State of New Jersey  
Dept. of Environmental Protection  
Division of Parks & Forestry  
Forest Service  
501 E. State Street  
PO Box 404  
Trenton, NJ 08625-0404  

ATTN: Dave Johnson  
Regional Forester  
Community Forestry Program  

RE: Reforestation Plan  
Rowan Boulevard Stormwater Management Basin  
Block 1, Lot 7  
Borough of Glassboro, Gloucester County, New Jersey  
S&A File No. G-247  

Dear Mr. Johnson:  

Our firm is designing a stormwater management basin on property owned by Rowan University in Glassboro, New Jersey. The basin will be constructed on a wooded lot that is 2.94 acres in area.  

We have developed a Reforestation Plan as required by the No Net Loss Reforestation Program. Enclosed please find six (6) copies of this plan.  

I look forward to hearing from you soon. If you have any questions or require any further information, do not hesitate to call.  

Very truly yours,  

SICKELS & ASSOCIATES, INC.  

[Signature]  
Kerry Engelhardt, P.E., C.M.E.  
Project Engineer  

KLE  
Enclosure  

cc: Joe Orlins, Rowan University, w/enclosure  
Mark Brunermer, PE, CME  

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Sherwood Mews • 833 Kings Highway  
Woodbury, New Jersey 08096-3110  
(856) 848-6800  FAX (856) 848-8520  
www.sickelsassoc.com
REFORESTATION PLAN

ROWAN UNIVERSITY BASIN
BLOCK 1, LOT 7
BOROUGH OF GLASSBORO
GLouceSTER COUNTY, NJ
S&A FILE NO. G-247

December 2008

Prepared by:

Sickels & Associates, Inc.
Sherwood Mews
833 Kings Highway
Woodbury, NJ 08096
N.J. CERTIFICATE OF AUTHORIZATION NO. GA27994900
TEL. (856) 848-6800 – FAX (856) 848-8250

MARK R. BRUNERMER, PE
NEW JERSEY PROFESSIONAL ENGINEER LICENSE #37048
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General Information Form
No-Net Loss Reforestation Program

Agency or Department Name: Rowan University, Facilities Planning, Construction & Operations

Contact Person: Joseph Orlins

Title: Asst. Vice President, Facilities Planning, Construction & Operations

Mailing Address: Linden Hall, 201 Mullica Hill Road
Glassboro, NJ 08028

Telephone Number: (856)256-5328    Fax: (856)256-5636

E-Mail Address: orlins@rowan.edu

Project Name: Rowan Boulevard Stormwater Management Basin

Estimated Project Start Date:    Estimated Project Duration:

Project Location: Borough of Glassboro (municipality/municipalities)
Gloucester County (county/county)

Block 1, Lot 7
Mullica Hill Rd (Rt. 322), across from Whitney Ave

(specific location)

Total amount of acreage proposed to be deforested: 1.81 acres

Amount of acreage proposed to be reforested on-site: 0 acres

Amount of acreage proposed to be reforested off-site: 1.81 acres

(If reforestation objectives cannot be achieved on site the Secondary Reforestation Form must be filled out)
Off-Site Reforestation Form
No-Net Loss Reforestation Program

Off-Site Land Owner: Rowan University

Mailing Address: Linden Hall, 201 Mullica Hill Road
Glassboro, NJ 08028

Off-Site Contact Person: Joseph Orlins

Title: Asst. Vice President, Facilities Planning, Construction & Operations

Telephone Number: (856) 256-5328
Fax: (856) 256-5636

E-Mail Address: orlins@rowan.edu

Project Location: Glassboro (Municipality/municipalities)
Gloucester County (County/counties)
Off-site reforestation will occur throughout the
Rowan University campus in Glassboro.

