SECTION S611 - PLANTING

S611-1 DESCRIPTION

Work consists of furnishing and planting trees, shrubs, vines and ground cover as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

Hereinafter, in general trees, shrubs, vines and ground cover will be referred to as plant materials.

S611-2 MATERIALS

S611-2.01 General

Plant materials are to be purchased directly from nursery growers located within east coast to mid-west regions of United States to ensure compatibility with local climatic conditions. Listing of nursery(s), including contact person, from which plant materials are being purchased is to be supplied to Project Manager within 14 calendar days of purchasing plant materials.

Plants are to be true to botanical name, grown in nurseries in USDA Zone 5 or colder and must meet standards of American Standard for Nursery Stock, latest edition as published by American Association of Nurserymen (AAN) of Washington, D.C.

Prior to delivery of plant materials to project site, City reserves right to inspect plant materials at nursery which are tagged for installation, and prior to digging of such plant materials. Plant materials which do not meet standards of quality and uniformity will be rejected. Such inspection and rejection may occur at nursery and/or project site. City will inspect replacement plant materials to ensure that they meet standards of quality and uniformity.

Balled and burlapped plants are to be freshly dug. Heeled-in or cold-storage plants will be accepted only with prior written approval from City. Manufactured, cracked or broken root balls are not acceptable.

Plant sizes are minimum size required, and plants will be accepted at larger sizes specified providing plants meet requirements of AAN standards of size and quality. Plants are to be live, healthy, and vigorous, free of disease, insect pests and their eggs and larvae. Plants are to be free of physical damage such as scrapes, broken or split branches or canes, unhealed scars, bark abrasions, sun scalds, fresh limb cuts, disfiguring knots, or any other defects.

Plants stored temporarily at nursery or at Contractor's site are to be properly heeled-in, protected from injury, and properly cared for to maintain plant's life, health, and vigor.

Container grown plants are to have been grown in container long enough for new fibrous roots to develop so that root ball is firm and will retain its shape and hold together when removed from container. Containers are to be sufficiently rigid and sound to hold root ball shape and protect root ball during shipping and handling.

Balled and burlapped plants are to be dug immediately before shipment, and properly dug and protected to preserve natural earth which is in contact with roots. Plants are to have labels securely attached indicating nursery of origin, plant size, and plant identification.

Tarpaulins or other covers are to be placed over plants being transported by open truck or open freight car to prevent wind damage and desiccation. Closed trucks and boxcars that are used for transportation of plants are to be adequately ventilated to prevent sweating.

S611-2.02 Trees

Trees are to be specimen quality trees grown for street tree usage with single strong central leaders for minimum of 3/4's of overall tree height. Trees are to have outstanding form, being symmetrical, heavily branched with even branch distribution and straight trunks, and densely foliated when in leaf. Trees are to possess normal balance between height and spread.

Tree caliper is to be 3 to 3-1/2 inches. Branching height for trees is to begin no lower than 6 feet from grade for major tree species, and 4 feet from grade for minor tree species, as measured at nursery.

Tree roots are to be balled and burlapped. Usage of wire baskets for balling tree roots is acceptable, but only natural burlap and jute twine may be used for wrapping root ball. Bare root tree stock is unacceptable.

Trees are to have well developed fibrous root system typical of their species. Trees are not to be pruned at or by nursery at any point during digging, loading and delivery process. Trees vegetative crown is to be securely tied prior to shipping to prevent damage.

S611-2.03 Shrubs

Shrubs are to be matched specimens from single block source.

Shrubs may be either container grown material or balled and burlapped. Bare shrub root materials will be accepted only with prior written approval from City.

S611-2.04 Vines and Ground Cover

Vines are to be of size specified and trained on vertical lattice or other framework, unless otherwise specified.

Ground cover plants are to be minimum 2 years old and well rooted.

S611-2.05 Planting Medium

Non-native planting medium is to consist of 80 percent coarse sand and 20 percent soil material by volume.

Soil material is to be natural, fertile, friable soil typical of region. Soil material is to be from surface layer of soil, free of undesirable materials which are larger than 1 inch in its greatest dimension. Types of undesirable materials are, but not limited to: refuse; paving materials such as concrete, asphalt, brick; materials which are toxic to plant growth and grass seed; subsoil; woody vegetation, stumps, roots, brush; clods, hard lumps, and rocks. Sod and herbaceous growth such as grass and weeds need not be removed from soil material, but are to be thoroughly broken up and mixed into overall soil material. Soil material is to contain between 3 and 6 percent of natural organic matter as determined by loss on ignition of moisture-free samples dried and tested in accordance with current methods of Association of Official Agricultural Chemists.

