Guide to Preparing a Restoration Proposal

This document offers guidance to Property Owners who are interested in preparing their own restoration proposal for attaining compliance with an enforcement action issued by the Bureau of Coastal and Land Use Compliance and Enforcement.

November 2017

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Getting Started

This guide has been designed primarily to assist property owners in preparing a restoration proposal in response to an enforcement action ("EA") such as a Warning Letter, Notice of Violation (NOV), Administrative Order (AO), or an Administrative Order and Notice of Civil Administrative Penalty Assessment (AONOCAPA) issued by the Bureau of Coastal and Land Use Compliance and Enforcement (CLUE) that requires the restoration of a disturbed area. For help with understanding the difference between the enforcement actions referenced above, go to https://www13.state.nj.us/DataMiner#e, "Help" link, then "Terms and Definitions".

Your enforcement action may have multiple conditions that must be satisfied to bring the property into compliance. This document provides assistance with compliance requirements that refer to "restoration". This document is not appropriate for all types of coastal and land use violations, as some restoration projects may require engineered analysis and plans or consideration of regional matters. Approval from CLUE must be sought prior to using this document to resolve a physical violation. Please contact the CLUE staff specified in the EA you received.

This document does not replace other approvals. The property owner must ensure that all necessary federal, state, and local approvals are obtained prior to implanting a DEP approved restoration plan.

Goals of the Restoration Proposal

The goal of restoration is to return a disturbed ecosystem back to pre-disturbance conditions. Re-establishing these sensitive areas preserves and restores valuable environmental functions such as wildlife habitat, water quality, flood storage, flood and shoreline protection, erosion control, biodiversity, and recreational opportunities.

Preparing a Restoration Proposal

Your Restoration Proposal must fully address the correction of the unauthorized activities cited in the EA you received and any additional regulated activities identified by DEP. Restoration proposals must include and address the following elements as appropriate for your circumstances:

1. A true scaled and surveyed depiction of the property such as a Site Plan, also referred to as a Plot Plan, or similar plan, including the following:

    a. an arrow depicting north if not already on the plan,
    b. areas of restoration activities,
    c. a key or legend that identifies the areas on site where specific restoration activities such as fill removal, revegetation and soil stabilization will take place,
    d. staging areas for soil, equipment, materials and plants, and
    e. access points.

    Refer to page 14 for an example of a Site Plan

Note: If you did not obtain a survey or Site Plan at the time you purchased your property, your municipality may be able to provide you with a copy. Otherwise, one must be obtained from a New Jersey licensed, professional Engineer or land surveyor.

2. A narrative description explaining how the restoration activities will be carried out including the following:

a. A Plan for the removal of unauthorized structures, fill material, and/or re-establishing the pre-disturbance topographic grade. The plan must describe what is being removed or moved and to where and a description of the equipment to be used, such as hand tools and/or machinery. Be specific;

b. A Soil Stabilization Plan that provides a description of the soil erosion control methods being proposed, such as installation of silt fence, application of seed mixes, and use of straw mulch. If a seed mix is proposed for stabilization, provide the composition and percentage of each seed species in the seed mix. Assistance in the use of and installation of silt fence, straw mulch application rates and methods can be found in "***Standards for Soil Erosion and Sediment Control in New Jersey***". *Refer to page 4 for more information on soil stabilization*;

c. A Planting Plan for revegetation that includes:

I. the type of each category of vegetation to be reestablished; i.e., tree, shrub, forb (non-woody herbaceous plant) and/or grasses,
II. the species' common and scientific names,
III. the quantity and size of each species, including the composition of any seed mixes to be applied,
IV. the stock type; i.e., balled and burlapped (B&B), bare root, potted, or seed, source of the plant material,
V. the plant spacing within the restoration area, and
VI. any necessary soil amendments to improve plant survival;
Refer to pages 4 - 6 for more information on planting plans.