(State address or specific location)

State Entity Contact Person: same
(If different from General Information Form)

Title:

Telephone Number: 
Fax:

Estimated Planting Dates: April 2009 through April 2011

Amount of compensated acreage to be reforested off-site: 1.81 acres

Department of Environmental Protection
Division of Parks and Forestry
State Forest Service
PROJECT NARRATIVE

INTRODUCTION

The stormwater control requirements of the ongoing redevelopment within the Borough of Glassboro will be met, to a large extent, by a proposed stormwater management wet basin on the property of Rowan University. This wet pond will store and attenuate runoff from both the borough’s redevelopment area, as well as proposed student housing on the university campus. The site for this proposed basin is currently wooded, and a large area will be cleared for the construction of the basin. In accordance with the New Jersey No Net Loss Reforestation Act, the University (a state entity) has prepared this Reforestation Plan to illustrate how the loss of established forest will be offset by the planting of trees elsewhere throughout the campus.

EXISTING CONDITIONS

The site of the proposed stormwater management basin is located at Block 1, Lot 7 in Glassboro, Gloucester County, New Jersey, on Mullica Hill Road (US Route 322). The property is owned by Rowan University (the state entity.) The proposed development of the subject property shall consist of the construction of a stormwater management basin with a permanent pool (a “wet pond.”) This proposed basin will detain and attenuate stormwater runoff generated by the proposed development of the Glassboro Redevelopment Area, which is bounded by US Route 322, High Street, Main Street, and Mick Drive; as well as the proposed development of the University’s East Campus Village, which will be located northeast of the proposed stormwater basin, bounded by Carpenter Street, Main Street, and US Route 322. The basin will be owned and operated by Rowan University. The basin will discharge to an existing culvert via a proposed manhole on adjacent Lot 1, which is also owned by Rowan University.

The site is currently wooded, with no existing structures. A small stream crosses the southwest corner of the lot, flowing from the southeast to the northwest. The site is bounded to the south by Mullica Hill Road (US Route 322;) to the west by university administrative buildings; to the north by a pond owned by the University; and to the east by an abandoned residential building, as well as student housing, all of which is also owned by the University.

The majority of the site soils are a Downer-Urban land complex, which have a hydrologic classification of type “B” soils. These are well-drained soils.

The site is primarily wooded. Dominant tree species on site include black walnut, honey locust, and pin oak. The understory includes American Holly and Highbush blueberry.

A site visit was conducted October 10, 2008, with Kerry Engelhardt, a representative from Sickels and Associates; Joseph Orlins, Assistant Vice President of
Facilities Planning, Constructions & Operations at Rowan University (the state entity); Ed Thompson, Director of Facilities, Landscape Management at Rowan University; and Dave Johnson, Regional Forester in the Community Forestry Program at the New Jersey Division of Parks & Forestry. The site was assessed as an established forest during this visit.

The area of the site which must be deforested in order to construct the proposed stormwater management basin is 1.81 acres. Using a Tree Replacement Factor (TRF) of 204 (as per the “established forest” assessment), this will require reforestation of three hundred and sixty nine (369) trees of a 2” – 2 ½” caliper.

The lots adjoining the basin site are all owned by the University. The clearing that the basin construction requires will occur in the center of the site; a buffer of existing trees will remain along each property line. Additionally, the property is at a higher elevation than the lots to the west and north. Therefore, the deforestation will not significantly affect the view from either the west (the university Facilities buildings) or the north (Abbotts Pond.) To the south is Route 322. Since the deforestation is to occur over one hundred (100) feet from the right of way, many trees will remain between the roadway and the proposed basin, which means that the view will not be affected significantly. The adjoining property to the east is the future site of the East Campus Village. As mentioned, some trees will remain between the proposed pond and this proposed student housing area; however, the university looks forward to a scenic vista that includes the wet basin. The basin is being designed to be an attractive feature, and the university views the sight of the proposed pond from the neighboring proposed housing as an asset, rather than a drawback.

PROPOSED REFORESTATION

Since the majority of the area of disturbance will contain the proposed wet pond, there is a limited area available on site for reforestation. A proposed basin liner precludes the planting of significant trees on-site. Therefore, the University will fulfill the reforestation requirement by planting trees elsewhere on the campus. The University will design landscaping for the basin site at a future date, when the design of the proposed East Campus Village is finalized. At this time, however, all of the reforestation requirement necessitated by the basin’s construction will occur elsewhere through the university campus. No reforestation is proposed beyond the confines of the campus.

