

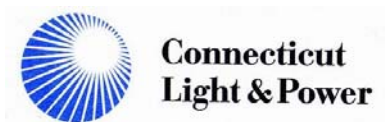


**Connecticut Siting Council
Docket No. 272**

**Development & Management Plan
for the
Middletown-Norwalk
345-kV Transmission Line Project**

**Segment 1b –
Royal Oak Bypass
Middletown and Middlefield**

May 2006



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**Connecticut Siting Council
Docket No. 272**

**Submitted By:
The Connecticut Light and Power Company**

May 2006

**Prepared by:
Burns & McDonnell Engineering Company, Inc**

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81.021

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1.0 INTRODUCTION

The Connecticut Light and Power Company (CL&P) hereby submits this Development and Management (D&M) Plan for Segment 1b of the Middletown-Norwalk 345-kV Project (the Project), in accordance with the Connecticut Siting Council (Council) Decision and Order for Docket 272 of April 7, 2005, and pursuant to Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies, *Requirements for a right-of-way development and management plan*. Segment 1b covers the bypass of the existing ROW through the Royal Oak neighborhood, known as the Royal Oak Bypass, through the Towns of Middletown and Middlefield.

The Middletown-Norwalk Project consists of approximately 69 miles of 345-kV transmission line from CL&P's existing Scovill Rock Switching Station (located in the City of Middletown in Middlesex County), through New Haven County to CL&P's existing Norwalk Substation (located in the City of Norwalk in Fairfield County). The Project will include approximately 45 miles of overhead transmission line construction and 24 miles of underground transmission line construction. The overhead portion of the Project will extend from the Scovill Rock Switching Station in the City of Middletown to the East Devon Substation in the City of Milford. The underground portion will extend from the East Devon Substation to the Norwalk Substation in Norwalk. The Project will include the construction of two new electric substations (East Devon Substation in Milford and United Illuminating's Singer Substation in the City of Bridgeport) and one new switching station (Beseck in Wallingford), as well as modifications to the existing Norwalk Substation and Scovill Rock Switching Station. CL&P will own all overhead portions of the Project, as well as the underground portion from East Devon Substation to the first vault west of the Housatonic River in Stratford. CL&P ownership continues for the entire underground portion from the Singer Substation to the Norwalk Substation. The United Illuminating Company will build and own the Singer Substation and the underground segment from the Singer Substation to the first splice-vault inclusive of the splice vault west of the Housatonic River, a distance of approximately 5.6 miles.

CL&P plans to submit thirteen separate D&M plans for its portion of the Project. The D&M plans will be developed based on the type of construction and geographic location along the route, as follows:

Switching Stations and Substations (4 D&M plans)

- Scovill Rock (Middletown) – Approved by the Council on August 25, 2005
- Beseck (Wallingford) – Approved by the Council February 22, 2006
- East Devon (Milford)
- Norwalk (Norwalk)

Overhead Lines (4 D&M plans)

- Segment 1a: Scovill Rock Switching Station to Chestnut Junction, Oxbow Junction to Beseck Switching Station (with the exception of the Royal Oak Bypass), and Black Pond Junction to Beseck Switching Station
(Middletown, Haddam, Durham, Middlefield, Meriden, Wallingford) – Approved by the Council March 8, 2006
- Segment 1b: Royal Oak Bypass
(Middlefield, Middletown)
- Segment 2a: Beseck Switching Station to Cheshire/Hamden Town line
(Wallingford, Cheshire) – Filed with the Council on March 31, 2006
- Segment 2b: Cheshire/Hamden Town line to East Devon Substation
(Hamden, Bethany, Woodbridge, West Haven, Orange, Milford)

Underground Lines (4 D&M plans)

- Segment 3: East Devon Substation to Housatonic River Crossing (Milford, Stratford) - Approved by the Council March 29, 2006
- Segment 4a: Singer Substation to Fairfield/Westport Town line (Bridgeport, Fairfield) – Approved by the Council February 22, 2006
- Segment 4b: Fairfield/Westport Town line to Norwalk Substation (Westport, Norwalk)
- Segment 4c: Westport Avenue in Norwalk to Norwalk Substation (Norwalk)

Underground Watercourse and Railroad Crossings (1 D&M plan)

(Milford, Stratford, Bridgeport, Fairfield, Westport, Norwalk)

1.1 PROJECT DESCRIPTION

Segment 1b consists of a 1.2-mile overhead segment of the proposed 345-kV overhead transmission line that will be routed away from an existing CL&P 115-kV line corridor and onto a bypass around the Royal Oak Subdivision (Royal Oak). This segment of the new 345-kV line is routed through the towns of Middletown (0.7 miles) and Middlefield (0.5 miles), as shown on Figure 2-1, Key Map.

This segment of new 345-kV line begins at a location within the existing 115-kV right-of-way (ROW) that is approximately 300 feet east of Royal Oak near the Durham-Middletown town line. The bypass angles northwest around the north side of Royal Oak through the City of Middletown, across South Main Street (Route 17) into the Town of Middlefield, and then turns south to rejoin the existing ROW just inside the Durham town line and approximately 400 feet west of Royal Oak.

The new 345-kV line will be supported on delta-configured tubular steel monopole structures with a typical height of 85 feet as shown in Exhibit 2-1, Typical Cross Section. This segment will require a new 125-foot wide right-of-way.

1.2 CONDITIONS

In addition to the *Requirements for a right-of-way development and management plan* found in Sections 16-50-j-60 et seq. of the Regulations of Connecticut State Agencies, the Council stipulated certain requirements for the D&M plans in conditions 14-21 of its Decision and Order for the Project. A copy of this portion of the Decision and Order is provided in Appendix A. Those requirements have been incorporated in this D&M Plan either directly or by reference (see Section 5.1 below). Construction procedures will also be described in the *Method and Manner of Construction* filing that will be submitted to the Connecticut Department of Public Utility Control pursuant to Connecticut General Statutes §16-243 and associated Department regulations. The Project is also subject to a permit from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the River and Harbors Act.

1.3 CONSULTATIONS

Prior to preparing this D&M Plan, CL&P consulted with officials of the two Segment 1b municipalities – Middletown and Middlefield.

An overview of these consultations is presented below.

1.3.1 City of Middletown

On May 10, 2005, a meeting was held with the Mayor of Middletown and other City officials to review the Council decision. On July 6, 2005, a joint meeting was held with the Mayor of Middletown and the First Selectmen of both Middlefield and Durham to discuss the D&M Plan process and to notify the municipalities of the availability of the Technical Advisor. CL&P explained the Council's decision at a meeting scheduled by the City of Middletown on August 9, 2005 for the property owners whose parcels are crossed by the bypass ROW. On December 20, 2005, a meeting was held with the newly-elected Mayor to brief him on Project status.

On February 6, 2006, the CSC received a letter from the Mayor of Middletown stating that the City of Middletown is fully supportive of the proposed route for the Royal Oak Bypass ROW that was part of the settlement agreement negotiated between CL&P and Linda Wilson and Ralph Wilson, Trustee, owners of a property crossed by the Bypass.

1.3.2 Town of Middlefield

On July 6, 2005, a joint meeting was held with the Mayor of Middletown and the First Selectmen of Middlefield and Durham to discuss the D&M Plan process and to notify the municipalities of the availability of the Technical Advisor.

2.0 DRAWINGS AND SITE INFORMATION

CL&P inventoried and assessed environmental conditions and cultural resources as part of the Application to the Council in Docket No. 272 (the Application). The following provides descriptive information regarding the existing conditions and modifications that will take place within Segment 1b. Much of this information is shown graphically on the Plan drawings as described below.

2.1 KEY MAP

The location of Segment 1b is shown on the Key Map, Figure 2-1.

2.2 PLAN DRAWINGS

The D&M Plan drawings depict the cross-section depicting typical structure profiles and ROW requirements (see Appendix B, Exhibit 2-1), the plan view for the overhead portion of the Project in Segment 1b (see Appendix B, Exhibit 2-2), typical foundation drawings (see Appendix B, Exhibit 2-3) and erosion control details (see Appendix B, Exhibit 2-4).

2.3 LAND OWNERSHIP

All of the land within Segment 1b is privately owned with the exception of a parcel owned by the City of Middletown and administered by its Middletown Water Department. Land ownership is identified on the Plan Drawing in Exhibit 2-2. Landowner information for parcels where additional easement rights will have to be acquired is provided in Table 2-1.

One of the parcels impacted by the Royal Oak Bypass is owned by Linda Wilson and Ralph Wilson, Trustee (“the Wilsons”). The Wilsons filed an administrative appeal of the Council’s April 7, 2005 decision. CL&P and the Wilsons have reached a settlement agreement that will result in the withdrawal of the administrative appeal.

2.4 PUBLIC ROADS AND LANDS

There is one public road crossing on Segment 1b: Route 17, also known as South Main Street, in Middletown.

2.5 TOPOGRAPHY AND GRADING

No significant changes in topography or grade will occur as a result of the construction and installation of new overhead transmission lines in Segment 1b. Minor deviations may occur along access roads or approaches to stream crossings. Locations where construction mats are used may require some grading to provide a level work area.

2.6 STRUCTURE AND FOUNDATION LOCATIONS

The location and type of structures along the ROW are shown on the plan view drawing, Exhibit 2-2. A drawing depicting typical foundation configurations is found in Exhibit 2-3.

2.7 ACCESS POINTS FOR CONSTRUCTION

Access roads (and alternates) are identified on the plan view drawing provided in Exhibit 2-2. Access includes both existing access roads and newly constructed access roads, including spurs from access roads to structures, where needed. New access roads will be permanent. The width of access roads is typically 15 feet. Only roads approved by the Council will be used for access. Prior to the initiation of construction activities, the Owner’s Representative (OR) or the Construction Supervisor representing CL&P will install signage identifying access roads restricted from vehicular traffic associated with construction.

N:\INUSCO\38565\Cadd\OHID-M PLAN\Segment 1b\Figure 2-1.dwg (SHEET 1) 04-19-2006 13:23 JPB B&McD



TO BESECK S/S

ROYAL OAK BYPASS

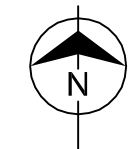
START OF SEGMENT 1B

END OF SEGMENT 1B

OXBOW JUNCTION

LEGEND

- - - - - Segment 1B
- · - · - Segment 1A



Source: USGS 1:24,000
 Topographic Quadrangles:
 Durham, Meriden, Middletown,
 Wallingford 1996 &
 Middle Haddam 1984

Scale: 0 2000' 4000'
 SCALE IN FEET



Connecticut Light & Power

FIGURE 2-1
KEY MAP
 SEGMENT 1B
 SHEET 1 OF 1

Table 2-1. Landowner Information for Parcels Impacted by ROW Acquisition.

Line List No.	Owner Name	Site Address	Contact Address	Assessors Parcel Number	Approximate Acreage of Additional Easement Rights Needed
124	Moss, John T., Estate Moss, Carol W. Executrix	218 Route 17 Durham, CT 06422	200 Pine Orchard Rd. Branford, CT 06405	21 22	2.5
124.01	City of Middletown	2 Snell Road Middlefield, CT 06455	Dekoven Drive Middletown, CT 06455	18 18	4.5
127	Boscarino, Nancy, Trustee Etals	2175 South Main Street Middletown, CT 06457	31 Laureate Drive Middletown, CT 06457	32 46 1 14-1	1.1
129	Hamden Greenhouse LLC	2301 South Main Street Middletown, CT 06457	2301 South Main Street Middletown, CT 06457	32 46 1 14-X	1.1
131	Wilson, Linda D. and Wilson, Ralph E., Trustee	2200 South Main Street Middletown, CT 06457	591 Bow Lane Middletown, CT 06457	32 47 2-3	8.5
124	Moss, John T., Estate Moss, Carol W. Executrix	218 Route 17 Durham, CT 06422	200 Pine Orchard Rd. Branford, CT 06405	21 22	0.1
				Total	17.7

2.8 VEGETATION AND CLEARING

Vegetation types occurring in Segment 1b include forested wetland and mixed hardwood uplands. The locations of vegetation identified in Section 16-50j-61(b)(6) of the Regulations of Connecticut State Agencies are provided on the plan view drawing in Exhibit 2-2.

2.8.1 Vegetation

The wetland west of Route 17 is a mature forested wetland with red maple being the predominant wetland species mixed with black gum, yellow poplar, yellow birch, ash, elm and beech. East of Route 17, the vegetation is almost entirely upland mixed hardwood trees typically 50 to 85 feet tall with mixed deciduous and conifer species including maples, oaks, hickories, red cedar and pine. Age and ratio of deciduous to conifers varies.

2.8.2 Clearing

Clearing, for a width of 125 feet, will occur along most of the ROW. The western portion of Segment 1b is in a forested wetland while the eastern portion of the ROW is situated in mature mixed hardwoods.

The clearing practices to be used are consistent with CL&P's Design and Application Standard titled "Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines" (TRM 81.021) provided in Appendix C, the New England Independent System Operator's Vegetation Clearing Standard OP-4, and the National Electrical Safety Code Rule 218 as adopted by the Connecticut Department of Public Utility Control (Regulation Sec. 16-11-134). The construction clearing practices include retention of a buffer for wetlands and watercourses. A 50-foot buffer will be used near intermittent streams and wetlands and a 100 foot buffer will be used near perennial streams, where practicable. A professional forester will oversee clearing activities.

2.8.3 Low-Impact Tree Clearing

Low-impact tree clearing incorporates a variety of approaches, techniques and equipment to minimize site disturbance and to protect forests, wetlands, watercourses, soils and cultural resources, including stone walls and old foundations. Low-impact tree clearing includes:

- Professionally prepared harvesting plan detailing landing areas, access and stream/wetland crossings.
- Employing directional tree felling – both hand felling and mechanical felling.
- Following Best Management Practices (BMP's) for harvesting in the design and implementation phase as outlined in *Logging and Water Quality in Connecticut* – developed by the Connecticut 208 Forestry Advisory Committee, 1982.
- Professionally prepared harvesting contract that includes specifications for access, wetland/stream crossings, vegetation removal, cultural resource protection and residual site quality.
- Selecting tree-clearing contractors that are experienced in low impact tree clearing and certified in the State of Connecticut.
- Utilizing a professional forester to oversee the tree clearing operations, access development, wetland/watercourse crossings, wetland and archaeological site protection and wood removal for contract compliance.
- Regulate days of operation depending on suitable/unsuitable ground conditions.
- Using a variety of tree clearing equipment to minimize impacts – forwarders, feller bunchers (cut-to-length systems), cable and grapple skidders, high-flotation tires, portable bridges and temporary culverts. The correct equipment will be matched to each specific site and conditions.

- The skidding of severed trees (tops of trees are dragged along the ground behind a skidder) will be limited to areas of low erosion potential. A forwarder is the recommended equipment type in areas with sensitive soil conditions.
- Cutting trees close to the ground, while leaving stumps and root systems in the ground to naturally decompose over time. These decaying root systems provide additional soil stability as well as hosting native organisms.
- Maximizing use of upland portions of the existing cleared ROW for landing areas and the use of existing access roads.

The benefits of low-impact tree clearing compared with conventional land clearing are substantial. Low-impact tree clearing strives to minimize site disturbances and maximize timber utilization. These objectives are less of a factor in conventional land clearing. Most land that is conventionally cleared for roads, homes and commercial development is stumped, excavated and graded.

Trees will be directionally felled either by hand – a chainsaw and operator – or felled mechanically by the equipment described below, which typically includes a felling head (a type of rotary saw) attached to a boom. The boom extends out to the tree, the felling head severs the tree, and the boom and operator place the tree on the ground.

Skidders are large articulated tractors with either a grapple or cable winch at the rear of the machine. The winch allows the skidder to be parked away from sensitive areas and to winch trees back to the machine. They may have rubber tires or tracks.

A forwarder is a tractor with a loading boom and bunk on the back of the machine to hold logs. A forwarder drives up to a pile of logs, loads the logs onto its bunk and drives back to the landing area. The logs are never skidded on the ground.

A feller buncher is a “cut-to-length” system consisting of a tractor with a specialized felling head on a boom that is capable of cutting a tree, directing its fall, removing the limbs and cutting the bole into logs. This system is more commonly used for smaller diameter conifers.

There are some variations to the equipment described above, including whether the equipment is mounted on tracks or rubber tires, but these devices are typically the equipment recommended for use in this type of clearing.

