

SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The Contractor shall furnish all labor, materials, tools, equipment, supervision, and services necessary to install sod, seed, preparation of soil, fine grading, watering, proper disposal of any excess earth or debris, all in accordance with the accompanying Drawings and these Specifications.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sodding.

1.3 RELATED SECTIONS

- A. Section 329300 – Plants

1.4 DEFINITIONS

- A. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

1.5 INFORMATIONAL SUBMITTALS

- A. Prior to delivery to the job site, contractor shall submit to the Owner or Landscape Architect the source and supplier of all grass sod, seed, fertilizer and other materials along with the type of equipment to be used on this project.
- B. Certification of each seed mixture for turfgrass sod.
- C. Product certificates.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Comply with applicable requirements of Federal, State, and Local laws, regulations and codes having jurisdiction at the project site.
 - 2. Contractor shall be responsible for certificates of inspection of plant material that may be required by Federal and Local authorities to accompany shipments of plants.
- B. Reference Standards
 - 1. "Standardized Plant Names" by the American Joint Committee of Horticultural Nomenclature.
 - 2. American National Standards Institute (ANSI); Publication Z60.1.
- C. Coordination

1. Work in conjunction with other trades as directed, taking all reasonable precautions to avoid disturbance or interference with any other operation or installation on the site. Contractors shall be responsible for the cost of replacing any material damaged as a result of his/her negligence.
 - D. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 2. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
 - a. Landscape Industry Certified Technician - Exterior.
 - b. Landscape Industry Certified Lawncare Manager.
 - c. Landscape Industry Certified Lawncare Technician.
 3. Pesticide Applicator: State licensed, commercial.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Storage of Materials
 1. All materials delivered to the job shall be stored so as to keep them in new condition and free from deterioration. Peat moss, fertilizer, etc., shall be stored in temporary sheds off-site at Contractor's expense.
 - B. Packaged Materials
 1. Deliver packaged materials in unopened containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.
 - C. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.
 - D. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.
- 1.8 JOB CONDITIONS
- A. Examination of Site:
 1. The bidder must acknowledge that he has examined the site, Drawings and Specifications and the submission of a quotation shall be considered evidence that examinations have been made.
 - B. Field Conditions: The Contractor shall verify drawing dimensions with actual field conditions and inspect related work and adjacent surfaces. The Contractor shall report to the Landscape Architect all conditions which prevent proper execution of this work.
 - C. The Contractor shall determine the exact location of all existing utilities, structures, and geogrid reinforcement before commencing work. The Contractor shall conduct his work so as to prevent interruption of service or damage to them. The Contractor agrees to be fully responsible for any and all damage which might be occasioned by the Contractor's failure to exactly locate and preserve any and all utilities, structures, and geogrid reinforcement.
- 1.9 SEQUENCING AND SCHEDULING

- A. Planting Time: Proceed with and complete planting as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- B. Planting Dates:
 - 1. Recommended dates for seeding and sodding shall be April 1 - June 15 for spring planting and September 1 - December 15 for fall planting.

1.10 MATERIALS CLEAN-UP

- A. The Contractor shall keep the premises free from rubbish and all debris associated with their work at all times and all unused materials and debris shall be removed from the site.

1.11 WARRANTY

- A. All plant material (lawns) shall be warranted for a period of not less than one (1) year from the date of issuance of the letter of Substantial Completion.
- B. All replacement stock shall be subject to the same warranty requirements as the original stock. Any damage due to replacement operations shall be repaired by the Contractor. At the end of the warranty period, inspections shall be made jointly by the Owner, Landscape Architect, and Contractor. All lawn areas not in a healthy growing condition shall be removed and replaced with grasses of a like kind and size before the close of the next planting season and before issuance of the letter of Final Completion.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.
- B. Grass seed shall be a blend of turf type fescues as detailed below. Provide fresh, clean, new-crop seed complying with established tolerances for germination and purity in accordance with the U.S. Department of Agriculture Rules and Regulations under the latest edition of the Federal Seed Act. All seed shall be maxed by the Dealer and shall be delivered to the site in sealed containers which shall bear the Dealer's guaranteed analysis. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be acceptable.

