

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Temporary erosion- and sedimentation-control measures.

1.2 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction.
- E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.
- B. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

3. Provide traffic control for portion (s) of trail remaining open during construction times when equipment and trucks are crossing existing trail. Some trail closures will be necessary during working hours. Contractor to supply trail closure signage.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises.
- D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.
- F. The following practices are prohibited within protection zones:
 1. Storage of construction materials, debris, or excavated material.
 2. Parking vehicles or equipment.
 3. Excavation or other digging unless otherwise indicated.
 4. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- I. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - EXECUTION

2.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Protect existing site improvements to remain from damage during construction.
 1. Restore damaged improvements to their original condition, as acceptable to Owner.

2.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties, roads, and walkways.
- B. Verify that flows of water redirected from construction areas or generated by construction activity are treated with erosion and sediment control measures.

- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

2.3 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory topsoil unless further excavation or earthwork is indicated.
- C. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

2.4 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 31 10 00

SECTION 31 20 00 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating and filling for rough and finish grading of the Site and erosion control structures.

B. Related Sections:

1. Division 31 Section "Site Clearing" for site, grubbing, stripping and stockpiling topsoil.
2. Division 32 Section "Seeding" for finish grading in seed and mulch areas.

1.2 DEFINITIONS

- A. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- B. Fill: Subsoil materials used to raise existing grades.
- C. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- D. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services.

1.3 SUBMITTALS

- A. Pre-excavation Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.4 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

3. Provide traffic control for portion (s) of trail remaining open during construction times when equipment and trucks are crossing existing trail. Some trail closures will be necessary during working hours.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 1. Do not proceed with work on adjoining property until directed by Owner.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.
- D. Do not commence earth moving operations until temporary erosion and sedimentation control measures are in place.

1.5 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.

1.6 DEWATERING

- A. Construction will occur during low flow period of year (Aug. – Nov.). Most channel work will occur in or near standing and or flowing water. The contractor is responsible for dewatering the active construction site as-needed.
- B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

1.7 TOPSOIL

- A. Remove topsoil in accordance with Section 32 91 17

1.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations.

1.9 BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.

1.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place soil fill on subgrades free of mud, frost, snow, or ice.

1.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

1.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698.

1.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

1.14 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Owner's Representative.

END OF SECTION 31 20 00

SECTION 32 91 17 - TOPSOIL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Strip topsoil from on-site locations and place in stockpile.
 - 2. Spread stockpiled topsoil in prepared areas.
 - 3. Furnish and spread topsoil on prepared areas.

1.2 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.
- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction.
- E. Imported Soil: Soil that is transported to the project site for use.

1.3 SUBMITTALS

- A. For Contractor furnished topsoil: a minimum of seven working days before soil delivery, submit to the Owner's Representative the laboratory test results from each topsoil source to be used.

PART 2 - PRODUCTS

2.1 CONTRACTOR FURNISHED TOPSOIL

- A. Determine PH, EC, and SAR with a saturated soil paste or 1:1 soil/water testing method. Meet the following:
 - 1. PH: 6.0 to 8.0

2. Electrical Conductivity (EC): Less than 4 ds/m
3. Sodium Adsorption Ratio (SAR): Less than 10
4. Organic Matter: 1 to 2 percent

2.2 TEXTURAL CLASSIFICATION

- A. Loam, sandy loam, silt loam, or sandy clay loam not exceeding the percentiles in Table 1. Refers to Textural Triangle National Soils Handbook, Part 603-5.

Table 1

Textural Classification	
Soil Component	Percentile Range
Sand	20 to 70
Silt	20 to 70
Clay	10 to 30

- B. Topsoil shall be free of:
1. Subsoils (no B or C horizon soils).
 2. Coarse sand and gravel.
 3. Stiff clay, hard clods, or hard pan soils.
 4. Rock larger than 3 inches in any dimension.
 5. Trash, litter, or refuse.
 6. Invasive and noxious weeds and weed seeds.