2.9 ENVIRONMENTALLY SENSITIVE AREAS

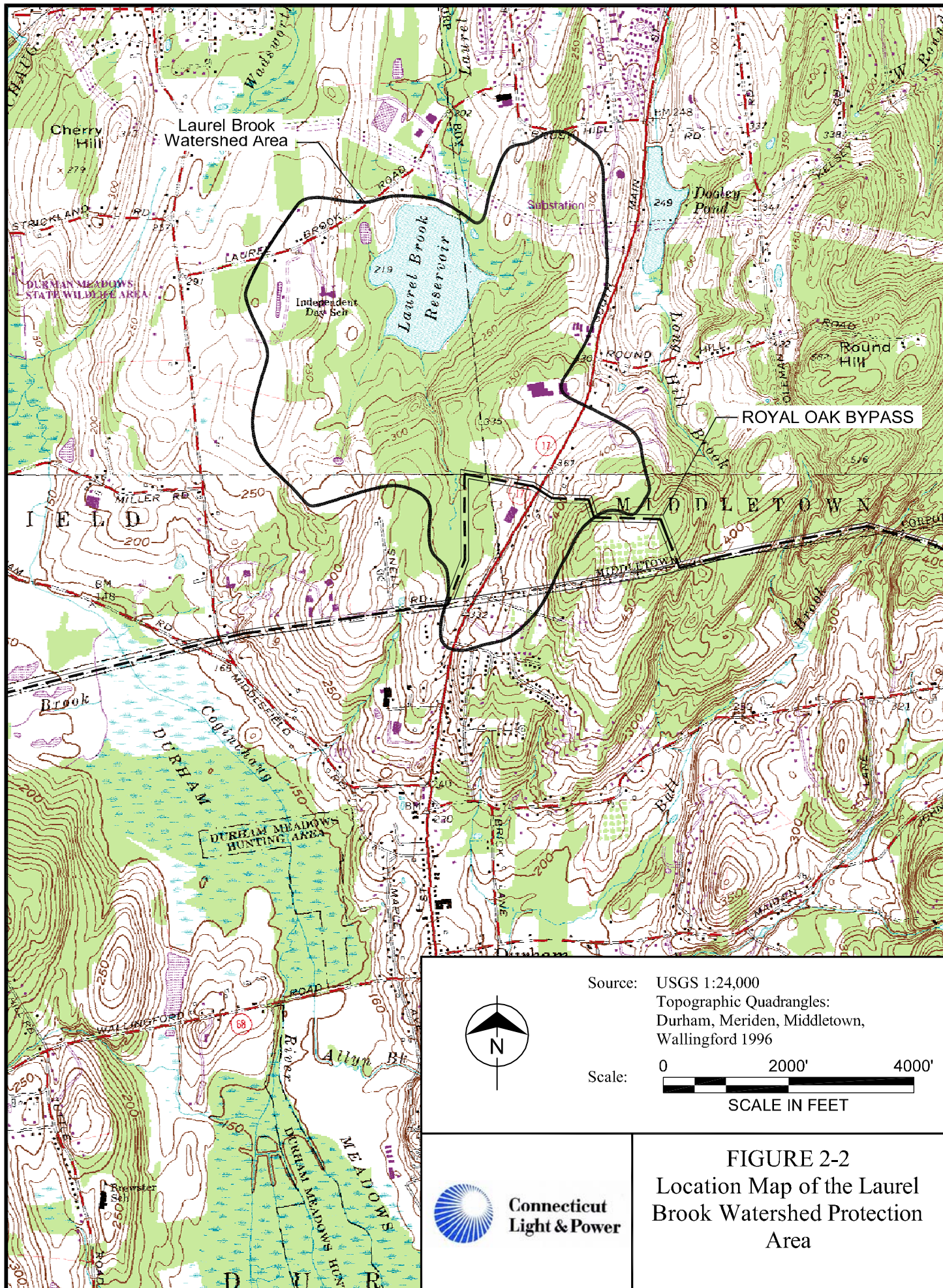
Wetlands and watercourses are identified on the plan view drawing in Exhibit 2-2. Erosion and sediment control measures necessary to protect the resource are provided in Exhibit 2-2. Details for erosion and sediment control measures are provided in Exhibit 2-4.

Much of the route is located in the Laurel Brook watershed protection area as shown on Figure 2-2. The Laurel Brook watershed is an inactive water supply for the Town of Middletown. Parcel Number 18-18 is owned by the City of Middletown and administered by the Middletown Water Department.

CL&P will limit the conductor pulling sites to upland areas to the extent practicable. Conductor pulling sites will be identified to the Council prior to commencement of construction.

2.10 EXISTING UNDERGROUND UTILITIES

Prior to and during the construction phase of the Project, the Construction Contractor will be required to use “Call Before You Dig” to identify buried utilities.



2.11 STAGING AREA AND CONSTRUCTION FACILITIES

A combination of temporary storage areas, staging areas and laydown areas will be needed to support construction. Material staging sites will be required at locations in the vicinity of the transmission line corridor. Although these areas do not necessarily have to be adjacent to the transmission line ROW, the closer these areas are to the ROW, the less the disturbance to the public. Material storage, staging and laydown areas will be on property owned by NU. If NU-owned property is not available, areas such as parking lots or land that is not in use will be considered, provided the areas are of sufficient size and in the general vicinity of construction.

The Construction Contractor will be responsible for selecting sites for material staging and for making arrangements with property owners for use of the land during construction. Material staging areas proposed for use will be submitted to Council staff for review and approval prior to use through the Change Approval Process described in Appendix E of this Plan.

3.0 CONSTRUCTION INFORMATION

This section contains information concerning construction practices and mitigation measures related to the construction of Segment 1b overhead lines.

3.1 TIMBER AND SNAG TREES

To maximize forest resource utilization, CL&P employed a professional forestry consulting firm to inventory trees on the properties affected by the new ROW. Private landowners own marketable timber in the affected ROW. CL&P will work with these private landowners to determine the disposition of wood product. The Wilson agreement has specific requirements for wood product handling.

3.1.1 Marketable Timber

Trees identified during the marketable timber survey to be removed during construction of the Project fall into three categories of marketability:

- **Non-marketable Timber** – Trees that are generally small, seedling and sapling sized, or larger trees with significant defect.
- **Marginal Value Timber** – Trees that are generally pole timber sized (6-11 inch diameter at breast height (dbh)) or larger trees with some defect. Common uses for these trees include fuelwood and pulpwood, and pallet wood. This category also includes larger sawtimber trees whose economic value has been decreased due to high harvesting costs.
- **Marketable Timber** – Trees that are sawtimber sized (12+ inches dbh), sound and reasonably accessible to harvesting. Uses for these trees include veneer and dimensional lumber products.

Utilization of the harvested trees will fall into one or more of the following categories:

- **Chipped on Site** – These trees are usually non-marketable or marginally marketable. Chips would be blown onto upland portions of the ROW.
- **Cut, Trimmed and Piled on Site** – The harvested trees are trimmed, piled and available to the landowner whose property is crossed by the CL&P ROW and chooses to maintain ownership of the wood. These wood products may be used as fuelwood or have other uses. This approach can be used in areas where the transportation of harvested wood has the potential for site impact.
- **Removed from Site** – The harvested trees and chips can be removed from site and be utilized at various mills. Markets, harvesting and transportation costs will determine the viability of this option.

A number of options exist for capturing the value of the trees removed during construction activities. These include:

- **Roadside Sale** – Landclearing contractor(s) will pile marketable timber roadside. CL&P will have the logs measured, graded and sold to the forest products industry.
- **Contractor's Timber Sale** – There are two options available for Contractor's timber sale. One employs the use of detailed data to provide a reasonably accurate estimate of the value of the timber. The other option uses estimates to derive the value of the timber.

- The logging contractor/construction contractor accepts ownership of the marketable timber. CL&P will have the logs measured, graded and appraised. The appraised value will be deducted from the contractor/construction contractor's bid price for clearing.
- The logging contractor/construction contractor is provided with an inventory and location map prior to clearing to ascertain approximate timber value. The approximate timber value can be deducted from the ROW clearing bid price for NU properties.

3.1.2 Snag Trees

A snag tree is a standing tree in some stage of decay that has one or more biological and structural attributes usable by wildlife. Snag trees can be used for cavity and branch nesting, perches, insect production and cover. Existing snag trees will remain along the transmission corridor providing they meet all specifications for line clearance and safety. There is a constant supply of new snag trees being created along the ROW due to tree damage caused naturally by ice, wind, insects and disease.

3.2 CONSTRUCTION AND REHABILITATION PROCEDURES

Construction procedures for water crossings, sedimentation and erosion control, protected species, hydrologic features and cultural resource properties are described below.

3.2.1 Water Crossing Techniques for Overhead Construction

The drawing in Exhibit 2-2 depicts water resources in the area and the recommended crossing methods. Water crossing methods that may be used during construction include flume pipe with crushed rock ramp, temporary bridge, construction mats, stone fords and crushed stone with gravel surface. Some access roads have gaps in them to avoid crossing surface waters and/or wetlands. These gaps are identified on the drawings in Exhibit 2-2 as "Restricted Access." Temporary bridges and construction mats and associated materials will be removed upon completion of construction.

Specific construction techniques at each of the water crossings in Segment 1b will be dependent upon site conditions at the time of construction and will be the responsibility of the Owner's Representative and/or Construction Supervisor representing CL&P. Periods of low flow occur in the summer months of June through September and in the winter months of January through March. If, during periods of low flow, a precipitation event increases the rate of flow and no crossing structure is installed, the Construction Contractor will either delay construction activities until the flow decreases or install a crossing structure as described in the sedimentation and erosion control measures in Appendix D.

3.2.2 Sedimentation and Erosion Control Procedures

Construction activities will comply with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. A discussion of sedimentation and erosion control measures is provided in Appendix D. Specific sedimentation and erosion control measures are shown on the plan view drawing in Exhibit 2-2. Sedimentation barriers will be installed on the downhill side of the construction area to control sedimentation. Excess spoil material will be removed from wetland areas by the contractor and disposed of in approved locations.

As the Council stated in the Decision and Order (condition 14(r)) excavated material in upland areas may be graded in proximity to the structure, and excavated soil in wetlands construction will be stockpiled in an upland area for use in wetland restoration.

Groundwater encountered during the installation of structure foundations will be discharged in accordance with the Department of Environmental Protection (DEP) General Permit for Stormwater and Dewatering Wastewaters from Construction.

3.2.3 Precautions for Protected Species

Pursuant to consultation with the DEP Natural Diversity Database, there are no known protected species existing along the Segment 1b ROW.

3.2.4 Restoration of Hydrologic Features

No significant permanent changes will occur to hydrologic features in the Segment 1b ROW. Temporary changes may occur from installation and removal of crossing structures, or other construction-related activities. Use of site-specific water crossing techniques, careful logging and other BMP will minimize or alleviate impacts to hydrologic features.

3.2.5 Protection of Cultural Resources

CL&P contracted with a cultural resource consultant, Raber & Associates, to perform a Phase I Cultural Resources Assessment as part of the Application to the Council. A significant portion of the Segment 1b ROW was identified as being “sensitive” with a high probability of encountering unknown resources. Further information is needed to complete the cultural resource assessment. In accordance with the Council Decision and Order condition 21, CL&P has contracted with Raber and Associates to perform Phase II surveys of the Project ROW at structure locations prior to construction to identify sites that are eligible for inclusion on the National Register of Historic Places.

Rock walls identified by the SHPO as having significance, as defined in the National Historic Preservation Act of 1966, will be dismantled for approximately 20 linear feet to permit access by heavy construction equipment. The portion of the wall that is dismantled will be reassembled after construction. Additional measures, if any, will be developed in consultation with the SHPO, cultural resource consultant and CL&P prior to construction.

3.2.6 Herbicide Use

No herbicides will be used during construction. No change in ROW maintenance practices is anticipated due to the construction of new lines in Segment 1b.

3.2.7 Public Recreation Areas

There are no recreation areas in or along Segment 1b.

3.2.8 Disposal and Maintenance Procedures

The Construction Contractor will remove all construction debris and dispose of it in accordance with local, state and federal regulations. Excess soil in upland areas will be spread on the ROW in adjacent upland areas as noted in condition 14(r) of the Council’s Decision and Order. No burning of debris will occur on the ROW.

3.2.9 Blasting Procedures

Blasting is not anticipated for Segment 1b. However, should further geotechnical studies or field conditions dictate the use of blasting, a blasting plan will be prepared and submitted to the Council and Fire Marshall for review and approval prior to any blasting on the ROW.

3.2.10 Rehabilitation Plans

Detailed information pertaining to restoration of wetlands is contained in Section 5.0 of the Sedimentation and Erosion Control Plan in Appendix D.

3.2.10.1 Wetlands Restoration

Detailed information pertaining to restoration of wetlands is contained in Section 5.0 of the Sedimentation and Erosion Control Plan in Appendix D.

3.2.10.2 Invasive Species

Wetlands are the most susceptible habitat for invasive species introduced by construction activities associated with the Project. The DEP, under P.A. 03-136 and in cooperation with the Connecticut Invasive Plants Council through the Invasive Plant Atlas of New England, has compiled a list of invasive plants for the State of Connecticut. The most common invasive species include the following:

- Purple loosestrife (*Lythrum salicaria*)
- Autumn olive (*Eleagnus umbellatus*)
- Barberry (*Berberis spp*)
- Ligustrum (*Ligustrum spp*)
- Honeysuckle (*Lonicera spp*)
- Buckthorn (*Rhamnus sp*)
- Rose (*Rosa multiflora*)
- Spurge (*Euphorbia spp*)
- Common reed (*Phragmites australis*).

Areas where these species occur in significant numbers, either within or adjacent to the ROW, are noted on the Plan drawings. These areas will be monitored for a period of two growing seasons following final restoration of the ROW. If significant new populations occur within the ROW, a professional horticulturist and/or wetland scientist will be retained to recommend and implement methods of control for invasive species and to maximize re-establishment of native vegetation.

The ROW will also be inspected one year after final restoration for the remaining species on the invasive plant list noted in the Invasive Plant Atlas of New England. If significant new populations of these less common species are found on the ROW, a professional horticulturist, forester and/or wetland scientist will be retained to recommend and implement methods of control for invasive species and to maximize re-establishment of native vegetation.

3.2.11 Independent Environmental Consultant

The Council approved BSC Group as the independent environmental consultant at its January 25, 2006 meeting.

4.0 NOTICES AND REPORTS

This section outlines requirements regarding notifications and reporting procedures per Section 16-50j-62 of the Regulations of Connecticut State Agencies.

4.1 STAGING AND MATERIAL LAYDOWN AREAS

Where possible, material storage, staging and laydown areas will be on property owned by NU. If NU property is not available, areas such as parking lots or land that is not in use will be considered provided the areas are of sufficient size and in the vicinity of construction. Potential material staging areas were identified in Volume 1, Section K (Proposed Construction Areas) of the Application. The Construction Contractor may use these locations or choose to identify others that may be more suited to its needs. Staging and material laydown areas proposed for use will be submitted to the Council for review and approval.

4.2 NOTICES TO THE COUNCIL

Three types of notices are required by the Council for construction. Each type is described below.

4.2.1 Notice of Beginning

CL&P will provide written notification to the Council a minimum of two weeks prior to beginning construction activities, including clearing and access work.

4.2.2 Notice of Changes

For all segments of this Project, CL&P intends to utilize a uniform procedure for interfacing with the Council regarding any changes to approved D&M Plans, namely, the procedure that the Council has already approved in connection with the D&M Plan for Scovill Rock Switching Station. This model, which has also been successfully used for the Bethel-Norwalk Project, (Docket No. 217) is described and depicted in Appendix E.

4.2.3 Notice of Completion

CL&P will provide the Council written notification of the completion of construction and site restoration for Segment 1b.

4.3 NOTICE TO MUNICIPALITIES

CL&P will provide written notification to the Chief Elected Officials of Middletown and Middlefield a minimum of three weeks prior to beginning construction activities, including clearing and access work. CL&P will also notify the Chief Elected Officials upon completion of the work.

4.4 NOTICE TO LANDOWNERS

CL&P will provide written notification to adjacent landowners a minimum of two weeks prior to beginning construction activities, including clearing and access work.

4.5 MONTHLY REPORTS

CL&P will provide the Council with written monthly progress reports.

4.6 FINAL REPORT

CL&P will provide a final report to the Council as required in Section 16-50j-62 of the Regulations of Connecticut State Agencies. The final report will contain the following information as prescribed in the regulations:

1. All agreements with abutters or other property owners regarding special maintenance precautions.
2. Significant changes to the D&M Plan that were required because of the property rights of underlying and adjoining owners or for other reasons.
3. Location of non-transmission materials that have been left in place.
4. Actual construction cost of the facility including but not limited to the following:
 - Clearing and access
 - Construction
 - Restoration

5.0 ADDITIONAL ELEMENTS PER COUNCIL ORDER

The listing of additional elements identified in the Decision and Order for Docket No. 272 pertaining to D&M Plans is included in Appendix A. All applicable information is contained within the above portions of the plan.

5.1 Decision and Order Checklist

The following is a synopsis of the requirements for the D&M Plans for the Middletown-Norwalk Project as stated in the Decision and Order, followed by the location of the information in the Segment 1b Plan, or a statement if not applicable to this D&M Plan.

ITEM FROM DECISION	LOCATION/APPLICABILITY
14. D&M Elements	
a. Detailed site plan showing access roads, foundations, staging areas for overhead route	Plan Drawings, Exhibit 2-2
b. Detailed site plan showing splice vaults, duct banks, staging areas for underground route	Not Applicable
c. Identification of horizontal directional drill and jack and bore sites for underground	Not Applicable
d. Erosion and Sediment Control Plan	Section 3.2.2, Appendix D
e. Provisions for crossing wetlands and watercourses	Section 2.9 and Section 3.2.1, Plan Drawings – Exhibit 2-2, Exhibit 2-4
f. Vegetation Clearing Plan	Section 2.8
g. Wetland Restoration Plan	Section 3.2.10, Appendix D
h. Invasive Species Management Plan	Section 3.2.10
i. Plan for Pre-Construction Survey for species of concern	Section 3.2.3; None required by DEP
j. Post-construction EMF Monitoring Plan	Section 5.2
k. Fencing of vernal pools; buffer around wetlands	Sections 2.8 and 2.9, Plan Drawings-Exhibit 2-2
l. Inland Wetlands Restoration Plan	Section 3.2.10, Appendix D
m. Monitoring and Operations Plan for each water crossing	Not Applicable
n. Traffic Control Plan	Not Applicable
o. Blasting Plan	Section 3.2.9
p. Groundwater Best Management Practices	Section 3.2.2
q. Identification of staging areas	Sections 2.11 and Section 4.1
r. May spread excavated material in uplands; stockpile excavated soil from wetlands	Section 3.2.2

s. Limit conductor installation sites and pulling sites to cleared ROW, not in wetlands	Section 2.9
t. Plan to remove or adjust selected structures	Not Applicable (none of the mentioned structures are located in Segment 1b)
15. DEP Consultation (river crossings)	Not Applicable (no DEP-permitted water crossings in Segment 1b)
16. Regional Water Authority (RWA) Conditions	Not Applicable
17. DOT Encroachment Permit Process	Not Applicable (no areas of DOT encroachment)
18. Provide the Following Permits Prior to Construction (Public Health, OLISP, Water Crossings)	Not Applicable
19. Waste Management Permits	Section 3.2.8
20. Independent Environmental Consultant	Section 3.2.11
21. Phase II Archeological Reconnaissance Survey	Section 3.2.5

5.2 SUPPLEMENTAL PLANS AND INFORMATION

CL&P and UI intend to file a single electric and magnetic field monitoring plan for locations along the project route at a future date.

