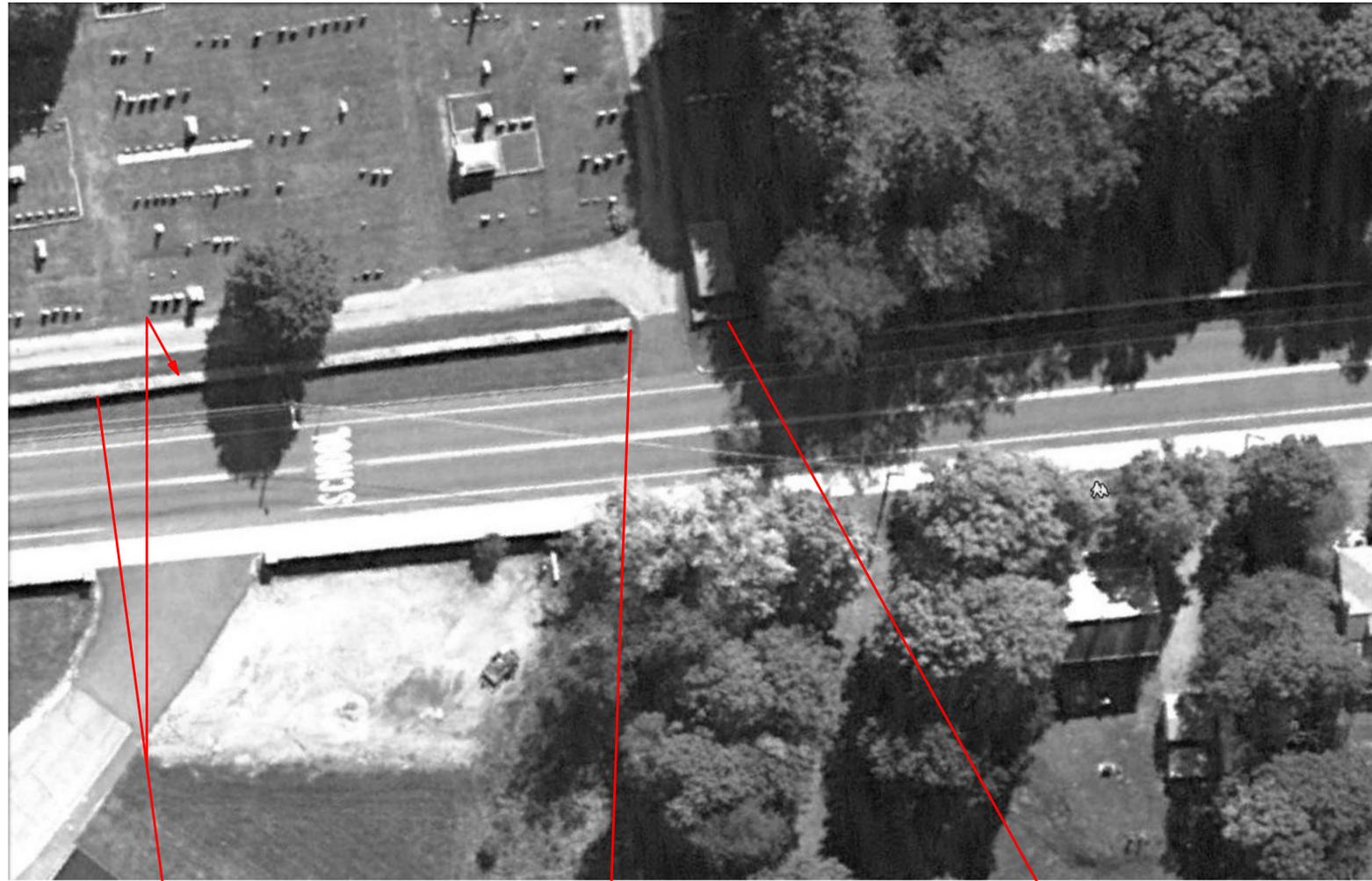
Printed on: 9/22/2014 3:56:52 PM

Issue Date: 09/17/2014
 Project No. 1122
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A105

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Reset capstones as necessary and remove all loose mortar. Repoint capstone joints

Repoint face of wall; remove all loose mortar prior to repointing. Both faces to be pointed of exposed wall above grade where applicable.