2.2 TURFGRASS SOD

- A. Turfgrass Sod: **Certified**, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.
- B. Turf Type Fescue Sod - Sod shall be a blend of not less than 3 improved Kentucky Bluegrass (*Poa pratensis*) varieties, a native mixture of Hounddog, Rebel, or Falcon Finebladed Turf Type Tall Fescue (*Festuca arundinacea*), and Rye (*Lolium jultiflorum* and *Perene domestic*). It shall be a mix of 20% Kentucky Bluegrass, 70% Finebladed Turf Type Tall Fescue, and 10% Rye. Sod shall be well rooted, 2 year old stock, 3/4" thick, harvested in rolls, and fertilized 2-3 weeks prior to cutting. The sod shall be top quality certified sod, free of weeds, undesirable native grasses, insects and diseases. All sod shall be machine cut and vigorously growing (not dormant). Maximum time from stripping to planting shall be 24 hours.

- C. Provide sod of uniform pad sizes with maximum 5 percent deviation in either length or width. Broken pads or pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically with a firm grasp on upper 10 percent of pad will be rejected.

2.3 FERTILIZERS

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, conforming to the applicable State Fertilizer Laws, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: Not less than 13% phosphoric acid and not less than 13% potassium, and percentage of nitrogen required to provide not less than 1 lb. of actual nitrogen per 1,000 sq. ft. of lawn area or as recommended by the County Extension Agent based on soil test results. Provide nitrogen in a form that will be available to lawn during period of growth.

2.4 PESTICIDES

- A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

EXECUTION

2.5 TURF AREA PREPARATION

- A. General:
 - 1. Clearing
 - a. All areas of turf establishment are to be cleared by the Contractor.
 - b. Clearing shall consist of the satisfactory removal and disposal of brush, rubbish, and other vegetative growth occurring within all proposed turf areas unless turf is being overseeded. All debris associated with this work shall be gathered and removed from the project by the Contractor.
 - 2. Preparation of Planting Mixture
 - a. Mix recommended soil amendments and fertilizers with topsoil at rates recommended by the soil test results. Delay addition of fertilizer if planting mixture will not be used within two (2) days.
 - 3. Protection of Existing Vegetation
 - a. All areas under drip lines of existing trees shall be kept free of construction equipment, trailers, material storage, and vehicles.
 - b. Exercise extreme care when working around existing trees to remain. No soil scarification or compaction from construction vehicles shall occur under any existing tree dripline.
 - c. In areas of established turf, the surrounding turf area shall be covered in a manner that will provide protection before excavations begin for sodded turf.
- B. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

- D. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

2.6 SODDING

- A. All sod areas indicated on the plans shall have temporary cover removed, fine graded and sodded as specified herein and in strict accordance with standard horticultural practices
- B. Lay sod within 24 hours from time of stripping. Do not plant dormant sod or if ground is frozen.
- C. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not overlap. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to each other. Lateral joints shall be staggered to promote more uniform growth and strength. Sod is not to be stretched or overlapped. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to insure contact with subgrade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering of adjacent grass.
- D. In sloping areas sod shall be laid with the long edges perpendicular to the slope and with staggered joints. In all drainage swales, regardless of the degree of slope, the sod shall be laid with the long edges parallel to the contour lines and with staggered joints.
- E. Where sod is indicated on the plans, all slopes greater than 3:1 (horizontal:vertical) and within all drainage swales shall be secured in-place with specified stakes. Stakes shall be placed at intervals no greater than 2'-0" on center, with a minimum of two stakes per piece of sod. Stakes shall be driven into the ground, leaving 2" above the sod line, with the broad face of the stake perpendicular to the slope.
- F. As sodding is completed in any one section, the entire area shall be rolled or tamped to insure solid contact of roots with the soil surface. Sod shall be watered immediately after rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly moistened. The operations of laying, tamping and watering for any piece of sod shall be completed within eight (8) hours.
- G. Sodded areas shall be guaranteed by the Contractor for the specified period (a minimum of two years) or longer if necessary to establish a dense cover as specified above.
- H. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
- I. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings.