6.0 PROJECT SCHEDULE

The construction schedule for Segment 1b is shown below. The schedule is currently under review and subject to modifications. Construction activities are expected to take place during six 10-hour days per week, with additional time if necessary.

SEGMENT 1b CONSTRUCTION SCHEDULE

Survey	February 2006 – June 2006
Geotech testing	May 2006 – June 2006
Right-of-way clearing	January 2007 – February 2007
Mobilization	February 2007 – March 2007
Structure Removal	Not Applicable
Structures/Cable installation	March 2007 – October 2007
Cut-overs	October 2007
Site Restoration	May 2007 – May 2008.

APPENDICES

- A Docket 272 Selected Portions of Decision and Order**
- B Drawings**
 - Exhibit 2-1 – Cross Section**
 - Exhibit 2-2 - Plan view**
 - Exhibit 2-3 – Typical Foundations**
 - Exhibit 2-4 – Erosion Control Details**
- C Right-of-Way Vegetation Clearing Standard TRM 81.021**
- D Sediment and Erosion Control Plan**
- E D&M Plan Change Approval Process**

APPENDIX A

DOCKET 272

SELECTED PORTIONS OF DECISION AND ORDER

APPENDIX A
DOCKET 272
SELECTED PORTIONS OF DECISION AND ORDER

14. The Certificate Holders shall not commence construction of the overhead and underground electric transmission system until securing Council approval of a D&M Plan, consistent with the Regulations of Connecticut State Agencies Section 16-50j-60 through Section 16-50j-62 and which includes the following elements:
- a. A detailed site plan showing the placement of the access roads, structure foundations, equipment and material staging area for the overhead route;
 - b. A detailed site plan showing the underground route, splice boxes, provisions for underground cable protection, and equipment and material staging area;
 - c. Identification of horizontal directional drill and jack and boring sites;
 - d. An erosion and sediment control plan, consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control as amended for both overhead and underground routes;
 - e. Provisions for crossing inland wetland and watercourses for both overhead and underground routes;
 - f. Vegetative clearing plan;
 - g. A wetland restoration plan;
 - h. Invasive species management plan;
 - i. A Plan for a pre-construction survey for all other endangered, threatened and species of special concern, flag areas of mudwort and bayonet grass, sweep areas for eastern box turtle and wood turtle prior to construction and abide to construction periods as outlined by the DEP Wildlife Division;
 - j. A post-construction electric and magnetic field monitoring plan;
 - k. A plan for installing construction fencing at vernal pools near construction activities and a buffer area be established around inland wetlands;
 - l. An inland wetlands restoration plan;
 - m. Monitoring and Operations Plan for each water body crossing;
 - n. A traffic control plan to include scheduling of construction hours during nights and/or weekends and mitigation of lighting and noise;
 - o. A blasting plan
 - p. Groundwater best management practices plan;
 - q. Identification of developed areas for staging and equipment lay down, field office trailers, sanitary facilities and parking before establishing a new area;
 - r. Excavated material in upland construction may be allowed to be graded in proximity to the structure and excavated soil in wetland construction shall be stockpiled in an upland area for use in wetland restoration;
 - s. Conductor installation sites shall be within the existing ROW, use of existing cleared areas, to the extent possible, and pulling sites will not be allowed in wetlands;
 - t. A plan for the following: structure #4010 may be eliminated; in Woodbridge, details on removal of structure #3920 and new poles may be eliminated in the area of wetland #133; a number of structures within wetland #70 adjacent to Tamarac Swamp in Wallingford may be reduced, especially structures #8769 and 8800; and a set of existing pole structures immediately adjacent to the Farmington Can Recreational Trail in Hamden could be removed.

15. The Certificate Holders are directed to consult with DEP on the following matters:
 - a. Concerning horizontal directional drill and the jack and bore crossing techniques;
 - b. Forging streams; and
 - c. Construction scheduling at the Milford boat launch and the line should be sited so as to not interfere unreasonably with any future maintenance needs.

16. The Certificate Holders shall abide to the following Regional Water Authority (RWA) conditions:
 - a. Shall provide all information necessary for the RWA to prepare a DPH Change in Use Application and Revocable License Agreement for the construction activities on RWA owned watershed land.
 - b. Shall prepare a Stormwater Pollution Prevention Plan (SWPPP) during the development of the Development and Management Plan (D&M Plan). The D&M Plan shall be prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control.
 - c. Refueling of construction equipment on public water supply watershed and aquifer areas shall only be conducted over portable spill container areas. Absorbent spill response materials shall be readily available on-site. The RWA shall be immediately notified of any hazardous material spills or other water quality incidents on its public water supply watershed or aquifers.
 - d. Any fuel, oils, paints solvents, or other hazardous material stored on-site during the construction process shall be in a secure area with at least 100 percent secondary containment.
 - e. Submittal of an Integrated Pest Management Plan for long-term maintenance of right-of-ways and submittal of an annual summary of pesticide use and other maintenance activities on RWA property.
 - f. If blasting is required, pre-blast surveys of RWA facilities shall be done, recording seismographs shall be in place during blasting and copies of the survey and sand seismograph results shall be provided to the RWA.
 - g. Provision of reimbursement for reasonable costs incurred by the RWA regarding review and inspection of the Project, including costs for review by its special consultants, and costs associated with designing and relocating the RWA's facilities, if required.
 - h. Preliminary and final D&M Plans shall be provided to the RWA for its review comments. The RWA shall be allowed at least 30 days to review and comment.
 - i. The RWA shall receive between three and five days notice prior to commencement of construction activity on public water supply watershed or aquifers, or in the vicinity of RWA facilities.

17. The Certificate Holders shall use the DOT encroachment permit process developed for Docket No. 217 project as a template.

18. The Certificate Holders shall provide the following permits prior to the commencement of construction:
 - a. Department of Public Health change-in-use permit;
 - b. Office of Long Island Sound Programs (OLISP) coastal permits for the Singer and East Devon Substations; and
 - c. DEP water body crossing permits.

19. The Certificate Holders shall obtain necessary waste management permits for activity in any solid waster disposal areas and remove and dispose of contaminated soil per municipal, state and federal regulations.
20. The Certificate Holders shall hire an independent environmental consultant, subject to Council approval, to monitor and report on the installation of the overhead and underground transmission system.
21. The Certificate Holders shall conduct a Phase II Archeological Reconnaissance Survey in consultation with the Connecticut Historical Commission prior to construction.

APPENDIX B

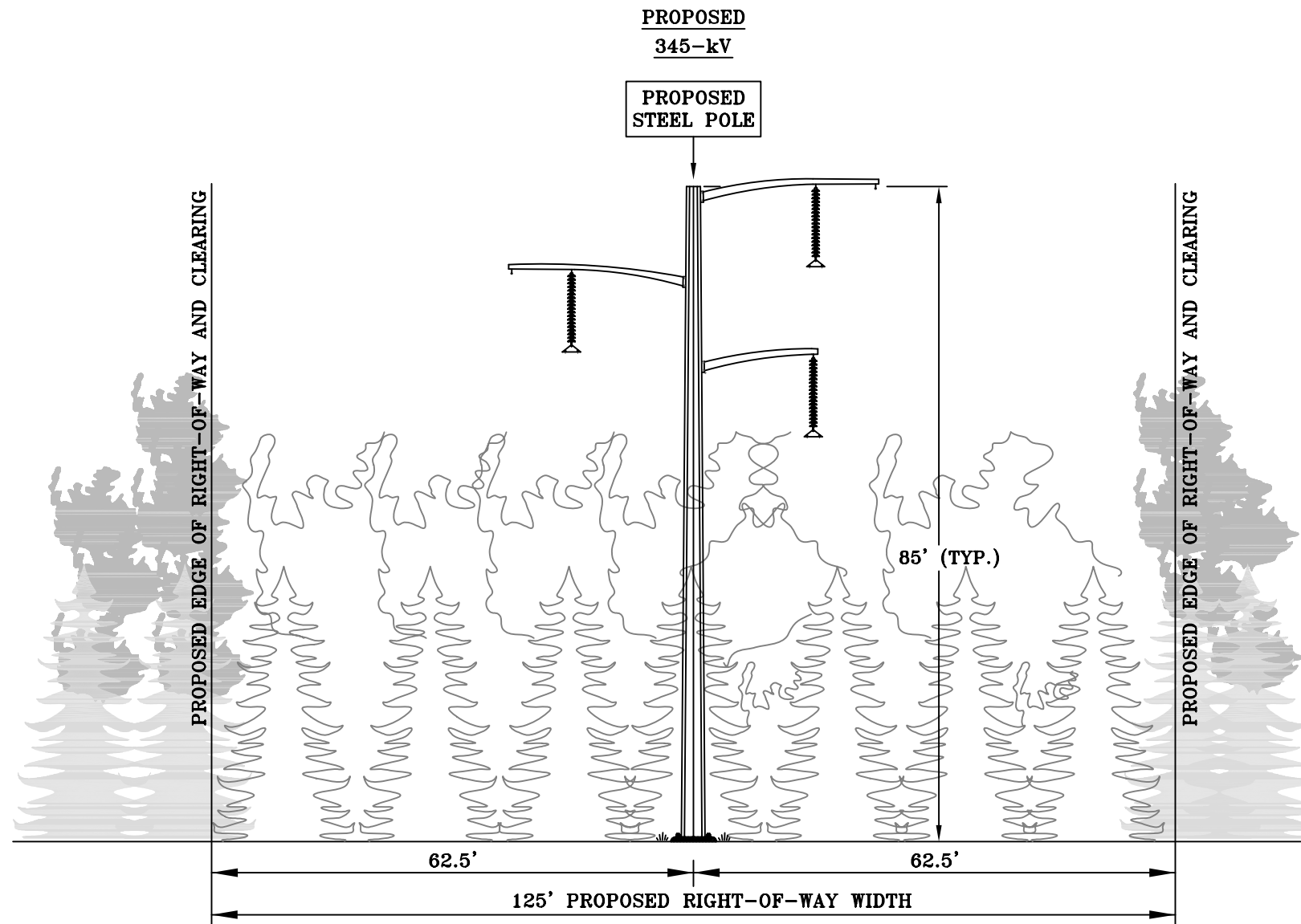
DRAWINGS

Exhibit 2-1 – Cross Section

Exhibit 2-2 – Plan view

Exhibit 2-3 – Typical Foundations

Exhibit 2-4 – Erosion Control Details



ROYAL OAK BYPASS
 LOOKING NORTHWEST
 FROM EAST OF ROYAL OAK TO LITTLE LANE
 IN THE TOWN OF MIDDLEFIELD
 AND THE CITY OF MIDDLETOWN

NOTE: SEE INDEX MAP FOR
 LOCATION OF CROSS SECTION

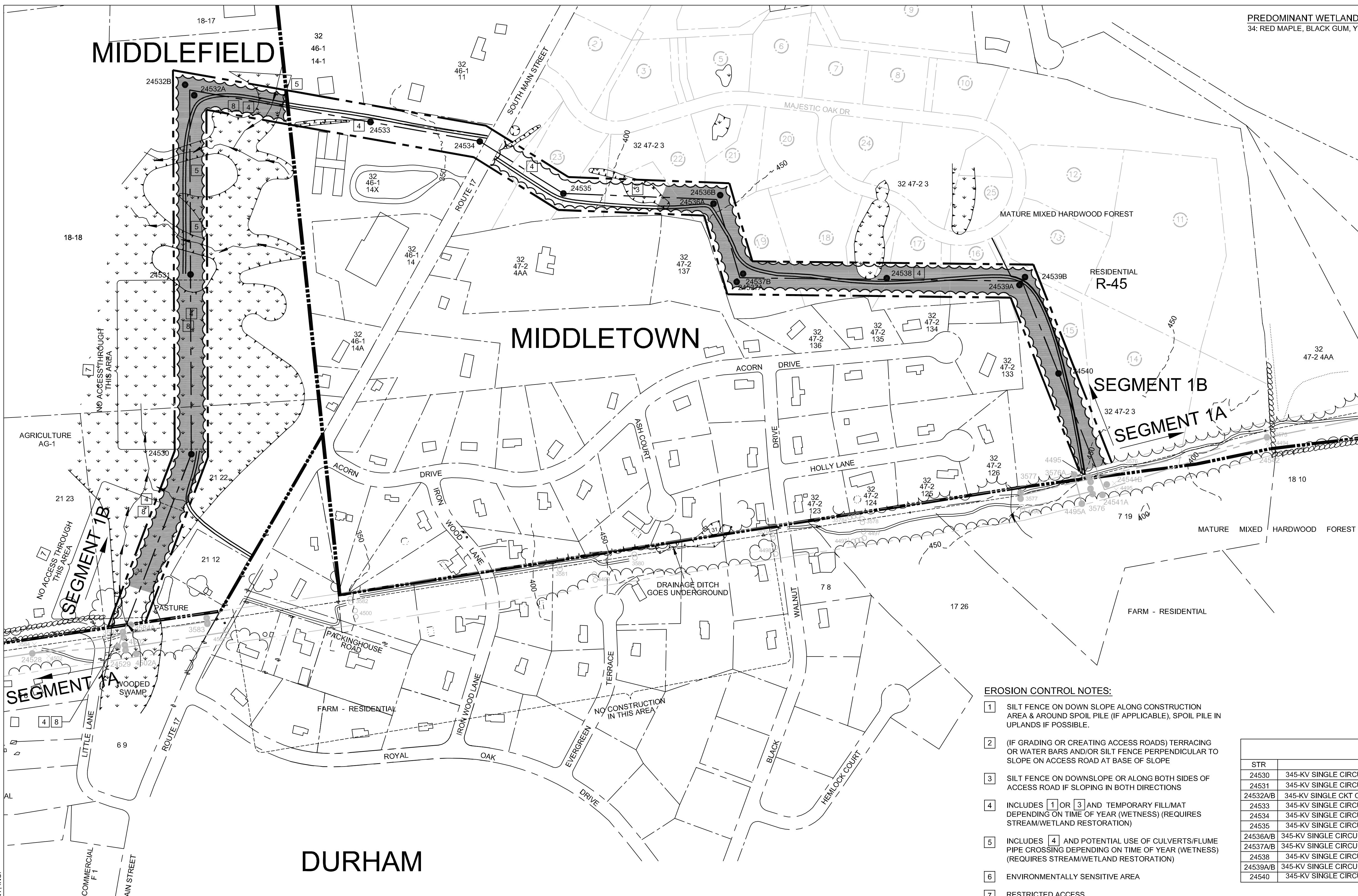
CSC DECISION CONFIGURATION



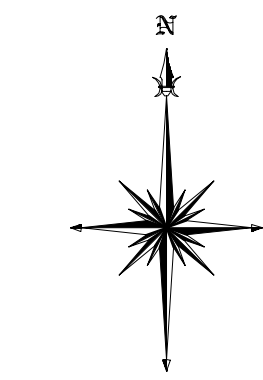
TITLE
 TYPICAL CROSS SECTION
 MIDDLETOWN - NORWALK
 345-kV TRANSMISSION LINE

BY	JMH - B&McD	CHKD	APP	APP
DATE	04/2005	DATE	DATE	DATE
SCALE	N.T.S.	MICROFILM DATE	DWG. NO.	
P.A. #			EXHIBIT 2-1	

PREDOMINANT WETLAND VEGETATION
34: RED MAPLE, BLACK GUM, YELLOW POPLAR, YELLOW BIRCH, ASH, ELM, BEECH



Line List Number	Owner Name (Now or Formerly)	Assess. Parcel Number
119	Morrow, Mark Edward	21 23
120	Hicks, Norman W. and Charlene S.	06 08
122	Moss, John T, Estate of C/O Moss Carol W. Executrix	06 09
124	Moss, John T, Estate of C/O Moss Carol W. Executrix	21 22
124.01	Middletown Water Co.	18 18
125	Moss, John T & Katherine A	21 12
126	Boscarino, Nancy Trustee Etals of C & S & M Boscarino Trust	18 17
127	Boscarino, Nancy Trustee Etals	32 46 1 14-1
128	Scirpo, Sebastian & Kathleen J.	32 46 1-11
129	Hamden Greenhouse LLC	32 46 1 14-X
131	Wilson, Linda D. (1/2) Int. & Wilson, Ralph E As. Trustee (1/2 Int.)	32 47 2-3
131.01	Wilson, Linda D. (1/2) Int. & Wilson, Ralph E As. Trustee (1/2 Int.)	7 19
160	Griffin, William F. Jr.	18 10
161	Barone, Al J. & Cynthia A.	32 47 2-4AA
131.01	Charles M. & Gloria A. Renna	32 47 2-4AA
131.02	Patricia A. Tucker	32 47 2-137
131.03	Vanphung & Marian N. Phan	32 47 2-136
131.04	Gregory A. & Claudia Horn	32 47 2-135
131.05	Rueben & Carmen Rivera	32 47 2-134
131.06	Joan Milas Bohan	32 47 2-133
130.10	Patricia Mahoney	32 47 2-126
130.11	Russel B. Jr. & Dianne D. Lennon	32 47 2-125
130.12	Steve & Michelle Gaudreau	32 47 2-124
130.13	Mark Stouffer	32 47 2-123
130.14	Pietruska, Walter & Gertrud, Trustees	07 08
130.15	Berten, Elizabeth	17 26



UPLAND RIGHT-OF-WAY VEGETATION
PREDOMINANT: MAPLES, OAKS, HICKORIES, RED CEDAR, PINE.