Existing corner pier shall have cap replaced.

Repoint face of wall; all exposed faces

Repoint face of wall and capstones; remove all loose mortar prior to repointing; Both faces of exposed wall above grade where applicable.

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No.	Description	Date
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Sheet Title:
**THOMPSON ST
 ENLARGED
 UPPER SECTION
 PLAN**

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Issue Date:
 09/17/2014
 Project No.
 1122
 Drawn By:
 RSH
 Checked By:
 RSH

A106

HILLSIDE CEMETERY STONE WALL REPAIRS Phase II

HILLSIDE CEMETERY MAIN STREET MONSON, MA



MONSON TOWN SELECTMEN

Edward S. Harrison
John Morell
Dr. Richard M. Smith

PROCUREMENT

Evan Brassard
Town Administrator

MONSON CEMETERY COMMISSION

James Duggan
John Silva
Chris DePace



DRAWING LIST

GENERAL	
COVER SHEET	G001
HISTORIC PRESERVATION STANDARDS	G002
HISTORIC PRESERVATION STANDARDS	G004
ARCHITECTURAL	
OVERALL KEY PLAN	A101
MILL STREET ENLARGED PLAN	A103
THOMPSON ST ENLARGED LOWER SECTION PLAN	A104
THOMPSON ST ENLARGED MIDDLE SECTION PLAN	A105
THOMPSON ST ENLARGED UPPER SECTION PLAN	A106

PROJECT TEAM

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No.	Description	Date
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Sheet Title:
COVER SHEET

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Repairs\1122.rvt

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Issue Date: 09-17-14

Project No. 1122

Drawn By: DD

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G001

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STRUCTURAL ELEMENTS

Issues
The repair and restoration requirements for elements like walls, tombs, vaults, larger monuments, plot edging, etc., are different than for grave markers. Most of these are constructed of a number of smaller components.

The principle underlying all conservation work is the retardation of the natural process of decay in a manner that does not cause any other sort of harm. Water penetration, combined with freeze/thaw movement, is the major cause of damage encountered today. Horizontal and vertical structures exposed to the weather are susceptible to a gradual infiltration of moisture and frost with subsequent damage in the form of movement and deterioration of porous elements like mortar, brick and concrete. It has been observed that structures made up of large stones withstand the punishment from weather much better than structures built of smaller elements.

Stone and concrete cap details are often inadequate to prevent water intrusion and/or they were built without sufficient allowance for differential movement. The introduction of roofing and flashing materials on historic masonry is often inappropriate, impractical and in many cases impossible.

Recommendations

No repair that has been made should be regarded as permanent because the original construction was often inappropriate for the intended purpose or dimensionally less ample than would be used today. Ongoing maintenance will be necessary because unsheltered burial ground and cemetery structures will deteriorate rapidly without some form of protection from water penetration. Repairs on these sites should be considered an ongoing process, rather than "permanent" solutions, because the work involves historic components. The rate of natural deterioration can be slowed, but can not be completely stopped, as long as masonry and metals remain in their historic outdoor locations.

The overuse and over application of excessively hard mortars has been observed at most if not all of the sites. Virtually all of the original work involved the use of lime/sand mortar which predominated until about 1880. Although susceptible to washout, it was soft enough to allow bricks or stones some movement relative to each other. In a structure that lacks flexibility, stones and bricks break, mortar joints open and serious damage results. Cement mortars used after about 1880 were hard, creating strong and unyielding joints. They are appropriate to contemporary bricks and concrete blocks. Hard and soft building materials can not be used together effectively. Hard cement mortar will cause soft bricks and stones to spall and deteriorate.