The university views this reforestation plan as an opportunity to work towards eventual status as an arboretum. As the Landscaping Plan indicates, trees will be planted in several different types of locations:

- **Street/Curb Lawn Type Trees (22 species)** – This group of trees will be used to line roadways and thoroughfare type walks so as to form geometric allees, and architectural backdrops. A tolerance for high soil temperatures, road salt, drought and low oxygen plays a key role in the use of these trees.
- **Large Trees for Mass Planting/Reforestation (33 species)** – This group of trees will be used for screening and creating canopied open space. These trees will have to handle low fertility levels and, once established, periodic drought.

- **Trees for understory planting (15 species)** – These are mostly flowering trees, used in areas where there are existing or proposed large trees.

- **Ornamental Trees (19 species)** These will be planted mostly adjacent to buildings, to create visual interest. They are small- to mid-sized full sun flowering and non-flowering trees.

- **Specimen/Accent Trees (25 species)** – These will be distributed throughout campus. This reforestation plan is a great opportunity to choose unusual and interesting trees to plant throughout campus.

The landscape plan that is a part of this Reforestation Plan demonstrates the location of each required tree. All three hundred and sixty-nine (369) of the required trees have been accounted for (note that some trees are proposed to be planted at a larger caliper; these trees will count for more than “one” tree unit.) However, each planting location is not associated with a specific tree species. Instead, each planting location on campus is associated with a proposed tree type, as described above. A list of potential tree species is a part of this Plan. As the planting proceeds throughout campus, trees will be chosen from the approved list, in the required caliper. In this way, the University retains the freedom to choose available species from local nurseries, whilst still adhering to the required Reforestation Plan.

The list of potential tree species has been assembled by Ed Thompson, director of facilities, landscape management at Rowan University. Mr. Thompson holds a bachelor's degree in horticulture and a graduate degree in landscape architecture. The goal of the reforestation plan is not simply to beautify the campus, but to make it more functional, directing foot traffic so that a stroll around Rowan is a sensory experience. Mr. Thompson has chosen tree species which are suited for the soils and climate conditions of the university campus. Careful consideration has been made as to the location of each type of tree; in regards to the amount of sunlight each tree will receive, as well as the size of the mature tree in relation to both its roots (and how that will affect sidewalks, roadways, and curbing) and its canopy (and how that will affect sightlines, adjacent trees and buildings, utility lines, signs and light poles.)

**CONCLUSIONS**

The construction of the proposed stormwater basin on Rowan University property will necessitate the deforestation of over one and a half acres of established forest. The University looks upon this required reforestation plan as an opportunity to increase the interest and diversity of the landscaping on campus, and will meet the Reforestation Plan
requirements of the NJDEP Division of Parks and Forestry with creativity, beauty, and inventiveness.

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PROJECT PLANT LIST
1. STREET/CURB LAWN TYPE TREES
2. LARGE TREES FOR MASS PLANTING/REFORESTATION
3. TREES FOR UNDERSTORY PLANTING
4. ORNAMENTAL TREES
5. SPECIMEN/ACCENT TREES
PROJECT PLANT LIST

Below is a list of tree species, varieties and cultivars for planting on the Rowan University campus as it works toward one day achieving arboretum status. The plant material required to meet state mandates for tree replacement on the Rowan University Campus as a result of the deforestation created by the construction of the Rowan Boulevard Stormwater Management Basin will be chosen from this list.

Plants selected from the list will be placed in accordance with the Landscape Drawing contained in this Reforestation Plan. The quantity of a given plant will be based on design requirements. For example, the 8 trees along the Rowan Hall walk will all be of one matching type. Each area selected for planting will have a number and type of tree that will produce a positive overall aesthetic impact. The total number of trees needed for replacement will only address a small portion of those indicated on the list.

Street/Curb Lawn Type Trees (22 species) – This group of trees will be used to line roadways and thoroughfare type walks so as to form geometric allees and architectural backdrops.