- EROSION CONTROL NOTES:**
- 1 SILT FENCE ON DOWN SLOPE ALONG CONSTRUCTION AREA & AROUND SPOIL PILE (IF APPLICABLE), SPOIL PILE IN UPLANDS IF POSSIBLE.
 - 2 (IF GRADING OR CREATING ACCESS ROADS) TERRACING OR WATER BARS AND/OR SILT FENCE PERPENDICULAR TO SLOPE ON ACCESS ROAD AT BASE OF SLOPE
 - 3 SILT FENCE ON DOWNSLOPE OR ALONG BOTH SIDES OF ACCESS ROAD IF SLOPING IN BOTH DIRECTIONS
 - 4 INCLUDES 1 OR 3 AND TEMPORARY FILL/MAT DEPENDING ON TIME OF YEAR (WETNESS) (REQUIRES STREAM/WETLAND RESTORATION)
 - 5 INCLUDES 4 AND POTENTIAL USE OF CULVERTS/FLUME PIPE CROSSING DEPENDING ON TIME OF YEAR (WETNESS) (REQUIRES STREAM/WETLAND RESTORATION)
 - 6 ENVIRONMENTALLY SENSITIVE AREA
 - 7 RESTRICTED ACCESS
 - 8 TREE CLEARING REQUIRED (CUT OFF AT BASE & KEEP ROOT SYSTEM INTACT)
 - 9 PERMANENT FILL REQUIRED (STONE OR WOOD SLAB BASE)

STRUCTURE DATA SUMMARY					
STR	DESCRIPTION	HEIGHT	FINISH	FOUNDATION	
24530	345-KV SINGLE CIRCUIT COMPACT DELTA ANGLE (20-30 DEG)	110	WEATHERING	84" DIA DRILLED SHAFT	
24531	345-KV SINGLE CIRCUIT TANGENT COMPACT DELTA (0-2 DEG)	110	WEATHERING	84" DIA DRILLED SHAFT	
24532A/B	345-KV SINGLE CKT COMPACT DELTA DEADEND (100-110 DEG)	120	WEATHERING	96" DIA DRILLED SHAFT	
24533	345-KV SINGLE CIRCUIT TANGENT COMPACT DELTA (0-2 DEG)	110	WEATHERING	84" DIA DRILLED SHAFT	
24534	345-KV SINGLE CIRCUIT COMPACT DELTA ANGLE (20-30 DEG)	95	WEATHERING	84" DIA DRILLED SHAFT	
24535	345-KV SINGLE CIRCUIT COMPACT DELTA ANGLE (20-30 DEG)	90	WEATHERING	84" DIA DRILLED SHAFT	
24536A/B	345-KV SINGLE CIRCUIT COMPACT DELTA DEADEND (70-80 DEG)	90	WEATHERING	96" DIA DRILLED SHAFT	
24537A/B	345-KV SINGLE CIRCUIT COMPACT DELTA DEADEND (70-80 DEG)	110	WEATHERING	96" DIA DRILLED SHAFT	
24538	345-KV SINGLE CIRCUIT TANGENT COMPACT DELTA (0-2 DEG)	105	WEATHERING	84" DIA DRILLED SHAFT	
24539A/B	345-KV SINGLE CIRCUIT COMPACT DELTA DEADEND (60-70 DEG)	90	WEATHERING	96" DIA DRILLED SHAFT	
24540	345-KV SINGLE CIRCUIT TANGENT COMPACT DELTA (0-2 DEG)	90	WEATHERING	84" DIA DRILLED SHAFT	

UPLAND RIGHT-OF-WAY VEGETATION
PREDOMINANT: RED MAPLE
COMMON: BLACK GUM, YELLOW POPLAR, YELLOW BIRCH, ASH, ELM, BEECH



LEGEND			
	SELECTIVE CLEARING AREAS		NEW STRUCTURE CENTERLINE
	EDGE OF PROPOSED CLEARING		MONUMENT CENTERLINE
	EDGE OF EXISTING CLEARING		EXISTING WORKING EDGE OF R.O.W.
	FENCE		PROPOSED EDGE OF R.O.W. (INCLUDING WORKING EDGE)
	NEW POLE		WETLAND AREA
	EXISTING POLE TO BE REMOVED		WETLAND BOUNDARY
	EXISTING POLE TO REMAIN		TRAIL
	EXISTING TOWER TO BE REMOVED		CONTOUR LINE
	EXISTING TOWER TO REMAIN		PROPERTY LINE
			CL&P PROPERTY LINE
			STREAM FLOW DIRECTION
			EXISTING CULVERT
			MARKETABLE TIMBER
			EXISTING ACCESS ROAD
			TEMPORARY ACCESS ROAD (APPROXIMATE LOCATION)
			PROPOSED ACCESS ROAD (APPROXIMATE LOCATION)
			TOWN LINE
			STONE WALL
			UTILITY POLE
			R.O.W. GATE



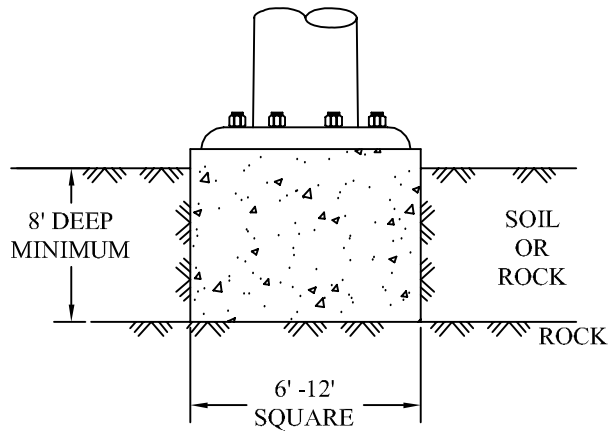
38565
date FEBRUARY 16, 2006
designed J. BOYER
detailed J. BOYER
checked -

NO.	DATE	REVISIONS	BY	CHK	APP	APP
4	5/10/06	ISSUED TO CSC	JPB	JMH		
3	4/21/06	ISSUED FOR TOWN REVIEW	JPB	JMH		
2	4/17/06	ISSUED FOR PROPERTY OWNER REVIEW	JPB	JMH		
1	3/15/06	ISSUED FOR FIRST NU REVIEW	JPB	JJW		

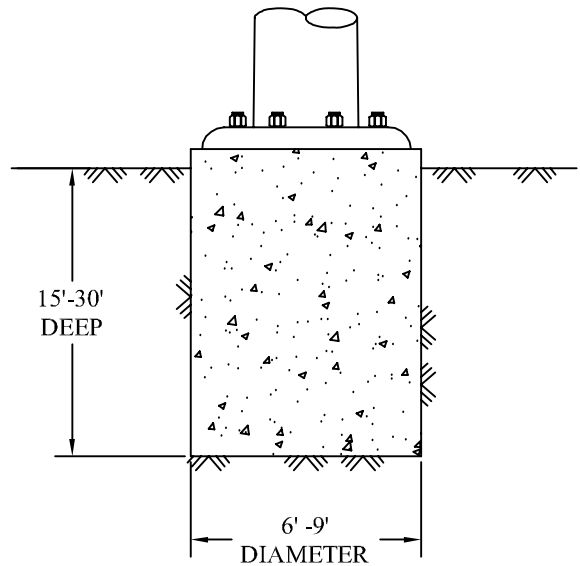
NORTHEAST UTILITIES SERVICE CO.
FOR THE CONNECTICUT LIGHT & POWER CO.
TITLE BESECK S/S - OXBOW JCT 345/115KV LINE
DEVELOPMENT & MANAGEMENT PLAN
SEGMENT 1B

BY MEC - BMCD	CHKD -	APP -	APP -
DATE AUG 2005	DATE -	DATE -	DATE -
SCALE 1"=200'	D	DWG. NO.	EXHIBIT 2-2

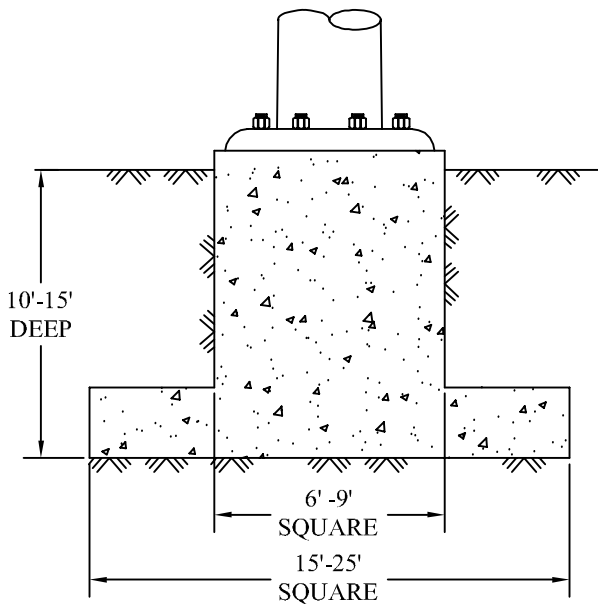
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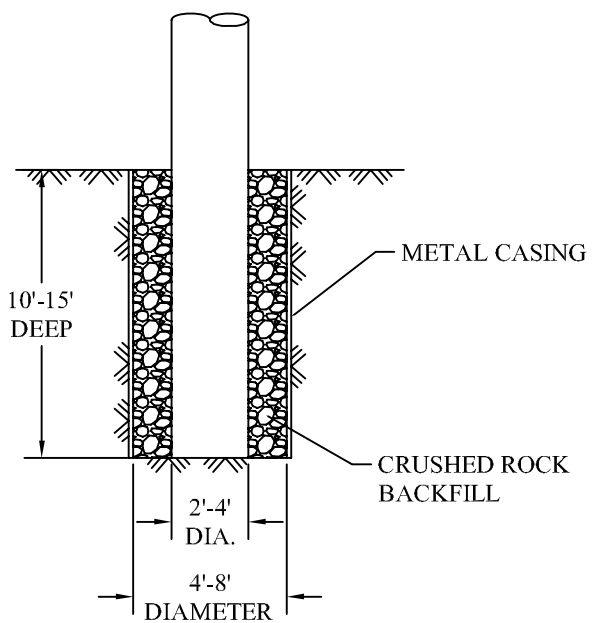
TYPICAL ROCK FOUNDATION FOR STEEL POLE