Soil material is to meet following requirements:

- Acidity range between 6.0 to 7.2 pH inclusive
- Fertility rate high in natural nutrients or amended to acceptable levels, as based on Cornell Soil Test
- Should tests and analysis indicate that soil material is deficient in any requirements, system of amelioration is to be proposed for approval

Soil material is to be tested prior to acceptance and placement. Testing is to be done by an approved independent testing laboratory, or by an agriculture unit of State university system. Representative sample of soil material is to be provided minimum of 21 days before use, to testing laboratory for analysis to allow sufficient time for testing. Test reports are to contain specific recommendations for amelioration including types of additive and fertilizer, and composition and rate and means of application, based upon soil test results and type of plant material to be planted.

At minimum, analysis is to include:

- Percent organic content
- Soil pH
- Percent clay, silt, sand particles, and fractionation
- Nutrient analysis

Soil material approved for use is to be stockpiled so as not to be mixed with other fill materials. Amelioration recommendations are to be followed during planting operations.

S611-2.06 Structural Soil

Structural soil is to be three component mix consisting of crushed stone, soil, and hydrogel, meeting following mix proportion:

Component	Percent by Dry Weight
Crushed Stone	80%
Soil	20%
Hydrogel	0.03%

Total optimum moisture at mixing should be 10 percent in accordance with AASHTO T 99 (ASTM D 698).

Crushed stone is to be highly angular granite or sandstone, without any fines, meeting following gradation requirements:

Screen Size	General Limits Percent Passing by Weight
1-1/2 inch	100%
3/4 inch	0%

Soil is to be loam to heavy clay loam in accordance with USDA soil classification system, with minimum of 20 percent clay. Organic matter should range between 2 percent and 20 percent.

Hydrogel is used as tackifier to prevent separation of crushed stone and soil during mixing and installation. Hydrogel is to be non-toxic, non-phytotoxic, natural or synthetic polymer, such as Gelscape as manufactured by Amereq Corporation; Soilmoist as manufactured by JRM Chemical Inc.; Supersorb as manufactured by Aquatrols Corporation; or approved equivalent.

S611-2.07 Curbed Planting Bed

A. General

Curbed planting bed composition and plantings will be as specified in Contract Documents.

B. Planting Soil

Non-native planting soil is to consist of 60 percent soil, 20 percent builder sand and 20 percent well decomposed compost material by volume. Soil is to be in accordance with Subsection S611-2.05 Planting Medium.

C. Mulch

Mulch is to be in accordance with Subsection S611-2.09 Mulch.

D. Geotextile Fabric

Geotextile fabric is to be in accordance with Subsection S611-2.10 Geotextile Fabric.

E. Stone Curb

Stone curb is to be either medina stone, blue stone or granite stone in accordance with Section S609 Curb. Width will be as specified in Contract Documents

F. Concrete Curb

Concrete curb is to be in accordance with Section S609 Curb.

S611-2.08 Sump Stone

Sump stone is to be underdrain filter material in accordance with requirements of Section S605 Underdrain.

S611-2.09 Mulch

Mulch is to be well shredded hardwood, maximum 1/2 to 1 inch in size, partially decomposed, free of disease and debris, with no green leaf matter or sprouts.

S611-2.10 Geotextile Fabric

Geotextile fabric is to be 100 per cent staple polyester and polypropylene non-woven needle-punched geotextile fabric designed for long-term passage of water, as per AEF 480HS as manufactured by American Engineering Fabrics Inc., FX-40HS as manufactured by Carthage Mills, 140NC as manufactured by Mirafi/TenCate, or approved equivalent.

S611-3 CONSTRUCTION DETAILS

S611-3.01 General

Planting seasons for deciduous plants is between March 15th and May 15th, and between October 15th and December 1st. No planting is to take place between December 2nd and March 14th.

Deciduous plants may be planted between May 16th and October 14th only with prior approved by Project Manager, and require weekly watering until final acceptance.

No planting is to be done in frozen soil, or soil in an unsatisfactory working condition.

Rocks or other underground obstructions encountered during excavation are to be removed to depth necessary to permit planting, or planting site moved to another location, as directed by Project Manager.

