SECTION TABLE OF CONTENTS DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 93 00 EXTERIOR PLANTS

08/17

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SECTION 32 93 00

EXTERIOR PLANTS
08/17

PART 1 GENERAL.

1.1 REFERENCES.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA P5	(2015) Standard for Waterborne Preservatives
AWPA T1	(2020) Use Category System: Processing and Treatment Standard
AWPA U1	(2020) Use Category System: User Specification for Treated Wood

AMERICANHORT (AH)

ANSI/ANLA Z60.1	(2004) American Standard for Nursery Stock

ASTM INTERNATIONAL (ASTM)

ASTM A580/A580M	(2018) Standard Specification for Stainless Steel Wire
ASTM C4	(2004; R 2014) Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile
ASTM C602	(2019) Agricultural Liming Materials
ASTM C700	(2013) Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM D2729	(2017) Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3034	(2016) Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and

	Fittings
ASTM D4427	(2018) Standard Classification of Peat Samples by Laboratory Testing
ASTM D4972	(2018) Standard Test Methods for pH of Soils
ASTM D5268	(2019) Topsoil Used for Landscaping Purposes
ASTM D5539	(2013) Seed Starter Mix
ASTM D5852	(2000; R 2007; E 2014) Standard Test Method for Erodibility Determination of Soil in the Field or in the Laboratory by the Jet Index Method
ASTM D6155	(2019) Nontraditional Coarse Aggregate for Bituminous Paving Mixtures
ASTM D6629	(2001; R 2012; E 2012) Selection of Methods for Estimating Soil Loss by Erosion
ASTM F667/F667M	(2016) Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings

L.H. BAILEY HORTORIUM (LHBH)

LHBH	(1976) Hortus Third

TREE CARE INDUSTRY ASSOCIATION (TCIA)

TCIA A300P1	(2017) ANSI A300 Part1: Tree Care Operations - Trees, Shrubs and Other Woody Plant Maintenance Standard Practices - Pruning
TCIA Z133	(2017) American National Standard for Arboricultural Operations - Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements

U.S. DEPARTMENT OF AGRICULTURE (USDA)

DOA SSIR 42	(1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.2 RELATED REQUIREMENTS.

Section 31 00 00 EARTHWORK and Section 32 05 33 LANDSCAPE ESTABLISHMENT applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

1.3 SUBMITTALS.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the government officer that will review the submittal for the Government.

SD-01 Preconstruction Submittals

Time Restrictions and Planting Conditions

Indicate anticipated dates and locations for each type of planting.

SD-03 Product Data

Peat

Composted Derivatives

Rotted Manure

Gypsum

Drainage Pipe

Landscape Rock; G, COR

Mulch; G, COR

Ground Stakes

Fertilizer

Weed Control Fabric; G, COR

Root Control Barrier; G, COR

Staking Material

Wood Edging

Metal Anchors

Antidesiccants

Erosion Control Materials

Photographs; G, COR

SD-10 Operation and Maintenance Data

Plastic Identification

When not labeled, identify types in Operation and Maintenance Manual.

1.4 QUALITY ASSURANCE.

1.4.6 Pre-Installation Meeting

Convene a pre-installation meeting a minimum of one week prior to commencing work of this section. Require attendance of parties directly affecting work of this section. Review conditions of operations, procedures and coordination with related work. Agenda must include the following:

a. Tour, inspect, and discuss conditions of planting materials.

b. Review planting schedule and maintenance.

c. Review required inspections.

d. Review environmental procedures.

1.5 DELIVERY, STORAGE, AND HANDLING.

1.5.1 Delivery

1.5.1.1 Branched Plant Delivery

Deliver with branches tied and exposed branches covered with material which allows air circulation. Prevent damage to branches, trunks, root systems, and root balls and desiccation of leaves.

1.5.1.2 Soil Amendment Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, or trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer, gypsum, sulfur, iron, and lime may be furnished in bulk with a certificate indicating the above information. Store in dry locations away from contaminates.