TYPICAL CAISSON FOUNDATION FOR STEEL POLE




TYPICAL PAD & PIER FOR STEEL POLE

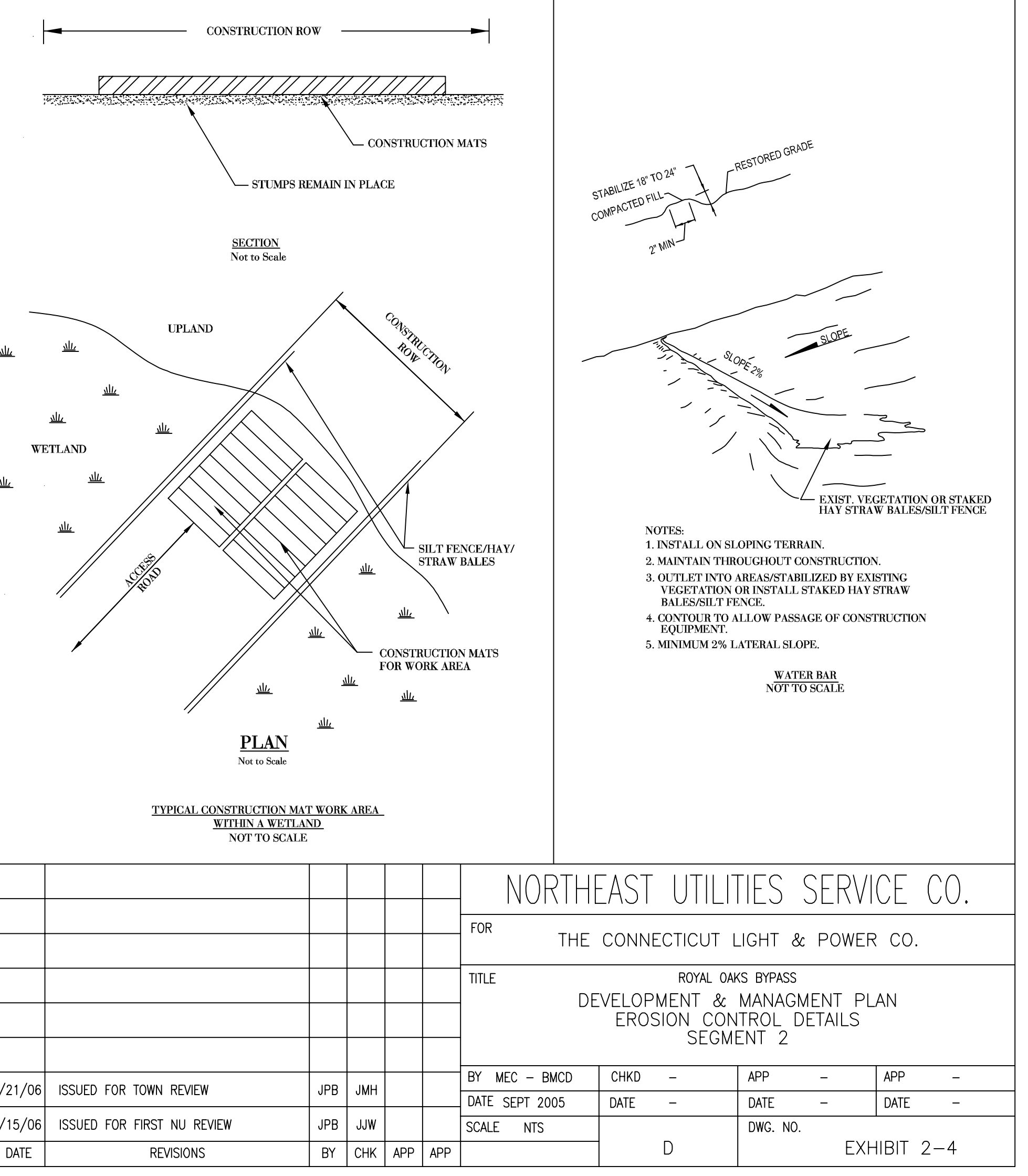
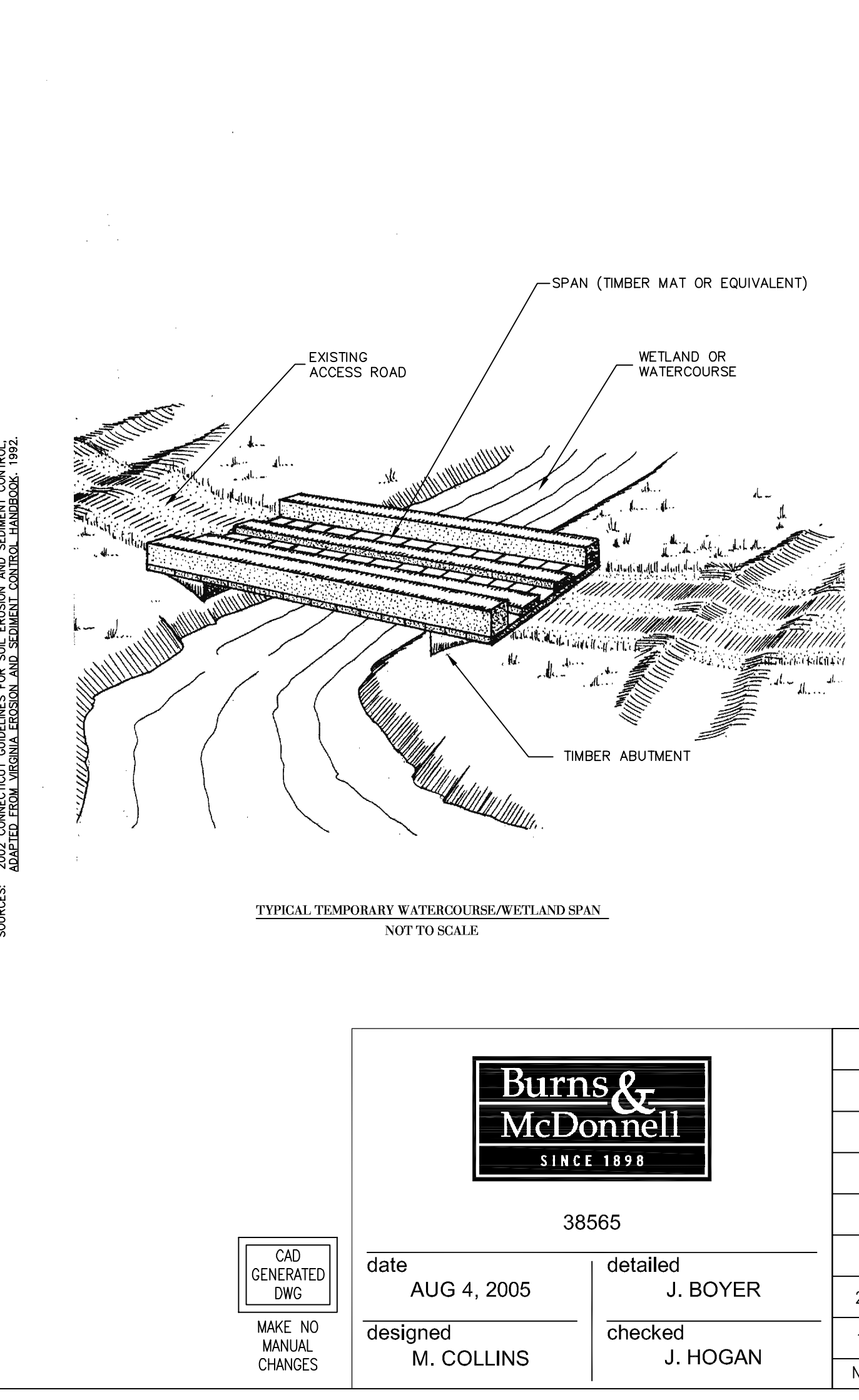
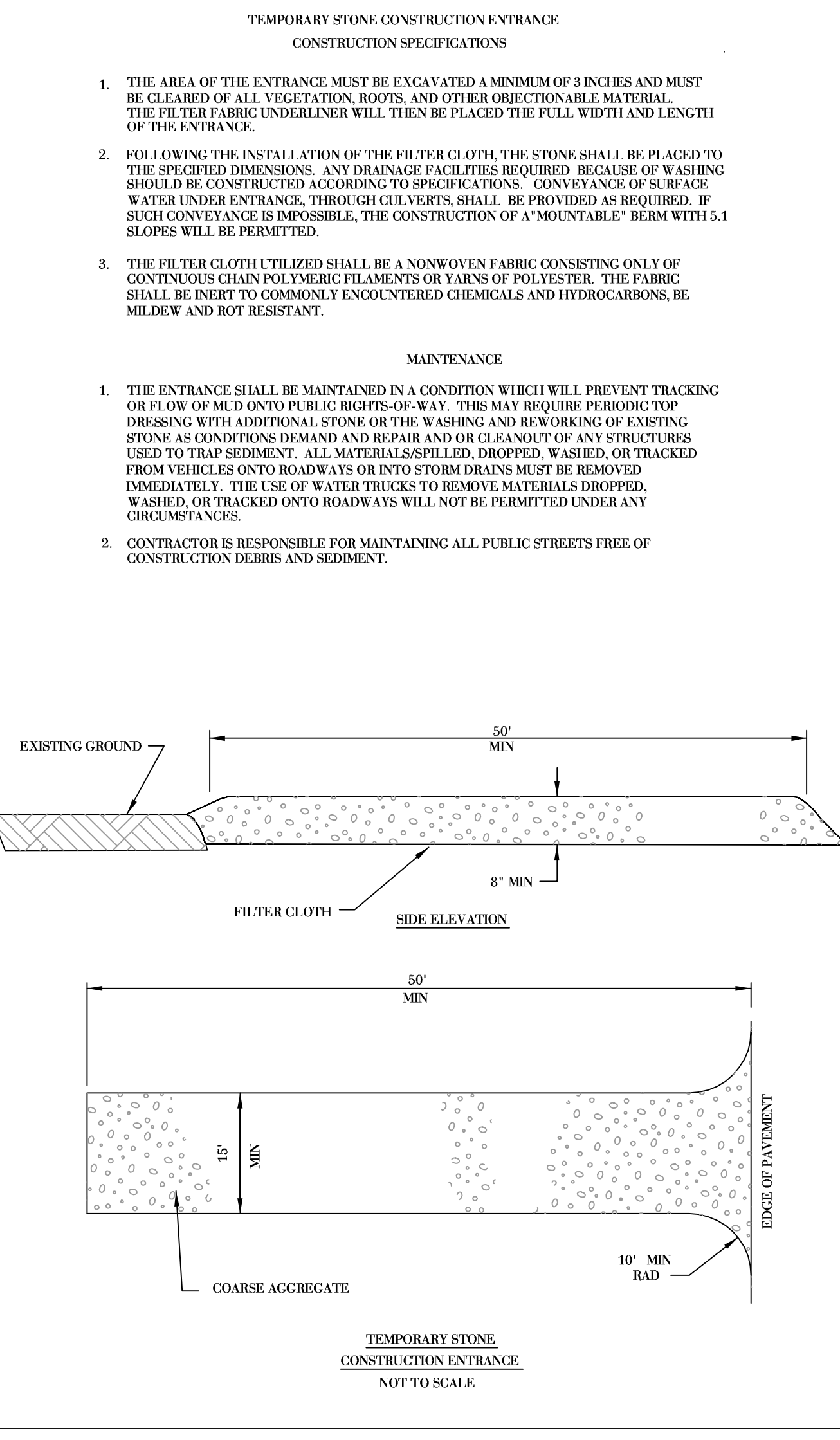
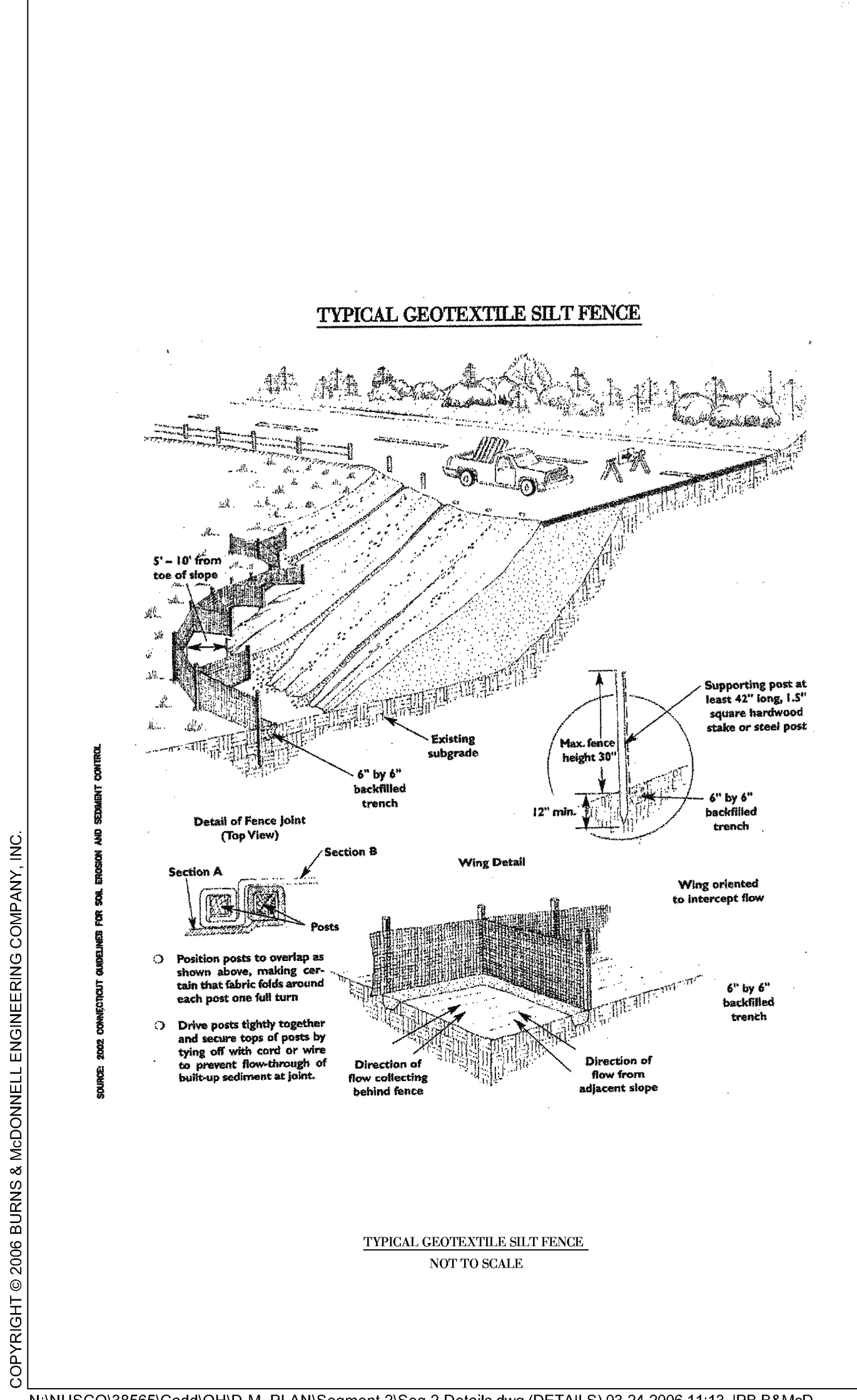
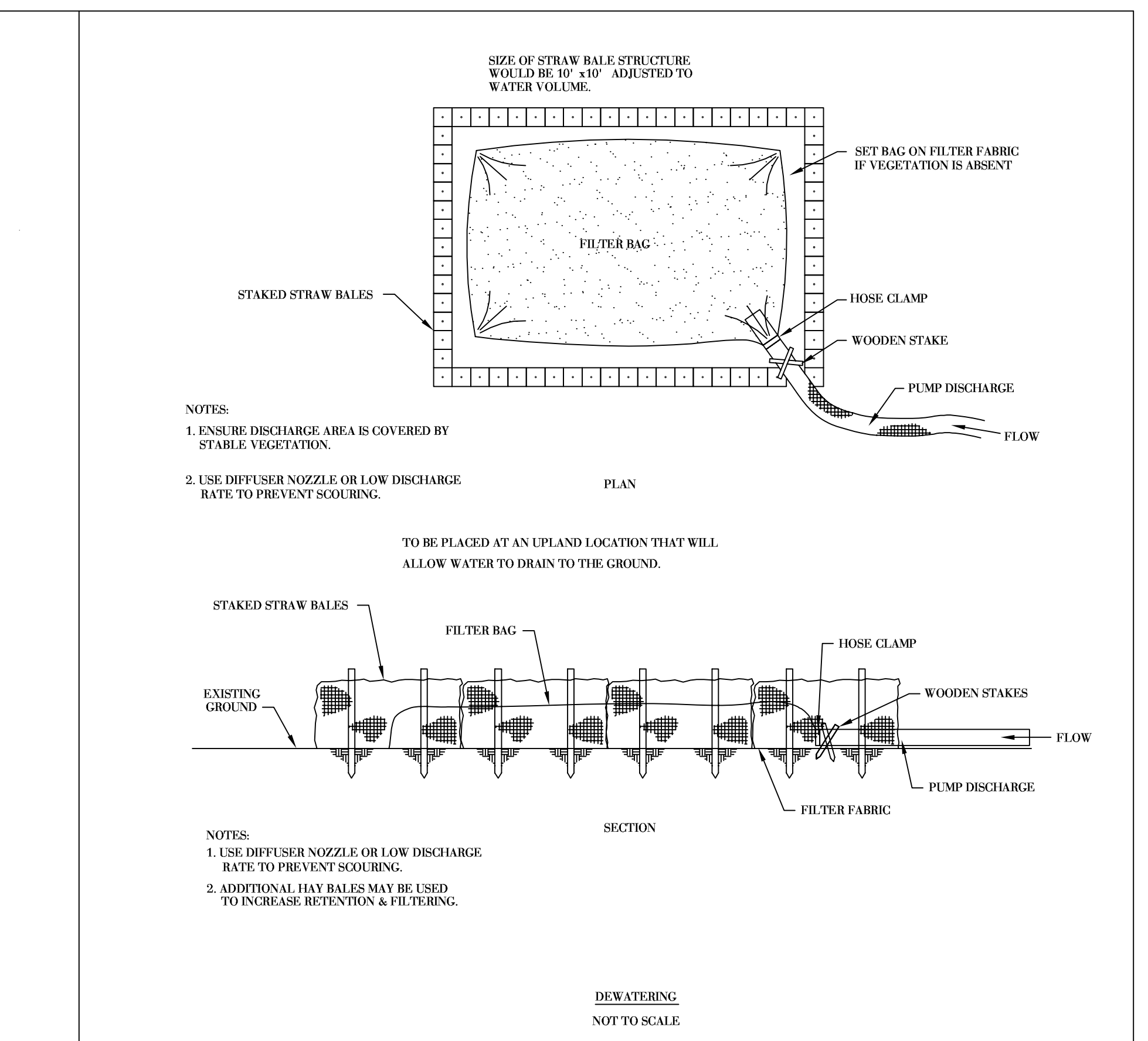
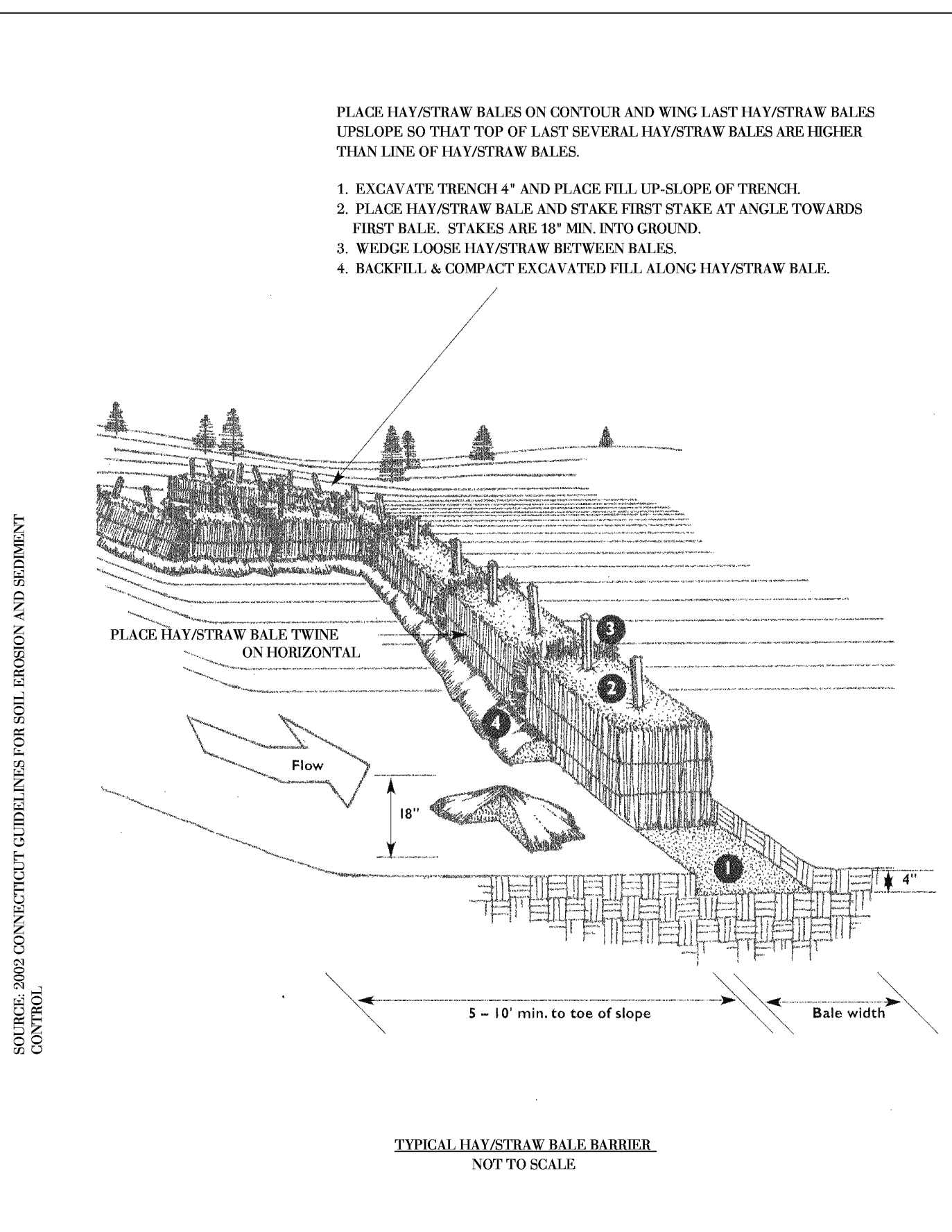
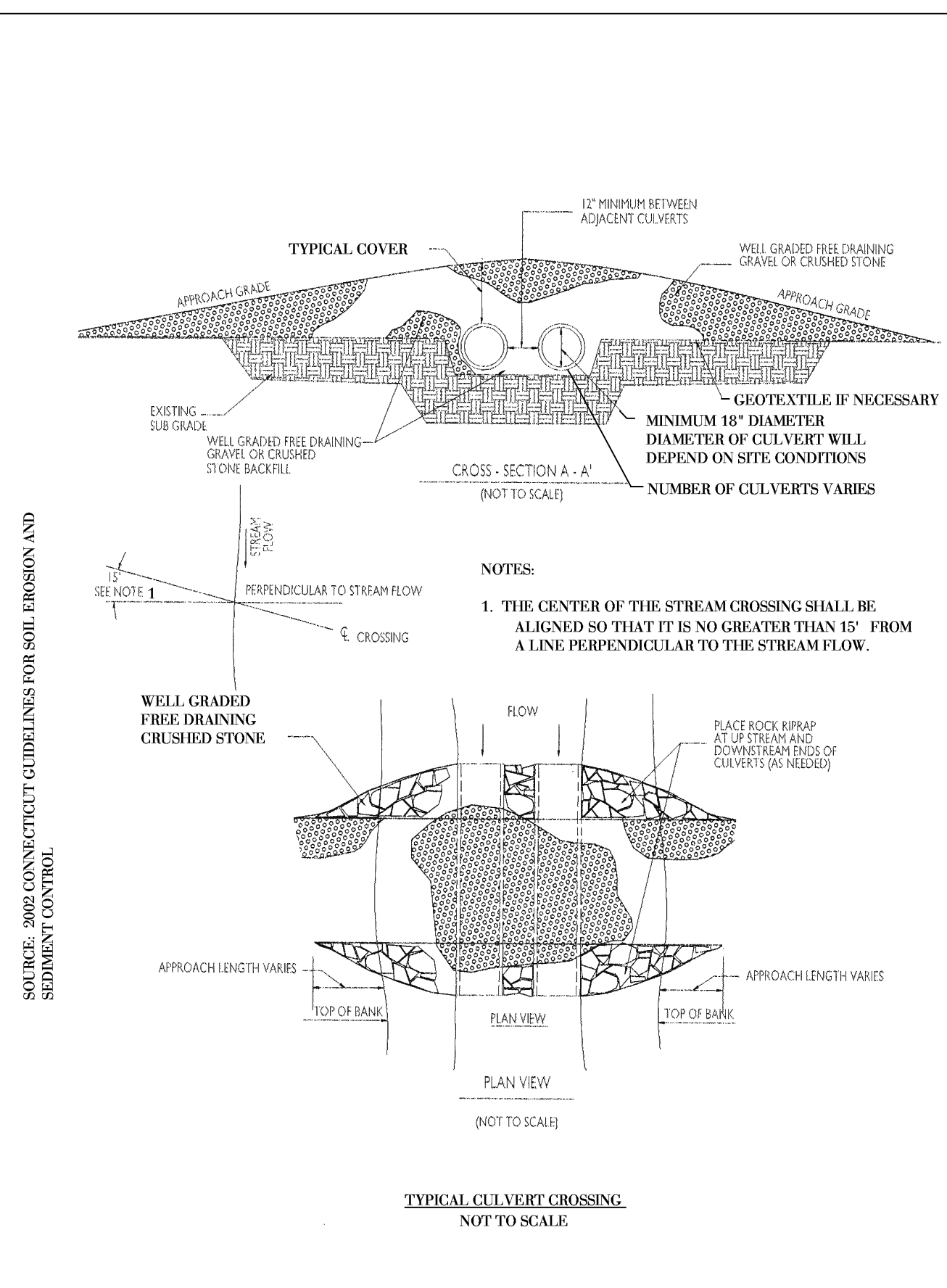
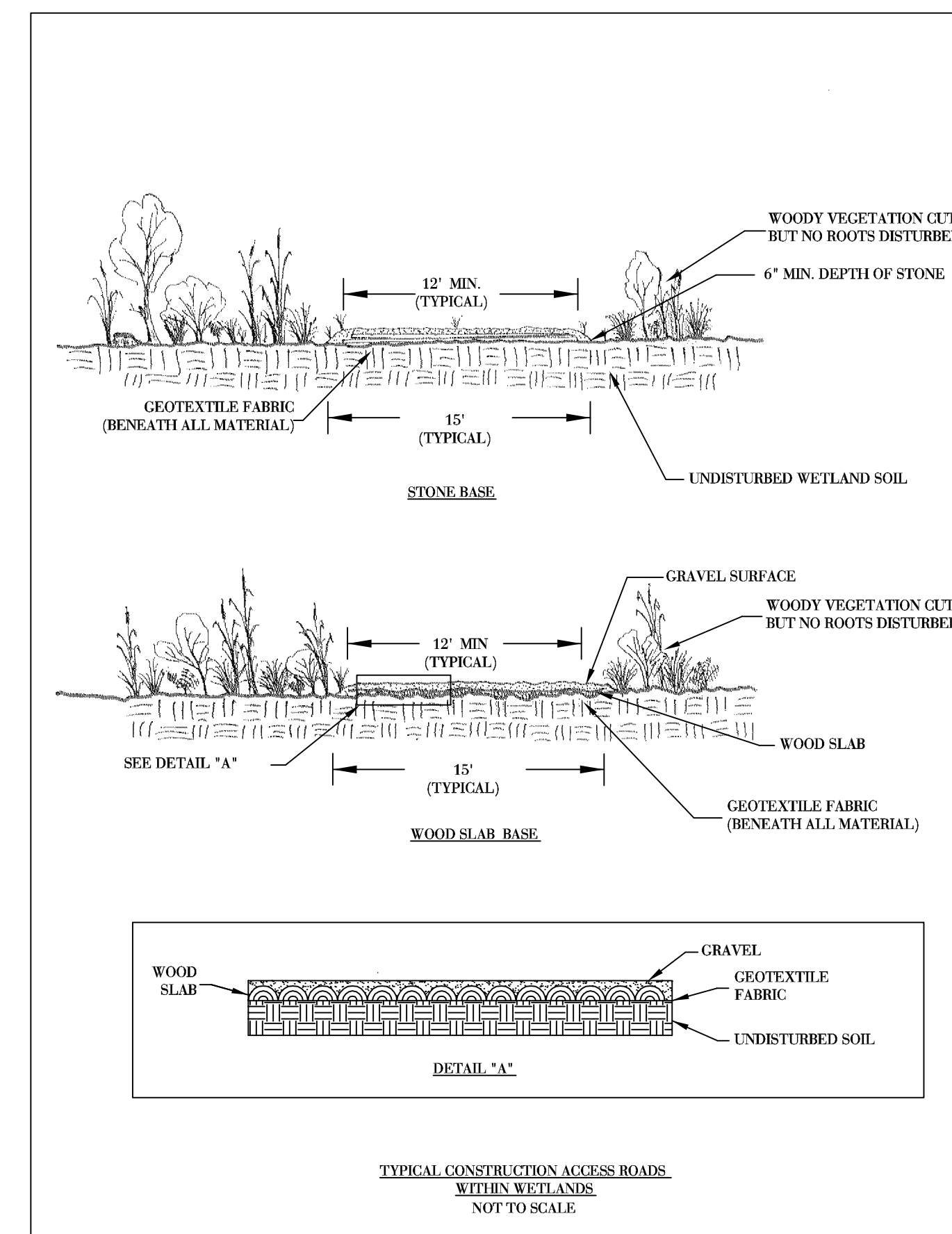