Because these sites are located in a northern temperate climate, structural elements are subjected to a wide range of temperatures. This thermal stress requires regular examination and subsequent maintenance of structural elements. Inspect for cracked mortar, loose bricks, broken stones and other movement annually. Repair at least every 5 years.

Masonry Repair and Repointing

Issues
Repointing is probably the most common operation practiced in preserving and restoring old masonry structures. Improper repointing with soft mortars has been done on occasion in the past. But repointing that has been done since the introduction of hard cement mortar is more harmful. Repointing when badly done is difficult and expensive to correct. In extreme cases it causes irreparable damage to the physical structure as well as its appearance.

The clean, white appearance of lime tinted slightly by sand was a highly favored architectural effect. As a general rule, the color of the mortar used in historic structures in the United States depended on the color of the sand used in the mixture. White marble dust was sometimes added to mortar, replacing part or all of the sand, when pointing the joints between bricks and stones. Colored mortar, obtained by mixing in mineral or earth pigment like lampblack or Venetian red, was used sparingly. They are sometimes subject to fading. During the second half of the 19th century, dark mortar was popular. When colored to approximate brick, the narrow joints then fashionable contributed to create a continuity of wall surface effect.

General Recommendations - 51

Recommendations

Masonry repairs should be performed by experienced conservation professionals. When choosing the type of mortar to be used in repointing, full consideration must be given to matching the old mortar in color, texture, aggregate, strength and hardness [density and porosity]. The new mortar used in repointing should have the same physical characteristics as the old, only if the old mortar was reasonably appropriate in the first place. It is best to repoint with mortar having the same density and absorbency as the stones or bricks in a structure.

Masonry repairs should be performed with a mortar formulation that contains at least equal parts of cement and Type S hydrated lime for repointing. Lime mortars are both more flexible in conditions of thermal and moisture cycling. It is important that mortar used for routine pointing is compatible with the softness or hardness of a brick or stone. With long stretches of unrelieved wall, the mortar should be as soft as possible [for thermal expansion and contraction resiliency] with some hardness for durability. A type N mortar formulated just above the proportions used for type O would provide both of these characteristics. Use a color, aggregate and joint profile to harmonize visually with the adjacent work.

Perimeter walls and retaining walls need routine, periodic maintenance at least once every five years. All joints that have loose mortar should be repointed. All surfaces to be repointed should be properly prepared and cleaned, removing all loose and deteriorated mortar. Joints should be raked out by hand. The depth of chipping and raking should be at least twice the width of the joint to a maximum depth of 1-1/2". Care must be taken to avoid enlarging the width of joints. Mortar should be applied in lifts no greater than 1/2" at a time.

Masonry repairs should include repointing of all field stone walls. Where mortar that is deep inside the joints of a wall is soft, remedial work should include consideration of weep holes or other drainage devices. In addition, cavities should be packed with a material such as foam backer rods or the equivalent. Walls should be anchored to the work of adjacent materials where possible. Many walls remain standing despite incredible abuse and neglect simply because they possess some form of tie back.

Dry laid stone wall, Old Burying Grounds, Littleton



52 - General Recommendations

Masonry repairs should be supervised by experienced professionals. Specific but broad comments relating to this topic are as follows:

- Never use premixed bagged mortar or grout. These materials are too hard. They will not accommodate movement of the masonry and in rare cases they may overstress the stone edge.
- Never point a bulged or leaning wall with hard mortar. This type of quick fix solution accelerates outward movement. Bowing is generally caused by earth pressure and/or mortar washout. Where possible and appropriate, use gravel backfill behind the wall and install weep holes.
- Masonry that has undergone excessive local movements should be rebuilt, not repointed. Do not exceed a joint width of 3/8" when rebuilding.
- Whenever possible, carry repointing below grade.
- Do not smear mortar on adjacent surfaces or on the joint being repaired.
- Where possible, tie thin elements together using stainless pins.
- Allow for large relative movements between concrete and brick. According to the Brick Institute of America, the thermal movement of concrete is more than double that of brick construction. Where possible and practical, install or cut drip edges in concrete caps to prevent moisture from entering mortar beds.

