321440 STONE PAVING, STEPS, WALLS AND BENCH

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide stone paving, steps, walls and bench as shown on the Drawings and specified herein. The work includes:

1. Supplying and placing sand setting bed for paving stones.
2. Supplying and installing paving stones in quality, shape, thickness and color as specified and shown on drawings.
3. Supplying and placing mortar setting bed for steps.
4. Supplying and installing stone slab steps in quality, shape, thickness and color as specified and shown on drawings.
5. Supplying stone wall veneer in quality, shape, thickness and color as specified and shown on drawings.
6. Supplying and installing stone bench in quality, shape, thickness and color as specified and shown on drawings.

B. Related work:

1. Section 313000 – Earthwork
2. Section 321100 – Base Courses
3. Division 3 – Concrete
4. Division 4 - Masonry

1.2 QUALITY ASSURANCE

A. Comply with Section 02000 requirements.

B. Materials and methods of construction shall comply with the standards of the American Society for Testing Materials, (ASTM).

C. Installation: Performed only by skilled workers with experience installing specified product in specified pattern on a complete project of comparable scale and quality.

D. Sample panels: Provide sample panels of paving and wall veneer for approval by the Landscape Architect, using materials and patterns indicated for project work. The sample area may be a portion of the project work, but must pass approval before continuing paving work. Provide an area of not smaller than thirty (30) square feet. Correct and rebuild sample panels until Landscape Architect's acceptance of the work. Subsequent work must match approved sample area for methods, color, texture and workmanship.

E. Do not change source of materials during the course of this work.

1.3 SUBMITTALS

A. Shop Drawings: Provide shop drawings to the Landscape Architect for approval prior to ordering materials.

1. Shop Drawing shall show all stone pieces, identified by number and related to their locations in the construction drawings.

2. All drawings shall include dimensions of all stone units; and shall indicate details, fasteners connections, joints, finishes, and adjacent work.

B. Samples: Deliver to job site a representative stone sample (min. 12” x 2’-0”) for each element in the design (i.e., pavers, step, wall veneer). Landscape Architect and Owner will review for color, texture, finish, and general condition.

1. Samples that do not meet approval shall be replaced until approval is met.

C. If applicable, submit manufacturer’s product data and installation instructions for stone units.

D. Submit manufacturer’s certification that paving units comply with specified material and physical requirements.

E. Submit approximately one gallon of sand to be swept into paving joints.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect paving units from damage, chipping, and soiling during delivery and storage. Store off the ground on pallets or wood platforms, or as per approved industry standards.

B. Store loose granular materials in a well drained area on a solid surface to prevent mixing with foreign materials. Cover loose granular materials in inclement weather to prevent saturation.

1.5 PROJECT CONDITIONS

A. Review installation procedures and coordinate paving work with other work affected by the unit paving work.

B. Cold weather:

1. Do not use frozen materials or materials mixed or coated with ice or frost.
2. Do not build on frozen work or wet, saturated or muddy subgrade. Remove and replace paving damaged by frost or freezing.

C. Protect partially completed paving against weather damage when work is not in progress.

D. Provide temporary barricades and warning lights as required for protection of project work and public safety.

E. Protect adjacent work from damage, soiling, or staining during paving operations.

PART 2 - PRODUCTS

2.1 MATERIALS / MANUFACTURERS

A. All stone pavers shall be granite of the following two types:

1. Freshwater Pearl
2. Woodbury Gray

Finish shall be flamed. Refer to drawings for unit paver dimensions. Stone to be supplied by Freshwater Stone, 4 Upper Falls Road, P.O. Box 15, Orland, Maine 04472, (207) 469-6331, info@freshwaterstone.com, or approve equal.

B. All stone steps, wall veneer, and bench shall be Freshwater Pearl granite from the same source as the pavers.

C. Granite, sand and subbase materials shall be regionally extracted and fabricated.

D. Sand setting bed: Provide hard, durable, clean, washed natural sand aggregate.

E. Mortar setting bed: Provide mortar in accordance with ASTM C 270.

F. Concrete shall be as indicated on the drawings and specified in Division 3 - Concrete.

G. Subbase as indicated on the drawings and specified in Section 02300 - Earthwork.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine installation conditions. Do not start stone work until unsatisfactory conditions are corrected.