Acer nigra cultivars – Black Maple (some times considered a form of Sugar Maple)
Acer rubrum cultivars – Red Maple varieties
Acer rubrum x saccharinum hybrids – (Autumn Blaze, Freeman)
Acer saccharium cultivars – Sugar Maple
Aesculus flava – Yellow Buckeye
Aesculus glabra – Ohio Buckeye
Celtis occidentalis - Hackberry
Celtis pumila – Dwarf Hackberry
 Corylus columna – Turkish Filbert
Ginko biloba varieties – Ginko Tree
Gleditsia tricanthos cultivars – Honey Locust
Gymnoclatus dioicus - Kentucky Coffee Tree (male and female)
Magnolia grandiflora cultivars – Southern Magnolia
Platanus occidentalis x orientalis – London Plane Tree
Quercus imbricaria – Shingle Leaf Oak
Quercus macrocarpa – Bur Oak
Quercus phellos – Willow Oak
Quercus prinus – Chestnut Oak
Quercus shumardii – Shumard Oak
Tilia americana cultivars – Basswood
Tilia cordata cultivars - European Linden
Zelkova serrata – Japanese Zelkova

**Large Trees for Mass Planting/Reforestation – This group of trees will be used for screening and creating canopied open space. (33 species)**

Abies concolor cultivars – White Fir
Abies firma – Japanese Fir
Cunninghamia lanceolata – China-fir
Cedrus atlantica cultivars – Blue Atlas Cedar
Cedrus deodara cultivars – Deodara Cedar
Cedrus libani cultivars – Cedar of Lebanon
Chamaecyparis nootkatensis cultivars – Alaska Cedar
Chamaecyparis obtusa cultivars – Japanese Cypress
Cryptomeria japonica cultivars – Japanese Cedar
Cupressocyparis leylandii – Leyland Cypress
Facus grandifolia – American Beech
Ilex aquifolium cultivars/hybrids – English Holly
Ilex chinensis cultivars/hybrids – Chinese Holly
Ilex opaca cultivars – American Holly
Larix laricina - Tamarack
Liquidambar styraciflua – Sweet Gum
Liriodendron tulipifera – Tulip tree
Liriodendron chinensis – Chinense Tuliptree
Nyssa sylvatica - Tupelo
Oxydendron arboreum - Sourwood
Picea abies – Douglas Fir
Picea concolor – White Fir
Pinua aristata – Bristlecone Pine
Pinus bungeana – Lacebark Pine
Pinus ponderosa – Ponderosa Pine
Pinus monticola – Western White Pine
Pinus strobus cultivars – White Pine
Pinus taeda – Loblolly Pine
Pinus thunbergii – Japanese Black Pine
Pinus virginiana – Jersey Pine, Virginia Pine
Populus deltoids – Eastern Cottonwood
Thuja occidentalis cultivars – American arborvitae, White Cedar
Thuja plicata – Thuja Green Giant, Western Red Cedar
Trees for understory planting (mostly flowering trees) \((15\ species)\)

Cercis canadensis varieties – Eastern Redbud

Cercis chinensis – Chinese Redbud

Cornus alterifolia – Pagoda Dogwood

Cornus florida x kousa varieties – Rutgers Dogwood Series

Cornus kousa varieties – Kousa Dogwood

Chionanthus virginicus – Fringe Tree

Halesia tetraperta varieties – Carolina/Mountain Silver Bell Tree

Magnolia macrophyllum – Big Leaf Magnolia

Magnolia stellata varieties – Star Magnolia

Magnolia tripetala – Umbrella – Tree

Ostrya virginiana - Hophornbeam

Prunus laurocerasus varieties – Cherry Laurels

Sassafras albidum - Sassafras

Taxus cuspidate – Japanese yew

Taxus baccata x cuspidate varieties – English Yew

**Ornamental Trees \((19\ species)\)**

Aesculus hippocastanum – Horse Chestnut

Acer campestre Hedge Maple

Acer ginnala – Amur Maple

Acer palmatum varieties – Japanese Maple

Amelanchier lavis – Alleghany serviceberry

Amelanchier canadensis - Juneberry
Cotinus coggyria – Smoke Tree
Crataegus phaenopyrum – Washington Hawthorn
Lagerstromia indica varieties – Crepe Myrtle
Malus spp varieties – Crabapples
Myrica cerifera – Southern Bayberry
Myrica pensylvanica – Northern Bayberry
Photinia x fraseri – Red Robin Photinia
Salix discolor – Pussy Willow
Sorbus aucuparia varieties – Rowan Tree (English), Mountain Ash (North America)
Styrax japonica – Japanese Snowbell
Syringa pekinensis – Peking Lilac
Syringa japonica varieties – Japanese Lilac
Vitex agnus castus – Chaste Tree