FOR REFERENCE

Removing Biological Growths

Issues
Some lichens and biological growths are acidic in nature or produce acids that can etch the surface or eat into stone, particularly porous stones like marble and limestone, in addition to discoloring them. Some lichens penetrate stone causing microfractures. Others develop parallel with the stone surface and may be mechanically removed. It is possible that some protect the surface of stone, reducing degradation from weathering.

In general, the larger the population of certain types of growth above the stone surface, the more decay is caused below the surface, and thus the greater the need for removal. On the other hand, more damage is often incurred by removing these growths than the decay caused by them. Removal may be desirable but can result in considerable harm. Careless intervention can make the process of degradation more rapid. At the Botanic Garden of Ajuda in Lisbon, it was recently decided to leave botanic growths in place on a very important limestone balustrade rather than risk causing irreparable damage.

Recommendations
A stone conservator should determine the type and nature of biological growths and the condition of a stone prior to taking any action. If it is determined that it is a growth that can be removed without causing damage, a conservator may proceed with caution. Biological growths on the surface of markers should be removed only if the stone is stable to the touch. Only those older stones which have substantial moss or dark botanical growth should be cleaned.

One approach to removing some surface biological growths is dry brushing with a soft brush during dormant seasons. With great care, soft wood or flexible plastic scrapers may be tested, but care should be taken not to remove any surface grains of a stone, particularly if it is marble or sandstone. Another good conservative approach entails the use of copious wetting and neutral poultices.

It is possible to retard the harmful biological growth on historic markers. Seek the advice of a professional conservator for how that may best be done for any given stone and growth. Always be sure to have supervised testing of any material recommended before working on a whole stone.

After brushing and/or scraping, a biocide solution may be brush applied to retard recolonization and to remove exceedingly stubborn growths. Markers with stable surfaces may be brushed with a biocide solution and then washed gently.

Once every 5 years is a typical cycle of retreatment, but local conditions of exposure to vegetation, water and shade may suggest more or less frequent application.

Marble Protection

Issues
Marble components have generally deteriorated much more than the older slate components. Most of the white marble stones have lost surface detail due to acid rain and general weathering. A survey should be undertaken to identify and locate the most endangered marble markers at each site, designating those that still have legible inscriptions for immediate conservation. Many however are now illegible.

Recommendations
A long term plan should include selective conservation. Enough carved detail and lettering must remain legible to make a stone worth conserving. Where there is no legible lettering, conservation or consolidation is not advisable.

Do not treat stones with protective coatings that are impermeable to water vapor. These coatings can be very harmful to stones over time and others are ineffective.

Slate marker with biological growth, Old Buryal Ground, East Bridgewater



48 - General Recommendations

Where brick walls require rebuilding, horizontal wire joint reinforcement and vertical reinforcing bars should be included in their reconstruction. Surface brick work should be performed so as to match surrounding brick work in every respect. Bricks should match in dimension, color, surface texture and gloss, hardness and absorption rate.

On masonry and stone fence or gate posts, the insertion points of horizontal metal fence rails should be repaired with appropriate pockets to take the metal inside the masonry or stone surfaces.

A concrete cap with expansion joints at ten feet on center with sealed contact edges is an acceptable alternative, but not as durable as lead coated copper flashing. In some locations consideration could be given to lead coping joint fillers like those made by Weathercap, Inc. of Slidell LA. While these joints have a slight crown that may be visually inappropriate, they offer long term durability.

Repointing weathered materials

Issues
Weathered bricks and stones in an old wall frequently acquire worn edges and rounded profiles. When repointing them it is advisable to recess the face of the new mortar slightly to keep the joint from becoming too wide and avoid spreading mortar over the edges of the bricks and stones. When repointing bricks and rubble, feather edges should be avoided. They break off easily, carrying particles of stone with them and leaving cavities through which moisture may enter.