City will inspect all plants on Project site prior to their being planted. City reserves right to reject plants that are not in accordance with these specifications. Rejected plants are to be replaced in-kind with plants that are in accordance with these specifications.

S611-3.02 Preparation and Planting

A. General

Mark and outline limits of planting areas before commencing any digging operations, and completely clean planting area of debris, grass, weeds and other forms of vegetation. Removed debris and other undesirable excavated materials are to be properly disposed of off-site.

Excavate entire planting pit to minimum of twice diameter of root ball, and stockpile excavated material on-site for possible reuse as backfill material.

Plants are to be set plumb in all directions and at such level that after settlement, it bears same relationship to surrounding grade as it originally did before being transplanted. Plants are to be centered in planting pit on undisturbed subgrade material, or on well compacted backfill material.

Prior to backfilling planting pit, top half of root ball is to be exposed. Wire basket is to be cut or bent back, burlap and twine is to be cut and removed or peeled back. Bottom half of root ball is to remain contained, do not completely remove wire basket or burlap and twine from entire root ball. Synthetic fabric and/or synthetic rope is to be completely removed from entire plant.

Girdling and/or encircling roots on potted plants are to be loosened or cut.

Backfill planting pit with planting medium, or acceptable excavated material. Before excavated material can be reused for backfill, it is to be thoroughly cleaned of debris that is greater than 1 inch in diameter. Backfill is to be placed in multiple layers, 4 to 6 inches thick, thoroughly watering-in each successive layer to remove any air pockets.

B. Tree Planting Grass Area

Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Backfill remaining planter pit area with planting medium, and minimum of 3 inches of mulch.

C. Tree Planting Paved Area

1. *Tree Planting Paved Area – Stone/Brick Pavers.* Drainage sumps are to be provided in accordance with Subsection S611-3.02C5 Sump Installation. Tree is to be set at such level that after settlement, top of root ball is 1 to 2 inches below bottom of stone/brick pavers. Place geotextile fabric over entire opening of tree pit area, leaving an opening for tree trunk. Backfill remaining tree pit area with sand and stone/brick pavers in accordance with Section R616 Tree Planter.

2. *Tree Planting Paved Area – Tree Grate.* Drainage sumps are to be provided in accordance with Subsection S611-3.02C5 Sump Installation. Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below bottom of tree grate. Place geotextile fabric over entire opening of tree pit area, leaving an opening for tree trunk. Backfill remaining tree pit area with pea stone or mulch up to bottom of tree grate. Tree grate is to be installed in accordance with Section R616 Tree Planter.

3. *Tree Planting Paved Area – Mulch.* Drainage sumps are to be provided in accordance with Subsection S611-3.02C5 Sump Installation. Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Place geotextile fabric over entire opening of tree pit area, leaving an opening for tree trunk. Backfill remaining tree pit area with minimum of 3 inches of mulch.

4. *Tree Planting Paved Area – Flexible Porous Product*. Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Place flexible porous product over entire opening of tree pit area up to finish grade, leaving 3 to 4 inch opening around tree trunk. Flexible porous product is to be installed in accordance with Section S409 Flexible Porous Product.

5. *Sump Installation*. Drainage sumps can be constructed by excavating with an auger, post hole digger, or other such device. Drainage sump excavations are to be completely filled with underdrain filter material. After drainage sump excavations are completely filled, cover bottom of tree pit area, including drainage sumps, with geotextile fabric.

D. Tree Pit - Plantings by Others

Construct tree pit in accordance with Subsections S611-3.02 Preparation and Planting. Trees will be supplied by and planted by others.

E. Shrubs

Shrubs are to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Backfill remaining planter pit area with planting medium, and minimum of 3 inches of mulch.

F. Vines and Ground Cover

Place 1-1/2 to 2 inches of peat moss over planting bed material, and thoroughly saturate with water. Rototil planting bed area until saturated peat moss is thoroughly and uniformly blended with and into top 3 inches of planting bed material.

S611-3.03 Curbed Planting Bed

Curbed planting bed composition and plantings will be as specified in Contract Documents.

Mark and outline limits of curbed planting bed area before commencing any digging operations. Excavate entire area of curbed planting bed to minimum depth of 2.50 feet below finished grade, removing all materials. Excavated materials are to be removed and properly disposed of off-site in accordance with NYSDOT Section 203 Excavation and Embankment.

Curb is to installed in accordance with Section S609 Curb.