d. A Time Schedule for implementation that identifies the date on which restoration work is expected to begin, the date by which work is expected to be completed, the dates on which specific restoration activities will take place, i.e. regrading, tilling, planting, soil stabilization, and the estimated time it will take to complete each specific restoration activity from beginning to end;

e. A Preventative Maintenance Plan describing what measures will be taken to increase the success of the restoration plan such as predation control for the plantings, control of invasive and noxious plants and a watering plan to ensure early plant survival. *Refer to page 6 through 8 for more information on maintenance and monitoring.*

Removal of Unauthorized Structures and Fill Material, Correcting Soil Disturbances and Dune Restoration

Structures

If structures must be removed from a regulated area, indicate on the Site Plan or Plot Plan which structure(s) will be removed and whether it/they will be taken off site or relocated on site. If a structure will be located elsewhere on the site, give an explanation in the narrative and depict the new location on the Site Plan. Ensure that the new location is outside of all State regulated areas. Be sure to check with your local zoning or construction official to ensure the new location will comply with local zoning ordinances. Foundations must be completely removed from regulated areas and the disturbed area must be properly graded, revegetated and stabilized.

Fill Material and Correcting Soil Disturbances

If fill material was placed, and/or the native soil was disturbed through excavation or some other means, the proposal must, in addition to the narrative elements above, describe how and from where the unauthorized fill material will be removed and how the soils will be graded to re-establish the original grade. In cases where native soil material was excavated or graded off and remains on site, that native soil material shall be used to re-establish the grade. If excavated native soil material was removed from the site, clean soil similar to the native soil type removed, may be used to restore pre-existing grades.

Fill material removed from a regulated area may not be placed in other regulated areas, whether on or off site. Your restoration proposal must identify where excavated fill material will be relocated or taken. Any fill material that is or may be contaminated must be managed in accordance with DEP's Site Remediation Program's applicable rules and regulations. In addition, if your restoration proposal required the importation or exportation of soil to or from your property, and/or grading, check with your municipality and County, as you may need a soil moving permit and/or a grading plan.

During fill removal and/or regrading, all soil disturbance must be adequately monitored for the presence of acid-producing deposits. If not properly identified and managed, acid producing soils may make restoration more difficult, more expensive, or even impossible. For a map of potential acid producing soils in New Jersey and the standards that must be adhered to when working in these areas see "Standard for Management of High Acid-Producing Soils" section (Chapter 1, pages 1-3) of the "***Standards for Soil Erosion and Sediment Control in New Jersey***" found at:
http://www.nj.gov/agriculture/divisions/anr/pdf/2014NJSoilErosionControlStandardsComplete.pdf.

In many cases re-establishing the proper topographic grade can be critical for the success of a restoration project, especially wetland restoration, as grading can influence hydrology (ground and/or surface water levels). Once you know when grading will be complete, contact the CLUE staff managing your case so that a site visit can be made to check the grading, if necessary, before proceeding with planting.

Dune Restoration

The New Jersey Coastal Zone Management Rules at N.J.A.C. 7:7 identify specific standards and publications to be followed for the creation and maintenance of dunes. These Rules also apply to restoration projects. When

re-establishing dune topography, the clean fill used must be the same or larger grain size sand as the adjacent beach. In addition, specific plant species are required for reestablishing vegetation within frontal, back, and secondary dune areas. Dune restoration proposals must be prepared following guidance from the Coastal Zone Management Rules found at http://www.nj.gov/dep/rules/rules/njac7_7.pdf . See subchapter 10.4 paragraphs (a) through (f) beginning on page 178, and the following guidance documents which are referenced within subchapter 10.4: "***Guidelines and Recommendations for Coastal Dune Restoration and Creation Projects***" (DEP, 1985) and "***Restoration of Sand Dunes along the Mid-Atlantic Coast"*** available at http://www.nj.gov/dep/landuse/download/cp_036.pdf (Soil Conservation Service, 1992).

Soil Stabilization Plan

Effective erosion controls are important in preventing soil loss, water pollution, and wildlife habitat loss. All soil disturbances occurring during restoration must be stabilized within 24 hours of completion to prevent soil erosion. This is required by the "***Soil Erosion and Sediment Control Act***", N.J.S.A. 4:24-39 et. seq. which can be found at: http://www.nj.gov/agriculture/divisions/anr/agriassist/chapter251.html. "***Standards for Soil Erosion and Sediment Control in New Jersey***" (Jan 2014, Revised 2017) at http://www.nj.gov/agriculture/divisions/anr/pdf/2014NJSoilErosionControlStandardsComplete.pdf provides information on developing a soil erosion control plan.