2.7 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Landscape Architect:
 - 1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

- B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

2.8 MAINTENANCE

- A. The Contractor shall maintain sod and seed areas by weeding and mowing as required for healthy growth until issuance of the letter of Substantial Completion for the entire site and scope of work.
- B. The Contractor shall be responsible for watering sod and seed areas until the existing irrigation system is repaired and completely functional and the letter of Substantial Completion has been issued. Contractor shall be responsible for watering seed areas by hand where irrigation system does not cover. Hand watering of these areas shall continue until letter of Substantial Completion has been issued. Watering shall supplement natural rainfall and shall assure that the seed areas receive a minimum of one (1) inch of water per week. Seed shall be watered daily during the first week and in sufficient quantities to maintain moist soil to a depth of four inches (4"). After the first week seed shall be watered as necessary to maintain adequate moisture.

END OF SECTION 329200

SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The Contractor shall furnish all labor, materials, tools, equipment, supervision, and services necessary to install plant material, preparation of soil, fine grading, planting, mulching, guying, pruning, watering, and the proper disposal of any excess earth or debris, all in accordance with the accompanying Drawings and these Specifications.

1.2 SUMMARY

- A. Section Includes:
 - 1. Plants.
 - 2. Landscape edging

1.3 RELATED SECTIONS

- A. Section 329200 – Turf and Grasses

1.4 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.
- C. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.5 ACTION SUBMITTALS

- A. Prior to delivery to the job site, contractor shall submit to the Owner or Landscape Architect the source and supplier of all plant material, fertilizer and mulch, and other materials along with the type of equipment to be used on this project.
- B. Product Data: For each type of product.
- C. Samples of each type of mulch.

1.6 INFORMATIONAL SUBMITTALS

- A. Product certificates.

- B. Sample warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

1.8 QUALITY ASSURANCE

- A. Regulatory Requirements

1. Comply with applicable requirements of Federal, State, and Local laws, regulations and codes having jurisdiction at the project site.
2. Contractor shall be responsible for certificates of inspection of plant material that may be required by Federal and Local authorities to accompany shipments of plants.

- B. Reference Standards

1. "Standardized Plant Names" by the American Joint Committee of Horticultural Nomenclature.
2. "American Standard of Nursery Stock" by the American Association of Nurseryman.
3. American National Standards Institute (ANSI); Publication Z60.1.

- C. Substitutions

1. Substitutions of plant material will not be permitted unless authorized in writing by Owner or Landscape Architect. If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract Price. Such proof shall be substantiated and submitted in writing to the Owner and Landscape Architect at least thirty (30) days prior to start of the work under this Section. These provisions shall not relieve the Contractor of the responsibility of obtaining specified materials in advance if special growing conditions or other arrangements must be made in order to supply specified materials.

- D. Condition and Source of Plants

1. Plants shall be subject to review and approval by the Owner or Landscape Architect upon delivery for conformity to Specifications. Such approvals shall not impair the right of review and rejection during progress of the Work. Submit written request for inspection of plant material at place of growth and quantity of plants to be inspected.

- E. Coordination

1. Work in conjunction with other trades as directed, taking all reasonable precautions to avoid disturbance or interference with any other operation or installation on the site. Contractors shall be responsible for the cost of replacing any material damaged as a result of his/her negligence.

- F. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

1. Pesticide Applicator: State licensed, commercial.

- G. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Storage of Materials

1. All materials delivered to the job shall be stored so as to keep them in new condition and free from deterioration. Peat moss, fertilizer, etc., shall be stored in temporary sheds off-site at Contractor's expense.
- B. Packaged Materials
 1. Deliver packaged materials in unopened containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.
- C. Plant Material
 1. Plants shall not be delivered to the site until the corresponding beds are fully prepared. All shipments of nursery materials shall be thoroughly protected from the sun and from drying winds during transit. All plants which cannot be planted at once after delivery to the site of the work shall be well protected against the possibility of drying by wind and sun. Balls of earth on B&B plants shall be kept covered with soil or other acceptable material. All materials heeled-in on the property shall be adequately watered.
 2. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
 3. Handle planting stock by root ball.
 4. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.
 5. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
- D. Review of Stock
 1. All planting stock shall be inspected as required by Local, State, or Federal laws, and upon delivery at premises shall be subject to review by the Owner and/or Landscape Architect. All plant material is subject to rejection by the Owner and/or Landscape Architect either at time of delivery or after planting, provided it does not comply with the requirements stated herein. Any rejected stock shall be immediately removed from the premises and replaced with approved stock.