Recommendations
The surface of an area that has been repointed or patched should be brushed so that some aggregate is raised before the mortar becomes hard. Alternatively, stippling the joint [marking it by touching it with the end of a stiff brush] before the mortar completely sets helps to give it a worn appearance. This surface texture retains a historic appearance and does not call as much attention to itself as a smooth mortar surface.



Mortared stone wall, Old Buryal Ground, East Bridgewater

General Recommendations - 53

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HILLSIDE CEMETERY MAIN STREET MONSON, MA



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Revisions		

Sheet Title:
HISTORIC PRESERVATION STANDARDS

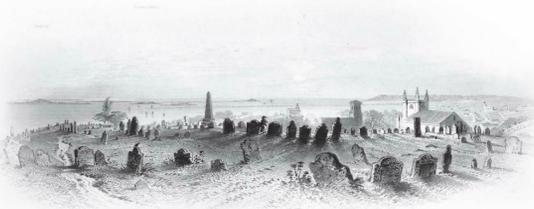
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PRESERVATION GUIDELINES
FOR MUNICIPALLY OWNED
HISTORIC BURIAL GROUNDS AND CEMETERIES

THIRD EDITION



dcr MASSACHUSETTS DEPARTMENT OF
CONSERVATION AND RECREATION



These Guidelines are a publication of the
Massachusetts Department of Conservation
and Recreation (DCR), Executive Office of
Energy and Environmental Affairs (EOEEA)

Commonwealth of Massachusetts
Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor

Executive Office of Energy
and Environmental Affairs
Ian A. Bowles, Secretary

Department of Conservation and Recreation
Richard K. Sullivan, Commissioner
Patrice Kish, Director

Prepared by Walker-Klausling Design Group
for the DCR Historic Cemeteries Preservation
Initiative.

Cover Illustration: Steel engraving of "The
Burial Hill" from *The Pilgrim Fathers* by William
H. Bartlett, London 1854 (*Boston Public Library
Rare Books Department, Courtesy of the Trustees*)
June 2002, Second Edition,
Expanded and Revised, 2009 Third Edition

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American Society of Landscape Architects, 2000
Merit Award for Landscape Planning,
Boston Society of Landscape Architects, 2000

Stone carving detail,
Cambridge



INTRODUCTION

**SIGNIFICANCE OF HISTORIC
BURIAL GROUNDS AND CEMETERIES**
The historic burial grounds and cemeteries of
Massachusetts are vital elements of the Com-
monwealth's cultural heritage. They are often the
oldest surviving remnants from the early years
of a community and represent important social,
historic, architectural and archeological artifacts.
In addition to their historic value, many of these
significant cultural landscapes must also meet
contemporary needs.

Burial grounds and cemeteries are important
public spaces with a vital link to the past. These
sites tell a story of evolving burial and mourn-
ing practices, from the bleak Puritan graveyards
to the richly ornamented rural cemeteries of the
19th century. When little else may remain intact
from the beginnings of a city or town, the burial
ground, with its stone walls, mature trees and dirt
paths can often evoke the early history of a com-
munity. As open space becomes more and more
scarce and undeveloped land is increasingly used
for other purposes, burial grounds and ceme-
teries remain places for solitude, contemplation and
reflection.

These properties are considered not only public
open spaces and areas of respite, but also out-
door museums. Unlike traditional museums,
these sites present a permanent collection of rare
three dimensional artifacts, some of which have
remained in place more than 300 years. These
historic artifacts are a finite and deteriorating
resource that need preservation and protection
from damage by weathering, vegetation and
vandandalism, as well as deferred and inappropriate
maintenance practices.

Introduction - 1

Documentary Research
The documentary record is often the best place
to start to gain an overall understanding of the
evolution and development of a burial ground
or cemetery. Information on a specific cemetery,
especially one that is municipally owned, is
often found within the community in which it
is located. While each city or town is organized
differently, local historical commissions, histor-
ical societies and municipal libraries are often a
good starting point. Valuable records can also be
found in other municipal offices such as the city
or town clerk (birth and death records); the ceme-
tery commission (inventory records, physical
and policy changes) and the community's annual
reports (expenditures, capital improvement).
Documentary information can also be obtained
from local histories, historical maps and atlases,
property deeds, land plats, newspaper accounts,
standard and aerial photographs, vital records,
family histories and genealogies, census sched-
ules and tax records.