B. Do not use paving units with chips, cracks, voids, discolorations, or other visible defects.

C. Cut paving units with motor-driven saw equipped with a diamond blade designed to cut masonry with clean, sharp unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible. Where cutting is required, use the largest size units possible. Avoid the use of small pieces of pavers or large joint spaces, except as indicated on the Drawings.

3.2 PREPARATION

A. Compaction of soil backfills and fills

1. Place backfill and fill soil materials in layers not more than 6 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.

2. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

3. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

4. Under granite pavers, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.

B. Field quality control

1. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

a) Determine prior to placement of fill that site has been prepared in compliance with requirements.
b) Determine that fill material and maximum lift thickness comply with requirements.
c) Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

2. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

3. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

4. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

5. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 25 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

6. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.3 INSTALLATION: SAND SETTING BED

A. Place units at the locations and grades indicated on the drawings so that they are plumb, level, and in alignment on prepared base. Use care in moving units to avoid scratching, chipping, or gouging the surfaces. Adjust elevation of units by shimming with fine gravel

B. Joints: All joints shall be square and true, to the dimensions indicated on the drawings.

C. Spread sand evenly over prepared substrate to maximum thickness of 1 inch.

D. Dampen and roller compact sand to level and even surface.

E. Screed and scarify top 1/2 inch of sand.

F. Place paver units in pattern shown on plans from straight reference edge.

G. Sprinkle sand over surface, sweep into joints and moisten. Recover with additional sand until firm joints are achieved. Remove excess sand.

H. Tamp and level paver units with mechanical vibrator until units are firmly bedded, level, and to correct elevation and gradients.

I. Recover with additional sand, sweep into joints and remove excess sand.

J. Clean completed paved area, leaving a surface free of all mortar, jointing or other foreign materials.

K. Protect work area and bedding course from damage until covered with paver units. Protect completed paving against damage throughout construction.

3.4 CLEANING

A. Remove and replace paving units that are broken, chipped, stained, or otherwise damaged as directed by the Landscape Architect. Provide and install new matching pavers as specified, and eliminate evidence of replacement.

B. Clean soiled surfaces using cleaning solution. Do not harm pavers, joint materials, or adjacent surfaces.

C. Use non-metallic tools in cleaning operations.

D. Rinse surfaces with clean water.

E. Broom clean paving surfaces. Dispose of excess sand.

F. Perform cleaning during installation of work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from unit paving operations.

3.5 STOCKPILE

A. Contractor shall provide Owner with ten (10) additional pavers and five (5) additional veneer units. Stone shall be carefully stockpiled as per manufacturer's recommendation storage facility designated by the Owner for use as replacements as needed.

B. **END OF SECTION 321440**

SECTION 329300 - PLANTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Preparation of topsoil.
2. Topsoil bedding.
3. Trees, plants, and ground cover.
4. Mulch.
5. Fertilizer.
6. Pruning.
7. Maintenance

B. Related Sections:
1. Section 32 14 40 - Stone Pavement

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Plants:
1. Basis of Measurement: By each.
2. Basis of Payment: Includes preparation of subsoil, placing topsoil, planting, watering and maintenance to specified time period.

1.3 REFERENCES

A. American National Standards Institute:
1. ANSI A300 - Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices.
2. ANSI Z60.1 - Nursery Stock.

B. Forest Stewardship Council:
1. FSC Guidelines - Forest Stewardship Council Guidelines.

1.4 DEFINITIONS

A. Weeds: Vegetative species other than specified species to be established in given area.

B. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections and as required by applicable governmental authorities.

C. Submit Product certificates signed by manufacturers or vendors certifying that materials and products comply with specified requirements.
   1. Manufacturer's certified analysis for standard products.
   2. Label data substantiating that plants, trees, shrubs, and planting materials comply with specified requirements.