2.3 SOURCE QUALITY CONTROL – CONTRACTOR FURNISHED MATERIAL

- A. Obtain Soil Samples while the Owner’s Representative is present. Provide no less than ½ lb. per soil sample.
- B. Obtain samples from a thin slice of soil cut from the side of a freshly dug hole or by using a soil auger or sampling tube.
- C. Mix the several small samples taken from various places around the source together to produce a composite sample.
- D. More than one composite sample may be required if the topsoil horizon changes significantly across the source.
- E. Store samples in a clean container at room temperature and out of direct sunlight.
- F. Label the location and date on each sample container.

2.4 SOIL TESTING

- A. The Contractor shall submit soil samples to an approved independent soil testing laboratory capable of performing the tests listed in this section.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Complete final grading and surface preparation before placing topsoil.
- B. Provide a suitable topsoil surface just before seeding and hydromulching.

3.2 STRIP AND STOCKPILE EXISTING TOPSOILS

- A. Strip the topsoil only from areas to be excavated as identified on the plans.
- B. Leave in place and protect individual trees, groups of trees, shrubs, or other vegetation to be protected during construction as noted on the plans and flagged in field by owners representative.
- C. Stockpile stripped topsoil at location that is acceptable to the Owner's Representative.
- D. Grade to minimize erosion on and around the stockpiles.

3.3 SPREAD STOCKPILED TOPSOIL

- A. Place and spread topsoil over the area identified on the plans after final grading activities have been approved.

3.4 SPREAD CONTRACTOR FURNISHED TOPSOIL

- A. Clear the areas to receive topsoil of all trash, debris, and weeds, and dispose of objectionable material in an approved manner.
- B. Place remaining salvaged plants and logs.
- C. Place and spread the stockpiled topsoil over the prepared slopes to the depth of 6 inches.
- D. Avoid tracking across or compacting topsoil.

END OF SECTION 32 91 17

SECTION 32 92 10 - SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Seeding.
2. Erosion-control material(s).

B. Related Sections:

1. Division 31 Section "Site Clearing" for topsoil stripping and stockpiling.
2. Division 31 Section "Earth Moving" for excavation, filling and backfilling, and rough grading.

1.2 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- D. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- F. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.3 SUBMITTALS

- A. Certification of Seed: From seed vendor for each mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 1. Certification of each seed mixture. Include identification of source and name and telephone number of supplier.

- B. Qualification Data: For qualified landscape Installer.
- C. Material Test Reports: For existing native surface topsoil.
- D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of seeded plants during a calendar year. Submit before expiration of required initial maintenance periods.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful native seed establishment.
- B. Preinstallation Conference: Conduct conference at Project Site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

1.6 PROJECT CONDITIONS

- A. Seeding Restrictions: Seed during one of the following periods. Coordinate seeding periods with initial maintenance periods to provide required maintenance from date of seeding completion.
 - 1. Spring Seeding: As authorized by Owner's Representative.
 - 2. Fall Seeding: September 15 to December 1, or as authorized by Owner's Representative.
- B. Weather Limitations: Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 SEED

- A. Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

- B. Native Grass and Wildflower Seed: Fresh, clean, and dry new seed, of mixed species as specified in Construction Plans.
- C. Seed Carrier: Inert material, sharp clean sand or perlite, mixed with seed at a ratio of not less than two parts seed carrier to one part seed.
- D. Order the seed mix according to seed size in order to accommodate drill seeder settings.

2.2 PLANTING SOILS

- A. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on site or contractor supplied topsoil. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

2.3 HYDROMULCH

- A. Wood Fiber Hydromulch with Tackifier to protect seeded areas from wind and water erosion during establishment.
- B. Materials: 100% wood fiber, nonasphaltic tackifier, and dark green marker dye.
- C. Application Rate: 3,000 pounds per acre.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Owner's Representative and replace with new planting soil.