TYPICAL CAISSON FOUNDATION FOR EMBEDDED STEEL OR WOOD POLE

NOTES:

DIMENSION RANGES COVER MOST 115kV AND 345kV SITUATIONS. HOWEVER, LARGER AND SMALLER SIZES MAY BE NECESSARY DEPENDING UPON STRUCTURE LOADING AND SOIL CONDITIONS.

	NORTHEAST UTILITIES SERVICE CO.			
	FOR THE CONNECTICUT LIGHT & POWER COMPANY BERLIN, CONNECTICUT			
TITLE				
TYPICAL FOUNDATIONS				
BY	RDG	CHKD	APP	APP
DATE	2/17/05	DATE	3/21/05	DATE
SCALE	NTS	MICROFILM DATE	DWG. NO.	EXHIBIT 2-3
P.A. #			PROJ.	V.S.



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SOURCE: 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.

SOURCE: 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL. ADAPTED FROM USACE EROSION AND SEDIMENT CONTROL HANDBOOK, 1992.



38565

CAD GENERATED DWG
MAKE NO MANUAL CHANGES

date AUG 4, 2005
designed M. COLLINS

detailed J. BOYER
checked J. HOGAN

NO.	DATE	REVISIONS	BY	CHK	APP	APP
2	4/21/06	ISSUED FOR TOWN REVIEW	JPB	JMH		
1	3/15/06	ISSUED FOR FIRST NU REVIEW	JPB	JJW		

NORTHEAST UTILITIES SERVICE CO.					
FOR THE CONNECTICUT LIGHT & POWER CO.					
TITLE ROYAL OAKS BYPASS DEVELOPMENT & MANAGEMENT PLAN EROSION CONTROL DETAILS SEGMENT 2					
BY	MEC - BMCD	CHKD	-	APP	-
DATE	SEPT 2005	DATE	-	DATE	-
SCALE	NTS	DWG. NO.	D	EXHIBIT 2-4	

APPENDIX C

RIGHT-OF-WAY VEGETATION CLEARING STANDARD TRM
81.021

General

The major factor positively affecting transmission line reliability is a well managed program of vegetation control directed toward tall and fast-growing trees and invasive shrub species in and adjacent to transmission line rights-of-way. Vegetation related outages of high-voltage transmission lines can be minimized by applying this clearing standard to new and replacement lines and post-construction periodic vegetation management. The clearance minimums in this standard will provide safe clearances after re-growth at the end of a typical four (4) year maintenance cycle.

This specification conforms to the scope and intent of the NEPOOL Operating Procedures OP-3 Appendix 3-D1 titled “NEPOOL Right-of-Way Vegetation Management Standard” dated 02/26/99.

Clearance Between Conductors and Woody Vegetation

Transmission lines within the Northeast Utilities’ system present a variety of woody vegetation control situations. Regulatory permit conditions often specify “buffers” or “screenings” at visually sensitive highway and local road crossings and other locations which require special attention to the desired screening and to the necessary clearances. Northeast Utilities’ right-of-way vegetation clearing practices differ in specific areas as defined below:

1. Under and adjacent to the conductors of the transmission line as depicted on Figure C; cut all tall-maturing tree species of any height while retaining existing compatible woody shrub species (see Appendix 1).
2. At structure sites and access roads; clear cut what is required to insuring clear construction and maintenance areas as depicted on Figure C.
3. At road crossings, within 15 feet of the edge of clearing and other sensitive areas that may be specified under the regulatory permit; retain low-maturing tree species such as Flowering Dogwood (see Appendix 2) to the extent that they will not conflict with operation of the transmission line throughout the vegetation maintenance cycle.
4. At ravines, river crossings, and similar locations; allow tree species to remain where the conductors will be significantly higher than normal and where the vegetation at full mature height would not violate Figure A clearances or will not cause construction, or access or problems.

The minimum clearances established in Figures A, B, and C between conductors and woody vegetation includes the allowance for re-growth over the periodic maintenance cycle of 4 years in order to prevent clearance problems to the energized conductors between maintenance cycles. The defined clearances cover all types of vegetation including natural growth, orchards, ornamental plantings, nursery stock, and danger trees.

The minimum clearances applicable to woody vegetation are shown in the included figures.

Figure A; Minimum Conductor Clearances

Figure B; Danger Tree Clearance

Figure C; Clear Cut Area for New Construction

Where orchards, ornamental plantings, or nursery stock exist, the maximum tree height is shown in Figure A. Individual easements or other legal instruments may define site specific maximum allowable tree heights.

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Where rights exist beyond the edge of the right-of-way, any tree designated as a “danger tree”, i.e.; a tree that can fall within the dimensions noted in Figure B, will be removed at the discretion of the arborist. In sensitive areas adjacent to or within the right-of-way or where rights or other permission to remove danger trees cannot be obtained, the solution is to remove those portions of the tree canopy projecting into the right-of-way and those portions of a tree which, if they become detached, may fall within the clearance area.

On sidehill rights-of-way, danger trees can be found significantly further from the conductors on the up-hill side of the right-of-way than they will be on the down-hill side of the right-of way.

Clearing Activities

There are four distinct right-of-way vegetation clearing areas and activities:

1. Preparatory clearing for new transmission line construction.
2. Preparatory clearing for the replacement of an existing line, structure or appurtenance.
3. Clearing for wind-displaced conductor clearances.
4. Maintenance clearing.

Each clearing activity accomplishes a different objective by completing a different level of vegetation removal. New construction, equipment replacement, or repair typically involves activities 1 or 2, and 3.

Preparatory Clearing for New Construction

This clearing consists of clear cutting three distinct areas of the right-of-way and removing other trees which may be a hazard to the line due to their mature height as defined by Figure C. These clearing areas are:

1. At each structure site for a distance of twenty-five (25) feet from all surfaces of the structure, all poles of a multiple pole structure, and all anchor locations.
2. The full length of all access road and spurs to structure sites for a cleared width of fifteen (15) feet.
3. A width along the centerline of construction to a horizontal distance outside the two outermost conductors in accordance with Figure A. Low-maturing woody shrub species are typically not removed, and low maturing tree species such as Flowering Dogwood may be allowed to remain along the outer edges (“B” dimension of Figure A).

For new construction, in addition to the twenty-five (25) foot cleared area around the structure, a lay-down and assembly area may be required that is considerably larger. This area is dependant upon topography, the type of structure to be assembled, and the type of foundation required at the site.

Preparatory Clearing for Structure Maintenance or the Replacement of an Existing Line

This clearing is similar to new construction clearing with the following exceptions:

1. Clearing is dependant on the relative location of the rebuilt line with respect to the existing

cleared area and the proposed construction method for installation of conductors and shield wires. These factors may significantly reduce or eliminate needed clearing.

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2. The structure site and access clearing will still be required but may also be significantly reduced.
3. When structures from the old line are removed, the clear area at these sites and the access spurs to them will be allowed to naturally re-vegetate with native plant species which may include native grasses, forbs or shrubs.

Clearing for Conductor Clearance

After the conductors are installed a reference is established to determine required conductor clearances. Additional "danger trees" outside of the initial cleared area will be identified and removed in accordance with the clearance envelope lines shown in Figure B.

Maintenance Clearing

This clearing will allow natural re-vegetation across the entire width of the right-of-way to the extent that the mature height of any second growth vegetation remains under the clearance envelope lines shown in Figure A. Normally maintenance in the area under the conductors will result in vegetation heights which do not exceed eight (8) feet. Additionally, at each clearing cycle the right-of-way will be examined to determine if any new danger trees have developed. If so, arrangements for their removal will be negotiated as needed and the trees removed or overhanging portions trimmed.

Decision Responsibility for Clearing Woody Vegetation

For initial clearing, the transmission line Construction Manager, with assistance as necessary from the Project Engineer, will be responsible for obtaining approval from the Transmission Supervisor, Vegetation Management before allowing vegetation to remain which conflicts with the clearances shown in Figures A, B, and C.

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APPENDIX 1

SHRUB SPECIES ALLOWED TO REMAIN: (PARTIAL LIST)

<u>COMMON NAME</u>	<u>GENUS/SPECIES</u>
Arrowwood Viburnum	<i>Viburnum dentatum</i>
Bayberry	<i>Myrica pennsylvanica</i>
Blueberry - Highbush	<i>Vaccinium corymbosum</i>
Blueberry - Lowbush	<i>Vaccinium angustifolium</i> & <i>V. vacillans</i>
Brambles	<i>Rubus spp.</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Dogwood - Gray	<i>Cornus racemosa</i>
Dogwood - Redosier	<i>Cornus stolonifera</i>
Dogwood - Silky	<i>Cornus amomum</i>
Elderberry	<i>Sambucus spp.</i>
Hazelnut	<i>Corylus americana</i> & <i>C. cornuta</i>
Honeysuckle - Bush	<i>Diervilla lonicera</i>
Honeysuckle - Fly	<i>Lonicera canadensis</i>
Honeysuckle - Tartarian	<i>Lonicera tatarica</i>
Huckleberry	<i>Gaylussacia spp.</i>
Maple-leaf Viburnum	<i>Viburnum acerifolium</i>
Meadowsweet - Broad-leaved	<i>Spirea latifolia</i>
Meadowsweet - Narrow-leaved	<i>Spirea alba</i>
Mountain Laurel	<i>Kalmia spp.</i>
Oblong Fruited Juneberry	<i>Amelanchier bartramiana</i>
Oldfield Common Juniper	<i>Juniperus depressa</i>
Pasture Juniper	<i>Juniperis communis</i>
Running Shadbush	<i>Amelanchier stolonifera</i>
Sheeplaurel	<i>Kalamia augustifolia</i>
Spicebush	<i>Lindera benzoin</i>
Steeplebush	<i>Spirea tomentosa</i>
Sweetfern	<i>Comptonia peregrina</i>
Sweetpepperbush	<i>Clethra alnifolia</i>
Winterberry	<i>Ilex verticillata</i>
Witch Hobble	<i>Vburnum alnifolium</i>
Witherod	<i>Viburnum cassinoides</i>

APPENDIX 2

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LOW-MATURING TREE SPECIES ALLOWED TO REMAIN ALONG THE SIDES OF CLEARING: (PARTIAL LIST)

All species listed above including:

- | | |
|-------------------------------|-----------------------------|
| Alder | <i>Alnus spp.</i> |
| Dogwood - Alternate-leaved | <i>Cornus alternifolia</i> |
| Dogwood - Flowering | <i>Cornus florida</i> |
| Sumac - Shining | <i>Rhus copillina</i> |
| Sumac - Smooth | <i>Rhus glabra</i> |
| Sumac - Staghorn | <i>Rhus typhina</i> |
| Willows (except tree species) | <i>Salix spp.</i> |
| Witch-Hazel | <i>Hamamelis virginiana</i> |

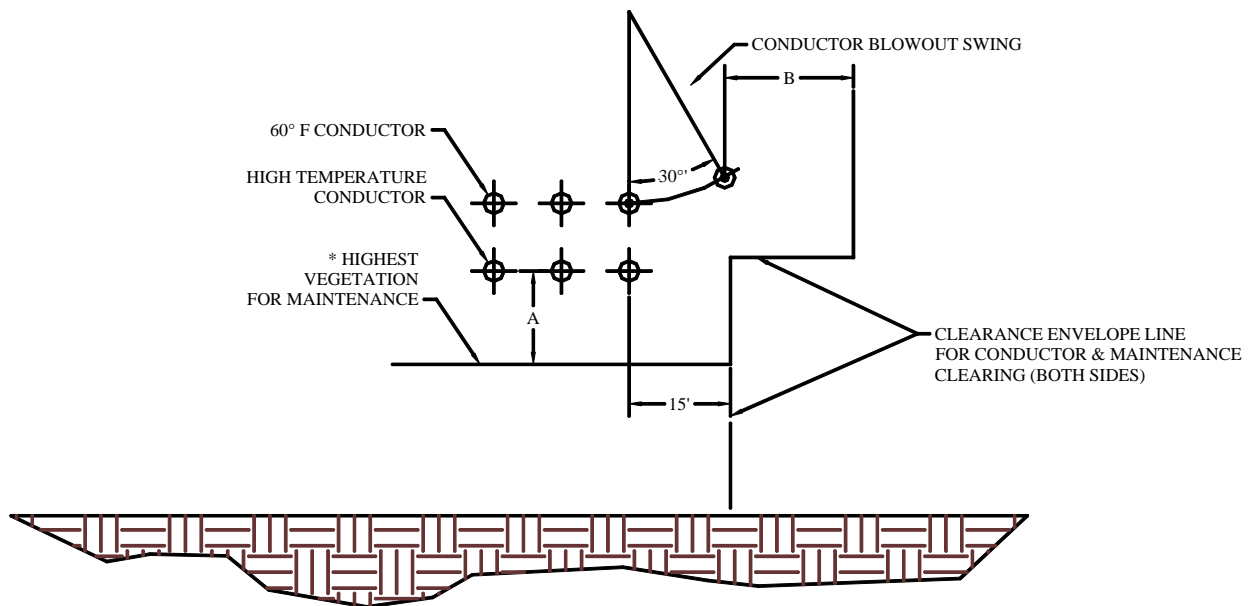
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Figure A