D. Samples of each of the following:
   1. Sample of imported mulch.
   2. Sample of imported topsoil.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, at least fifteen names and address of Landscape Architects and Owner's, total years of experience and Landscape contractor's license number.

F. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.
   1. Chemical and mechanical analysis of topsoil and suitability as a medium for growing plant material. Include recommendations of amendments required to make topsoil suitable as a growing medium.

G. Submit proposed planting schedule indicating anticipated dates and locations for each type of planting. Correlate with specified maintenance periods to provide maintenance from date of substantial completion.

H. Submit typewritten maintenance instructions recommending procedures to be established by Owner for maintenance of landscaping for an entire year. Submit prior to expiration of required maintenance periods.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Submit typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

A. Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.

B. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability together with proposal for use of equivalent material for L.A. approval.

C. Package standard products with manufacturers certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with

methods established by the Association of Official Agricultural Chemists, wherever applicable.

D. Provide trees, shrubs and plants of quantity, size, genus, species and variety shown on the drawings in compliance with ANSI Z60.1 "American Standard for Nursery Stock". Provide healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sun scald, injuries, abrasions, or disfigurement.

E. Label each tree and shrub with securely attached waterproof tag bearing legible designation of botanical and common name.

F. Where formal arrangements or consecutive order of trees or shrubs are shown, select stock for uniform height and spread, and label with number to assure symmetry in planting.

G. The Landscape Architect may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size and quality. Landscape Architect retains right to further inspect trees and shrubs for size and condition of balls and root systems insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.

H. Measure trees and shrubs according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6" (150 mm) above ground for trees up to 4" (100-mm) caliper size, and 12" (300 mm) above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

I. Tree Pruning: ANSI A300 Pruning Standards for Woody Plants.

1.8 QUALIFICATIONS

A. Installer Qualifications: Landscape work shall be performed by a single firm specializing in Landscape work. Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful Landscape establishment.
   1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.

B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Landscape Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

1.9 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum 2 weeks prior to commencing work of this section.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Packaged Materials: Deliver packaged materials in containers with manufacturer's certification of weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

C. Trees and Shrubs: Deliver trees, shrubs, and ground covers. Do not prune before delivery, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery. Do not drop trees and shrubs during delivery. For trees which cannot be dug in the summer, Contractor shall have trees pre-dug and heeled-in at the nursery where they are grown until planting. Contractor shall be responsible for ensuring that the trees have been adequately watered and cared for at the nursery prior to delivery. No substitutions will be allowed for trees which cannot be "summer-dug".
   1. Ship Landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to Landscape materials.
   2. Label each tree and shrub with securely attached waterproof tag bearing legible designation of botanical and common name.
   3. Where formal arrangements or consecutive order of trees or shrubs are shown, select stock for uniform height and spread, and label with number to assure symmetry in planting.

D. Handle balled and burlap-ed stock by the root ball.

E. Deliver trees, shrubs, and ground covers after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist.
   1. Set plant stock on ground and protect root system with soil, peat moss, sawdust, or other acceptable material.
   2. Do not remove container-grown stock from containers before time of planting.
   3. Water root systems of trees and shrubs stored on site as often as necessary to maintain root systems in optimal condition.

F. The Landscape Architect may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size and quality. Landscape Architect retains right to further inspect

trees and shrubs for size and condition of balls and root systems insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.

G. Deliver trees and shrubs after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture.

H. Plant material damaged as a result of delivery, storage or handling will be rejected.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Proceed with and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.

C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required.

D. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting.

E. Plant trees and shrubs after final grades are established and prior to seeding operations, unless otherwise acceptable to Landscape Architect. If planting of trees and shrubs occurs after seeding work, protect seeded areas and promptly repair damage to seeded areas resulting from planting operations.

1.12 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Install plant life in coordination with installation of underground irrigation system piping, watering heads and soil aeration system.

C. Coordinate installation of planting materials to occur during optimal planting seasons if possible or in "normal" seasons for each type of plant material required in this locale.
   1. After notification to proceed, planting operations shall be conducted under favorable weather conditions during the normal planting season. The Landscape Contractor shall make provisions for watering the material on an as-needed basis and as frequently as is required to insure that plant material thrives.