**Specimen/Accent Trees (25 species)**

Castanea chinensis – Chinese Chestnut
Castanea dentate x chinensis – American Chestnut hybrids
Cercidiphyllum japonicum – Katsura Tree
Chamaecyparis lawsoniana varieties – Lawson’s Cypress
Chamaecyparis obtuse varieties – Hinoki Cypress
Chamaecyparis pisifera varieties – Sawara Cypress
Claudrastis lutea - Yellowwood
Fagus grandifolia – American Beech
Fagus sylvatica cultivars – European Beech
Franolina Altamaha – Franklin Tree
Gordonia lasianthus varieties - Gordonia
Koelrauteria paniculata – Golden Raintree
Laburnum anagyroides x alpinum - Golden chain
Magnolia acuminata varieties – Cucumber Tree
Magnolia acuminate x denudate varieties – Includes Sister Series
Magnolia denudate varieties - Yulan Magnolia
Magnolia kobus – Kobush Magnolia
Magnolia liliflora varieties – Mulan Magnolia
Magnolia virginiana varieties – Sweet Bay Magnolia
Pinus thunbergii – Japnese black Pine
Sequoia sempervirens – Coast Redwood
Taxodium distichum – Bald Cypress
Taxodium ascendens – Pond Cypress
Tilia tomentosa – Silver Linden
Ulmus americana (disease resistant varieties) – American Elm
MAPS
1. STREET MAP
2. COLOR PHOTOGRAPHS
3. AERIAL MAP
Rowan University Basin – Reforestation Plan
Block 1, Lot 7 – Borough of Glassboro, Gloucester County, NJ
S&A File No. G-247
Photos taken October 10, 2008
Rowan University Basin – Reforestation Plan
Block 1, Lot 7 – Borough of Glassboro, Gloucester County, NJ
S&A File No. G-247
Photos taken October 10, 2008
LANDSCAPE DRAWING
- PLANTING DIAGRAM
- TREE PLANTING SPECIFICATIONS
- REFORESTATION PROTECTION AND CARE METHODS
TREE PLANTING DETAIL
TREE PLANTING SPECIFICATIONS

1. GENERAL

All materials, equipment and personnel shall be limited to the work area defined by the project supervisor.

Trees shall be free of damage as the result of handling or transportation.

No substitution of plant material is allowed unless written permission is obtained from the project supervisor prior to the delivery date of the material.

All work shall conform to accepted horticultural practices as ultimately determined by the project supervisor.

Since the Facilities Department of Rowan University will be conducting all of the tree planting on the University campus, all references below to “project supervisor” shall correspond to Ed Thompson, Director of Facilities, Landscape Management, or his designated representative; and all references below to “contractor” shall correspond to Mr. Thompson’s staff.

2. SCOPE OF WORK

Work shall consist of:

- preparation of areas for planting
- furnishing and planting of specified trees, unless the contract is for planting only
- maintenance of plantings until acceptance by the project supervisor
- clean up and restoration of any disturbed areas to the condition prior to the contractor's operations

3. SCHEDULING OF WORK

The contractor shall submit a proposed work schedule to the project supervisor for approval at least seven (7) days prior to beginning operations. After the schedule is accepted, no modifications will be permitted without written authorization from the project supervisor.

The contractor shall arrange to confine his operations to normal working hours for the industry and no work will be permitted on Sundays or holidays without written authorization from the project supervisor.
4. PERSONNEL

All personnel will be properly supervised in a manner that assures that the property is protected from damage that the safety of all personnel and the public is protected and that all contract work is done in a professional manner and according to accepted horticultural standards.

5. PROTECTION OF UTILITIES

Prior to any excavation or the driving of stakes into the ground, the contractor shall ascertain and have marked out the location of all underground utilities. The contractor shall take proper precautions not to disturb or damage any sub-surface utilities.