1.5.1.3 Plant Labels

Deliver plants with durable waterproof labels in weather-resistant ink. Provide labels stating the correct botanical and common plant name and variety as applicable and size as specified in the list of required plants. Attach to plants, bundles, and containers of plants. Groups of plants may be labeled by tagging one plant. Labels must be legible for a minimum of 60 days after delivery to the planting site.

1.5.2 Storage

1.5.2.1 Plant Storage and Protection

Store and protect plants not planted on the day of arrival at the site as follows:

a. Shade and protect plants in outside storage areas from the wind and direct sunlight until planted.

b. Heel-in bare root plants.

c. Protect balled and burlapped plants from freezing or drying out by covering the balls or roots with moist burlap, sawdust, wood chips, shredded bark, peat moss, or other approved material. Provide

covering which allows air circulation.

d. Keep plants in a moist condition until planted by watering with a fine mist spray.

e. Do not store plant material directly on concrete or bituminous surfaces.

1.5.2.2 Fertilizer, Gypsum, pH Adjusters and Mulch Storage

Store in dry locations away from contaminants.

1.5.2.3 Topsoil

Prior to stockpiling topsoil, eradicate on site undesirable growing vegetation. Clear and grub existing vegetation three to four weeks prior to stockpiling existing topsoil.

1.5.2.4 Root Control Barrier and Weed Control Fabric

Store materials on site in enclosures or under protective covering in dry location. Store under cover out of direct sunlight. Do not store materials directly on ground.

1.5.2.5 Handling

Do not drop or dump plants from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Handle plants carefully to avoid damaging or breaking the earth ball or root structure. Do not handle plants by the trunk or stem. Puddle bare-root plants after removal from the heeling-in bed to protect roots from drying out. Remove damaged plants from the site.

1.5.4 TIME LIMITATION

Except for container-grown plant material, the time limitation from digging to installing plant material must be a maximum of 90 days. The time limitation between installing the plant material and placing the mulch must be a maximum of 24 hours.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS.

Coordinate installation of planting materials during optimal planting seasons for each type of plant material required.

1.7 GUARANTEE.

All plants must be guaranteed for two years beginning on the date of inspection by the Contracting Officer to commence the plant establishment period, against defects including death and unsatisfactory growth. Replace palms which are not alive at the end of a one-year period. Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season. At end of warranty period, replace planting materials that die or have 25 percent or more of their branches that die during the construction operations or the guarantee period.

1.8 PLASTIC IDENTIFICATION.

Provide product data indicating polymeric information in Operation and

Maintenance Manual.

Type 1: Polyethylene Terephthalate (PET, PETE).
Type 2: High Density Polyethylene (HDPE).
Type 3: Vinyl (Polyvinyl Chloride or PVC).
Type 4: Low Density Polyethylene (LDPE).
Type 5: Polypropylene (PP).
Type 6: Polystyrene (PS).
Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

PART 2 PRODUCTS.

2.1 PLANTS.

2.1.1 Regulations and Varieties

Existing trees and shrubs to remain must be protected and a planting plan be arranged around them. Furnish nursery stock in accordance with ANSI/ANLA Z60.1, except as otherwise specified or indicated. Furnish plants, including turf grass, grown under climatic conditions similar to those in the locality of the project. Plants of the same specified size must be of uniform size and character of growth. All plants must comply with all Federal and State Laws requiring inspection for plant diseases and infestation.

2.1.2 Shape and Condition

Well-branched, well-formed, sound, vigorous, healthy planting stock free from disease, sunscald, windburn, abrasion, and harmful insects or insect eggs and having a healthy, normal, and undamaged root system.

2.1.2.1 Deciduous Trees and Shrubs

Symmetrically developed and of uniform habit of growth, with straight boles or stems, and free from objectionable disfigurements.

2.1.2.2 Evergreen Trees and Shrubs

Well-developed symmetrical tops with typical spread of branches for each particular species or variety.

2.1.2.3 Ground Covers and Vines

Number and length of runners and clump sizes indicated, and of the proper age for the grade of plants indicated, furnished in removable containers, integral containers, or formed homogeneous soil section.

2.1.3 Plant Size

Minimum sizes measured after pruning and with branches in normal position, must conform to measurements indicated, based on the average width or height of the plant for the species as specified in ANSI/ANLA Z60.1.