Soil Stabilization utilizing seed, straw much, and silt

Your restoration proposal must describe what methods of soil erosion controls will be used for the restoration area. This may include the application of an appropriate seed mix and straw mulch and/or other methods, depending on site conditions. Seed mixes specific to New Jersey and the north east for use in a variety of wetland types, riparian corridors, woodland, coastal and upland areas can be found for purchase through companies on the internet. You may also want to check with local plant nurseries. Seed mixes that contain any type of fescue, perennial rye, deer tongue or reed canary grass will not be approved. Seed mixes may be either a mixture of native, non-invasive plant species, annual rye grass, or a mix of both. Some seed companies can customize the mixes to exclude species inappropriate for a restoration site.

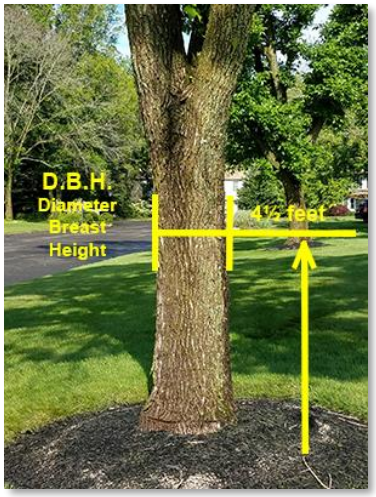
If restoration activities will disturb soil in an area greater than 5,000 square feet, a certification may be necessary from the local Soil Conservation District (SCD) office. Your local SCD can provide soil stabilization guidance, confirm whether you are in an area of acid producing soils and answer questions you may have about soil erosion control. Soil Conservation District locations and contact information can be found at http://www.nj.gov/agriculture/divisions/anr/pdf/soilconservationdistricts.pdf .

Planting Plan for Revegetation

Only native, non-invasive, species suitable for your region of the State and the ecosystem (wetland, dune, stream corridor etc.) will be approved for restoration. Native species have the greatest potential to thrive in

their native environment and provide food and habitat to native wildlife. Invasive, hybrid, and cultivar species will not be approved for restoration. The Bureau strongly encourages the use of plants and trees beneficial to pollinators and those that provide high wildlife value (food and cover) whenever possible. These types of plants often produce berries and bloom that can increase the visual appeal of your restoration project. When selecting plant material keep in mind soil, moisture, sunlight and spacing requirements. Purchasing plants from local growers can improve the chances that your restoration project will succeed since local plant material is adapted to local conditions, which can improve its survival rate. Always check the scientific name to ensure you are purchasing true native plants. If in doubt, check with a plant nursery and/or the resources listed below.

Trees, shrubs, and forbs should be described in your proposal in terms of size as either diameter at breast height (DBH) or height for trees and container size for shrubs and herbaceous plantings. Seed is described in pounds/square feet. Generally, larger plant material will have a greater survival rate, when properly cared for, and will better hold up to deer, as few deer eat vegetation six feet or more above ground level.



How to measure DBH

Your restoration proposal must identify the planting locations for all trees, shrubs, forbs and grasses and the spacing for trees shrubs, and forbs. Spacing generally dictates the number of plantings needed. A general guideline for spacing is 15 – 25 feet on center for trees and 8 – 15 feet on center for shrubs in a random layout. "On center" is the distance between the center of one plant relative to another. Planting smaller specimens may change the number of plantings required. Since planting density is often site specific, it is recommended that you discuss the density needs at your site with the CLUE staff managing your case.