In the event that any sub-surface utilities are uncovered or damaged, the contractor shall immediately notify the project supervisor so that the contract work may be relocated or stopped until the damage can be repaired. The contractor shall be financially responsible for any damage to utilities and structures and shall properly maintain the protection of same.

6. MULCH

Mulch shall be uniformly shredded hard wood. All foreign material including twigs, stones, cans, soil, etc. shall be removed prior to spreading.

7. LAYOUT

All trees and shrubs shall be located as shown on the plans supplied by the project supervisor. Should the contractor encounter obstructions of any nature, he shall notify the project supervisor who will arrange adjustments. All adjustments to the plan must be authorized in writing.

The project supervisor or his designee shall stake the exact planting location of each tree in accordance with the plans. The staking and layout work shall be done sufficiently in advance of planting to avoid delays to the contractor.

No planting holes shall be excavated in advance of planting operations. The planting holes must be approved by the project supervisor prior to the start of the planting operation. Each plant shall be planted in an individual hole as specified. All plants shall be set to ultimate finished grade so that they will bear the same relationship to finished grade as they bore to the natural grade before transplanting. See the accompanying planting diagram for details.
8. WATER

Plants shall be thoroughly watered in after planting. The project supervisor will notify the contractor if water suitable for irrigation is available on the site. If water is unavailable on the site, it is the responsibility of the contractor to furnish it at the time of planting.

9. NURSERY STOCK

Plant species shall conform to those indicated on the drawings, plant list, and the publication Hortus Third.

All landscape nursery stock shall conform to the standard specifications of The American Standard for Nursery Stock sponsored by the American Association of Nurserymen, Inc. All plants shall be grown under climatic conditions similar to the job site for a period of not less than two (2) years immediately prior to this project.

No substitutions shall be permitted in either kind or grade without written authorization from the project supervisor.

Any materials and/or work may be rejected, if, in the opinion of the project supervisor, it does not meet the requirements of the specifications. All rejected material shall be promptly removed from the site by the contractor at his own expense.

10. QUALITY

Plants shall have the habit of growth that is normal for the species or cultivar and shall be sound, healthy, vigorous, free from insects, plant diseases and injuries or damage of any nature. All plants shall be of the grades specified, neither larger nor smaller, without written authorization from the project supervisor. All plants specified as single stem shade trees on the landscape drawing key shall have their branching starting between six and seven feet in height. Tree crowns shall be balanced and scaffolding branches shall be adequately spaced and developed in proportion to each other. No plants shall be pruned, clipped or trimmed prior to delivery without written authorization from the project supervisor. All landscape stock must be nursery grown.

All plants shall have been root pruned at the nursery at least once during the three year period immediately preceding transplanting and at least one year prior to transplanting.

All plants must be State Inspected and a copy of the "Certificate of Inspections" issued by the State Department of Agriculture at the point of origin must accompany shipments from each source.
11. SHIPMENT, DELIVERY, INSPECTION AND ACCEPTANCE

The project reserves the right to inspect and select all plant material at its point of origin. Acceptance at the nursery, in which the plant is growing, prior to transplanting, does not preclude rejection at the site for just cause.

The plant material is to be delivered to the site in quantities and on the dates agreed upon by the project supervisor. The contractor shall advise the project supervisor of all deliveries at least 48 hours prior to its arrival at the site, so that all trees may be inspected upon delivery to the site.

All plants shall be tarped, protected from weather and be adequately packed to avoid breakage, sun scald, windburn, desiccation and other damage during loading and shipment. All measures customary in good trade practice shall be taken to keep the plants in good condition.

No plants shall be planted until they have been inspected and approved on the site by the project supervisor.

Legible tags shall be attached to each tree. Trees that fail to meet the specifications set forth in sections 9 and 10 will be rejected. Rejected plants shall be removed from the site immediately and approved replacement stock that meets the specifications set forth in sections 9 and 10 will be planted in the prescribed manner by the contractor at his expense. Final written acceptance of the plants will be given only after they have been planted and after the requirements prescribed herein are met.

12. TIME OF PLANTING

Prior to commencement of planting, the contractor shall contact the project supervisor to establish a schedule of planting dates. Trees will be planted from March 1 through June 30 or September 1 through November 30.