Plants larger in size than specified may be provided with approval of the Contracting Officer. When larger plants are provided, increase the ball of earth or spread of roots in accordance with ANSI/ANLA Z60.1.

2.1.4 Root Ball Size

All box-grown, field potted, field boxed, collected, plantation grown, bare root, balled and burlapped, container grown, processed-balled, and in-ground fabric bag-grown root balls must conform to ANSI/ANLA Z60.1. All wrappings and ties must be biodegradable. Root growth in container grown plants must be sufficient to hold earth intact when removed from containers. Root bound plants will not be accepted.

2.1.5 Growth of Trunk and Crown

2.1.5.1 Deciduous Trees

A height to caliper relationship must be provided in accordance with ANSI/ANLA Z60.1. Height of branching must bear a relationship to the size and species of tree specified and with the crown in good balance with the trunk. The trees must not be "poled" or the leader removed.

a. Single stem: The trunk must be reasonably straight and symmetrical with crown and have a persistent main leader.

b. Multi-stem: All countable stems, in aggregate, must average the size specified. To be considered a stem, there must be no division of the trunk which branches more than 150 mm 6 inches from ground level.

2.1.5.2 Palms

Palms must have the specified height as measured from the base of the trunk to the base of the fronds or foliage in accordance with ANSI/ANLA Z60.1. The palm must have straight trunk and healthy fronds or foliage as typical for the variety grown in the region of the project. Palms trimmed or pruned for delivery must retain a minimum of 150 mm 6 inches of foliage at the crown as a means of determining plant health.

2.1.5.3 Deciduous Shrubs

Deciduous shrubs must have the height and number of primary stems recommended by ANSI/ANLA Z60.1. Acceptable plant material must be well shaped, with sufficient well-spaced side branches, and recognized by the trade as typical for the species grown in the region of the project.

2.1.5.4 Coniferous Evergreen Plant Material

Coniferous Evergreen plant material must have the height-to-spread ratio recommended by ANSI/ANLA Z60.1. The coniferous evergreen trees must not be "poled" or the leader removed. Acceptable plant material must be exceptionally heavy, well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired must be as indicated.

2.1.5.5 Broadleaf Evergreen Plant Material

Broadleaf evergreen plant material must have the height-to-spread ratio recommended by ANSI/ANLA Z60.1. Acceptable plant material must be well shaped and recognized by the trade as typical for the variety grown in the region of the project.

2.1.5.6 Ground Cover and Vine Plant Material

Ground cover and vine plant material must have the minimum number of runners and length of runner recommended by ANSI/ANLA Z60.1. Plant material must have heavy, well developed and balanced crown with vigorous,

well developed root system and must be furnished in containers.

2.2 TOPSOIL.

2.2.1 Existing Soil

Modify to conform to requirements specified in paragraph COMPOSITION.

2.2.2 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph COMPOSITION. When available topsoil must be existing surface soil stripped and stockpiled on-site in accordance with Section 31 00 00 EARTHWORK.

2.2.3 Off-Site Topsoil

Conform to requirements specified in paragraph COMPOSITION. Additional topsoil must be furnished by the Contractor.

2.2.4 Composition

Evaluate soil for use as topsoil in accordance with ASTM D5268. From 5 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 6 mm 1/4 inch screen. The pH must be tested in accordance with ASTM D4972. Topsoil must be free of sticks, stones, roots, plants, and other debris and objectionable materials. Other components must conform to the following limits:

Silt	7 to 17
Clay	4 to 12
Sand	20-35
pH	5.5 to 7.0
Soluble Salts	600

2.3 SOIL CONDITIONERS.

Provide singly or in combination as required to meet specified requirements for topsoil. Soil conditioners must be nontoxic to plants.

2.3.1 Lime

Commercial grade hydrated or burnt limestone containing a calcium carbonate equivalent (C.C.E.) as specified in ASTM C602 of not less than 80 percent.

2.3.2 Aluminum Sulfate

Commercial grade.