1.10 JOB CONDITIONS

- A. Examination of Site:
 1. The bidder must acknowledge that he has examined the site, Drawings and Specifications and the submission of a quotation shall be considered evidence that examinations have been made.
- B. Field Conditions: The Contractor shall verify drawing dimensions with actual field conditions and inspect related work and adjacent surfaces. The Contractor shall report to the Landscape Architect all conditions which prevent proper execution of this work.
- C. The Contractor shall determine the exact location of all existing utilities, structures, and geogrid reinforcement before commencing work. The Contractor shall conduct his work so as to prevent interruption of service or damage to them. The Contractor agrees to be fully responsible for any and all damage which might be occasioned by the Contractor's failure to exactly locate and preserve any and all utilities, structures, and geogrid reinforcement.

1.11 SEQUENCING AND SCHEDULING

- A. Planting Time: Proceed with and complete planting as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.
- B. Planting Dates:
 1. Trees, shrubs, and perennials shall be planted only when the ground is not frozen, snow covered, or in an otherwise unsuitable condition for planting. Spring planting shall generally occur between April 1 and June 15, and fall planting shall generally occur between August 15 and November 15.

1.12 MATERIALS CLEAN-UP

- A. The Contractor shall keep the premises free from rubbish and all debris associated with their work at all times and all unused materials and debris shall be removed from the site.

1.13 WARRANTY

- A. All plant material (trees, shrubs, etc.) and planting supplies (bark mulch, etc.) shall be warranted for a period of not less than one (1) year from the date of issuance of the letter of Substantial Completion.
- B. All replacement stock shall be subject to the same warranty requirements as the original stock. Any damage due to replacement operations shall be repaired by the Contractor. At the end of the warranty period, inspections shall be made jointly by the Owner, Landscape Architect, and Contractor. All plants not in a healthy growing condition shall be removed and replaced with plants of a like kind and size before the close of the next planting season and before issuance of the letter of Final Completion.
- C. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
 - b. Structural failures including plantings falling or blowing over.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. Topsoil shall be fertile, natural topsoil, typical of the locality. Stockpiled topsoil may be used. It shall be free of subsoil, slag, clay, stones, lumps, sticks, plants or their roots, toxic substances or other extraneous matter that may be harmful to plant growth or would interfere with future maintenance. Topsoil pH range shall be 6.0 to 7.0.
- B. Soil Testing:
 - 1. Onsite Topsoil – The Contractor shall be responsible for having onsite topsoil tested by the Local County Extension Office to determine the amounts of amendments needed to meet the desired pH, nutritional organic levels determined to be adequate for the area by the County Extension Agent. The Contractor shall submit topsoil tests to the Landscape Architect.
 - 2. Offsite Topsoil - The Contractor shall be responsible for having offsite imported topsoil tested by the Local County Extension Office to determine the amounts of amendments needed to meet the desired pH, nutritional organic levels determined to be adequate for the area by the County Extension Agent. The Contractor shall submit topsoil tests to the Landscape Architect.
- C. Soil Conditioners and Amendments:
 - 1. Aluminum sulfate shall be horticultural grade.
 - 2. Peat shall be a natural product of sphagnum peat (peat moss), derived from a fresh-water site conforming to ASTM D 2607 except as otherwise specified. Peat shall be shredded and conditioned in storage piles for at least 6 months after excavation.
 - 3. Sand shall be clean and free of toxic materials.
 - 4. Vermiculite shall be horticultural grade and free of any toxic materials.
 - 5. Rotted manure shall be unleached stable or cattle manure not less than 8 months or more than 2 years old, containing not more than 25 percent by volume of straw, sawdust, or other bedding

materials; and containing no chemicals or ingredients harmful to plants. The manure shall be heat treated to kill weed seeds.