Plantings are to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Plants are to be set and planted in accordance with Subsections S611-3.02B Tree Planting Grass Area, S611-3.02F Shrubs and S611-3.02G Vines and Ground Cover, for types of plants to be planted.

Backfill excavation with planting soil to within 3 inches of top of curb. Backfill is to be placed in multiple layers 4 to 6 inches thick, thoroughly watering-in each successive layer to remove any air pockets.

If required, place geotextile fabric over entire opening of curbed planting bed area and on top of planting soil, leaving 3 to 4 inch opening around each plant. Finish curbed planting bed with minimum of 3 inches of mulch, evenly spread over entire planting box area. Mulch is not to extend over top of curb.

S611-3.04 Structural Soil

Structural soil is to be prepared and installed in accordance with manufacturer's instructions.

Typically structural soil components are delivered to site, and are mixed in batches as material is required for placement. Structural soil mix is to be mixed until uniform blend is produced. Structural soil mix is placed in lifts not exceeding 6 inches in thickness prior to compaction, and compacted to not less than 95 percent of standard Proctor density.

Structural soil is to be at or near optimum compaction moisture content in accordance with AASHTO T 99 (ASTM D 698), and is not to be placed in frozen, wet or muddy excavations.

Structural soil is to be protected from exposure to excess water and from erosion at all times. Do not stockpile or store structural soil, unless it is properly covered and protected with waterproof covering. Excess water that is introduced into structural soil after grading, is to be allowed to drain until optimum compaction moisture content is reached.
Excavate and compact proposed subgrade to depths, slopes and widths as required. Areas to receive structural soil are to be inspected by installer before starting work, and all defects such as incorrect grading, compaction, and inadequate drainage are to be reported to Project Manager and corrected before placing structural soil.

Excavation area is to be clear of all construction debris, trash, rubble and any other foreign material. In event that fuels, oils, concrete washout silts or other material harmful to plants have been spilled into subgrade material, excavate and remove contaminated subgrade material. Fill any over excavation with approved fill and compact to required subgrade compaction.

Do not proceed with placement of structural soil until all utility work in excavated area has been finished.

Clean up all trash and any soil or dirt spilled on any paved surface at end of each working day.

S611-3.05 Pruning

Pruning is to be limited only to those branches which are dead, damaged, weak, diseased, insect infested, rubbing against another branch, cross over another branch, or have tight branching angle or sucker growth. Pruning can also be done to reshape plant to improve overall shape or silhouette of plant by thinning or removing unnecessary branches. Use sharp clean pruning tools to cut branch, with final cut being made at branch collar. When heading is necessary, final cut is to be to lateral branch that is 1/3 to 1/2 diameter of branch to be removed.

S611-3.06 Mulch

Minimum of 3 inches of mulch is to be spread evenly to required thickness over entire planting area.

S611-3.07 Wrapping

Wrapping is not permitted unless otherwise specifically specified in Contract Documents.

S611-3.08 Fertilizer

Plantings are to be treated with slow release nitrogen fertilizer at manufacturer's recommended rates, and thoroughly watered in. Type of fertilizer to be used is to be as approved by Project Manager prior to application.

S611-3.09 Restoration

Areas disturbed by planting operations are to be restored in-kind. Excess backfill material is to be disposed of off-site.

S611-3.10 Care - Trees

Care of trees is to begin immediately after each tree is planted and is to continue for period of 2 years from date of planting. Care of trees is to include watering, pruning, fertilizing, and other reasonable means of ensuring that tree remains live, viable, and vigorous. At end of 2 year care period Contractor is to completely remove all staking and guying materials, and cease care.

If City determines that any tree has failed and is not live, viable or vigorous at any time during 2 year care period due to lack of proper installation or care, Contractor is to replace failed tree during next available planting season with new tree in accordance with these specifications. Contractor is to then care for new tree planting for an additional period of 2 years. At end of additional 2 year care period Contractor is to completely remove all staking and guying materials and cease care.

S611-3.11 Care – Shrubs, Vines and Ground Covers

Care of shrubs, vines and ground covers is to begin immediately after each plant is planted and is to continue for period of 1 year from date of planting. Care is to include watering, pruning, fertilizing, and other reasonable means of ensuring that plants remain live, viable, and vigorous. At end of 1 year care period Contractor is to completely remove all staking and guying materials, and cease care.