13. PLANTING

Unless otherwise specified within these specifications, all work shall conform to accepted horticultural practices as ultimately determined by the project supervisor.

Plants shall be protected upon arrival to the site by being thoroughly watered and properly maintained until properly planted and watered. Unplanted stock shall be "healed-in" a bed of material approved by the project supervisor upon delivery to the site unless they will be planted within four (4) hours after delivery. At all times workmanlike methods customary in good horticultural practices shall be exercised.
The contractor shall protect all existing features on the site including underground utilities, structures and existing trees.

All trees shall be planted in pits that are a minimum of two (2') feet larger in diameter than their ball of earth or their spread of roots. The depth of the pits shall be equal to the depth of the root ball after proper planting. The tree shall be centered in the hole and then back filled one half the depth of the soil ball with topsoil. The backfill shall be lightly but thoroughly tamped and well watered. The remainder of the hole is then to be backfilled with approved topsoil to a depth that after settling will assure the tree will be at the same level it was previously growing at in the nursery. The tree will be well watered again before mulch is placed over the surface of the root ball.

14. GUYING, STAKING AND WRAPPING

The installation of tree stakes and supporting materials will be done to those trees that the project supervisor deems necessary. Stakes shall be made of wood, of the length and size required to restrict excessive movement by the tree, as ultimately determined by the project supervisor. Tie materials shall be plastic chain lock or flat, woven webbing designed specifically for staking trees.

For details on proper staking, see the planting diagram.

Tree trunks shall not be wrapped.

15. PLANTING PREPARATIONS

Prior to backfilling, balled and burlapped trees shall have burlap and twine removed from around the trunks, stems and tops of the balls. The burlap shall be peeled back off the top of the ball, or if bulky, cut away and removed from the upper three-quarters of the soil ball. No burlap shall be pulled out from underneath the ball.

At least the upper two-thirds of the wire basket shall be removed from the root balls after the trees are set in the planting pit by cutting with any tool that does not destroy the integrity of the root ball or injure the tree roots. The remaining lower section of the wire basket shall be flattened as much as possible in the planting hole.

Backfilling shall be lightly but thoroughly tamped and well watered as described under planting. Only the prescribed approved topsoil may be used to backfill the holes during planting operations. Unsuitable excavated material, as designated by the project supervisor shall be removed from the site by the contractor at his expense.
16. MULCHING

Shredded hardwood mulch supplied by the contractor shall be free of debris and shall be placed by the contractor around all plantings at the time of planting to a depth of three (3") inches as shown in the planting diagram. Care shall be exercised to keep mulch two (2") inches away from the bases of all plantings. After the mulching operation has been approved by the project supervisor, the mulch shall be thoroughly watered.

17. PRUNING

The contractor shall not prune any plant.

18. CLEAN-UP

During the course of operations, the Contractor shall remove from the property at his expense all excess and waste materials. Any damaged lawn areas or planting areas will be restored to their original condition by the contractor at his expense, if such damage is the result of the contractor's operations.

19. INSPECTION FOR ACCEPTANCE

Inspection: The contractor shall notify the project supervisor when planting is completed and shall request an inspection in order to determine whether or not the project meets the specifications contained herein. If the work is acceptable, a written notice shall be provided stating so. If deficiencies are found in the work, a list of items requiring attention shall be furnished to the contractor by the project supervisor. The contractor shall correct the deficiencies within ten (10) days and a re-inspection shall be made. This procedure will continue until the work is found acceptable.

Acceptance: After inspection, the contractor will be notified in writing by the project supervisor of the acceptance of all work.
TREE MAINTENANCE SPECIFICATIONS

1. GENERAL

Maintenance procedures will be carried out to promote the establishment of the trees and ensure that they are in a healthy and viable condition two years after planting.

Since the Facilities Department of Rowan University will be conducting all of the tree planting on the University campus, all references below to “project supervisor” shall correspond to Ed Thompson, Director of Facilities, Landscape Management, or his designated representative; and all references below to “contractor” shall correspond to Mr. Thompson’s staff.