6. Rotted sawdust shall have 7.5 pounds of nitrogen added uniformly to each cubic yard and shall be free of chips, stones, sticks, soil, and toxic substances.
 7. Gypsum shall be 90 percent pure, free of any toxic materials, and at least 95 percent by weight shall pass a 4-mesh sieve.
 8. Other amendments as recommended by County Extension Agent.
- D. Treatment of Saline Soil: Saline soil shall be leached out by a controlled amount of water sufficient enough to leach the salts to a level below the root zone. Water used for this purpose shall have a low salt content.

2.2 PLANTING SOIL MIXTURE

- A. The "topsoil mixture" shall be composed of on-site or off-site topsoil and additional soil amendments appropriate for the location and plantings based on the soil test provided in the appendix.
- B. The "planting soil mixture" for all planting pits shall be 80% topsoil mixture, 10% peatmoss, and 10% well composted manure. Mix thoroughly for uniformity of texture and distribution before placing in pit.

2.3 PLANT STOCK

- A. Plant material shall be first quality stock and shall conform to the code of standards set forth in the current edition of the American Standards of Nursery Stock sponsored by the American Association for Nurserymen, Inc.
- B. Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Species and variety as specified on the Drawings and delivered to the site shall be certified true to their genus, species and variety and as defined within the current edition of "Standardized Plant Names" by the American Joint Committee of Horticultural Nomenclature.
- E. The Contractor shall facilitate inspection and identification by labeling of trees, shrubs, and perennials with a durable waterproof label and weather-resistant ink. Labels shall state the correct plant name and size as specified in the plant list of required plants. Labels shall be securely attached to plants and shall be legible for 60 days after delivery to the planting site. Wire identification tags shall not be used. Plants not labeled will be rejected. The Contractor shall remove all tags after the Landscape Architect's acceptance of the installation.
- F. Plants shall be nursery grown and shall be of varieties specified in the plant list bearing botanical names.
- G. Planting stock shall be well-branched and well formed, sound, vigorous, healthy, free from disease, sun-scale, windburn, abrasion, and harmful insects or insect eggs; and shall have healthy, normal unbroken root systems. Deciduous trees and shrubs shall be symmetrically developed, of uniform habit of growth, with straight trunks or stems, and free from objectionable disfigurements. Evergreen trees and shrubs shall have well-developed symmetrical tops with typical spread of branches for each particular species or variety. Evergreen trees and shrubs shall not be sheared. Plants shall have been grown under climatic conditions similar to those in the locality of the project. Deciduous plants shall be dug in a dormant stage only.
- H. Stock Sizes: All stock measurements - caliper, height, branching level, number of canes, ball sizes shall be in strict accordance with the latest edition of the American Standard for Nursery Stock, unless otherwise noted on the plans. Plants used on the project shall meet or exceed all minimum requirements indicated in the size, condition, and remarks sections of the planting legend on the plan sheets.

- I. All stock shall be balled and burlapped or container grown stock. Bareroot stock of any kind is unacceptable.
- J. All plant material must be watered the same day it is planted in order to comply with these Specifications.
- K. All trees shall be staked and guyed as shown on Drawings.

2.4 FERTILIZER

- A. All fertilizers shall be horticultural grade complete formula fertilizers and shall conform to the applicable State Fertilizer Laws.
- B. Plant Stock: Fertilizer shall be "AGRIFORM" slow release fertilizer tablets. To be applied per manufacturer's specifications. Perennials areas: Fertilizer shall be applied at the same rate as the lawn areas.