The following links can assist you in your choice of plantings:

Native and Non-Native Plants

- **NJ Policy Directive: plant species considered non-native and invasive in New Jersey**: http://www.nj.gov/dep/commissioner/policy/pdir2004-02_appendix.pdf
- **Invasive Species Fact Sheets** www.nj.gov/dep/njisc/Factsheets
- **Invasive Species and Native Alternatives including species suitable for lawn alternatives** http://envirostewards.rutgers.edu/Lecture%20Resource%20Pages/The%20weeds%20of%20Nature%27s%20Garden%20-%20edited.pdf
- **New Jersey Invasive Species Strike Team – Do Not Plant List** http://www.njisst.org/documents/DoNotPlantList.pdf www.njisst.org
- **New Jersey Native Plants** http://www.jerseyyards.org/jersey-friendly-plants/native-plants/
- **Native Plant Society of NJ - Native Plants of NJ** http://www.npsnj.org/pages/nativeplants_Plant_Lists.html

Pollinator and High Wildlife Value Plants

- **NJDEP Monarch Butterfly Conservation Guide**

http://www.nj.gov/dep/docs/monarch-guide.pdf
Extensive information on high value plants for North East pollinators including host plants for butterfly larva stages, flies and bats. (Funded in part by the U.S. Forest Service and the Bureau of Land Management.)
http://www.pollinator.org/PDFs/EasternBroadleaf.Oceanic.rx18.pdf

- **Listing of Food Sources for Bees in Order of Bloom Time**
  https://njaes.rutgers.edu/pubs/fs1222/
- **Doug Tallamy (U. of Delaware) - Best Bets to** Attract Pollinators **(Butterflies and Moths) in the US Mid-Atlantic Region. (Lists the number of species supported by each plant listed)**
  http://www.bringingnaturehome.net/what-to-plant.html
- **Native Plants with High Wildlife Value for the Pinelands Region**
  http://www.state.nj.us/pinelands/about/events/handouts/handouts/Pat%20Sutton/Pat%20Sutton's%20Native%20Tree-Shrub-Vine-LIST%20-%20NJ%20Pinelands.pdf

Coastal Area Plants

- **Native Plants with High Wildlife Value for the Coastal Plain Region**
  http://capeatlantic.org/Native Plants for Wildlife Booklet.pdf
- **Barnegat Bay Watershed Native Plants Beneficial to Birds and Pollinators including Light, Soil, and Moisture Requirements**
  http://bbp.ocean.edu/PDFFiles/BBP_Native Plant brochure, May2012_six-pgs,8%275x11%20forWeb.pdf

Implementation of Your Approved Restoration Plan

The implementation and completion dates of approved restoration plans are generally timed to coincide with the optimal spring and fall planting times in your region of the state. Once you receive written approval of your restoration proposal you may begin implementation of the approved plan in accordance with your approved time schedule.

You are required to notify the CLUE staff managing your case at least 48 hours prior to starting the approved restoration work and again upon completion so that a site visit and compliance evaluation can be conducted.

Monitoring and Success of the Restoration Area

All restoration projects are subject to a monitoring period during which the success of the restoration work will be evaluated. Once the initial restoration work has been completed to the satisfaction of the CLUE staff managing your case, the monitored period begins. During this time carrying out your preventative maintenance plan is critical. Success is achieved if a minimum of 85% of the plantings survive and 85% of the restoration area is vegetated, in accordance with the planting plan, within at least 3 growing seasons. In some cases, the monitoring period may be extended. If the restoration is deemed unsuccessful, CLUE may require additional plantings and/or other corrective actions.

Soil compaction, deer browse, invasive species and lack of proper maintenance, including insufficient watering of new plantings, can cause restoration failure.

Soil Compaction

Avoid operating heavy vehicles in the restoration area to prevent further compaction of the soil. Compaction can lead to poor plant growth, inhibit water percolation and if severe, cause complete failure of the restoration project. Soils with higher clay content will compact more easily and more densely.

Avoid working when soils are wet and restrict vehicle traffic as much as possible within the restoration area. If machinery is necessary for restoration activities, the use of track vehicles is recommended as the greater surface area of the tracks will disperse weight more broadly than tires.