1.13 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for warranties.

B. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

C. Special Warranty: Warrant trees for a period of one year after date of Substantial Completion and all other plant material for 60 days, against defects including death and unsatisfactory growth, except for defects resulting from inadequate maintenance, neglect, or abuse by Owner, abnormal weather conditions during warranty period, or incidents that are beyond Contractor's control.

D. Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition during warranty period. Replace trees and shrubs which are in doubtful condition at end of warranty period; unless, in opinion of the Landscape Architect, it is advisable to extend warranty period for a full growing season.

E. Another inspection will be conducted at end of extended warranty period to determine acceptance or rejection. Only one replacement per tree, shrub or plant will be required at end of warranty period, except for losses or replacements due to failure to comply with specified requirements.

F. Replace planting materials that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

G. A limit of one replacement of each plant material will be required, except for losses or replacements due to failure to comply with requirements.

1.14 MAINTENANCE SERVICE

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance service.

B. Maintain plant life immediately after placement until plants are well established and exhibit vigorous growing condition. Continue maintenance until termination of warranty period.

C. Maintenance includes:
1. Cultivation and weeding plant beds and tree pits.
2. Applying herbicides for weed control. Remedy damage resulting from use of herbicides.
3. Remedy damage from use of insecticides.
4. Irrigating sufficient to saturate root system.
5. Pruning, including removal of dead or broken branches.
6. Disease control.

7. Maintaining wrapping, guys, [turnbuckles,] and stakes. [Adjust turnbuckles to keep guy wires tight.] Repair or replace accessories when required.
8. Replacement of mulch.

PART 2 PRODUCTS

2.1 TREES, PLANTS, AND GROUND COVER

A. Regional Materials: Provide plantings, soil and mulch materials harvested and fabricated within 500 miles of Project Site.

B. Planting Stock:
1. Deciduous Trees: Provide trees of a minimum height and caliper scheduled or shown and with branching configuration recommended by ANSI Z60.1 for type and species required. Provide single stem trees except where special forms are shown or listed. Provide only balled and burlapped deciduous trees.
2. Deciduous Shrubs: Provide shrubs of the height shown or listed and with not less than minimum number of canes required by ANSI Z60.1 for type and height of shrub required. Provide Container grown deciduous shrubs subject to specified limitations for container grown stock.
3. Coniferous and Broadleafed Evergreens: Provide evergreens of sizes shown or listed. Dimensions indicate minimum spread for spreading and semi-spreading type evergreens and height for other types, such as globe, dwarf, cone, pyramidal, broad upright, and columnar. Provide normal quality evergreens with well balanced form complying with requirements for other size relationships to the primary dimension shown. Provide only balled and burlapped evergreen trees.
4. Species: In accordance with Standardized Plant Names, official code of American Joint Committee on Horticulture Nomenclature.
5. Identification: Label individual plants or each bundle of plants when tied in bundles.
6. Plants: No. 1 Grade conforming to “American Standard for Nursery Stock” of American Association of Nurserymen (AAN); well-branched, vigorous and balanced root and top growth; free from disease, injurious insects, mechanical wounds, broken branches, decay and other defects.
7. Trees: Furnish with reasonably straight trunks, well balanced tops, and single leader.
8. Deciduous plants: Furnish in dormant state, except those specified as container grown.

2.2 SOIL MATERIALS

A. Topsoil for landscape work is not available at site and shall be furnished as specified.

B. Provide new topsoil which is fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots,

stumps, stones larger than 2" in any dimension, and other extraneous or toxic matter harmful to plant growth.

C. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well drained sites where topsoil occurs in a depth of not less than 4"; do not obtain from bogs or marshes.

D. Planting medium for plaza trees to be manufactured for optimal plant growth and for supporting the plaza paving. Soil specifications to be developed in coordination with a licensed soil scientist with experience designing soils for urban conditions.