2.5 MYCORRHIZAL

- A. All mycorrhizal shall be horticultural grade complete formula mycorrhizal and shall conform to the applicable State Mycorrhizal Laws.
- B. MYKE Pro Landscape Granular Mycorrhizal Inoculant
 - 1. Distributor: Subject to compliance with requirements, provide products by the following:
 - 2. Arbor Valley Nursery, Brighton, CO, (303) 654-1682, ArborValleyNursery.com
 - 3. For approved equal, reference specific written instructions from manufacturer

2.6 MULCHES FOR PLANTINGS

- A. Hardwood Mulch: Mulch in all open planting beds labeled as hardwood mulch shall be shredded double ground oak or dark hardwood mulch of its natural color. Cypress, or dyed or colored mulch is unacceptable. Bark shall be of a relative uniform particle size with a median size of one and one-half inches (1-1/2") and shall be free of sticks, stones, leaves and any other debris.

2.7 EDGING

- A. Bed edging adjacent to turf, concrete curb, pavement and sidewalk shall be steel edging per details. Color to be green. Size to 4" x 12' x 1/8" thick. Manufactured by Sure-loc, Colmet, Reyerson or other approved equal. Submit sample for approval

2.8 GUYING AND STAKING MATERIALS

- A. Stakes for tree support shall be steel "T" bar fence post, 8' long, painted dark green with the top 6" painted white.
- B. Tree tie systems shall be easily adjustable, strong in all weather, and easily attached and removed. Hose and wire are not acceptable for staked trees. Tree tie systems shall be the following or approved equal:
 - 1. Cinch Ties, J. Lichtenthaler
P.O. Box 938
Cerritos, CA 90701
 - 2. Adj-A-Type
Heavyweight only, plastic chain twist tie
 - 3. A.M. Leonard and Sons
Piqua, Ohio 43356
Plastic Binder Tye, tie with tapered beads that snap lock

2.9 WATER

- A. Water shall not contain elements toxic to plant life. It shall be the Contractor's responsibility to obtain water to be used for watering of plant material.

2.10 ANTI-DESICCANT

- A. Anti-desiccant shall be an emulsion that will provide a film over plant surfaces permeable enough to permit transpiration, and not damage the plant.

2.11 HERBICIDES

- A. Herbicides used must comply with all applicable State and Federal laws and be registered with the U.S. Environmental Protection Agency.
 - 1. Herbicide control shall be: Pre-emergence application of "Dacthal" or equivalent applied according to manufacturer's recommendations and incorporated into soil as specified. Herbicide shall be in dry/pellet form.
 - 2. Post-emergence application of "Roundup" or equivalent, applied as specified by manufacturer. Use with extreme care to avoid contact with landscape plantings.

2.12 PESTICIDES

- A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 GENERAL PREPARATION

- A. Clearing
 - 1. All planting bed areas are to be cleared by the Contractor.
 - 2. Clearing shall consist of the satisfactory removal and disposal of rock, gravel, rubbish, and other vegetative growth occurring within all planting bed areas. All debris associated with this work shall be gathered and removed from the project by the Contractor.
- B. Preparation of Planting Soil Mixture
 - 1. Mix recommended soil amendments and fertilizers with topsoil at rates recommended by the soil test results. Delay addition of fertilizer if planting mixture will not be used within two (2) days.
- C. Protection of Existing Vegetation
 - 1. All areas under drip lines of existing trees shall be kept free of construction equipment, trailers, material storage, and vehicles.
 - 2. Exercise extreme care when working around existing trees to remain. No soil scarification or compaction from construction vehicles shall occur under any existing tree dripline.
 - 3. In areas of established turf, the surrounding turf area shall be covered in a manner that will provide protection before excavations begin.

3.2 TREE, SHRUB, AND PERENNIAL PLANTING

- A. All planting shall be performed by personnel familiar with the accepted procedure of planting and under the constant supervision of a qualified planting foreman.
- B. All planting is to be done as shown on drawings and as specified herein and in strict accordance with standard horticultural practices.

C. Layout

1. Plant material locations and planting bed outlines shall be staked on the project site by the Contractor and approved by the Owner or Landscape Architect before any plant pits or beds are excavated. Plant material locations and bed outlines may be adjusted by the Landscape Architect to meet field conditions.