2.3.3 Sulfur

100 percent elemental

2.3.4 Iron

100 percent elemental

2.3.5 Peat

Natural product of peat moss derived from a freshwater site and conforming to ASTM D4427 or ASTM D5539 as modified herein. Shred and granulate peat to pass a 12.5 mm 1/2 inch mesh screen and condition in storage pile for minimum 6 months after excavation. Peat must not contain invasive species, including seeds.

2.3.6 Sand

Clean and free of materials harmful to plants.

2.3.7 Perlite

Horticultural grade.

2.3.8 Composted Derivatives

Ground bark, nitrolized sawdust, humus or other green wood waste material free of stones, sticks, invasive species, including seeds, and soil stabilized with nitrogen and having the following properties:

2.3.8.1 Particle Size

Minimum percent by weight passing:

No. 4 mesh screen	95
No. 8 mesh screen	80

2.3.8.2 Nitrogen Content

Minimum percent based on dry weight:

Fir Sawdust	0.7
Fir or Pine Bark	1.0

2.3.9 Gypsum

Coarsely ground gypsum comprised of calcium sulfate dihydrate 80 percent, calcium 18 percent, sulfur 14 percent; minimum 96 percent passing through 20 mesh screen, 100 percent passing thru 16 mesh screen.

2.3.10 Vermiculite

Horticultural grade for planters.

2.3.11 Rotted Manure

Well rotted horse or cattle manure containing maximum 25 percent by volume of straw, sawdust, or other bedding materials; free of seeds, stones, sticks, soil, and other invasive species.

2.4 PLANTING SOIL MIXTURES.

100 percent topsoil as specified herein or 100 percent on-site topsoil.

2.5 FERTILIZER.

Fertilizer for groundcover, wildflowers and grasses is not permitted. Fertilizer for trees, plants, and shrubs must be as recommended by plant supplier, except synthetic chemical fertilizers are not permitted. Fertilizers containing petrochemical additives or that have been treated with pesticides or herbicides are not permitted.

2.5.1 Fertilizer Tablets

Organic, plant tablets composed of tightly compressed fertilizer chips forming a tablet that is insoluble in water, is designed to provide a continuous release of nutrients for at least 24 months and contains the following minimum percentages, by weight, of plant food nutrients:

20 percent available nitrogen
20 percent available phosphorus
5 percent available potassium

2.6 WEED CONTROL FABRIC.

2.6.1 Roll Type Polypropylene or Polyester Mats

Fabric must be woven, needle punched or non-woven and treated for protection against deterioration due to ultraviolet radiation. Fabric must be minimum 99 percent opaque to prevent photosynthesis and seed germination from occurring, yet allowing air, water and nutrients to pass thru to the roots. Minimum weight must be 5 ounces per square yard with a minimum thickness of 20 mils with a 20 year (minimum) guarantee.

2.7 DRAINAGE PIPE FOR PLANT PITS AND BEDS.

Plastic polyvinyl chloride pipe, unperforated conforming to ASTM D3034 SDR 35 perforated conforming to ASTM D2729. Plastic HDPE pipe, unperforated or perforated. Plastic ABS pipe, unperforated or perforated. Corrugated plastic drainage tubing, unperforated or perforated conforming to ASTM F667/F667M.

2.8 MULCH. N/A

2.9 STAKING AND GUYING MATERIAL.

2.9.1 Staking Material

2.9.1.1 Tree Support Stakes

Rough sawn hard wood free of knots, rot, cross grain, bark, long slivers, or other defects that impair strength. Stakes must be minimum 2 inches square or 2-1/2 inch diameter by 8 feet long, pointed at one end.

2.9.1.2 Ground Stakes

Rough sawn hard wood or plastic, 2 inches square are by 3 feet long, pointed at one end.

2.9.2 Guying Material

2.9.2.1 Guying Wire

12 gauge annealed galvanized steel, ASTM A580/A580M.

2.9.2.2 Guying Cable

Minimum five-strand, 3/16 inch diameter galvanized steel cable plastic coated.

2.9.3 Hose Chafing Guards

New or used 2 ply 3/4 inch diameter reinforced rubber or plastic hose, black or dark green, all of same color.