When investigating historical era Native Ameri-
can cemeteries, families and individuals, the
Indian Affairs records from the Massachusetts
State Archives and the 19th century Earle Report
can provide helpful information. Also useful
are military records which provide brief service
records for war veterans (e.g. municipal military
museums, Massachusetts Soldiers and Sailors in the
Revolutionary War, Massachusetts Soldiers and
Sailors in the Civil War, Massachusetts Soldiers
in the French and Indian War). Finally, oral his-
tories and community traditions often generate
helpful hints on cemetery locations, construction,
enlargement and repair.

National Register Bulletin No. 41 offers a descrip-
tion of the type of documentation to be collected.
While it is not always possible to find information
in all categories, the summary below is a useful
starting point.

"Documentation begins with compiling informa-
tion on the background of the site and its develop-
ment over time. Such information would include
the date the burial place was established, the period
in which it was active, the circumstances under
which it was established and maintained, and
the cultural groups, individuals, organizations,
agencies, or corporations responsible for initial
and subsequent development. For a burial place
with design distinction, such as a large commu-
nally designed cemetery, information should be
provided about those who designed the overall
landscape and its architectural features, and those
who carried or fabricated individual monuments
and grave markers. An analysis of components
of the burial place would include identification of
methods of construction and manufacturing tech-
niques, as described in stone cutters handbooks,
fabricators' catalogs, and professional publica-
tions. Characteristic plant materials, layout of
burial plots and circulation features, average
enclosure, and the purpose or function of areas
and features within the site boundaries also are
important. The research should determine when
newer tracts were added to the site and describe the
site as a relation to its surrounding landscape."

Site Survey and Condition Assessment
The walkover or site survey is another key step
in identifying the significant features of a burial
ground or cemetery. The site survey reveals how
burials are placed in the physical environment
and how the natural environment is altered to
memorialize the dead. If at all possible, data
gathered during the walkover should be recorded
on a site map. If a detailed survey map is not
available, an assessor's map can provide the basic
outlines of the property and key details can be
sketched in. The maps prepared for the ceme-
teries described in this report can serve as models.
Lynette Strangstad's *A Graveyard Preservation
Primer* offers guidance on selecting a datum point
which can be used to prepare a more accurate
survey of site features.

It is often desirable to take photographs of current
conditions as well. They should include overall
views as well as details of significant features.
While color photographs provide a good visual
record, black and white photographs are required
for Massachusetts Historical Commission (MHC)
survey forms and National Register nominations.
To avoid duplication of effort, MHC and National
Register requirements for photo documentation
should be reviewed before photos are taken.

Documentary research should be compiled into
a written narrative accompanied by graphic
documentation, such as maps and photographs,
if available. In addition, it may be useful to com-
pile a binder containing supporting information
which can be consulted when additional ques-
tions arise.

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The following list of features to be identified
and evaluated is adapted from *National Register
Bulletin No. 41*, which should be consulted for
additional information.

- **Topography**, including slope and elevation,
both within the burial ground and in relation
to its larger setting
- **Natural Features** such as streams, hills and
native vegetation, and naturalistic features
such as ponds, lakes and land forms
- **Spatial Organization** or arrangement of man-
made features within the cemetery (i.e. rec-
tilinear, grid-like, curving or naturalistic)
- **Views and Vistas**, both within the site and
external to it
- **Characteristic Vegetation**, including trees,
shrubs, grasses, ornamental flower beds and
specimen plantings
- **Circulation Features** such as roads, paths,
steps, pavement materials
- **Gatesways, Fences and Hedges** used for bound-
ary and spatial definition, especially perim-
eter walls and fences, also features defining
individual burial plots, such as fences, curbs
or changes in topography
- **Grave Markers**, including gravestones, monu-
ments and mausoleums, for which typical or
outstanding examples should be described
[see section below on grave marker inven-
tory, which is often undertaken as a separate
project]