D. Installation of Trees and Shrubs

1. Planting pits shall be excavated to produce vertical sides and flat bottoms. Scarify side walls to alleviate glazing and loosen any hard subsoil in bottom of pit. Minimum pit sizes shall be as shown on drawings. Tree pits within parking lot islands shall be excavated per detail removing existing soil to depth shown prior to gravel and geotextile placement.
2. Dispose of all subsoil, clay, and rock (off-site) removed from planting excavations. The top six (6) inches of topsoil excavated from the planting pit, if free from subsoil, clay, rocks, roots, or other debris, may be utilized in the topsoil mixture as specified.
3. Setting Plants
 - a. Balled and burlapped and container grown plants shall be handled and moved only by the ball or container. Plants shall be set plumb and held in position until a sufficient quantity of planting soil mixture has been firmly placed around roots or ball. Plants shall be set in relation to surrounding grade so that they are 2" higher than the depth at which they are grown in the nursery, collecting field, or container. Fertilizer in tablet form shall be placed prior to backfilling and in accordance with the manufacturer's specifications. Mycorrhizal
 - b. Apply Mycorrhizal to the top 2/3 of root balls of all plant material according to the manufacturer's recommended rates. Inoculant must be physically rubbed onto the root ball thoroughly prior to backfilling planting hole. There is no restriction for use of slow release fertilizers with Mycorrhizal inoculant.
 - c. Balled and bur lapped stock shall be backfilled with the specified planting soil mixture to approximately half the depth of the ball and then tamped and watered. Burlap and tying materials shall be carefully removed or opened and folded back from top 1/3 of root ball. The remainder of backfill of planting soil mixture shall be tamped and watered.
 - d. Container-grown stock shall be removed from containers without damaging plant or root system. Planting shall be completed as specified for balled or burlapped plants.
4. Edging Planting Beds
 - a. All planting beds shall be edged with steel edging as indicated on the drawings.
5. Mulching (Hardwood)
 - a. Prior to the installation of mulch, all areas to be covered shall be weed free and treated with the specified pre-emergent herbicide as specified herein.
 - b. Mulch for planting beds shall be installed to a minimum depth of three inches (3") in all planting bed areas specified on the Drawings. Mulch for all tree plantings shall be three inches (3") in depth.
 - c. Mulching shall take place within 48 hours after planting.
 - d. Mulch shall be kept out of the crowns of shrubs and off walls, sidewalks, light standards, and other structures.
 - e. The top of all areas covered with of mulch shall be 1" below the top of adjacent curb, walk, wall, wall cap, or edge of pavement.
6. Pruning: The Contractor shall prune new plant material in the following manner: Dead and broken branches shall be removed. Evergreen plants shall not be thinned out or sheared. Shrubs shall not be sheared. All plants shall meet or exceed the minimum requirements indicated in the size, condition, and remarks sections of the planting legend on the plan sheets after pruning has taken place. Cuts shall be made with sharp instruments, and shall be flush with trunk or adjacent branch to insure elimination of stubs. "Headback" cuts at right angles to line of growth shall not be permitted. All trimmings shall be removed from the site.

3.3 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees, shrubs, and vines as directed by Landscape Architect.
- C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- D. Do not apply pruning paint to wounds.

3.4 PLANT MAINTENANCE

- A. The Contractor shall maintain trees, shrubs, and other plants by pruning, cultivating, and weeding as required for healthy growth until issuance of the letter of Substantial Completion for the entire site and scope of work. The Contractor shall tighten and repair stake and tree tie systems, reset trees and shrubs to proper grades or vertical position, restore or replace damaged wrappings, and apply herbicides and pesticides to keep trees, shrubs, and other plant material free of insects and disease as required until issuance of the letter of Substantial Completion.
- B. The Contractor shall be responsible for watering trees, shrubs, and other plant material until the irrigation system is completely functional and the letter of Substantial Completion has been issued. Contractor shall be responsible for watering trees by hand where irrigation system does not cover. Hand watering of these trees shall continue for 90 days after letter of Substantial Completion has been issued. Watering shall supplement natural rainfall and shall assure that the trees, shrubs, and other plant material receive a minimum of one (1) inch of water per week. Seed shall be watered daily during the first week and in sufficient quantities to maintain moist soil to a depth of four inches (4"). After the first week seed shall be watered as necessary to maintain adequate moisture.

END OF SECTION 329300