2.9.4 Turnbuckles

Galvanized or cadmium-plated steel with minimum 3 inch long openings fitted with screw eyes. Eye bolts must be galvanized or cadmium-plated steel with one inch diameter eyes and screw length 1-1/2 inches, minimum.

2.9.5 Deadmen

4 by 8 inch rectangular or 8 inch diameter by 36 inch long, pine or fir wood material.

2.9.6 Metal Anchors

2.9.6.1 Driven Anchors

Malleable iron, arrow shaped, galvanized, sized as follows:

Tree Caliper	Anchor Size
2 inches and under	3 inches
3 to 6 inches	4 inches
6 to 8 inches	6 inches
8 to 10 inches	8 inches
10 to 12 inches	10 inches

2.9.6.2 Screw Anchors

Steel, screw type with welded-on 3 inch round helical steel plate, minimum 3/8 inch diameter, 15 inches long.

2.10 EDGING MATERIAL.

2.10.1 Metal Edging

Minimum thickness shall be 1/4 inch and capable of bending a minimum 24 radius, powder coated dark brown and with slip joint connections. Anchors

and stakes must be of the same manufacturer and color as the edging.

2.10.2 Concrete Edging

Concrete Edging. Cast-in-place 6 by 6 inch concrete mowstrip. Provide saw cut contraction joints to a depth of 3/4 inch after the surface has been finished. Provide joints every 5 lineal feet. Provide ½ inch thick expansion joints at change of direction and where mowstrip abuts rigid pavement. Provide #4 reinforcement bar and other devices necessary to install and secure reinforcement. Provide a floated finish, then finish with a flexible bristle broom. 4000 psi compressive concrete strength at 28 days as specified under Section 03 30 00 CAST-IN-PLACE CONCRETE.

2.11 ANTIDESICCANTS.

Sprayable, water insoluble vinyl-vinledine complex which produce a moisture retarding barrier not removable by rain or snow. Film must form at temperatures commonly encountered out of doors during planting season and have a moisture vapor transmission rate (MVT) of the resultant film of maximum 10 grams per 24 hours at 70 percent humidity.

2.12 EROSION CONTROL MATERIALS.

Erosion control material must conform to the following:

2.12.1 Erosion Control Blanket

100 percent agricultural straw stitched with a degradable nettings, designed to degrade within 12 months.

2.12.2 Erosion Control Fabric

Fabric must be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips must have a minimum life of 6 months.

2.12.3 Erosion Control Net

Net must be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately one inch square.

2.12.4 Hydrophilic Colloids

Hydrophilic colloids must be physiologically harmless to plant and animal life without phytotoxic agents. Colloids must be naturally occurring, silicate powder based, and must form a water insoluble membrane after curing. Colloids must resist mold growth.

2.12.5 Erosion Control Material Anchors

Erosion control anchors must be as recommended by the manufacturer.

2.13 ROOT CONTROL BARRIER.

Flexible and permeable geotextile fabric with permanently attached time-released nodules. Color to be black,Pre-formed, round, tapered cylinder or linear barrier with integral vertical root deflecting ribs constructed of

ultraviolet resistant polypropylene material.

2.14 WATER.

Source of water to be approved by Contracting Officer and suitable quality for irrigation and must not contain elements toxic to plant life, including acids, alkalis, salts, chemical pollutants, and organic matter. Use collected storm water or graywater when available.

2.15 SOURCE QUALITY CONTROL.

The Contracting Officer and Landscape Engineer of Record will inspect plant materials at the project site and approve them. Tag plant materials for size and quality.

PART 3 EXECUTION.

3.1 EXTENT OF WORK.

Provide soil preparation, including soil conditioners and soil amendments prior to planting. Provide tree, shrub, vine, groundcover, seed, and sod planting, post-planting fertilizer, edging, staking, guying, weed control fabric, erosion control material, and root control barrier installation of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.2 ALTERNATIVE HERBICIDE TREATMENT (SOLARIZING SOIL).