• **Cemetery Buildings** such as chapels, gate
houses, offices, greenhouses, house houses
and crematories

• **Site Furnishings** such as signs, flagpoles,
lighting, benches, planters and fountains and
commemorative features such as cannons and
slogans

The primary goal of the site survey is to docu-
ment the property's present physical character
in comparison with its appearance during the period
of its most active use and to identify major plan-
ning and preservation issues. The visual exami-
nation of surfaces remains may also be important
for locating unmarked burials and defining the
spatial extent of unmarked burial grounds or
cemeteries. Visual inspection can also reveal
where original cemeteries were later enlarged or
enclosed, where the natural landscape has been
modified, or associated historic features, such as
ancient roads and ways may also reveal changes to
subsequent development. A systematic search for
burial ground features, particularly remote corners,
or bases, tomb mounds, family plot markers and
surface depressions often signals potential burial
locations.

An effective way to begin a pedestrian survey
is by perambulation of the interior and exterior
cemetery walls to search for evidence of changes
to the external boundaries, access ways, and gates,
and to search for associated structures, former
roads and access ways. Close inspection of stone
walls and fences may reveal differential masonry
techniques and a variety of materials, indicating
where an original wall or fence has been repaired,
or where material has been removed. Cle-
ver fragments of broken markers are found at the
base of the burial ground or cemetery walls, and
outside the site, where they were thrown during
episodic hilling or have fallen down slope from
the site. A systematic walk from north-south
through the interior of the cemetery may identify
rows of head and foot stones aligned east-west
according to Christian tradition. When the inter-
nal configuration and spatial array of the burial
rows is known, anomalous surface conditions will
indicate absent markers, walkways, gullyways
and tree falls and may also reveal changes to
entrances and gateways. Vacant portions of the
burial ground, particularly remote corners, can
indicate the location of unmarked graves where
town gaugers were buried.

Stone carving detail in slate
Old Hill Cemetery, Newburyport



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Once a burying ground or cemetery is closed it
can quickly turn from a community asset into a
liability. When a property like this stops gener-
ating an income and is recognized for its
purpose, it only creates expenses, and often there
is no one to maintain or watch over it. This leads
to abandonment and further neglect.

Despite these pressing needs, few historic burial
grounds or cemeteries have condition assess-
ments, inventories, master plans or preservation
maintenance plans to guide their management
or care. While there is some excellent material
prepared by advocacy organizations and mu-
nicipalities, primarily related to headstones, there
is very little easily accessible written informa-
tion focusing on the overall care of this historic
landscape type, and, in particular, balancing the
needs of competing resources such as trees and
burial markers.

Finally, even where adequate preservation plan-
ning has been done, few burial grounds and ceme-
teries have been listed on the National Register of
Historic Places, or have been determined eligible
for listing. This precludes them from receiving
construction funds from programs such as DCR's
Historic Landscape Preservation Grant Program,
or MHC's Massachusetts Preservation Project
Fund (MPPF).

**PURPOSE AND GOALS
OF THE PRESERVATION GUIDELINES**
These guidelines offer a compendium of informa-
tion directly related to the preservation, restora-
tion, rehabilitation, reconstruction, management
and care of the Commonwealth's municipally
owned historic burial grounds and cemeteries.

Specific goals of the guidelines include:

- Restoration and rehabilitation of these historic
resources in a contemporary context.
- Reinforcement of an overall image compatible
with the historic assets of these properties.
- Improvement of accessibility, and
- Increasing passive recreation and educational
opportunities.

The individual preservation master plans and
implementation plans included in the case stud-
ies portion of this report can also serve as models
for both long and short term planning and im-
provements at other historic burial grounds and
cemeteries.