Compaction can be amended by utilizing walk-behind aerators and rear-tine rototillers for smaller areas. Tilling the soil using a disk harrow, may be best for larger areas. Perform decompaction to a minimum depth of 12 inches. A bedding harrow or cultivator is useful in recreating microtopography like that found in natural wetland areas but is not as effective for loosening the soil. Incorporating organic material such as leaf compost into the soils can also help alleviate compaction. If you decide to incorporate compost into your restoration plan, you must specify the amount to be used since excessive amounts may constitute a regulated activity. Avoid tilling or disking when the soil is too wet or too dry as this can cause further compaction.

Rear-tine Rototiller

Controlling Deer Browse

New plantings will need protection from deer browse and buck rubs. The most effective protection is preventing access to new plantings by fencing the entire restoration area or individual plantings. If individual plants under 6 feet tall are fenced they will also need to be covered with netting to protect branch tips and new growth. Essentially, any plant parts under about 6 feet are susceptible to damage. Generally, fences should be a minimum of 6 – 8 feet tall using box wire, or plastic mesh. With enough motivation, however, deer can scale an 8-foot fence. Tree shelters or tubes are not recommended for seedlings or smaller trees as they often result in weak trees that cannot stand on their own. To prevent this, trees in shelters or tubes should be well above the height of the tube and if under about 6 feet, will need to be netted. Tree shelters or tubes also protect bark from buck rubs and rodents though tree wraps can serve this purpose at a lower cost. Tree shelters, tubes or wraps should be regularly monitored for damage by buck rubs, rodents or weather and replaced as necessary. Keep in mind that deer resistance is relative and does not mean deer proof.

Fenced restoration area

For specific landscape plants rated by deer resistance refer to: https://njaes.rutgers.edu/deerresistance/.

Controlling Invasive Species

Invasive species can cause extensive damage to ecosystems by eliminating biodiversity and the natural habitat wildlife depend upon, as well as causing the impairment of water quality, erosion control, and flood protection. Proper control and disposal of invasive plants can make the difference between a successful restoration and a failed restoration. The most effective method of invasive species control is dependent upon the species and size of the area to be treated. Control methods, in order of preference are:

a) **Digging or hand-pulling**: Ensure that the entire root is removed to prevent re-sprouting. This is best for small or young plants in loose soil or when heavier soils are damp.

b) **Smothering**: Cut the vegetation in the treatment area as short as possible then cover the area with a tarp, black plastic or other impenetrable barrier for at least one growing season.

c) **Cutting or Mowing**: Mowing regularly during the growing season will prevent invasive plants from flowering which not only prevents seeds from developing but over time can weaken the plants. Mowing just before plants flower is most effect. Continue to monitor plants for re-flowering and do not mow if seeds develop. Note that the Cut and Treat method described below is a better approach for plants that re-sprout vigorously when cut. Note: This method is not effective for highly invasive species such as Common Reed, (*Phragmities australus*) and Japanese Knotweed (*Fallopia japonica*).

d) **Herbicides**: Some invasive species such as Common Reed, (*Phragmities australus*) cannot be controlled without using herbicides, however not all herbicides are appropriate for all situations or plant species. Herbicides are most effective when used as part of a multi method treatment plan such as Cut and Treat, and may need to be used for more than one season. Bundle stems of herbaceous plants, cut the stems and immediately apply herbicide to the fresh cut ends with a sponge paint brush or spray. This method is also effective for shrubs and trees and is an excellent way to target treatment and limit damage to surrounding desirable plants, as even a subtle breeze can cause the herbicide to drift. Using pieces of cardboard boxes can be an effective way of shielding adjacent desirable plants from herbicide drift. Treated plants will need to be monitored and any new shoots or growth will need to be treated. Note that many pesticide formulas are harmful to aquatic life and should not be used near water. Always read and follow product label instructions.