Within 48 hours of subsoil preparation, saturate soil with water to a depth of 3 feet.Immediately stake polyethylene sheeting over area to be planted. Stake tightly to surface of soil. Maintain sheeting in place for a minimum of 6 weeks. Immediately after removing sheeting, cover area to be planted with topsoil. Do not till soil prior to applying topsoil.

3.3 PREPARATION.

3.3.1 Protection

Protect existing and proposed landscape features, elements, and sites from damage or contamination. Protect trees, vegetation, and other designated features by erecting high-visibility, reusable construction fencing. Locate fence no closer to trees than the drip line. Plan equipment and vehicle access to minimize and confine soil disturbance and compaction to areas indicated on Drawings.

3.3.2 Layout

Stake out approved plant material locations and planter bed outlines on the project site before digging plant pits or beds. The Contracting Officer reserves the right to adjust plant material locations to meet field conditions. Do not plant closer than 24 inches to a building wall, pavement edge, fence or wall edge and other similar structures. Provide on-site locations for excavated rock, soil, and vegetation.

3.3.3 Erosion Control

Provide erosion control and seeding with native plant species to protect slopes.

3.4 PLANT BED PREPARATION.

Verify location of underground utilities prior to excavation. Protect existing adjacent turf before excavations are made. Do not disturb topsoil and vegetation in areas outside those indicated on Drawings. Where planting beds occur in existing turf areas, remove turf to a depth that will ensure removal of entire root system. Measure depth of plant pits from finished grade. Depth of plant pit excavation must be as indicated and provide proper relation between top of root ball and finished grade.Install plant material as specified in paragraph PLANT INSTALLATION. Do not install trees within 10 feet of any utility lines or building walls.

3.5 PLANT INSTALLATION.

3.5.1 Individual Plant Pit Excavation

Excavate pits at least twice as large in diameter as the size of ball or container to depth shown.

3.5.2 Plant Beds with Multiple Plants

Excavate plant beds continuously throughout entire bed as outlined to depth shown.

3.5.3 Handling and Setting

Move plant materials only by supporting the root ball. Set plants on hand compacted layer of prepared backfill soil mixture 6 inches thick and hold plumb in the center of the pit until soil has been tamped firmly around root ball. Set plant materials, in relation to surrounding finish grade, at which they were grown in the nursery, collecting field or container. Replace plant material whose root balls are cracked or damaged either before or during the planting process.

Plant material must be set in plant beds according to the drawings. Backfill soil mixture must be placed on previously scarified subsoil to completely surround the root balls, and must be brought to a smooth and even surface, blending to existing areas.

3.5.3.1 Balled and Burlapped Stock

Backfill with prepared soil mixture to approximately half the depth of ball and then tamp and water. Carefully remove or fold back excess burlap and tying materials from the top a minimum 1/3 depth from the top of the rootball. Tamp and complete backfill, place mulch topdressing, and water. Remove wires and non-biodegradable materials from plant pit prior to backfill operations.

3.5.3.2 Bare-Root Stock

Plant so roots are arranged in a natural position. Place roots in water a minimum of 30 minutes prior to planting. Carefully work prepared soil mixture among roots. Tamp remainder of backfill, place mulch topdressing and water.

3.5.3.3 Container Grown Stock

Remove from container and prevent damage to plant or root system.

3.5.3.4 Ground Covers and Vines

Smooth planting areas before planting to provide even, smooth finish. Plant after placing weed control fabric and mulch topdressing. Do not remove plant material from flats or containers until immediately before planting. Space at the intervals indicated. Plant at a depth to sufficiently cover all roots. Start watering areas planted as required by temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to a depth of 6 inches without run off or puddling. Add mulch topdressing as needed.

3.5.4 Earth Mounded Watering Basin for Individual Plant Pits without Irrigation.

Form with topsoil around each plant by placing a mound of topsoil around the edge of each plant pit. Watering basins must be 150 mm 6 inches deep for trees and 100 mm 4 inches deep for shrubs. Construct watering basin in a 1.4 m 4-1/2 foot diameter circle around specimen (not planted in a close group) trees and shrubs.