3.2 PREPARATION

- A. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 SEEDING

- A. Sow seed with drill seeding machine or broadcast spreader. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Distribute seed evenly by sowing equal quantities in two directions at right angles to each other.
 - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
 - 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Protect seeded areas by applying wood fiber hydromulch with tackifier over seeded areas that are not to receive erosion control blanket or woven coir fiber mat.

3.4 CLEANUP AND PROTECTION

- A. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- C. Remove nondegradable erosion-control measures after plant establishment period.

END OF SECTION 32 92 10

SECTION 32 93 00 - PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plants.

B. Related Requirements:

1. Section 32 92 10 SEEDING for seeding, and erosion-control materials.

1.2 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Planting Area: Areas to be planted.

C. Planting Soil: Existing topsoil, or contractor furnished topsoil.

D. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, or herbaceous vegetation.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.3 DELIVERY, STORAGE, AND HANDLING

A. 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 if applicable.

B. 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.

1.4 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

- B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 - 1. Spring Planting: As authorized by Owner's Representative.
 - 2. Fall Planting: September 15 to November 15, or as authorized by Owner's Representative.
- C. Weather Limitations: Proceed with planting only when existing and forecasted weather and river water elevation conditions permit planting to be performed when beneficial and optimum results may be obtained.

1.5 WARRANTY

- A. Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within warranty period of 12 months.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: 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.
- B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Owner's Representative, with a proportionate increase in size of roots or balls.
- 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. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

2.2 WILLOW AND COTTONWOOD POLE CUTTINGS

- A. Collect cuttings from live native stands of the species listed from October 15 to February 15.
- B. Obtain cuttings from riparian areas that will be destroyed due to construction, from areas adjacent to the project, or from locations that are ecologically matched in climate and elevation.
- C. Prune branches using current standards from the International Society of Arboriculture when collecting cuttings from trees and shrubs that will remain.

- D. Remove no more than 1/3 of the branches from any tree or shrub when obtaining cuttings from vegetation that will remain.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance of the Work.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
 - 3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable or which is dusty.
- B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Owner's Representative and replace with new planting soil.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and existing plants from damage caused by planting operations.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Owner's Representative acceptance of layout before excavating or planting. Make minor adjustments as required.

3.3 WILLOW AND COTTONWOOD POLE CUTTINGS STORAGE

- A. Store dormant pole cuttings acquired but not planted in the fall, until ground thaws.
- B. Store in plastic bags at temperatures between 32 degrees F to 41 degrees F or outside in snow-filled plastic bags.
- C. Do not allow cuttings to dry out or break bud while being stored.

3.4 WILLOW AND COTTONWOOD POLE INSTALLATION

- A. Install per plan details.
- B. Stake pole cuttings at plan locations for approval or as directed.
- C. Dig a hole deep enough to accommodate 90 percent of the cutting.
- D. Remove 1 inch from the basal end of the cutting just before planting.
- E. Place one cutting in the hole basal end first.
- F. Backfill and compact around pole to eliminate air pockets.
- G. Water the pole planting and add more backfill if settling occurs.

3.5 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits.
 - 1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
 - 2. Excavate approximately three times as wide as ball diameter.
 - 3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
 - 4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
 - 5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
 - 6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
- B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.
- C. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.6 TREE AND SHRUB PLANTING

- A. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- B. Bare-Root Stock: Set and support each plant in center of planting pit with root flare adjacent finish grade.
 - 1. Backfill: Planting soil.

2. Spread roots without tangling or turning toward surface. Plumb before backfilling, and maintain plumb while working.
 3. Carefully work backfill in layers around roots by hand. Bring roots into close contact with the soil.
 4. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
- C. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.7 GROUND COVER AND PLANT PLANTING

- A. Dig holes large enough to allow spreading of roots.
- B. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.
- C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.8 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, restoring planting saucers, adjusting and resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

3.9 REPAIR AND REPLACEMENT

- A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Owner's Representative.

3.10 CLEANING AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

- C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

END OF SECTION 32 93 00