If City determines that any plant has failed and is not live, viable or vigorous at any time during 1 year care period due to lack of proper installation or care, Contractor is to replace failed plant during next available planting season with new plant in accordance with these specifications. Contractor is to then care for new plant for an additional period of 1 year. At end of additional 1 year care period Contractor is to completely remove all staking and guying materials and cease care.

S611-3.12 Warrantee

Trees are to be warranted for period of 2 years from date of planting against failure due to lack of proper installation and care as outlined in Section S611-3 Construction Details.

Shrubs, vines and ground cover plants are to warranted for period of 1 year from date of planting against failure due to lack of proper installation and care as outlined in Section S611-3 Construction Details.

S611-4 METHOD OF MEASUREMENT

S611-4.01 Plantings

Quantity to be measured for payment will be number of plants installed.

S611-4.02 Curbed Planting Bed

Quantity to be measured for payment will be number of square feet of curbed planting bed constructed, by measuring top surface area of curbed planting bed.

S611-4.03 Structural Soil

Quantity to be measured for payment will be number of cubic yards installed.

S611-5 BASIS OF PAYMENT

S611-5.01 General All Items

Unit price bid for all items includes cost of: inspection; layout; excavation; removing and disposing obstructions, debris, rubble, sod and other vegetation; ground preparation; furnishing, installing, pruning, wrapping and caring for plant; removing and disposing wire baskets, burlap, twine, rope and synthetic material; furnishing and installing backfill material, soil amendments, mulch, fertilizer, water, stakes, wire and webbing; replacement and additional care of any failed plant; and furnishing all labor, materials, and equipment necessary to complete work.

S611-5.02 Tree Planting Paved Area

Unit price bid also includes cost of: planting medium; mulch; sump installation; furnishing and installing underdrain filter material and geotextile fabric.

Furnishing and placing of stone/brick pavers, tree grates, and flexible porous product will be paid for under separate bid items.

S611-5.03 Tree Planting Paved Area – at Existing Tree Pit

Unit price bid also includes cost of: excavation; removing and disposing existing plant, backfill, fabric, left over guying materials; planting medium; sump installation; furnishing and installing underdrain filter material and geotextile fabric.

S611-5.04 Vines and Ground Cover

Unit price bid also includes cost of: furnishing and installing peat moss; planting medium; and rototiling.

S611-5.05 Tree Pit - Plantings by Others

Unit price bid includes cost of: excavation; removing and disposing obstructions, debris, rubble, sod and other vegetation; ground preparation; sump installation; furnishing and installing underdrain filter material and geotextile fabric; furnishing and installing planting medium, soil amendments; mulch; and furnishing all labor, materials, and equipment necessary to complete work.

Furnishing and placing of stone/brick pavers, tree grates, and flexible porous product will be paid for under separate bid items.

S611-5.06 Curbed Planting Bed

Unit price bid includes cost of: excavation; removing and disposing all excavated materials; furnishing and installing curb, planting soil, soil amendments, mulch; furnishing and installing geotextile fabric if required; and furnishing all labor, materials, and equipment necessary to complete work.

Furnishing and installing plantings for curbed planting bed will be paid for under bid Items S611.04XX Tree Planting, S611.07XX Shrub Planting, and S611.08XX Vines and Ground Cover.

S611-5.07 Structural Soil

Unit price bid includes cost of: excavation; removing and disposing all excavated materials; furnishing, preparing and installing structural soil; soil amendments; stockpiling; waterproof covering; protection; and furnishing all labor, materials, and equipment necessary to complete work.

S611-5.08 Excavation

Excavation will be measured from top of existing surface at time of excavation.

Excavation that is included in pay item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Payment will be made under:

Note: XX in bid item number represents each individual species of planting. i.e.: Kwanzan Cherry tree would be bid as S611.0401 Tree Planting (Prunus Serrulata "Kwanzan" - Kwanzan Cherry).

ITEM NO.	ITEM	PAY UNIT
S611.04XX	Tree Planting (species)	Each
S611.05XX	Tree Planting Paved Area (species)	Each
S611.06XX	Tree Planting Paved Area - at Existing Tree Pit (species)	Each
S611.07XX	Shrub Planting (species)	Each
S611.08XX	Vines and Ground Cover (species)	Each
S611.09	Tree Pit - Plantings by Others	Each
S611.1001	Curbed Planting Bed	Square Feet
S611.11	Structural Soil	Cubic Yard

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