2.3 Perform chemical and mechanical analysis on topsoil. Topsoil shall contain at least 5% organic matter determined by loss of ignition of moisture-free samples dried in accordance with the current method of the Association of Official Agricultural Chemists. The acidity range shall be pH 6.5 to pH 7.0 inclusive. The chemical analysis shall state the percentages of nitrogen, phosphoric acid and potash.

2.4 SOIL AMENDMENT MATERIALS

A. Aluminum Sulfate: Commercial grade, unadulterated.

B. Sand: Clean, washed sand, free of toxic materials.

C. Lime: ASTM C 60-2, Class T, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 (2.36 mm) sieve and a minimum 75 percent passing a No. 60 (250 micrometer) sieve. Provide lime in the form of dolomitic limestone.

D. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.

E. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

F. Permatill: 3/8 inch to No. 8 Stallite Permatill rotary Kiln Expanded Slate (3/8 to 5/16 inch)

G. ASTM C330: ASTM gradation 3/8 inch to No. 8 size

H. The expanded slate must contain no clay lumps or any organic impurities.

I. Herbicides: EPA registered and approved, of type recommended by manufacturer.

J. Water: Potable.

K. When soil tests indicate soil amendment, apply soil conditioners or fertilizers to amend soil to specified conditions.

L. Tree Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing not less than 5% total nitrogen, 10% available phosphoric acid and 5% soluble potash.

M. Bone Meal: Raw, finely ground, commercial grade, minimum of 3 percent nitrogen and 20 percent phosphorous.

2.5 MULCH MATERIALS

A. Organic Mulch: Mulch shall be 100 percent fine-shredded pine or other softwood bark of uniform size and free from rot, leaves, twigs, debris, stones, or any material harmful to plant growth. Bark shall have been shredded and stockpiled no less than two months and no more than two years before use.

B. Submit 5 gallon sample for approval.

2.6 ACCESSORIES

A. Wrapping Materials: Tree wrap tape not less than 4" wide, designed to prevent bore damage and winter freezing.

B. Stakes: Provide stakes and deadmen of sound new hardwood, treated softwood, free of knot holes and other defects.

C. Cable, Wire, Eye Bolts: Provide wire ties and guys of 2 strand, twisted, pliable galvanized iron wire not lighter than 12 ga. with zinc coated turnbuckles.

D. Plant Protectors: Provide not less than 1/2" diameter rubber or plastic hose, cut to required lengths and of uniform color, material and size to protect tree trunks from damage by wires.

2.7 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Test and analyze imported and existing topsoil.

C. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt and organic matter; pH value.

D. Provide recommendation for fertilizer and soil amendment application rates for specified planting as result of testing.

E. Testing is not required when recent tests are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected. Do not seed the site until the Landscape Architect has reviewed the final grades.

3.2 PREPARATION

A. Lay out individual tree and shrub and groundcover locations and areas for multiple plantings. Entire areas for multiple plantings shall be chiseled to a depth of 12 inches and tilled and amended to a depth of 8 inches with the same soil mixture as is required for planting backfill material. Stake locations, outline areas, and secure Landscape Architect's acceptance before the start of planting work. Make minor adjustments as may be required by the Landscape Architect. Notify the Landscape Architect at least 10 working days prior to placement of all plantings.

3.3 PLANTING SOIL PREPARATION

A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

B. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.

C. For tree pit or trench backfill, mix planting soil before backfilling and stockpile at site.

D. For planting beds, mix planting soil prior to planting.
   1. Incorporate ground limestone with dry soil prior to mixing fertilizer. Mix with the topsoil at the appropriate rate per cubic yard of topsoil used in the planting mixture, depending on the pH value indicated by the chemical analysis of the topsoil.

E. Do not perform soil preparation or plant installation when soils are frozen, wet, in poor tilth or otherwise unsuitable for planting.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Pits and Trenches: Excavate with vertical sides and with bottom of excavation slightly raised at center to assist drainage. Loosen hard subsoil in bottom of excavation to a depth of 6 inches, using a cultimulcher or similar equipment. Remove stones over 1-1/2 inches in diameter, sticks stones or other extraneous matter.
   1. Excavate planting pits and zones as per the planting details.