3.5.5 Weed Control Fabric Installation

Remove grass and weed vegetation, including roots, from within the area enclosed by edging. Completely cover areas enclosed by edging with specified weed control fabric prior to placing mulch layer. Overlap cut edges 6 inches.

3.5.6 Erosion Control Material

Install in accordance with manufacturer's instructions.

3.5.7 Placement of Mulch Topdressing

Place specified mulch topdressing on top of weed control fabric covering total area enclosed by edging. Place mulch topdressing to a depth of 3 inches.

3.5.8 Mulch Topdressing -N/A

3.5.9 Installation of Edging

Uniformly edge beds of plants to provide a clear cut division line between planted area and adjacent lawn. Construct bed shapes as indicated. Install metal or concrete edging material as indicater an as per manufacturer's instructions. Install edging material in a perfect 4 foot diameter circle inside the 4-1/2 foot watering basin, around individual specimen trees and shrubs not planted in a close group. Install edging with minimum one inch above ground level.

3.5.10 Fertilization

3.5.10.1 Fertilizer Tablets

Place fertilizer planting tablets evenly spaced around the plant pits to the manufacturer's recommended depth.

3.5.10.2 Granular Fertilizer

Apply granular fertilizer as a top coat prior to placing mulch layer and water thoroughly.

3.5.11 Watering

Start watering areas planted as required by temperature and wind conditions. Slow deep watering must be used. Apply water at a rate sufficient to ensure thorough wetting of soil to a depth 12 inches without run off or puddling. Watering of other plant material or adjacent areas must be prevented.

3.5.12 Staking and Guying

3.5.12.1 Staking

Stake plants with the number of stakes indicated complete with double strand of 12 gage guy wire as detailed. Attach guy wire half the tree height but not more than 5 feet high. Drive stakes to a depth of 2-1/2 to 3 feet into the ground outside the plant pit. Do not injure the root ball. Use hose chafer guards where guy wire comes in contact with tree trunk.

3.5.12.2 Guying

Guy plants as indicated. Attach two strands of guying wire around the tree trunk at an angle of 45 degrees at approximately 1/2 of the trunk height. Protect tree trunks with chafing guards where guying wire or cable contacts the tree trunk. Anchor guys to malleable iron anchors. Fasten flags to each guying wire/cable approximately 2/3 of the distance up from ground level. Provide turnbuckles as indicated.

3.5.12.3 Chafing Guards

Use hose chafing guards, as specified where guy wire/cable will contact the plant.

3.5.12.4 Deadmen

Place deadmen minimum 18 inches below ground surface. Place equal distance from tree trunk and around the plant pit.

3.5.12.5 Wood Ground Stakes

Drive wood ground stakes into firm ground outside of plant pit with top of stake flush with ground. Place equal distance from tree trunk and around the plant pit.

3.5.12.6 Iron Anchors

Drive malleable iron anchors into firm ground outside of plant pit a minimum 30 inches below finish grade. Place equal distance from tree trunk and around the plant pit.

3.5.12.7 Steel Screw Anchors

Insert steel screw anchors as recommended in manufacturer's data. Place equal distance from tree trunk and around the plant pit.

3.5.12.8 Flags

Securely fasten flags on each guy wire and cable approximately two-thirds of the distance up from ground level.

3.5.13 Pruning

Prune in accordance with safety requirement of TCIA Z133.

3.5.13.1 Trees and Shrubs

Remove dead and broken branches. Prune to correct structural defects only. Retain typical growth shape of individual plants with as much height and spread as practical. Do not cut central leader on trees. Make cuts with sharp instruments. Do not flush cut with trunk or adjacent branches. Collars must remain in place. Pruning must be accomplished by trained and experienced personnel and must be accordance with TCIA A300P1.

3.5.13.2 Wound Dressing

Do not apply tree wound dressing to cuts.

3.6 RESTORATION AND CLEAN UP.

3.6.1 Restoration

Turf areas, pavements and facilities that have been damaged from the planting operation must be restored to original condition at the Contractor's expense.

3.6.2 Clean Up

Excess and waste material must be removed from the installed area and must be disposed offsite at an approved landfill, recycling center, or composting center. Adjacent paved areas must be cleared.

-- End of Section --