Obleisk detail, Chocksett Cemetery, Sterling

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Endless stone carving detail in marble
Watertown



GUIDELINES FOR PRESERVATION PLANNING

Before physical improvements begin, careful
planning is needed to determine an appropriate
overall approach and to set priorities. This is
done through the preservation planning process
which has three steps: documentation, evaluation,
and decision making, all of which are described
briefly in this section. For additional information
see Lynette Strangstad's, *A Graveyard Preservation
Primer and Preservation of Historic Burial Grounds*,
Information Series No. 70 as well as *National Register
Bulletin No. 41, Guidelines for Evaluating and Reg-
istering Cemeteries and Burial Places*. Full citations
are in the Bibliography.

DOCUMENTATION
The first step in any effort to protect a historic
burial ground or cemetery is to compile informa-
tion on its origins, evolution over time and current
conditions. This documentation process, which
involves both historical research and on-site ob-
servations, provides valuable information about
the site and also forms the basis for subsequent
evaluation and decision-making. The information
generated as part of the documentation process
also becomes part of the historical record of the
burial ground, and can be used for other pur-
poses, such as gaining public appreciation and
support for the property.

Documentation is most commonly undertaken by
local historical commissions, sometimes working
in collaboration with one or more preservation
consultants who may be art, landscape architec-
tural or social historians, cultural geographers or
have training in other related fields.

Grave Marker Inventory
Stove by stone inventories recording the number,
materials, artistic and historic significance, and
condition of the gravestones must form the basis
for stone conservation programs. More specific
information regarding grave marker inventory
can be found in the appendix.

Subsurface Investigations
Excavation in a historic burial ground or cemetery
is strongly discouraged, but is sometimes neces-
sary for planting, the repair or installation of walls
or other structures, or to resolve drainage issues.
All excavation, to any depth, requires review and
approval in the form of a permit from the Mas-
sachusetts Historical Commission and the advice
of a professional archaeologist.

Archaeological excavation of burial grounds
and cemeteries can be conducted only by pro-
fessional archaeologists and is generally limited
to the search for unmarked burials. Archaeol-
ogists can exhume human remains from a burial
ground or cemetery only after a special permit
has been obtained from the State Archaeologist
at the Massachusetts Historical Commission, and
only if exceptional circumstances warrant their
removal.

Archaeologists employ a variety of means to
search for unmarked burials, including docu-
mentary research, informant interviews and site
localization models. Field techniques include
geophysical or remote-sensing methods such as
electrical resistivity, electrical conductivity and
ground-penetrating radar. Systematic probing to
search for buried gravestone fragments is another
way to identify unmarked burials and to find bro-
ken burial markers. Remote sensing and probing
are employed during the preliminary search for
unmarked burials but have been subsequently in-
vestigated by standard manual excavation.

Unmarked burial grounds can also be identified
by machine assisted soil stripping. During soil
stripping archaeologists monitor the removal of
consecutive soil layers to search for changes in
soil color and texture associated with burials.
Prior to machine excavation archaeologists test
to determine whether graves contain evidence
of surface treatment, to identify the natural strati-
graphy, and to predict the depth at which the
burials have been interred. This method is par-
ticularly effective to search for clustered burials
which have been associated with Christian Native
American cemeteries.

When an unmarked burial ground or cemetery
is identified, archaeologists conduct field pros-
pectations to determine the size of the site, define
the boundaries and identify the spatial array of
the burials. Angle-oriented hand troweling is
an effective means for exposing grave shafts to
reveal the spatial array of ordered rows within
the cemetery. When the size and boundaries of
unmarked burial grounds or cemeteries have
been identified, archaeologists can then estab-
lish physical boundaries so that the site can be
protected from development in surrounding
property. These methods are also appropriate
for defining the extent of small family plots and
confirming that burials do not extend beyond the
known perimeter. Excavation of historic burial
grounds and cemeteries is the exception, not the
norm and should be undertaken only by a profes-
sional archaeologist under permit.

TOWN OF MONSON:

HILLSIDE CEMETERY STONE WALL REPAIRS Phase II
HILLSIDE CEMETERY MAIN STREET MONSON, MA

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HISTORIC
PRESERVATION
STANDARDS

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Project No.
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