2. SCOPE OF WORK

Work shall consist of:
- Inspections
- Watering
- Mulching
- Weeding
- Securing stakes and guys
- Resetting trees to plumb
- Insect and disease control
- Fertilization
- Pruning

INSPECTIONS
Inspections shall consist of regular visits to the planting site/s by a qualified professional to determine the health and needs of the trees. Inspection times and dates are the responsibility of the contractor but a minimum of four inspections shall be done during the year, with one scheduled during each of the months of April, May, June and November.

WATERING
Watering is the most crucial maintenance procedure to ensure plant establishment and survivability. When seasonal rainfall is inadequate to provide sufficient soil moisture for good tree establishment, watering shall be done. A thorough watering every five to seven days shall be considered ample when rainfall is insufficient to maintain soil moisture content. Four gallons per 2" -2 12" caliper tree shall be considered adequate during rainless periods provided that the water is not applied faster than the ground can absorb it. The use of water-holding containers with small drain holes or products such as Treegator or the equivalent shall be the preferred method of watering. The project supervisor will notify the contractor if water suitable for irrigation is available on the site. If water is
unavailable on the site, it is the responsibility of the contractor to furnish.

**MULCHING**
Shredded hardwood mulch shall be the preferred type of mulch but other organic mulches may be used if approved by the project manager. The mulch supplied by the contractor shall be free of debris and shall be maintained by the contractor around all plantings to a depth of three (3") inches as shown in the planting diagram for the entire maintenance period. Care shall be exercised to keep mulch two (2") inches away from the base of all plantings. The mulch ring shall be maintained at a size of 36" in diameter.

**WEEDING**
The mulch rings of caliper size trees shall be kept free of weeds by using either chemical controls and/or hand weeding. Tall growing weeds that can hinder the establishment of seedlings and smaller trees shall be controlled in a large enough area around the plant to ensure competition from the weeds does not adversely effect the trees' survival. Any pre-emergent or post emergent weed control applications shall be applied in a manner consistent with the label and only target the undesirable plants.

**SECUERING STAKES AND GUYS**
Tree stakes and supporting materials shall be maintained according to the planting specifications or replaced as necessary during the first maintenance year. For details on proper staking, see the planting diagram. All staking materials and guys shall be removed and disposed of by the contractor at the end of the first year unless otherwise directed by the project manager.

**RESETTNG TREES TO PLUMB**
Any tree that deviates from a vertical position shall be adjusted so that the main trunk is plumb in two directions that are ninety degrees from each other. All care shall be taken not to harm the root ball or root system of the tree during resetting operations.

**INSECT & DISEASE CONTROL**
Trees shall be kept free of insect or disease infestations that can affect their health or establishment. Integrated pest management techniques shall be employed by the contractor to minimize or alleviate the undesirable condition. If the timing is incorrect to administer a control, contractor shall monitor the insect or disease the next season and apply the appropriate controls at that time, if necessary. All insect or disease problems are to be diagnosed and treated individually. No broadcast spraying of pesticides shall be done.

**FERTILIZATION**
A balanced, slow release fertilizer shall be applied at the recommended rate at the end of the first growing season in late fall. The fertilizer shall be formulated for trees and approved by the project manager prior to application. The application may be made by either soil injection along the outside of the mulch ring or by applying a granular form to
the mulch ring area.

**PRUNING**
Pruning shall be done only to dead, broken, diseased or infested branches during the maintenance period and according to the New Jersey Board of Tree Experts' *Pruning Standards for Shade Trees*.

3. **MAINTENANCE SCHEDULE**

The contractor shall arrange to confine his operations to normal working hours for the industry and no work will be permitted on Sundays or holidays without written authorization from the project supervisor.

4. **PERSONNEL**

All personnel will be properly supervised in a manner that assures that the property is protected from damage, that the safety of all personnel and the public is protected and that all contract work is done in a professional manner and according to accepted arboricultural standards.

5. **CLEAN-UP**

During the course of operations, the contractor shall remove from the property at his expense all excess and waste materials. The contractor, at his expense, will restore any damaged lawn areas or planting areas to their original condition if such damage is the result of the contractor's operations.

6. **OTHER**

Unless otherwise specified within these specifications, all work shall conform to accepted arboricultural practices as ultimately determined by the project supervisor.