Minimum Conductor Clearances

* All Other Woody Species		
Line Voltage	A (ft.)	B (ft.)
69 & 115 kV	12	11
230 & 345 kV	16	15

* Orchards		
Line Voltage	A (ft.)	B (ft.)
69 & 115 kV	14	11
230 & 345 kV	18	15

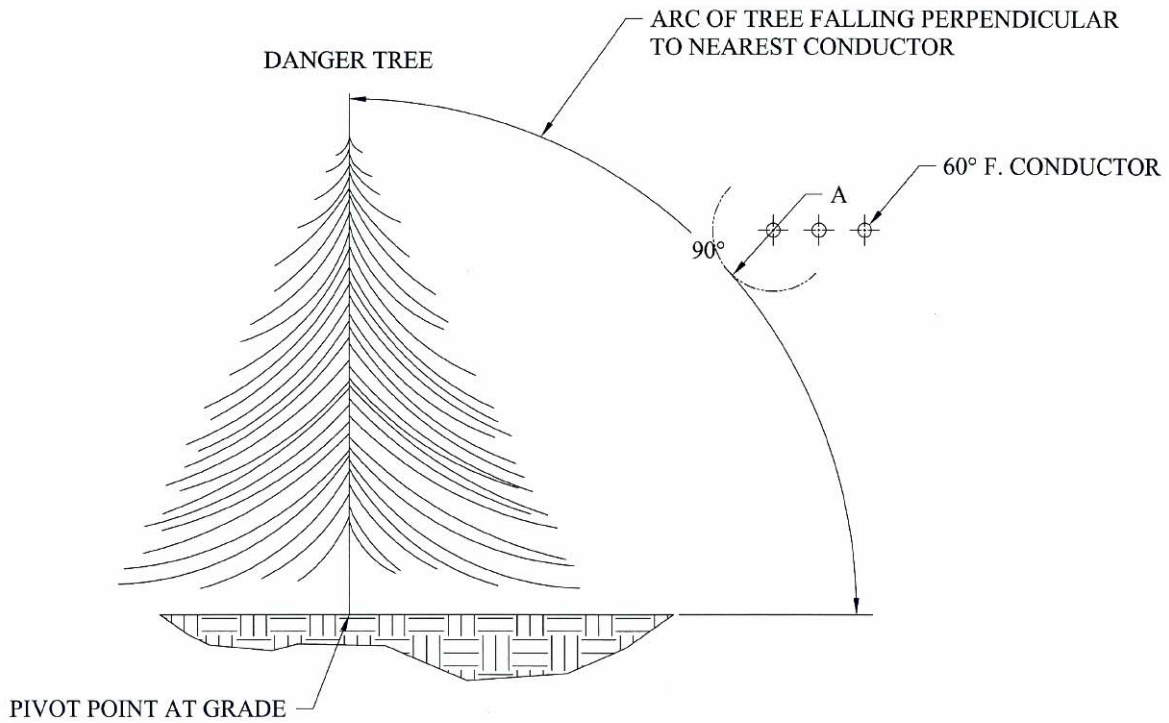


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Figure B

Danger Tree Clearances

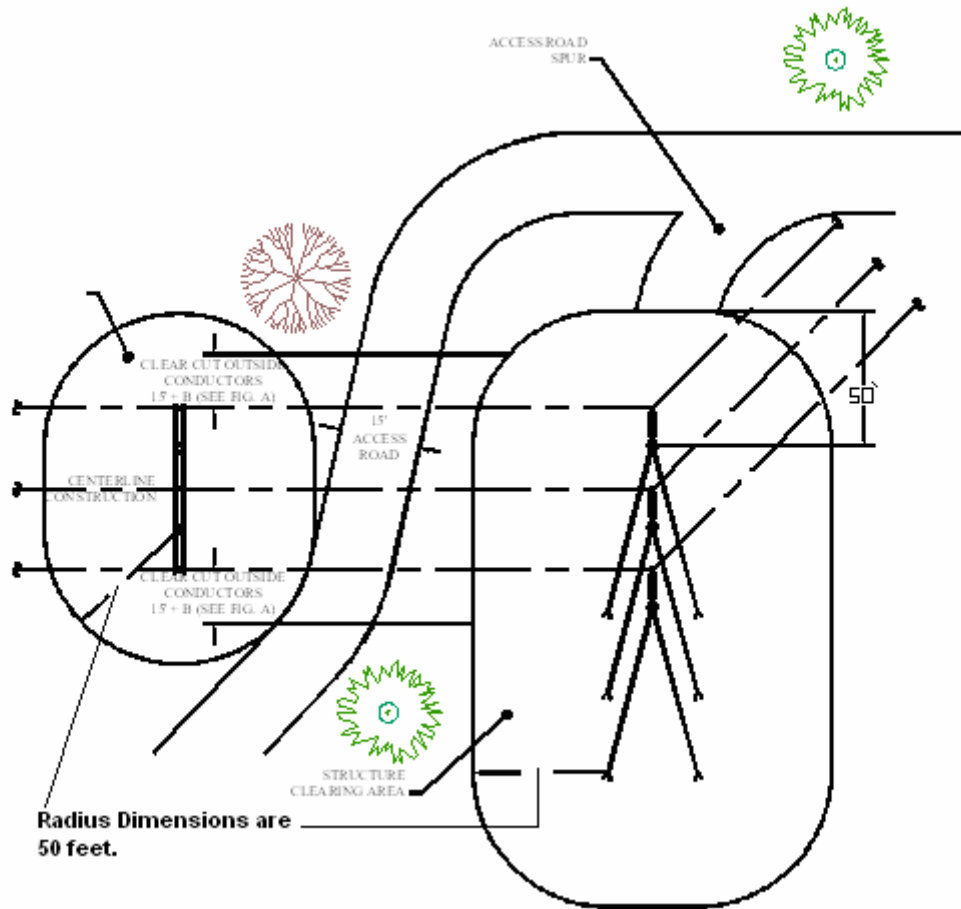
Line Voltage	A (ft.)
69 & 115 kV	6
230 & 345 kV	10



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Figure C

Clear Cut Area for New Construction



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APPENDIX D

SEDIMENT AND EROSION CONTROL PLAN

APPENDIX D

SEDIMENT AND EROSION CONTROL PLAN

The objective of this Plan is to minimize the potential for erosion and sedimentation impact during construction and to effectively restore the work areas and other disturbed areas. This objective will be met by implementing the erosion and sediment control measures contained in this section. These erosion and sediment control measures will serve as minimum erosion sedimentation by:

- Minimizing the quantity and duration of soil exposure
- Protecting areas of critical concern during construction by redirecting and reducing the velocity of runoff
- Installing and maintaining erosion and sediment control measures during construction
- Establishing vegetation where required as soon as possible following final grading
- Inspecting the work areas and maintaining erosion and sediment control as necessary until final stabilization and inspection are achieved.

It is Connecticut Light and Power Company (CL&P) responsibility for ensuring that all contracts implement and maintain erosion and sediment control measures during construction. This plan includes erosion and sediment control techniques that apply to all areas of construction, expands on the impact minimization associated with clearing, grading, installation, and restoration phases and discusses the use of construction safety precautions.

1.0 Standard Construction Methods

Construction of an aboveground electric transmission line consists of several distinct phases: clearing, grading, drilling of foundations, installation of new structures and restoration.

1.1 CLEARING

All clearing activities will conform to the methods dictated in this section.

- Transmission line right-of-way boundaries will be clearly delineated in the field before commencement of clearing activities. The Owner's Representative (OR) will ensure that no clearing occurs beyond these boundaries.
- Trees to be saved shall be clearly marked (flagging, snow fencing, etc.) before commencement of clearing operations. As part of the pre-construction planning and vegetation inventory, efforts have been, and will continue to be, made to identify unique or specimen trees that are located within or near the construction workspace. Landowners will be consulted concerning their desire to protect such trees. The specified trees will be flagged and, to the extent practical, attempts will be made to preserve the identified trees during the construction process.
- Stemmed vegetation such as brush, shrubs and trees shall be removed at or near the ground surface to allow the root system to remain intact.
- All existing fences and walls shall be maintained by the use of temporary fences section (gap). Prior to removal, the fence or wall will be properly braced and similar material used to construct the gap. At no time will an opening be left unattended. The gap will be replaced after cleanup with a permanent fence or wall of the same or similar material and condition.
- When pruning is necessary, it shall be conducted as follows:
 - a. Cuts shall be smooth
 - b. Branch collars shall not be cut (i.e., cuts should be made immediately in front of the branch collar)

- c. Large, heavy branches shall be precut on the underside to prevent splitting or peeling
- d. Climbing spurs shall not be used
- Trees shall be cut to grade within the non-paved work area
- Trees and limbs will not be permitted to fall into wetlands or watercourses, where possible.
- Construction activity with the potential for generating high-decibel noise levels will be restricted to the period between 7am and 7pm or in accordance with local regulations.
- Brush will be piled at the edge of the work area to provide additional runoff protection or additional wildlife habitat.
- All brush will be removed from wetland areas.
- Chips may be left on the workspace with OR approval if placement does not inhibit revegetation.
- Chips will not be left in wetlands or agricultural lands or stockpiled in such a location that they may be transported into wetland or agricultural lands.

1.2 GRADING

When existing topography and/or terrain does not permit crews and equipment to operate safely and does not provide access or an effective work area, grading may be required. The following general construction methods will be employed by CL&P during grading.

1.2.1 Removal of Tree Stumps

In upland areas, stumps can be removed across the entire width of the construction workspace; however, in wetlands, stumps will be removed only if they are in a structure foundation location. Stumps that create construction constraints or safety concerns may require removal from under a work pad or on a side slope. Stumps may be chipped in upland areas. Grindings will be removed from the wetlands to the maximum extent practicable.

1.2.2 Rock Disposal

Excess rock, including drilled rock, shall be used or disposed of by one or more of the following methods:

- Windrowed in uplands per landowner agreement and applicable permits, or removed if it exceeds that of surrounding terrain.
- Hauled to disturbed property per landowner agreement. As part of the agreement, the landowner will accept responsibility for the rock and not place it in a wetland area.
- Removed and disposed at an approved site that is traditionally used for rock debris disposal.
- Used to construct stonewalls or fences, if approved by CL&P per landowner agreement.
- Used to improve designated construction access roads per appropriate approval.

1.2.3 Water Bars/Terraces (Slope breakers where necessary)

- Water bars/terraces shall be installed diagonally across the work area when needed.
- A temporary channel will be excavated and a compacted berm created adjacent to the channel or ridge of compacted soil.
- The type of soil, degree of slope, runoff area and location of suitable outlets determines the number and shape of water bars required. The minimum guidelines for water bar spacing per the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control are:

<u>Percent (%) Slope</u>	<u>Spacing (feet)</u>
1	400
2	245
5	125
10	78
15	58

- The bar/terrace will be created in such a way as not to prohibit safe passage.
- Water bars/terraces will be maintained and repaired at the end of each day.
- Water bars/terraces will divert water to a well vegetated area. If a vegetated area is unavailable, erosion control barriers shall be installed at the limit of the construction workspace at the outlet of the water bar.
- Silt fence, straw/hay bales or sandbags may be used in place of water bars/terraces per the OR.

1.2.4 Temporary Erosion Control Barriers

Straw/hay bales and silt fences are interchangeable, except where noted below. Temporary erosion control barriers shall be installed prior to initial disturbance of soil and maintained as described below.

- At the outlet of a water bar when existing vegetation is not adequate to control erosion.
- Along banks of waterbodies between the workspace and waterbody after clearing.
- Downslope of any stock piled soil in the vicinity of waterbodies and vegetated wetlands.
- At sideslope and downslope boundaries of the construction area where runoff is not otherwise directed by a water bar/terrace.
- Maintain throughout construction and remain in place until permanent soil stabilization has been judged successful, at which time they will be removed (straw/hay bales may be left in place).
- Between wetlands and adjacent disturbed upland areas and as necessary to prevent siltation of ponds, wetlands, or other waterbodies adjacent to /downslope of the work areas.
- At the edge of the construction workspace as needed to contain soil and sediment.
- To be inspected on a daily basis in areas of active construction or equipment operation, on a weekly basis in areas with no construction or equipment operation and within 24 hours of a storm event that is 0.5 inches or greater.

1.2.4.1 Silt Fence Installation and Maintenance

- All silt fences shall be installed as directed by manufacturer and applicable permit conditions.
- A sufficient supply of silt fence shall be stockpiled onsite for emergency use and maintenance.

1.2.4.2 Straw/Hay Bale Installation and Maintenance

Straw/hay bales may be used in place of, or in addition to, silt fence. If straw/hay bales are to be used it must be installed and maintained as described below.

- It shall be anchored in place with at least two 2-inch diameter stakes.
- Bindings on bales shall be horizontal, in compliance with 2002 CT Guidelines for soil Erosion and Sediment Control.
- Bales shall be replaced if damaged or allowing water flow underneath.
- Damaged bales shall be replaced with new bales as deemed necessary by the OR.

- A sufficient supply of bales shall be maintained onsite for emergency use.
- Bales bound with wire or plastic shall not be used.

1.3 DRILLING OF FOUNDATIONS

To prepare for the installation of the concrete foundations, holes must be drilled into the ground. Since many of the proposed foundation locations are located on rock, rock drilling is likely to be required. Excess rock shall be disposed of as described in Section 1.2.2 of this Plan. Excess soil generated by the preparation for the foundation will be disposed of by:

- Spreading in uplands or removed if it exceeds that of surrounding terrain.
- Hauled to disturbed property per landowner request. As part of the agreement, the landowner will accept responsibility for the spoil. It cannot be placed in a wetland area.
- Removed and disposed at an approved site that is traditionally used for soil disposal.
- Used to improve designated construction access roads per appropriate approval.

Temporary erosion control barriers must also be installed around spoil piles as described in Section 1.2.4 of this Plan. Spoil will be stored at least 50 feet from waterbodies, where possible.

Underground utilities shall be located and carefully exposed, by hand digging if necessary. Appropriate authorities, such as "Call Before You Dig", will be notified 72 hours in advance of conducting any drilling.

1.4 INSTALLATION

Transmission line structures will be transported and unloaded in the general vicinity of their location. The structures will not be stored in wetlands or other waterbodies. Once the foundation holes are drilled, the foundations will be constructed. The foundations consist of re-inforced concrete with an above-grade bolting system. Excavations may require dewatering as a result of storm water or groundwater. Dewatering shall be conducted as described below.

- The dewatering location shall be a fairly level upland that is well vegetated, as to allow for the water to drain to the ground. Water will not be discharged to a wetland or waterbody.
- The dewatering area shall consist of a 10 ft by 10 ft straw/hay bale perimeter (size adjusted per water volume). Straw/hay bales shall be installed and maintained per Section 1.2.4.2 of this Plan.
- The pump hose shall be connected to a filter bag that is placed within the straw/hay bale barrier. The pump hose shall contain a diffuser nozzle or be installed to allow for a low discharge rate to prevent scouring.
- Additional straw/hay bales can be used to increase detention and filtering.

Once the foundations are cured (approximately 7 to 28 days) the steel transmission line structures will be erected and bolted securely to the foundation.

After all the structures are erected, the electric cables will be strung via pulley system from designated pulling areas. These areas will not be located within 50 feet of the edge of a wetland or waterbody.

1.5 RESTORATION AND REVEGETATION

Restoration and revegetation of the work areas incorporates permanent erosion and sediment control measures. However, in the event that final restoration cannot occur in a timely manner due to weather or soil conditions, temporary erosion and sediment control measures will be maintained until weather is suitable for final cleanup and revegetation. In no case shall final cleanup be delayed beyond the end of the next growing season.

1.5.1 Temporary Erosion Control

- Stabilization measures shall be initiated as soon as practical on portions of the workspace where activities have temporary or permanently ceased except:
 - a. When the initiation of stabilization measures are precluded by weather. Stabilization measures shall be initiated as soon as machinery is able to obtain access to the work areas.
 - b. When activities will resume within 21 days, stabilization measures do not have to be initiated by the fourteenth day following the cessation of activities.
- If construction is completed more than 30 days before the perennial vegetation seeding season, wetland areas and adjacent to waterbodies shall be mulched with straw or equivalent for a minimum of 100 feet on either side of the waterbody.
- Temporary plantings will be fertilized in accordance with the recommendations of the local NRCS office or other soil conservation authority.
- Temporary sediment barriers will be removed when an area is successfully revegetated in compliance with applicable regulatory approvals.