Invasive Species Disposal

Proper disposal is critical to preventing the spread of invasive species. Carefully collect all plant parts and securely bag. If invasive species currently exist within the disturbed area to be restored, extra care must be taken to prevent the spread of invasive plant material to new areas. All equipment including tracks and tires coming into contact with invasive species plant parts must be thoroughly cleaned before moving into unaffected areas to prevent the spread of invasive species. Carefully disposed of soil containing invasive species plant parts such as roots, root fragments, leaves, and stems. Invasive plant and root material is *NOT* appropriate for backyard composting since small compost piles do not generate the heat necessary to destroy all invasive plant seeds and roots. This may also be true for municipal compost facilities; however, you may want to check with your town. For homeowners, aside from effective municipal composting operations, the next best option is bagging all invasive plant parts for pick up by your regular garbage disposal service.

Examples of Common Invasive Species in New Jersey

Japanese Honeysuckle
(*Lonicera japonica*)
Richard Gardner, UMES, Bugwood.org

Garlic Mustard (*Alliaria petiolata*)
Flowering and developing seed
Chris Evans, University of Illinois, Bugwood.org

Japanese Stiltgrass
***(Microstegium vimineum*)**
Chuck Bargeron, University of Georgia, Bugwood.org

Multifora Rose (*Rosa Multiflora*)
James H. Miller, USDA Forest Service, Bugwood.org

Japanese Knotweed
(*Fallopia japonica*)
flowering
Chris Evans, University of Illinois, Bugwood.org

Japanese Knotweed in seed
Jan Samanek, Phytosanitary Administration, Bugwood.org

David English Ivy, *(Hedera helix)*
Stephens, Bugwood.org

Common Reed (*Phragmites australis)*
Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Callery or Bradford Pear
(*Pyrus calleryana*)
James H. Miller, USDA Forest Service, Bugwood.org

Norway Maple (*Acer platanoides*)
T. Davis Sydnor, The Ohio State University, Bugwood.org

Norway Maple seed (*Acer platanoides*)
Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Wetland Restoration

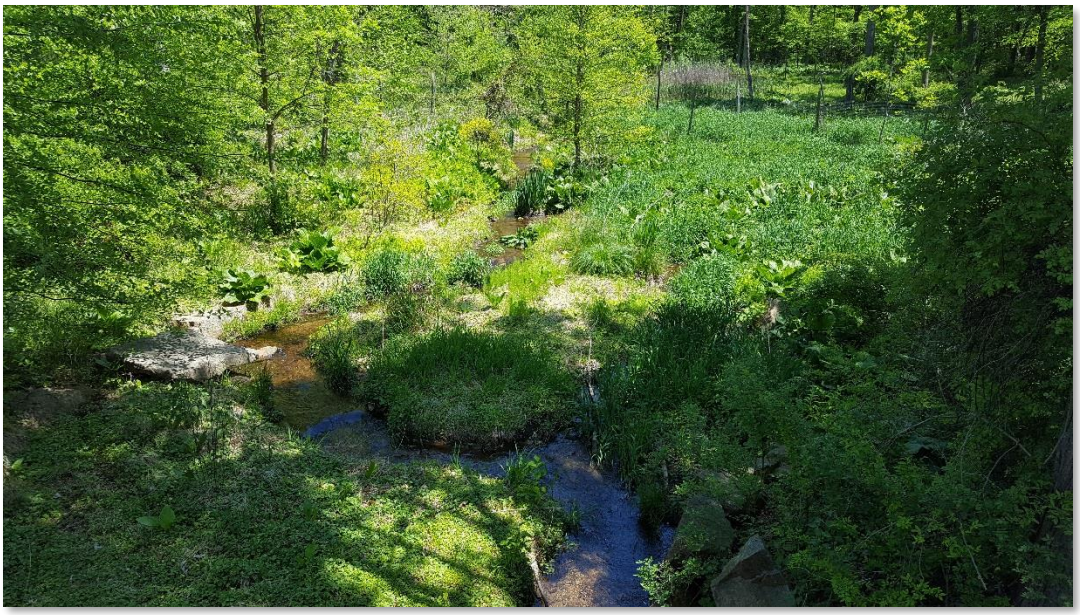
April 2004

May 2007

Stream Restoration

Channelization of a trout production stream resulting in a straight channel without meanders.

Restoration reestablished a meandering channel and recreated riffle and pool habitat for trout. Plantings included trees that will in time provide much needed shade to help keep water temperatures cooler.