B. Obstructions: Notify Landscape Architect if unexpected rock, utilities, or other structures, or obstructions detrimental to trees or shrubs are encountered in excavations.

C. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

D. Fill excavations with water. Allow to percolate out before placing setting layer and positioning trees and shrubs.

E. Stop work immediately and notify Landscape Architect if any utilities are encountered.

3.5 PLANTING TREES, SHRUBS AND GROUNDCOVER

A. Set plants, plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
1. Place stock on setting layer of compacted planting soil.
2. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill. For cacti, wait two weeks after planting to apply water.

B. Set container-grown stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
1. Carefully remove containers so as not to damage root balls.
2. The root ball shall be loosened to alleviate matted or encircling roots. Roots shall be spread out evenly in an outward, radial fashion.
3. Place stock on setting layer of compacted planting soil.
4. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

C. Dish and tamp top of backfill to form a 3-inch-high mound around the rim of the pit. Do not cover top of root ball with backfill.

D. Wrap trees of 2-inch (50-mm) caliper and larger with trunk-wrap tape if the species is susceptible to sun or wind scorch. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Inspect tree trunks for injury, improper pruning, and insect infestation and take corrective measures required before wrapping. Do not wrap the trees at the base to discourage insect infestation.

3.6 TREE AND SHRUB PRUNING

A. Prune, thin, and shape trees and shrubs as directed by Landscape Architect.

B. Only minimal pruning should be necessary at time of planting since plant material shall conform to the specified standards for quality. All pruning performed by the Contractor shall conform to the standards of the current ANSI A300, American National Standard for tree care operations. Under no circumstances shall the Contractor cut or prune leaders or remove more than 1/3 of the top without permission of the Landscape Architect. Prune to remove dead wood, crossovers, split or broken branches. Do not shorten, trim or clip branches solely for appearance purposes unless directed to by the Landscape Architect.

3.7 TREE AND SHRUB GUYING AND STAKING

A. Upright Staking and Tying: Stake trees of 2- through 5-inch (50- through 125-mm) caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend at least 72 inches (1800 mm) above grade. Set vertical stakes and space to avoid penetrating balls or root masses. Support trees with 2 strands of flexible Arbortape or equivalent 3/4-inch woven belt synthetic fabric strap at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree. Flag heavily in recreation areas or any places where children are likely to be.

B. Note: Only upright staking of trees will be allowed around child play areas to avoid tripping hazards. Refer to the staking detail on the drawings.

3.8 MULCHING

A. Mulch backfilled surfaces of pits, trenches, planted areas, and other areas indicated on the plans.

B. Organic Mulch: Apply the following average thickness of organic mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.
   1. Thickness: minimum 2-inch depth of mulch materials.

3.9 INSTALLATION OF MISCELLANEOUS MATERIALS

A. Apply anti-desiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.
   1. When deciduous trees or shrubs are moved in full-leaf, spray with anti-desiccant at nursery before moving and again 2 weeks after planting.

3.10 INSPECTION AND ACCEPTANCE

A. When Landscape work is completed, including maintenance, Landscape Architect will, upon written request, make a final inspection to determine acceptability.

B. When inspected Landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by Landscape Architect and found to be acceptable. Remove rejected plants and materials promptly from Project Site.

3.11 CLEANUP AND PROTECTION

A. During landscaping, keep pavements clean and work area in an orderly condition.

B. Protect landscaping from damage due to Landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged Landscape Work as directed.

3.12 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property unless an agreement is made with the Owner otherwise.

3.13 INSPECTION AND ACCEPTANCE

A. When Landscape work is 100 percent complete, including maintenance, Landscape Architect will, upon request, make an inspection to determine acceptability. Landscape work may be inspected for acceptance in portions agreeable to Landscape Architect and the Owner, provided work offered for inspection is complete.

B. Where inspected Landscape Work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected and found to be acceptable. Remove rejected plants and materials promptly from project site.

END OF SECTION 329300