1.5.2 Permanent Restoration Measures

- Final grading around structure foundations shall be completed after installing foundation and pole structure, weather permitting.
- For wetland and/or stream impacted areas, re-contouring will be completed as soon as the foundation and pole structures are installed and temporary wetland stream access location structures such culverts, pipe flume, or matting have been removed. These erosion and sediment control structures shall be removed upon completion of that portion of the project and when they are no longer needed for construction purposes/access. Permanent structures within streams or wetlands may require federal, state, or local permitting.
- Construction debris shall be removed from the workspace, and the area shall be graded so that the soil is left in the proper condition for mulching, seeding or natural revegetation.
- Permanent water bars/terraces shall be constructed in association with final grading and prior to seeding.
- Permanent water bars will be constructed to replace temporary erosion control barriers at road and waterbody crossings.
- Permanent water bars/terraces will be constructed to the same specifications as temporary water bars.

1.5.3 Revegetation and Seeding

- The workspace will be seeded within 7 working days of final grading, weather and soil conditions permitting and planted in accordance with recommended seeding dates.
- Where broadcast or hydro-seeding occurs the seedbed will be scarified to ensure sites for seed to lodge and germinate.
- The seedbed will be prepared to an average depth of 3-4 inches using appropriate equipment to provide a firm, smooth seedbed, free of debris.

- Slopes steeper than 3:1 shall be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.
- The seed shall be applied and covered uniformly in accordance with the 2002 Connecticut Guidelines for Erosion and Sedimentation Control Guidelines. Broadcast or hydro-seeding can be used at double the recommended seeding rates. Where broadcast seeding is used, the seedbed shall be firmed after seeding.
- Areas seeded will be mulched with straw to prevent erosion.

1.5.4 Mulching

- After seeding, mulch will be applied at a rate of approximately 2 tons per acre on the disturbed areas, except wetlands, lawns, agriculture areas and areas where hydro-mulch is used.
- If construction or restoration activity is interrupted for extended periods (greater than 21 days), mulch will be applied.
- If mulching before seeding, mulch application will be increased on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre at a 4 inch depth.
- Mulch shall be anchored immediately after placement on steep slopes and stream banks.
- When mechanically anchoring mulch, mulch anchoring tool or tracked equipment will be used to crimp the mulch to a depth of 2-3 inches.
- When anchoring with liquid mulch binders, application rates will be as recommended by the manufacturer. Liquid mulch binders will not be used within 100 feet of wetlands or waterbodies.

1.5.5 Matting/Netting

- Matting or netting will be applied to sensitive areas (i.e., steep slopes, banks of waterbodies, bar ditches, etc.), in accordance with permit requirements.
- Matting or netting will be anchored with pegs or staples.

1.5.6 Monitoring/Reporting

- CL&P will conduct follow-up inspections after the first and second growing seasons after seeding to monitor the success of revegetation. In upland areas, revegetation will be considered successful if vegetation cover is sufficient to prevent erosion of soils disturbed in the workspace. Sufficient vegetation coverage is defined as a uniform 70%. If sufficient vegetative cover has not been achieved after two full growing seasons, additional restoration measures will be implemented. Erosion control devices shall be removed upon successful stabilization and revegetation of disturbed areas.
- CL&P will implement one or more of the following measures in cooperation with the landowner, if warranted or required, to control off-road vehicles:
 - Post and maintain, as necessary, appropriate signage
 - Installing a locking gate with fencing to prevent bypassing
 - In extremely sensitive areas, planting conifers or other appropriate shallow-rooted trees and shrubs in underground areas and overhead line areas across the workspace except where access is required for periodic inspection and maintenance use by CL&P. The spacing of trees and shrubs and length of workspace plantings shall comply with CL&P and national codes. This method will be used only when reflected on site specific plans or required by a regulatory agency
 - Installing a slash and timber barrier or boulders across the ROW.

2.0 Safety

- Temporary safety fences shall be erected at ROW crossings (e.g., residential areas, sensitive environmental areas, road crossings, etc.) where necessary.
- The length of time that the foundation pit/hole is left open shall be minimized through coordination by the construction inspector and the construction contractor.
- Soil tracked onto roads by construction equipment shall be minimized and will be cleaned in a manner consistent with all applicable permits. If stone access pads are used in residential or active agricultural areas, synthetic fabric will be used to facilitate removal.
- CL&P may employ flagmen and/or police detail for traffic control, temporary traffic detours and/or off-site parking facilities and busing for work crews.
- An electric utility surveyor/inspectors will be on-site at all times while construction activities occur near electric utilities.
- Overhead spotters will be on-site during construction activities.

3.0 Access Roads

- The contractor will not make any arrangements with landowners to use, change, or improve private access roads or property beyond those specified on the drawings or designated in the landowner agreement.
- Water bars will be necessary on steep slopes if the road will require grading or regrading as described in Section 1.2.3.
- If side ditches are required to provide drainage, they shall be excavated parallel to the road to carry runoff away from the road.
- Where an access road crosses an intermittent drain, culverts or pipe flumes will be installed as necessary to maintain existing drainage patterns, and clean stone/rock will be used to improve the surface of access roads for stabilization and/or rutting protection.
- If open water crossings are required, an equipment bridge will be used.
- Access roads will be restored to pre-construction condition unless specified otherwise by the landowner and approved by applicable permits.
- If subsoils are unstable, the use of timber mats may be required. These materials will be removed during clean up.
- Erosion control barriers will be installed, inspected and maintained as required at the edge of access roads where necessary to prevent siltation of ponds, wetlands of other adjacent/downslope waterbodies.

4.0 Inadvertent Disturbance Off Right-Of-Way

CL&P will restrict all activities to the permitted construction work areas. However, under extreme circumstances, such as while working on steep slopes in slippery conditions, and while grading on steep side hills, some inadvertent disturbance may occur outside of these areas. In the event that inadvertent disturbances occur, the following procedures will be implemented:

- The operator or foreman will immediately report the occurrence to a CL&P Inspector, who will notify the construction inspector and environmental inspector. The environmental inspector will then notify the appropriate CL&P personnel.
- The conditions that caused the disturbance will be evaluated, and the construction inspector and environmental inspector will determine whether work at the site can continue under those conditions.

- The nature of the disturbance will be evaluated and corrective actions taken as deemed necessary by the construction inspector and environmental inspector. Such measures may include immediate re-contouring and seeding of the disturbed site, and/or installation of erosion control devices to contain the disturbance.
- CL&P will notify the landowner and appropriate agencies of the disturbance

5.0 Waterbodies and Wetlands

5.1 WETLANDS

CL&P will protect and minimize potential adverse impacts to wetlands by:

- Expediting construction in and around wetlands and limiting the amount of equipment and mainline construction activities within wetlands to reduce disturbances of wetland soils
- Limiting grading to the amount necessary to provide a safe workspace
- Segregating disturbed topsoil from subsoil, as practical, depending on soil saturation at the time of construction
- Restoring wetlands to their original configurations and contours
- Permanently stabilizing upland areas near wetlands as soon as practical after transmission line structure installation
- Inspecting the ROW periodically during and after construction and repairing any erosion control or restoration features until permanent revegetation is successful

Additional workspace at wetland crossings will be minimized and located at least 50 feet from the edge of the wetland where topographic conditions permit. No refueling of construction vehicles will occur within 100 feet of any wetland resource area. The setbacks from watercourses and wetlands will be clearly marked in the field before the start of construction. Hazardous materials, chemicals, fuels or lubricating oils will not be stored nor will concrete coating activities be conducted within 100 feet of a wetland or waterbody boundary.

5.1.1 Clearing

- Equipment will not be allowed to work in wetlands unless it will not damage the existing root systems and as approved by the OR. Bulldozers will not be used for clearing. Trees and brush will be cut at ground level by hydro axes, tree shears, grinders or chainsaws.
- Stumps will be left in place, except at foundation locations or unless the removal is necessary to ensure worker safety. Stumps may be ground to a suitable height for safety reasons.

5.1.2 Grading

- Grading will be limited to the immediate work area of the foundation location, except where topography requires additional grading for safety reasons. Where grading is required, topsoil will be segregated and returned as an even layer to all graded areas.
- Prior to grading along or within wetlands, temporary erosion control barriers shall be installed on the down slope side of the area to be graded.

5.1.3 Drilling/Stock Piling

Since the drilled hole/pit will be filled with concrete to form the foundation, the spoil will be removed from the wetland by side-casting in adjacent uplands or by hauling it out of the wetland by vehicle, to be disposed of as described below.

- Spread in uplands or removed if it exceeds that of surrounding terrain.
- Hauled to disturbed property per landowner agreement. As part of the agreement, the landowner will accept responsibility for the spoil. It cannot be placed in a wetland area.
- Removed and disposed at an approved site that is traditionally used for soil disposal.
- Used to improve designated construction access roads per appropriate approval.

Spoil will be stored at least 100 feet from wetlands. Spoil placed up gradient of wetlands will be contained with sediment control.

Excess rock shall be disposed of as described in Section 1.2.2 of this Plan.

5.1.4 Cleanup/Restoration

- All construction debris shall be removed following foundation completion and transmission line structure erection.
- Once the structures are erected, CL&P will restore the original contours (within 6 inches) and flow regimes to the extent practical with the exceptions of unnatural features and unstable grades.
- The disturbed areas will be seeded with annual rye grass (40 pounds/acre, unless standing water is present) to stabilize the area until indigenous hydrophilic vegetation can become reestablished. If the wetland is within an active agricultural parcel, reseeded will be performed according to appropriate land management or state agency permits and/or landowner agreements.
- If weather limits the effectiveness of reseeded efforts, non-paved work areas may be mulched to minimize erosion until conditions are suitable for reseeded at the discretion of the OR and as allowed by all applicable permits.
- No fertilizer or lime shall be used in wetlands unless specified by the NRCS.

5.1.5 Monitoring

CL&P or its designated OR will monitor wetland revegetation efforts annually for a period of two years. Revegetation will be considered successful if at least 70% of the total cover is native species and the level of diversity of the native species present after construction is at least 50 % of the level originally found in the wetland. If the area is not showing signs of re-establishing native wetland vegetation during the first growing season following construction, CL&P will develop and implement (in consultation with a professional wetland scientist) a plan to revegetate the wetland with native wetland species.

5.2 WATERBODIES

CL&P will ensure that construction across or within waterbodies is completed in the shortest amount of time possible to minimize the duration of potential adverse impacts.

5.2.1 Additional Work Space Areas

Cable pulling locations, additional temporary workspaces, or staging areas will be located 50 feet beyond the edge of an intermittent waterbody and 100 feet from perennial streams.

5.2.2 Spoil Pile Placement/Control

Spoil will be stored at least 50 feet from stream banks and waterbody crossings, where possible. Spoil placed up gradient of stream banks will be contained with sediment control.

5.2.3 Equipment Crossings

Measures will include the use of timber mats laid adjacent to and across streambeds, flume pipes covered by fill material (clean gravel or crushed stone) or portable bridges as approved by the OR. Flume pipes will conform to waterbody crossing dimensions and alignments. Stream channels will not be permanently straightened or realigned for any reason, unless a permit has been acquired to do so. The size and number of the flumes will be sufficient for maximum anticipated flows.

If fill for an equipment crossing includes log riprap or other erodible materials sandbags will be placed in the waterbody at the upstream and downstream ends of the crossing to stabilize and seal the flume pipes. To prevent erosion, sandbags will be placed high enough along both sides of the equipment crossing to contain the fill material (straw/hay bales may also be used for this purpose).

5.2.4 Clearing/Grading

- The construction of the equipment crossing will use one of the following:
 - a. Timber mats with or without flumes
 - b. Clean rock fill and flumes
- Equipment bridges will be maintained to prevent soil from entering the waterbody.
- If more than one-week will pass between the time when the area is cleared and when the pipe is installed, the clearing crew may:
 - a. Leave a 10 foot vegetative strip on either side of the waterbody (excluding the equipment crossing). Trees greater than 4 inches in diameter may be removed from the vegetative strip at the time of initial clearing
 - b. Install sediment barriers at the top of the stream bank if no vegetation strip is left.

5.2.5 Drilling/Stock Piling

Procedures for drilling and stock piling shall be consistent with Section 5.1.3 of this Plan.

5.2.6 Cleanup/Restoration

- During restoration, flume pipes, sand bags and other materials will be removed and the stream will be restored to preconstruction contours or better.
- Stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing the crossing.
- Equipment crossing will be left in place if needed for access during seeding. They will be removed if 1) more than one month will pass between final cleanup/grading and the beginning of initial permanent seeding and 2) appropriate alternative access is available.
- Jute thatching or other erosion control material will be used to stabilize stream banks as necessary.
- Banks of waterbodies disturbed during construction shall be restored in accordance with the 2002 CT Guidelines for Soil Erosion and Sediment Control as well as applicable approvals from the Department of Environmental Protection and the U.S. Army Corps of Engineers. Trees and/or shrub species selected for use in restoration shall be native and provide habitat components for existing fisheries as well as resident migratory wildlife.

5.2.7 Temporary Erosion and Sediment Control

- Install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction

and reinstalled as necessary, until replacement by permanent erosion controls or restoration of adjacent upland areas are complete.

- Install sediment barriers across the entire construction access road or disturbed area at all waterbody crossings. Temporary interceptor dikes may be used in lieu of sediment barriers in front of equipment bridges or timber mats across the travel lane.
- Install sediment barriers as necessary along the edge of the access road or construction area to contain spoil and sediment within them where waterbodies are adjacent or parallel to the access road or construction area.

5.2.8 Restoration

- Return waterbody banks to preconstruction contours.
- Limit the placement of riprap to the slopes along the disturbed waterbody crossing.
- Install seeded erosion control fabric along waterbodies with flow conditions.
- Revegetate disturbed riparian areas with conservation grasses and legumes. In the event that final cleanup is deferred more than 20 days after the structure is installed, all slopes adjacent to waterbodies shall be mulched with 3 tons/acre of straw for a minimum of 100 feet on each side of the waterbody crossing.
- Remove all temporary sediment barriers when restoration of adjacent upland areas is successful as specified in Section 1.5.2 of this Plan.
- Install a permanent interceptor dike at the base of slopes near each waterbody crossed. Permanent interceptor dikes may not be installed in agricultural areas.

6.0 Stabilization of Disturbed Areas Over Winter

If portions of the Project are constructed in the late fall or early winter (due, for example, to timing restrictions), revegetation and permanent site stabilization immediately after the completion of construction will be impractical. In addition, inclement weather late in the construction season also could delay final restoration on transmission line segments.

When such circumstances delay final restoration and permanent site stabilization, temporary erosion control measures will be used to minimize the potential for erosion until clean-up and permanent revegetation can proceed. These measures may include the following:

- Maintain or install hay or straw/hay bales as silt barriers in swales, at the base of slopes, adjacent to streams and wetlands at access road crossings, and in other areas subject to sedimentation from low velocity runoff.
- Use straw or hay mulch stabilized with a binder or equivalent on disturbed slopes greater than 5%.
- Temporarily seed critical areas (e.g., stream banks on access roads) with a fast-germinating grass such as winter rye.
- Conduct periodic inspections of the construction ROW over the winter and early spring to ensure that the temporary measures are maintained and are effective.

In the event of such inclement weather conditions late in the construction season, final ROW restoration will be deferred until the following spring or early summer, after the ground has thawed, and soil conditions are suitable.

APPENDIX E
D&M PLAN CHANGE APPROVAL PROCESS

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D&M PLAN CHANGE APPROVAL PROCESS

Identification of Significant Changes:

Once CL&P identifies a required change to the D&M Plan, it must determine whether it is a “significant change,” because such changes require advance Council approval. CL&P proposes the following criteria for identifying significant changes: a “significant change” is a change to the Project that significantly reduces the amount of protection to the environment or significantly increases potential public concerns. To be “significant”, the change must have a meaningful impact to the environment, public, or other permits.

For the underground portion of the Project, once CL&P identifies a potential change, it will consult with a Connecticut Department of Transportation (CDOT) representative to reach an agreement as to whether the change is “significant.” Any changes to existing CDOT facilities or affecting planned projects of CDOT will be considered “significant.”

Procedure for Council Review of “Significant Changes” to D&M Plan:

“Urgent” Case: If the change is “urgent” (i.e., if having to wait until the next regularly scheduled meeting of the Council to obtain approval of the change would have a material impact on construction cost or scheduling), then CL&P will contact Council staff to determine if the Council chairman will grant oral permission for the change so as to allow construction to continue in accordance with the proposed change. If oral permission is granted, CL&P will continue construction in accordance with the change and will file documentation regarding the change within 24 hours. If oral permission is denied, CL&P will file the proposed D&M Plan Change with the Council for review and will hold construction impacted by the change pending the Council’s determination.

“Non-Urgent” Case: If the change is not “urgent,” then CL&P will file the proposed D&M Plan Change with the Council for review at its next meeting and will delay the construction impacted by the change pending the Council’s determination.

Procedure for Council Review of Other Types of Changes to the D&M Plan:

For purposes of reviewing and processing changes to an approved D&M Plan that are not deemed to be “significant”, CL&P will categorize the change as one of the following:

Non-significant change: a change to the Project that may reduce the amount of protection to the environment or may increase potential public concerns, but only in a minor or trivial manner.

Positive Change: A change to the Project that increases the amount of protection to the environment or decreases public concerns, having no negative aspects in this regard (that is, positive impacts may not be considered to offset any negative impacts).

Minor Change: A change to a design aspect of a drawing, where the design has no bearing on the environment or potential public concerns.

For “non-significant” and “positive” changes, CL&P will inform Council staff of the change by phone (or telephone message) and will file appropriate documentation with the Council within 24 hours. There will be no “hold” on construction for such non-significant and positive changes.

For “minor changes”, there will be no formal notification process prior to proceeding with construction incorporating the change, and the reporting of such changes will occur biweekly, as described below.

Weekly Reporting of All Changes to D&M Plans

CL&P will document all D&M Plan changes - significant, non-significant, positive, and minor – in an attachment to the environmental inspector’s weekly report.

**Middletown-Norwalk Transmission Project
D&M Plan Change Approval Process**