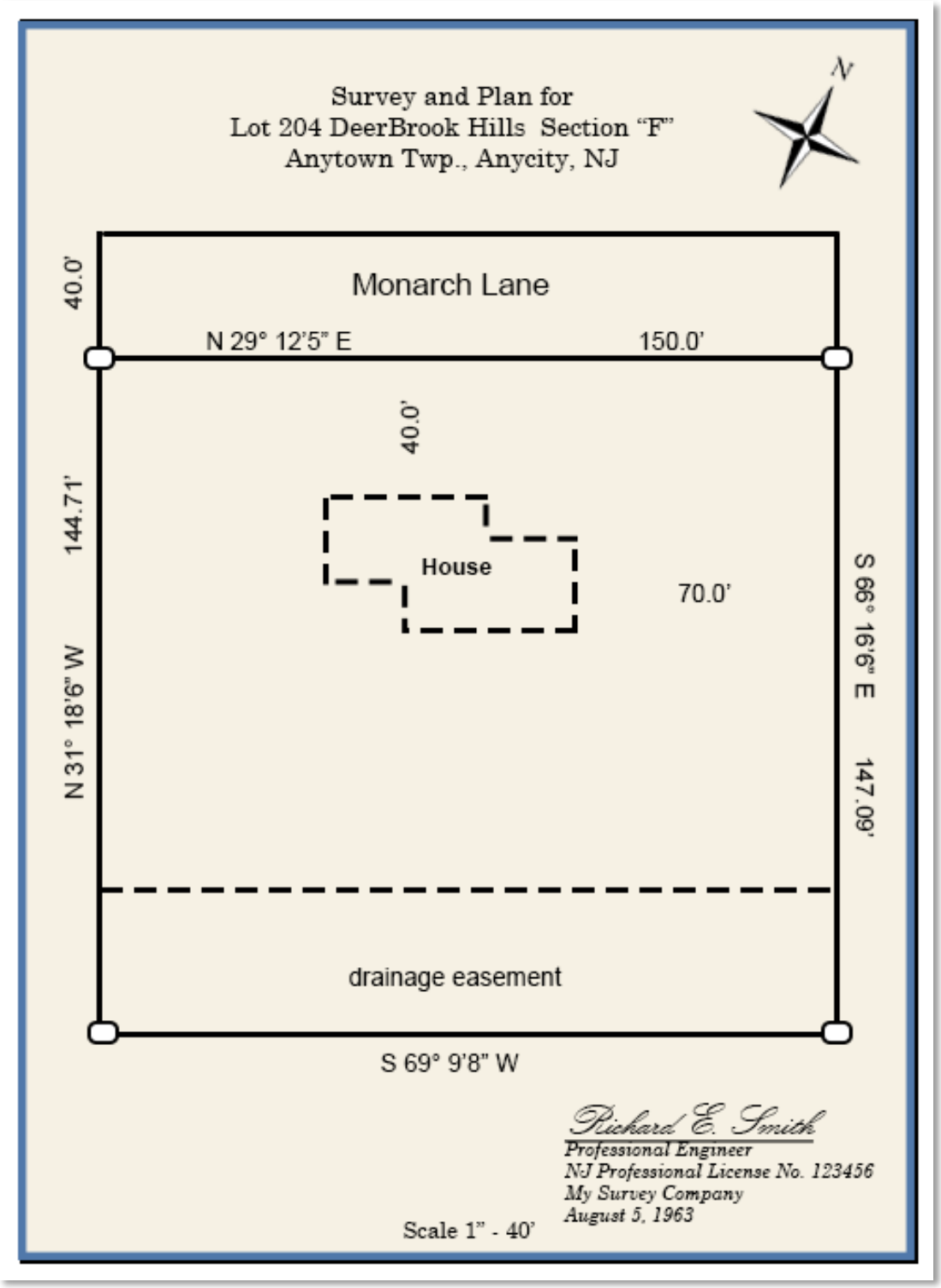


Eight years after restoration

April 2004

June 2005

Example of a Site Plan
(Not to scale)



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